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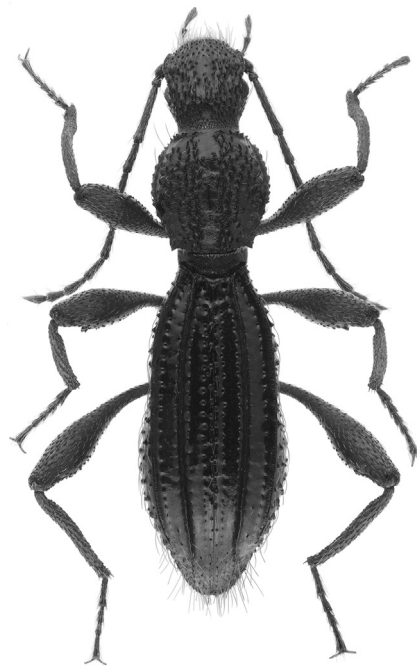


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На титуле оригинальная фотография М.В. Набоженко *Leptodes zulkovi* Semenov, 1909

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Редактирование, корректура, обработка иллюстраций и компьютерная верстка – С.В. Набоженко



## Новые виды долгоносиков рода *Trachyphloeoides* Formánek, 1907 (Coleoptera: Curculionidae: Blosyrini) из Китая

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**Резюме.** Род *Trachyphloeoides* Formánek, 1907 (типовой вид *T. sordidus* Faust, 1890) включает 8 видов, шесть из которых описаны здесь как новые для науки: *T. sordidus* (провинция Ганьсу), *T. io* Grebennikov, 2018 (провинция Юньнань), *T. belousovi* sp. n. (провинция Сычуань), *T. hartmanni* sp. n. (провинция Сычуань), *T. kabaki* sp. n. (провинция Юньнань), *T. potanini* sp. n. (провинция Ганьсу), *T. reuteri* sp. n. (провинция Сычуань), *T. shokhini* sp. n. (провинция Юньнань). Дана определительная таблица видов рода *Trachyphloeoides*.

**Ключевые слова:** *Trachyphloeoides*, новые таксоны, Китай, определительная таблица.

### New species of weevils of the genus *Trachyphloeoides* Formánek, 1907 (Coleoptera: Curculionidae: Blosyrini) from China

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**Abstract.** Brief morphological characteristic of the little known genus *Trachyphloeoides* Formánek, 1907 (type species *T. sordidus* Faust, 1890) is given. It is known from Gansu, Sichuan and Yunnan provinces in China. The genus includes eight species, from which six are described herein as new for science: *T. sordidus* (Gansu Province), *T. io* Grebennikov, 2018 (Yunnan Province), *T. belousovi* sp. n. (Sichuan Province), *T. hartmanni* sp. n. (Sichuan Province), *T. kabaki* sp. n. (Yunnan Province), *T. potanini* sp. n. (Gansu Province), *T. reuteri* sp. n. (Sichuan Province), *T. shokhini* sp. n. (Yunnan Province). *Trachyphloeoides potanini* sp. n. is similar to *T. sordidus* in the shape of the rostrum, strongly compressed in the basal half and blunted apex of the penis; the new species differs from the latter one in the following features: pronotum moderately transverse, 1.53 times as wide as long; apical half of the antennal scape covered by narrow scales and setae; the 1<sup>st</sup> funicular segment slightly longer than the 2<sup>nd</sup>; setae on the elytral interstriae are narrower, about 2.5–3.35 times as long as wide. *Trachyphloeoides belousovi* sp. n. is similar to *T. reuteri* sp. n. in the shape of elytra, covered by semierected and long setae, differs from it in the following features: rostrum at the level of antennal insertion 1.21 times as wide as the length of the antennal scape; apical margin of elytra angularly curved at middle; surface of the abdominal ventrites 3 and 4 looks like transversal carina, ventrite 5 rounded at apex; scales on elytra flattened, lanceolate, with hair-shaped apex; penis noticeably narrowed apically, smoothly dorsoventrally curved, its lamella moderately narrowly rounded and slightly blunted in the middle; armament of the endophallus not projects beyond apex of penis. *Trachyphloeoides reuteri* sp. n. has the rostrum at the level of the antennal insertion 1.37 times as wide as the antennal scape length; apical margin of elytra broadly rounded; abdominal ventrites 3 and 4 smoothly convex, ventrite 5 almost straightly truncate at apex; elytral scales usually with equal length and width or barely elongate, slightly pointed or broadly incised at apex; penis almost parallel sided, at middle part somewhat compressed from sides, strongly curved dorsoventrally, apex of lamella broadly blunted and emarginated; armament of endophallus distinctly projects beyond apex of penis in the shape of semitransparent plate. *Trachyphloeoides hartmanni* sp. n. is similar to *T. io* and *T. shokhini* sp. n. in oviform elytra. It differs from both species in the following features: eyes strongly convex; apical part of 5<sup>th</sup> elytral interstria distinctly elevated with tubercle at apex; penis gradually narrowed apicad, 3.3 times as long as wide. *Trachyphloeoides shokhini* sp. n. differs from *T. io* in the following features: inner side of hind tibiae with distinct sharpened granules; 1<sup>st</sup> protarsomere transverse, 2<sup>nd</sup> one strongly transverse, 2.42 times as wide as long, 3<sup>rd</sup> protarsomere 1.26 times as wide as protibial apex; penis narrower, 3 times as long as wide, at middle part distinctly compressed from sides; armament of the endophallus with two long sclerotized rods, slightly projecting from basal margin of the penis. *Trachyphloeoides kabaki* sp. n. easily differs from all congeners in the following features: eyes almost hemispherical, rather strongly projected beyond of the head contour; rostrum usually distinctly narrowed apicad; elytra smoothly compressed from sides behind humeri; 2<sup>nd</sup>–5<sup>th</sup> of elytral interstriae with tubercles at the apical part distinctly projecting beyond the body contour. A key to eight species of the genus *Trachyphloeoides* is given.

**Key words:** *Trachyphloeoides*, new taxa, China, identification key.

Предлагаемая работа продолжает публикации автора, посвященные изучению жуков-долгоносиков из Сино-Тибетских гор Китая. В ней представлены новые материалы по бескрылым горным долгоносикам рода *Trachyphloeoides* Formánek, 1907 из трибы Blosyrini Lacordaire, 1863. Согласно каталогу долгоносиков Палеарктики [Alonso-Zarazaga et al., 2023] род *Trachyphloeoides* включает 2 вида: *T. sordidus* Faust, 1890 (типовой вид) и

*T. io* Grebennikov, 2018. Здесь приводится описание еще шести новых для науки видов этого рода из китайских провинций Ганьсу, Сычуань и Юньнань.

### Материал и методы

Работа выполнена на основе коллекций Зоологического института РАН (ZIN, Санкт-Петербург, Россия) и

Музея природы в Эрфурте (NME, Naturkundemuseum Erfurt, Германия). Жуки наклеены на прямоугольные картонные пластинки, отчлененное брюшко наклеено на ту же пластинку в заднем правом углу, а гениталии и терминалии помещены в каплю водорастворимого фиксатора в заднем левом углу. Длина тела жуков измерялась от переднего края глаз до вершины надкрылий, длина пениса – по прямой, соединяющей основание и вершину его вентральной стенки. В видовых очерках размеры тела обоих полов объединены в общий диапазон. Индексы, приведенные для *T. sordidus*, измерены по фотографии лектотипа. Для характеристики формы чешуек использована работа Арзанова и Валова [2011].

Публикуемые здесь фотографии лектотипа *T. sordidus* сделаны Олафом Ягером (Dr Olaf Jäger, SNSD, Senckenberg Naturhistorische Sammlungen, Дрезден, Германия), остальные – автором. Фотографии гениталий и терминалий выполнены с препаратов в глицерине на микроскопе Axio Imager M-1 фирмы Carl Zeiss в лаборатории биометода Всероссийского научно-исследовательского института защиты растений (ВИЗР, Санкт-Петербург, Россия).

**Subfamily Entiminae Schoenherr, 1823**  
**Tribe Blosyrini Lacordaire, 1863**  
**Род *Trachyphloeoides* Formánek, 1907**

Formánek, 1907: 124.

Типовой вид *Trachyphloeus sordidus* Faust, 1890 по монотипии.

Для вида *Trachyphloeus sordidus* Форманеком был выделен самостоятельный род *Trachyphloeoides* в составе трибы *Trachyphloeini* Gistel, 1848. Боровец [Боровец, 2009] перенес этот род в трибу *Blosyrini* на основании следующих признаков: головотрубка не коническая; спинка головотрубки очень широкая, скрывает сверху усиковые бороздки; при осмотре сбоку усиковые бороздки желобковидные; рукоять усиков доходит до заднего края глаза или едва заходит за него; бедра без зубца, коготки лапок сросшиеся.

**Переописание.** Самец. Глаза круглые, латеральные, расположены ближе к верхней стороне головы. Головотрубка поперечная, как правило, не коническая, ее ширина в вершинной части в 1.21–1.44 раза больше длины рукояти усиков. Спинка головотрубки и лоб находятся в одной плоскости, с отчетливой или неясной поперечной бороздкой между ними, вершинная часть спинки довольно сильно расширена, по бокам закруглена и умеренно распластана, целиком скрывает усиковые бороздки. Голова позади глаз поперечно перетянута, лоб по бокам приподнят в виде бугорков.

Усиковые бороздки латеральные, не доходя до глаз, сильно изогнуты вниз. Рукоять усиков булавовидная, в состоянии покоя не заходит за задний край глаз. Жгутик усиков 7-члениковый, 1-й членик слегка длиннее и шире 2-го, 2-й удлиненный, приблизительно в 2 раза длиннее 3-го, 3–7-й почти круглые, слегка расширяются к булаве. Булава усиков широко веретеновидная, ее 1-й членик приблизительно равен длине остальных, вместе взятых.

Переднеспинка умеренно или сильно поперечная, наиболее широкая дистальнее середины, ее бока почти прямо сходятся к основанию. Передний край переднеспинки по бокам прямой, без заглазничных лопастей. Щиток очень маленький, едва заметный.

Надкрылья овальные, в средней части почти параллельносторонние, или яйцевидные, на вершинном скате подо-

гнуты, вершинный край надкрылий закруглен или угловидно изогнут посередине. Надкрылья без бугорков или с единственным бугорком на вершине 5-го промежутка, иногда с бугорками на 2–5 промежутках на вершинном скате и перед ним. Жуки бескрылые.

Передние тазики соприкасаются, одинаково отстоят от переднего и заднего краев переднегруды. Бедра без зубца, голени прямые или слегка изогнуты внутрь, на вершине не расширены, иногда едва расширены, с довольно крупным шиповидным мукро на внутреннем углу, вершина голени с венчиком из несомкнутого ряда длинных светло-коричневых шипиков. 2-й членик передних лапок поперечный, 3-й – двухлопастной, коготки в основной половине сросшиеся, на вершине свободные.

1-й абдоминальный венрит приблизительно в 2.5 раза длиннее 2-го, 3-й и 4-й одинаковой длины, слегка короче 2-го, 5-й трапециевидный или треугольный, закругленный на вершине.

Вентральная и боковые стенки пениса умеренно склеротизованы, дорсальная – мембранозная. Остиальная пластина обычно уже пениса, иногда плохо различима. Тегмен без параметра. Вооружение эндофаллуса обычно с двумя продольными склеротизованными тяжами.

Жуки обычно целиком в плотном земляном налете. Тело в густом покрове из ланцетовидных прижатых чешуек (у *T. reuteri* sp. n. чешуйки широкие, едва удлиненные, на вершине слегка заострены или вырезаны) и торчащих, иногда полуприжатых щетинок. Чешуйки и щетинки с отчетливой микроскульптурой из продольных бороздок. Спинка головотрубки в вершинной части голая. Головная капсула на нижней стороне голая, с узкой полоской чешуек вдоль заднего и нижнего края глаз.

Самка. Внешние отличия от самца выражены очень слабо. Ламелла *spiculum ventrale* треугольная, слегка поперечная или удлиненная, манубриум приблизительно в 1.5 раза длиннее ламеллы. Сперматека с длинным серповидным согну, который значительно крупнее, чем *gamus* и *collum*, последние сильно сближены друг с другом. Кокситы на вершине с отчетливым стилусом. Вагина мембранозная, без склеротизованных полей.

Жуки небольшого размера: длина 3.2–4.4 мм, ширина 1.9–2.55 мм.

**Дифференциальный диагноз.** Виды рода *Trachyphloeoides* отличаются от большинства азиатских представителей трибы *Blosyrini* следующими признаками: жуки маленького размера; тело довольно густо покрыто чешуйками и щетинками, как правило, в сплошном земляном налете; спинка головотрубки в вершинной половине расширена, слегка распластана на боках, полностью скрывает усиковые бороздки при осмотре сверху; *gamus* и *collum* сперматеки сильно сближены друг с другом, значительно меньше длинного серповидного согну. Кроме того, от остальных известных *Blosyrini* род *Trachyphloeoides* хорошо отличается вооружением эндофаллуса.

**Биология.** Все виды рода умеренно мезофильные, собраны просеиванием подстилки из-под кустарников. Партеногенетические формы неизвестны.

**Распространение.** Известен из Китая в провинциях Ганьсуй, Сычуань и Юньнань.

*Trachyphloeoides sordidus* (Faust, 1890)

(Рис. 1, 9, 21)

Faust, 1890: 430–431 (*Trachyphloeus*).

Вид описан в роде *Trachyphloeus* по материалам, собранным экспедицией Г.Н. Потанина (1884–1886) в ки-

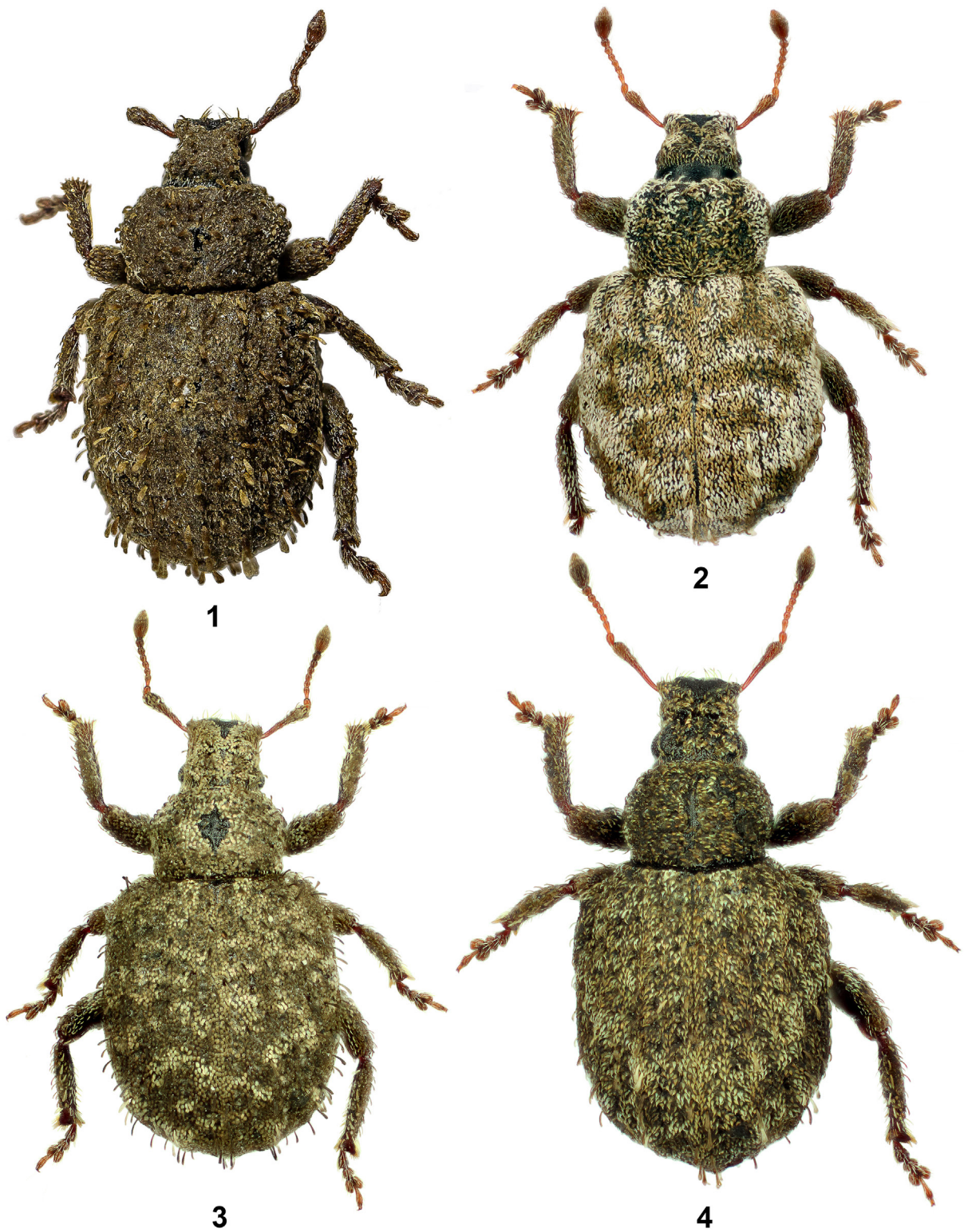


Рис. 1–4. Виды рода *Trachyphloeoides*, самцы, общий вид.

1 – *T. sordidus*, лектотип; 2 – *T. potanini* sp. n., голотип; 3 – *T. reuteri* sp. n., голотип; 4 – *T. belousovi* sp. n., голотип.

Figs 1–4. Species of the genus *Trachyphloeoides*, males, habitus.

1 – *T. sordidus*, lectotype; 2 – *T. potanini* sp. n., holotype; 3 – *T. reuteri* sp. n., holotype; 4 – *T. belousovi* sp. n., holotype.



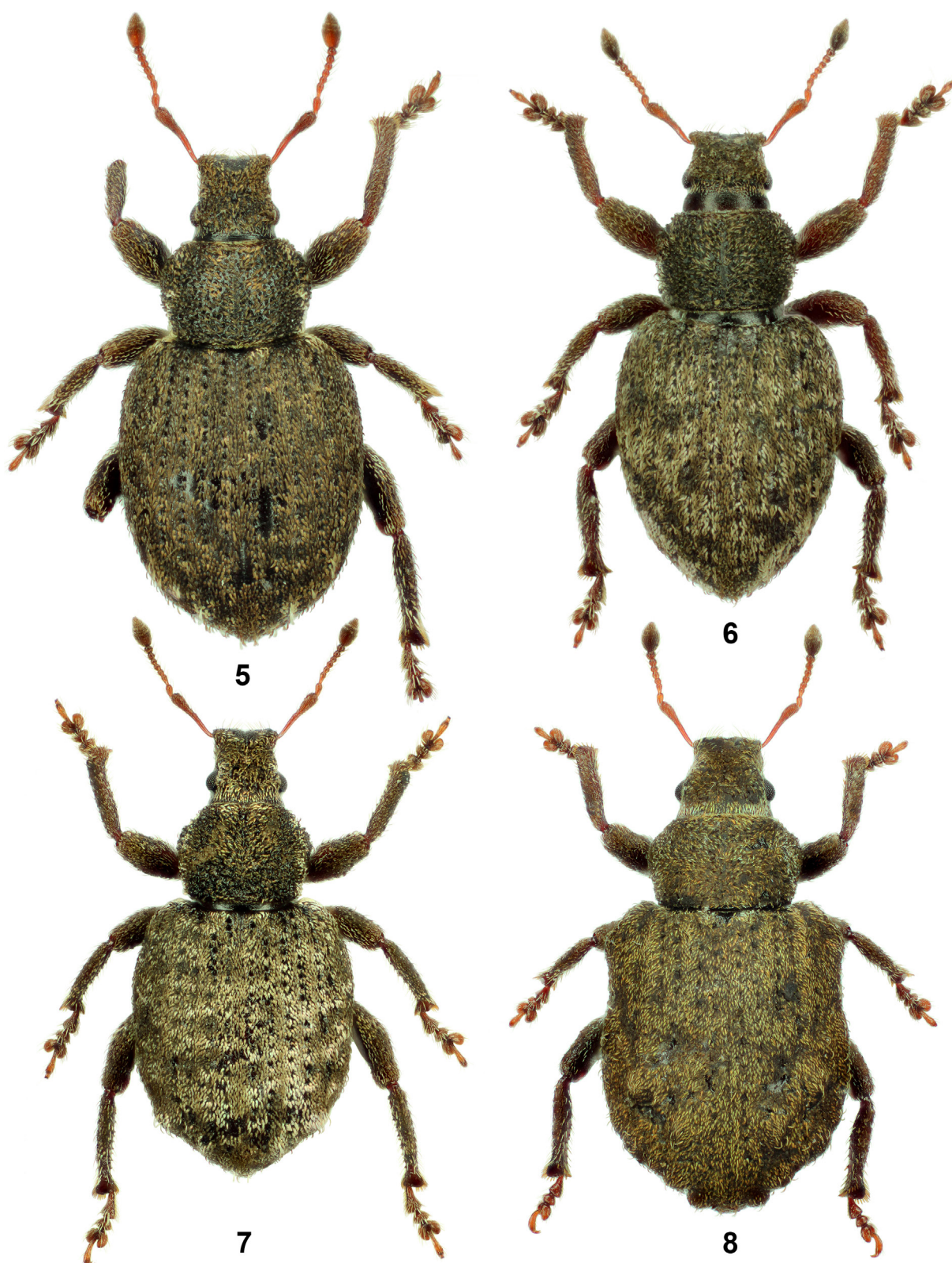


Рис. 5–8. Виды рода *Trachyphloeoides*, самцы, общий вид.

5 – *T. sp. pr. io*; 6 – *T. shokhini sp. n.*, голотип; 7 – *T. hartmanni sp. n.*, голотип; 8 – *T. kabaki sp. n.*, голотип.

Figs 5–8. Species of the genus *Trachyphloeoides*, males, habitus.

5 – *T. sp. pr. io*; 6 – *T. shokhini sp. n.*, holotype; 7 – *T. hartmanni sp. n.*, holotype; 8 – *T. kabaki sp. n.*, holotype.

тайской провинции Ганьсу: «Gan-ssu, Kloster Kadigar». Точное местоположение этой точки приводится в статье Фролова [Frolov, 2001: 395]: «Kan-ssa, Kadigar (Kadiger) Cloister, 35°05'N / 103°00'E, 24.V.1885 (~150 km SSW of Lanzhou)». Типовые экземпляры (1♂, 1♀), хранятся в коллекции Й. Фауста (SNSD), в качестве лектотипа был обозначен самец [Borovec, 2003]. Фотографии обоих типовых экземпляров впервые приводятся в статье Гребенникова [Grebennikov, 2018]. Лектотип и отпрепарированный эдеагус наклеены на одну и ту же картонную пластинку. Типы мной не изучены.

Согласно первоописанию 1-й членик жгутика усиков несколько шире 2-го, равен ему по длине или едва короче, переднеспинка сильно поперечная, почти в 2 раза шире длины. На имеющихся фотографиях лектотипа переднеспинка шире длины в 1.73 раза, ее диск в центральной части с маленьким голым участком, на котором просматривается фрагмент срединного кия, надкрылья в 1.18 раза длиннее ширины.

*Trachyphloeoides potanini* Davidian, **sp. n.**

(Рис. 2, 10, 18, 22)

**Материал.** Голотип, ♂ (ZIN): China, SE of Gansu Province, 23.9 km S of Wushan, timber-line, 34°30'23"N / 104°49'48"E, H = 2995 m, 17.06.2005 (I.A. Belousov, I.I. Kabak).

Голотип в удовлетворительном состоянии, на его задней левой лапке сохранился только первый членик.

**Описание.** Самец. Тело в сплошной точечной микро-скульптуре и довольно густом опушении из несомкнутых чешуек коричневого и светло-коричневого цвета.

Голова на уровне глаз в 1.17 раза шире головотрубки. Головотрубка слабо поперечная, в 1.2 раза шире длины, в вершинной части в 1.27 раза шире самой узкой части посередине. Спинка головотрубки и лоб при осмотре сбоку находятся в одной плоскости, с поперечной бороздкой между ними, которая изогнута посередине и почти скрыта чешуйками. Глаза едва удлиненные, латеральные, расположены ближе к дорсальной стороне головы, слабо выпуклые, слегка выступают из контура головы. Лоб посередине с глубокой ямкой, которая продолжена на спинке головотрубки в виде поверхностной срединной бороздки, раздвоенный перед эпистомом. Спинка головотрубки в вершинной половине с крупным треугольным голым участком черного цвета, эпистомальный киль в виде слабо выпуклого валика. Усиковые бороздки латеральные, едва не доходят до переднего края глаз, сверху не видны.

Рукоять и жгутик усиков красноватые, булава почти черная. Рукоять усиков булавовидно расширена к вершине от середины, ее длина в 1.44 раза меньше ширины головотрубки у места прикрепления усиков. 1-й членик жгутика заметно шире и приблизительно в 1.37 раза длиннее 2-го, 2-й членик удлиненный, в 1.33 раза длиннее 3-го, 3–7-й членики почти одинаковой длины и ширины. Булава широко веретеновидная, в 1.71 раза длиннее ширины, наиболее широкая посередине, 1-й членик булавки составляет 0.61 ее длины.

Переднеспинка поперечная, наиболее широкая слегка дистальнее середины, ее ширина в 1.53 раза больше длины. Переднеспинка довольно грубо пунктирована, со слабо выпуклыми бугорками между точек, на диске со слабой срединной бороздкой из продольного ряда точек.

Надкрылья с маленькими плечами, наиболее широкие дистальнее середины, по вершинному краю широко и равномерно закруглены. Надкрылья в 1.14 раза длиннее своей ширины и в 1.67 раза шире переднеспинки. Бороздки надкрылий неглубокие, частично скрыты чешуйками, приблизительно в 2 раза уже промежутков, промежутки без бугорков, четные – плоские, нечетные заметно приподняты.

Передние голени почти прямые, на вершине не расширены, с венчиком из светло-коричневых шипиков, почти таких же, как на внутреннем крае голени. Внутренняя сторона задних голеней с маленькими заостренными зернышками, более отчетливыми, чем на передних и средних. 2-й членик передних лапок поперечный, в 1.55 раза шире длины, 3-й членик в 1.83 раза шире 2-го и слегка шире вершины голени, часть коготкового членика, выступающая за вершинный край 3-го, слегка длиннее последнего. 2-й членик задних лапок в 1.36 раза шире длины.

Брюшко в 1.11 раза шире длины, 1-й абдоминальный вентрит в 2.75 раза длиннее 2-го, 5-й вентрит трапециевидный, в 1.95 раза шире длины, со слабым медиальным вдавлением в вершинной половине.

Вершинная половина рукояти усиков и бедра покрыты узкими щетинками, слегка более широкими на задних бедрах, без широких чешуек. Верх тела в полуприжатых удлиненно-треугольных чешуйках, которые в 2.5 раза длиннее ширины, не оттянуты на заостренной вершине. Нечетные промежутки надкрылий с 1–2 спутанными рядами изогнутых косо торчащих щетинок, на четных промежутках щетинки редкие, не образуют ясных рядов. Щетинки закруглены на вершине и наиболее широкие дистальнее середины, они в 2.5–3.35 раза длиннее своей ширины, приблизительно в 2.5 раза длиннее чешуек, одинаковой с ними ширины или шире. Чешуйки на надкрыльях формируют неясные поперечные перевязи бежевого и коричневого цвета. Два первых вентрита покрыты волосковидными щетинками и полуприжатыми узкими светлыми чешуйками, на остальных вентритах чешуйки встречаются только по бокам.

Пенис почти параллельносторонний, на вершине широко закруглен, в 1.82 раза длиннее ширины. Остиальная пластина удлиненная, выпуклая, с тонким срединным килем. Аподемы в 1.5 раза длиннее пениса. Эндофаллус между аподемами с 2 длинными склеротизованными тяжами, суженными к вершине.

Длина тела голотипа 3.5 мм, ширина 2.13 мм.

Самка неизвестна.

**Сравнительный диагноз.** Строением головотрубки, сильно сдавленной с боков в основной половине, широко округленным вершинным краем надкрылий и притупленным на вершине пенисом новый вид наиболее близок к *T. sordidus*. Отличается менее поперечной переднеспинкой, короткоовальной формой надкрылий и более узкими приподнятыми щетинками на покровах.

**Распространение.** Китай, юго-восток провинции Ганьсу.

**Этимология.** Новый вид назван именем Григория Николаевича Потанина, известного русского исследователя Центральной Азии.

*Trachyphloeoides belousovi* Davidian, **sp. n.**

(Рис. 4, 12, 14, 23)

**Материал.** Голотип, ♂ (ZIN): China, Sichuan Province, Jiulong County, SW of Wulaxixiang Village, 28°35'30"N / 101°37'22" E, H = 3105 m, 11.06.2012 (I.A. Belousov, G.E. Davidian).

У голотипа целиком утрачена задняя левая нога.

**Описание.** Самец. Головотрубка в 1.21 раза шире длины, голова на уровне глаз в 1.12 раза шире головотрубки. Спинка головотрубки слегка проксимальнее середины и перед лбом с двумя отчетливыми поперечными перетяжками, между ними с умеренно углубленной срединной бороздкой, перед основанием приподнята в виде бугорков. Лоб с 3 продольными бороздками, разделяющими его на фрагменты одинаковой ширины. Глаза умеренно выпуклые. Усиковые бороздки в



средней части едва видны сверху. Ширина головотрубки приблизительно в 1.3 раза больше длины рукояти усиков.

Рукоять и жгутик усиков красноватые, булава почти черная. 1-й членик жгутика заметно шире и едва длиннее 2-го, 3-й едва удлинённый, в 1.92 раза короче 2-го, 4–7-й членики приблизительно одинаковой длины и ширины, постепенно утолщаются к вершине усиков. Булава наиболее широкая дистальнее середины, в 1.78 раза длиннее ширины, 1-й членик булавы составляет 0.6 ее длины.

Переднеспинка наиболее широкая посередине, слегка сдавлена с боков перед основанием, в 1.34 раза шире длины. Диск переднеспинки в мелких бугорках, с отчетливым срединным килем почти по всей длине.

Надкрылья с отчетливыми скошенными плечами, в средней части почти параллельносторонние, в 1.27 раза длиннее ширины и в 1.69 раза шире переднеспинки, верхинный край посередине слегка угловидно изогнут. 3-й, 5-й и в меньшей степени 7-й промежутки перед верхинным скатом выпуклые.

Передние голени едва изогнуты внутрь, не расширены на вершине. Лапки красноватые. 2-й членик передних лапок в 1.67 раза шире длины, 3-й членик в 1.4 раза шире 2-го, слегка уже вершины голени, часть коготкового членика, выступающая за верхинный край 3-го, равна длине последнего.

Брюшко слегка поперечное, его ширина в 1.03 раза больше длины. 3-й и 4-й абдоминальные вентриты очень узкие, в средней части почти килевидные, 5-й вентрит по верхинному краю закруглен, заметно вдавлен в верхинной половине.

Темя в очень узких заостренных прижатых чешуйках. Верхинная половина рукояти усиков в приподнятых заостренных щетинках и очень узких прижатых чешуйках. Верх тела в чешуйках треугольной формы с волосковидно оттянутой вершиной. Нечетные промежутки надкрылий с продольным рядом изогнутых, косо торчащих апикально расширенных и закругленных на конце щетинок, длина которых в 3.14–5 раз больше ширины. Четные промежутки с единичными щетинками. Щетинки приблизительно одинаковой ширины с чешуйками, в 2.44–2.75 раза длиннее их. Бока надкрылий с вкраплениями чешуек, таких же, как на диске. Ноги без широких чешуек, в длинных, узких торчащих щетинках и прилегающих заостренных на конце чешуйках. Два первых вентрита в торчащих щетинках и полуприжатых золотистых заостренных чешуйках, основная половина 5-го вентрита с очень узкими редкими чешуйками.

Пенис постепенно сужен от основания к умеренно узко закругленной вершине, в 2.22 раза длиннее ширины, слегка короче аподем. Остиальная пластина хорошо видна, удлиненно-треугольная с отчетливым срединным килем. Вооружение эндофаллуса на уровне основания аподем со склеротизованной поперечной пряжкой, от которой по бокам отходят узкие склеротизованные тяжи, достигающие верхинной трети аподем.

Длина тела голотипа 3.85 мм, ширина 2.25 мм.

Самка неизвестна.

**Сравнительный диагноз.** Внешне похож на *T. reuteri* sp. n., от которого отличается следующими признаками: поверхность 3-го и 4-го вентритов в средней части почти поперечно килевидная; верхинная половина рукояти усиков в несомкнутом покрове из щетинок и очень узких мелких чешуек; верх тела в ланцетовидных чешуйках с сильно заостренной оттянутой вершиной; пенис на вершине умеренно узко округлен; вооружение эндофаллуса не выступает из остиального отверстия за вершину пениса.

**Распространение.** Китай, юг провинции Сычуань.

**Этимология.** Новый вид назван именем Игоря Александровича Белоусова (Санкт-Петербург, Россия).

### *Trachyphloeoides reuteri* Davidian, sp. n.

(Рис. 3, 11, 19, 24, 31–33)

**Материал.** Голотип, ♂ (NME): China, Sichuan Province, Garzê Tibetan Autonomous Prefecture, Yajiang environment, W of Yalong River, 30.02°N / 100.98°E, 2800–3000 m, 12–21.06.2016 (Ch. Reuter). Паратипы: 11 экз. (NME, ZIN), собраны с голотипом.

**Описание.** Самец. Головотрубка в 1.26 раза шире длины, наиболее широкая в предвершинной части и уже всего посередине. Спинка головотрубки в верхинной половине расширена, слегка распластана по бокам, посередине и перед лбом с 2 поперечными перетяжками. Глаза круглые, наиболее выпуклые позади середины, расположены ближе к верхней стороне головы. Усиковые бороздки латеральные, сверху не видны. Ширина головотрубки на уровне места прикрепления усиков в 1.38 раза больше длины рукояти усиков.

Усики красноватые. 1-й членик жгутика усиков заметно шире и в 1.19 раза длиннее 2-го, 3-й в 1.74 раза короче 2-го, 3–7-й членики круглые, иногда 3-й и 4-й едва удлинённые, 7-й наиболее широкий. Булава веретеновидная, наиболее широкая посередине, в 1.96 раза длиннее ширины, 1-й членик булавы слегка длиннее остальных члеников, вместе взятых.

Переднеспинка наиболее широкая дистальнее середины, в основной части сдавлена с боков, в 1.4 раза шире длины. Верхинный край переднеспинки прямой, основной слегка закруглен. Диск переднеспинки в средней трети с маленьким, иногда слегка удлинённым гоальм пятном, на котором обычно хорошо заметен срединный киль.

Надкрылья с отчетливо скошенными плечами, в средней части почти параллельносторонние, на вершине широко закруглены, в 1.16–1.28 раза длиннее ширины и в 1.69–1.79 раза шире переднеспинки. Верхинная часть 3-го и 5-го промежутков надкрылий слегка приподнята, не выступает за контуры тела.

Голени прямые, не расширены на вершине, на внутренней стороне без отчетливых зернышек. Лапки довольно узкие, 1-й членик передних лапок слегка удлинённый, 2-й членик умеренно поперечный, в 1.4–1.8 раза шире длины, 3-й членик равен ширине вершины голени, часть коготкового членика, выступающая за верхинный край 3-го членика, равна его длине.

Брюшко едва поперечное, 5-й абдоминальный вентрит трапециевидный, в 1.75–2.09 раза шире длины, в основной части выпуклый, с округлым медиальным вдавлением в верхинной половине.

Основная треть рукояти усиков почти голая, ее верхинная половина довольно густо покрыта широкими прижатыми чешуйками и приподнятыми щетинками. Верх тела в густых, мелких, широких чешуйках. Чешуйки обычно одинаковой длины и ширины или слабо удлинённые, на вершине слабо заострены или широко вырезаны, с 2 короткими тонкими отростками по бокам. На промежутках надкрылий по ширине располагается до 4–5 чешуек. Чешуйки коричневого, бежевого, иногда грязно-белого цвета, образуют пятнистый рисунок. Щетинки длинные, слабо расширены к вершине и притуплены на конце, примерно в 5.5 раза длиннее чешуек, образуют полные ряды на нечетных промежутках и более редкие на четных. Они отчетливо торчат по всему телу и на ногах. 1-й, 2-й и центральная часть 5-го вентрита в отчетливых прижатых ланцетовидных и притупленных на конце чешуйках, а также с единичными широкими, удлиненно-яйцевидными чешуйками.

Пенис почти параллельносторонний, в средней части слегка сдавлен с боков, сильно дорсовентрально изогнут, на вершине притуплен, с отчетливой вырезкой в средней части. Остиальная пластина слабо удлинённая. Аподемы в 1.3 раза длиннее пениса. Эндофаллус с двумя длинными, сильно склеротизованными, дорсовентрально дуговидно изогнутыми тяжами по всей длине пениса, заметно выступающими за верхинный край пениса в виде полупрозрачной пластинки. Под основной частью указанных длинных тяжей находится пара очень коротких склеритов.

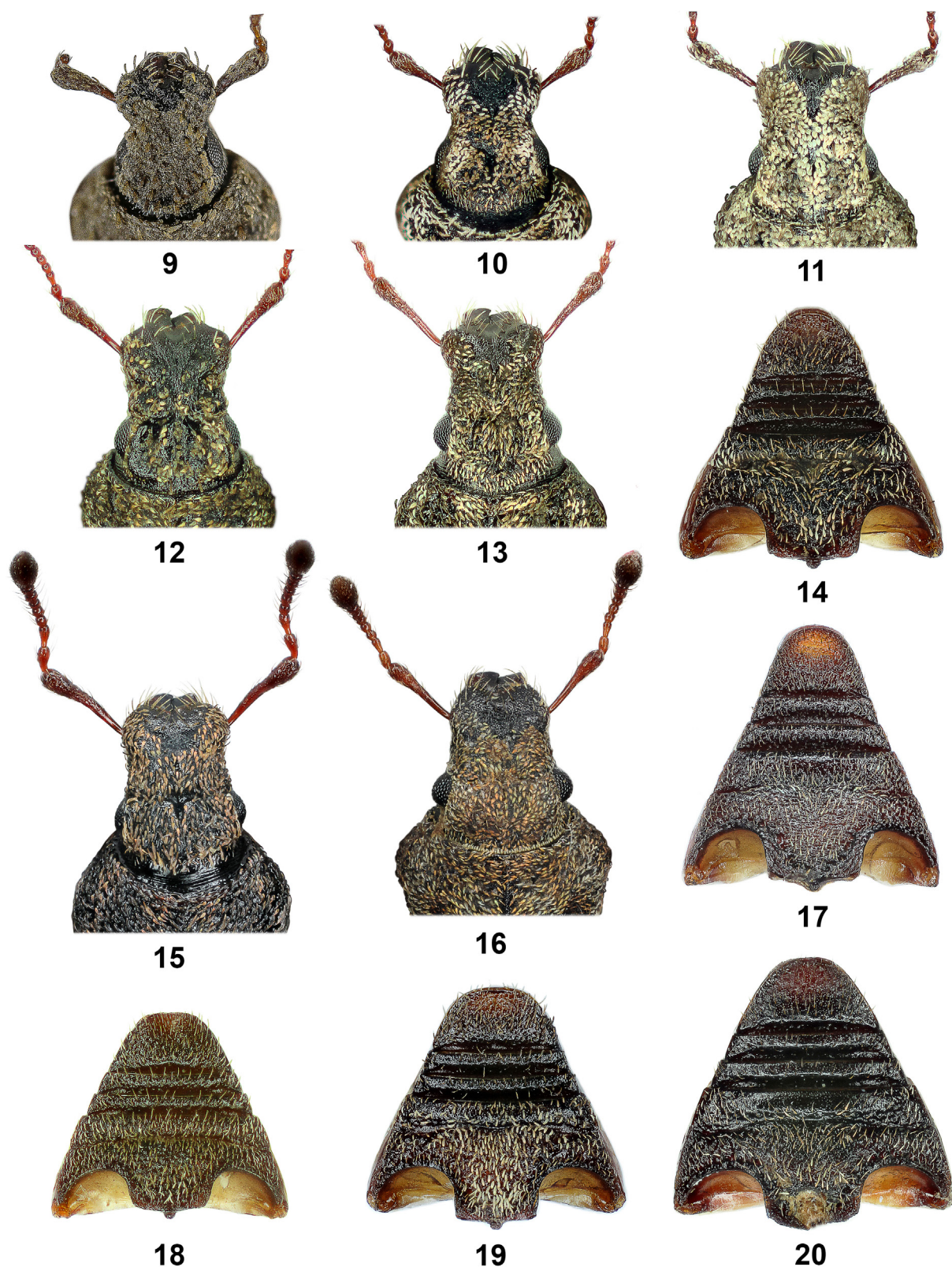


Рис. 9–20. Виды рода *Trachyphloeoides*, самцы, детали строения.  
 9 – *T. sordidus*, лектотип; 10, 18 – *T. potanini* sp. n., голотип; 11, 19 – *T. reuteri* sp. n., голотип; 12, 14 – *T. belousovi* sp. n., голотип; 13, 17 – *T. hartmanni* sp. n., голотип; 15 – *T. sp. pr. io*; 16, 20 – *T. kabaki* sp. n., паратип. 9–13, 15–16 – голова, вид сверху; 14, 17–20 – вентриты.

Figs 9–20. Species of the genus *Trachyphloeoides*, males, details of structure.  
 9 – *T. sordidus*, lectotype; 10, 18 – *T. potanini* sp. n., holotype; 11, 19 – *T. reuteri* sp. n., holotype; 12, 14 – *T. belousovi* sp. n., holotype; 13, 17 – *T. hartmanni* sp. n., holotype; 15 – *T. sp. pr. io*; 16, 20 – *T. kabaki* sp. n., paratype. 9–13, 15–16 – head, dorsal view; 14, 17–20 – ventrites.



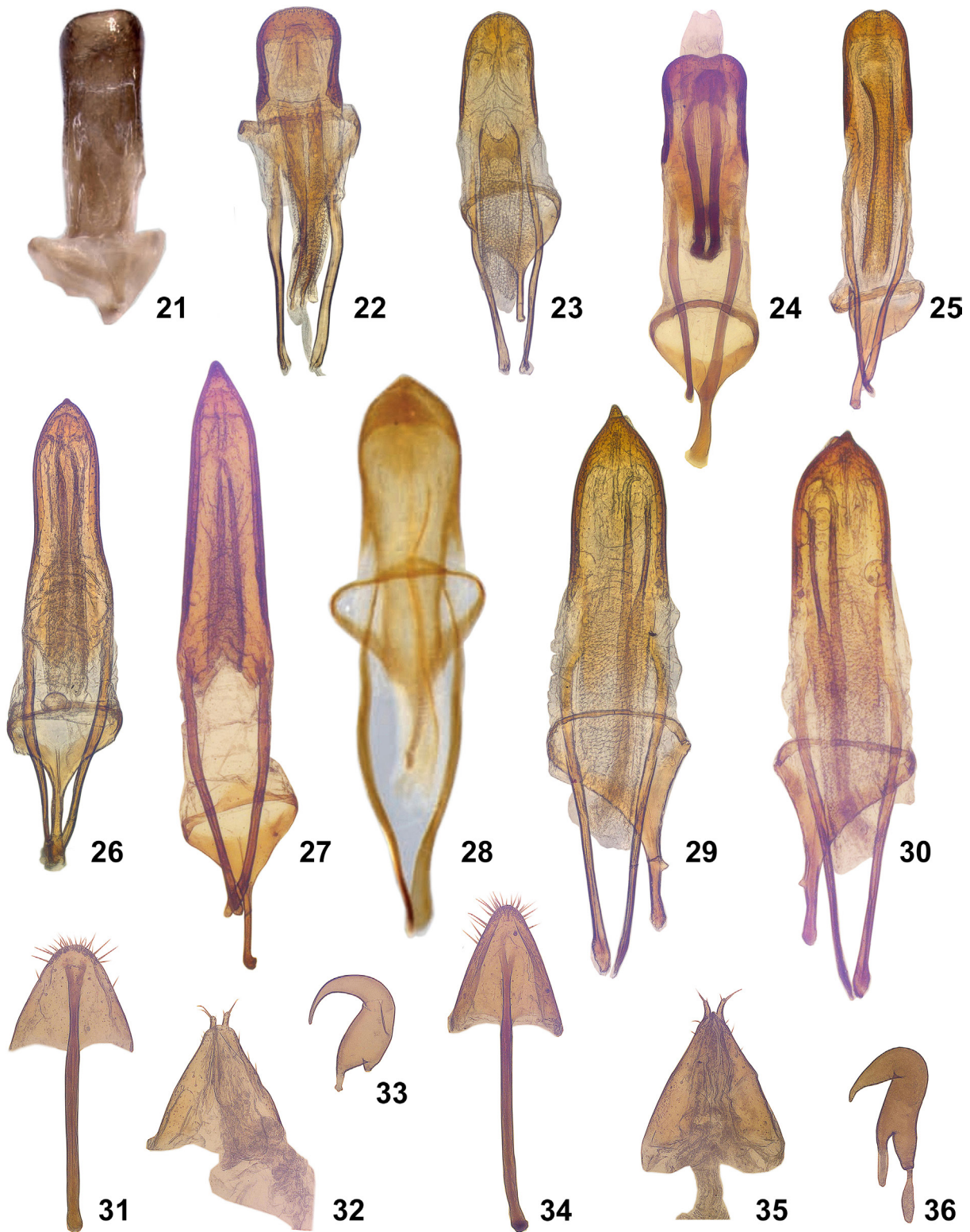


Рис. 21–36. *Trachyphloeoides*, гениталии самца и самки.

21 – *T. sordidus* (по [Grebennikov, 2018]); 22 – *T. potanini* sp. n.; 23 – *T. belousovi* sp. n.; 24, 31–33 – *T. reuteri* sp. n.; 25 – *T. kabaki* sp. n.; 26 – *T. shokhini* sp. n.; 27, 34–36 – *T. hartmanni* sp. n.; 28 – *T. io* (по [Grebennikov, 2018]); 29–30 – *T. sp. pr. io*. 21–29 – эдеагус, вид сверху; 30 – эдеагус, вид снизу; 31, 34 – spiculum ventrale; 32, 35 – кокситы; 33, 36 – сперматека.

Figs 21–36. *Trachyphloeoides*, male and female genitalia.

21 – *T. sordidus* (after Grebennikov [2018]); 22 – *T. potanini* sp. n., holotype; 23 – *T. belousovi* sp. n., holotype; 24, 31–33 – *T. reuteri* sp. n., holotype; 25 – *T. kabaki* sp. n.; 26 – *T. shokhini* sp. n., holotype; 27, 34–36 – *T. hartmanni* sp. n., holotype; 28 – *T. io* (after Grebennikov [2018]); 29–30 – *T. sp. pr. io*. 21–29 – aedeagus, dorsally; 30 – aedeagus, ventrally; 31, 34 – spiculum ventrale; 32, 35 – coxites; 33, 36 – spermatheca.



Самка. 5-й абдоминальный вентрит на вершине закруглен. Ламелла *spiculum ventrale* в виде правильного, узко закругленного на вершине треугольника, в 1.5 раза короче манубриума. Кокситы почти такой же формы и слегка крупнее ламеллы *spiculum ventrale*. Сперматека с серповидным *collum*, значительно более крупным по сравнению с *collum* и *gamus*. *Collum* в виде широкого треугольника, значительно крупнее, чем *gamus*, последний в виде короткого сосочка.

Длина тела 3.2–4 мм, ширина 1.9–2.45 мм, у голотипа 3.7 и 2.2 мм соответственно.

**Сравнительный диагноз.** Габитусом в длинных торчащих щетинках похож на *T. belousovi* sp. n., от которого отличается следующими признаками: поверхность 3-го и 4-го вентритов плавно выпуклая; вершинная половина рукояти усиков обычно в густом покрове из щетинок и широких прижатых чешуек; верх тела в мелких широких чешуйках, слабо заостренных или широко вырезанных на вершине; penis на вершине пригнут и широко вырезан; вооружение эндофаллуса отчетливо выступает из остиального отверстия за вершину пениса в виде полупрозрачной пластинки.

**Распространение.** Китай, Гардзе-Тибетский автономный округ провинции Сычуань.

**Этимология.** Новый вид назван именем Христофа Рейтера (Christoph Reuter, Гамбург, Германия), впервые его собравшего.

*Trachyphloeoides io* Grebennikov, 2018

(Рис. 28)

Grebennikov, 2018: 213.

Вид описан по материалам из китайской провинции Юньнань: «Haba Shan Mt., 27°21'57"N / 100°06'55"E, H = 3362 m, 29.06.2012 (V.V. Grebennikov)». Приведенная автором морфологическая характеристика этого вида очень краткая и сводится к следующему: «Larger (distance between anterior edge of pronotum and elytral apex 3.5–4.4 mm); elytral apex weakly pointed; aedeagus apically pointed and its sides weakly constricted». Согласно опубликованным фотографиям *T. io* также характеризуется следующими признаками: 2-й членик передних лапок умеренно поперечный, penis довольно широкий, в средней части почти параллельносторонний, вооружение эндофаллуса с двумя склеротизованными тяжами, достигающими до середины аподем. Типы мной не изучены.

**Сравнительный диагноз.** Яйцевидной формой надкрылий, а также вооружением эндофаллуса наиболее похож на *T. shokhini* sp. n. и *T. hartmanni* sp. n., от которых хорошо отличается строением пениса. Кроме того, от *T. shokhini* sp. n. отличается менее поперечным 2 члеником передних лапок, от *T. hartmanni* sp. n. – отсутствием предвершинного бугорка на 5 промежулке надкрылий.

*Trachyphloeoides* sp. pr. *io* Grebennikov, 2018

(Рис. 5, 15, 29, 30)

Среди имеющихся у меня материалов к *T. io* очень близок самец с этикеткой: «China, Yunnan Province, Shangrila–Deqen 214 Road, NE slope of SE Baima MtR, SW of Benzilanzhen Vill., 28°10'27"N/ 99°14'06"E, 5.06.2013,

H = 3350 m (I.A. Belousov, I.I. Kabak, G.E. Davidian)». Точное определение видовой принадлежности этого экземпляра без сравнения с типовыми не представляется возможным, поэтому он приводится здесь как *T. sp. pr. io* Grebennikov. От голотипа *T. io* [Grebennikov, 2018] он отличается более узкими надкрыльями.

**Описание.** Самец. Спинка головотрубки в основной части слабо сдавлена с боков, наиболее узкая слегка дистальнее середины, отделена от лба слабой поперечной бороздкой с глубокой точкой посередине, эпистомальный киль едва намечен. Глаза умеренно выступают за контуры головы, наиболее выпуклые слегка позади середины.

Переднеспинка поперечная, наиболее широкая перед вершинной третью, перед основанием слегка сдавлена с боков, в 1.54 раза шире длины. Вершинный край переднеспинки слегка вырезан, основной – закруглен, диск со слабо выпуклым узким срединным килем.

Надкрылья яйцевидные, без бугорков, наиболее широкие слегка базальнее середины, в 1.29 раза длиннее ширины. Бороздки надкрылий из одинаковых точек, в 2 раза уже промежутков.

Передние голени в вершинной половине слегка изогнуты внутрь, по внутреннему краю S-образно изогнуты, без отчетливых зернышек, наружный вершинный угол не расширен. Задние голени перед вершиной слегка сдавлены с боков, их внутренняя сторона с очень мелкими зернышками. 2-й членик передних лапок в 1.78 раза шире длины, 3-й слабо поперечный, в 1.09 раза шире вершины голени, часть коготкового членика, выступающая за вершинный край 3-го, равна длине последнего.

Брюшко густо и равномерно пунктировано. 1-й абдоминальный вентрит в средней части заметно вдавлен, слегка короче 2–4-го, вместе взятых, 3-й и 4-й вентриты выпуклые, 5-й – треугольный, закругленный на вершине.

Верхняя сторона головы в торчащих щетинках, наиболее длинных вдоль заднего края лба, темя в прижатых волосковидных чешуйках. Рукоять в вершинной половине в приподнятых волосковидных щетинках, без чешуек. Верх тела умеренно густо покрыт ланцетовидными чешуйками преимущественно темно-коричневого цвета с вкраплениями из светлых чешуек на вершинном скате надкрылий, а также по бокам у основания переднеспинки и надкрылий. Длина чешуек в 3 раза больше ширины. Бороздки надкрылий с очень тонкими волосками, длина которых равна диаметру точек в бороздках и слегка меньше длины чешуек. Промежутки надкрылий с рядом слабо приподнятых изогнутых, узких или явственно расширенных к вершине щетинок, которые наиболее заметны на вершинном скате и по бокам надкрылий. Щетинки в 1.33 раза длиннее чешуек, слегка уже или равной с ними ширины. Два первых вентрита в волосковидных щетинках и редких сильно удлинённых узколанцетовидных чешуйках.

Penis в основной части почти параллельносторонний, его вершинная треть явственно изогнута вниз, ламелла треугольная, заострена к вершине. Penis в 2.71 раза длиннее своей ширины, слегка короче аподем. Вооружение эндофаллуса с 2 длинными узкими склеротизованными тяжами, не достигающими до ламеллы пениса и сильно выступающими за его основной край, они почти одинаковой длины с аподемами адеагуса.

Длина тела 4.1 мм, ширина 2.3 мм.

**Распространение.** Китай, провинция Юньнань.

*Trachyphloeoides shokhini* Davidian, sp. n.

(Рис. 6, 26)

**Материал.** Голотип, ♂ (ZIN): China, NW of Yunnan Province, Haba Xue Schan, environment of Bailakou Pass, H = 3400–3800 m, traps, 28.05–7.06.2006 (I.V. Shokhin, S.V. Murzin).

**Описание.** Самец. Голова на уровне глаз в 1.16 раза шире головотрубки. Глаза умеренно выступают за контуры головы, наиболее выпуклые слегка позади середины. Головотрубка в 1.29 раза шире длины, наиболее узкая приблизительно посередине. Ширина головотрубки на уровне места прикрепления усиков в 1.26 раза больше длины рукояти усиков. Эпистомальный киль сглажен. Поперечная бороздка перед лбом неясная, с точкой посередине. Усиковые бороздки сверху не видны.

Рукоять и жгутик усиков красноватые, булава почти черная. 1-й членик жгутика усиков заметно шире и в 1.11 раза длиннее 2-го, 2-й в 1.8 раза длиннее своей ширины и в 2 раза длиннее 3-го, 3–7-й членики почти одинаковой длины и ширины, заметно расширяются к булаве. Булава наиболее широкая посередине, в 1.91 раза длиннее ширины, 1-й ее членик равен длине остальных члеников, вместе взятых.

Переднеспинка наиболее широкая дистальнее середины, слабо без поперечной перетяжки сужена к основанию, в 1.27 раза шире длины, ее вершинный край едва вырезан, основной – закруглен. Поверхность диска переднеспинки преимущественно в сильно сглаженных, едва различимых зернышках и точках, с отчетливыми зернышками только вдоль основного края, срединный киль стертый почти по всей длине.

Надкрылья яйцевидные, наиболее широкие заметно базальнее середины, в 1.32 раза длиннее своей ширины, в 1.63 раза шире переднеспинки. Бока надкрылий перед основанием закруглены, без плеч, вершинный край узко округлен. Промежутки надкрылий без бугорков, с едва приподнятой вершинной частью 5-го промежутка. Бороздки надкрылий точечные, приблизительно в 2 раза уже промежутков.

Передние голени едва изогнуты внутрь, не расширены на вершине. Задние голени сдавлены с боков перед вершиной и расширены на вершине, на внутренней стороне с отчетливыми заостренными зернышками. Передние лапки очень широкие, 2-й членик сильно поперечный, в 2.42 раза шире длины, 3-й членик в 1.26 раза шире вершины голени, часть коготкового членика, выступающая за вершинный край 3-го, заметно короче последнего.

Брюшко едва поперечное, в 1.11 раза шире длины, в сплошной довольно грубой пунктировке.

Пенис в средней трети явственно сдавлен с боков, ламелла треугольная, заострена на вершине. Длина пениса в 3 раза больше его ширины и слегка больше длины аподем. Вооружение эндофаллуса с 2 продольными склеротизованными тяжами, почти не выступающими за основание пениса.

Рукоять усиков в основной половине почти голая, в вершинной – в волосковидных заостренных щетинках, без чешуек. Верх головы в темно-коричневых щетинках, наиболее длинных в задней части лба, темя в прижатых очень узких, заостренных чешуйках. Верх тела в густых, заостренных на вершине чешуйках, длина которых в 2–2.5 раза больше ширины. Щетинки на надкрыльях слабо приподняты, на вершине притуплены или узко закруглены, приблизительно в 1.5 раза длиннее чешуек, наиболее хорошо заметны по бокам и на вершинном крае надкрылий. Чешуйки и щетинки коричневого или грязновато-бежевого цвета, формируют пятнистый рисунок. Брюшко почти в одинаковых волосковидных косо торчащих щетинках, без широких чешуек. Вершина бедер в очень узких заостренных прижатых чешуйках и приподнятых, слегка более широких, притупленных на конце щетинках.

Длина тела голотипа 4.1 мм, ширина 2.12 мм.

Самка неизвестна.

**Сравнительный диагноз.** Наиболее близок к *T. io* и *T. hartmanni* sp. n. с яйцевидной формой надкрылий, от которых хорошо отличается следующими признаками: 2-й членик передних лапок сильно поперечный, в 2.4 раза шире длины, 3-й членик в 1.26 раза шире голени на вершине; пенис в средней части довольно сильно сдавлен с боков. Кроме того, от *T. hartmanni* sp. n.

хорошо отличается отсутствием бугорков в вершинной части надкрылий.

**Распространение.** Китай, провинция Юньнань.

**Этимология.** Новый вид назван именем Игоря Владимировича Шохина (Ростов-на-Дону, Россия), впервые его собравшего.

*Trachyphloeoides hartmanni* Davidian, sp. n.

(Рис. 7, 13, 17, 27, 34–36)

**Материал.** Голотип, ♂ (NME): China, S of Sichuan Province, Pass between of Yanyuan and Muli, 27.68638°N / 101.22335°E, H = 3244 m, 11–18.06.2017 (Ch. Reuter). Паратипы: 11 экз. (NME, ZIN), собраны вместе с голотипом.

**Описание.** Самец. Голова на уровне глаз в 1.23–1.24 раза шире головотрубки. Головотрубка слабо поперечная, в 1.11–1.22 раза шире длины. Спинка головотрубки явственно расширена в вершинной части, наиболее узкая дистальнее середины, перед лбом с глубокой поперечной бороздкой в средней трети, от которой к теменю отходят 3 продольных бороздки. Глаза довольно сильно выступают за контуры головы, наиболее выпуклые позади середины.

Длина рукояти усиков немного меньше ширины головотрубки. Два первых членика жгутика усиков приблизительно в 2 раза длиннее ширины, из них 1-й членик заметно длиннее и шире 2-го, 3–7-й почти круглые, последний из них наиболее широкий. Булава широко веретеновидная, наиболее широкая посередине, в 1.69 раза длиннее ширины, ее 1-й членик едва длиннее остальных, вместе взятых.

Переднеспинка умеренно поперечная, наиболее широкая дистальнее середины, в 1.32 раза шире длины. Диск переднеспинки в довольно грубой сплошной скульптуре из точек и зернышек, с узким срединным килем в средней трети.

Надкрылья яйцевидные, на боках перед основанием закруглены, без плеч, наиболее широкие базальнее середины, в 1.26–1.29 раза длиннее ширины, в 1.6–1.64 раза шире переднеспинки. Вершинный край надкрылий посередине почти угловидно изогнут, вершинный скат подогнут, 5-й промежуток надкрылий в вершинной части отчетливо приподнят.

Брюшко едва удлинненное, в 1.03–1.06 раза длиннее ширины, 5-й абдоминальный вентрит в вершинной половине почти по всей ширине поверхностно вдавлен, широко округлен на вершине.

Передние голени в вершинной половине слегка изогнуты внутрь, не расширены на вершине. Внутренняя сторона голени с зернышками, наиболее крупными на средних и задних. Задние голени на вершине едва расширены. 1-й членик передних лапок приблизительно одинаковой длины и ширины, 2-й членик в 1.6–1.8 раза шире длины, 3-й членик лапок слегка шире вершины голени, часть коготкового членика, выступающая за вершинный край 3-го, приблизительно равна длине последнего или слегка длиннее.

Вершинная половина рукояти усиков в очень узких прижатых чешуйках и приблизительно таких же полуприжатых щетинках. Надкрылья в ланцетовидных чешуйках, длина которых в 1.5–1.75 раза больше ширины; щетинки узкие, слабо приподняты, в 5–8 раз длиннее своей ширины, в 2–2.3 раза длиннее чешуек, наиболее заметны на бугорках надкрылий. Брюшко с очень сильно удлинненными золотистыми щетинковидными чешуйками, хорошо заметными на первых двух вентритах и очень редкими на 5 вентрите.

Пенис в 3.3 раза длиннее ширины, плавно дорсовентрально изогнут, при осмотре сверху постепенно сужается от основания к вершине, ламелла удлинненно-треугольная, очень узко закруглена на конце, заметно отогнута вентрально. Пенис длиннее аподем в 1.4 раза. Остиальная пластина плохо различима. Вооружение эндофаллуса с 2 длинными склеротизованными тяжами, слегка сходящимися к вершине и не вы-

ступающими за основной край пениса, их длина составляет 0.6 длины пениса.

Самка. Брюшко едва удлиненное или почти одинаковой длины и ширины. Предпоследний тергит брюшка на вершине широко и плавно вырезан. 5-й абдоминальный вентрит почти плоский. Ramus почти в 2 раза крупнее collum, приблизительно одинаковой ширины с cornu; ramus и collum соприкасаются у основания. Кокситы треугольные, с отчетливым удлиненным стилусом на вершине. Ламелла spiculum ventrale удлиненно-треугольная, в 1.6 раза короче, чем манубриум.

Длина тела 3.8–4.1 мм, ширина 2.1–2.3 мм, у голотипа 4.03 и 2.2 мм соответственно.

**Сравнительный диагноз.** Новый вид относится к группе видов с яйцевидной формой надкрылий; от остальных видов группы хорошо отличается выпуклой вершинной частью 5-го промежутка надкрылий.

**Распространение.** Китай, провинция Юньнань.

**Этимология.** Новый вид назван именем Матиаса Хартманна (Dr Matthias Hartmann, NME, Эрфурт, Германия), передавшим мне для изучения интересные материалы из Китая и Непала.

*Trachyphloeoides kabaki* Davidian, sp. n.

(Рис. 8, 16, 20, 25)

**Материал.** Голотип, ♂ (ZIN): China, Yunnan Province, Laojunshan Mts, 6.26 km SSW of Segengsheng, 27°0'20"N / 99°28'33"E, Н = 3575 m, 6.06.2016 (I.I. Kabak, G.E. Davidian). Паратипы: 21 экз. (ZIN), собраны вместе с голотипом; 3 экз. (ZIN), NNE of Wexi City, 9.5 km ESE of Shajiamia, 27°19'59"N / 99°26'28"E, Н = 3570 m, 8.06.2015 (I.A. Belousov, I.I. Kabak).

**Описание.** Самец. Головогубка слабо поперечная, в 1.27–1.33 раза шире длины, умеренно сужена к вершине. Спинка головогубки в вершинной половине расширена, в основной – сдавлена с боков, с продольным медиальным вдавлением, отделена от лба поперечной бороздкой с глубокой точкой посередине, эпистом треугольный, с едва заметным эпистомальным килем. Усиковые бороздки частично видны сверху в основной половине. Глаза круглые, сильно выпуклые, более выпуклые едва позади середины, явственно выступают за контуры головы. Диаметр глаза слегка меньше расстояния от глаза до места прикрепления усиков.

Рукоять и жгутик усиков красноватые, булава темная. Длина рукояти заметно меньше ширины головогубки на вершине. 1-й членик жгутика усиков в 1.67–1.7 раза длиннее своей ширины, слегка длиннее и шире 2-го членика, 3–7-й членики почти круглые, из них 7-й наиболее широкий. Булава широко веретеновидная, наиболее широкая посередине, в 1.63 раза длиннее ширины, ее 1-й членик едва длиннее остальных члеников, вместе взятых.

Переднеспинка поперечная, наиболее широкая перед вершинной третью, в 1.69–1.74 раза шире длины. Основание переднеспинки слегка округлено, вершина прямо обрезана, бока прямо сходятся к основанию, средняя часть диска обычно с широким слабо или умеренно выпуклым срединным килем.

Надкрылья с хорошо развитыми скошенными плечами, позади которых, как правило, явственно сдавлены с боков, наиболее широкие приблизительно посередине, в 1.22–1.28 раза длиннее своей ширины, в 1.57–1.65 раза шире переднеспинки. Диск надкрылий с небольшими округлыми поверхностными вдавлениями, обычно более темного цвета, вершинная часть надкрылий с отчетливыми бугорками, некоторые из которых явственно выступают за контур тела: 2-й промежуток на вершинном скате с отчетливым маленьким бугорком; 3–6-й промежутки перед вершинным скатом с бугорками, расположенными в ряд, кроме того, 3-й и 5-й промежутки немного проксимальнее с дополнительными бугорка-

ми; 7-й промежуток в средней части выпуклый. Промежутки надкрылий приблизительно в 2 раза шире точечных бороздок.

Передние голени широкие, на вершине прямо обрезаны и едва расширены наружу. Внутренняя сторона голени с отчетливыми заостренными зернышками, средние на вершине не расширены, задние слабо расширены. 1-й членик передних лапок треугольный, одинаковой длины и ширины, 2-й членик поперечный, в 1.85–1.86 раза шире длины, 3-й членик умеренно поперечный, в 1.38–1.47 раза шире длины, приблизительно равен ширине вершины голени, часть коготкового членика, выступающая за вершинный край 3-го членика, едва короче последнего.

Брюшко едва поперечное, в 2.88–3 раза шире межтазикового выступа, 1-й абдоминальный вентрит слегка длиннее 2–4-го, вместе взятых, 5-й вентрит почти трапециевидный, плоский или едва вдавлен, на вершине широко округлен.

Вершинная часть спинки головогубки голая, рукоять усиков в вершинной половине в одинаковых косо торчащих волосковидных щетинках, без чешуек. Темя в прижатых удлиненно-треугольных, сильно заостренных на вершине чешуйках. Верх тела умеренно густо покрыт прижатými ланцетовидными чешуйками и приподнятыми более длинными щетинками, наиболее отчетливыми на бугорках надкрылий. В других местах щетинки более тонкие, волосковидные. Два первых абдоминальных вентрита в очень узких золотистых чешуйках, 3–5-й вентриты только в волосковидных щетинках.

Пенис слегка сужен к вершине, в средней части почти параллельносторонний, его ламелла поперечная, на вершине широко округлена и обычно слегка вырезана посередине, пенис в 2.73 раза длиннее ширины, слегка длиннее аподем. Остиальная пластина слабо склеротизована, слегка удлинённая, заметно уже пениса. Вооружение эндофаллуса с длинной продольной трубчатой склеротизованной структурой, наиболее узкой в средней части, заметно выступающей за основной край пениса. Длина указанной структуры эндофаллуса приблизительно равна длине пениса.

Самка. 5-й абдоминальный вентрит треугольный, слабо поперечный. Cornu серповидный, заметно длиннее и шире, чем ramus. Collum довольно широкий, меньше, чем ramus, с тонким сосочком на вершине. Кокситы удлиненно-треугольные, с удлиненным стилусом на вершине. Ламелла spiculum ventrale треугольная, в 1.4 раза короче манубриума.

Длина тела 3.6–4.4 мм, ширина 2.1–2.55 мм, у голотипа 4.3 и 2.5 мм соответственно.

**Сравнительный диагноз.** От остальных видов рода хорошо отличается отчетливыми бугорками в вершинной части 2–6-го промежутков надкрылий, явственно выступающими за контуры тела.

**Распространение.** Китай, провинция Юньнань.

**Этимология.** Новый вид назван именем Ильи Игоревича Кабака (Санкт-Петербург, Россия).

**Определительная таблица видов рода**

*Trachyphloeoides* Formánek, 1907

- 1(2). Глаза почти полусферические, сильно выступают за контуры головы. Головогубка, как правило, слегка сужена к вершине. Надкрылья с отчетливыми бугорками в вершинной части 2–5-го промежутков, явственно выступающими за контур тела. Основание переднеспинки уже основания надкрылий. Надкрылья с сильно скошенными плечами, позади плеч, как правило, плавно сдавлены с боков ..... *T. kabaki* sp. n.
- 2(1). Глаза обычно умеренно выпуклые, слабо выступают за контуры головы (как исключение, у



- T. hartmanni* sp. n. сильно выпуклые). Головоотрубка перед глазами обычно уже, чем в вершинной части, иногда одинаковой ширины. Надкрылья без бугорков или с единственным бугорком на вершине 5-го промежутка. Основание переднеспинки уже основания надкрылий или они одинаковой ширины. Надкрылья без плеч или со скошенными плечами, бока надкрылий прямые или округлены.
- 3(6). Головоотрубка в основной половине довольно сильно равномерно сдавлена с боков, ее ширина в вершинной части в 1.21–1.28 раза больше, чем в наиболее узкой части. Вершинный край надкрылий широко округлен. Пенис на вершине притуплен по всей ширине или слегка округлен.
- 4(5). Переднеспинка сильно поперечная, на фотографии лектотипа в 1.73 раза шире длины. Вершинная половина рукояти усиков покрыта щетинками и довольно широкими чешуйками. 1-й членик жгутика усиков равен длине 2-го или слегка короче его. Щетинки, торчащие на промежутках надкрылий, шире, приблизительно в 2.35–3 раза длиннее ширины ..... *T. sordidus*
- 5(4). Переднеспинка умеренно поперечная, в 1.53 раза шире длины. Вершинная половина рукояти усиков покрыта щетинками и узкими чешуйками. 1-й членик жгутика усиков слегка длиннее 2-го. Щетинки, торчащие на промежутках надкрылий, уже, приблизительно в 2.5–3.35 раза длиннее ширины ..... *T. potanini* sp. n.
- 6(3). Головоотрубка в основной половине умеренно или слабо сдавлена с боков, ее ширина в вершинной части в 1.09–1.17 раза больше, чем в наиболее узкой части. Вершинный край надкрылий при осмотре сверху узко или широко округлен, иногда почти угловидно изогнут посередине. Пенис на вершине заострен, узко округлен или с выемкой посередине.
- 7(10). Спинка головоотрубки с двумя отчетливыми поперечными перетяжками посередине и перед лбом. Надкрылья широко овальные, с отчетливыми скошенными плечами, в средней части почти параллельносторонние, по вершинному краю широко округлены или угловидно изогнуты. Промежутки надкрылий в длинных торчащих щетинках, длина которых в 2.45–5.5 раза больше ширины. Пенис на вершине умеренно узко закруглен или притуплен и с выемкой посередине.
- 8(9). Ширина головоотрубки на уровне места прикрепления усиков в 1.21 раза больше длины рукояти усиков. Вершинный край надкрылий угловидно изогнут посередине. 3-й и 4-й абдоминальные вентриты килевидно выпуклые, 5-й вентрит на вершине округлен. Чешуйки на надкрыльях ланцетовидные, волосковидно оттянуты на вершине. Пенис заметно сужен от основания к вершине, плавно дорсовентрально изогнут, его ламелла умеренно узко округлена и слегка притуплена в средней части. Вооружение эндофаллуса не выступает за вершину пениса ..... *T. belousovi* sp. n.
- 9(8). Ширина головоотрубки на уровне места прикрепления усиков в 1.37 раза больше длины рукоя-
- ти усиков. Вершинный край надкрылий широко округлен. 3-й и 4-й абдоминальные вентриты плавно выпуклые, 5-й вентрит на вершине почти прямо обрезан. Чешуйки на надкрыльях обычно одинаковой длины и ширины или слабо удлиненные, на вершине слегка заострены или широко вырезаны. Пенис почти параллельносторонний, в средней части заметно сдавлен с боков, сильно дорсовентрально угловидно изогнут, его ламелла на вершине довольно широко вырезана. Вооружение эндофаллуса отчетливо выступает за вершину пениса в виде полупрозрачной пластинки ..... *T. reuteri* sp. n.
- 10(7). Спинка головоотрубки с единственной, обычно отчетливой, поперечной перетяжкой перед лбом. Надкрылья яйцевидные, без плеч, вершинный край посередине узко округлен или угловидно изогнут. Промежутки надкрылий в более коротких, менее заметных полуприжатых и наклонных щетинках, длина которых в 1.33–2.3 раза больше ширины. Пенис на вершине явственно заострен.
- 11(12). Глаза сильно выпуклые. Вершинная часть 5-го промежутка надкрылий отчетливо приподнята, с бугорком на конце. Внутренняя сторона задних голеней в отчетливых заостренных зернышках. Пенис равномерно сужен от основания к вершине, в 3.3 раза длиннее ширины ..... *T. hartmanni* sp. n.
- 12(11). Глаза умеренно выпуклые. Надкрылья без бугорков. Внутренняя сторона задних голеней с едва заметными или отчетливыми заостренными зернышками. Пенис в средней части слегка или явственно сдавлен с боков, менее удлиненный, в 3 раза длиннее ширины.
- 13(14). Внутренняя сторона задних голеней с очень мелкими, плохо различимыми зернышками. 1-й членик передних лапок слегка удлиненный, 2-й членик в 1.78 раза шире длины, 3-й в 1.09 раза шире вершины голени. Пенис широкий, почти параллельносторонний, в средней части слегка сдавлен с боков, в 2.71 раза длиннее ширины. Вооружение эндофаллуса с 2 длинными склеротизованными тяжами, достигающими до середины аподем ..... *T. sp. pr. io*
- 14(13). Внутренняя сторона задних голеней с отчетливыми заостренными зернышками. 1-й членик передних лапок поперечный, 2-й членик сильно поперечный, в 2.42 раза шире длины, 3-й членик в 1.26 раза шире вершины голени. Пенис значительно уже, в 3 раза длиннее ширины, в средней части явственно сдавлен с боков. Вооружение эндофаллуса с 2 длинными склеротизованными тяжами, едва выступающими за основание пениса ..... *T. shokhini* sp. n.

## Обсуждение

В статьях Гребенникова [Grebennikov, 2018, 2022], посвященных долгоносикам трибы Blosyrini, отражена вся имевшаяся на тот момент информация о малоизвестном роде *Trachyphloeoides*, с ценными сведениями о типовом виде рода, проиллюстрированном

качественными фотографиями. Значительная часть этих работ посвящена обсуждению результатов молекулярного анализа фрагментов митохондриальной и ядерной ДНК, на основании чего сделан вывод о монофилетическом характере рода, включающего 2 вида, *T. sordidus* и *T. io* [Grebennikov, 2022]. Для молекулярного анализа *T. sordidus* были использованы материалы, собранные В.В. Гребенниковым в провинции Юньнань [Grebennikov, 2018], которые, с моей точки зрения, относятся к другому виду, возможно, близкому к *T. reuteri* **sp. n.** Это предположение подтверждается, в частности, особенностями строения эдегуса, которые хорошо видны на фотографии.

Из представленного здесь сравнительного морфологического анализа рода *Trachyphloeoides* следует, что входящие в него виды довольно сильно отличаются строением головы, надкрылий, эдегуса, а также вооружением эндофаллуса. Предварительно в составе рода могут быть выделены видо-вые группы *sordidus* (*T. sordidus*, *T. potanini* **sp. n.**), *io* (*T. io*, *T. hartmanni* **sp. n.**, *T. shokhini* **sp. n.**), *belousovi* (*T. belousovi* **sp. n.**, *T. reuteri* **sp. n.**) и *kabaki* (*T. kabaki* **sp. n.**), диагностические особенности которых отражены выше в определительной таблице. Я допускаю, что группа *belousovi* может оказаться сборной, так как вооружение эндофаллуса у включенных в нее видов не гомологизируется. Более детальное обсуждение системы *Trachyphloeoides* пока представляется преждевременным из-за недостаточной репрезентативности имеющегося материала.

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## Два новых вида и новые находки пауков (Aranei) в Дагестане (Россия)

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**Резюме.** С юга России (Республика Дагестан) описаны два новых вида пауков из семейств Gnaphosidae и Zodariidae. *Haplodrassus nabozhenkoi* Ponomarev, **sp. n.** близок к *H. signifer* (C.L. Koch, 1839) и *H. pseudosignifer* Marusik, Hippa et Koponen, 1996, от которых отличается формой эмболярного апофиза (у нового вида он слабо изогнут, почти прямой), строением эмболюса, формой латеральных карманов и ямки эпигины, размером сперматек (у нового вида они относительно крупнее). *Zodariellum dagestanum* Ponomarev, **sp. n.** наиболее близок к *Z. volgouralense* Ponomarev, 2007, от которого отличается меньшими размерами, деталями в строении пальпы самца, окраской. Приведены данные о первых находках *Clubiona caucasica* Mikhailov et Otto, 2017, *Diaea livens* Simon, 1876 в Дагестане и *Titanoeca caucasica* Dunin, 1985 на территории России и Грузии.

**Ключевые слова:** Araneae, пауки, фауна, Северный Кавказ.

### Two new species and new records of spiders (Aranei) in Dagestan (Russia)

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**Abstract.** Two new spider species from the families Gnaphosidae and Zodariidae are described from the south of Russia (Republic of Dagestan). *Haplodrassus nabozhenkoi* Ponomarev, **sp. n.** is similar to *H. signifer* (C.L. Koch, 1839) and *H. pseudosignifer* Marusik, Hippa et Koponen, 1996, from which it differs in the shape of the embolic apophysis (slightly curved, almost straight in the new species), the structure of the embolus, the shape of the lateral pockets and the fovea of epigyne, the size of spermathecae (they are relatively larger in the new species). *Zodariellum dagestanum* Ponomarev, **sp. n.** is similar to *Z. volgouralense* Ponomarev, 2007, from which it differs in the smaller size and details in the structure of the male palp, and colouration. Data on the first records of *Clubiona caucasica* Mikhailov et Otto, 2017, *Diaea livens* Simon, 1876 in Dagestan and *Titanoeca caucasica* Dunin, 1985 in Russia and Georgia are also provided.

**Key words:** Araneae, spiders, fauna, Northern Caucasus.

### Введение

Дагестан относится к территориям, где с начала XXI века ведутся интенсивные исследования фауны пауков [Пономарёв, Халидов, 2007; Пономарёв и др., 2011; Пономарёв, Алиева, 2010; Абдурахманов, Алиева, 2009, 2011 и др.]. Данные, полученные на основе этих работ, были обобщены в монографии Абдурахманова с соавторами [2012], в которой для Дагестана было указано 397 видов из 31 семейства. Последующие исследования [Пономарев, Двадненко, 2013; Пономарев, Абдурахманов, 2014; Пономарев и др., 2017; Ponomarev et al., 2019] значительно расширили наши знания о пауках Дагестана. К настоящему времени в фауне республики зарегистрировано не менее 460 видов пауков из 32 семейств. Тем не менее обработка материала, имеющегося в нашем распоряжении, указывает на значительные пробелы в изучении аранеофауны этого региона.

В предлагаемой статье мы описываем 2 новых вида пауков из двух семейств и приводим новые данные по распространению трех видов.

### Материал и методы

В статье использован материал, собранный в 2002, 2017 и 2018 годах на территории Республики Дагестан (Россия) Г.М. Абдурахмановым, М.А. Алиевым (Махачкала, Дагестан, Россия) и М.В. Набоженко (Ростов-на-Дону, Россия). Кроме того, использован дополнительный материал из Астраханской области (Россия) и Грузии, предоставленный авторам С.К. Алексеевым (Калуга, Россия), Ю.Г. Арзановым (Ростов-на-Дону, Россия) и П.П. Ивлиевым (Ростов-на-Дону, Россия). Фотографии сделаны в Южном научном центре Российской академии наук (Ростов-на-Дону, Россия) с помощью конструкции, изготовленной В.Ю. Шматко из цифрового фотоаппарата Sony Alpha ILCE-6000 и микроскопа МЛ-2. Используемая в тексте номенклатура деталей копулятивных органов дана по Ковблюку с соавторами [Kovblyuk et al., 2012], Омелько, Марусику [Omelko, Marusik, 2012], Замани, Марусику [Zamani, Marusik, 2022]. Сокращения, используемые в тексте: ALE – передние латеральные глаза, AME – передние



медиальные глаза, PLE – задние латеральные глаза, PME – задние медиальные глаза. Расшировка сокращений, используемых в рисунках, дана в подписях к рисункам.

Типовой материал передан на хранение в Зоологический музей Московского государственного университета (ЗММГУ, Москва, Россия) и Зоологический институт РАН (ЗИН, Санкт-Петербург, Россия). Часть паратипов и остальной материал хранится в личной коллекции А.В. Пономарёва (КП, станция Раздорская, Ростовская область, Россия).

### Семейство Clubionidae

#### *Clubiona caucasica* Mikhailov et Otto, 2017

*Clubiona caucasica* Mikhailov et Otto in Mikhailov et al., 2017: 363, figs 1a–b, e, 2a–b, 3a–d (♂♀).

**Материал.** 1♂ (КП), Россия, Дагестан, Казбековский р-н, пос. Дылым, 43.063704°N / 46.632083°E, грабовый лес, 30.05.2018 (М.А. Алиев).

**Распространение.** Вид широко распространен на Кавказе. На территории России выявлен в Краснодарском (окрестности Сочи) и Ставропольском (Пятигорск) краях, в Северной Осетии. Отмечен в Грузии, Азербайджане, Армении, Турции [Mikhailov et al., 2017]. Первая находка в Дагестане.

### Семейство Gnaphosidae

#### *Haplodrassus nabozhenkoi* Ponomarev, sp. n.

(Рис. 1–7, 12–14)

**Материал.** Голотип, ♂ (ЗММГУ): Россия, Дагестан, Унцукульский р-н, склоны на З окраине с. Майданское, 42.601689°N / 46.947486°E, сухая каменистая степь, 715 м, 20.04.2017 (М.В. Набоженко). Паратипы: 2♀ (ЗММГУ), 2♀ (ЗИН), 2♀ (КП: 18.24.18/1), вместе с голотипом (М.В. Набоженко).

**Сравнительный материал.** *Haplodrassus signifer* (C.L. Koch, 1839) (рис. 8–11, 15–17): 3♂ (КП), Россия, Астраханская обл., Богдинско-Баскунчакский заповедник, подножие г. Большое Богдо, 48.139861°N / 46.857667°E, 22.04–9.05.2002 (С.К. Алексеев); 4♂ (КП), Россия, Дагестан, бархан Сарыкум, 42.004458°N / 47.240365°E, 6–20.05.2017 (М.А. Алиев); 1♀ (КП), там же, 19.05.2018 (М.А. Алиев).

**Описание.** Самец (голотип). Длина тела 7 мм; длина карапакса 3 мм, ширина 2.2 мм. Карапакс светло-коричневый, с неясными серыми радиальными полосками, отходящими от медиальной борозды. По краю карапакса проходит тонкая серая полоска. Стернальный щит, лабиум, максиллы, тазики ног светло-коричневые, хелицеры коричневые. Ноги и пальпы желтые, предлапка и лапка I затемнены. Брюшко дорсально желто-серое, в передней половине с медиальным ланцетовидным серым пятном, ниже которого расположен слабо заметный елочковидный рисунок. Задний ряд глаз шире переднего; PME овальные; расстояние между PME и PLE чуть больше диаметра последних. Расстояние между AME больше, чем расстояние между AME и ALE. Лапки I, II со скопулой; предлапки I без вентральных шипов, предлапки II с одной парой вентральных шипов. Предлапки и голени III, IV с многочисленными шипами.

Отросток голени пальпы короче голени; к вершине равномерно сужается, на конце с небольшим расширением (рис. 3). Эмболический апофиз относительно длинный (отношение длины к ширине ~2.5), слабо изогнут, почти прямой (рис. 1, 2), в средней части с невысоким, но длинным гребнем, достигающим конца отростка эмболюса (рис. 1, 2, 4, 13). Эмболюс в апикальной части с крупным зубцом (рис. 13), в средней части с явным расширением (рис. 12, 14). Отношение длины к ширине цимбиума – 1.66.

Самка. Длина тела 7–11 мм; длина карапакса 3.2–3.5 мм, ширина 2.6–2.9 мм. Окраска тела и вооружение ног как у сам-

ца. Эпигина как на рисунках 5–7. Длина ямки эпигины больше ее ширины; боковые карманы длинные, почти параллельные (рис. 5); ямка эпигины без продольной борозды; капюшон слабо склеротизован; сперматеки круглые, большие, их диаметр чуть меньше ширины ямки эпигины (рис. 6, 7).

**Диагноз.** *Haplodrassus nabozhenkoi* Ponomarev, sp. n. близок к циркумглоарктическому *H. signifer* и палеарктическому *H. pseudosignifer* Marusik, Hippa et Koronen, 1996. От *H. signifer* самец нового вида отличается меньшими размерами копулятивных органов (рис. 12, 13, 15, 16), формой эмболического апофиза (у нового вида он слабо изогнут, почти прямой), относительно невысоким гребнем эмболического апофиза; деталями строения эмболюса, в частности более крупным зубцом эмболюса, расширенной средней частью эмболюса (рис. 12). От *H. pseudosignifer* самец *H. nabozhenkoi* Ponomarev, sp. n. отличается более длинным и менее массивным эмболическим апофизом, более крупным зубцом эмболюса, деталями строения апикальной части эмболюса, что видно при сравнении рисунков 12, 13 и рисунков из статей Марусика с соавторами [Marusik et al., 1996: 27, figs 63, 64], Ковблюда с соавторами [Kovblyuk et al., 2012: 81, fig. 69], Шестаковой с соавторами [Šestáková et al., 2022: 20, fig. 9g]. Самки *H. nabozhenkoi* Ponomarev, sp. n. отличаются от *H. pseudosignifer* и *H. signifer* формой ямки эпигины (у нового вида она уже), слабо изогнутыми латеральными карманами (lateral pockets) эпигины, крупными сперматеками (рис. 5–7).

**Распространение.** Только типовое местонахождение.

**Этимология.** Вид назван именем М.В. Набоженко, обнаружившего новый вид.

### Семейство Thomisidae

#### *Diaea livens* Simon, 1876

*Diaea livens* Simon, 1876: 182 (♀); Zamani et al., 2017: 68, figs 3G, 5F (♂).

**Материал.** 1♂ (КП), Россия, Дагестан, Казбековский р-н, пос. Дылым, 43.063704°N / 46.632083°E, грабовый лес, 30.05.2018 (М.А. Алиев).

**Распространение.** Вид, новый для фауны Дагестана. На территории России отмечался только в Крыму [Mikhailov, 2013]. Распространен в Южной и Центральной Европе, Турции, Иране, интродуцирован в США [World Spider Catalog, 2023]; на Кавказе выявлен в Грузии, Южной Осетии, Азербайджане [Пономарёв, Комаров, 2015; Otto, 2022].

### Семейство Titanocidae

#### *Titanoeca caucasica* Dunin, 1985

(Рис. 18–24)

*Titanoeca caucasica* Dunin, 1985: 932, figs 1–8 (♂♀).

**Материал.** 1♀ (КП), Россия, Дагестан, Унцукульский р-н, с. Майданское, 42.599938°N / 46.960082°E, 07.2002 (Г.М. Абдурахманов); 1♀ (КП), там же, склоны на З окраине с. Майданское, 42.601689°N / 46.947486°E, сухая каменистая степь, 715 м, 20.04.2017 (М.В. Набоженко).

**Дополнительный материал.** 1♂, 5♀ (КП), Грузия, Кахетия, окр. Сагареджо, 41.668667°N / 45.39°E, берег р. Иори, 530 м, 17–27.05.2017 (П.П. Ивлиев).

**Указание для Дагестана.** *Titanoeca* sp.: Абдурахманов, Алиева, 2009: 46; Абдурахманов, Алиева, 2011: 58 (с. Майданское, Дагестан, Россия).



Рис. 1–11. Виды рода *Haplodrassus* Chamberlin, 1922, детали строения.  
 1–7 – *H. nabozhenkoi* Ponomarev, sp. n.; 8–11 – *H. signifler* (экземпляры: 8, 10–11 – из Дагестана, 9 – из Астраханской области). 1–4, 8–10 – паляпа самца; 5 – эпигина; 6, 7, 11 – вульва. 1–2, 5–6 – вентрально (1–2 – разные ракурсы); 3, 8 – ретролатерально; 4, 9–10 – пролатерально (9–10 – разные ракурсы); 7, 11 – дорсально. *E* – эмболюс, *EA* – эмболический апофиз, *RTA* – ретролатеральный отросток голени. Масштабные линейки 0.25 мм.

Figs 1–11. Species of the genus *Haplodrassus* Chamberlin, 1922, details of structure.  
 1–7 – *H. nabozhenkoi* Ponomarev, sp. n.; 8–11 – *H. signifler* (specimens: 8, 10–11 – from Dagestan, 9 – from Astrakhan Region). 1–4, 8–10 – male palp; 5 – epigyne; 6, 7, 11 – vulva. 1–2, 5–6 – ventral view (1–2 – different angles); 3, 8 – retrolateral view; 4, 9–10 – prolateral view (9–10 – different angles); 7, 11 – dorsal view. *E* – embolus, *EA* – embolic apophysis, *RTA* – retrolateral tibial apophysis. Scale bars 0.25 mm.



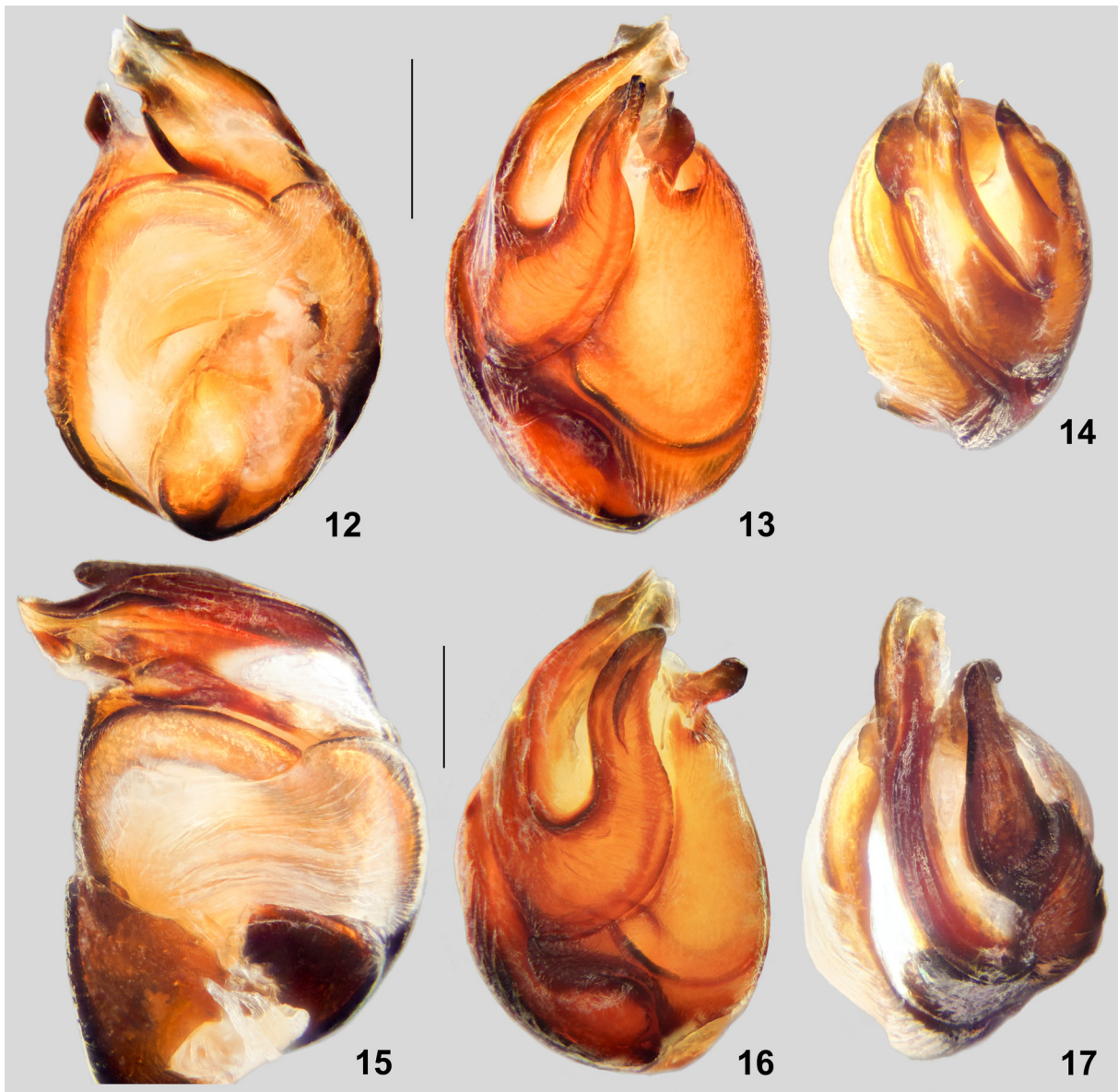


Рис. 12–17. Виды рода *Haplodrassus*, бульбусы.  
 12–14 – *H. nabozhenkoi* Ponomarev, sp. n.; 15–17 – *H. signifier*. 12, 15 – дорсально; 13, 16 – вентрально; 14, 17 – апикально. Экземпляры: 12–15, 17 – из Дагестана, 16 – из Астраханской области. Масштабные линейки 0.25 мм.  
 Figs 12–17. Species of the genus *Haplodrassus*, bulbus.  
 12–14 – *H. nabozhenkoi* Ponomarev, sp. n.; 15–17 – *H. signifier*. 12, 15 – dorsal view; 13, 16 – ventral view; 14, 17 – apical view. Specimens: 12–15, 17 – from Dagestan, 16 – from Astrakhan Region. Scale bars 0.25 mm.

**Замечания.** Малоизвестный вид, поэтому приводим иллюстрации (рис. 18–24) копулятивных органов *T. caucasica* из нашей коллекции.

**Распространение.** Вид был описан из Азербайджана [Дунин, 1985], обнаружен в Турции и Иране [World Spider Catalog, 2023]. Впервые отмечается для России и Грузии.

#### Семейство Zodariidae

*Zodariellum dagestanum* Ponomarev, sp. n.

(Рис. 25, 27, 28)

*Zodariellum volgouralense* Ponomarev, 2007: Пономарёв, 2002: 545 (только Дагестан), ошибочное определение.

**Материал.** Голотип, ♂ (ЗММГУ): Россия, Дагестан, Кумторкалинский р-н, бархан Сарыкум, 42.943285°N / 47.261104°E, солончак, 30.05.2018 (М.А. Алиев).

**Сравнительный материал.** *Zodariellum volgouralense* Ponomarev, 2007 (рис. 26, 29): 8♂, паратипы (КП: 12.10.2/3), Россия, Астраханская обл., окр. оз. Баскунчак, 48.111267°N / 46.823214°E, 05.2003 (Ю.Г. Арзанов).

**Описание.** Самец (голотип). Длина тела 3.25 мм; длина карапакса 1.5 мм, ширина 1.15 мм. Размеры глаз: АМЕ: 0.15 мм, АЛЕ: 0.1 мм, РМЕ: 0.1 мм, РЛЕ: 0.075 мм. Карапакс, ноги, пальпы, хелицеры, стернум, лабиум, максиллы, паутинные бородавки желтые. Глазное поле коричневое. Карапакс в средней части с небольшим коричневым пятном неправильной формы с размытыми краями. Брюшко дорсально коричневое. Пальпа как на рисунках 25, 27, 28. Отросток голени пальпы длиннее



Рис. 18–24. *Titanoeoa caucasica*, копулятивные органы. 18–20, 22 – пальпа самца; 21 – голень пальпы самца; 23 – эпигина; 24 – вульва; 18 – ретролатерально; 19 – пролатерально; 20 – вентро-ретролатерально; 21 – дорсолатерально; 22, 24 – дорсально; 23 – вентрально. Масштабные линейки 0.25 мм.

Figs 18–24. *Titanoeoa caucasica*, copulatory organs.

18–20, 22 – male palp; 21 – tibia of male palp; 23 – epigyne; 24 – vulva; 18 – retrolateral view; 19 – prolateral view; 20 – ventral-retrolateral view; 21 – dorsolateral view; 22, 24 – dorsal view; 23 – ventral view. Scale bars 0.25 mm.

голеи; его длина в 2.7 раза больше ширины голени у основания; в апикальной части изогнут дорсо-ретролатерально, с небольшим треугольным выростом; в месте изгиба образует две ветви (рис. 25, 27). Вентральная ветвь длинная, дуговидно изогнута, по внутреннему краю в мелких зубчиках (рис. 25), дорсальная ветвь короткая, резко заостренная. Основание шпоры тегулярного отростка без зубчиков. Соотношение длины к ширине цимбиума – 1.8. Начало эмболюса находится в позиции примерно 5:30 часов.

Самка неизвестна.

**Диагноз.** *Zodariellum dagestanum* Ponomarev, sp. n. близок к североприкаспийскому *Z. volgouralense* (рис. 26, 29) и восточноказахстанско-монгольскому *Z. nenilini* (Eskov, 1995). От первого вида отличается значительно меньшими размерами, отсутствием зуб-

цов на шпоре тегулярного отростка (рис. 25, 26), изгибом кондуктора, отсутствием на дорсальной стороне брюшка рисунка из мелких частых продольных полосок и медиальной полосы в задней части брюшка. От *Z. nenilini* новый вид отличается окраской, в частности отсутствием на дорсальной стороне брюшка каудальной продольной цепочки из четырех треугольных светлых пятен; деталями в строении пальпы самца, а именно более длинной вентральной ветвью отростка голени пальпы.

**Распространение.** Только типовое местонахождение.

**Этимология.** Название вида относится к Дагестану, где был собран голотип.



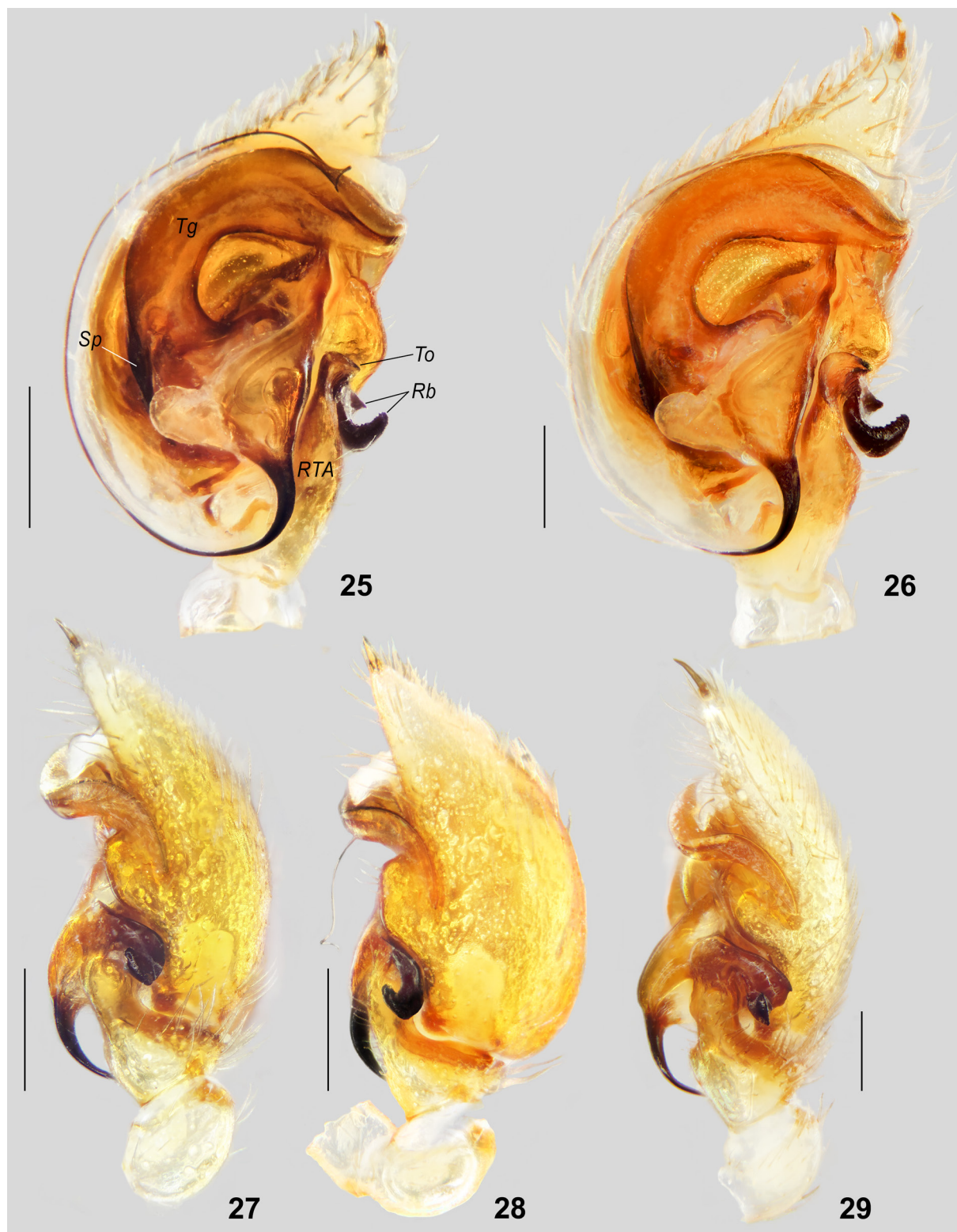


Рис. 25–29. Виды рода *Zodariellum* Andreeva et Tystshenko, 1968, палпы самца.  
 25, 27–28 – *Z. dagestanum* Ponomarev, sp. n. (27–28 – разные ракурсы); 26, 29 – *Z. volgouralense*. 25–26 – вентрально; 27–29 – латерально. RTA – ретролатеральный отросток голени, Rb – ветви ретролатерального отростка голени, Sp – шпора тегулярного апофиза, Tg – тегулярный апофиз, To – треугольный отросток. Масштабные линейки 0.25 мм.

Figs 25–29. Species of the genus *Zodariellum* Andreeva et Tystshenko, 1968, male palp.  
 25, 27–28 – *Z. dagestanum* Ponomarev, sp. n. (27–28 – different angles); 26, 29 – *Z. volgouralense*. 25–26 – ventral view; 27–29 – lateral view. RTA – retrolateral tibial apophysis, Rb – branches of the retrolateral tibial apophysis, Sp – spur of the tegular apophysis, Tg – tegular apophysis, To – triangular outgrowth. Scale bars 0.25 mm.

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## К познанию фауны пилильщиков (Hymenoptera: Symphyta) Мордовии (Россия)

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**Резюме.** Представлен список из 122 видов пилильщиков, относящихся к 8 семействам, собранных в Республике Мордовия. *Dolerus quadrinotatus* (Bíró, 1884) указан впервые для фауны России. Приведены фотографии этого редкого вида и даны отличия от *D. liogaster* Thomson, 1871, имеющего схожую окраску тела. *Allantus cingulatus* (Scopoli, 1763), *Empria fletcheri* (Cameron, 1878), *E. immersa* (Klug, 1818), *E. pumila* (Konow, 1896), *Cladardis hartigi* Liston, 1995, *Aglaostigma gibbosum* (Fallén, 1808), *Macrophya teutona* (Panzer, 1799), *Tenthredopsis auriculata* (Thomson, 1870) и *T. scutellaris* (Fabricius, 1804) – виды, новые для фауны Мордовии.

**Ключевые слова:** Symphyta, новые находки, Мордовский заповедник, национальный парк «Смольный», Мордовия.

### To the knowledge of the fauna of sawflies (Hymenoptera: Symphyta) of Mordovia (Russia)

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**Abstract.** An annotated list of 122 species of sawflies belonging to eight families collected in the Republic of Mordovia (Russia) is presented. *Dolerus quadrinotatus* (Bíró, 1884) is recorded for the fauna of Russia for the first time. Photographs of this rare species are given and differences from *D. logaster* Thomson, 1871, which has a similar body colour, are discussed. The following species are new for the fauna of Mordovia: *Allantus cingulatus* (Scopoli, 1763), *Empria fletcheri* (Cameron, 1878), *E. immersa* (Klug, 1818), *E. pumila* (Konow, 1896), *Cladardis hartigi* Liston, 1995, *Aglaostigma gibbosum* (Fallén, 1808), *Macrophya teutona* (Panzer, 1799), *Tenthredopsis auriculata* (Thomson, 1870) and *T. scutellaris* (Fabricius, 1804).

**Key words:** Symphyta, new records, Mordovia State Nature Reserve, National Park “Smolny”, Mordovia.

Подотряд сидячебрюхих перепончатокрылых (Hymenoptera: Symphyta) включает в себя более 8000 видов рогахостов и пилильщиков, относящихся к 13 семействам [Taeger et al., 2010]. Согласно опубликованным данным в России отмечено 1546 видов рогахостов и пилильщиков [Sundukov, 2017]. На территории центрального региона европейской части России, в состав которого помимо Республики Мордовия входит еще 19 областей, было обнаружено 437 видов из 13 семейств. Несмотря на имеющиеся данные, каталогизация симфит этой территории, включая отдельные регионы, далека до своего завершения.

### Материал и методы

В данной работе рассматриваются находки пилильщиков, сделанных сотрудниками Мордовского государственного заповедника А.Б. Ручиным, М.Н. Есиным и Г.Б. Семишиным в 2021–2022 годах как в Мордовском заповеднике и национальном парке «Смольный», так и в некоторых других районах республики. Основная часть материала была собрана в ловушки Малеза, в желтые тарелки и ловушки с приманкой из бродящего пива [Голуб и др., 2012]. Отдельные виды

пилильщиков были отловлены сачком при ручном (индивидуальном) сборе.

Основные места сбора материала:

Мордовский заповедник:

кордон Инорский – Республика Мордовия, Темниковский район, 54.7277°N / 43.1510°E, сосновый лес, лесная поляна у озера, ловушка Малеза;

кордон Вальзенский – Республика Мордовия, Темниковский район, 54.7202°N / 43.2341°E, желтые тарелки;

кордон Жегаловский – Республика Мордовия, Темниковский район, 54.7787°N / 43.3622°E, желтые тарелки.

Национальный парк «Смольный»:

Барахмановское лесничество – Республика Мордовия, Ичалковский район, желтые тарелки и ловушка Малеза;

Кемлянский лесничество – Республика Мордовия, Ичалковский район, желтые тарелки;

кордон Мокров – Республика Мордовия, Ичалковский район, 54.7591°N / 45.6124°E, южная опушка соснового леса, ловушка Малеза.

На рисунке 1 показаны все точки сбора материала. В некоторых точках было несколько пунктов исследований, в тексте они приведены более подробно (с координатами).

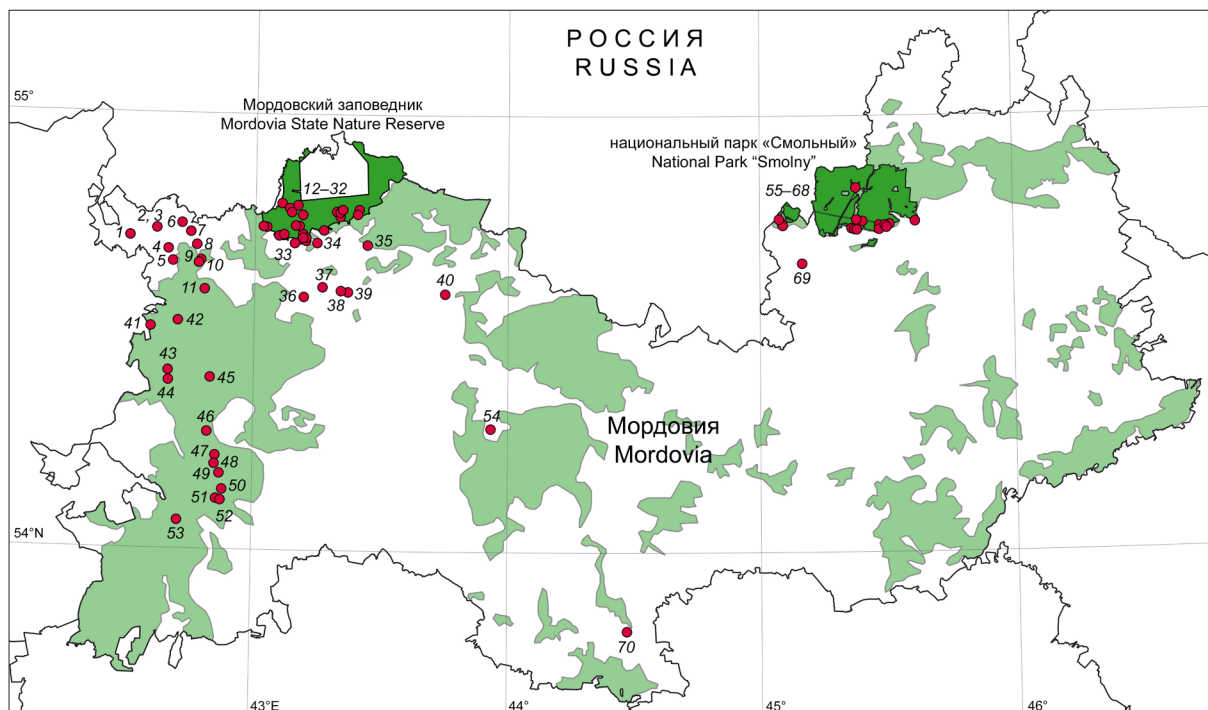


Рис. 1. Основные точки сбора пилильщиков в Республике Мордовия.

Теньгушевский район: 1 – 3 км северо-восточнее с. Стандрово, 2 – 3 км северо-восточнее с. Теньгушево, 3 – 5 км юго-западнее с. Теньгушево, 4 – д. Александровка, 5 – 3 км севернее д. Клемешей, 6 – с. Куликово, 7 – д. Телимерки, 8 – окрестности оз. Шелубей, 9 – 2 км северо-западнее с. Ивановка, 10 – оз. Пиявское, 11 – 14 км западнее пос. Барашево. Темниковский район, Мордовский заповедник: 12 – кордон Инорский, 13 – кордон Вальзенский, 14 – кордон Жегаловский, 15 – кордон Подрубный, 16 – кордон Таратинский, 17 – квартал 278/303, 18 – квартал 301, 19 – квартал 330, 20 – квартал 369, 21 – квартал 373, 22 – квартал 394, 23 – квартал 401, 24 – квартал 409, 25 – квартал 434, 26 – квартал 435, 27 – квартал 441, 28 – кордон Долгий Мост, 29 – пос. Пушта, 30 – окрестности оз. Большая Вальза, 31 – квартал 398, 32 – квартал 449. Темниковский район: 33 – с. Татарское Караево, 34 – д. Сосновка, 35 – 9 км северо-западнее с. Пурдошки, 36 – 2 км севернее с. Бабеево, 37 – с. Кондровка, 38 – с. Аксела, 39 – с. Алкаево. Ельниковский район: 40 – окрестности с. Стародевичье. Zubovo-Polyanskiy район: 41 – 8 км южнее пос. Дачный, 42 – 22 км северо-западнее пос. Явас, 43 – пос. Озерный, 44 – 2 км севернее пос. Озерный, 45 – пос. Явас, 46 – 3 км южнее пос. Леплей, 47 – пос. Молочница, 48 – 3 км южнее пос. Молочница, 49 – 12 км севернее пос. Потьма, 50 – 5 км севернее пос. Потьма, 51 – 2 км северо-западнее пос. Потьма, 52 – пос. Потьма, 53 – 5 км южнее пос. Zubova Polyana. Kovyalkinskiy район: 54 – севернее д. Лепьево. Ичалковский район, национальный парк «Смольный»: Баракмановское лесничество: 55 – квартал 87, 56 – квартал 98, 57 – квартал 104, 58 – квартал 107, 59 – квартал 108, 60 – квартал 113, 61 – кордон Мокров, 62 – квартал 78; Львовское лесничество: 63 – квартал 63; Кемляньское лесничество: 64 – квартал 76, 65 – квартал 92, 66 – квартал 93, 67 – квартал 122, 68 – квартал 128. Ичалковский район: 69 – урочище Ендова. Инсарский район: 70 – окрестности с. Нижняя Вязера.

Fig. 1. The main localities of sawflies in the Republic of Mordovia.

Tengushevo District: 1 – 3 km northeast of Standrovo village, 2 – 3 km northeast of Tengushevo village, 3 – 5 km southwest of Tengushevo village, 4 – Aleksandrovka village, 5 – 3 km north of Klemeshchey village, 6 – Kulikovo village, 7 – Telimerki village, 8 – Shelubey Lake environs, 9 – 2 km northwest of Ivanovka village, 10 – Piyavskoe Lake, 11 – 14 km west of Barashevo village. Temnikov District, Mordovia State Nature Reserve: 12 – Inorskiy cordon, 13 – Valzenskiy cordon, 14 – Zhegalovskiy cordon, 15 – Podrubnyy cordon, 16 – Taratinskiy cordon, 17 – section 278/303, 18 – section 301, 19 – section 330, 20 – section 369, 21 – section 373, 22 – section 394, 23 – section 401, 24 – section 409, 25 – section 434, 26 – section 435, 27 – section 441, 28 – Dolgiy Most cordon, 29 – Pushta village, 30 – Bol'shaya Val'za Lake environs, 31 – section 398, 32 – section 449. Temnikov District: 33 – Tatarskoe Karaevo village, 34 – Sosnovka village, 35 – 9 km northwest of Purdoshki village, 36 – 2 km north of Babevo village, 37 – Kondrovka village, 38 – Aksele village, 39 – Alkaevo village. Elniki District: 40 – Starodevich'e village environs. Zubova Polyana District: 41 – 8 km south of Dachnyy village, 42 – 22 km northwest of Yavas village, 43 – Ozernyy village, 44 – 2 km north of Ozernyy village, 45 – Yavas village, 46 – 3 km south of Lepley village, 47 – Molochnitsa village, 48 – 3 km south of Molochnitsa village, 49 – 12 km north of Pot'ma village, 50 – 5 km north of Pot'ma village, 51 – 2 km northwest of Pot'ma village, 52 – Pot'ma village, 53 – 5 km south of Zubova Polyana village. Kovyalkino District: 54 – north of Lep'evoye village. Ichalkovskiy District, National Park "Smolny": Barakhmanovskoye forestry: 55 – section 87, 56 – section 98, 57 – section 104, 58 – section 107, 59 – section 108, 60 – section 113, 61 – Mokrov cordon, 62 – section 78; Lvovskoye forestry: 63 – section 63; Kemyanskoye forestry: 64 – section 76, 65 – section 92, 66 – section 93, 67 – section 122, 68 – section 128. Ichalkovskiy District: 69 – Endova natural boundary. Insar District: 70 – Nizhnyaya Vyazera village environs.

Определение материала проводили по работам отечественных и зарубежных авторов [Гуссаковский, 1935; van Achterberg, van Aarsten, 1986; Желоховцев, 1988; Taeger, 1988, 1989; Blank, Ritzau, 1998; Haris, 2000; Heidema, 2004; Heibo et al., 2008; Macek, 2010; Prous, 2012; Haris, Gyurkovics, 2014; Prous et al., 2014; Taeger, Viitasaari, 2015; Костюнин, 2017; Liston et al., 2019, 2022].

Виды, новые для фауны Республики Мордовия, отмечены звездочкой \*, вид, новый для фауны России – двумя звездочками \*\*.

### Семейство Cephidae

#### *Calameuta filiformis* (Eversmann, 1847)

**Материал.** 3♀, кордон Инорский, 31.05–7.06.2021; 1♂, Ичалковский р-н, урочище Ендова, 54.6613°N / 45.1747°E, 28.06.2022; 37♂, 9♀, кордон Мокров, 7–24.06.2022, 5–12.07.2022, 5–8.08.2022.

#### *Calameuta (Calameuta) pallipes* (Klug, 1803)

**Материал.** 2♀, кордон Инорский, 7–10.06.2021, 15–18.06.2021; 6♂, 5♀, кордон Мокров, 7–24.06.2022.

*Calameuta (Calameuta) punctata* (Klug, 1803)= *C. filum* (Gussakovskij, 1935).**Материал.** 2♀, кордон Инорский, 17–20.05.2021.**Замечание.** Приводился [Ruchin et al., 2022] для Мордовского заповедника как *C. filum* (Gussakovskij, 1935). Новая синонимия дана по [Liston et al., 2022].*Cephus brachycercus* Thomson, 1871**Материал.** 4♀, кордон Инорский, 17–31.05.2021; 3♂, 3♀, кордон Мокров, 7–19.06.2022; 4♂, 3♀, Барахмановское лесничество, квартал 113, 54.7394°N / 45.4747°E, 21–24.06.2022.*Cephus cinctus* Norton, 1872**Материал.** 1♂, Кемляное лесничество, квартал 76, 54.7470°N / 45.3249°E, 20.07.2022.*Cephus fumipennis* Eversmann, 1847**Материал.** 2♀, кордон Мокров, 19–24.06.2022, 5–12.07.2022.*Cephus pygmaeus* (Linnaeus, 1767)**Материал.** 1♀, кордон Инорский, 3–7.06.2021; 1♂, кордон Мокров, 11–15.06.2022.*Cephus sareptanus* Dovnar-Zapolskij, 1928**Материал.** 1♂, 1♀, кордон Мокров, 15–19.06.2022.*Cephus spinipes* (Panzer, 1800)**Материал.** 9♀, кордон Мокров, 11.06–20.07.2022; 4♀, Барахмановское лесничество, квартал 113, 54.7394°N / 45.4747°E, 21–24.06.2022.*Phylloecus linearis* (Schrank, 1781)**Материал.** 1♂, 1♀, кордон Мокров, 19–24.06.2022; 2♂, 2♀, Барахмановское лесничество, квартал 113, 54.7394°N / 45.4747°E, 21–24.06.2022.*Phylloecus niger* (M. Harris, 1779)**Материал.** 1♀, кордон Инорский, 17–20.05.2021.**Семейство Orussidae***Orussus abietinus* (Scopoli, 1763)**Материал.** 1♂, Мордовский заповедник, квартал 434, 54.7342°N / 43.3103°E, 31.05–15.06.2022; 1♂, 2♀, кордон Мокров, 7–15.06.2022; 1♀, кордон Инорский, поляна, 17.06.2022.**Семейство Pamphiliidae***Acantholyda (Acantholyda) flaviceps* (Retzius, 1783)**Материал.** 1♂, Мордовский заповедник, квартал 331, 54.7740°N / 43.1854°E, 5–21.05.2022.*Cephalcia lariciphila* (Wachtl, 1898)**Материал.** 1♀, Мордовский заповедник, пос. Пушта, 5.05.2022; 1♀, кордон Мокров, 10–17.05.2022.*Pamphilius hortorum* (Klug, 1808)**Материал.** 1♀, Мордовский заповедник, квартал 401, пойма р. Мокша, 54.7473°N / 43.0851°E, 26–29.05.2021; 1♀, Мордовский за-

поведник, квартал 401, 54.87°N / 43.49°E, 26–29.05.2021; 1♀, кордон Жегаловский, 27–31.05.2021; 1♂, Zubovo-Полянский р-н, пос. Потья, 17–19.06.2021; 1♂, кордон Вальзенский, 18–22.05.2022; 1♀, кордон Мокров, 19–24.06.2022.

*Pamphilius varius* (Audinet-Serville, 1823)**Материал.** 1♂, 1♀, Мордовский заповедник, квартал 449, 54.7117°N / 43.2284°E, 18–22.05.2021.**Семейство Xiphidiidae***Xiphidria camelus* (Linnaeus, 1758)**Материал.** 1♀, кордон Инорский, поляна, 25.07–8.08.2022.**Семейство Argidae***Arge fuscipes* (Fallén, 1808)**Материал.** 1♀, кордон Мокров, 11–15.06.2022.*Arge gracilicornis* (Klug, 1814)**Материал.** 1♂, кордон Инорский, 3–7.06.2021.*Arge nigripes* (Retzius, 1783)**Материал.** 1♀, кордон Вальзенский, 18–22.05.2022.*Arge ochropus* (Gmelin, 1790)**Материал.** 1♀, Барахмановское лесничество, квартал 108, поляна, 54.7454°N / 45.5038°E, 3.08.2022.*Arge pullata* (Zaddach, 1859)**Материал.** 1♀, Барахмановское лесничество, квартал 108, под линией электропередачи, 54.74°N / 45.50°E, 14–24.06.2022.**Семейство Cimbicidae***Abia fasciata* (Linnaeus, 1758)**Материал.** 1♀, Мордовский заповедник, квартал 373, 54.7812°N / 43.4124°E, 27–31.05.2021; 3♀, кордон Мокров, 24.06–5.07.2022.*Trichiosoma lucorum* (Linnaeus, 1758)**Материал.** 1♀, Мордовский заповедник, квартал 441, 54.7318°N / 43.2219°E, 18.05.2021.*Praia taczanowskii* Wankowicz, 1880**Материал.** 1♀, Мордовский заповедник, кордон Долгий Мост, 54.7481°N / 43.2010°E, 14–17.05.2021.**Семейство Diprionidae***Microdiprion pallipes* (Fallén, 1808)**Материал.** 1♂, Мордовский заповедник, пос. Пушта, в деревянном доме, 54.7778°N / 43.3726°E, 7.12.2021.*Neodiprion sertifer* (Geoffroy, 1785)**Материал.** 2♀, кордон Инорский, 31.08–9.09.2021.**Семейство Tenthredinidae***Ametastegia (Ametastegia) albipes* (Thomson, 1871)**Материал.** 1♂, Мордовский заповедник, окр. оз. Большая Вальза, 30.04–3.05.2021; 1♂, Мордовский заповедник, квартал 278/303,

54.7942°N / 43.2300°E, 19–21.05.2021; 1♀, кордон Инорский, 18–22.06.2021; 2♀, Темниковский р-н, 2 км С с. Бабеево, 6–9.07.2021; 1♂, Теньгушевский р-н, 2 км СЗ с. Ивановка, 9–13.07.2021; 1♀, Теньгушевский р-н, 3 км СВ с. Стандрово, 13–16.07.2021; 1♀, Zubovo-Polyanskiy р-н, 3 км Ю пос. Молочница, 3–15.08.2021.

*Ametastegia (Ametastegia) equiseti* (Fallén, 1808)

**Материал.** 25♂, 7♀, кордон Инорский, 11–31.05.2021, 3–25.06.2021, 12–27.07.2021, 30.07–15.08.2021; 2♂, кордон Жегаловский, 27–31.05.2021; 4♂, 11♀, кордон Мокров, 19.06–12.07.2021, 15.07–12.08.2022; 1♀, Zubovo-Polyanskiy р-н, 12 км С пос. Потьма, 3–15.08.2021.

*Ametastegia (Ametastegia) glabrata* (Fallén, 1808)

**Материал.** 6♂, 1♀, кордон Инорский, 11–31.05.2021, 25–28.06.2021, 5–8.07.2021; 1♂, 1♀, Мордовский заповедник, квартал 401, пойма р. Мокша, 54.7473°N, 43.0851°E, 26–29.05.2021; 1♂, кордон Жегаловский, 27–31.05.2021; 2♂, Теньгушевский р-н, 2 км СЗ с. Ивановка, 9–13.07.2021; 4♂, Теньгушевский р-н, 3 км СВ с. Теньгушево, 16–20.07.2021; 1♂, Теньгушевский р-н, д. Телимерки, 16–20.07.2021; 1♀, Zubovo-Polyanskiy р-н, 3 км Ю пос. Молочница, 3–15.08.2021; 1♀, кордон Мокров, 7–11.06.2022; 1♀, Барахмановское лесничество, квартал 87, 54.7775°N / 45.6150°E, 7.08.2022.

*Ametastegia (Protemphytus) carpini* (Hartig, 1837)

**Материал.** 5♂, 3♀, кордон Инорский, 11–17.05.2021, 18–22.06.2021, 2–5.07.2021; 1♀, Zubovo-Polyanskiy р-н, 5 км С пос. Потьма, 3–15.08.2021; 1♂, кордон Мокров, 11–15.06.2022.

*Ametastegia (Protemphytus) pallipes* (Spinola, 1808)

**Материал.** 1♀, кордон Инорский, 26.04–11.05.2021; 1♂, Мордовский заповедник, окр. оз. Большая Вальза, 30.04–3.05.2021; 1♂, 1♀, Zubovo-Polyanskiy р-н, пос. Озерный, 26–29.06.2021; 1♀, Темниковский р-н, 9 км СЗ с. Пурдошки, 6–9.07.2021; 1♀, Теньгушевский р-н, д. Александровка, 54.7068°N / 42.8136°E, 13–16.07.2021; 1♀, Zubovo-Polyanskiy р-н, пос. Молочница, 3–15.08.2021; 4♀, кордон Мокров, 7–11.06.2021, 28.07–5.08.2022; 1♀, Барахмановское лесничество, квартал 108, поляна, 54.7454°N / 45.5038°E, 1–3.08.2022; 1♀, Барахмановское лесничество, квартал 113, 54.7394°N / 45.4747°E, 2–4.08.2022; 1♀, Кемляное лесничество, квартал 122, сосняк, 54.7608°N / 45.0830°E, 15–17.08.2022.

*Ametastegia (Protemphytus) perla* (Klug, 1818)

**Материал.** 1♀, кордон Инорский, 15–18.06.2021.

*Ametastegia (Protemphytus) tenera* (Fallén, 1808)

**Материал.** 68♂, 55♀, кордон Инорский, 26.04–20.05.2021, 31.05–28.06.2021, 2–31.08.2021; 1♂, Мордовский заповедник, окр. оз. Большая Вальза, 30.04–3.05.2021; 1♂, Барахмановское лесничество, квартал 104, под линией электропередачи, 54.7562°N / 45.4448°E, 14–24.06.2022; 58♂, 22♀, кордон Мокров, 10–23.05.2022, 7.06–12.07.2022, 17.07–24.08.2022; 1♂, Кемляное лесничество, квартал 93, 54.7378°N / 45.4044°E, 27.07.2022; 1♂, Барахмановское лесничество, квартал 78, луг/опушка вдоль противопожарной минерализованной полосы, 54.7699°N / 45.5608°E, 30.07–2.08.2022 (К. Томкович); 1♂, Барахмановское лесничество, квартал 98, под линией электропередачи, 54.7591°N / 45.4089°E, 1–3.08.2022.

*Taxonus agrorum* (Fallén, 1808)

**Материал.** 1♂, Мордовский заповедник, кордон Долгий Мост, 54.7481°N / 43.2010°E, 14–17.05.2021; 6♂, 2♀, кордон Инорский, 17.05–15.06.2021, 2–5.08.2021; 1♂, Мордовский заповедник, квартал 401, 54.7716°N / 43.4803°E, 26–29.05.2021; 1♂, кордон Жегаловский, 27–31.05.2021; 1♂, Мордовский заповедник, кордон Таратинский, 54.7450°N / 43.0869°E, 7–10.06.2021; 1♂, Zubovo-Polyanskiy р-н, пос. Явас, 17–19.06.2021; 1♀, Темниковский р-н, с. Кон-

дровка, 6–9.07.2021; 1♀, Темниковский р-н, с. Аксел, 6–9.07.2021; 1♂, 1♀, Мордовский заповедник, окр. оз. Большая Вальза, 8–15.07.2021; 1♀, Теньгушевский р-н, д. Александровка, 54.7068°N / 42.8136°E, 13–16.07.2021; 1♀, Теньгушевский р-н, с. Куликово, 16–20.07.2021; 1♂, Теньгушевский р-н, 5 км ЮЗ с. Теньгушево, 16–20.07.2021; 2♀, Теньгушевский р-н, д. Телимерки, 16–20.07.2021; 1♀, Zubovo-Polyanskiy р-н, 3 км Ю пос. Молочница, 3–15.08.2021; 3♀, Zubovo-Polyanskiy р-н, 2 км СЗ пос. Потьма, 3–15.08.2021; 2♀, Zubovo-Polyanskiy р-н, 5 км С пос. Потьма, 3–15.08.2021; 3♂, 1♀, кордон Вальзенский, 18–22.05.2022; 1♀, Кемляное лесничество, квартал 92, 54.7393°N / 45.3879°E, 19–21.07.2022; 1♀, Барахмановское лесничество, квартал 113, поляна, 54.7407°N / 45.4732°E, 1–3.08.2022; 1♂, Барахмановское лесничество, квартал 87, 54.7775°N / 45.6150°E, 7.08.2022; 2♂, 1♀, кордон Мокров, 7–15.06.2022, 12–17.08.2022; 1♀, Кемляное лесничество, квартал 122, сосняк, 54.7608°N / 45.0830°E, 15–17.08.2022.

*Allantus (Emphytus) basalis* (Klug, 1818)

**Материал.** 9♂, 3♀, кордон Инорский, 11–31.05.2021, 7–10.06.2021, 19–30.07.2021.

*Allantus (Emphytus) calceatus* (Klug, 1818)

**Материал.** 16♂, 13♀, кордон Инорский, 26.04–25.05.2021, 2–21.07.2021; 3♂, кордон Жегаловский, 27–31.05.2021; 1♀, Темниковский р-н, с. Аксел, 6–9.07.2021; 1♀, Теньгушевский р-н, оз. Пиявское, 9–13.07.2021; 1♀, Теньгушевский р-н, 14 км 3 пос. Барашево, 23–26.07.2021; 1♀, кордон Мокров, 15–20.07.2022; 1♀, Темниковский р-н, с. Татарское Караево, на противопожарной минерализованной полосе, 54.7143°N / 43.2389°E, 8–10.08.2022.

*Allantus (Emphytus) cinctus* (Linnaeus, 1758)

**Материал.** 1♀, Темниковский р-н, с. Аксел, 6–9.07.2021; 1♀, Zubovo-Polyanskiy р-н, пос. Потьма, 3–15.08.2021; 1♂, 4♀, кордон Мокров, 10–17.05.2022, 28.07–5.08.2022; 1♀, Барахмановское лесничество, квартал 107, сосняк, 54.7509°N / 45.5004°E, 1–3.08.2022.

\**Allantus (Emphytus) cingulatus* (Scopoli, 1763)

**Материал.** 1♀, Темниковский р-н, с. Аксел, 6–9.07.2021; 1♀, кордон Мокров, 1–5.08.2022.

*Allantus (Emphytus) didymus* (Klug, 1818)

**Материал.** 1♂, Ичкаловский р-н, Львовское лесничество, квартал 63, 54.8321°N / 45.3778°E, 16–20.07.2021.

*Allantus (Emphytus) truncatus* (Klug, 1818)

**Материал.** 1♀, Мордовский заповедник, кордон Подрубный, 54.7981°N / 43.1465°E, 19–21.05.2021; 1♂, кордон Инорский, 27.09–4.10.2021.

*Empria candidata* (Fallén, 1808)

**Материал.** 1♂, кордон Долгий Мост, 54.7481°N / 43.2010°E, 14–17.05.2021; 1♂, Мордовский заповедник, квартал 330, 54.7786°N / 43.1802°E, 27.04–5.05.2022; 3♀, кордон Мокров, 10–23.05.2022.

\**Empria fletcheri* (Cameron, 1878)

**Материал.** 1♂, 6♀, кордон Инорский, 11–20.05.2021; 1♀, Мордовский заповедник, кордон Таратинский, 54.7450°N / 43.0869°E, 7–10.06.2021; 4♀, кордон Вальзенский, 18–22.05.2022.

\**Empria immersa* (Klug, 1818)

**Материал.** 1♂, 4♀, Мордовский заповедник, окр. оз. Большая Вальза, 30.04–3.05.2021; 1♂, 1♀, Мордовский заповедник, квартал 394, 54.7778°N / 43.3726°E, 5–17.05.2021; 2♂, 4♀, кордон Инорский,



11–17.05.2021; 1♂, Мордовский заповедник, квартал 360, 54.7730°N / 43.2405°E, 5–21.05.2022.

*Empria liturata* (Gmelin, 1790)

**Материал.** 1♀, кордон Инорский, 11–17.05.2021; 1♂, кордон Мокров, 7–11.06.2022.

*Empria pallimacula* (Audinet-Serville, 1823)

**Материал.** 1♂, кордон Мокров, 10–17.05.2022.

\**Empria pumila* (Konow, 1896)

**Материал.** 1♀, Мордовский заповедник, окр. оз. Большая Вальза, 30.04–3.05.2021; 2♂, 8♀, кордон Инорский, 11–20.05.2021.

*Empria tridens* (Konow, 1896)

**Материал.** 1♀, Мордовский заповедник, квартал 401, 54.7716°N / 43.4803°E, 26–29.05.2021.

*Eriocampa ovata* (Linnaeus, 1760)

**Материал.** 1♀, Zubovo-Polyanskiy r-n, пос. Потьма, 17–19.06.2021; 1♀, Zubovo-Polyanskiy r-n, 22 км СЗ пос. Явас, 23–26.06.2021; 1♀, Zubovo-Polyanskiy r-n, 2 км С пос. Озерный, старый лес, 26–29.06.2021; 2♀, Теньгушевский р-н, 3 км С д. Клемешей, 9–13.07.2021; 4♀, Zubovo-Polyanskiy r-n, пос. Молочница, 3–15.08.2021.

*Eriocampa umbratica* (Klug, 1816)

**Материал.** 1♀, Мордовский заповедник, пос. Пушта, 11–14.05.2021.

*Athalia bicolor* Audinet-Serville, 1823

**Материал.** 1♂, кордон Инорский, 15–18.08.2021.

*Athalia circularis* (Klug, 1815)

**Материал.** 15♂, 37♀, кордон Инорский, 25.05–28.06.2021, 2.07–18.08.2021; 1♂, Мордовский заповедник, квартал 369, 54.7660°N / 43.0882°E, 27–31.05.2021; 1♂, Zubovo-Polyanskiy r-n, пос. Потьма, 17–19.06.2021; 1♀, Темниковский р-н, с. Алкаево, 6–9.07.2021; 1♂, Теньгушевский р-н, 3 км С д. Клемешей, 9–13.07.2021; 3♂, Теньгушевский р-н, д. Александровка, 54.7068°N / 42.8136°E, 13–16.07.2021; 1♂, Теньгушевский р-н, 5 км ЮЗ с. Теньгушево, 16–20.07.2021; 1♂, Zubovo-Polyanskiy r-n, пос. Молочница, 3–15.08.2021; 5♀, Zubovo-Polyanskiy r-n, 2 км СЗ пос. Потьма, 3–15.08.2021; 1♂, 2♀, Zubovo-Polyanskiy r-n, 3 км Ю пос. Молочница, 3–15.08.2021; 1♀, Zubovo-Polyanskiy r-n, пос. Потьма, 3–15.08.2021; 1♂, 2♀, Кемляное лесничество, квартал 93, 54.7378°N / 45.4044°E, 16.07.2022; 1♂, Барахмановское лесничество, квартал 108, поляна, 54.7435°N / 45.4896°E, 1–3.08.2022; 2♀, Барахмановское лесничество, квартал 113, 54.7394°N / 45.4747°E, 2–4.08.2022; 1♂, 8♀, кордон Мокров, 24.06–28.07.2022, 5–8.08.2022.

*Athalia cordata* Audinet-Serville, 1823

**Материал.** 2♂, Zubovo-Polyanskiy r-n, 3 км Ю пос. Леплей, 17–19.06.2021; 3♂, 21♀, кордон Инорский, 18–25.06.2021, 30.07–23.08.2021; 1♂, 1♀, Темниковский р-н, 2 км С с. Бабеево, 6–9.07.2021; 1♀, Мордовский заповедник, окр. оз. Большая Вальза, 8–15.07.2021; 1♂, Теньгушевский р-н, с. Куликово, 16–20.07.2021; 1♂, Теньгушевский р-н, 5 км ЮЗ с. Теньгушево, 16–20.07.2021; 1♀, Теньгушевский р-н, 14 км З пос. Барашево, 23–26.07.2021; 1♀, кордон Мокров, 11–15.06.2022; 1♂, Барахмановское лесничество, квартал 113, 54.7394°N / 45.4747°E, 21–24.06.2022.

*Athalia lugens* (Klug, 1815)

**Материал.** 1♂, Теньгушевский р-н, 14 км З пос. Барашево, 23–26.07.2021.

*Athalia rosae* (Linnaeus, 1758)

**Материал.** 1♀, Zubovo-Polyanskiy r-n, 3 км Ю пос. Молочница, 3–15.08.2021; 1♀, кордон Инорский, 15–18.08.2021; 1♂, Ковылкинский р-н, С д. Лепьево, 8–14.09.2021; 1♀, Мордовский заповедник, квартал 330, просека, 54.7729°N / 43.1848°E, 12–14.09.2022; 1♀, Мордовский заповедник, квартал 409, берег пруда, 54.75329°N / 43.2067°E, 12–14.09.2022; 1♀, кордон Вальзенский, поляна, 54.7202°N / 43.2329°E, 12–14.09.2022; 1♀, Мордовский заповедник, квартал 301, 54.7830°N / 43.1873°E, 12–23.09.2022; 2♂, 3♀, Ельниковский р-н, окр. с. Стародевичье, луг, 54.5875°N / 43.7786°E, 15–20.09.2022; 1♀, Мордовский заповедник, квартал 330, 54.7786°N / 43.1802°E, 23.09–4.10.2022.

*Athalia scutellariae* Cameron, 1880

**Материал.** 1♀, Теньгушевский р-н, 14 км З пос. Барашево, 23–26.07.2021; 1♀, Кемляное лесничество, квартал 128, опушка, 54.7416°N / 45.1065°E, 15–17.08.2022.

*Caliroa annulipes* (Klug, 1816)

**Материал.** 1♂, 5♀, кордон Инорский, 25–31.05.2021, 27.07–15.08.2021.

*Caliroa varipes* (Klug, 1816)

**Материал.** 1♂, 2♀, кордон Инорский, 30.07–15.08.2021; 2♂, кордон Мокров, 7–11.06.2022, 28.07–1.08.2022; 2♀, Барахмановское лесничество, квартал 113, 54.7394°N / 45.4747°E, 21.06–5.07.2022.

\**Cladardis hartigi* Liston, 1995

**Материал.** 1♀, кордон Инорский, 11–17.05.2021.

*Eutomostethus ephippium* (Panzer, 1798)

**Материал.** 2♀, Мордовский заповедник, пос. Пушта, 4.06.2021; 1♀, Теньгушевский р-н, 14 км З пос. Барашево, 23–26.07.2021; 1♀, кордон Вальзенский, 18–22.05.2022; 1♀, Барахмановское лесничество, квартал 113, 54.7394°N / 45.4747°E, 21–24.06.2022.

*Eutomostethus gagathinus* (Klug, 1816)

**Материал.** 1♀, Zubovo-Polyanskiy r-n, 3 км Ю пос. Молочница, 3–15.08.2021.

*Eutomostethus luteiventris* (Klug, 1816)

**Материал.** 1♀, кордон Мокров, 11–15.06.2022.

*Heterarthrus vagans* (Fallén, 1808)

**Материал.** 1♀, 5 км Ю пос. Зубова Поляна, ольховый лес, 54.5233°N / 42.6308°E, 23–26.07.2021; 1♂, 1♀, Zubovo-Polyanskiy r-n, 3 км Ю пос. Молочница, 3–15.08.2021.

*Monophadnus pallescens* (Gmelin, 1790)

**Материал.** 3♀, кордон Инорский, 11–17.05.2021, 25–31.05.2021.

*Stethomostus funereus* (Klug, 1816)

**Материал.** 3♂, 5♀, кордон Инорский, 11–31.05.2021; 1♂, 2♀, Мордовский заповедник, пос. Пушта, 11–14.05.2021; 22♂, 5♀, кордон Догий Мост, 54.7481°N / 43.2010°E, 14–17.05.2021; 1♀, Мордовский заповедник, квартал 401, 54.7716°N / 43.4803°E, 26–29.05.2021; 1♀, Мордовский заповедник, кордон Таратинский, 54.7450°N / 43.0869°E, 7–10.06.2021; 1♀, Zubovo-Polyanskiy r-n, пос. Потьма, 17–19.06.2021; 1♀, Барахмановское лесничество, квартал 87, 54.7775°N / 45.6150°E, 7.08.2022.

*Stethomostus fuliginosus* (Schrank, 1781)

**Материал.** 1♀, Мордовский заповедник, кордон Долгий Мост, 54.7481°N / 43.2010°E, 15–19.04.2021; 3♂, 15♀, Мордовский заповедник, окр. оз. Большая Вальза, 30.04–3.05.2021; 8♀, кордон Инорский, 11–20.05.2021, 15–18.06.2021; 1♀, Мордовский заповедник, квартал 449, 54.7117°N / 43.2284°E, 18–22.05.2021; 1♀, кордон Жегаловский, 27–31.05.2021; 1♀, Zubovo-Polyanskiy r-n, pos. Yavas, 17–19.06.2021; 1♀, Zubovo-Polyanskiy r-n, pos. Ozerный, 26–29.06.2021; 3♀, Теньгушевский р-н, д. Клемешей, 9–13.07.2021; 2♀, Теньгушевский р-н, с. Куликово, 16–20.07.2021; 4♀, кордон Мокров, 10–23.05.2022.

*Cladius (Cladius) pectinicornis* (Geoffroy, 1785)

**Материал.** 6♂, 5♀, кордон Инорский, 11.05–18.06.2021, 15–19.07.2021, 27.07–15.08.2021; 1♀, Мордовский заповедник, квартал 278/303, 54.7942°N / 43.2300°E, 19–21.05.2021; 1♀, Мордовский заповедник, квартал 401, 54.7716°N / 43.4803°E, 26–29.05.2021; 1♀, Темниковский р-н, с. Алкаево, 6–9.07.2021; 1♀, Теньгушевский р-н, 3 км С д. Клемешей, 9–13.07.2021; 1♂, Теньгушевский р-н, окр. оз. Шелубей, травяная растительность в пойме р. Мокша, 54.6988°N / 42.7002°E, 13–16.07.2021; 1♀, Zubovo-Polyanskiy r-n, 22 км СЗ пос. Явас, сосновый лес, 23–26.07.2021; 2♂, 1♀, Барханмановское лесничество, квартал 113, 54.7394°N / 45.4747°E, 2–4.08.2022; 3♀, Zubovo-Polyanskiy r-n, 2 км СЗ пос. Потьма, 3–15.08.2021; 1♀, Zubovo-Polyanskiy r-n, 5 км С пос. Потьма, 3–15.08.2021; 4♂, 6♀, кордон Мокров, 10–17.05.2022, 11–15.06.2022, 5–28.07.2022, 5–17.08.2022; 1♀, Кемляное лесничество, квартал 122, сосняк, 54.7608°N / 45.0830°E, 15–17.08.2022.

*Cladius (Priophorus) brullei* (Dahlbom, 1835)

**Материал.** 12♂, 4♀, кордон Инорский, 11.05–3.06.2021, 26–28.08.2021; 1♂, Мордовский заповедник, кордон Таратинский, 54.7450°N / 43.0869°E, 7–10.06.2021; 1♀, Zubovo-Polyanskiy r-n, pos. Yavas, 17–19.06.2021; 4♀, Теньгушевский р-н, д. Клемешей, 9–13.07.2021; 1♀, Zubovo-Polyanskiy r-n, pos. Молочица, 3–15.08.2021; 2♀, Zubovo-Polyanskiy r-n, 3 км Ю пос. Молочица, 3–15.08.2021; 1♀, Zubovo-Polyanskiy r-n, 5 км С пос. Потьма, 3–15.08.2021; 2♂, 2♀, кордон Мокров, 5.06–5.07.2022, 15–20.07.2022; 1♂, 1♀, Барханмановское лесничество, квартал 108, поляна, 54.7435°N / 45.4896°E, 1–3.08.2022.

*Cladius (Priophorus) compressicornis* (Fabricius, 1804)

**Материал.** 1♂, 4♀, Мордовский заповедник, окр. оз. Большая Вальза, 30.04–3.05.2021; 2♂, 1♀, кордон Инорский 11–17.05.2021, 21–30.07.2021; 4♂, 1♀, Zubovo-Polyanskiy r-n, 2 км С пос. Озерный, 26–29.06.2021; 4♀, Теньгушевский р-н, 3 км С д. Клемешей, 9–13.07.2021; 1♂, Теньгушевский р-н, д. Клемешей, 9–13.07.2021; 1♀, Теньгушевский р-н, 14 км З пос. Барашево, 23–26.07.2021; 1♂, 1♀, 5 км Ю пос. Zubova Polyana, ольховый лес, 54.5233°N / 42.6308°E, 23–26.07.2021; 1♂, Zubovo-Polyanskiy r-n, 8 км Ю пос. Дачный, ольховый лес, 54.5052°N / 42.6468°E, 23–26.07.2021; 1♀, Zubovo-Polyanskiy r-n, 3 км Ю пос. Молочица, 3–15.08.2021; 1♂, кордон Мокров, 12–17.08.2022.

*Cladius (Priophorus) hyalopterus* (Jakovlev, 1891)

**Материал.** 1♀, Темниковский р-н, с. Кондровка, 6–9.07.2021; 1♀, Zubovo-Polyanskiy r-n, 2 км СЗ пос. Потьма, 3–15.08.2021.

*Cladius (Priophorus) rufipes* Audinet-Serville, 1823

**Материал.** 1♀, Мордовский заповедник, квартал 435, 54.7312°N / 43.1294°E, 28.07–15.08.2021; 1♂, кордон Мокров, 5–8.08.2022.

*Mesoneura opaca* (Fabricius, 1775)

**Материал.** 1♀, кордон Инорский, 26.04–11.05.2021.

*Nematinus acuminatus* (Thomson, 1871)

**Материал.** 1♀, кордон Инорский, 10–15.06.2021.

*Nematus alniastri* (Scharfenberg, 1805)

**Материал.** 1♀, Zubovo-Polyanskiy r-n, 5 км С пос. Потьма, 3–15.08.2021; 1♀, кордон Мокров, 1–5.08.2022.

*Nematus brischkei* Zaddach, 1876

**Материал.** 1♀, Мордовский заповедник, клюквенное болото, 54.7847°N / 43.4289°E, 27–31.05.2021.

**Замечание.** Виды группы *septentrionalis* характеризуются вздутыми первыми члениками задних лапок [Желоховцев, 1988; Prous et al., 2014]. Данный вид отличается от *N. alniastri* наличием слабого затемнения подптеростигмой на передних крыльях и черной головой. У *N. brischkei* наличник, верхняя губа и часто основание нижних челюстей беловатые.

*Euura vicina* (Audinet-Serville, 1823)

**Материал.** 1♂, кордон Инорский, 20–25.05.2021.

*Birka cinereipes* (Klug, 1816)

**Материал.** 1♀, кордон Инорский, 11–17.05.2021; 1♀, Теньгушевский р-н, 3 км С д. Клемешей, 9–13.07.2021.

*Nesoselandria morio* (Fabricius, 1781)

**Материал.** 1♂, 1♀, кордон Инорский, 2–5.08.2021; 2♀, кордон Мокров, 11–24.06.2022.

*Dolerus (Dicrodolerus) vestigialis* (Klug, 1818)

**Материал.** 11♀, кордон Инорский, 17.05–7.06.2021; 1♂, Темниковский р-н, д. Сосновка, 21–31.05.2022; 1♂, кордон Мокров, 7–11.06.2022.

*Dolerus (Dolerus) germanicus* (Fabricius, 1775)

**Материал.** 1♀, кордон Мокров, 24.06–5.07.2022.

*Dolerus (Loderus) pratorum* (Fallén, 1808)

**Материал.** 1♀, Мордовский заповедник, окр. оз. Большая Вальза, 30.04–3.05.2021.

*Dolerus (Oncodolerus) evermanni* W.F. Kirby, 1882

**Материал.** 1♀, кордон Инорский, 25–31.05.2021.

*Dolerus (Poodolerus) asper* Zaddach, 1859

**Материал.** 1♀, кордон Инорский, 20–25.05.2021.

*Dolerus (Poodolerus) gonager* (Fabricius, 1781)

**Материал.** 2♂, кордон Инорский, 11–17.05.2021.

*Dolerus (Poodolerus) haematodes* (Schrank, 1781)

**Материал.** 1♀, кордон Инорский, 17–20.05.2021.

**\*\*Dolerus (Poodolerus) quadrinotatus** (Bíró, 1884)  
(Рис. 2–5)

**Материал.** 2♀, кордон Инорский, 26.04–11.05.2021.



Рис. 2–5. *Dolerus quadrinotatus*, самка, общий вид и детали строения.  
 2–3 – габитус: 2 – вид сверху, 3 – вид сбоку; 4 – вид створок сверху; 5 – вершина пилки.  
 Figs 2–5. *Dolerus quadrinotatus*, female, general view and details of structure.  
 2–3 – habitus: 2 – dorsal view, 3 – lateral view; 4 – sawsheath, dorsal view; 5 – the upper part of lancet.

**Замечания.** Новый вид для фауны России. Пилильщик достаточно редок в сборах и известен только по одиночным находкам из Испании, Венгрии, Словакии и Эстонии [Haris, 2000, 2018; Heidema, 2004]. Вид имеет черную окраску тела. Лишь овальные пятна на боковых лопастях прескутума и верхняя часть мезоплевр желто-красного цвета. Опушение ножен образует овал, вершина пилки тупая (рис. 2–5). Схожую окраску прескутума можно обнаружить у некоторых экземпляров широко распространенного *D. liogaster* Thomson, 1871 [Basov, 2023]. От *D. quadrinotatus* этот вид хорошо отличается черными мезоплеврами и красной окраской ног. Имеются и другие заметные различия. Так, волоски ножен у *D. liogaster* расходятся в стороны, образуя полукруг, а вершина пилки образует уступ [Желоховцев, 1988; Haris, 2000; Liston et al., 2022].

*Dolerus (Poodolerus) nigratus* (O.F. Müller, 1776)

**Материал.** 5♂, 7♀, кордон Инорский, 26.04–31.05.2021.

*Dolerus (Poodolerus) nitens* Zaddach, 1859

**Материал.** 1♂, Мордовский заповедник, окр. оз. Большая Вальза, 30.04–3.05.2021; 2♂, кордон Мокров, 10–23.05.2022.

*Strongylogaster filicis* (Klug, 1817)

**Материал.** 1♀, Мордовский заповедник, квартал 360, 54.7730°N / 43.2405°E, 21–31.05.2021.

*Strongylogaster macula* (Klug, 1817)

**Материал.** 1♀, кордон Мокров, 7–11.06.2022.

*Strongylogaster xanthocera* (Stephens, 1835)

**Материал.** 1♀, кордон Мокров, 7–11.06.2022.

\**Aglaostigma (Aglaostigma) gibbosum* (Fallén, 1808)

**Материал.** 1♀, кордон Инорский, 25–28.06.2021.

*Aglaostigma (Astochus) aucupariae* (Klug, 1817)

**Материал.** 1♂, 3♀, кордон Инорский, 11–17.05.2021, 3–7.06.2021; 1♂, Мордовский заповедник, кордон Долгий Мост, 54.7481°N / 43.2010°E, 14–17.05.2021; 1♂, Zubovo-Polyanskiy r-n, pos. Yavas, 17–19.06.2021; 1♀, кордон Мокров, 10–17.05.2022; 1♂, 1♀, кордон Вальзенский, 18–22.05.2022.

*Aglaostigma (Astochus) fulvipes* (Scopoli, 1763)

**Материал.** 1♂, кордон Мокров, 10–17.05.2022; 1♂, 1♀, кордон Мокров, 17–23.05.2022, 15–19.06.2022.

*Macrophya albipuncta* (Fallén, 1808)

**Материал.** 1♀, кордон Инорский, 25–31.05.2021.

*Macrophya annulata* (Geoffroy, 1785)

**Материал.** 1♂, 7♀, кордон Инорский, 7–28.06.2021; 1♂, кордон Мокров, 19–24.06.2022; 1♀, Барахмановское лесничество, квартал 113, 54.7394°N / 45.4747°E, 9–11.07.2022.

*Macrophya duodecimpunctata* (Linnaeus, 1758)

**Материал.** 27♂, 14♀, кордон Инорский, 17.05–20.06.2021, 2–5.07.2021; 1♀, 5 км Ю пос. Зубова Поляна, ольховый лес, 54.5233°N / 42.6308°E, 23–26.07.2021; 2♂, 2♀, кордон Мокров, 11–24.06.2022; 1♀, Кемляное лесничество, квартал 76, луг, 54.7619°N / 45.3830°E, 5–7.07.2022.

*Macrophya (Macrophya) montana* (Scopoli, 1763)

**Материал.** 1♀, кордон Мокров, 19–24.06.2022.

*Macrophya sanguinolenta* (Gmelin, 1790)

**Материал.** 17♂, 6♀, кордон Инорский, 24.04–5.05.2021, 17.05–28.06.2021, 5–27.07.2021; 5♀, кордон Мокров, 11.06–5.07.2022.

*\*Macrophya (Macrophya) teutona* (Panzer, 1799)

**Материал.** 1♀, кордон Мокров, 19–24.06.2022.

*Pachyprotasis rapae* (Linnaeus, 1767)

**Материал.** 2♂, кордон Инорский, 25–31.05.2021; 1♂, кордон Мокров, 7–11.06.2022.

*Pachyprotasis simulans* (Klug, 1817)

**Материал.** 1♀, кордон Мокров, 11–15.06.2022.

*\*Tenthredopsis auriculata* (Thomson, 1870)

**Материал.** 1♀, кордон Инорский, 25–31.05.2021.

*Tenthredopsis friesei* (Konow, 1884)

**Материал.** 1♀, кордон Мокров, 7–11.06.2022.

*Tenthredopsis litterata* (Geoffroy, 1785)

**Материал.** 1♂, 2♀, кордон Инорский, 3–25.06.2021; 2♂, 4♀, кордон Мокров, 11–19.06.2022, 24.06–5.07.2022, 20–28.07.2022.

*Tenthredopsis ornata* (Audinet-Serville, 1823)

**Материал.** 1♂, кордон Мокров, 7–11.06.2022.

*\*Tenthredopsis scutellaris* (Fabricius, 1804)

**Материал.** 3♂, 1♀, кордон Инорский, 31.05–7.06.2021, 22–28.06.2021; 1♀, Теньгушевский р-н, 3 км С.д. Клемешей, 9–13.07.2021; 1♂, Кемляное лесничество, квартал 76, 54.7470°N / 45.3249°E, 5.06.2022; 1♂, кордон Мокров, 7–11.06.2022; 1♀, Кемляное лесничество, квартал 92, просека, 54.7422°N / 45.3669°E, 5–7.07.2022.

*Tenthredopsis stigma* (Fabricius, 1798)

**Материал.** 1♂, кордон Инорский, 31.05–3.06.2021.

*Tenthredopsis tessellata* (Klug, 1817)

**Материал.** 1♂, кордон Инорский, 25–31.05.2021.

*Sciapteryx consobrina* (Klug, 1816)

**Материал.** 1♀, Мордовский заповедник, окр. оз. Большая Вальза, 30.04–3.05.2021; 1♀, кордон Вальзенский, 18–22.05.2022.

*Rhogogaster chambersi* Benson, 1947

**Материал.** 1♂, Мордовский заповедник, квартал 278/303, 54.7942°N / 43.2300°E, 19–21.05.2021; 1♀, Ичалковский р-н, урочище Ендова, 54.6613°N / 45.1747°E, 28.06.2022.

**Замечание.** Вид был недавно обнаружен в России на территории Мордовского заповедника [Lengsova et al., 2020].

*Rhogogaster chlorosoma* (Benson, 1943)

**Материал.** 7♀, кордон Инорский, 3–22.06.2021, 21–27.07.2021.

*Rhogogaster genistae* Benson, 1947

**Материал.** 1♀, кордон Мокров, 24.06–5.07.2022.

*Rhogogaster scalaris* (Klug, 1817)

**Материал.** 6♀, кордон Инорский, 25–31.05.2021, 15–18.06.2021, 9–12.07.2021, 30.07–2.08.2021; 1♀, кордон Мокров, 7–11.06.2022.

*Tenthredo (Cephaledo) bifasciata rossii* (Panzer, 1803)

**Материал.** 2♀, Кемляное лесничество, квартал 76, 54.7470°N / 45.3249°E, 20.07.2022.

*Tenthredo (Elinora) flaveola* Gmelin, 1790

**Материал.** 1♀, Кемляное лесничество, квартал 93, 54.7378°N / 45.4044°E, 5.07.2022; 1♀, кордон Мокров, 20–28.07.2022.

**Замечание.** В каталоге перепончатокрылых России [Sundukov, 2017] вид не приведен для рассматриваемого региона, хотя он и отмечался для фауны Мордовии [Ручин, Ленгесова, 2012].

*Tenthredo (Endotethryx) campestris* Linnaeus, 1758

**Материал.** 1♂, 1♀, Зубово-Полянский р-н, 3 км Ю пос. Леплей, 17–19.06.2021.

*Tenthredo (Tenthredella) amurica* Dalla Torre, 1894

**Материал.** 1♂, кордон Инорский, 7–10.06.2021.

**Замечание.** В каталоге перепончатокрылых России [Sundukov, 2017] этот вид не приведен для рассматриваемого региона. Для Мордовского заповедника отмечался ранее [Ruchin et al., 2022].

*Tenthredo (Tenthredella) livida* Linnaeus, 1758

**Материал.** 1♀, кордон Инорский, 2–5.07.2021.

*Tenthredo (Tenthredo) notha* Klug, 1817

**Материал.** 1♀, Инсарский р-н, окр. с. Нижняя Вязера, лесополоса, 53.8220°N / 44.4903°E, 5.08.2022.



*Tenthredo (Tenthredo) scrophulariae* Linnaeus, 1758

**Материал.** 1♂, кордон Мокров, 20–28.07.2022.

*Tenthredo (Zonuledo) zonula* Klug, 1817

**Материал.** 1♀, кордон Инорский, 2–5.07.2021.

В результате проведенных исследований было собрано 122 вида симфит из 8 семейств. Впервые в России был обнаружен *Dolerus quadrinotatus*, а еще 9 видов пилильщиков оказались новыми для фауны Республики Мордовия. Основные сборы перепончатокрылых проводились в Мордовском заповеднике и национальном парке «Смольный». Несмотря на то, что исследования симфитофауны этих заповедных территорий ведется давно и к настоящему времени известно более 169 видов [Ручин, Ленгесова, 2012; Lengsova et al., 2020; Ruchin et al., 2022], к списку было добавлено еще 28 видов. Полученные данные указывают на необходимость продолжения дальнейших исследований этой группы насекомых.

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## Four new species and new records of *Thinophilus* Wahlberg, 1844 (Diptera: Dolichopodidae) from Iranian mangroves with a key to the species known from Iran

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**Abstract.** Four new long-legged fly species, *Thinophilus albihirtus* sp. n., *Thinophilus albisetosus* sp. n., *Thinophilus nigrihirtus* sp. n., and *Thinophilus qeshmensis* sp. n., from southern Iran, all collected in or near the mangrove forests, are described and illustrated. Four more species of the genus are collected from the same localities. Polyzoal *T. indigenus* Becker, 1902 is found in the Fars Province. Three known species are firstly recorded from Iran (*T. deemingi* Grichanov, 2023, *T. gallagheri* Grichanov, 2023 and *T. ochripalpis* Becker, 1910). The Iranian species are considered members of one Oriental (*T. murphy* group), two Afrotropical species groups (*T. gallagheri* and *T. calopus* groups) and *T. indigenus* lineage distributed widely in the Old World. A check-list and identification key to males of 12 species known from Iran are provided.

**Key words:** Hydrophorinae, *Thinophilus*, new species, Palearctic, Bushehr, Fars, Hormozgan, Sistan and Baluchestan.

### Четыре новых вида и новые указания *Thinophilus* Wahlberg, 1844 (Diptera: Dolichopodidae) из иранских мангровых лесов с определителем видов из Ирана

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**Резюме.** Даны описания и иллюстрации четырех новых видов мух-зеленушек, *Thinophilus albihirtus* sp. n., *Thinophilus albisetosus* sp. n., *Thinophilus nigrihirtus* sp. n. и *Thinophilus qeshmensis* sp. n., из Южного Ирана, все собраны в мангровых лесах или рядом с ними. Еще четыре вида рода собраны в тех же стациях. Полизоальный *T. indigenus* Becker, 1902 обнаружен в провинции Фарс. Три известных вида впервые зарегистрированы в Иране (*T. deemingi* Grichanov, 2023, *T. gallagheri* Grichanov, 2023 и *T. ochripalpis* Becker, 1910). Иранские виды считаются членами одной группы ориентальных (группа *T. murphy*), двух групп афротропических видов (*T. gallagheri* и *T. calopus*) и линии *T. indigenus*, широко распространенной в Старом Свете. Приведен список и определительная таблица самцов 12 видов, известных из Ирана.

**Ключевые слова:** Hydrophorinae, *Thinophilus*, новые виды, Палеарктика, Бушер, Фарс, Хормозган, Систан и Белуджистан.

## Introduction

The Palearctic, Afrotropical and western Oriental species of the genus *Thinophilus* Wahlberg, 1844 (subfamily Hydrophorinae) were recently reviewed, and regional identification keys were compiled [Negrobov et al., 2016; Grichanov, 2022, 2023a, b]. Now about 160 species are known from all realms worldwide [Grichanov, 2017, 2023a, b]. The genus is very diverse at mangroves and salt lakes along the Indian Ocean coast, but yet unknown from Iran close Persian and Oman gulfs of the Arabian Sea. Only five species of *Thinophilus* widely distributed in the Old World were known from Iranian inland [Grichanov, Gilasian, 2023a]. Unfortunately, exact collection localities were usually not provided in old literature.

Eight species including four new species of this hydrophorine genus collected from Iranian mangroves have been found in the collection of the Hayk Mirzayans Insect Museum (HMIM), Iranian Research Institute of Plant Protection (IRIPP, Tehran, Iran). They are considered

members of one Oriental (*T. murphy* group), two Afrotropical species groups (*T. gallagheri* and *T. calopus* groups) and the *T. indigenus* lineage distributed widely in the Old World. A list and identification key to males of 12 species from Iran are provided.

## Material and methods

The paper is based on the material found in the HMIM collection that will be deposited in HMIM and the Zoological Institute of the Russian Academy of Sciences (ZISP, St Petersburg, Russia). All specimens are mounted on pins.

Specimens have been studied and photographed with a ZEISS SteREO Discovery.V12 modular stereo microscope and an AxioCam MRc5 camera. The preparations of the male genitalia were photographed with a ZEISS Axiostar stereo microscope and an AxioCam ICc3 camera. The measurement accuracy of these microscopes is 0.01 mm. Morphological terminology and abbreviations follow

Cumming and Wood [2017] and Grichanov and Brooks [2017]. The lengths of the antennomeres and podomeres are given in millimetres. Body length is measured from the base of the antenna to the tip of abdominal segment 6. Wing length is measured from the base to the wing apex. Antenna length is measured from the base of the scape to the tip of the arista-like stylus. The figures showing the hypopygium in lateral view are oriented as it appears on the intact specimen, with the morphologically ventral surface of the genitalia facing upwards, dorsal surface downwards, anterior end facing right and posterior end facing left. References with only Iranian records are provided for known species.

#### Genus *Thinophilus* Wahlberg, 1844

*Thinophilus* Wahlberg, 1844: 37. Type species: *Rhaphium flavipalpe* Zetterstedt, 1843 (monotypy).

**Note.** See diagnosis and discussion on species groups in Negrobov [1979], Grootaert [2018] and Grichanov [2023b]. Species known from Iran are listed below.

#### *Thinophilus argyropalpis* Becker, 1907

Becker, Stein, 1913: 597 (female).

**Material.** Iran: 1♂ (HMIM), Hormozgan Prov., Gabrik protected area, Keyki, 25°41'49.7"N / 58°30'32.9"E, 0 m, light trap, 15.05.2022 (M. Mofidi, A. Hajiesmalian).

**Type locality.** Egypt: Port Said.

**Distribution.** Afrotropical: Senegal. The species is known from Algeria, Tunisia, Egypt; Ukraine (Odessa), Russia (Volgograd); Iraq, Saudi Arabia, Kazakhstan, Turkmenistan, Uzbekistan, Kyrgyzstan, and Mongolia. Iran (Hormozgan, Sistan and Baluchestan: "Kirman, Chousdar, Gurmuk" (between Hamun Lake and Taftan volcano)); first record from Hormozgan Province and second record from Iran.

#### *Thinophilus deemingi* Grichanov, 2023

**Material.** Iran: 1♂, 1♀ (HMIM, ZISP), Hormozgan Prov., Bandar-e Khamir, Marduo Island, 26°58'33"N / 55°40'25"E, 3 m, yellow pan trap, 30.10–2.11.2021 (E. Gilasian); 3♂ (HMIM, ZISP), Hormozgan Prov., Qeshm Island, Kovarzin, 26°48'39"N / 56°46'38"E, 0 m, yellow pan trap, 3–4.11.2021 (E. Gilasian); 1♂ (HMIM), Hormozgan Prov., Qeshm Island, Dokuhak, 26°59'5.0"N / 56°11'19"E, 0 m, light trap, 4.11.2021 (E. Gilasian); 1♀ (HMIM), Bushehr Prov., Asaluyeh, Nayband, next to Mangrove forest, 27°24'07"N / 52°40'9.0"E, –10 m, yellow pan trap, 6–8.11.2021 (E. Gilasian); 6♂, 3♀ (HMIM), Sistan and Baluchestan Prov., Chabahar, Govater, 25°09'54.8"N / 61°29'41.2"E, 0 m, pan trap, 18.05.2022 (M. Mofidi, A. Hajiesmalian).

**Type locality.** Oman: "Muscat, Qurum Beach".

**Distribution.** Afrotropical: Oman. First record from the Palaearctic Region and Iran (Bushehr, Hormozgan, Sistan and Baluchestan).

#### *Thinophilus flavipalpis* (Zetterstedt, 1843)

Grichanov et al., 2017: 106.

**Type locality.** Sweden: Gottlandia, Bursviken.

**Distribution.** Trans-Palaearctic species. Iran (Markazi: Kavir-e Meighan Lake).

#### *Thinophilus gallagheri* Grichanov, 2023

**Material.** Iran: 1♂, 2♀ (HMIM, ZISP), Hormozgan Prov., Bandar-e Khamir, Marduo Island, 26°58'33"N / 55°40'25"E, 3 m, yellow pan trap,

30.10–2.11.2021 (E. Gilasian); 2♂, 1♀ (HMIM), Hormozgan Prov., Qeshm Island, Kovarzin, 26°48'39"N / 56°46'38"E, 0 m, yellow pan trap, 3–4.11.2021 (E. Gilasian); 3♂, 1♀ (HMIM), Hormozgan Prov., Gabrik protected area, Keyki, 25°41'49.7"N / 58°30'32.9"E, 0 m, light trap, 15.05.2022 (M. Mofidi, A. Hajiesmalian); 2♂ (in ethanol; ZISP): Sistan and Baluchestan Prov., Chabahar, Govater, 25°09'54.8"N / 61°29'41.2"E, 0 m, pan trap, 18.05.2022 (M. Mofidi, A. Hajiesmalian).

**Type locality.** Oman: "Shinass".

**Distribution.** Afrotropical: Oman. Palaearctic: Iran (Hormozgan, Sistan and Baluchestan). First record from Iran.

#### *Thinophilus indigenus* Becker, 1902

Becker, Stein, 1913: 596 ("Bampur"); Negrobov, 1971: 904 ("Baluchestan"); Rezaei et al., 2019: 9 (as *Thinophilus* sp.).

**Material.** Iran: 1♂ (ZISP), Fars Prov., Larestan, 27°31'55.4"N / 54°26'1.36"E, 30.03–9.04.2018 (S. Rezaei).

**Type locality.** Egypt: Kairo, Assiur, Luxor, Assuan, Fayum, and Suez.

**Distribution.** Palaearctic: Morocco, Algeria, Egypt, Turkey, Israel, Saudi Arabia, Mongolia. Oriental and Afrotropical regions. Iran (Fars; Sistan and Baluchestan: Bampur); first record from Fars Province of Iran.

#### *Thinophilus ochripalpis* Becker, 1910

**Material.** Iran: 1♂ (ZISP), Hormozgan Prov., Bandar-e Khamir to Bandar-e Lenge rd., Sayeh Khosh, next to hand planted Mangrove trees, 26°47'4.0"N / 55°21'17"E, 1.11.2021, 0 m, light trap (E. Gilasian); 2♂, 2♀ (HMIM), Hormozgan Prov., Bandar-e Khamir, Marduo Island, 26°58'33"N / 55°40'25"E, 3 m, Malaise trap, 30.10–2.11.2021 (E. Gilasian); 1♂ (HMIM), Hormozgan Prov., Sirik, Azini wharf, 26°19'39.9"N / 057°06'15.7"E, 0 m, pan trap, 13.05.2022 (M. Mofidi, A. Hajiesmalian); 7♂, 2♀ (HMIM), Bushehr Prov., Asaluyeh, Nayband, next to Mangrove forest, 27°24'07"N / 52°40'9.0"E, –10 m, yellow pan trap, 6–8.11.2021 (E. Gilasian).

**Type locality.** South Yemen: "von Aden, Makallaebene".

**Distribution.** Afrotropical: Tanzania, Somalia, Yemen, Oman. Palaearctic: Saudi Arabia. Iran (Bushehr, Hormozgan); first record from Iran.

#### *Thinophilus quadrimaculatus* Becker, 1902

Becker, Stein, 1913: 596; Negrobov, 1979: 432.

**Type locality.** Egypt: Cairo.

**Distribution.** The species is known from Algeria, Tunisia, Egypt, Israel, and Tadjikistan. Iran (Sistan and Baluchestan: "Kirman, Basman [= Bazman] über Farra und nach Bampur").

#### *Thinophilus spinatarsis* Becker, 1907

Becker, Stein, 1913: 597 (females).

**Type locality.** China: "O. Zaidam, im nord-Osu; Tibet, Kurlyk am Fl. Baingol".

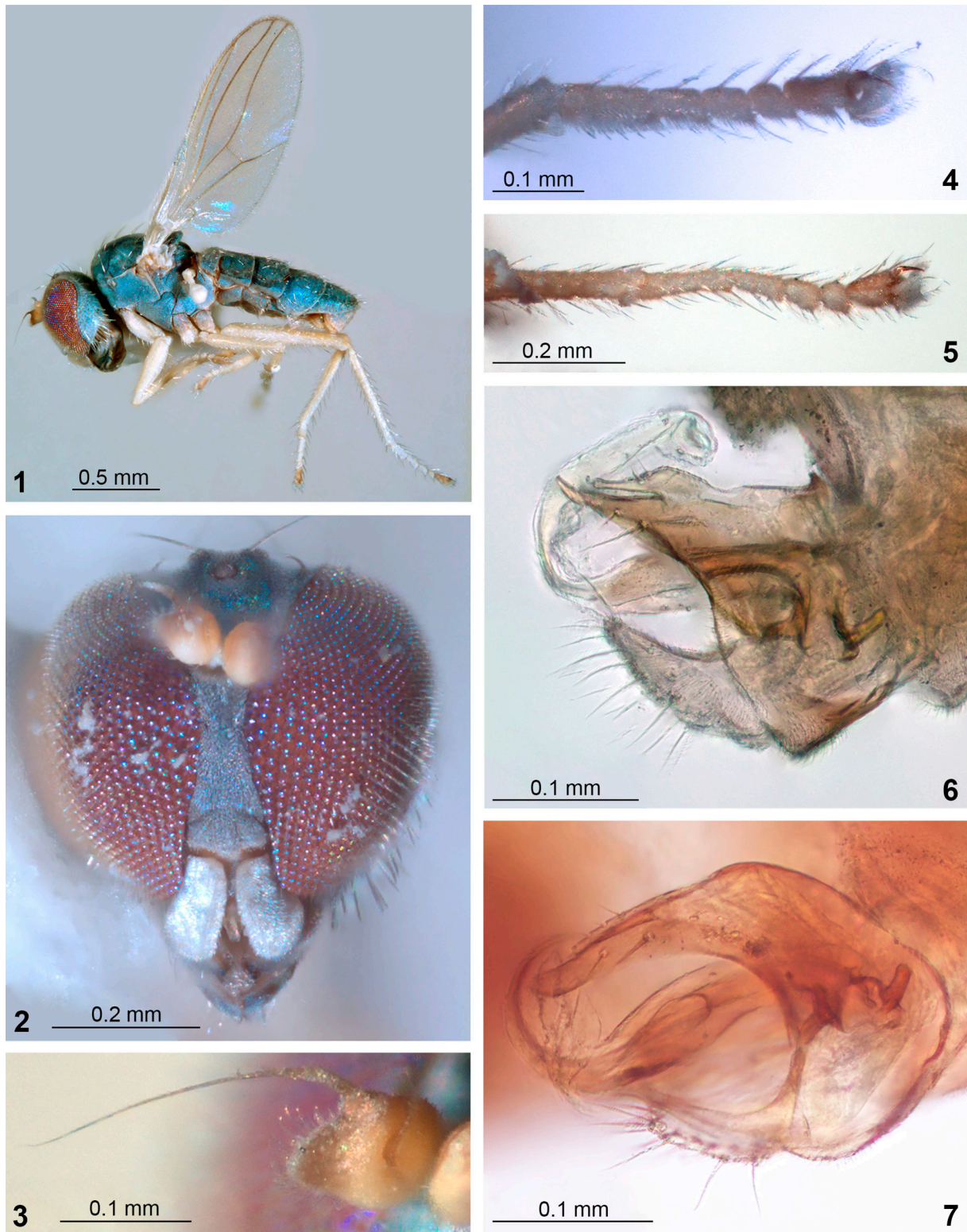
**Distribution.** The species is known from Russia (Kherson), Israel, Turkmenistan, Tajikistan, China (Tibet). Afrotropical: Senegal. Oriental: India (Gujarat), China (Taiwan). Iran (Sistan and Baluchestan: "Kirman, von Ssargad").

#### *Thinophilus albisetosus* sp. n.

(Figs 1–7)

**Material.** Holotype, ♂ (ZISP): Iran, Hormozgan Prov., Gabrik protected area, Keyki, 25°41'49.7"N / 58°30'32.9"E, 0 m, light trap,



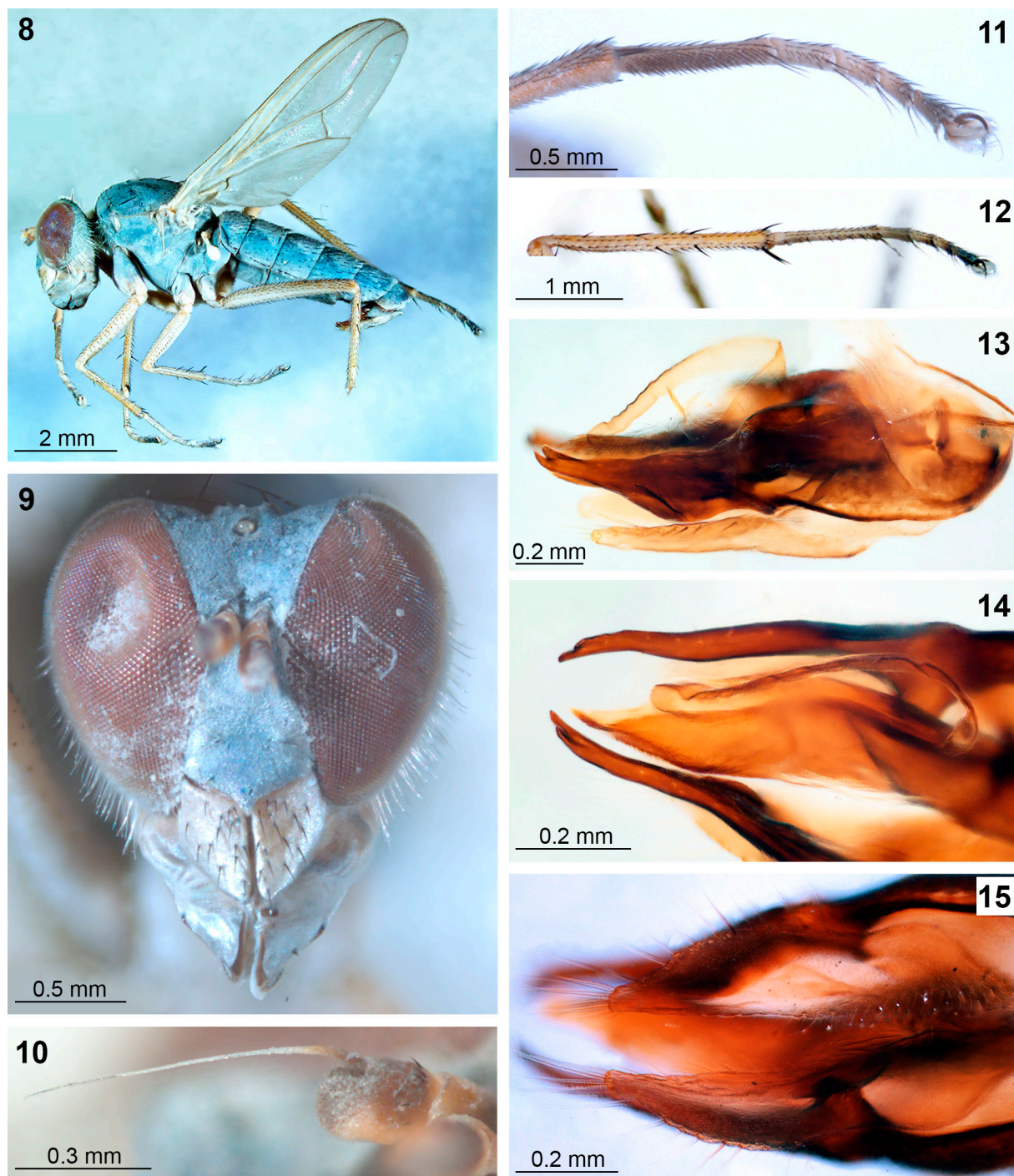


Figs 1–7. *Thinophilus albisetosus* sp. n., male, paratype, general view and details of structure. 1 – habitus; 2 – head; 3 – antenna; 4 – fore tarsus; 5 – mid tarsus; 6 – hypopygium after maceration, lateral view; 7 – hypopygium after maceration, ventral-lateral view.

Рис. 1–7. *Thinophilus albisetosus* sp. n., самец, паратип, общий вид и детали строения.

1 – внешний вид; 2 – голова; 3 – усик; 4 – передняя лапка; 5 – средняя лапка; 6 – гипопигий после размачивания, сбоку; 7 – гипопигий после размачивания, снизу-сбоку.





Figs 8–15. *Thinophilus qeshmensis* sp. n., male, paratype, general view and details of structure.

8 – habitus; 9 – head; 10 – antenna; 11 – fore tarsus; 12 – mid tibia and tarsus; 13 – hypopygium after maceration, lateral view; 14 – phallosome and surstylus, ventral view; 15 – cerci, dorsal view.

Рис. 8–15. *Thinophilus qeshmensis* sp. n., самец, паратип, общий вид и детали строения.

8 – внешний вид; 9 – голова; 10 – усик; 11 – передняя лапка; 12 – средняя голень и лапка; 13 – гипопигий после размачивания, сбоку; 14 – фаллосома и сурстиль, снизу; 15 – церки, сверху.

15.05.2022 (M. Mofidi, A. Hajiesmalian). Paratypes: 2♂ (HMIM, ZISP), same data as for holotype; 1♂ (ZISP), Iran, Sistan and Baluchestan Prov., Chabahar, Govater, 25°09'54.8"N / 61°29'41.2"E, 0 m, pan trap, 18.05.2022 (M. Mofidi, A. Hajiesmalian).

**Additional material.** 3♀ (HMIM, ZISP), same data as for holotype.

**Diagnosis.** *Thinophilus albisetosus* sp. n. and *T. gallagheri* are remarkable in bearing only whitish yellow bristles and setae on body and legs, differing from all other Old World species bearing black major bristles. The new species differs from the latter in narrow male face, not wider than height of postpedicel, which is subtriangular, nearly as high as long (8/9), with basodorsal arista-like stylus. *Thinophilus gallagheri* male has broad face, nearly 2 times as wide as height of postpedicel, which is rounded, higher than long (12/9), with nearly apical arista-like stylus.

**Description.** Male (Fig. 1). Length (mm): body 1.8, antenna 0.4, wing 1.6/0.6. Head (Fig. 2) with all bristles yellowish white; postcranium and frons greenish blue, white pollinose; face black, densely white pollinose, narrow under antenna, not wider than height of postpedicel, broad at clypeus; clypeus broad, 2 times wider than face; palp yellow, bearing yellow bristly hairs; proboscis black; 2 diverging ocellars; 1 strong vertical, 1 postvertical, nearly as long as vertical, stronger and longer than, and not in row with upper postoculars; upper postoculars uniseriate; middle and lower postoculars biseriate, slightly longer than upper postoculars; antenna (Fig. 3) yellow, darkened at apex of postpedicel; scape small; pedicel simple, convex on inner side; postpedicel subtriangular, pubescent, nearly as high as long (8/9); arista-like stylus basodorsal, brown, thick basally, thin distally, microscopically pubescent; length (mm) of scape to pedicel to postpedicel to stylus (segments 1 and 2), 0.04 : 0.04 : 0.09 : 0.04 : 0.21.

Thorax greenish blue, weakly grey pollinose, with all bristles yellowish white; no acrostichals; 4 dorsocentrals of almost equal length and 2 hair-like setae anteriorly; scutellum with 2 strong marginals; no laterals; 2 lower propleural setae of different length.

Legs almost entirely light yellow, with all bristles and setae yellowish white; mid and hind coxae mostly black, segment 5 of all tarsi brown; claws black. Fore leg with long setulae; coxa with setae and bristles; femur simple, with 2 ventral rows of bristles, nearly as long as femur height; tibia and tarsus simple, without strong bristles; tarsal segment 5 weakly flattened and widened (Fig. 4); length of fore femur, tibia and tarsal segments (in mm): 0.48 : 0.39 : 0.11 : 0.05 : 0.05 : 0.05 : 0.08. Mid leg with long setulae; coxa with setae; femur with ventral rows of setae, about as long as femur height; tarsal segment 5 weakly flattened and widened (Fig. 5); length of mid femur, tibia and tarsal segments (in mm): 0.47 : 0.52 : 0.13 : 0.08 : 0.06 : 0.06 : 0.06. Hind leg with long setulae; coxa with 1 exterior bristle; femur with ventral and dorsal rows of setae, about as long as femur height; tibia with row of long dorsals; tarsal segment 5 weakly flattened and widened; length of hind femur, tibia and tarsal segments (in mm): 0.73 : 0.62 : 0.11 : 0.08 : 0.06 : 0.04 : 0.09.

Wing (Fig. 1) hyaline; veins yellow; distal part of  $M_{1+2}$  gently sinuate;  $R_{4+5}$  and  $M_{1+2}$  convergent distally, parallel at apex; ratio of part of costa between  $R_{2+3}$  and  $R_{4+5}$  to that between  $R_{4+5}$  and  $M_{1+2}$  (in mm), 0.26 : 0.09; crossvein dm-m straight; ratio of dm-m to distal part of  $M_4$ , 0.14 : 0.28; anal vein fold-like; halter yellow; lower calypter yellow, with white cilia.

Abdomen blue black, grey pollinose, with all setae and bristles yellowish white, short; sternites with short setae. Hypopygium (Fig. 6) black, appendages light brown; epandrial lobe broad in basal half, narrow in distal half, with row of 4 short setae decreasing in length distally; hypandrium reduced, apically concave; phallosome broad, reaching apex of surstyli; phallus coiled, long and band-like; surstylus fingerlike, with strong dorsal bristle at base, few short setae distally (Fig. 7); cerci separated, dorsally adjoined at base, short, ovate, with long light bristles.

Female. Similar to male except lacking male secondary sexual characters.

**Distribution.** Iran.

**Etymology.** From Latin "albus", "seta" (white-bristled).

### *Thinophilus qeshmensis* sp. n.

(Figs 8–15)

**Material.** Holotype, ♂ (ZISP): Iran, Hormozgan Prov., Qeshm Island, Dokuhak, 26°59'5.0"N / 56°11'19"E, 0 m, light trap, 4.11.2021 (E. Gilasian). Paratypes: 1♂, 2♀ (HMIM, ZISP), same data as for holotype; 2♂, 2♀ (HMIM, ZISP), Iran, Sistan and Baluchestan Prov., Chabahar, Govater, 25°09'54.8"N / 61°29'41.2"E, 0 m, pan trap, 18.05.2022 (M. Mofidi, A. Hajiesmalian).

**Diagnosis.** *Thinophilus qeshmensis* sp. n. is close in habitus to the Afrotropical *T. quadrisetus* group [Grichanov, 2023b] and the Oriental *T. murphy* group of species [Grootaert, 2018]. The new species differs from Afrotropical species in black (vs yellow) bristly hairs on palps. It differs from species of the *T. murphy* group in short simple setation on legs and two pairs of nearly equal in length bristles on scutellum. Males of the *T. murphy* group bear remarkable ornamentation on legs and much shorter laterals on scutellum in comparison with strong major bristles.

**Description.** Male (Fig. 8). Length (mm): body 7.9, antenna 1, wing 5.8/1.8. Head (Fig. 9): postcranium, frons and face greenish blue, grey pollinose; face under antennae nearly 2 times as wide as height of postpedicel, broader at clypeus; clypeus about 3/5 as long as epistome, about 2 times wider than long; palp yellow, bearing black bristly hairs; proboscis black; 2 diverging ocellars; 1 vertical, 1 postvertical, much stronger and longer than, and not in row with upper postoculars; upper postoculars uniseriate, black; middle and lower postoculars multiseriate, white, long; antennal scape yellow, pedicel blackish dorsally, yellow ventrally, postpedicel black dorsally and apically (Fig. 10); pedicel simple, convex on inner side; postpedicel rounded, with microscopic pubescence, slightly longer than high (23/19); arista-like stylus dorsal, black and thick basally, whitish and thin distally, microscopically pubescent; length (mm) of scape to pedicel to postpedicel to stylus (segments 1 and 2), 0.16 : 0.11 : 0.23 : 0.06 : 0.71.

Thorax metallic greenish blue, grey dusted; no acrostichals; 6 dorsocentrals decreasing in length anteriorly; scutellum with 2 strong marginals and 2 strong laterals, nearly as long as marginals; about 15 upper and about 10 lower, long fine white propleural bristles of different length.

Legs: mostly yellow; coxae black in basal half, yellow in apical half; tarsi black from tip of segment 4. Fore leg: coxa with short black setae; femur simple, with short setulae; tibia bearing 2 anterodorsal, 3 posterodorsal and 4–5 apical short setae, glabrous anteriorly on distal 1/3; basitarsus densely covered with short simple setulae anteroventrally; tarsal segments 1–4 with elongate apicoventral setae; segment 5 slightly flattened dorsoventrally (Fig. 11); length of femur, tibia and tarsal segments (in mm): 1.91 : 1.71 : 0.78 : 0.33 : 0.26 : 0.23 : 0.29. Mid leg: coxa with rather short black setae and setulae; femur with very short setae and setulae; 1 preapical posteroventral; tibia bearing 3 anterodorsal, 2 ventral short bristles, 5 apicals; tarsal segments 1–4 ventrally with short setae; segment 5 slightly flattened dorso-ventrally (Fig. 12); length of femur, tibia and tarsal segments (in mm): 2.02 : 2.35 : 0.99 : 0.29 : 0.24 : 0.22 : 0.26. Hind leg: coxa with 1 short black exterior bristle; femur ventrally without remarkable setae; 2 anterodorsal bristles; tibia bearing 3 anterodorsal, 4 posterodorsal bristles, no ventrals, 3 apicals; tarsal segments 1–4 ventrally with short setae; segment 5 slightly flattened dorso-ventrally; length of femur, tibia and tarsal segments (in mm): 3.14 : 2.82 : 0.62 : 0.54 : 0.35 : 0.28 : 0.29.

Wing (Fig. 8) hyaline, without darker shades; veins yellow-brown, more yellowish at base; distal part of  $M_{1+2}$  sinuate; tip of



$R_{4+5}$  parallel with  $M_{1+2}$ ; ratio of part of costa between  $R_{2+3}$  and  $R_{4+5}$  to that between  $R_{4+5}$  and  $M_{1+2}$  (in mm), 0.62 : 0.38; crossvein dm-m almost straight; ratio of dm-m to distal part of  $M_4$ , 0.55 : 0.49; anal vein distinct; halter yellow; lower calypter yellow, with white cilia.

Abdomen metallic greenish blue, grey dusted; setae and hind-marginal bristles on tergites black, short; sternites with sparse short black setulae. Hypopygium (Fig. 13) black with brown surstylus and yellow cercus; epandrial lobe reduced; hypandrium fused with epandrium, short and broad, apically concave; phallosome broad, narrow at apex, reaching apex of surstyli (Fig. 14); phallus coiled, long and band-like; surstylus straight, broad in basal half (lateral view), narrow in distal half, cleft at apex, with minute setae (Fig. 14); cerci separated, elongate-ovate, with long marginal bristles (Fig. 15).

Female. Similar to male except lacking male secondary sexual characters.

**Distribution.** Iran.

**Etymology.** The species is named after the Qeshm Island, where the holotype was collected.

*Thinophilus albihirtus* sp. n.  
(Figs 16–23)

**Material.** Holotype, ♂ (ZISP): Iran, Hormozgan Prov., Bandar-e Khamir, Marduo Island, 26°58'33"N / 55°40'25"E, 3 m, yellow pan trap, 30.10–2.11.2021 (E. Gilasian). Paratypes: 3♂ (ZISP), same data as for holotype; 6♂ (HMIM, ZISP), Iran, Sistan and Baluchestan Prov., Chabahar, Tis, 25°24'27.4"N / 60°37'48.8"E, 0 m, light trap, 17.05.2022 (M. Mofidi, A. Hajiesmalian).

**Additional material.** 4♀ (HMIM), Iran, Sistan and Baluchestan Prov., Chabahar, Tis, 25°24'27.4"N / 60°37'48.8"E, 0 m, light trap, 17.05.2022 (M. Mofidi, A. Hajiesmalian); 1♀ (HMIM), Iran, Sistan and Baluchestan Prov., Chabahar, Govater, 25°09'54.8"N / 61°29'41.2"E, 0 m, pan trap, 18.05.2022 (M. Mofidi, A. Hajiesmalian).

**Diagnosis.** *Thinophilus albihirtus* sp. n. along with *T. nigrihirtus* sp. n. may be included into the rather loose Afrotropical and Palaearctic *T. ochripalpis* species group of large *T. indigenus* lineage [Grichanov, 2023b]. The new species differs from other species of the *T. ochripalpis* group in strongly sinuate distal section of wing vein  $M_{1+2}$ ; tarsal segments 1–4 each with 2 apicoventral setae, as long as or longer than next segment; mostly yellow tarsi, with only tarsal segment 5 mostly black; bilobate surstylus. Males of other species of the *T. ochripalpis* group have straight or inconspicuously sinuate distal section of wing vein  $M_{1+2}$ ; tarsal segments 1–4 with short apicoventral setulae; tarsi darker, with at least tarsal segments 4–5 of mid and hind tarsi brown-black; surstylus one-lobed. Males of *T. albihirtus* sp. n. differs from *T. nigrihirtus* sp. n. in fore and mid femora bearing ventral tuft of fine white cilia in basal half, at most as long as femur height; and surstylus with wide lobes. Males of *T. nigrihirtus* sp. n. have only black setulae on fore and mid femora ventrally, at most half as long as femur height; surstylus with narrow lobes.

**Description.** Male (Fig. 16). Length (mm): body 4.7, antenna 0.7, wing 3.7/1.1. Head (Fig. 17): postcranium, frons and face bluish green; postcranium and face white pollinose, frons shining; face under antennae 1.5 times as wide as height of postpedicel, wider at clypeus; clypeus about half as long as epistome, about 2 times wider than long; palp yellow, bearing sparse black setulae; proboscis black; 2 diverging ocellars; 1 vertical, 1 postvertical, much stronger and longer than, and not in row with upper postoculars; upper postoculars uniseriate, black; middle and lower postoculars multiseriate, white, long; antennal scape yellow, pedicel brownish dorsally, yellow ventrally, postpedicel brown dorsally and apically (Fig. 18); pedicel simple, convex on inner side; postpedicel apically browned, rounded, with

short pubescence, slightly longer than high (18/15); arista-like stylus dorsal, brown and thick basally, whitish and thin distally, shortly pubescent; length (mm) of scape to pedicel to postpedicel to stylus (segments 1 and 2), 0.12 : 0.06 : 0.18 : 0.03 : 0.49.

Thorax metallic blue-green, weakly grey dusted; no acrostichals; 7 dorsocentrals decreasing in length anteriorly; scutellum with 2 strong marginals and 2 small laterals; 7–8 upper and 5–6 lower, fine white propleural bristles of different length.

Legs: coxae black, yellow at apex; legs mostly yellow; tarsi white, distal half of tarsomere 5 of all tarsi black. Fore leg: coxa with short white setae; femur simple, with ventral rows of fine white curved setae in basal half, about half as long as height of femur; tibia bearing 2 anterodorsal, 2 posterodorsal and 4–5 apical short bristles, glabrous anteriorly in distal 1/3; basitarsus densely covered with short simple setulae anteroventrally; tarsal segments 1–4 with elongate apicoventral setae, nearly 2 times as long as width of tarsomeres; segment 5 slightly flattened dorso-ventrally (Fig. 19); length of femur, tibia and tarsal segments (in mm): 1.23 : 1.09 : 0.36 : 0.17 : 0.16 : 0.14 : 0.19. Mid leg: coxa with short white setae and 1 short black bristle; femur with ventral rows of short white hairs, about 1/3 as long as height of femur; tibia bearing 2 anterodorsal; 3 posterodorsal short bristles, 2 strong apicoventral bristles; tarsal segments 1–4 with elongate apicoventral setae; segment 5 slightly flattened dorso-ventrally; length of femur, tibia and tarsal segments (in mm): 1.33 : 1.43 : 0.49 : 0.19 : 0.19 : 0.16 : 0.17. Hind leg: coxa with 1 short black exterior bristle; femur ventrally without remarkable setae, with very short white hairs in basal half; tibia bearing 3 anterodorsal, 3 posterodorsal bristles, 3 apicals; tarsal segments 1–4 with elongate apicoventral setae; segment 5 slightly flattened dorso-ventrally; length of femur, tibia and tarsal segments (in mm): 1.95 : 1.87 : 0.27 : 0.28 : 0.20 : 0.18 : 0.23.

Wing (Fig. 16) hyaline, without darker shades; veins yellow-brown, more yellowish at base; distal part of  $M_{1+2}$  sinuate; tip of  $R_{4+5}$  parallel with  $M_{1+2}$ ; ratio of part of costa between  $R_{2+3}$  and  $R_{4+5}$  to that between  $R_{4+5}$  and  $M_{1+2}$  (in mm), 0.33 : 0.22; crossvein dm-m almost straight; ratio of dm-m to distal part of  $M_4$ , 0.3 : 0.6; anal vein distinct; halter yellow; lower calypter yellow, with white cilia.

Abdomen metallic blue-green, weakly grey dusted; setae and hind-marginal bristles on tergites black, short; sternites with short sparse white setulae. Hypopygium (Fig. 20) black with brown surstylus and yellow cercus; epandrial lobe reduced; hypandrium fused with epandrium, short and broad, apically concave; phallosome broad, reaching apex of surstyli; phallus coiled, long and band-like; surstylus broad, deeply split at apex (lateral view; Fig. 21), with moderately long and short setae (Fig. 22); cerci separated, dorsally adjoined at base, band-like, with long marginal bristles (Fig. 23).

Female. Similar to male except lacking male secondary sexual characters.

**Distribution.** Iran.

**Etymology.** From Latin “albus”, “hirtus”, white-haired femora.

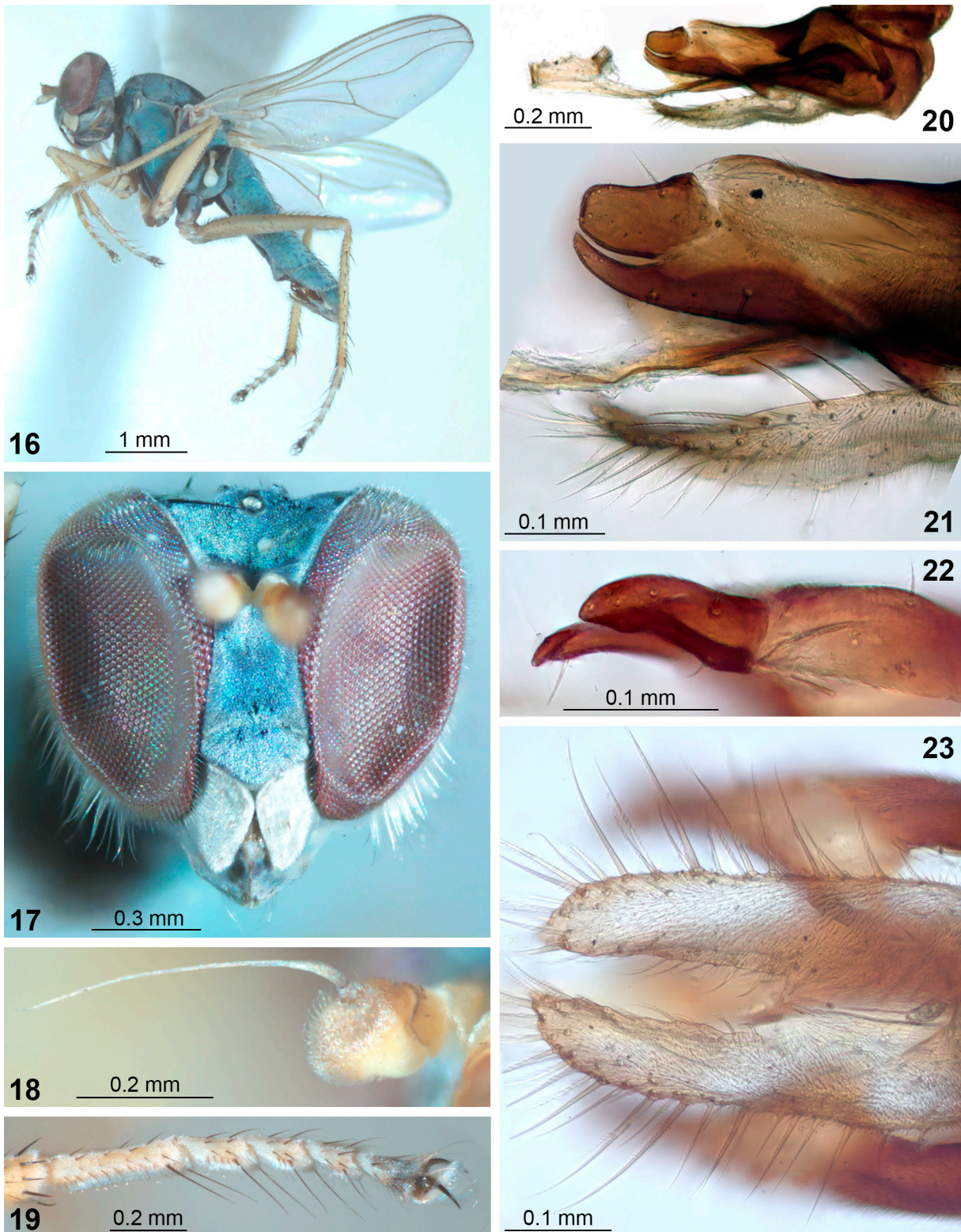
*Thinophilus nigrihirtus* sp. n.  
(Figs 24–32)

**Material.** Holotype, ♂ (ZISP): Iran, Hormozgan Prov., Qeshm Island, Dokuhak, 26°59'5.0"N / 56°11'19"E, 0 m, light trap, 4.11.2021 (E. Gilasian). Paratypes: 7♂ (HMIM, ZISP), same data.

**Additional material.** 3♀ (HMIM), same data as for holotype.

**Diagnosis.** *Thinophilus nigrihirtus* sp. n. is close in habitus to *T. albihirtus* sp. n., differing from the latter in only black setulae on fore and mid femora ventrally, at most half as long as femur height; and surstylus with narrow lobes. Males of *T. albihirtus* sp. n. have fore and mid femora bearing ventral tuft of fine white cilia in basal half, at most as long as femur height; and surstylus with wide lobes.



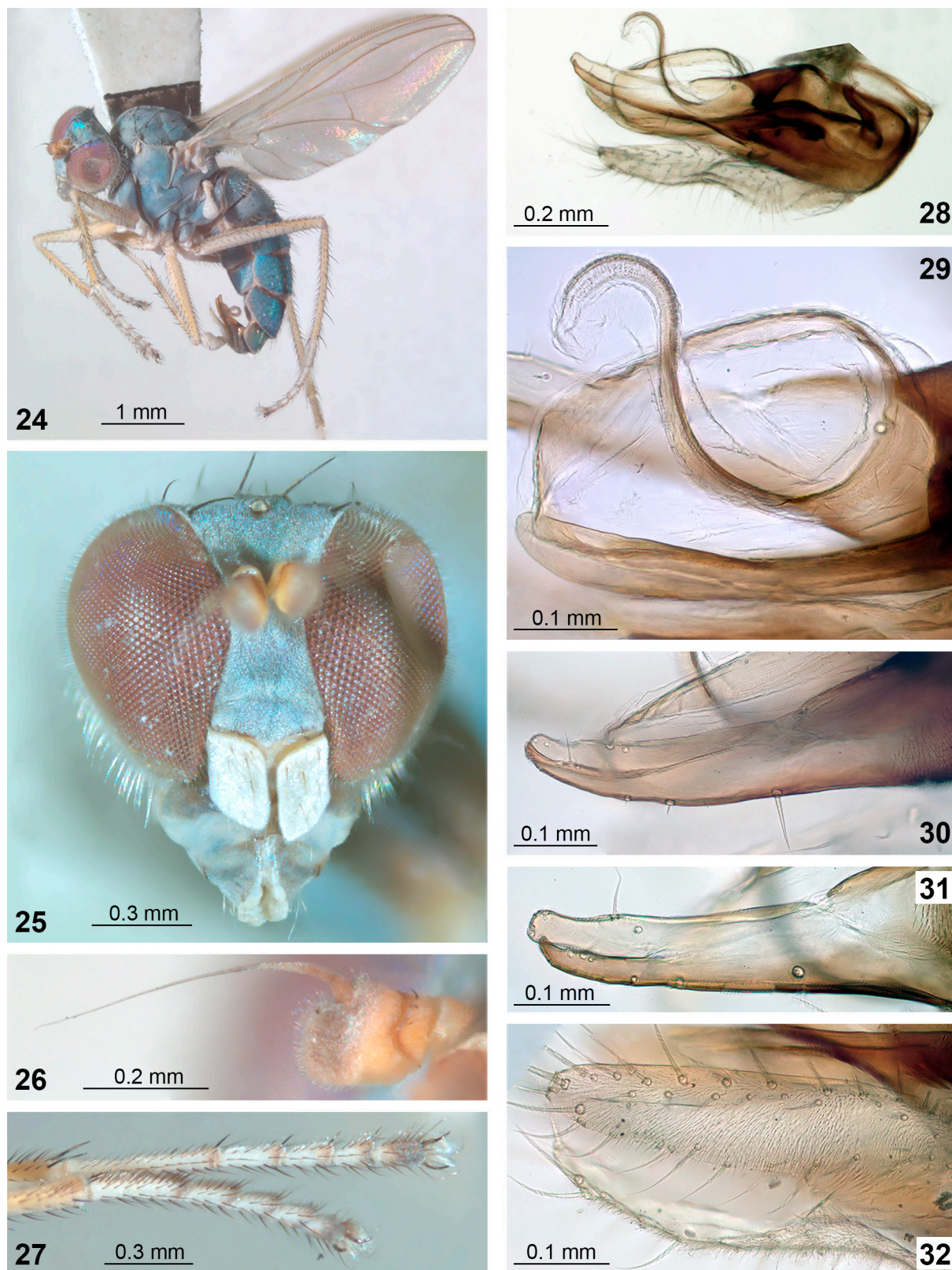


Figs 16–23. *Thinophilus albihirtus* sp. n., male, paratype, general view and details of structure.  
 16 – habitus; 17 – head; 18 – antenna; 19 – fore tarsus; 20 – hypopygium after maceration, lateral view; 21 – surstylus and cercus, lateral view; 22 – surstylus, ventral view; 23 – cerci, dorsal view.

Рис. 16–23. *Thinophilus albihirtus* sp. n., самец, паратип, общий вид и детали строения.

16 – внешний вид; 17 – голова; 18 – усик; 19 – передняя лапка; 20 – гипопигий после размачивания, сбоку; 21 – сурстиль и церка, сбоку; 22 – сурстиль, снизу; 23 – церки, сверху.





Figs 24–32. *Thinophilus nigrihirtus* sp. n., male, paratype, general view and details of structure.

24 – habitus; 25 – head; 26 – antenna; 27 – fore and mid tarsi; 28 – hypopygium after maceration, lateral view; 29 – phallosome and phallus, ventral view; 30 – surstylus, lateral view; 31 – surstylus, ventral-lateral view; 32 – cerci, dorsal view.

Рис. 24–32. *Thinophilus nigrihirtus* sp. n., самец, паратип, общий вид и детали строения.

24 – внешний вид; 25 – голова; 26 – усик; 27 – передняя и средняя лапки; 28 – гипопигий после размачивания, сбоку; 29 – фаллосома и фаллус, снизу; 30 – сурстий, снизу; 31 – сурстий, снизу-сбоку; 32 – церки, сверху.

**Description.** Male (Fig. 24). Similar to *Thinophilus albihirtus* sp. n. in all respects except as noted. Length (mm): body 4.8, antenna 0.8, wing 3.8/1.2. Head (Fig. 25): face under antennae 1.3 times as wide as height of postpedicel; clypeus nearly half as long as epistome, more than 2 times wider than long; length (mm) of scape to pedicel to postpedicel to stylus (segments 1 and 2), 0.09 : 0.07 : 0.17 : 0.04 : 0.48 (Fig. 26).

Thorax: 6 dorsocentrals decreasing in length anteriorly.

Legs: fore leg: femur simple, without ventral rows of fine white curved setae, with 3 preapical posteroventral bristles; tarsal segments 1–4 with elongate apicoventral setae, about as long as width of tarsomeres; length of femur, tibia and tarsal segments (in mm): 1.19 : 0.99 : 0.34 : 0.18 : 0.17 : 0.15 : 0.16 (Fig. 27). Mid leg: femur without ventral rows of white hairs, with only black setulae; tibia bearing 3–4 apicals; tarsal segments 1–4 ventrally with short setae; length of femur, tibia and tarsal segments (in mm): 1.18 : 1.25 : 0.51 : 0.21 : 0.18 : 0.14 : 0.18 (Fig. 27). Hind leg: femur without white hairs, with only black setulae ventrally; tarsal segments 1–4 ventrally with shorter setae; length of femur, tibia and tarsal segments (in mm): 1.72 : 1.63 : 0.38 : 0.31 : 0.22 : 0.18 : 0.19.

Wing (Fig. 24): ratio of part of costa between  $R_{2+3}$  and  $R_{4+5}$  to that between  $R_{4+5}$  and  $M_{1+2}$  (in mm), 0.34 : 0.24; ratio of dm-m to distal part of  $M_4$ , 0.36 : 0.56.

Abdomen: hypopygium (Figs 28–32) black with brown surstylus and yellow cercus; epandrial lobe reduced; hypandrium fused with epandrium, short and broad, apically concave; phallosome broad, not reaching apex of surstyli (Fig. 29); phallus coiled, long and band-like; surstylus narrow, deeply split at apex (lateral view; Fig. 30), with moderately long and short setae (Fig. 31); cerci separated, dorsally adjoined at base, band-like, with long marginal bristles (Fig. 32).

Female. Similar to male except lacking male secondary sexual characters.

**Distribution.** Iran.

**Etymology.** From Latin “niger”, “hirtus”, black-haired femora.

#### Key to species of *Thinophilus* from Iran (males)

This key builds extensively on Grichanov [2022, 2023b] but has scattered modifications based on material examined for the present study in our respective collections.

1. Mesonotum with four strong dorsocentrals of almost equal length; body and legs with only whitish yellow bristles; body length less than 2 mm (*T. gallagheri* group) ..... 2
  - Mesonotum with at least five dorsocentrals, usually greatly decreasing in length anteriorly; body and legs with mainly black bristles; body usually longer than 2 mm ..... 3
2. Face broad, nearly 2 times as wide as height of postpedicel; postpedicel rounded, higher than long (12/9); arista-like stylus nearly apical [Grichanov, 2023b: fig. 6]; body length 1.7 mm ..... *T. gallagheri*
  - Face narrow, not wider than height of postpedicel; postpedicel subtriangular, nearly as high as long (8/9); arista-like stylus basodorsal (Figs 1–7); body length 1.8 mm ..... *T. albisetosus* sp. n.
3. Scutellum with two pairs of almost equal in length bristles; palp with black setae; upper postoculars uniseriate; fore coxa black in basal half, with black setulae; mid femur without preapical; wing vein M strongly sinuate (Figs 8–15); body length 7.9 mm (*T. murphy* group) ..... *T. qeshmensis* sp. n.

- Another combination of characters ..... 4
- 4. Palp with white setae; all tarsi entirely black or brownish at base; surstylus straight, slightly narrowed distally [Grichanov, 2023b: fig. 1]; body length 2.5–3.3 mm (*T. calopus* group) ..... *T. argyropalpis*
  - Palp with black setae; tarsi gradually darkened towards tarsomere 5 or mostly yellow (*T. indigenus* group) ..... 5
- 5. Mesonotum with distinct dark lateral spot at notopleura ..... 6
  - Mesonotum monochrome, or with longitudinal stripes dorsally, without dark lateral spots, rarely with postalar dark spot ..... 7
- 6. Mesonotum with additional spot in front of scutellum; no spot at wing apex; male genitalia as in Negrobov [1978: figs 1371–1373]; body length 2.5–3 mm ..... *T. indigenus*
  - Mesonotum without spot in front of scutellum; wing with dark spot near the end of  $R_{2+3}$  and  $R_{4+5}$  [Negrobov, 1978: fig. 1351]; male genitalia as in Negrobov [1978: figs 1386–1388]; body length 4.75 mm ..... *T. quadrimaculatus*
- 7. Male hind coxa with long straight apical spine [Dawah et al., 2020: fig. 5b]; body length 4–4.5 mm ..... *T. ochripalpis*
  - Male hind coxa without spine ..... 8
- 8. Male fore basitarsus with nearly right-angled bend; mid femur with posteroventral setae in middle part, at least half as long as femur diameter; male fore tibia with 2 or 3 strong curved posteroventral bristles at apex; male genitalia as in Negrobov [1978: figs 1364–1366]; body length 5.5–6 mm ..... *T. flavipalpis*
  - Male fore basitarsus straight or fairly curved; mid femur with short or long setae in middle part; male fore tibia without strong curved posteroventral bristles at apex .. ..... 9
- 9. Fore basitarsus with ventral row of short but strong black spines, at least half as long as article diameter; fore tarsomere 4 with strong dorsal bristle, as long as or longer than tarsomeres 4 and 5 combined; male genitalia as in Negrobov [1978: figs 1393–1396]; body length 3.7–5.4 mm ..... *T. spinitarsis*
  - Fore basitarsus without ventral spines, with simple setulae only; fore tarsomere 4 without strong dorsal bristle ..... 10
- 10. Fore tibia 1/3 longer than fore tarsus (4/3); fore tarsomeres 2–4 triangular, wider than long; wing crossvein dm-m half as long as distal part of M [Grichanov, 2023b: fig. 10]; body length 1.8–2 mm ..... *T. deemingi*
  - Fore tibia not longer than fore tarsus; fore tarsomeres cylindrical, longer than wide; wing crossvein dm-m usually as long as or 2/3 as long as distal part of M .... ..... 11
- 11. Fore and mid femora with ventral tuft of fine white cilia in basal half, at most as long as femur height; surstylus with wide lobes (Fig. 6); body length 4.7 mm ..... *T. albihirtus* sp. n.
  - Fore and mid femora with only black setulae ventrally, at most half as long as femur height; surstylus with narrow lobes (Fig. 31); body length 4.8 mm ..... *T. nigrihirtus* sp. n.





Fig. 33. Distribution of the *Thinophilus* species in Iran.

1 – Meighan, Markazi Province (*T. flavipalpis*), 2 – Asaluyeh, Bushehr Province (*T. deemingi*, *T. ochripalpis*), 3 – Larestan, Fars Province (*T. indigenus*), 4 – Mardou Island, Bandar-e Khamir, Hormozgan Province (*T. albihirtus* sp. n., *T. deemingi*, *T. gallagheri*, *T. ochripalpis*), 5 – Qeshm Island, Hormozgan Province (*T. deemingi*, *T. gallagheri*, *T. qeshmensis* sp. n., *T. nigrihirtus* sp. n.), 6 – Gabrik, Hormozgan Province (*T. albisetosus* sp. n., *T. argyropalpis*, *T. gallagheri*), 7 – Sirik, Hormozgan Province (*T. ochripalpis*), 8 – Ssargad (Sarhad), Sistan and Balouchestan Province (*T. spinitarsis*), 9 – Chousdar, Sistan and Balouchestan Province (*T. argyropalpis*), 10 – Bazman, Sistan and Balouchestan Province (*T. quadrimaculatus*), 11 – Bampur, Sistan and Balouchestan Province (*T. indigenus*), 12 – Chabahar, Tis, Sistan and Balouchestan Province (*T. albihirtus* sp. n.), 13 – Chabahar, Govater, Sistan and Balouchestan Province (*T. albihirtus* sp. n., *T. albisetosus* sp. n., *T. deemingi*, *T. gallagheri*, *T. qeshmensis* sp. n.).

Рис. 33. Распространение видов рода *Thinophilus* в Иране.

1 – Мейган, провинция Маркази (*T. flavipalpis*), 2 – Асалуя, провинция Бушер (*T. deemingi*, *T. ochripalpis*), 3 – Ларестан, провинция Фарс (*T. indigenus*), 4 – остров Марду, Бандар-э-Хамир, провинция Хормозган (*T. albihirtus* sp. n., *T. deemingi*, *T. gallagheri*, *T. ochripalpis*), 5 – остров Кешм, провинция Хормозган (*T. deemingi*, *T. gallagheri*, *T. qeshmensis* sp. n., *T. nigrihirtus* sp. n.), 6 – Габрик, провинция Хормозган (*T. albisetosus* sp. n., *T. argyropalpis*, *T. gallagheri*), 7 – Сирик, провинция Хормозган (*T. ochripalpis*), 8 – Ссаргад (Sarhad), провинция Сисан и Белуджистан (*T. spinitarsis*), 9 – Чоусдар, провинция Сисан и Белуджистан (*T. argyropalpis*), 10 – Базман, провинция Сисан и Белуджистан (*T. quadrimaculatus*), 11 – Бампур, провинция Сисан и Белуджистан (*T. indigenus*), 12 – Чабахар, Тис, провинция Сисан и Белуджистан (*T. albihirtus* sp. n.), 13 – Чабахар, Говатер, провинция Сисан и Белуджистан (*T. albihirtus* sp. n., *T. albisetosus* sp. n., *T. deemingi*, *T. gallagheri*, *T. qeshmensis* sp. n.).

## Conclusion

As a result of this study, the *Thinophilus* species number in Iran has increased to twelve: nine species have been reported from Sistan and Baluchestan, eight from Hormozgan, two from Bushehr, one from Fars and one from

Markazi Province (Fig. 33). They are considered members of one Oriental (*T. murphy* group), two Afrotropical species groups (*T. gallagheri* and *T. calopus* groups) and the *T. indigenus* lineage distributed widely in the Old World [Grootaert, 2018; Grichanov, 2023b]. Three known species are firstly recorded from Iran: *T. deemingi* and

*T. gallagheri* have been recently described from Oman, and *T. ochripalpis* was previously known from Tanzania, Somalia, Saudi Arabia, Yemen, and Oman [Grichanov, 2023b].

In comparison, the Turkish fauna numbers five species [Tonguç et al., 2016; Grichanov, 2022]. The fauna of the Caucasus and East Mediterranean region as a whole includes 20 species of the genus [Grichanov, 2007, 2022]. Remarkably, twenty one *Thinophilus* species are known from small territory of Singapore, being common in mangroves mainly [Grootaert, 2018]. It means that new species records are anticipated in Iran.

This paper is the third contribution to the Iranian mangrove fauna of Dolichopodidae. See Grichanov, Gilasian [2023b, c] for the photographs and brief description of the collection localities in Bushehr, Hormozgan, and Sistan and Baluchestan provinces of Iran. The genus *Thinophilus* is here discovered in Iranian mangroves for the first time. Eight species have been collected in or near the mangrove forests by use of methods of mass trapping on the coast of the Persian and Oman gulfs of the Arabian Sea in 2021 and 2022.

In total, 188 species belonging to 31 genera of the family Dolichopodidae are recorded now from Iran [Grichanov, Gilasian, 2023a–f].

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## Азиатский вид *Sacodes martae* (Gusakov, 2022), comb. n. (Coleoptera: Scirtidae), описанный из Москвы (Россия)

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**Резюме.** На основании изучения паратипов недавно описанного из Москвы жука-трясинника *Elodes martae* Gusakov, 2022 (Coleoptera: Scirtidae) впервые проиллюстрировано строение половых органов самки и уточнено систематическое положение – *Sacodes martae* (Gusakov, 2022), **comb. n.** Род *Sacodes* LeConte, 1854 распространен преимущественно в Азии, на территории России от Западной Сибири до Дальнего Востока. Изолированные находки *Sacodes martae* в крупном мегаполисе, Москве, вероятно, указывают на их случайный характер в результате завоза, а сам вид является адвентивным для территории европейской части России.

**Ключевые слова:** жуки-трясинники, *Sacodes*, *Elodes*, половой аппарат, чужеродный вид.

### An Asian species, *Sacodes martae* (Gusakov, 2022), comb. n. (Coleoptera: Scirtidae), described from Moscow (Russia)

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**Abstract.** A systematic position of *Sacodes martae* (Gusakov, 2022), **comb. n.** previously described from Moscow in the genus *Elodes* Latreille, 1797 is considered. Female genitalia are illustrated for the first time based on paratypes specimens (two females). The genus *Sacodes* LeConte, 1854 is distributed mainly in Asia (in Russia from Western Siberia to Far East). Isolated records of the species from the City of Moscow may confirm his accidental importation, and that *Sacodes martae*, probably, is adventive species for European part of Russia.

**Key words:** marsh beetles, *Sacodes*, *Elodes*, genitalia, adventive species.

*Elodes martae* Gusakov, 2022 был описан из Москвы по двум самцам и трем самкам, собранным на стволах старых тополей в районе Большой Марьинской улицы (55°48'13.54"N / 37°38'1.54"E) в период 18–30.05.2022. Типовая серия хранится в Зоологическом музее Московского государственного университета (голотип и большая часть паратипов) (Москва, Россия) и в частной коллекции М.Л. Данилевского (Москва, Россия) [Гусаков, 2022]. Несмотря на то, что автор первоописания заключил, что новый вид «внешним обликом очень сходный с большинством представителей немногочисленного, характерного в основном для востока Азии рода *Sacodes* LeConte, 1854» [Гусаков, 2022: 499], описан таксон был в составе рода *Elodes* Latreille, 1797. Благодаря содействию сотрудников Зоологического музея МГУ нам удалось получить для детального изучения паратипы (две самки) этого вида, что позволило уточнить его систематическое положение.

Учитывая, что роды *Sacodes*, *Elodes* и *Odeles* Klausnitzer, 2004 образуют единую кладу с высокой поддержкой [Libonatti, 2016], а монофилия этой группы была четко продемонстрирована сочетанием признаков личинок [Hannappel, Paulus, 1987; Klausnitzer, 1987] и имаго [Yoshitomi, 2000, 2005], виды, относящиеся к этим таксонам, нередко имеют схожее строение, а их родовая принадлежность не всегда очевидна.

Тем не менее сестринский для *Elodes* род *Sacodes* в строении и имаго, и личинок имеет ряд аутапоморфий, которые были объединены и описаны в монографии Клаусницера [Klausnitzer, 2009]. В частности, для строения полового аппарата самцов *Sacodes* приведены следующие характерные особенности: 1) пенис полностью разделен на дорсальную и вентральную части; 2) дорсальная часть пениса впереди со срединным продольным гребнем (рис. 1b, 2b, 3b), а сзади несет две парные структуры – «ножки», или парамериды (рис. 1a, 2a, 3a). Из-за того, что в первоописании *Elodes martae* [Гусаков, 2022] фотография полового аппарата самца была приведена не полностью, нельзя было определить точную родовую принадлежность нового вида. Здесь мы приводим изображение целиком (рис. 3) в сравнении с иллюстрациями аналогично расположенных частей полового аппарата наиболее близкого вида *Sacodes protecta* Harold, 1881 (рис. 1, 2). Есть также некоторые детали, сближающие этот вид с *Sacodes kaszabi* (Klausnitzer, 1973). На основании этих деталей строения описанный ранее в роде *Elodes* вид следует перенести в сестринский род *Sacodes* и использовать название *Sacodes martae* (Gusakov, 2022), **comb. n.**

Изучение полового аппарата самок *Sacodes martae* (изображения публикуются впервые) также подтвер-

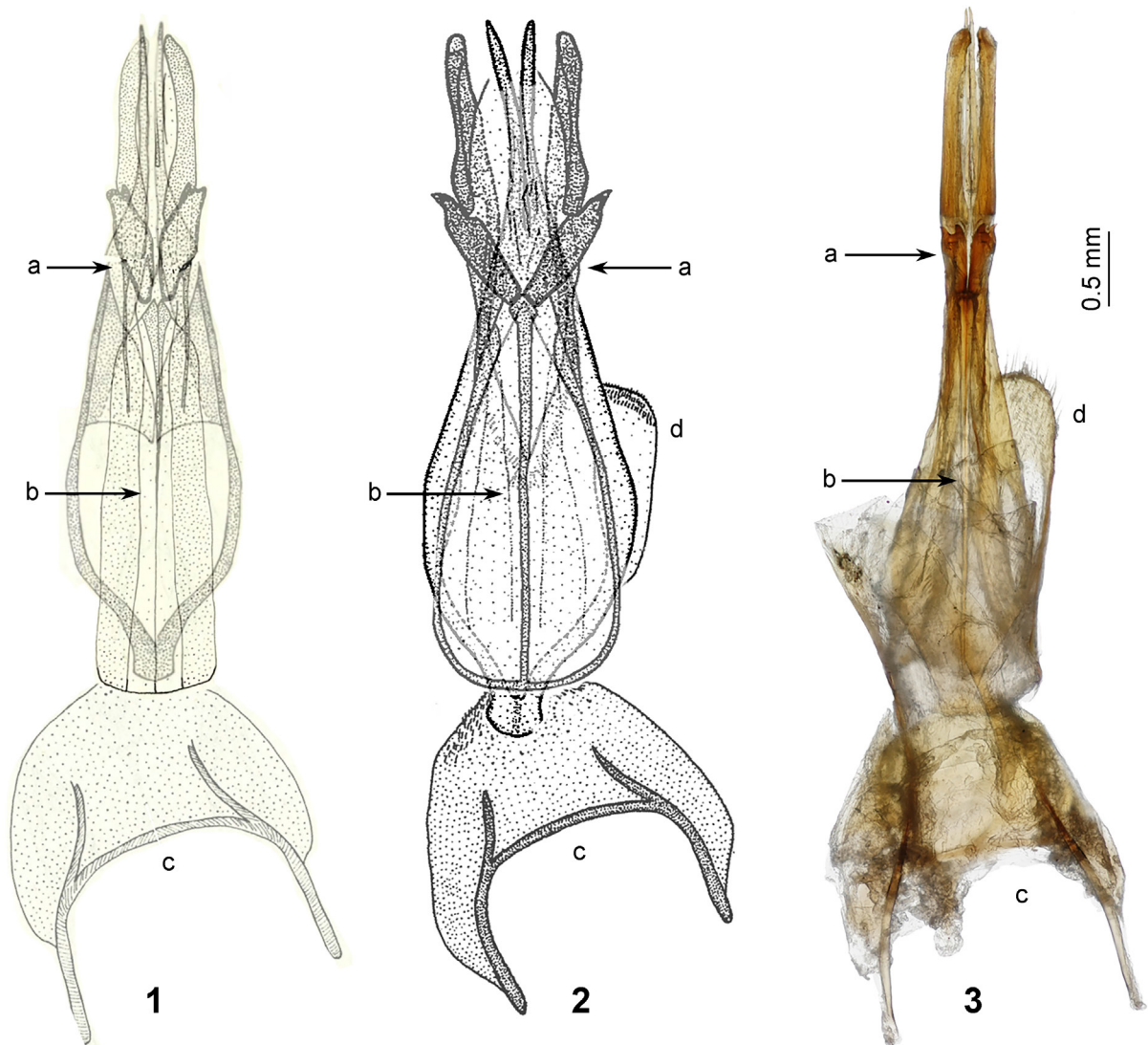


Рис. 1–3. Гениталии самцов *Sacodes* spp.

1–2 – *S. protecta*: 1 – по [Klausnitzer, 1973], с изменениями, 2 – по [Yoshitomi, 1997], с изменениями; 3 – *S. martae* (фотография К.В. Макарова). а – парамероиды; б – срединный гребень пениса; с – 8-й тергит; д – 9-й стернит.

Figs 1–3. Male genitalia of *Sacodes* spp.

1–2 – *S. protecta*: 1 – by Klausnitzer [1973], with changes, 2 – by Yoshitomi [1997], with changes; 3 – *S. martae* (photo by K.V. Makarov). а – parameroids; б – median crest of penis; с – 8<sup>th</sup> tergite; д – 9<sup>th</sup> sternite.

дило близость вида к *S. protecta*. Крупный прехенсор, представляющий собой пару склеритов в базальной части яйцеклада (рис. 4) и практически равный по длине бакулюсу, подобен таковому у *S. protecta* [Yoshitomi, 1997], как и другие детали строения, включая форму апикального стернита брюшка (рис. 5).

*Sacodes martae* отличается от близких видов. В частности, от *S. kaszabi* в первую очередь формой тегмена, который хорошо склеротизован, а в апикальной части расщеплен на 1/3 своей длины и несет тонкие выросты, тогда как у *S. kaszabi* тегмен слабо склеротизован, образует закрытый «рукав» вокруг пениса и имеет выемчатую вершину. Различны также форма 8-го тергита (у *S. kaszabi* он более продолговатый), строение парамероидов (у *S. kaszabi* они длиннее и несут более крупные зубцы).

От *S. protecta* вид *S. martae* отличается в целом меньшими размерами: самцы – 3.6 мм, самки – 3.5–4.7 мм [Гусаков, 2022], тогда как длина *S. protecta* 4–4.2 мм [Klausnitzer, 1973], самцы – 4.5–6 мм, самки – 4.7–6.2 мм [Yoshitomi, 1997], – а также соотношением длин парамероидов и простем: у *S. martae* простемы длиннее парамероидов в 2.7 раза, у *S. protecta* – в 1.5–1.6 раза.

Представители рода *Sacodes*, насчитывающего 19 видов [Klausnitzer, 2009, 2016; Yoshitomi, 2012], распространены в Голарктике и Ориентальной области, преимущественно в Азии (Северная Индия, Китай, Дальний Восток в широком смысле), несколько видов известно из Северной Америки (были описаны в роде *Flavohelodes* Klausnitzer, 1980, который в настоящее время является младшим синонимом *Sacodes*). Лишь

один вид, *S. flavicollis* (Kiesenwetter, 1859), известен из Европы. Фауна рода не ревизована, за последнее время из Азии (Япония, Тайвань) описано несколько новых видов *Sacodes* [Yoshitomi, 1997, 2000, 2008, 2012].

Личинки известны не для всех видов, однако у описанных представителей рода развитие связано с фитотельматами, включая скопление воды внутри дупел деревьев [Yoshitomi, 1997; Klausnitzer, 2009], что вероятно и для *Sacodes martae*, учитывая сборы типовой серии на стволах тополей.

Имея ввиду общее распространение видов рода, а также систематическую близость *S. martae* к восточно-азиатским *S. protecta* (Дальний Восток России и Япония) и *S. kaszabi* (Дальний Восток России и Северная Корея) [Klausnitzer, 2016; Sazhnev, Sergeev, 2021], можно предположить адвентивный характер его обнаружения в Москве, не исключая завоз с древесиной или иным субстратом. В пользу этого предположения говорят близость к типовому местонахождению железнодорожных путей и узлов сообщения, а также общая степень изученности региональной фауны мегаполиса и Московской области [Никитский, 2019], которая остается наиболее высокой в России.

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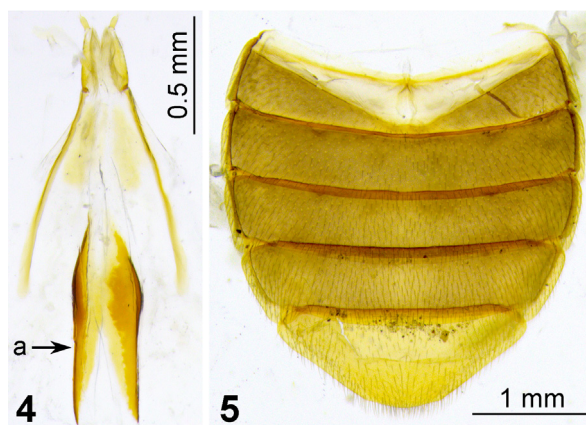


Рис. 4–5. *Sacodes martae*, самка, детали строения. 4 – яйцеклад со склеротизированным прехенсором (а); 5 – стерниты брюшка.  
Figs 4–5. *Sacodes martae*, female, details of structure. 4 – ovipositor with sclerotized prehensor (a); 5 – abdominal sternites.

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## Первая находка тли *Eotrama tamaricis* (Nevsky, 1951) (Hemiptera: Aphididae) в Европе

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**Резюме.** Приведены сведения о находке нового для Европы вида тлей *Eotrama tamaricis* (Nevsky, 1951) (Hemiptera: Aphididae). Материал собран в ноябре 2021 года на территории Донецкого ботанического сада на *Tamarix ramosissima*. Ранее вид был известен из пустынь и тугайных лесов Южного и Юго-Восточного Казахстана, Туркменистана и Узбекистана. Обсуждается статус вида на территории Донбасса. Предполагается возможность случайного завоза *E. tamaricis* на эту территорию вместе с посадочным материалом *Tamarix ramosissima*. Однако нельзя исключать вероятность обитания тли в естественных местах произрастания тамариксов на юге европейской части России.

**Ключевые слова:** Hemiptera, Aphididae, *Eotrama tamaricis*, первая находка, Россия, Европа.

### The first record of *Eotrama tamaricis* (Nevsky, 1951) (Hemiptera: Aphididae) in Europe

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**Abstract.** *Eotrama tamaricis* (Nevsky, 1951) (Hemiptera: Aphididae) is recorded for Europe for the first time. The material was collected in November 2021 on the territory of Donetsk Botanical Garden on *Tamarix ramosissima*. The species was known from the deserts and tугай forests of southern and southeastern Kazakhstan, Turkmenistan and Uzbekistan. The status of the species in the territory of Donbass is discussed. The possibility of accidental introduction of *E. tamaricis* into the territory of Donbass along with plants of *Tamarix ramosissima* is assumed. However, it cannot be excluded that aphids live in natural habitats of tamarix in the south of the European part of Russia.

**Key words:** Hemiptera, Aphididae, *Eotrama tamaricis*, first record, Russia, Europe.

*Eotrama tamaricis* (Nevsky, 1951) (младшие синонимы: *Trama xerophilaphica* Juchnevitch et Kan, 1971, *Trama lomovae* Narzikulov, 1973, *Eotrama xerophilaphica* Czylok, 1990, *Protrama tamaricis* Mamontova, 1991) – среднеазиатский вид тлей, обитающий в пустынях и тугайных лесах Южного и Юго-Восточного Казахстана, Туркменистана и Узбекистана [Мамонтова, 2012; Кадырбеков, 2017]. В 2021 году был обнаружен в Донецке (Донецкая Народная Республика, Россия) на территории Донецкого ботанического сада, что является первой находкой в Европе.

Тли были собраны вручную и зафиксированы в 96%-м этиловом спирте. Фотосъемку тлей в природе производили при помощи камеры Nikon D7200 с объективом Nikon 105mm f/2.8G IF-ED AF-S VR Micro-Nikkor и конвертером Raynox DCR-250. Фотосъемку зафиксированных экземпляров осуществляли при помощи камеры AxioCam ERc5s, установленной на бинокулярный микроскоп Carl Zeiss Stemi 2000-C. Измерения проводили при помощи программы ZEN 2012 (Blue Edition). Дополнительную обработку и стекинг фотоснимков производили при помощи программ Zerene Stacker 1.04 и Adobe Photoshop CS5. Материал хранится в коллекции автора. Для идентификации вида было проведено детальное изучение строения бескрылых самок и сравнение его с оригинальными описаниями [Невский, 1951; Юхневич, Кан, 1971; Мамонтова, 2012].

*Eotrama tamaricis* (Nevsky, 1951)  
(Рис. 1–9)

**Материал.** 6 бескрылых самок, 8 личинок, Россия, Донецкая Народная Республика, Донецк, Донецкий ботанический сад, 48°00'99"N / 37°87'87"E, под корой в прикорневой части ствола *Tamarix ramosissima* Ledeb., 15.11.2021 (А.И. Губин).

**Биология.** Жизненный цикл аномоциклический. В Средней Азии тли живут небольшими рассеянными колониями на корнях *Tamarix ramosissima* (Tamaricaceae) [Кадырбеков, 2017]. На территории Донецкого ботанического сада колонии локализовались под корой тамариксов в прикорневой части ствола под коркой из почвы, построенной муравьями *Lasius emarginatus* (Olivier, 1792). В середине ноября, когда проводились наблюдения, помимо живородящих самок в колониях были зарегистрированы личинки разных возрастов, что свидетельствует о размножении вида вплоть до наступления устойчивых холодов. Яйца и самцы обнаружены не были.

**Комментарии.** Вопрос о том, каким образом можно охарактеризовать находку среднеазиатского вида тлей в Северном Приазовье, остается открытым. В настоящее время во флоре Донбасса зафиксировано два вида тамариксов. Первый из них – *Tamarix gracilis*, реликтовый редкий вид, включенный в Красную книгу Донецкой Народной Республики и в естественных условиях произрастающий на приморских песках Белосарайской косы (национальный природный парк «Меоти-





Рис. 1–9. *Eotrama tamaricis*, общий вид и детали строения.  
 1–2 – тли на корнях *Tamarix ramosissima*: 1 – бескрылая самка, 2 – нимфа; 3–4 – зафиксированная бескрылая самка, общий вид: 3 – вид сверху, 4 – вид снизу; 5 – усик, общий вид; 6 – усик, V–VI членики; 7 – хоботок, III–IV членики; 8 – задняя лапка, вид сбоку; 9 – трубочка.

Figs 1–9. *Eotrama tamaricis*, general view and details of structure.  
 1–2 – aphids on the roots of *Tamarix ramosissima*: 1 – apterae female, 2 – nymph; 3–4 – fixed apterae female, general view: 3 – dorsal view, 4 – ventral view; 5 – antenna, general view; 6 – antenna, V–VI antennomeres; 7 – proboscis, III–IV segments; 8 – metatarsus, lateral view; 9 – siphunculus.

да») [Ібатуліна, Остапко, 2010]. Второй – *T. ramosissima*, адвентивный вид, широко распространенный в регионе [Остапко и др., 2010, 2020]. В урбо- и техноценозах Донбасса *T. ramosissima* используется для озеленения терриконов, отвалов, шламоотстойников и т.д., выращивается как декоративное растение, а также встречается в естественных фитоценозах как эрзаифит. Следствием интродукции тамарисков в регион является появление специализированных фитофагов. На сегодняшний день на тамарисках, произрастающих в Донецком ботаническом саду, был отмечен ряд монофагов, чье проникновение в регион, по всей вероятности, является следствием широкого использования этих растений в озеленении: *Brachyunguis tamaricis* (Lichtenstein, 1885) (Homoptera: Aphididae), *Coniatus splendidulus* (Fabricius, 1781) (Coleoptera: Curculionidae) и *Ornativulva plutelliformis* (Staudinger, 1859) (Lepidoptera: Gelechiidae).

Принимая во внимание вышеизложенное, логичным будет предположить возможность случайного завоза *Eotrama tamaricis* на территорию Донбасса вместе с посадочным материалом. Однако нельзя исключать вероятность обитания тли в естественных местах произрастания тамарисков на юге европейской части России. Для установления статуса вида в регионе необходимо проведение целенаправленных поисков *E. tamaricis* в степной зоне Восточной Европы, в том числе и на других видах рода *Tamarix*.

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## Таксономические замечания по роду *Pedinus* Latreille, 1796 (Coleoptera: Tenebrionidae) с новой определительной таблицей для видов европейской части России

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**Резюме.** Пересмотрено таксономическое положение некоторых видов и подвидов рода *Pedinus* Latreille, 1796. Два подвида вида *Pedinus cimmerius* G.S. Medvedev, 1968, обитающие на нижнеднепровских песках и песчаных морских побережьях Кавказа, отнесены к виду *Pedinus femoralis* (Linnaeus, 1767): *P. femoralis caucasicus* G.S. Medvedev, 1968 и *P. femoralis znoikoi* G.S. Medvedev, 1968. *Pedinus cimmerius* хорошо отличается от всех подвидов *P. femoralis* строением голеней самца: средние с резким угловидным перегибом в проксимальной трети внутренней (сгибательной) стороны, задние сильно изогнуты в проксимальной трети разгибательной стороны. Выделена псаммофильная форма *Pedinus femoralis femoralis* f. *psammophila* Nabozhenko, nov., включающая ряд изолированных популяций с песчаных речных массивов бассейна Дона и отличающаяся от форма *typica* номинативного подвида отсутствием продольной срединной складочки и наличием волосистой щеточки на внутренней поверхности задних голеней самца. Составлена новая определительная таблица для видов *Pedinus* европейской части России.

**Ключевые слова:** подвиды, формы, *Pedinus*, Tenebrionidae, Кавказ, Крым, европейские степи.

### Taxonomic notes on the genus *Pedinus* Latreille, 1796 (Coleoptera: Tenebrionidae) with a new key to species of the European part of Russia

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**Abstract.** The taxonomic position of some species and subspecies of the genus *Pedinus* Latreille, 1796 is revised. Two subspecies of the species *Pedinus cimmerius* G.S. Medvedev, 1968, occurring on the Lower Dnieper sands and sandy sea coasts of the Caucasus, are assigned to the species *Pedinus femoralis* (Linnaeus, 1767): *P. femoralis caucasicus* G.S. Medvedev, 1968 and *P. femoralis znoikoi* G.S. Medvedev, 1968. *Pedinus cimmerius* is well distinguished from all subspecies of *P. femoralis* by the structure of the male mesotibiae, which are characterized by the sharp angular emargination in the proximal third of the inner side, as well as strongly curved (from the extensor position) male metatibiae in the proximal third. The psammophilic form of *Pedinus femoralis femoralis* forma *psammophila* Nabozhenko, nov. is characterized. It includes a number of isolated populations from sands of the Don River basin and differs from the forma *typica* of the nominative subspecies in the absence of a longitudinal median fold and the presence of a hair brush on the inner surface of the hind tibiae of the male. A new key is compiled for the *Pedinus* species of the European part of Russia.

**Key words:** subspecies, forms, *Pedinus*, Tenebrionidae, Caucasus, Crimea, European steppes.

## Введение

Виды рода *Pedinus* Latreille, 1796 широко распространены в Западной Палеарктике (от восточноатлантического побережья до Алтая и Западного Китая) и, с небольшим перерывом в ареале, в Восточной Азии (от Тибета до Японии) [Iwan et al., 2020]. Почти все виды – обитатели безлесных пространств: степей, лугов различных типов, песчаных побережий рек и морей, полупустынь с закрепленными песками, нагорно-ксерофитных и средиземноморских ландшафтов. Лишь некоторые виды встречаются в светлых сухих сосновых лесах. К настоящему времени известно 64 вида и 11 подвидов этого рода [Kamiński, Iwan, 2017; Iwan et al., 2020].

Род *Pedinus* был ревизован дважды в пределах бывшего СССР и сопредельных стран. Рейхардт [1936, 1937] сделал таксономический обзор рода, в который он включал как восточноевропейские виды, относимые им к двум под родам (номинативному и *Vadalus* Mulsant et Rey, 1854), так и дальневосточные таксоны, помещенные в под род *Blindus* Mulsant et Rey, 1853 еще Зайдлицем [Seidlitz, 1893] и Райтером [Reitter, 1904]. Медведев [1968] в своей ревизии трибы Pedinini Советского Союза и прилегающих стран обосновал самостоятельность рода *Blindus* и оставил в роде *Pedinus* два под рода: номинативный и *Vadalus*. В недавней ревизии под трибы Pedinina [Kamiński, Iwan, 2017] три под рода (*Pedinus* s. str., *Blindus* и *Colpotus* Mulsant et Rey,

1853) были включены в состав рода *Pedinus*, а таксоны *Pedinulus* Seidlitz, 1893 и *Vadulus* рассматриваются как младшие синонимы номинативного подрода. Абдурахманов и Набоженко [2011] использовали иллюстрации и определительную таблицу (с изменениями и дополнениями) из монографии Медведева [1968], поскольку эти ключи считались надежными в течение более 40 лет.

Несмотря на такую, казалось бы, подробную изученность, некоторые виды рода *Pedinus* в ключах Медведева [1968] определяются с трудом или вовсе не диагностируются, а имаго (в том числе и типовые экземпляры) обладают признаками, противоречащими тезам и антитезам. Особенно это касается трех подвидов *Pedinus cimmerius* G.S. Medvedev, 1968. В нашей работе пересмотрен таксономический состав рода в пределах восточноевропейских степей, гор Крыма и Северного Кавказа.

## Материал и методы

В работе использован материал из Зоологического института РАН (ZIN, Санкт-Петербург, Россия), который подробно представлен в монографии Медведева [1968], изучен автором и в этой работе не дублируется. Ниже для некоторых видов добавлен лишь небольшой дополнительный материал, собранный в 2015 году в Краснодарском крае и Ростовской области (Россия) и хранящийся частично в ZIN, частично в коллекции М.В. Набоженко (PCMН, Ростов-на-Дону, Россия). Кроме того, использованы материалы, собранные автором в 1990-х годах и хранящиеся в Музее зоологии Южного федерального университета (MZ SFU, Ростов-на-Дону, Россия).

Фотографии жуков выполнены с помощью фотоаппарата Canon EOS 5D Mark IV Body, объектива Canon MP-E65MM F2.8 Macro, трансмиттера со вспышками Canon Macro Twin Lite MT-26X-RT и двумя дополнительными вспышками Canon Speedlite 430EX III-RT, стэкинг проводили с помощью фокусируемых макрорельсов Stack-shot 3X s/n 3734, закрепленных на репродукционной установке Kaiser Copy Stand RS 1. Фокус-стэкинг изображений выполняли в программе Helicon Focus 7.7.4 Pro. Изображения не масштабированы.

*Pedinus cimmerius* G.S. Medvedev, 1968

(Рис. 19, 20, 25–28)

**Замечания.** Медведев [1968] указывал следующие отличия *P. cimmerius* от сравниваемого с ним *P. femoralis*: изогнутые (с разгибательной стороны) задние голени самца (рис. 28) и отсутствие срединной продольной складочки на их внутренней (сгибательной) поверхности (рис. 27). Кроме указанных признаков *P. cimmerius* хорошо отличается от всех подвидов *P. femoralis* строением голеней самца: средние с резким угловидным перегибом в проксимальной трети внутренней (сгибательной) стороны (рис. 25, 26), задние сильно изогнуты в проксимальной трети разги-

бательной стороны. Самки *P. cimmerius* обладают по сравнению с *P. femoralis* почти параллельносторонними надкрыльями без густой «кожистой» микроскульптуры.

Медведев [1968] разделил этот вид на три географически разобщенных подвида, два из которых, *P. cimmerius caucasicus* G.S. Medvedev, 1968 и *P. cimmerius znoikoi* G.S. Medvedev, 1968, не обладают диагностическими признаками, характерными для номинативного подвида, и должны быть исключены из его состава.

**Распространение.** Предгорные и горные районы Крыма, включая Керченский полуостров.

*Pedinus femoralis* (Linnaeus, 1767)

(Рис. 29–43)

**Материал.** *Pedinus femoralis femoralis* f. *typica* (PCMН): 2♂, 2♀, Ростовская обл., Верхнедонской р-н, окр. х. Морозовский, правый берег р. Песковатка, степной склон, 13–15.05.2015 (М.В. Набоженко, И.В. Шохин, Е.Н. Терсков).

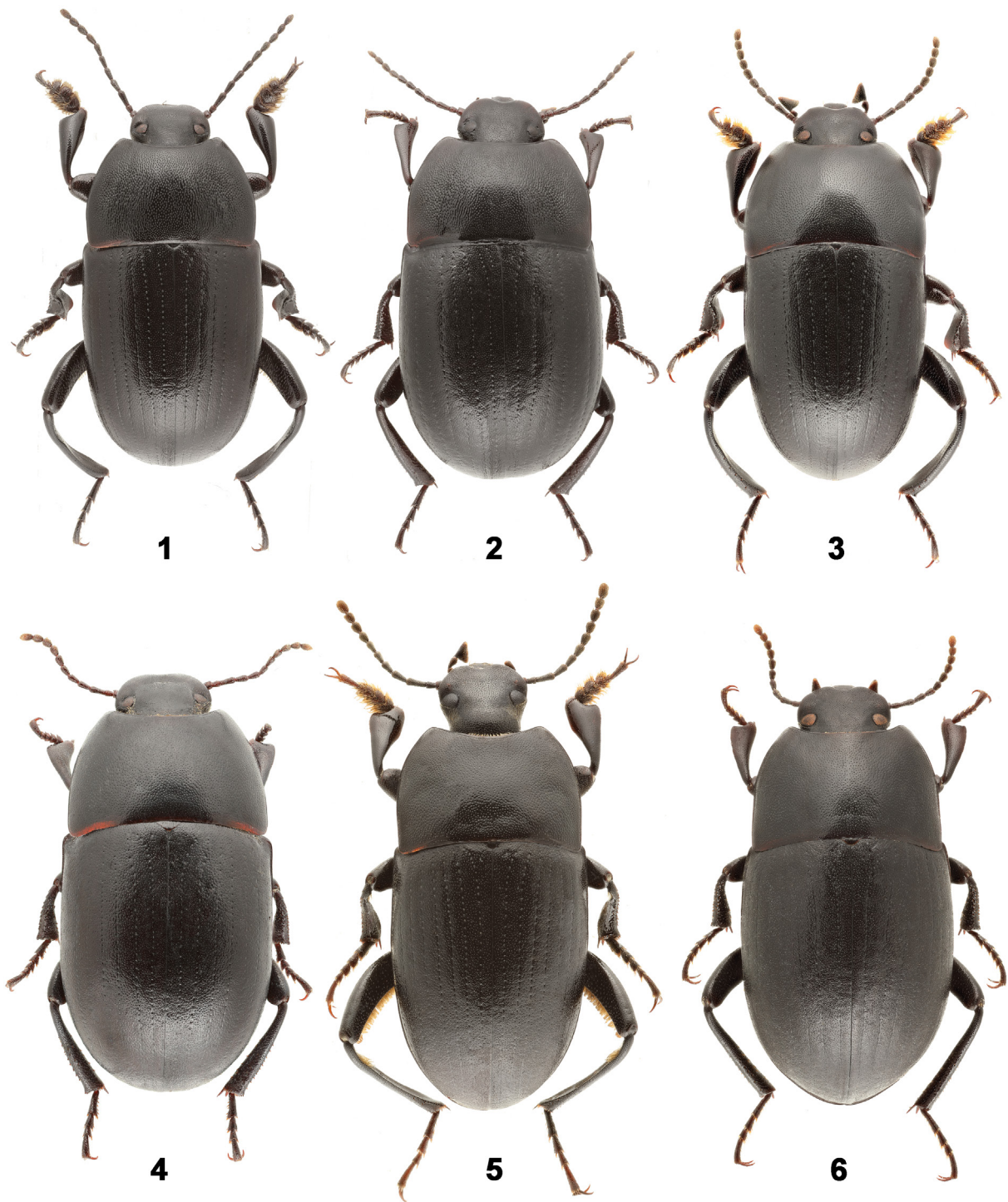
*Pedinus femoralis femoralis* f. *psammophila* Nabozhenko, nov.: 1♂ (ZM SFU), Ростовская обл., Усть-Донецкий р-н, х. Крымский, 06.1997 (сборщик неизвестен); 1♂, 1♀ (ZM SFU), Ростовская обл., Тарасовский р-н, станция Митякинская, 3–9.06.1997 (М.В. Набоженко); 4♂, 5♀ (ZIN, PCMН), Ростовская обл., Верхнедонской р-н, окр. х. Морозовский, левый берег р. Песковатка, пески, 13–15.05.2015 (М.В. Набоженко, И.В. Шохин, Е.Н. Терсков); 3♂, 1♀ (ZM SFU), Волгоградская обл., окр. х. Нижнегнутов, Цимлянский песчаный массив, 7–10.05.1998 (М.В. Набоженко, Д.В. Дубовиков, Л.В. Маркитан).

*Pedinus femoralis caucasicus*: 3♂, 5♀ (PCMН, ZIN), Краснодарский кр., Темрюкский р-н, коса Тузла, 45°12'09.87"N / 36°36'02.22"E, 29.06.2015 (М.В. Набоженко).

**Замечания.** Этот широко распространенный в Европе и Сибири вид, по словам Медведева [1968: 144], «не образует четко выраженных подвидовых или более мелких локальных форм». Рейхардт [1937] и Медведев [1968] придавали большое значение отсутствию или наличию срединной продольной складочки на внутренней (сгибательной) поверхности задних голеней самцов. Медведев [1968] подчеркивал, что, несмотря на широкое варьирование в выраженности этой складочки у разных популяций, экземпляры без нее встречаются очень редко. Несмотря на мнение Медведева об отсутствии локальных форм, автор [Набоженко, 1999] уже указывал на наличие песчаных популяций *Pedinus femoralis*, распространенных на донских песках и характеризующихся волосистой щеточкой в основании внутренней (сгибательной) поверхности голени самцов. В работе Набоженко [1999] было отмечено, что такая же песчаная форма встречается на Алёшковских песках в низовьях Днепра. В последнем случае указание необходимо отнести к днепровскому подвиду, описанному как *P. cimmerius znoikoi* [Медведев, 1968]. Это еще раз свидетельствует о существенных различиях между *P. cimmerius cimmerius* и его подвидами, с трудом отличимыми от *P. femoralis*.

Внимательное изучение подвидов *P. cimmerius caucasicus* и *P. c. znoikoi* и сопоставление их с донскими псаммофильными и степными популяциями показало, что оба они относятся к виду *P. femoralis* и имеют существенные отличия от *P. cimmerius cimmerius*: средние голени самца плавно S-образно изогнуты и не образуют резкого угловидного перегиба на внутренней сто-



Рис. 1–6. Виды рода *Pedinus*, габитус.1–2 – *P. infortunatus*: 1 – самец, 2 – самка; 3–4 – *P. tauricus*: 3 – самец, 4 – самка; 5–6 – *P. borysthenicus*: 5 – самец, 6 – самка.Figs 1–6. Species of the genus *Pedinus*, habitus.1–2 – *P. infortunatus*: 1 – male, 2 – female; 3–4 – *P. tauricus*: 3 – male, 4 – female; 5–6 – *P. borysthenicus*: 5 – male, 6 – female.

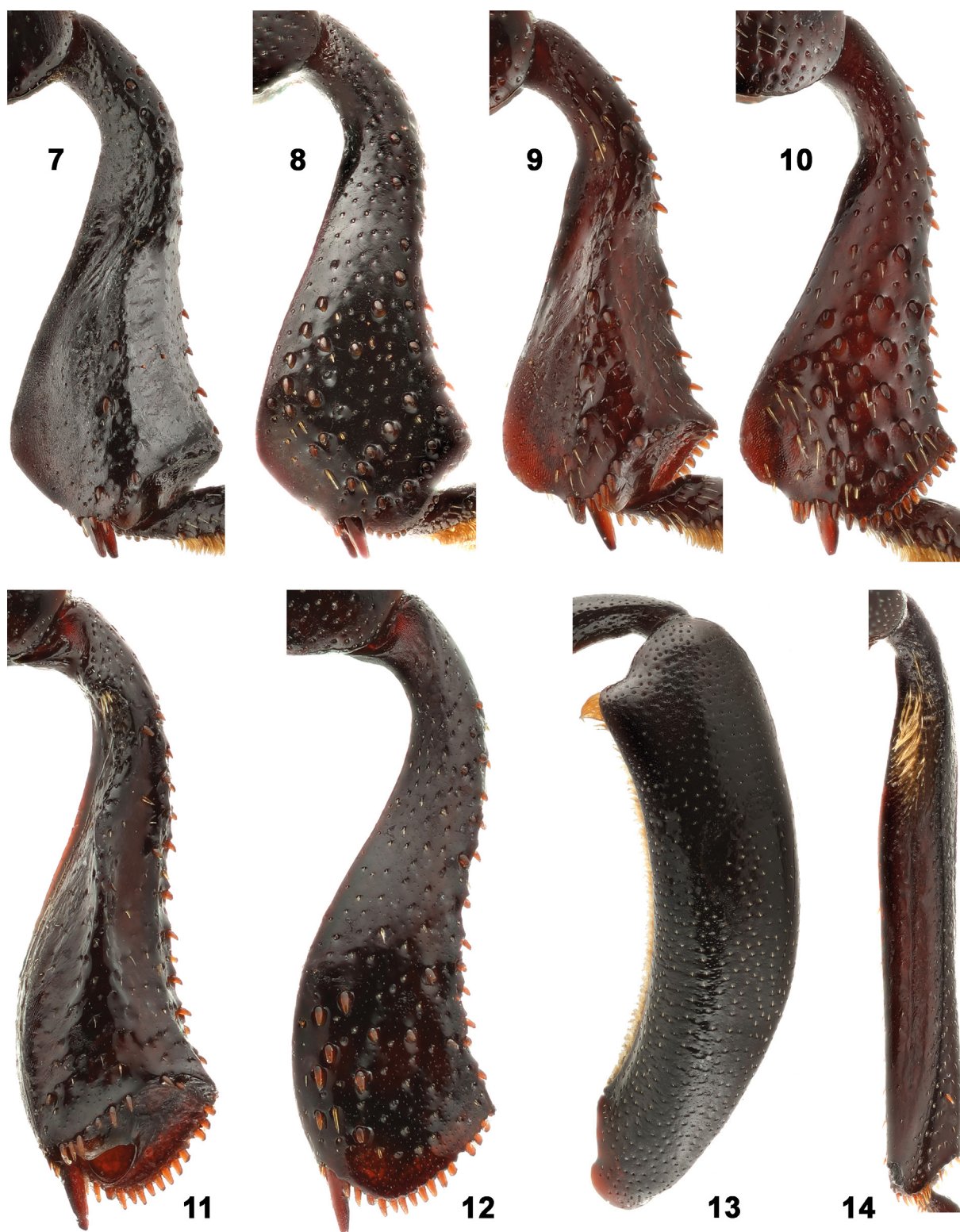
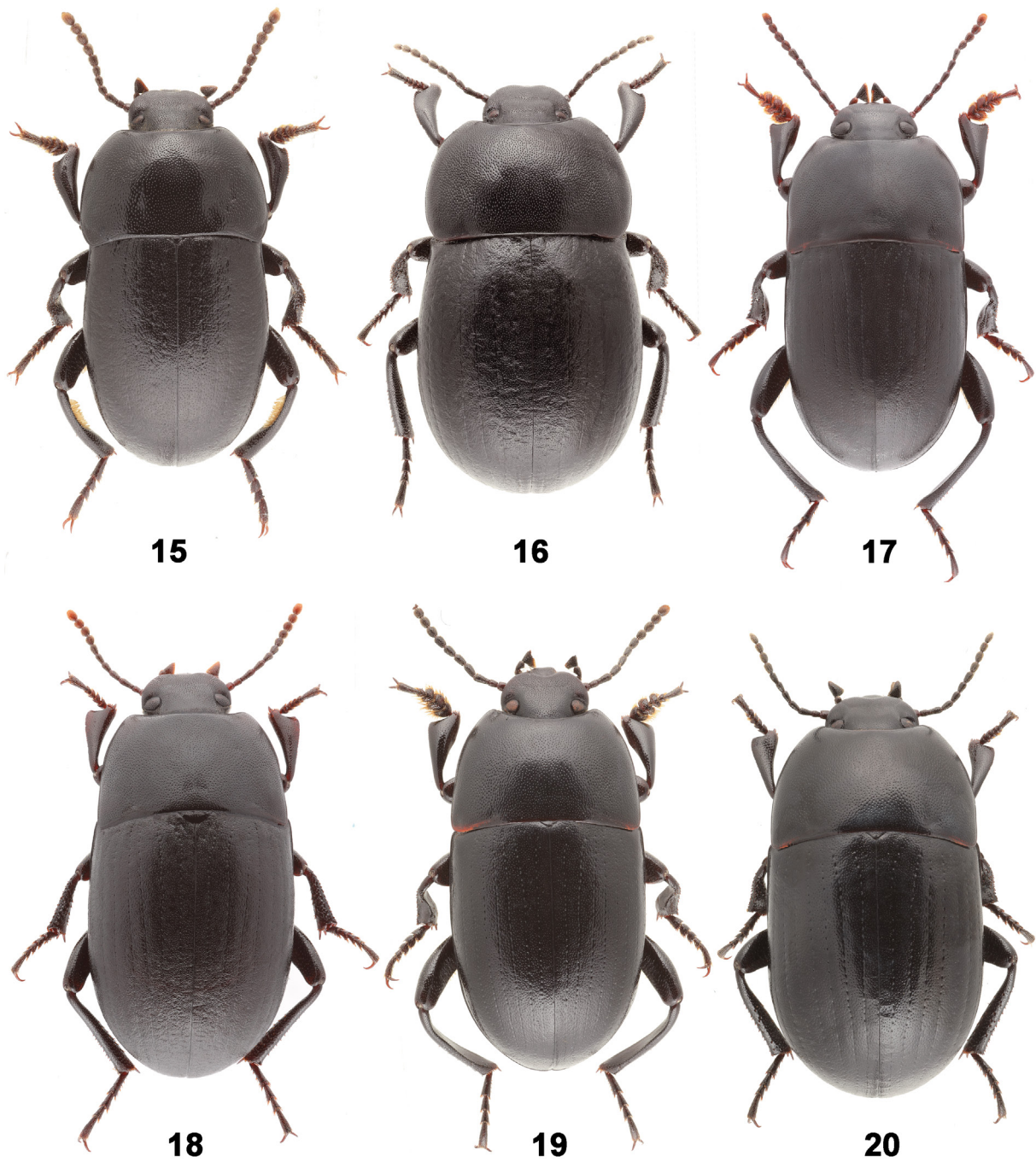


Рис. 7–14. Виды рода *Pedinus*, детали строения ног самцов.  
 7–8 – *P. infortunatus*, средняя голень: 7 – снизу, 8 – сверху; 9–10 – *P. tauricus*, средняя голень: 9 – снизу, 10 – сверху; 11–14 – *P. borysthenticus*: 11 – средняя голень снизу, 12 – то же, сверху, 13 – заднее бедро, 14 – задняя голень с разгибательной стороны.

Figs 7–14. Species of the genus *Pedinus*, details of structure of male legs.

7–8 – *P. infortunatus*, mesotibia: 7 – ventrally, 8 – dorsally; 9–10 – *P. tauricus*, mesotibia: 9 – ventrally, 10 – dorsally; 11–14 – *P. borysthenticus*: 11 – mesotibia ventrally, 12 – same, dorsally, 13 – metafemur, 14 – metatibia from extensor side.



Рис. 15–20. Виды рода *Pedinus*, габитус.

15–16 – *P. circassicus*: 15 – самец, 16 – самка; 17–18 – *P. volgensis*: 17 – самец, 18 – самка; 19–20 – *P. cimmerius*: 19 – самец, 20 – самка.

Figs 15–20. Species of the genus *Pedinus*, habitus.

15–16 – *P. circassicus*: 15 – male, 16 – female; 17–18 – *P. volgensis*: 17 – male, 18 – female; 19–20 – *P. cimmerius*: 19 – male, 20 – female.





Рис. 21–28. Виды рода *Pedinus*, детали строения ног самцов.  
 21–22 – *P. circassicus*: 21 – средняя голень сверху, 22 – задняя голень с разгибательной стороны; 23–24 – *P. volgensis*: 23 – средняя голень снизу, 24 – передняя голень снизу; 25–28 – *P. cimmerius*: 25 – средняя голень снизу, 26 – то же, сверху, 27 – задняя голень с разгибательной стороны, 28 – то же, со сгибательной стороны.

Figs 21–28. Species of the genus *Pedinus*, details of structure of male legs.

21–22 – *P. circassicus*: 21 – mesotibia dorsally, 22 – metatibia from extensor side; 23–24 – *P. volgensis*: 23 – mesotibia ventrally, 24 – protibia ventrally; 25–28 – *P. cimmerius*: 25 – mesotibia ventrally, 26 – same, dorsally, 27 – metatibia from extensor side, 28 – same, from flexion side.

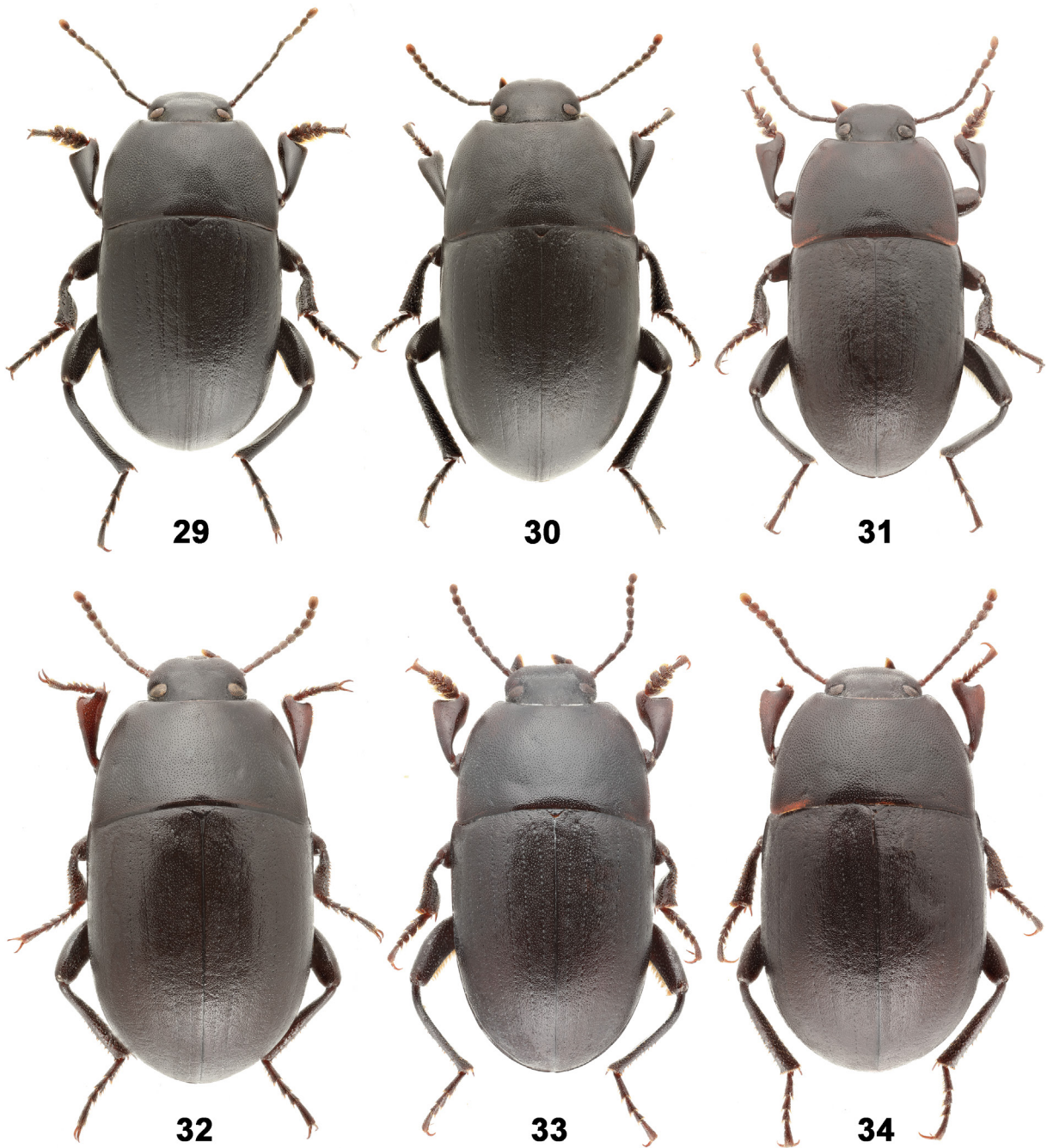


Рис. 29–34. Подвиды *Pedinus femoralis*, габитус.  
 29–30 – *P. femoralis femoralis*: 29 – самец, 30 – самка; 31–32 – *P. femoralis caucasicus*: 31 – самец, паратип, 32 – самка; 33–34 – *P. femoralis znoikoi*:  
 33 – самец, голотип, 34 – самка, паратип.  
 Figs 29–34. Subspecies of *Pedinus femoralis*, habitus.  
 29–30 – *P. femoralis femoralis*: 29 – male, 30 – female; 31–32 – *P. femoralis caucasicus*: 31 – male, paratype, 32 – female; 33–34 – *P. femoralis znoikoi*:  
 33 – male, holotype, 34 – female, paratype.





Рис. 35–43. *Pedinus femoralis femoralis*, детали строения ног.

35–36 – средняя голень самца: 35 – снизу, 36 – сверху; 37 – передняя голень самца снизу; 38 – то же, самка; 39 – заднее бедро самца; 40 – задняя голень самца со сгибательной стороны, форма *typica*; 41 – то же, с разгибательной стороны; 42 – задняя голень самца с разгибательной стороны, полубоком, форма *psammophila*; 43 – то же, в обычной позиции.

Figs 35–43. *Pedinus femoralis femoralis*, details of structure of legs.

35–36 – male mesotibia: 35 – ventrally, 36 – dorsally; 37 – male protibia ventrally; 38 – same, female; 39 – male metafemur; 40 – male metatibia from flexion side, forma *typica*; 41 – same, from extensor side; 42 – male metatibia from extensor side, semilateral position, forma *psammophila*; 43 – same, straight position.



роне; их внутренний край в проксимальной половине широко выемчатый, а не прямой, плавно переходит в закругленный; задние голени самца без сильного изгиба в проксимальной трети (с разгибательной стороны); надкрылья самки не параллельносторонние, овальные, без заметной «кожистой» микроскульптуры. Таким образом, эти подвиды относятся к виду *Pedinus femoralis*: *P. femoralis caucasicus* G.S. Medvedev, 1968 и *P. femoralis znoikoi* G.S. Medvedev, 1968.

Подвид с днепровских песков, *P. femoralis znoikoi*, в наибольшей степени отличается от двух других гораздо более широкими передними голениями (рис. 45). Оба псаммофильных подвида отличаются от номинативного меньшими размерами, отсутствием продольной складочки на внутренней поверхности задних голеней самца, наличием волосяной щеточки на внутренней стороне задних голеней самца (рис. 46, 47), нередко черно-бурым телом и гораздо более густой «кожистой» микроскульптурой надкрылий (рис. 31–34). Кроме того, ареалы всех трех подвигов не пересекаются. По крайней мере, нам не удалось найти зоны интерградации.

Псаммофильные популяции с донских песков (здесь им для удобства дано инфраподвидовое название *Pedinus femoralis femoralis* forma *psammophila* Nabozhenko, nov., не имеющее номенклатурного значения), так же как и оба псаммофильных подвида, отличается от экземпляров forma *typica* номинативного подвида отсутствием продольной срединной складочки и наличием волосяной щеточки на внутренней поверхности задних голеней самца (рис. 42, 43). В остальном forma *psammophila* номинативного подвида не имеет отличий от forma *typica* и не рассматривается здесь как подвид. Ареал forma *psammophila* простирается преимущественно в границах западной части ареала *P. volgensis*, но жуки приурочены исключительно к изолированным песчаным массивам Дона и его притоков. Лишь на юге лесостепной зоны (по меньшей мере, на севере Ростовской области) ареалы двух форм номинативного подвида *P. femoralis* пересекаются. В ряде случаев расстояние между местообитаниями этих форм составляет несколько десятков метров (хутор Морозовский, Верхнедонской район Ростовской области), но они всегда разделены какой-либо рекой (forma *typica* на высоких степных правых берегах, forma *psammophila* на низких песчаных левых). Несмотря на то, что мы не обнаружили между двумя формами экземпляров с переходными признаками, их наличие не исключено.

**Распространение.** *Pedinus femoralis femoralis* forma *typica* – Европа, Кавказ, Северный и Восточный Казахстан, Южная Сибирь на восток до Алтая, Западный Китай [Медведев, 1968; Iwan et al., 2020]. *Pedinus femoralis femoralis* forma *psammophila* – пески бассейна Дона на север до Верхнедонского района Ростовской области. *Pedinus femoralis caucasicus* – песчаные побережья Черного моря (на юг до Новороссийска) и Керченского пролива (на север до косы Тузла, на острове Тузла отсутствует). *Pedinus femoralis znoikoi* – низовья Днепра, Нижнеднепровские (Алешковские) пески.



Рис. 44–47. Подвиды *Pedinus femoralis*, детали строения ног самцов.

44 – *P. femoralis caucasicus*, передняя голень сверху; 45 – *P. femoralis znoikoi*, то же; 46 – *P. femoralis caucasicus*, задняя голень со сгибательной стороны; 47 – *P. femoralis znoikoi*, то же.

Figs 44–47. Subspecies *Pedinus femoralis*, details of structure of male legs.

44 – *P. femoralis caucasicus*, protibia dorsally; 45 – *P. femoralis znoikoi*, same; 46 – *P. femoralis caucasicus*, metatibia from extensor side; 47 – *P. femoralis znoikoi*, same.

**Определительная таблица  
видов рода *Pedinus* Latreille, 1796  
европейской части России по самцам**

В таблице мы приводим ссылки на изображения широкого спектра признаков, а не только диагностических, для лучшего различения видов.

- 1(4). Внутренний край средних голеней на вершине уплощен и оттянут в закругленный отросток (рис. 7–10).
- 2(3). Переднеспинка по бокам от центра с очень густой и грубой продольно удлинённой, часто сливающейся пунктировкой (рис. 1). Рисунки 1, 7, 8. Крым ..... *P. infortunatus* Kamiński et Iwan, 2017
- 3(2). Переднеспинка с тонкой пунктировкой из круглых точек (рис. 3). Рисунки 3, 9, 10. Крым ..... *P. tauricus* Mulsant et Rey, 1853
- 4(1). Внутренний край средних голеней на вершине не оттянут (рис. 11, 12, 23, 25, 26, 35, 36).
- 5(6). Задние бедра с отростком у вершины с наружной стороны (рис. 13). Рисунки 5, 11–14. Нижнеднепровские пески, Кинбурнская и Тендеровская косы, остров Джарыгач, устье Днестровского лимана ..... *P. borysthenicus* Reichardt, 1936
- 6(5). Задние бедра без отростка у вершины (рис. 39).
- 7(8). Средние голени изогнуты в проксимальной трети и параллельносторонние в дистальных 2/3 (вид сверху и снизу, не с торца) (рис. 21). Задние голени с очень густым рядом длинных волосков на внутренней стороне (рис. 22). Рисунки 15, 21, 22. Западный Кавказ ..... *P. circassicus* (Reitter, 1887)
- 8(7). Средние голени S-образно изогнутые (сверху и снизу, не с торца) (рис. 23, 25, 26). Задние голени голые (рис. 27, 41) или с очень маленьким пучком коротких полуприлегающих волосков в основании (рис. 42, 43, 46, 47).
- 9(10). Нижняя сторона передних голеней с тонкими поперечными щетинками, направленными внутрь (рис. 24). Рисунки 17, 23, 24. Степи от Днестра до долины Урала, Кавказ (Тамань, предгорный и локально внутригорный Дагестан), Крым (Керченский полуостров, равнинная северная часть) ..... *P. volgensis* Mulsant et Rey, 1853
- 10(9). Нижняя сторона передних голеней с продольными тонкими щетинками и шипиками, направленными вперед (рис. 37).
- 11(12). Средние голени резко изогнуты в проксимальной трети, внутренняя сторона с четкой угловидной выемкой на месте изгиба (рис. 25, 26). Задние голени сильно изогнуты в проксимальной трети при рассмотрении с разгибательной стороны (рис. 28). Рисунки 19, 25–28 ..... *P. cimmerius*
- 12(11). Средние голени равномерно S-образно изогнуты, без угловидной выемки с внутренней стороны (рис. 35, 36). Задние голени слабо изогнуты в проксимальной трети (вид с разгибательной стороны) (рис. 40).
- 13(14). Внутренняя сторона задних голеней с продольной складочкой, без пучка светлых волосков в основании (рис. 41). Рисунки 29, 35–37, 39–41 ..... *P. femoralis femoralis* f. *typica*

- 14(13). Внутренняя сторона задних голеней без четкой продольной складочки, с пучком (или областью) светлых волосков (рис. 42, 43, 46, 47).
- 15(16). Волосяной пучок в основании внутренней стороны задних голеней разреженный, с редкими длинными волосками (рис. 42, 43) ..... *P. femoralis femoralis* f. *psammophila*
- 16(15). Волосяной пучок в основании внутренней стороны задних голеней состоит из очень густых длинных волосков (рис. 46, 47).
- 17(18). Передние голени шире, их наружный край плавно закруглен (рис. 45). Рисунки 33, 45, 47 ..... *P. femoralis znoikoi*
- 18(17). Передние голени уже, их наружный край слабо широко выемчатый (рис. 44). Рисунки 31, 44, 46 ..... *P. femoralis caucasicus*

**Определительная таблица  
видов рода *Pedinus* Latreille, 1796  
европейской части России по самкам**

- 1(2). Средние голени в проксимальной части изогнуты, а в дистальных 2/3 параллельносторонние (рис. 21). Задние углы переднеспинки широко закругленные (рис. 16) ..... *P. circassicus*
- 2(1). Средние голени равномерно слабо S-образно изогнуты. Задние углы переднеспинки узко закругленные (рис. 2, 4, 6, 18, 20, 30, 32, 34).
- 3(4). Нижняя сторона передних голеней с поперечными тонкими щетинками, направленными внутрь (рис. 24) ..... *P. volgensis*
- 4(3). Нижняя сторона передних голеней с продольными шипиками и щетинками, направленными вперед (рис. 38).
- 5(6). Переднеспинка с грубой продольной, часто сливающейся пунктировкой по бокам от середины (рис. 2) ..... *P. infortunatus*
- 6(5). Переднеспинка с обычной тонкой пунктировкой из круглых точек (рис. 4, 6, 18, 20, 30, 32, 34).
- 7(8). Боковые края надкрылий параллельносторонние в базальных 2/3. Тело блестящее, надкрылья без «кожистой» микроскульптуры (рис. 20) ..... *P. cimmerius*
- 8(7). Боковые края надкрылий закругленные, междуядья надкрылий с «кожистой» микроскульптурой и дополнительно с продольными микроморщинками (рис. 4, 6, 30, 32, 34).
- 9(10). Надкрылья в основании заметно шире основания переднеспинки (рис. 4). Тело в среднем крупнее, 8,2–10,4 мм ..... *P. tauricus*
- 10(9). Надкрылья в основании едва шире, чем основание переднеспинки, или такой же ширины (рис. 6, 30, 32, 34). Тело в среднем меньше, 5,5–9 мм ..... *P. femoralis* (все подвиды), *P. borysthenicus*

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## A new species of the genus *Stepanovia* Kostjukov, 2004 (Hymenoptera: Eulophidae) from Taman Peninsula, Russia

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**Abstract.** A new species of the genus *Stepanovia* Kostjukov, 2004 (Hymenoptera: Eulophidae: Tetrastichinae), *S. kostjukovi* sp. n., is described from the arid steppe zone of southern coast of the Taman Peninsula (Veselovka village, Krasnodar Region). The new species is close to *S. rosae* Boyadzhiev et Todorov 2013 and *S. fructirosae* Boyadzhiev, Yefremova et Tozlu, 2017, and differs from the both latter species by the funicular segments of antenna shorter, ovipositor sheaths longer (up to twice as long as postcercal), and a combined length of ovipositor sheath and postcercal (almost equal to the length of hind tibia).

**Key words:** Chalcidoidea, Tetrastichinae, *Stepanovia*, parasitoids, new species, Krasnodar Region.

### Новый вид рода *Stepanovia* Kostjukov, 2004 (Hymenoptera: Eulophidae) с Таманского полуострова, Россия

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**Резюме.** Описан новый вид рода *Stepanovia* Kostjukov, 2004 (Hymenoptera: Eulophidae, Tetrastichinae), *S. kostjukovi* sp. n. из зоны сухих степей южного побережья Таманского полуострова (поселок Веселовка, Краснодарский край). Новый вид близок к *S. rosae* Boyadzhiev et Todorov, 2013 and *S. fructirosae* Boyadzhiev, Yefremova et Tozlu, 2017, от которых отличается более короткими члениками жгутика усика, длинными ножами яйцеклада, которые вдвое длиннее расстояния от пигостилей до вершины последнего тергита, а также суммарной длиной ножен яйцеклада и расстояния от пигостилей до вершины последнего тергита, которая почти равна длине задней голени.

**Ключевые слова:** Chalcidoidea, Tetrastichinae, *Stepanovia*, паразитоиды, новый вид, Краснодарский край.

## Introduction

The eulophid genus *Stepanovia* Kostjukov, 2004 (type species *Aprostocetus aspectabilis* Kostjukov, 1995) was erected for former species of the genus *Aprostocetus* Westwood, 1833, which mainly differs from *Aprostocetus* by malar sulcus below eye with a triangular fovea extending about half length of gena, flagellar segments of antenna thickened, and the middle lobe of mesoscutum with extremely fine superficial reticulation and without median line or sometimes with weakly traceable as a smoother line.

The species of *Stepanovia* attack hosts in the galls of *Diplolepis mayri* (Schlechtendal, 1877), *D. eglanteriae* (Hartig, 1840) and *D. spinosissima* (Giraud, 1859) (Hymenoptera: Cynipidae), as well as Diptera on woody plants [Graham, 1987; Kostjukov, 2004]. Boyadzhiev and Todorov [2013] and Boyadzhiev et al. [2017] reported *Diplolepis rosae* (Linnaeus, 1758) and *D. fructuum* (Rübsaamen, 1895) as a probably hosts of *Stepanovia rosae* Boyadzhiev et Todorov, 2013 and *S. fructirosae* Boyadzhiev, Yefremova et Tozlu, 2017, respectively.

Currently, *Stepanovia* comprises ten species known from the Western Europe, the North Caucasus and Far East of Russia [Graham, 1987; Storozheva et al., 1995; Kostjukov, 2004; Kostjukov et al., 2009; Boyadzhiev and Todorov, 2013; Boyadzhiev et al., 2017; Noyes, 2019].

## Material and methods

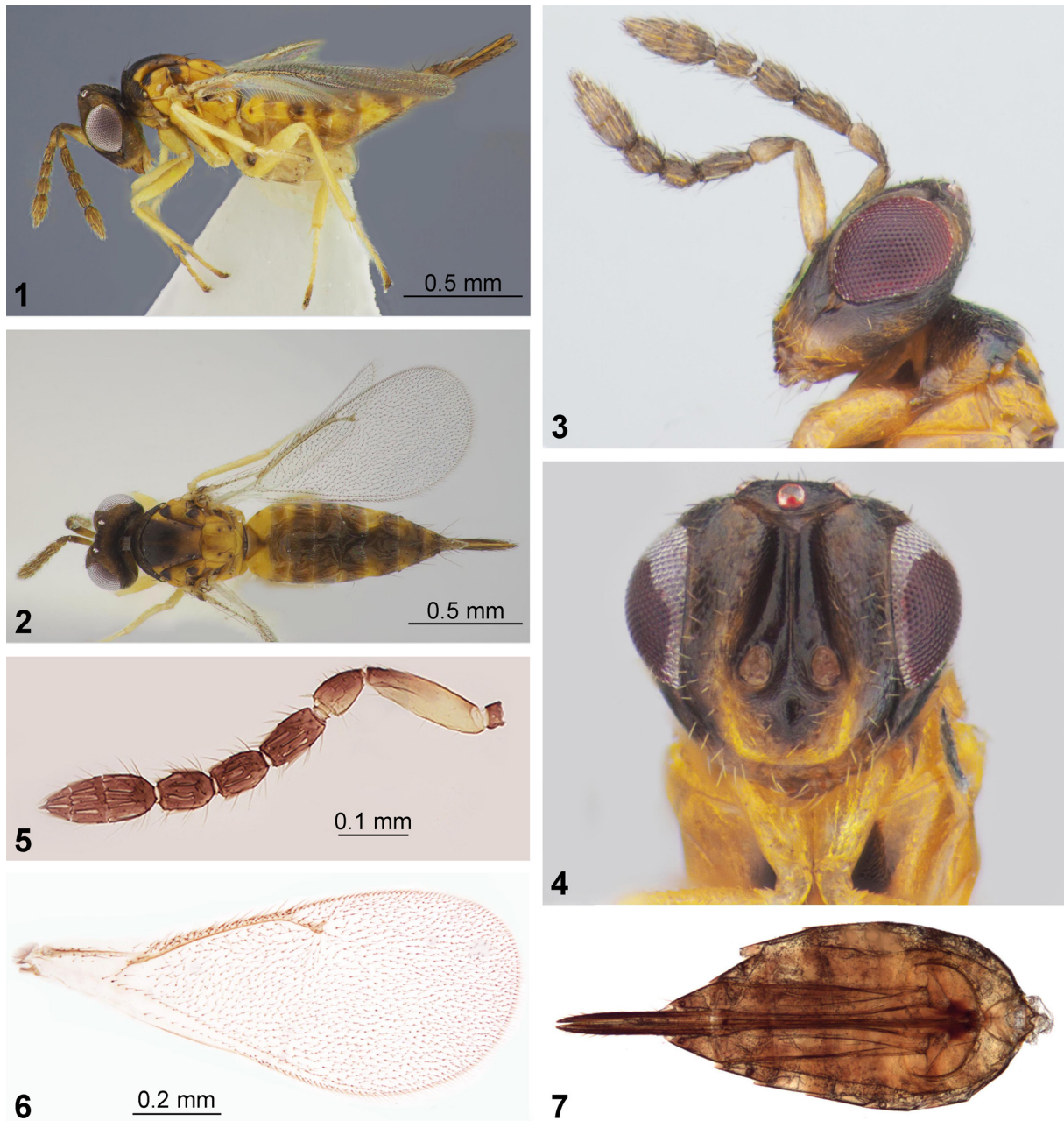
The type material of the new species is deposited in the collection of the Zoological Institute of the Russian Academy of Sciences (ZISP, St Petersburg, Russia).

Morphological terminology follows Graham [1987], Gibson [1997] and Storozheva et al. [1995]. Following abbreviations are used in the text: POL – posterior ocellar line, the shortest distance between the posterior ocelli; OOL – ocello-ocular line, the minimum distance between a posterior ocellus and compound eye margin; F1–F2 – funicular segments; C1–C3 – claval segments; M – marginal vein; ST – the length of the stigmal vein; PM – postmarginal vein. The pedicel is measured in lateral view.

The specimens examined were reared from the galls on *Rosa* sp. collected in dry steppe around Veselovka in Krasnodar Region of Russia, near the Black Sea coast. Parasitoid adults were preserved in 70% ethanol, then placed in 100% ethanol and air dried with HMDS. Specimens were examined using an Olympus SZ 60 microscope.

Photographs of parasitoid adults were taken with a Canon EOS 70D digital camera mounted on an Olympus SZX10 microscope (ZISP). Some parts of specimens were slide-mounted in Canada balsam and photographs of them were taken using a ZEISS SteREO Discovery.V12 modular stereo microscope and an AxioCam MRc5 camera (All-Russian Institute of Plant Protection, St Petersburg, Pushkin, Russia).





Figs 1–7. *Stepanovia kostjukovi* sp. n., female, general view and details of structure.

1–2 – habitus, holotype: 1 – lateral view; 2 – dorsal view; 3–4 – head: 3 – lateral view, 4 – front view; 5 – antenna; 6 – forewing; 7 – gaster. 3–7 – paratypes.

Рис. 1–7. *Stepanovia kostjukovi* sp. n., самка, общий вид и детали строения.

1–2 – габитус, голотип: 1 – вид сбоку; 2 – вид сверху; 3–4 – голова: 3 – вид сбоку, 4 – вид спереди; 5 – антенна; 6 – переднее крыло; 7 – брюшко. 3–7 – паратипы.

**Family Eulophidae Westwood, 1829**  
**Subfamily Tetrastichinae Foerster, 1856**  
**Genus *Stepanovia* Kostjukov, 2004**

*Stepanovia kostjukovi* sp. n.  
 (Figs 1–12)

**Material.** Holotype, ♀ (ZISP): Russia, Krasnodar Region, Temryuk District, Veselovka vill., dry steppe, galls on *Rosa* sp. 23–24.07.2020, parasitoid emergence 21–22.08.2020 (O.V. Kosheleva). Paratypes: 17♀, 4♂ (ZISP), 71♀, 3♂ (in ethanol, ZISP), same label as for the holotype, but parasitoids emergence 23–24.08.2020.

**Description.** Female (Figs 1–7). Body length 1.38–1.9 mm. Head 1.13–1.2 times as broad as mesoscutum, 1.18–2.25 times as broad as long; temples about 0.18–0.23 times length of eyes; POL 1.43–1.57 times OOL, OOL 1.75–2 times OD. Eye 1.78–2 times as long as broad (dorsal view), eyes separated from each other 1.18–1.27 times their height (frontal view). Malar space 0.52–0.58 times height of eye, sulcus with triangular fovea extending 0.33–0.5 times length of gena. Mouth 1.33–1.38 times malar space. Antenna with scape 0.78–0.88 times height of eye, 3.3–3.75 times as long as broad, not reaching median ocellus; pedicellus plus flagellum 1.28–1.46 times breadth of mesoscutum;

pedicellus 1.4–1.8 times as long as broad (lateral view) and 0.75–0.88 times as long as F1; funicle proximally same width as pedicellus, F1–F3 = 1.6–1.8, 1.5–1.55, 1.3–1.4 times as long as broad, respectively; clava 1.33 times broader than F3, 2.3–2.5 times as long as broad, with C1 as long as broad, C2 0.67 length of C1, C3 half length of C2, spine 0.3 length of C3.

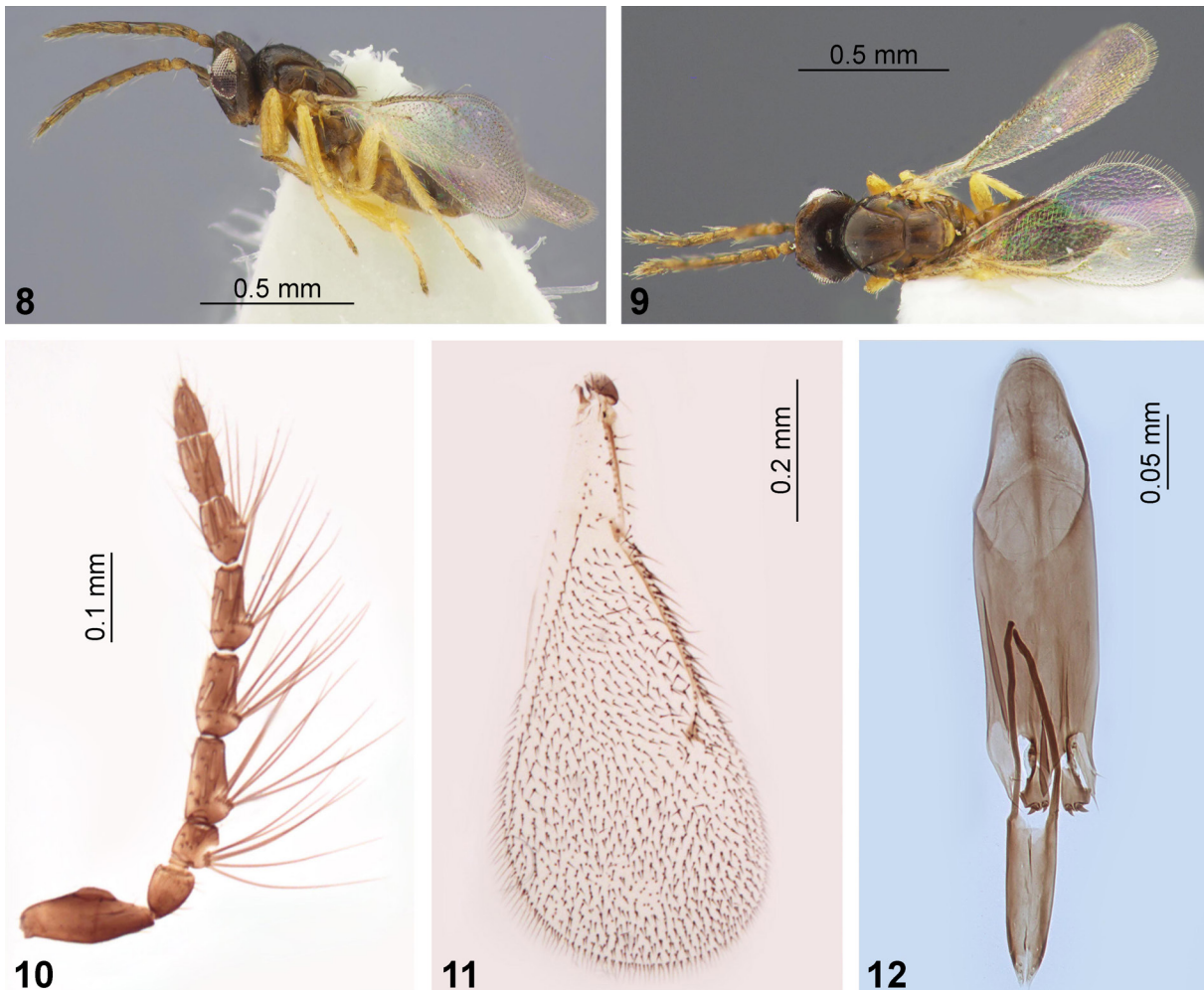
Mesosoma 1.26–1.45 times as long as broad. Pronotum 0.15–0.19 times as long as mesoscutum, with a row of setae near hind margin, they as long as scutellar setae. Mid lobe of mesoscutum 0.81–0.93 times as long as broad, not strongly convex, relatively shiny; median line absent; with 4 adnotaular setae on each side, hindmost about as long as scutellar setae. Scutellum 1.21–1.28 times as broad as long, 0.73–0.77 times as long as mesoscutum, sculptured like mesoscutum but more finely and with shorter areoles; submedian lines equidistant from each other and from sublateral lines, enclosing a space 2.7–3.2 times as long as broad; anterior and posterior setae about subequal in length, slightly greater than distance between submedian lines. Dorsellum 2.3–3 times as broad as long. Propodeum medially 0.80–1 times as long as dorsellum; median carina thin; callus with 2 setae. Legs. Hind coxae 1.77–1.83 times as long as broad; hind femora 4 times as long as broad; spur of mid tibia about as long as basitarsus. Forewing 2.34–2.44 times as long as broad; costal cell slightly shorter than M, SM with 4–5 dorsal setae; M 3.8–4 times

longer than ST; PM with distinct stub, speculum small, hardly extending M, closed below; cilia 0.33 times length of ST. Hindwing obtuse, cilia 0.29–0.36 times breadth of wing.

Metasoma. Gaster elongated, apically pointed, 2.2–2.3 times as long as mesosoma, 1.64–1.89 times as long as head plus mesosoma, 3.5–3.9 times as long as broad; last tergite 1.3–1.5 times as long as broad; ovipositor sheaths plus postcercalae 0.78–0.85 times length of hind tibia, ovipositor sheaths 1.2–2 times length of postcercalae; longest setae of each cercus 1.63–1.88 times length of next longest seta, slightly sinuate.

Colour. Body yellow or brownish, without metallic tinge. Head brownish with yellowish U-shaped pattern. Antenna with scape yellow, dorsal margin light brown; flagellum light brown to yellow. Mesosoma generally yellow, except pronotum and whole or anterior part of mesoscutum brown. Gaster yellow or brownish, with yellow to light brown transverse stripes, ovipositor sheaths dark brown. Legs pale yellow, with apices of tarsi darker. Wings hyaline with venation whitish.

Male (Figs 8–12). Body length 1.15–1.2 mm. Head 1.15–1.2 times as broad as mesoscutum, 2.24–2.39 times as broad as long; temples 0.08–0.15 times length of eyes; POL 2–2.2 times OOL, OOL 1.25–1.66 times OD. Eyes (dorsal view) 1.75–1.88 times as long as broad, separated by 1.35–1.47 times their height. Malar space 0.59–0.67 height of eye, sulcus with triangular fovea



Figs 8–12. *Stepanovia kostjukovi* sp. n., male, paratypes, general view and details of structure.

8–9 – habitus: 8 – lateral view, 9 – dorsal view; 10 – antenna; 11 – forewing; 12 – genitalia.

Рис. 8–12. *Stepanovia kostjukovi* sp. n., самец, паратипы, общий вид и детали строения.

8–9 – габитус (паратип): 8 – вид сбоку, 9 – вид сверху; 10 – антенна; 11 – переднее крыло; 12 – гениталии.

Table 1. Distinctive features of females of *Stepanovia kostjukovi* sp. n., *S. rosae* and *S. fructirosae*.  
Таблица 1. Отличительные признаки самок *Stepanovia kostjukovi* sp. n., *S. rosae* и *S. fructirosae*.

| Morphological character<br>Морфологический признак   | <i>S. rosae</i>   | <i>S. fructirosae</i>                                    | <i>S. kostjukovi</i> sp. n.                               |
|--|---|--|---|
| POL / OOL ratio<br>Отношение постоцеллярной линии к окулоцеллярной   | 1.31–1.43   | 1.31–1.44  | 1.43–1.57   |
| Pedicle length / breadth ratio (lateral view)<br>Отношение длины и ширины поворотного членика (вид сбоку)  | 1.81–1.84   | 1.8–2  | 1.4–1.8   |
| Pedicle plus flagellum / breadth of mesoscutum ratio /<br>Отношение поворотного членика и флагеллума, вместе взятых,<br>к ширине среднеспинки  | 1.18–1.29   | 1.08–1.17  | 1.28–1.46   |
| F1 length / breadth ratio<br>Отношение длины F1 к его ширине   | 2.13–2.36   | 2–2.22   | 1.6–1.8   |
| F2 length / breadth ratio<br>Отношение длины F2 к его ширине   | 1.56–1.69   | 1.72–2.22  | 1.5–1.55  |
| F3 length / breadth ratio<br>Отношение длины F3 к его ширине   | 1.3–1.53  | 1.8–2  | 1.3–1.4   |
| Clava length / breadth ratio<br>Отношение длины булавы к ее ширине   | 2.14–2.4  | 2.43–3.11  | 2.3–2.5   |
| Gaster length / breadth ratio<br>Отношение длины брюшка к его ширине   | 2.8–4   | 2.43–2.73  | 3.5–3.9   |
| Last tergite of gaster length / breadth ratio<br>Отношение длины последнего тергита брюшка к его ширине  | 1.15–1.21   | 0.98–1.15  | 1.3–1.5   |
| Ovipositor sheaths plus postcercal / length of hind tibia ratio /<br>Отношение суммарной длины ножен яйцеклада и расстояния<br>от пигостилей до вершины последнего тергита брюшка<br>к длине задней голени | 0.66–0.69   | 0.49–0.54  | 0.78–0.85   |
| Ovipositor sheaths / length of postcercal ratio /<br>Отношение длины ножен яйцеклада к расстоянию<br>от пигостилей до вершины последнего тергита брюшка  | 1–1.14  | 0.51–0.69  | 1.2–2   |
| Colour<br>Окраска  | Head and mesosoma black, gaster brownish /<br>Голова и мезосома черные, брюшко коричневатое | Body black or brownish /<br>Тело черное или коричневатое | Body yellow or brownish /<br>Тело желтое или коричневатое |

extending 0.3–0.4 length of gena. Mouth 1.1–1.36 times malar space. Antenna with scape 0.91–0.93 times height of eye, 2.33–2.6 times as long as broad, with ventral plaque 0.31–0.38 times length of scape; pedicle plus flagellum 1.95–2.03 times breadth of mesoscutum; pedicle 1.2–1.25 times as long as broad and 1.2–1.25 times as long as F1; F1 1.2–1.38 times, F2 to F4 2 times as long as broad; clava as broad as F4, as long as F3 + F4, 4.2–4.5 times as long as broad, C1 as long as C2, 1.6 and 2 times as long as broad, respectively, terminal spine 0.24 times length of C3, apical setae 3 times as long as terminal spine.

Mesosoma 1.38–1.59 times as long as broad. Pronotum 0.16–0.2 times as long as mesoscutum. Midlobe of mesoscutum 0.84–0.93 times as long as broad. Dorsellum 2.2–2.5 times as broad as long. Propodeum medially 1.2–1.25 times as long as dorsellum. Scutellum 1.21–1.33 times as broad as long, 0.63–0.71 times as long as mesoscutum. Forewing 2.16–2.22 times as long as broad; SM with 3–4 dorsal setae; M 3.57–3.84 times length of ST; cilia 0.57 times length of ST.

Metasoma. Gaster 0.97–1.12 times as long as mesosoma, 0.75–0.8 times as long as head plus mesosoma, twice as long as broad. Genitalia, see Fig. 12.

Colour. Body brownish, without metallic tinge. Antenna with scape brown; flagellum light brown to yellow. Mesosoma generally brown, except dorsellum pale yellow. Gaster brownish, basally yellowish. Legs pale yellow or hind coxae slightly darkened.

**Differential diagnosis.** The main morphological differences between *S. kostjukovi* sp. n., *S. rosae* and *S. fructirosae* are given in the Table 1.

**Distribution.** Russia (Krasnodar Region, Taman Peninsula).

**Hosts.** Unknown. Associated with gall wasps (Hymenoptera, Cynipidae) on *Rosa* sp.

**Etymology.** This species is named in honour of Viktor V. Kostjukov (Moscow, Russia), a Russian entomologist and expert on the eulophid wasps of the subfamily Tetrastichinae.

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## New and little known taxa of the genus *Calopsyra* Brunner von Wattenwyl, 1891 (Orthoptera: Tettigoniidae: Phaneropterinae) from Indo-Malayan Region

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**Abstract.** A new material on the Indo-Malayan genus *Calopsyra* Brunner von Wattenwyl, 1891 from the tribe Holochlorini is reviewed. This genus is divided into three subgenera: *Calopsyra* s. str., *Parapsyra* Carl, 1914, **stat. n.** (previously considered as a distinct genus) and *Rhodopsyra* **subgen. n.** Eight new combinations are proposed: *C. (P.) notabilis* (Carl, 1914), **comb. n.**, *C. (P.) nigrovittata* (Xia et Liu, 1992), **comb. n.**, *C. (P.) midcarina* (Liu et Kang, 2006), **comb. n.**, *C. (P.) nigrocornis* (Liu et Kang, 2006), **comb. n.**, *C. (P.) fuscomarginalis* (Liu et Kang, 2006), **comb. n.**, *C. (P.) brevicauda* (Liu, 2011), **comb. n.**, *C. (Rh.) muricetincta* (Karny, 1926), **comb. n.**, *C. (Rh.) laticauda* (Karny, 1926), **comb. n.** Two new species from Borneo and Sumatra are described: *C. (C.) sexmaculata* **sp. n.** and *C. (Rh.) rosealata* **sp. n.** The neotype for *C. (C.) octomaculata* (Westwood, 1848) is designated, and this species is redescribed in accordance with new data.

**Key words:** Orthoptera, Tettigoniidae, Phaneropterinae, *Calopsyra*, new species, Indo-Malayan Region.

### Новые и малоизвестные таксоны рода *Calopsyra* Brunner von Wattenwyl, 1891 (Orthoptera: Tettigoniidae: Phaneropterinae) из Индо-Малайской области

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**Резюме.** Рассмотрен новый материал по индо-малайскому роду *Calopsyra* Brunner von Wattenwyl, 1891 из трибы Holochlorini. Этот род подразделен на три подрода: *Calopsyra* s. str., *Parapsyra* Carl, 1914, **stat. n.** (ранее считавшийся самостоятельным родом) и *Rhodopsyra* **subgen. n.** Предложено восемь новых комбинаций: *C. (P.) notabilis* (Carl, 1914), **comb. n.**, *C. (P.) nigrovittata* (Xia et Liu, 1992), **comb. n.**, *C. (P.) midcarina* (Liu et Kang, 2006), **comb. n.**, *C. (P.) nigrocornis* (Liu et Kang, 2006), **comb. n.**, *C. (P.) fuscomarginalis* (Liu et Kang, 2006), **comb. n.**, *C. (P.) brevicauda* (Liu, 2011), **comb. n.**; *C. (Rh.) muricetincta* (Karny, 1926), **comb. n.**, *C. (Rh.) laticauda* (Karny, 1926), **comb. n.** Из Борнео и Суматры описаны два новых вида: *C. (C.) sexmaculata* **sp. n.** и *C. (Rh.) rosealata* **sp. n.** Обозначен неотип для *C. (C.) octomaculata* (Westwood, 1848), и этот вид переописан с учетом новых данных.

**Ключевые слова:** Orthoptera, Tettigoniidae, Phaneropterinae, *Calopsyra*, новые виды, Индо-Малайская область.

## Introduction

The generic composition of the Indo-Malayan tribe Holochlorini is now in need of revision, because some of its genera are very similar and probably closely related, and they are often impossible for any understandable separation, or this separation is based on very insufficient differences. Moreover, some species included in these genera are strongly different from other congeners and must be transferred in other genera (or subgenera as a minimum).

The considered here taxa *Calopsyra* Brunner von Wattenwyl, 1891 and *Parapsyra* Carl, 1914 are an example of such difficulties, because they are distinguished from each other by almost only the structure of RS in the tegmina [Carl, 1914], but the biramous proximal branch of RS (characteristic of *Parapsyra*) is a primitive character which may be very quickly lost when tegmina is lengthened or thinned (such process had place in some species closely related to the type species of *Calopsyra*). Thus, this character is insufficient for dividing these

taxa into two genera, but more corresponding to the subgeneric level. In addition, the former genus *Parapsyra* included two species (*P. muricetincta* Karny, 1926 and *P. laticauda* Karny, 1926) is very different from the type species of this taxon and of *Calopsyra* in the structure of their ovipositors and some other characters [Karny, 1926a; Cigliano et al., 2023]. Their differences from these type species show that they probably belong to a new genus, but their males are unknown, and therefore the description of a new genus for them may be premature. This is the reason why I assign them only to a new subgenus of *Calopsyra* s. l.

## Material and methods

The study is based on the material (including types of new taxa) deposited at the Zoological Institute of the Russian Academy of Sciences (ZIN, Saint Petersburg, Russia). This material is dry and pinned; it was collected by the Russian researchers in some countries of the Indo-Malayan Region.



**Tribe Holochlorini Brunner von Wattenwyl, 1878**  
**Genus *Calopsyra* Brunner von Wattenwyl, 1891**

**Note.** This genus was originally established for one variegated species from Sumatra [Brunner von Wattenwyl, 1878: *Phylloptera octomaculata* Westwood, 1848]. Later, one species of this genus was described as a unique representative of a new genus from Vietnam [Carl, 1914: *Parapsyra notabilis*], two additional species from Malay Peninsula were described in *Parapsyra* [Karny, 1926a: *P. muricetincta* and *P. laticauda*], and one uniformly coloured species from Malay Peninsula was moved to the genus *Calopsyra* [Karny, 1926b: *Psyra oblitterata* Karny, 1923]. Now a few species from South China as well as two new species from Borneo and Sumatra are added to this genus, and *Calopsyra* s. l. is divided into three subgenera characterized in a key below. Thus, the following new combinations are established: *Calopsyra (Parapsyra) notabilis* (Carl, 1914), **comb. n.**, *C. (P.) nigrovittata* (Xia et Liu, 1992), **comb. n.**, *C. (P.) midcarina* (Liu et Kang, 2006), **comb. n.**, *C. (P.) nigrocornis* (Liu et Kang, 2006), **comb. n.**, *C. (P.) fuscomarginalis* (Liu et Kang, 2006), **comb. n.**, *C. (P.) brevicauda* (Liu, 2011), **comb. n.**, *C. (Rhodopsyra) muricetincta* (Karny, 1926), **comb. n.**, *C. (Rh.) laticauda* (Karny, 1926), **comb. n.**

**Subgeneric key for *Calopsyra* s. l.**

1. Pronotal disc dark (Fig. 2) or with darkened stripes along lateral edges (Figs 5, 6); hind wings with transparent membranes usually having yellowish tinge (Figs 1, 4). Ovipositor moderately long and rather strongly curved upwards, with numerous and rather large denticles located along dorsal and ventral edges as well as on both lateral surfaces (Fig. 17) ..... 2
- Pronotal disc yellowish or greenish, uniformly coloured (Fig. 19) or with lighter lateral stripes on disc; hind wings usually with numerous rose or reddish membranes (Fig. 18). Ovipositor very long and slightly curved upwards, with distinct and very small denticles along distal part of ventral edge (lateral surfaces and dorsal edge of ovipositor non-denticulated and almost non-denticulated, respectively; Fig. 20) ..... subgenus *Rhodopsyra* **subgen. n.**  
 (Etymology: from the generic name *Calopsyra* and the Latinized Greek prefix “rhodo-” – rose. Composition, in original binomen: type species *Calopsyra (Rhodopsyra) roseolata* **sp. n.**, *Parapsyra muricetincta* Karny, 1926, *P. laticauda* Karny, 1926)
2. Tegmina with all branches of RS branching from RA (Figs 1, 4); styles of male genital plate usually long (such styles 2–2.5 times as long as width of genital plate very near their bases; Figs 11, 15); female genital plate with rather deep posteromedian notch (Fig. 16) .. subgenus *Calopsyra* s. str.  
 (Composition, in original binomen: type species *Phylloptera octomaculata* Westwood, 1848, *Calopsyra (Calopsyra) sexmaculata* **sp. n.**, possibly *Psyra oblitterata* Karny, 1923)
- Tegmina with two proximal branches of RS branching from general basal part (other branches of RS

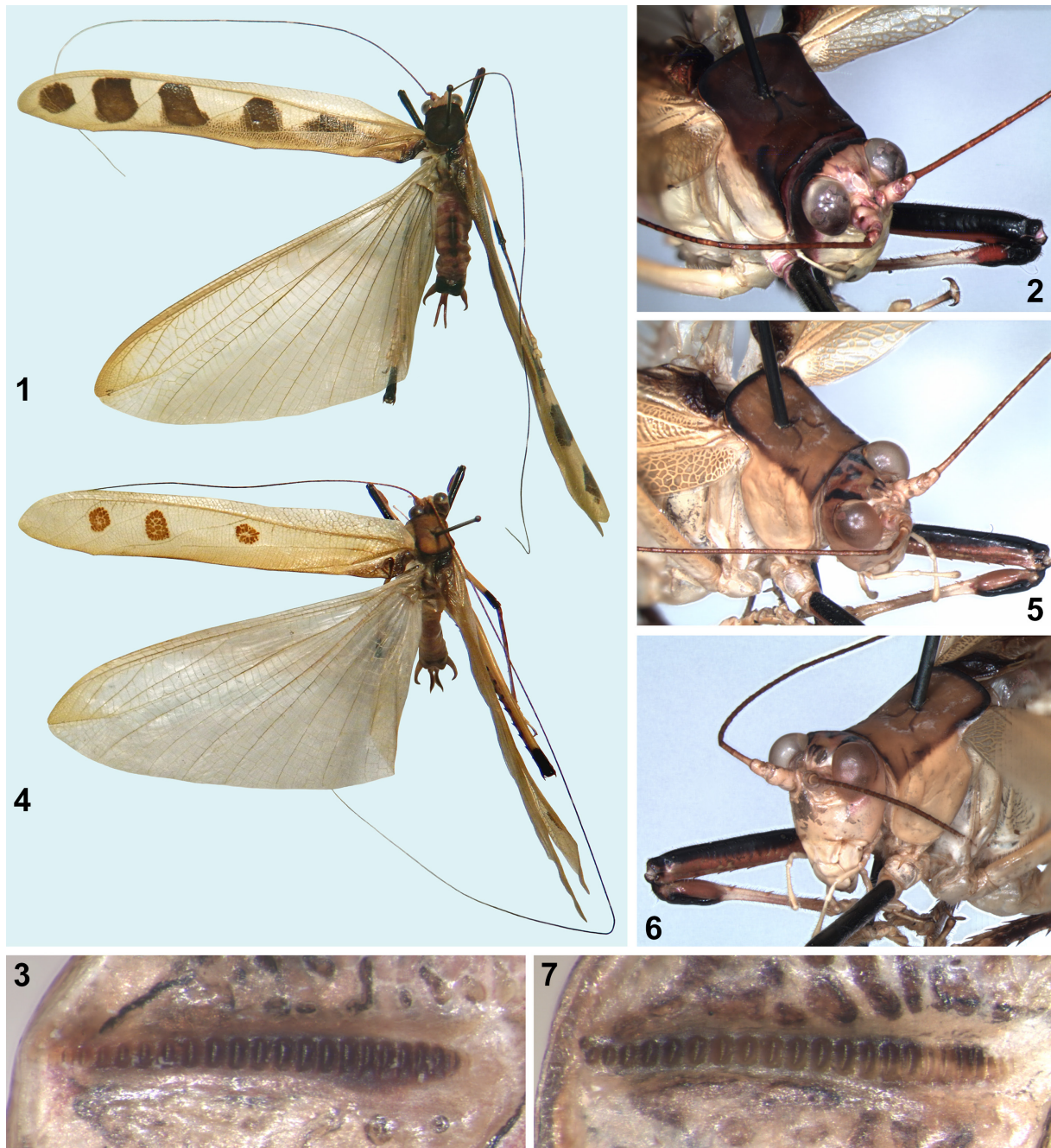
branching from RA; as in Fig. 18); styles of male genital plate short (lengths of these styles more or less equal to width of genital plate very near their bases); female genital plate with rounded, truncated or angular apical part lacking any posteromedian notch ..... subgenus *Parapsyra* Carl, 1914, **stat. n.**  
 (Composition, in original binomen: type species *Parapsyra notabilis* Carl, 1914, *P. nigrovittata* Xia et Liu, 1992, *P. midcarina* Liu et Kang, 2006, *P. nigrocornis* Liu et Kang, 2006, *P. fuscomarginalis* Liu et Kang, 2006, *P. brevicauda* Liu, 2011)

*Calopsyra (Calopsyra) octomaculata* (Westwood, 1848)  
 (Figs 1–3, 8–11)

**Material.** 1♂, neotype (here designated) (ZIN), Indonesia, Sumatra I., Aceh Prov. not far from border with North Sumatra Prov., environs of Ketambe vill. on Alas River near Gunung Leuser National Park, 3°41–42'N / 97°38–39'E, 300–500 m, 29.01–8.02.2023 (A. Gorochov, M. Omelko, A. Fomitchev); 1♂ (ZIN), same data as for neotype.

**Redescription.** Male (neotype). Body rather large and moderately slender. Colouration variegated (Fig. 1): head yellowish with blackish transverse band behind eyes (this band running along posterior edges of genae to subgenae, gradually narrowing under eyes and with dark brownish rose anterior border between eyes and subgenae), a few light brown small and poorly distinct marks on rest of epicranial dorsum, rose tinge on dorsal half of antennal cavity as well as on scape and pedicel (scape also with distinct brown dot at middle of dorsal surface), light brown to brown proximal part of antennal flagellum and dark brown to blackish rest of this flagellum (but flagellum additionally with small and very sparse yellowish to whitish spots; Figs 1, 2); pronotum yellowish with dark brown disc and a few blackish marks (line along anterior edge of pronotum, stripe along posterior edge of disc, a pair of small marks at middle of disc and oblique areas on anterodorsal parts of lateral lobes contacting with dark disc; Fig. 2); tegmina yellowish (greenish in living condition) with 4–5 large dark brown spots in lateral field (left tegmen with 5 spots, but right one with 4 spots: 2 proximal spots fused with each other), numerous brown dots in cells around MA vein, as well as light brown, brownish rose, dark brown and blackish marks in dorsal fields (Figs 1, 3, 8, 9); hind wings transparent with yellowish venation and some membranes in costal and apical parts as well as yellowish tinge of rest membranes (Fig. 1); legs yellowish with rose fore trochanter, brown fore femur (this femur also with blackish dorsal and apical areas as well as a few small marks at base of ventromedial spinules), dark brown to blackish distal portions of middle and hind femora as well as proximal third of fore tibia (Fig. 2), rose distal third of this tibia, brown to light brown dorsal longitudinal stripe on middle tibia as well as distal areas and ventral spines of this tibia, dark brown to blackish hind tibia having numerous reddish brown transverse bands and spots, and with a few small darkened marks on apical segment of all tarsi; rest of body yellowish with rose tinge on dorsum of pterothorax, rose to light brown most part of abdominal tergites (but last tergite blackish, and almost each of other abdominal tergites with brown dorsal spot or area), dark brown epiproct and paraprocts as well as bases of cerci and small lateral areas of genital plate, brownish rose rest of cerci (but its apices more darkened), and rose rest of genital plate (including styles; Figs 10, 11) and areas on abdominal sternites.

Head typical of Phaneropterinae, rather high and with following features: antennal cavities practically contacting with each other; upper rostral tubercle located above and behind place of this contact as well as having small rounded apical tubercle and somewhat higher rest part (this part with dorsal edge slightly arcuate in profile, with distinct longitudinal median groove



Figs 1–7. *Calopsyra (Calopsyra)*, males, general view and details of structure.

1–3 – *C. (C.) octomaculata*, neotype; 4–7 – *C. (C.) sexmaculata* sp. n.: 4, 7 – holotype, 5–6 – paratype. 1, 4 – general view of body with spread left wings; 2, 5–6 – head with pronotum and fore leg, dorsolateral and partly anterior view; 3, 7 – stridulatory vein of left tegmen from below.

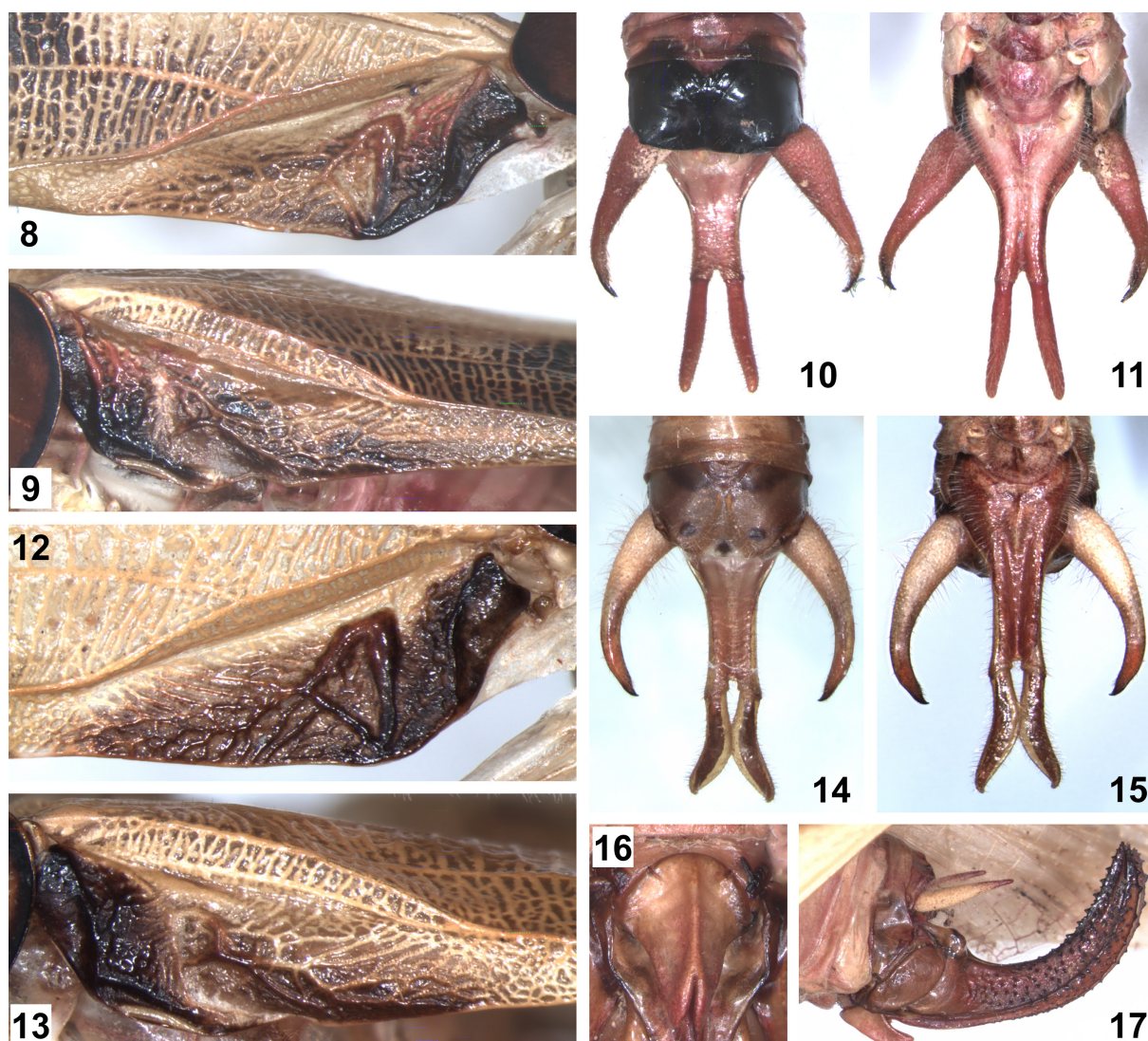
Рис. 1–7. *Calopsyra (Calopsyra)*, самцы, общий вид и детали строения.

1–3 – *C. (C.) octomaculata*, неотип; 4–7 – *C. (C.) sexmaculata* sp. n.: 4, 7 – голотип, 5–6 – паратип. 1, 4 – общий вид тела с расправленными левыми крыльями; 2, 5–6 – голова с переднеспинкой и передней ногой, вид сверху/сбоку и частично спереди; 3, 7 – стридуляционная жилка левого надкрыля снизу.

dorsally and with rather large oval lateral ocelli located laterally and almost vertically); lower rostral tubercle rather low, narrow and located between anterior keels of antennal cavities but slightly before place of contact of these cavities (Fig. 2). Pronotum rather high and short, with almost straight anterior edge of disc, clearly concave anterior edge of each lateral lobe, strongly convex ventral edge of this lobe (this edge separated from latter edge by short and almost angular projection), oblique ventral portion of posterior

edge of this lobe, roundly angular dorsal portion of this edge having also distinct and widely rounded humeral notch above, and with rather wide and moderately long hind lobe of disc having almost truncated posterior part as well as rounded posterolateral corners (Figs 1, 2). Tegmina long and narrow, significantly protruding beyond apices of hind femora, with 4 branches of RS branching from RA (proximal branch of RS distally fused with MA), with apical part narrowly rounded, and with stridulatory apparatus





Figs 8–17. *Calopsyra* (*Calopsyra*), details of structure.  
8–11 – *C. (C.) octomaculata*, neotype; 12–17 – *C. (C.) sexmaculata* sp. n.: 12–15 – holotype, 16–17 – paratype. 8–9, 12–13 – stridulatory apparatus in dorsal fields of male tegmina from above; 8, 12 – in left, 9, 13 – in right; 10–11, 14–15 – male abdominal apex: 10, 14 – from above, 11, 15 – from below; 16 – female genital plate from below; 17 – ovipositor and genital plate of female from side.

Рис. 8–17. *Calopsyra* (*Calopsyra*), детали строения.

8–11 – *C. (C.) octomaculata*, неотип; 12–17 – *C. (C.) sexmaculata* sp. n.: 12–15 – голотип, 16–17 – паратип. 8–9, 12–13 – стридуляционный аппарат в дорсальных полях надкрылий самца сверху; 8, 12 – в левом, 9, 13 – в правом; 10–11, 14–15 – вершина брюшка самца: 10, 14 – сверху, 11, 15 – снизу; 16 – генитальная пластинка самки снизу; 17 – яйцеклад и генитальная пластинка самки сбоку.

as in Figs 3, 8, 9; hind wings insignificantly protruding beyond tegminal apices (Fig. 1). Legs rather thin and moderately long, with following characters: fore coxa with distinct spine; proximal part of fore tibia somewhat widened, having large open outer tympanum and almost slit-like but practically not inflated inner tympanum (Fig. 2); hind femur with slightly widened proximal half; a few small spinules developed on ventromedial edge of fore femur and ventrolateral edge of middle femur as well as on both ventral edges of hind femur; 2 such spinules located on dorsolateral edge of fore tibia; a pair of similar dorsoapical spinules located on middle tibia; numerous and slightly larger spinules developed on all (4) edges of hind tibia. Abdomen with all tergites simple, but last tergite with rather short and roundly angular posteromedian projection curved downwards and having longitudinal median concavity; epiproct and paraprocts also simple, roundly triangular (almost not elongate), but paraprocts smaller than epiproct which directed

downwards/forwards; cerci with wide and very short bases as well as elongately conical rest parts having rather thin and arcuate distal portions (apices of these portions acute and directed somewhat medially; Figs 10, 11); genital plate with wide proximal half and narrow distal one having small posteromedian notch and a pair of very long stick-like styles (Fig. 11); genitalia membranous.

Variations. Second male with pronotal disc barely lighter (brown), 5 dark spots on each lateral tegminal field, hind tibia with dark parts distinctly larger than lighter parts, epiproct brownish rose with dark brown median stripe dorsally, and posteromedian notch of genital plate (between bases for styles) barely deeper.

Female unknown (but see notes below).

Length (in mm). Body 21–22; body with wings 53–55; pronotum 5.3–5.7; tegmina 46–48; hind femora 26–27.

**Notes.** This species was very briefly described from a female collected in “Sumatra” [Westwood, 1848]. However,



there are more than one species with a very similar appearance but different some male sexual characters including the characteristic shape of the male genital plate styles (see the description of a new species from Borneo below; Figs 10, 11, 14, 15). Moreover, the males from Sumatra described above have the same shape of these styles as the unique male from Borneo deposited in the Natural History Museum (London, UK) and identified as *C. octomaculata* [Natural History Museum, 2018]; thus, they may belong to the same widely distributed species sympatric to a new species from Borneo. So, we also cannot be sure that the new species is absent in Sumatra. In this connection, it is impossible to attribute Westwood's description to any of these species, because this description is insufficient and contains mainly data about tegminal spots (Westwood wrote about 8 spots on both tegmina, but the above-mentioned Sumatran specimens have 9–10 such spots, the London's specimen has 12 spots, and the new species has 6 spots), and the type material on *C. octomaculata* is not preserved [Natural History Museum, 2018; Cigliano et al., 2023]. It is a reason that here I designate one of my Sumatran males (see above) as a neotype of this species ("*Phylloptera 8-maculata*" in the original variant).

*Calopsyra (Calopsyra) sexmaculata* Gorochov, **sp. n.**  
(Figs 4–7, 12–17)

**Material.** Holotype, ♂ (ZIN): Malaysia, Borneo I., Sabah State, Trus Madi Mt, ~1000 m, primary/secondary forest, at light, 13–25.05.2007 (A. Gorochov). Paratypes: 1♂, 1♀ (ZIN), same data as for holotype; 1♂ (ZIN), same locality, but 13–24.01.2007 (A. Sotshivko).

**Description.** Male (holotype). General appearance similar to that of neotype of *C. octomaculata*, but body slightly smaller, and colouration with following differences (Fig. 4): head also yellowish but with light brown epicranial dorsum having a pair of small brown marks on dorsal part of posterior half of upper rostral tubercle and 3 dark brown longitudinal stripes between posterior parts of eyes and behind them, as well as with light brown proximal part of antennal flagellum and brown to dark brown rest of this flagellum (this flagellum additionally with light spots as in *C. octomaculata*); pronotum with light brown disc having anterior edge dark brown, a pair of stripes along lateral edges (but before hind lobe) brown, lateral and posterior edges of hind lobe blackish, and stripe along latter edges brown to dark brown, but lateral pronotal lobes completely yellowish (as in Figs 5, 6); wings of same colour as in *C. octomaculata*, but tegmina with only 3 (not 4 or 5) darkened spots in each lateral field (these spots brown and clearly smaller than in this species; compare Figs 1 and 4), and widened parts of dorsal tegminal fields with darkened structures as in Figs 12, 13; legs with lighter (almost yellowish) distal parts of fore and middle tibiae as well as smaller dark (dark brown to blackish) spots on hind tibia which clearly smaller than rose to light brown spots of this tibia (shape of these spots more or less similar to that of *C. octomaculata*); rest of body yellowish with rose tinge on majority of abdominal tergites and sternites, almost completely brownish rose genital plate, light brown apical (last) tergite and lower parts of subapical tergite as well as median part of epiproct and distal parts of cerci (but apical tergite also with brown anterodorsal spot and 3 dots along posterior edge; Figs 14, 15). Structure of body almost identical to that of *C. octomaculata*, but: tegmina with all 4 branches of RS free, and with stridulatory apparatus as in Figs 7, 12, 13; cerci slightly arcuate in all parts (vs straight but with arcuate distal parts; see Figs 10, 14); narrowed part of genital plate slightly longer, and styles of this plate distinctly widened in middle parts and with distal halves curved somewhat laterally (for comparison see Figs 11, 15).

Variations. Other males with median dark stripe on epicranial dorsum divided into 2 spots (Fig. 5), or all 3 dark stripes on this dorsum partly fused with each other; hind lobe of pronotal disc sometimes completely dark brown and with greenish tinge; light parts of coxae and femora sometimes greenish; light parts of fore and middle tibiae sometimes partly rose (Figs 5, 6); hind tibia often with dark spots somewhat larger than lighter ones; brown anterodorsal spot on last tergite sometimes divided into a pair of spots; epiproct often with darker (brown) median part.

Female. Colouration and structure of body very similar to those of holotype, but dark median stripe on epicranial dorsum wider, dorsal tegminal field uniformly yellowish (greenish in living condition) but with small brown mark at base, last tergite and epiproct rose to light brown (without darker marks), genital plate light brown, and ovipositor brown with dark brown apical part and denticles of rest part (Figs 16, 17), venation of dorsal tegminal fields irregularly and densely reticular but with one longitudinal vein near (along) anal edge of widened part of this field, last tergite smaller and with small posteromedian concavity (instead short posteromedian lobe), cerci shorter and straighter as well as somewhat thinner and almost fusiform (their apices not acute), and last abdominal sternite distinctly wider than other abdominal sternites. Genital plate rather small and narrow, with keel-like median longitudinal bend, short and rounded anterior projection, moderately deep and very narrow posteromedian notch as well as angular lobules around it (latter lobules located in subvertical planes and almost pressed to each other; Figs 16, 17); ovipositor rather long and not very wide (not very high), moderately curved upwards and with numerous distinct (strong) denticles along dorsal and ventral edges as well as on both lateral surfaces (Fig. 17).

Length (in mm). Body: males 21–28, female 26; body with wings: males 50–52, female 58; pronotum: males 5–5.5, female 6; tegmina: males 41.5–43, female 48; hind femora: males 24.5–25.5, female 27; ovipositor 12.5.

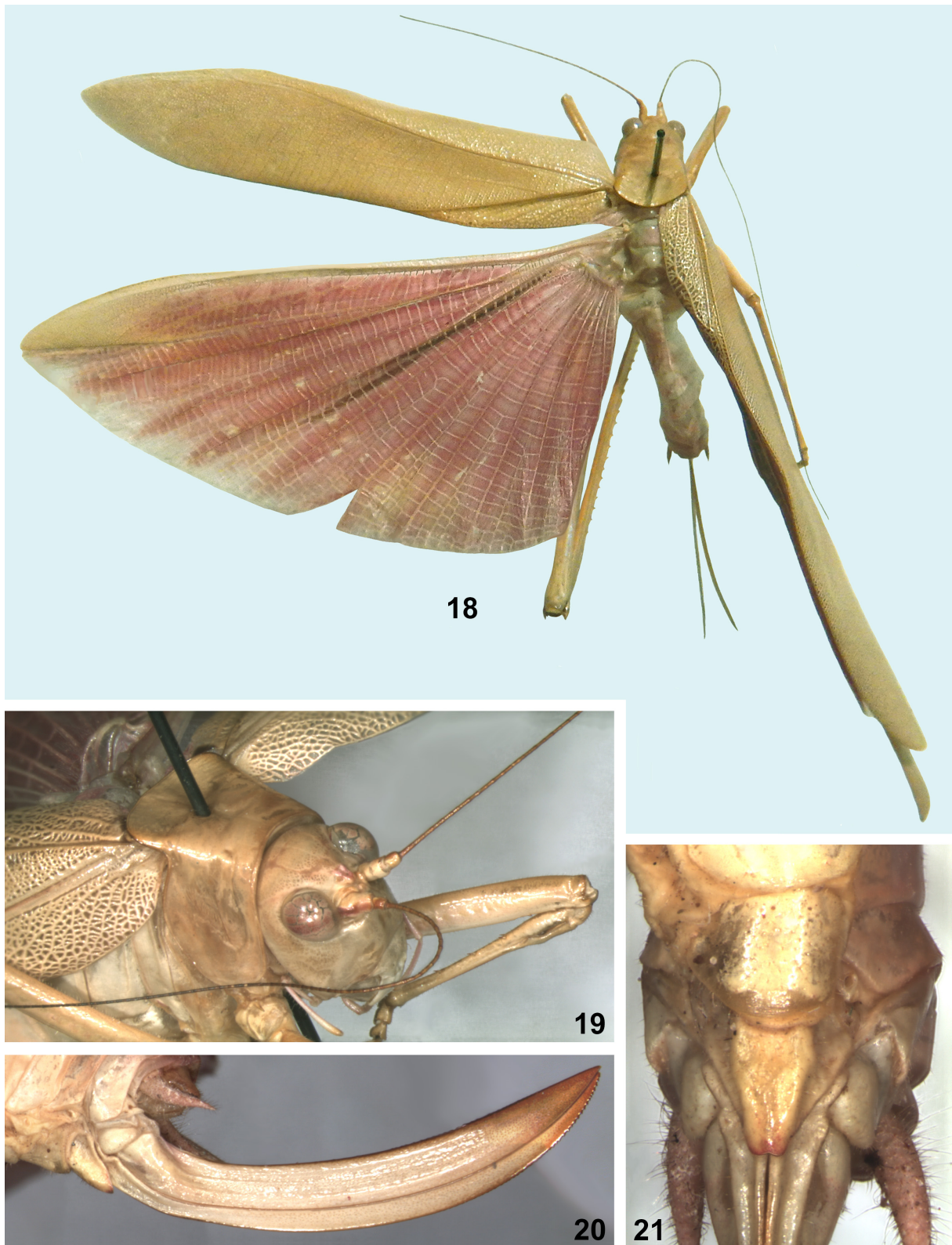
**Comparison.** The differences between the new species and *C. (C.) octomaculata* are given in the description of *C. (C.) sexmaculata* **sp. n.**; the most distinct of these are the absence of any darkenings on the pronotal lateral lobes and a different shape of the male genital plate styles (compare Figs 10, 11 and 14, 15). From *C. (? C.) obliterated*, the third possible species of this genus described from Malay Peninsula, the new species is distinguished by a more variegated body colouration including the presence of darkened spots on the tegminal lateral fields (the body colouration in *C. obliterated* is more uniformly greenish, without darkened spots on these fields), and by much larger styles of the male genital plate.

**Etymology.** This species name consists of the Latin words "sex" (six) and "maculata" (spotted) due to the characteristic tegminal colouration.

*Calopsyra (Rhodopsyra) roseolata* Gorochov, **sp. n.**  
(Figs 18–21)

**Material.** Holotype, ♀ (ZIN): Indonesia, Sumatra I., Lampung Prov., 15–20 km NE of Krui Town, Bukit Barisan Selatan National Park, Kubu Prah Camp, 5°4.341'S / 104°3.093' E, ~600 m, primary forest, at light, 18–19.04.2009 (A. Gorochov, M. Berezin, E. Tkatsheva).

**Description.** Female (holotype). Body size moderately large. Colouration more or less uniformly yellowish (light greenish in living condition), but upper rostral tubercle and maxillary palpi mostly rose, scape with reddish rose lobitudinal band on dorsal surface, dorsal part of pedicel and proximal part of antennal flagellum light brown with rose tinge, rest of this flagellum brown to dark brown (Fig. 19), dorsum of metathorax and abdominal tergites with rose tinge, tegmina with very small brown spot at base of each dorsal field and small rose membrane between this



Figs 18–21. *Calopsyra (Rhodopsyra) roseoalata* sp. n., female, holotype, general view and details of structure.  
 18 – general view of body with spread left wings; 19 – head with pronotum and fore leg, dorsolateral and partly anterior view; 20 – ovipositor and genital plate from side; 21 – genital plate with last sternite from below.

Рис. 18–21. *Calopsyra (Rhodopsyra) roseoalata* sp. n., самка, голотип, общий вид и детали строения.  
 18 – общий вид тела с расправленными левыми крыльями; 19 – голова с переднеспинкой и передней ногой, вид сверху/сбоку и частично спереди; 20 – яйцеклад и генитальная пластинка сбоку; 21 – генитальная пластинка и последний стернит снизу.



field and mesothorax, hind wings intensively rose with yellowish to greyish venation and whitish or transparent membranes along costal edge as well as in distal part of costal lobe (extremely narrow transparent or whitish stripes developed also on rose membranes along both edges of crossveins, but some membranes between 1A and 2A brownish grey or partly brownish grey; Fig. 18), legs with small light brown marks at apex of hind femur and on apical parts of spines in hind tibia as well as a few very small brown to dark brown marks on all tarsi, and ovipositor with light brown apical part (Fig. 20). Head relatively larger than in *Calopsyra* s. str. and with following features: interspace between antennal cavities very narrow; upper and lower rostral tubercles less separated from each other than in this subgenus; apices of these tubercles slightly wider; apical denticle of upper rostral tubercle dorsally almost flattened; more posterior part of this tubercle shorter and with shorter dorsomedian groove; lateral ocelli somewhat smaller (Fig. 19). Pronotum with disc separated from lateral lobes by less rounded (in transverse section) bends, with lateral lobes higher in lower halves and having less deep (almost rectangular) humeral notches, with anterior edge concave in dorsal part and almost straight in lateral parts, as well as with distinctly convex posterior edge (Figs 18, 19); tegmina long and moderately narrow, with dorsal fields and apical parts of lateral fields similar to those of female of *Calopsyra* s. str., but with 2–3 slightly oblique longitudinal veins in widened part of dorsal field as well as with proximal branch of RS biramous and not fused with MA (two more distal branches of RS branching from RA; Fig. 18); hind wings distinctly (but not strongly) protruding beyond tegminal apices (Fig. 18); legs with fore and middle femora lacking spinules (only ventral inner edge of fore femur with one very small ventral inner spinule), but tympana and armament of hind femur and of all tibiae more or less similar to those of *Calopsyra* s. str.; last tergite simple (without any lobes or other specializations); epiproct lobe-like and more or less rounded distally; paraprocts somewhat smaller than epiproct and roundly triangular; last sternite also unspecialized; genital plate not large, more or less triangular but with partly vertical lateral sides and very small apical notch (Fig. 21); ovipositor very long, slightly curved upwards, in profile barely widening from basal part to middle one and then gradually narrowing to acute apex (dorsal edge of ovipositor with traces of numerous and very small denticles, but its ventral edge with more distinct such denticles in distal part; Fig. 20).

Male unknown.

Length (in mm). Body 27; body with wings 57; pronotum 5.9; tegmina 44; hind femora 29; ovipositor 16.5.

**Comparison.** *Calopsyra* (*Rh.*) *roseolata* sp. n. is very similar to *C. (Rh.) muricetincta* comb. n. from Malay Peninsula and may be only its Sumatran subspecies, but this question cannot be decided until the discovery of unknown males of these species. The new species differs

from this congener in the absence of light stripes and their traces on the pronotal disc, the presence of a small notch at the apex of the female genital plate (vs this plate has a clearly rounded apex, judging by a picture in the original description) [Karny, 1926a: fig. 19], and the ovipositor shorter (in *C. muricetincta*, the hind femur is 1.55 times as long as the ovipositor, but in *C. roseolata* sp. n., this ratio is about 1.75). The new species is also similar to *C. (Rh.) laticauda* comb. n. described from the same peninsula and having the female genital plate also with a posteromedian notch, but it is distinguished from the latter species by the ovipositor distinctly less high [Karny, 1926a: fig. 20].

**Etymology.** This species name consists of the Latin word “alata” (winged) and the Latin prefix “roseo-” (rose) due to the characteristic colouration of the hind wings.

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## History of Collembola research in Belarus with checklist

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**Abstract.** A comprehensive overview of the history of Collembola research and an annotated checklist of species in Belarus is presented. The class Collembola belongs to one of the least studied groups of invertebrates. At present, 113 species (4 orders and 15 families) have been identified in Belarus according to literary sources, eight of which require confirmation, 11 taxa were not identified to species. Furthermore, at least 125 additional springtail species can potentially be identified.

**Key words:** springtails, fauna, research history, checklist, Belarus.

### История исследования Collembola в Беларуси со списком видов

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**Резюме.** Приведены сведения об истории изучения ногохвосток и аннотированный список видов Беларуси. Класс Collembola относится к одной из самых малоизученных групп беспозвоночных. В настоящее время по литературным источникам в Беларуси констатировано 113 видов (из 4 отрядов и 15 семейств), для восьми из них требуется подтверждение, 11 таксонов не определены до вида. Потенциально возможно выявление еще более чем 125 видов ногохвосток.

**Ключевые слова:** ногохвостки, фауна, история изучения, список видов, Беларусь.

### History of the study

Collembola belongs to one of the least studied groups of invertebrates in the Republic of Belarus [Khot'ko et al., 1982; Buřmachiu, 2010]. According to some researchers, the springtail fauna consists of only 15 species [Burko, Lopatin, 2001; Lopatin, 2004]. In subsequent articles, 61 species of springtails were identified in Belarus [Buřmachiu, 2010; Borodin, 2013; Ryzhaya, 2014]. The purpose of this work is to analyze scientific publications to study the history of research of the springtail fauna structure in Belarus and to determine the prospects for further investigation.

The water springtail *Podura aquatica* Linnaeus, 1758 was firstly recorded for Belarus by Solovyov [1926] in a sample of water from Horki (Mogilev Region). The first significant records about the springtail fauna of Belarus were made in 1947 in the works of Jan W. Stach. The records were based on the samples collected on the territory of present-day Brest Region by M. Znamierowska in 1924 [Stach, 1960], by K. Traaczewski in 1929 and 1932 [Stach, 1947, 1949a, 1951, 1954, 1956, 1957, 1960, 1963], and by F. Krasnodębski in 1936 [Stach, 1947], on the samples collected on the territory of present-day Grodno Region by J. Průffer in 1922 and 1930 [Stach, 1960] and by Prof. Federowicz in 1926 [Stach, 1956], as well as on the samples collected by S. Feliksiak in 1924, 1929–1932 on the territory of present-day Brest and Grodno regions [Stach, 1947, 1949a, 1949b (?)] (the record does not allow

to determine whether the material was collected from the Belarusian or Polish part of Belovezhskaya Pushcha), 1951, 1957].

Stach's papers provide an accurate annotated information about springtails supplemented with georeferences and some comments on the biological and ecological features of the identified species. Thus, an interesting discovery was made by F. Krasnodębski in Pinsk on the Pina River at a temperature of –22 °C on 25 January 1936 at 1:00 p.m. He discovered a group of *Isotoma viridis* (Bourlet, 1839) crawling on snow and ice [Stach, 1947]. Stach recorded 41 species from nine families and three orders found on the territory of Belarus for the first time. A number of springtail records from the works of J.W. Stach were also mentioned in the works of Grinbergs [1960] and Martynova [1964a, b].

There are other faunistic works that also contain the Collembola records on the territory of Belarus. Kipenvarlits [1961] discovered four species: *Entomobrya marginata* Tullberg, 1871, *Ceratophysella armata* Nicolet, 1842, *Onychiurus fimetarius* Linnaeus, 1758, *Stenaphorura quadrispina* Börner, 1901 (from four families and two orders). Radzymovsky and Polishchuk [1970] recorded in Belarus *Proisotoma ripicola* Linnaniemi, 1912.

Further studies were continued by Nataliya A. Kuznetsova. Together with co-authors she provided information on springtails of Vitebsk Region [Kuznetsova, 1984, 1988, 2002; Sterzyńska, Kuznetsova, 1995; Chernov et

al., 2010]. In general, N.A. Kuznetsova recorded 46 species (from 11 families and four orders) for the Belarusian fauna for the first time.

A number of important faunistic records were made in the 80–90s of the 20<sup>th</sup> century. Molodova [1986] registered *Pogonognathellus longicornis* (Müller, 1776) (verified by M.P. Potapov and I.P. Vtorov) in Gomel Region. Vetrava [1986] recorded *Coecobrya tenebricosa* (Folsom, 1902) and *Entomobryoides purpurascens* (Packard, 1872) for the territory of Belarus, but the collector and locality were not specified. Potapov [1991] published new faunistic data on *Parisotoma ekmani* (Fjellberg, 1977). Two species (*Schoettella ununguiculata* (Tullberg, 1869) and *Willemia intermedia* (Mills, 1934)) from one family and one order were added to the key to springtails of the fauna of Russia and neighboring countries [Babenko et al., 1994], but also without exact locality in Belarus.

Another significant study of springtails in Belarus was made by Galina N. Buşmachi. The research was conducted within a joint scientific project between Belarus and Moldova “Insect Biodiversity (Insecta: Collembola, Coleoptera, Lepidoptera) of the Coastal Areas of River Ecosystems in Belarus and Moldova in a Comparative Aspect” (2008–2010). The results of this project were summarized by Buşmachi [2010]. Buşmachi’s work contains all available information on the springtail fauna of Belarus, including new faunistic records. Moreover, she carried out studies of the Collembola species composition in coastal ecosystems of Belarus (Vitebsk, Brest and Gomel regions). Buşmachi [2010] firstly recorded for Belarus seven springtail species from three families and one order.

Furthermore, a lot of data on springtails were published by Moroz with co-authors [Moroz et al., 2002a, b, 2004a, b, 2005, 2007, 2008, 2012, 2013b, c, d, 2014, 2016, 2017a, b, c, 2018a, b, c, d, 2022; Moroz, Maksimenkov, 2006; Moroz, 2012, 2013a, b, c, 2015, 2016, 2018; Moroz, Laenko, 2013; Tishchikov et al., 2013; Moroz, Vezhnavev, 2015, 2019; Moroz, Lipinskaya, 2017]. *Lepidocyrtus lanuginosus* Linnaeus, 1788 was firstly recorded on the territory of Belarus [Tishchikov et al., 2013], as well as *Deuterostomothrus* sp. [Moroz et al., 2013b].

*Willemia scandinavica* Stach, 1949 was mentioned for Belarus by Kahrarian [2014] with reference to “Synopsis on Palaearctic Collembola” [Thibaud et al., 2004].

Fauna Europaea database [Fjellberg et al., 2013] contains 38 species of collembolans recorded for Belarus, four of which have not been mentioned for the country in other scientific publications: *Entomobrya muscorum* (Nicolet, 1842), *Pseudosinella zygophora* (Schille, 1908), *Ballistura tuberculata* (Stach, 1947), *Morulina gigantea* (Tullberg, 1877).

*Orchesella villosa* (Linnaeus, 1767) was mentioned for the first time as a representative of the fauna of Belarus in the Global Biodiversity Information Facility [GBIF.org, 2023]. The data presented in the GBIF publication [Borodin, Krasouski, 2020] were previously published by Borodin and Tsinkevich [2016a, b].

*Coecobrya tenebricosa* Folsom, 1902 and *Desoria olivacea* (Tullberg, 1871) were mentioned in scientific works [Kuznetsova, 1984; Antipov et al., 1986, 1989], but require confirmation.

Other scientific publications reproduce information from earlier sources [Vetrava, 1983a, b, c, 1984, 1986; Chumakov, 1985; Sławska, Sławaki, 2009; Fiera, Weiner, 2016; Borodin, Tsinkevich, 2016a, b; Skarżyński, 2019; Borodin, Krasouski, 2020].

The collection of the Siberian Zoological Museum confirmed the discovery of three species, *Isotomurus maculatus* (Schäffer, 1896), *Friesea mirabilis* (Tullberg, 1871), *Micranurida pygmaea* Börner, 1901, in Belarus [Berezina, 2002].

We did not find any information about the history of the formation of the collembolan fauna of Belarus. Only Perkovsky [2017] mentioned an inclusion of a representative of the order Symphypleona in Eocene Rovno amber found in the surroundings of Rechitsa (Brest Region, Stolín District, left bank of the Goryn River, 7 km from the Ukraine border).

In fact, the complete analysis of all available literary sources allowed to expand the checklist up to 113 species (including 8 unconfirmed species). For comparison, more than 130 Collembola species are known in the European part of Russia [Grinbergs, 1960; Babenko et al., 1994], 197 species in Latvia [Juceviča, 2003], 146 species in Lithuania [Grendienė, Rimšaitė, 2009; Grendienė, 2010], 441 species (including 31 unconfirmed species) in Poland [Skarżyński et al., 2002; Sławska, Sławaki, 2009], 527 species (including 90 unconfirmed species) in Ukraine [Kaprus et al., 2004, 2006]. Taking into account the number of species from neighboring regions, the potential for studying this group is huge considering that the Collembola fauna on the territory of Belarus is estimated to be at least 238 species [Ulrich, Fiera, 2009].

## Material and methods

This work contains only exact records of springtail species on the territory of Belarus.

The subfamilies are listed alphabetically along with the genera and species within each subfamily. Question marks indicate the information that requires confirmation.

The names of the Collembola species in Antipov et al. [1986, 1989] are given in Russian, so specialized books were used to accurately translate the names of species into Latin [Striganova, Zakharov, 2000; Birg, Snitko, 2001; Ümüt, 2018].

Systematic position and synonymy are given according to the Global Biodiversity Information Facility and scientific publications [Janssens, Christiansen, 2011; Hopkin, 2014; Potapov et al., 2021; Collembola, 2023].

## Checklist of Collembola

### Order Entomobryomorpha

#### Family Entomobryidae

#### Genus *Coecobrya* Yosii, 1956

(?) *Coecobrya tenebricosa* (Folsom, 1902)

**Records for the region.** *Sinella caeca*: Vetrava, 1986: 428.

*Sinella tenebricosa* Mills, 1934: Antipov et al., 1986: 420; Antipov et al., 1989: 422.



**Genus *Entomobrya* Rondani, 1861***Entomobrya corticalis* (Nicolet, 1842)

**Records for the region.** *Entomobrya corticalis* (Nicolet, 1842): Buřmachieu, 2010: 119–120.

*Entomobrya corticalis*: Stach, 1963: 64; Kuznetsova, 1984: 257; Sterzyńska, Kuznetsova, 1995: 149; Fjellberg et al., 2013; Baquero et al., 2014: 1566; Borodin, Tsinkevich, 2016b: 14; Borodin, Krasouski, 2020.

*Entomobrya marginata* (Tullberg, 1871)

**Records for the region.** *Entomobrya marginata* (Tullberg, 1871): Borodin, Tsinkevich, 2016b: 14.

*Entomobrya marginata*: Kipenvarlits, 1961: 57; Kuznetsova, 1984: 257; Kuznetsova, 1988: 40; Buřmachieu, 2010: 121.

(?) *Entomobrya muscorum* (Nicolet, 1842)

**Records for the region.** Fjellberg et al., 2013.

*Entomobrya nivalis* (Linnaeus, 1758)

**Records for the region.** Stach, 1963: 27; Kuznetsova, 1984: 257; Vetrava, 1986: 428; Antipov et al., 1986: 420; Kuznetsova, 1988: 33, 36–37; Antipov et al., 1989: 422; Sterzyńska, Kuznetsova, 1995: 149; Buřmachieu, 2010: 119, 121; Borodin, Tsinkevich, 2016b: 14; Fjellberg et al., 2013.

*Entomobrya quinquelineata* Börner, 1901

**Records for the region.** *Entomobrya quinquelineata* subsp. *quinquelineata* Börner, 1901: Fjellberg et al., 2013.

*Entomobrya quinquelineata*: Stach, 1963: 57; Sterzyńska, Kuznetsova, 1995: 149; Baquero, Jordana, 2008: 4; Fjellberg et al., 2013; Borodin, Tsinkevich, 2016b: 14; Borodin, Krasouski, 2020.

*Entomobrya superba* (Reuter, 1876)

**Records for the region.** *Entomobrya superba*: Kurachenko, 2008: 133.

*Entomobrya superba*: Kuznetsova, 1984: 257.*Entomobrya xerothermica* Stach, 1963

**Records for the region.** Buřmachieu, 2010: 119.

**Genus *Entomobryoides* Maynard, 1951**(?) *Entomobryoides purpurascens* (Packard, 1872)

**Records for the region.** *Entomobrya myrmecophila*: Vetrava, 1986: 428.

**Genus *Lepidocyrtus* Bourlet, 1839***Lepidocyrtus* sp.

**Records for the region.** Moroz et al., 2007: 102; Moroz, 2013b: 876; Moroz, Laenko, 2013: 79; Moroz et al., 2013b: 92.

*Lepidocyrtus curvicollis* Bourlet, 1839

**Records for the region.** Buřmachieu, 2010: 121.

*Lepidocyrtus cyaneus* Tullberg, 1871

**Records for the region.** *Lepidocyrtus violaceus* (Geoffroy, 1762): Kuznetsova, 1984: 257; Chernov et al., 2010: 564.

*Lepidocyrtus cyaneus*: Buřmachieu, 2010: 121; Borodin, Tsinkevich, 2016b: 14.

*Lepidocyrtus lignorum* (Fabricius, 1775)

**Records for the region.** Kuznetsova, 1984: 257; Kuznetsova, 1988: 33, 36–37, 39, 40, 42; Sterzyńska, Kuznetsova, 1995: 149; Buřmachieu, 2010: 121; Chernov et al., 2010: 563; Borodin, Tsinkevich, 2016b: 14; Borodin, Krasouski, 2020.

*Lepidocyrtus paradoxus* Uzel, 1890

**Records for the region.** Buřmachieu, 2010: 121; GBIF.org, 2023.

*Lepidocyrtus lanuginosus* (Linnaeus, 1788)

**Records for the region.** *Lepidocyrtus rivularis* Bourlet, 1843: Tishchikov et al., 2013: 160.

*Lepidocyrtus lanuginosus* Gmelin, 1788: Borodin, Tsinkevich, 2016b: 14.

*Lepidocyrtus rivularis* Bourlet, 1942: Borodin, Tsinkevich, 2016b: 14.

*Lepidocyrtus lanuginosus*: Borodin, Krasouski, 2020.**Genus *Pseudosinella* Schäffer, 1897***Pseudosinella horaki* Rusek, 1985

**Records for the region.** Chernov et al., 2010: 563.

(?) *Pseudosinella zygochora* (Schille, 1908)

**Records for the region.** Fjellberg et al., 2013.

**Genus *Willowsia* Shoebottom, 1917***Willowsia buski* (Lubbock, 1870)

**Records for the region.** *Willowsia buskii* Lubbock, 1870: Borodin, Tsinkevich, 2016b: 14.

*Willowsia buski*: Kuznetsova, 1984: 257; Sterzyńska, Kuznetsova, 1995: 149; Buřmachieu, 2010: 121; GBIF.org, 2023.

**Family Orchesellidae****Genus *Orchesella* Templeton, 1836***Orchesella cincta* (Linnaeus, 1758)

**Records for the region.** Stach, 1960: 125; Buřmachieu, 2010: 119; Fjellberg et al., 2013; GBIF.org, 2023.

*Orchesella flavescens* (Bourlet, 1839)

**Records for the region.** *Orchesella flavescens* Bourlet, 1839 var. *lateralis*: Stach, 1960: 45.

*Orchesella flavescens*: Kuznetsova, 1984: 257; Molodova, 1986: 300–301; Sterzyńska, Kuznetsova, 1995: 149; Buşmachi, 2010: 119–121; Chernov et al., 2010: 563; Fjellberg et al., 2013; Borodin, Tsinkevich, 2016b: 14; Borodin, Krasouski, 2020; GBIF.org, 2023.

*Orchesella pulchra* Scherbakov, 1898

**Records for the region.** Buşmachi, 2010: 120–121.

*Orchesella spectabilis* Tullberg, 1871

**Records for the region.** Stach, 1960: 53; Buşmachi, 2010: 119–121; Fjellberg et al., 2013.

*Orchesella sphagneticola* Stach, 1960

**Records for the region.** Stach, 1960: 132; Potapov, Kremenitsa, 2008: 108, 112; Buşmachi, 2010: 120–121; Fjellberg et al., 2013; Borodin, Tsinkevich, 2016b: 14.

*Orchesella villosa* (Linnaeus, 1767)

**Records for the region.** GBIF.org, 2023.

## Family Tomoceridae

Genus *Pogonognathellus* Paclt, 1944

*Pogonognathellus flavescens* (Tullberg, 1871)

**Records for the region.** Kuznetsova, 1984: 257; Kuznetsova, 1988: 36–37, 42; Sterzyńska, Kuznetsova, 1995: 149; Buşmachi, 2010: 121; Chernov et al., 2010: 563; Borodin, Tsinkevich, 2016b: 13; Borodin, Krasouski, 2020.

*Pogonognathellus longicornis* (Müller, 1776)

**Records for the region.** *Tomocerus longicornis* Müller, 1776: Molodova, 1986: 300–301; Buşmachi, 2010: 121; Borodin, Tsinkevich, 2016b: 13.

Genus *Tomocerus* Nicolet, 1842

*Tomocerus vulgaris* (Tullberg, 1871)

**Records for the region.** Kuznetsova, 1984: 257; Buşmachi, 2010: 121; Borodin, Tsinkevich, 2016b: 13.

## Order Neelipleona

## Family Neelidae

Genus *Megalothorax* Willem, 1900

*Megalothorax minimus* Willem, 1900

**Records for the region.** Kuznetsova, 1984: 257; Kuznetsova, 1988: 36–37, 39; Sterzyńska, Kuznetsova, 1995: 149; Borodin, Krasouski, 2020.

Genus *Neelus* Folsom, 1896

*Neelus murinus* Folsom, 1896

**Records for the region.** Sterzyńska, Kuznetsova, 1995: 149; Borodin, Krasouski, 2020.

## Order Poduromorpha

## Family Hypogastruridae

Genus *Ceratophysella* Börner, 1932

*Ceratophysella armata* (Nicolet, 1842)

**Records for the region.** *Hypogastrura armata* (Nicolet, 1842): Kipenvarlits, 1961: 57.

*Ceratophysella armata*: Vetrava, 1983b: 60; Kuznetsova, 1984: 257; Antipov et al., 1986: 420; Antipov et al., 1989: 422; Martynova, 1964b: 850.

*Ceratophysella mosquensis* (Becker, 1910)

**Records for the region.** *Ceratophysella monstrosa* Gisin, 1949: Kuznetsova, 1984: 257; Kuznetsova, 1988: 42.

*Ceratophysella mosquensis*: Kuznetsova, 2002: 380.

*Ceratophysella scotica* (Carpenter et Evans, 1899)

**Records for the region.** Kuznetsova, 1984: 257; Kuznetsova, 1988: 42; Babenko et al., 1994: 142; Sławska, Sławski, 2009: 41; Buşmachi, 2010: 118–119; Fjellberg et al., 2013; Skarżyński, 2019: 152; Skarżyński et al., 2021: 12.

Genus *Choreutinula* Paclt, 1944

*Choreutinula inermis* (Tullberg, 1871)

**Records for the region.** Kuznetsova, 1984: 257; Sterzyńska, Kuznetsova, 1995: 148; Borodin, Tsinkevich, 2016a: 13; Borodin, Krasouski, 2020.

Genus *Seira* Lubbock, 1870

*Seira squamoornata* (Scherbakov, 1898)

**Records for the region.** Sterzyńska, Kuznetsova, 1995: 149; Borodin, Tsinkevich, 2016b: 14; Borodin, Krasouski, 2020.

Genus *Schoettella* Schäffer, 1896

*Schoettella ununguiculata* (Tullberg, 1869)

**Records for the region.** Babenko et al., 1994: 197; Sterzyńska, Kuznetsova, 1995: 148; Buşmachi, 2010: 118–119; Fjellberg et al., 2013; Borodin, Tsinkevich, 2016a: 13; Borodin, Krasouski, 2020.

Genus *Willemia* Börner, 1901

*Willemia anophthalma* Börner, 1901

**Records for the region.** Kuznetsova, 1984: 257; Kuznetsova, 1988: 30, 33, 36–37, 39–40, 42; Sterzyńska, Kuznetsova, 1995: 148; Kuznetsova, 2002: 379; Borodin, Tsinkevich, 2016a: 13; Borodin, Krasouski, 2020.

*Willemia denisi* Mills, 1932

**Records for the region.** *Willemia aspinata* Stach, 1949: Kuznetsova, 1984: 257; Kuznetsova, 1988: 36–37, 42.

*Willemia denisi*: Sterzyńska, Kuznetsova, 1995: 148; Borodin, Tsinkevich, 2016a: 13; Borodin, Krasouski, 2020.

*Willemia intermedia* Mills, 1934

**Records for the region.** Babenko et al., 1994: 243; Buşmachi, 2010: 118–119; Fjellberg et al., 2013.

(?) *Willemia scandinavica* Stach, 1949

**Record for the region.** Kahrarian, 2014: 23.

**Genus *Xenylla* Tullberg, 1869**

*Xenylla* sp.

**Records for the region.** Kuznetsova, 1984: 257; Kuznetsova, 1988: 33; Buşmachi, 2010: 120; Chernov et al., 2010: 564.

*Xenylla brevicauda* Tullberg, 1869

**Records for the region.** Kuznetsova, 1984: 257; Kuznetsova, 1988: 36–37, 40; Sterzyńska, Kuznetsova, 1995: 148; Kuznetsova, 2002: 377; Borodin, Tsinkevich, 2016a: 13; Borodin, Krasouski, 2020.

*Xenylla grisea* Axelson, 1900

**Records for the region.** Stach, 1949a: 225; Grinbergs, 1960: 27; Buşmachi, 2010: 119.

**Family Isotomidae**

**Genus *Anurophorus* Nicolet, 1842**

*Anurophorus laricis* Nicolet, 1842

**Records for the region.** Kuznetsova, 1984: 257; Sterzyńska, Kuznetsova, 1995: 148; Buşmachi, 2010: 120–121; Fjellberg et al., 2013; Borodin, Tsinkevich, 2016b: 14.

*Anurophorus septentrionalis* Palissa, 1966

**Records for the region.** Kuznetsova, 1988: 30, 33, 36–37, 39–40, 42; Sterzyńska, Kuznetsova, 1995: 148; Kuznetsova, 2002: 376–377; Buşmachi, 2010: 118–119; Fjellberg et al., 2013; Borodin, Tsinkevich, 2016b: 14; Borodin, Krasouski, 2020.

**Genus *Bagnallella* Salmon, 1951**

*Bagnallella* sp.

**Records for the region.** Potapov et al., 2021: 170.

*Bagnallella ripicola* (Linnaniemi, 1912)

**Records for the region.** *Proisotoma ripicola* Linnaniemi, 1912: Radzymovsky, Polishchuk, 1970: 179; Moroz et al., 2002a: 90; Moroz et al., 2002b: 89; Moroz et al., 2007: 102; Buşmachi, 2010: 118–119; Moroz, 2013a: 99; Moroz, 2013b: 876; Moroz et al., 2013b: 92; Tishchikov et al., 2013: 160; Borodin, Tsinkevich, 2016b: 14; Moroz, 2018: 203; Borodin, Krasouski, 2020.

**Genus *Ballistura* Börner, 1906**

(?) *Ballistura tuberculata* (Stach, 1947)

**Records for the region.** Fjellberg et al., 2013.

**Genus *Desoria* Agassiz et Nicolet, 1841**

*Desoria hiemalis* (Schött, 1893)

**Records for the region.** *Isotoma hiemalis* Schött, 1893: Kuznetsova, 1984: 257; Kuznetsova, 1988: 30, 33, 36–37, 39–40, 42; Sterzyńska, Kuznetsova, 1995: 149.

*Desoria hiemalis*: Fjellberg et al., 2013; Borodin, Tsinkevich, 2016b: 14; Borodin, Krasouski, 2020.

*Desoria blekeni* Leinaas, 1980

**Records for the region.** Buşmachi, 2010: 120–121; Borodin, Tsinkevich, 2016b: 14.

*Desoria divergens* (Axelson, 1900)

**Records for the region.** Chernov et al., 2010: 563.

(?) *Desoria olivacea* (Tullberg, 1871)

**Records for the region.** *Isotoma gr. olivacea*: Kuznetsova, 1984: 258.

*Desoria violacea* (Tullberg, 1877)

**Records for the region.** *Isotoma violacea* Tullberg, 1876: Stach, 1947: 415.

*Isotoma neglecta* Schäffer: Kuznetsova, 1984: 257; Kuznetsova, 1988: 42.

*Desoria neglecta* (Schaeffer, 1900): Fjellberg et al., 2013.

*Desoria violacea*: Kuznetsova, 2002: 380.

**Genus *Folsomia* Willem, 1902**

*Folsomia fimetarioides* (Axelson, 1903)

**Records for the region.** Kuznetsova, 1984: 257.

*Folsomia manolachei* Bagnall, 1939

**Records for the region.** Chernov et al., 2010: 563.

*Folsomia quadrioculata* (Tullberg, 1871)

**Records for the region.** Stach, 1947: 169; Grinbergs, 1960: 37; Kuznetsova, 1984: 257; Kuznetsova, 1988: 30, 33, 36–37, 39, 42; Sterzyńska, Kuznetsova, 1995: 148; Kuznetsova, 2002: 376; Buşmachi, 2010: 119; Chernov et al., 2010: 563; Fjellberg et al., 2013; Borodin, Tsinkevich, 2016b: 14; Borodin, Krasouski, 2020.

**Genus *Isotoma* Bourlet, 1839**

*Isotoma* sp.

**Records for the region.** Kuznetsova, 1984: 257.



*Isotoma riparia* (Nicolet, 1842)

**Records for the region.** Buşmachi, 2010: 120–121.

*Isotoma viridis* Bourlet, 1839

**Records for the region.** *Isotoma (Isotoma) viridis* Bourlet, 1838: Grinbergs, 1960: 43.

*Isotoma viridis*: Stach, 1947: 428; Vetrava, 1983c: 399; Kuznetsova, 1984: 257; Antipov et al., 1986: 420; Kuznetsova, 1988: 42; Antipov et al., 1989: 422; Baichorov et al., 2002: 76; Moroz et al., 2002a: 90; Moroz et al., 2004a: 201; Moroz et al., 2005: 101; Moroz, Maksimenkov, 2006: 58; Moroz et al., 2007: 102; Moroz et al., 2008: 44; Buşmachi, 2010: 118–121; Moroz, 2012: 52; Moroz et al., 2012: 159; Moroz, 2013a: 99; Moroz, 2013c: 11; Moroz, Vezhnovets, 2013: 83; Moroz, Laenko, 2013: 79; Moroz et al., 2013b: 92; Moroz et al., 2013c: 107; Moroz et al., 2013d: 71; Tishchikov et al., 2013: 160; Fjellberg et al., 2013; Moroz et al., 2014: 23; Moroz, 2015: 194; Borodin, Tsinkevich, 2016b: 14; Moroz, 2016: 50; Moroz et al., 2016: 58; Moroz, Lipinskaya, 2017: 34; Moroz et al., 2017c: 70, 72; Moroz, 2018: 203; Moroz et al., 2018a: 16; Moroz et al., 2018c: 75; Moroz et al., 2018b: 404; Borodin, Krasouski, 2020.

**Genus *Isotomiella* Bagnall, 1939***Isotomiella minor* (Schäffer, 1896)

**Records for the region.** Stach, 1947: 303; Kuznetsova, 1984: 257; Kuznetsova, 1988: 30, 33, 36–37, 39–40, 42; Sterzyńska, Kuznetsova, 1995: 148; Kuznetsova, 2002: 376–377; Buşmachi, 2010: 118–120; Chernov et al., 2010: 563; Fjellberg et al., 2013; Borodin, Tsinkevich, 2016b: 14; Borodin, Krasouski, 2020.

**Genus *Isotomurus* Börner, 1903***Isotomurus* sp.

**Records for the region.** Moroz et al., 2013b: 92.

*Isotomurus maculatus* (Schäffer, 1896)

**Records for the region.** *Orchesella bifasciata* (Bourlet, 1839): Stach, 1960: 108; Kuznetsova, 1984: 257; Kuznetsova, 1988: 40; Sterzyńska, Kuznetsova, 1995: 149; Buşmachi, 2010: 119–121; Fjellberg et al., 2013; Borodin, Tsinkevich, 2016b: 14; Borodin, Krasouski, 2020.

**Collection.** Berezina [2002].

*Isotomurus palustris* (Müller, 1776)

**Records for the region.** *Isotomurus (Isotomurus) palustris* Müller, 1776: Grinbergs, 1960: 46.

*Isotomurus palustris*: Stach, 1947: 456; Moroz et al., 2007: 102; Buşmachi, 2010: 119–121; Moroz, 2012: 52; Moroz et al., 2012: 159; Fjellberg et al., 2013; Moroz, 2013b: 876; Moroz et al., 2013b: 92; Tishchikov et al., 2013: 160; Moroz, Vezhnovets, 2015: 73; Borodin, Tsinkevich, 2016b: 14; Moroz et al., 2017a: 49; Moroz et al., 2017c: 70, 72; Moroz, 2018: 203; Moroz et al., 2018c: 75; Borodin, Krasouski, 2020.

*Isotomurus stuxbergi* (Tullberg, 1877)

**Records for the region.** *Isotomurus ciliatus* Stach, 1947: Stach, 1947: 479.

*Isotomurus (Isotomurus) ciliatus* Stach, 1947: Grinbergs, 1960: 45.

*Isotomurus ciliatus* Stach, 1947: Martynova, 1964a: 75; Buşmachi, 2010: 118–119.

*Isotomurus stuxbergi*: Fjellberg et al., 2013.

**Genus *Pachyotoma* Bagnall, 1949***Pachyotoma crassicauda* (Tullberg, 1871)

**Records for the region.** *Ballistura crassicauda* Tullberg, 1871: Stach, 1947: 244.

*Pachyotoma crassicauda*: Grinbergs, 1960: 40; Buşmachi, 2010: 119; Fjellberg et al., 2013.

**Genus *Parisotoma* Bagnall, 1940***Parisotoma ekmani* (Fjellberg, 1977)

**Records for the region.** *Isotoma ekmani* Fjellberg, 1977: Potapov, 1991: 276.

*Parisotoma ekmani*: Fjellberg et al., 2013.

*Parisotoma notabilis* (Schäffer, 1896)

**Records for the region.** *Isotoma notabilis* Schäffer, 1896: Stach, 1947: 378; Kuznetsova, 1984: 257; Kuznetsova, 1988: 30, 33, 36–37, 39; Sterzyńska, Kuznetsova, 1995: 148; Kuznetsova, 2002: 376–377; Kurachenko, 2008: 133.

*Isotoma (Isotoma) notabilis* Schäffer, 1896: Grinbergs, 1960: 42.

*Parisotoma notabilis*: Buşmachi, 2010: 119–120; Chernov et al., 2010: 563; Fjellberg et al., 2013; Borodin, Tsinkevich, 2016b: 14; Borodin, Krasouski, 2020.

**Genus *Proisotoma* Börner, 1901***Proisotoma minima* (Absolon, 1901)

**Records for the region.** Kuznetsova, 1984: 257.

*Proisotoma minuta* (Tullberg, 1871)

**Records for the region.** Stach, 1947: 213; Grinbergs, 1960: 40; Buşmachi, 2010: 119; Fjellberg et al., 2013.

**Genus *Subisotoma* Stach, 1947***Subisotoma pusilla* (Schäffer, 1900)

**Records for the region.** *Subisotoma pussila* Schäffer, 1896: Buşmachi, 2010: 120.

*Subisotoma pusilla*: Borodin, Tsinkevich, 2016b: 14.

**Genus *Vertagopus* Börner, 1906***Vertagopus cinereus* (Nicolet, 1842)

**Records for the region.** *Vertagopus cinerea*: Kuznetsova, 1984: 258.

**Family Neanuridae****Genus *Anurida* Laboulbène, 1865***Anurida granulata* Agrell, 1943**Records for the region.** Kuznetsova, 1984: 257.**Genus *Friesea* von Dalla Torre, 1895***Friesea mirabilis* (Tullberg, 1871)**Records for the region.** *Friesea* (*Friesea*) *mirabilis* Tullberg, 1871: Grinbergs, 1960: 28.*Friesea mirabilis*: Stach, 1949a: 292; Kuznetsova, 1984: 257; Kuznetsova, 1988: 36–37; Sterzyńska, Kuznetsova, 1995: 148; Buşmachi, 2010: 119; Fjellberg et al., 2013; Fiera, Weiner, 2016: 23; Borodin, Tsinkevich, 2016a: 13; Borodin, Krasouski, 2020.**Collection.** Berezina [2002].**Genus *Micranurida* Börner, 1901***Micranurida pygmaea* Börner, 1901**Records for the region.** Kuznetsova, 1984: 257; Kuznetsova, 1988: 30, 33, 36–37, 39–40, 42; Sterzyńska, Kuznetsova, 1995: 148; Borodin, Tsinkevich, 2016a: 13; Borodin, Krasouski, 2020.**Collection.** Berezina [2002].**Genus *Morulina* Börner, 1906**(?) *Morulina gigantea* (Tullberg, 1877)**Records for the region.** *Morulina verrucosa* (Börner, 1903): Fjellberg et al., 2013.**Genus *Neanura* MacGillivray, 1893***Neanura muscorum* (Templeton, 1836)**Records for the region.** *Biloba muscorum* Templeton, 1835: Stach, 1951: 45.*Neanura* (*Neanura*) *muscorum* Templeton, 1835: Grinbergs, 1960: 32.*Neanura muscorum*: Kuznetsova, 1984: 257; Kuznetsova, 1988: 39; Sterzyńska, Kuznetsova, 1995: 148; Buşmachi, 2010: 119; Borodin, Tsinkevich, 2016a: 13; Borodin, Krasouski, 2020.**Genus *Pseudachorutes* Tullberg, 1871***Pseudachorutes dubius* Krausbauer, 1898**Records for the region.** Stach, 1949b: 103 (?) (the record does not allow to determine whether the material was collected from the Belarusian or Polish part of Belovezhskaya Pushcha); Kuznetsova, 1984: 257; Sterzyńska, Kuznetsova, 1995: 148.*Pseudachorutes corticicolus* Schaffer, 1896**Records for the region.** Kuznetsova, 1984: 257.*Pseudachorutes parvulus* Börner, 1901**Records for the region.** Kuznetsova, 1984: 257; Kuznetsova, 1984: 39; Sterzyńska, Kuznetsova, 1995: 148;

Buşmachi, 2010: 120–121; Borodin, Tsinkevich, 2016a: 13; Borodin, Krasouski, 2020.

*Pseudachorutes subcrassus* Tullberg, 1871**Records for the region.** Kuznetsova, 1984: 257; Chernov et al., 2010: 563.**Family Onychiuridae****Genus *Deuteraphorura* Absolon, 1901***Deuteraphorura variabilis* (Stach, 1954)**Records for the region.** *Onychiurus variabilis* Stach, 1954: Stach, 1955: 56.**Genus *Oligaphorura* Bagnall, 1949***Oligaphorura absoloni* (Börner, 1901)**Records for the region.** *Onychiurus absoloni*: Kuznetsova, 1984: 257.*Micraphorura absoloni* Börner, 1901: Kuznetsova, 2002: 376; Buşmachi, 2010: 118–119; Borodin, Tsinkevich, 2016a: 13.*Oligaphorura absoloni*: Kuznetsova, 1988: 30, 33, 36–37, 39–40, 42; Sterzyńska, Kuznetsova, 1995: 148; Borodin, Krasouski, 2020.**Genus *Onychiurus* Gervais, 1841***Onychiurus fimetarius* (Linnaeus, 1758)**Records for the region.** Kipenvarlits, 1961: 57; Vetrava, 1983a: 96; Antipov et al., 1986: 420; Antipov et al., 1989: 422.**Genus *Protaphorura* Absolon, 1901***Protaphorura armata* (Tullberg, 1869)**Records for the region.** *Onychiurus armatus* Tullberg, 1869: Stach, 1954: 127; Kipenvarlits, 1961: 57; Antipov et al., 1986: 420; Antipov et al., 1989: 422.*Onychiurus nemoratus* Gisin, 1952: Kuznetsova, 1984: 257.*Protaphorura armata*: Sterzyńska, Kuznetsova, 1995: 148; Borodin, Tsinkevich, 2016a: 13; Borodin, Krasouski, 2020.*Protaphorura nemorata* (Gisin, 1952)**Records for the region.** Kuznetsova, 1988: 40.*Protaphorura stogovi* Pomorski, 1993**Records for the region.** Kuznetsova, 2002: 379.*Protaphorura subarmata* (Gisin, 1957)**Records for the region.** *Onychiurus subarmatus* Gisin, 1957: Kuznetsova, 1984: 258.*Onychiurus armatus*: Vetrava, 1983a: 96.*Protaphorura subarmata*: Buşmachi, 2010: 120–121; Chernov et al., 2010: 563; Borodin, Tsinkevich, 2016a: 13.

*Protaphorura subuliginata* (Gisin, 1956)

**Records for the region.** Sterzyńska, Kuznetsova, 1995: 148.

**Genus *Xenyllodes* Axelson, 1903**

*Xenyllodes armatus* Axelson, 1903

**Records for the region.** Kuznetsova, 1984: 257; Kuznetsova, 1988: 42; Kuznetsova, 2002: 380.

**Family Poduridae**

**Genus *Podura* Linnaeus, 1758**

*Podura* sp.

**Records for the region.** *Hypogastrura* Bagnall, 1940: Kuznetsova, 1984: 257.

*Podura aquatica* Linnaeus, 1758

**Records for the region.** Solovyov, 1926: 41; Shalapenok, 1964: 198; Radzymovsky, Polishchuk, 1970: 179; Vetrava, 1984: 448; Antipov et al., 1986: 420; Antipov et al., 1989: 422; Baichorov et al., 2002: 76; Moroz et al., 2002a: 90; Moroz et al., 2002b: 89, 92; Moroz et al., 2004a: 200; Moroz et al., 2005: 101; Moroz, Maksimenkov, 2006: 58; Moroz et al., 2007: 102; Moroz et al., 2008: 44; Buşmachi, 2010: 118–119; Moroz, 2013b: 876; Moroz, 2013c: 11; Moroz, Laenko, 2013: 79; Moroz et al., 2013a: 97; Moroz et al., 2013b: 92; Tishchikov et al., 2013: 160; Moroz et al., 2014: 23; Ryzhaya, 2014: 377; Moroz, Vezhnovets, 2015: 73; Borodin, Tsinkevich, 2016a: 13; Moroz et al., 2016: 58; Moroz, Lipinskaya, 2017: 34; Moroz et al., 2017a: 49; Moroz et al., 2017b: 54; Moroz et al., 2017c: 70, 72; Moroz, 2018: 203; Moroz et al., 2018c: 75; Moroz et al., 2018d: 84; Moroz, Vezhnovets, 2019: 67; Borodin, Krasouski, 2020.

**Family Tullbergiidae**

**Genus *Mesaphorura* Börner, 1901**

*Mesaphorura* sp.

**Records for the region.** Kuznetsova, 1988: 30, 33, 36–37, 39–40, 42; Chernov et al., 2010: 564.

*Mesaphorura macrochaeta* Rusek, 1976

**Records for the region.** *Tullbergia krausbaueri* Greenslade, 1992: Kuznetsova, 1984: 257.

*Mesaphorura krausbaueri*: Kurachenko, 2008: 133.

*Mesaphorura macrochaeta*: Sterzyńska, Kuznetsova, 1995: 148; Kuznetsova, 2002: 376; Buşmachi, 2010: 118–119; Borodin, Tsinkevich, 2016a: 13; Borodin, Krasouski, 2020.

*Mesaphorura sylvatica* (Rusek, 1971)

**Records for the region.** *Tullbergia sylvatica* Rusek, 1971: Kuznetsova, 1984: 257.

**Genus *Stenaphorura* Absolon, 1900**

*Stenaphorura quadripina* Börner, 1901

**Records for the region.** *Tullbergia quadripina* (Börner, 1901): Kipenvarlits, 1961: 57.

**Order Symphypleona**

**Family Arrhopalitidae**

**Genus *Pygmarrhopalites* Vargovitsh, 2009**

*Pygmarrhopalites benitus* (Folsom, 1896)

**Records for the region.** *Arrhopalites principalis* Stach, 1945: Kuznetsova, 1984: 257; Kuznetsova, 1988: 42.

*Pygmarrhopalites cochlearifer* (Gisin, 1947)

**Records for the region.** *Arrhopalites cochlearifer* Gisin, 1947: Kuznetsova, 1984: 257; Sterzyńska, Kuznetsova, 1995: 149.

*Pygmarrhopalites secundarius* (Gisin, 1958)

**Records for the region.** *Arrhopalites secundarius* Gisin, 1958: Kuznetsova, 1984: 257; Kuznetsova, 1988: 42; Sterzyńska, Kuznetsova, 1995: 149.

**Family Bourletiellidae**

**Genus *Bourletiella* Banks, 1899**

*Bourletiella hortensis* (Fitch, 1863)

**Records for the region.** *Bourletiella (Bourletiella) hortensis* Fitch, 1863: Grinbergs, 1960: 59.

*Sminthurus pruinosus*: Chumakov, 1985: 71.

*Bourletiella hortensis*: Stach, 1956: 153; Buşmachi, 2010: 120.

**Genus *Deuterosminthurus* Börner, 1901**

*Deuterosminthurus* sp.

**Records for the region.** Moroz et al., 2013b: 92.

**Genus *Fasciosminthurus* Gisin, 1960**

*Fasciosminthurus circumfasciatus* (Stach, 1956)

**Records for the region.** *Deuterosminthurus circumfasciatus* Stach, 1956: Stach, 1956: 178; Buşmachi, 2010: 120.

*Bourletiella (Bourletiella) circumfasciata* Stach, 1956: Grinbergs, 1960: 59.

*Fasciosminthurus circumfasciatus*: Martynova, 1964a: 97; Fjellberg et al., 2013.

**Genus *Heterosminthurus* Stach, 1955**

*Heterosminthurus* sp.

**Records for the region.** Kuznetsova, 1984: 257.

*Heterosminthurus insignis* (Reuter, 1876)

**Records for the region.** *Bourletiella (Heterosminthurus) insignis* Reuter, 1876: Grinbergs, 1960: 58.

*Heterosminthurus insignis* Reuter, 1899: Stach, 1956: 200; Buşmachi, 2010: 120.

*Heterosminthurus insignis*: Fjellberg et al., 2013.

*Heterosminthurus linnaniemii* (Stach, 1920)

**Records for the region.** *Heterosminthurus linnaniemii* Stach, 1919: Stach, 1956: 189.



*Bourletiella* (*Heterosminthurus*) *linnaniemi* Stach, 1919: Grinbergs, 1960: 59.

*Heterosminthurus linnaniemi* Stach, 1920: Buşmachi, 2010: 120.

*Heterosminthurus linnaniemii*: Martynova, 1964a: 97; Fjellberg et al., 2013.

*Heterosminthurus novemlineatus* (Tullberg, 1871)

**Records for the region.** *Heterosminthurus novemlineatus* var. *pilosicauda* Stach, 1956: Stach, 1956: 196–197.

*Bourletiella* (*Heterosminthurus*) *novemlineata* Tullberg, 1871: Grinbergs, 1960: 58.

*Bourletiella* (*Heterosminthurus*) *novemlineata* var. *malopigmentata* Stach, 1956: Grinbergs, 1960: 58.

*Deuterosminthurus novemlineatus* (Tullberg, 1929): Moroz, Maksimenkov, 2006: 58; Moroz, Laenko, 2013: 79.

*Heterosminthurus novemlineatus*: Buşmachi, 2010: 120; Fjellberg et al., 2013.

#### Family Dicyrtomidae

##### Genus *Dicyrtoma* Bourlet, 1842

*Dicyrtoma fusca* (Lubbock, 1873)

**Records for the region.** *Dicyrtoma fusca* Lucas, 1849 f. *principalis*: Stach, 1957: 70.

*Dicyrtoma fusca* Lucas, 1849: Grinbergs, 1960: 62.

*Dicyrtoma fusca*: Buşmachi, 2010: 120; GBIF.org, 2023.

##### Genus *Dicyrtomina* Börner, 1903

*Dicyrtomina minuta* (Fabricius, 1783)

**Records for the region.** *Dicyrtomina minuta* Fabricius, 1783 f. *principalis*: Stach, 1957: 47.

*Dicyrtoma minuta* Fabricius, 1783: Grinbergs, 1960: 62.

*Dicyrtomina minuta* subsp. *minuta* (Fabricius, 1783): Fjellberg et al., 2013.

*Dicyrtomina minuta*: Buşmachi, 2010: 120–121; Fjellberg et al., 2013.

##### Genus *Ptenothrix* Börner, 1906

*Ptenothrix atra* (Linnaeus, 1758)

**Records for the region.** *Ptenothrix atra* Linnaeus, 1758: Stach, 1957: 90; Buşmachi, 2010: 120.

*Dicyrtoma atra* Linnaeus, 1758: Grinbergs, 1960: 63.

*Ptenothrix atra*: Kuznetsova, 1984: 257; Kuznetsova, 1988: 42; Sterzyńska, Kuznetsova, 1995: 149; Fjellberg et al., 2013.

*Ptenothrix leucostrigata* Stach, 1957

**Records for the region.** *Ptenothrix leucostrigata* Stach, 1957: Buşmachi, 2010: 120.

*Ptenothrix leucostrigata*: Stach, 1957: 101; Fjellberg et al., 2013.

#### Family Katiannidae

##### Genus *Sminthurinus* Börner, 1901

*Sminthurinus aureus* (Lubbock, 1862)

**Records for the region.** Chernov et al., 2010: 564.

*Sminthurinus domesticus* Gisin, 1963

**Records for the region.** *Sminthurinus niger* Gisin, 1963: Kuznetsova, 1984: 257.

*Sminthurinus igniceps* Reuter, 1881

**Records for the region.** *Sminthurinus ignipes* Reuter, 1881: Grinbergs, 1960: 58.

*Sminthurinus ignipes* Reuter, 1881: Buşmachi, 2010: 120.

*Sminthurinus igniceps*: Stach, 1956: 114; Martynova, 1964a: 96.

*Sminthurinus niger* (Lubbock, 1862)

**Records for the region.** *Sminthurinus niger* Lubbock, 1867: Kuznetsova, 1988: 42.

#### Family Sminthurididae

##### Genus *Allacma* Börner, 1906

*Allacma fusca* (Linnaeus, 1758)

**Records for the region.** *Sminthurus fuscus* Linnaeus, 1758: Grinbergs, 1960: 62; Molodova, 1986: 300–301.

*Sminthurus fuscus* Tullberg, 1871: Kuznetsova, 1984: 257.

*Allacma fusca*: Stach, 1956: 221; Buşmachi, 2010: 120; GBIF.org, 2023.

##### Genus *Caprainea* Dallai, 1970

*Caprainea marginata* (Schött, 1893)

**Records for the region.** Chernov et al., 2010: 564.

##### Genus *Lipothrix* Börner, 1906

*Lipothrix lubbocki* (Tullberg, 1872)

**Records for the region.** *Sphyrotheca lubbocki* Tullberg, 1872: Stach, 1956: 214; Kuznetsova, 1984: 257.

*Sminthurus* (*Sphyrotheca*) *lubbocki* Tullberg, 1872: Grinbergs, 1960: 60.

*Lipothrix lubbocki*: Kuznetsova, 1988: 40; Sterzyńska, Kuznetsova, 1995: 149; Buşmachi, 2010: 120; Fjellberg et al., 2013.

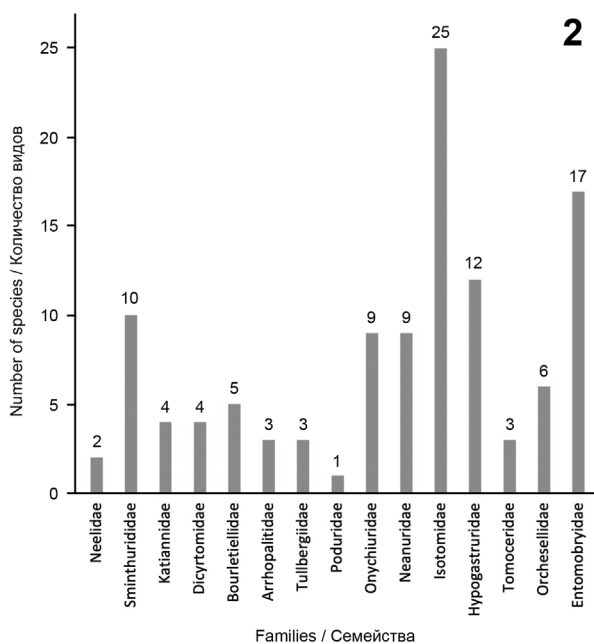
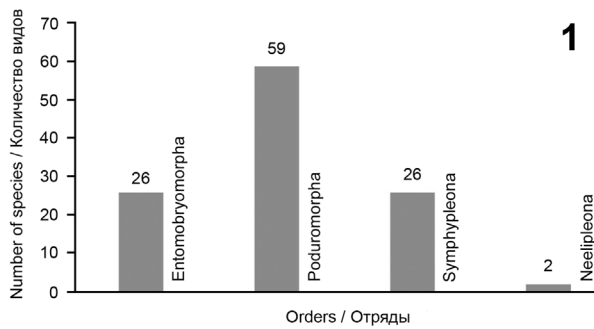
##### Genus *Sminthurides* Börner, 1900

*Sminthurides* sp.

**Records for the region.** Radzymovsky, Polishchuk, 1970: 179; Kuznetsova, 1988: 42.

*Sminthurides aquaticus* (Bourlet, 1843)

**Records for the region.** *Sminthurides aquatica* (Bourlet, 1843): Moroz et al., 2022: 8.



Figs 1–2. Taxonomic structure of springtails of Belarus.

1 – orders; 2 – families.

Рис. 1–2. Таксономическая структура ногохвосток Беларуси.

1 – отряды; 2 – семейства.

*Sminthurides aquaticus*: Stach, 1956: 25; Grinbergs, 1960: 55; Radzymovsky, Polishchuk, 1970: 179; Moroz et al., 2002a: 90; Moroz et al., 2004a: 201; Moroz et al., 2005: 100–101; Moroz, Maksimenkov, 2006: 58; Moroz et al., 2013b: 92; Buřmachiu, 2010: 118–119, 121; Tishchikov et al., 2013: 160; Moroz, Laenko, 2013: 79; Moroz et al., 2018c: 75; Borodin, Krasouski, 2020.

*Sminthurides malmgreni* (Tullberg, 1877)

**Records for the region.** *Sminthurides malmgreni* Tullberg, 1876: Grinbergs, 1960: 56.

*Sminthurides malmgreni*: Stach, 1956: 31; Buřmachiu, 2010: 120.

*Sminthurides pseudassimilis* Stach, 1956

**Records for the region.** *Sminthurides pseudoassimilis* Stach, 1956: Buřmachiu, 2010: 120.

*Sminthurides pseudassimilis*: Stach, 1956: 45; Grinbergs, 1960: 56.

*Sminthurides schoetti* Axelson, 1903

**Records for the region.** Kuznetsova, 1984: 257.

**Genus *Sminthurus* Latreille, 1802**

*Sminthurus* sp.

**Records for the region.** Antipov et al., 1986: 420; Antipov et al., 1989: 422.

*Sminthurus viridis* (Linnaeus, 1758)

**Records for the region.** *Sminthurus* (*Sminthurus*) *viridis* Linnaeus, 1758: Grinbergs, 1960: 60.

*Sminthurus viridis*: Stach, 1956: 271; Chumakov, 1985: 71; Buřmachiu, 2010: 120; Fjellberg et al., 2013.

**Genus *Spatulosminthurus* Betsch et Betsch-Pinot, 1983**

*Spatulosminthurus flaviceps* (Tullberg, 1871)

**Records for the region.** *Sminthurus flaviceps* Tullberg, 1871: Stach, 1956: 259; Chumakov, 1985: 71.

*Sminthurus* (*Sminthurus*) *flaviceps* Tullberg, 1871: Grinbergs, 1960: 60.

*Spatulosminthurus flaviceps*: Buřmachiu, 2010: 119.

**Genus *Sphaeridia* Linnaniemi, 1912**

*Sphaeridia pumilis* (Krausbauer, 1898)

**Records for the region.** *Sminthurides pumilis* Krausbauer, 1898: Grinbergs, 1960: 55.

*Sphaeridia pumilis*: Stach, 1956: 52; Kuznetsova, 1984: 257; Sterzyńska, Kuznetsova, 1995: 149; Buřmachiu, 2010: 119; Borodin, Krasouski, 2020.

## Conclusion

After conducting the analysis of all available scientific publications, a checklist of the species observed on the modern territory of Belarus has been compiled. In total, 113 species of Collembola from 4 orders and 15 families have been recorded (Figs 1, 2). Eleven taxa were not identified to species.

Confirmation is required for the following species: *Coecobrya tenebricosa*, *Willemia scandinavica*, *Desoria olivacea*, *Entomobrya muscorum*, *Entomobryoides purpurascens*, *Ballistura tuberculata*, *Pseudosinella zygophora*, *Morulina gigantea*.

Currently, several species mentioned earlier were identified *sensu lato*, but now they have been separated and consolidated into species-groups. As a result, many early records of springtails are obsolete. At present, the *Isotoma viridis* species-group includes the following species: *I. viridis*, *I. anglicana* Lubbock, 1862, *I. caerulea* Bourlet, 1839 and *I. riparia* [Burkhardt, Filser, 2005], as well as the *Parisotoma notabilis* species-group, including *P. notabilis*, *P. agrelli* (Deboutteville, 1950), *P. reducta* (Rusek, 1984), *P. ekmani*, *P. trichaetosa* Martynova, 1977 [Striuchkova et al., 2022], requires confirmation. Early records of *Lepidocyrtus lignorum* may correspond to the following species within the *lignorum* species-group: *L. lignorum*,

*L. lanuginosus*, *L. pallidus* Reuter, 1892, *L. violaceus* Lubbock, 1873 [Mateos, Álvarez-Presas, 2022].

At present, the estimated diversity of the Collembola species in Belarus is 47.48% of possibly identified species. Determination of the structure of the Collembola fauna in Belarus requires comprehensive studies in various biotopes and on different types of soils.

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## A contribution to the aphid fauna (Homoptera: Aphidinea) of Kaliningrad Region, Russia

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**Abstract.** The study of the aphid fauna in Kaliningrad Region (Russia) started in 60s of the 20<sup>th</sup> century, but a regional checklist has not been published yet. Based on material deposited in the collection of the Zoological Institute of the Russian Academy of Sciences and the Belarusian State University and data scattered in various scientific publications, we compiled the first comprehensive list of aphids recorded from Kaliningrad Region. The list includes 61 genera, 110 species and two subspecies of which 30 species and one subspecies are recorded in the region for the first time. The recorded taxonomic diversity is lower than in the nearby countries – Poland, Lithuania and Latvia. At least 11 species (10% of the faunal list) are alien for the regional fauna.

**Key words:** Homoptera, Aphidinea, alien species, Baltic region, new faunal records, regional checklist.

### К фауне тлей (Homoptera: Aphidinea) Калининградской области, Россия

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**Резюме.** Исследования фауны тлей в Калининградской области были начаты в 60-е годы XX столетия, однако до настоящего времени ни одного чек-листа тлей региона не было опубликовано. На основе материалов, хранящихся в коллекциях Зоологического института РАН и Белорусского государственного университета, и данных, имеющихся в научных публикациях, мы составили первый максимально полный список тлей, зарегистрированных в Калининградской области. Он включает 61 род, 110 видов и 2 подвида, из которых 30 видов и 1 подвид впервые отмечаются для фауны области. Выявленное таксономическое разнообразие тлей на территории Калининградской области оказалось меньше, чем в соседних странах – Польше, Литве и Латвии. Не менее 11 видов (10% видового богатства известной к настоящему времени региональной фауны тлей) являются чужеродными для фауны Калининградской области.

**Ключевые слова:** Homoptera, Aphidinea, чужеродные виды, балтийский регион, новые фаунистические находки, региональный список видов.

## Introduction

Kaliningrad Region is the westernmost region of Russia located on the coast of the Baltic Sea. The area of the region is 15,125 km<sup>2</sup>, its maximum length from west to east is 205 km, from north to south – 108 km. The relief of the region is a hilly plain, some parts of which are below the sea level. The average absolute height of the land surface of Kaliningrad Region above the level of the World Ocean is 15 meters. The climate of Kaliningrad Region is transitional from maritime to temperate continental, the average air temperature is about +8 °C, the maximum air temperature in summer is 22 to 26 °C, the minimum temperature in winter is from –3 to –15 °C. The heat and frosts in the region are short-term, snow cover is absent or does not last long. It rains on average 185 days a year, the annual amount of precipitation varies across the region from 600 to 740 mm. The territory of Kaliningrad Region belongs to the zone of mixed coniferous-deciduous forests. At the present time forests in the region are predominantly secondary – both naturally regenerated and planted in the 18<sup>th</sup>–19<sup>th</sup> centuries after broad-leaved forests were cut down.

The first studies of the aphid fauna of Kaliningrad Region were carried out by A. Rupais in 60s of the 20<sup>th</sup> century, they concerned pests of trees and shrubs in green areas. In his paper based on the results of these studies, Rupais [1964] listed 41 aphid species. Five years later, the book “Atlas of the Baltic dendrophilous plantlice” [Rupais, 1969] was published, in which 36 more species found after the publication of 1964 were given for Kaliningrad Region.

Recently, a short report on the aphid fauna of the arboretum of the Botanical Garden of Immanuel Kant Baltic Federal University (Kaliningrad) was published [Buga, 2020]. Of the twelve aphid species listed in the article, five were not mentioned in Rupais’s publications. There is no other information in the scientific literature about the aphid fauna of this region, except for the work by Rakauskas [2003] devoted to the possibility of formation of intermediate morphs in aphids, which mentions the discovery in Kaliningrad Region *Aphis (Bursaphis) schneideri* (Börner, 1940), a species already mentioned earlier for this area [Rupais, 1969]. Thus, up to now, 80 species of aphids have been known in the region, while

all of them were confined to trees and shrubs, and their possible presence on herbaceous plants was discussed only for dioecious species.

The authors of the present work started their research in Kaliningrad Region in 1982. First A.V. Stekolshchikov, then S.V. Buga, and in recent years A.R. Manukyan made aphid samples on the studied territory, which allowed us to significantly expand the list of aphid species known in this region.

## Material and methods

The article is based on materials collected in Kaliningrad Region by A.V. Stekolshchikov in 1982, by S.V. Buga in 1994–1998, 2000, 2016 and by A.R. Manukyan in 2022. In addition, the authors used materials from several collections of aphids from willow (*Salix*), which were made in Kaliningrad Region in 1997 by A.I. Khalaim (Zoological Institute of the Russian Academy of Sciences, St Petersburg, Russia).

Collection localities. For listing the material examined, the following notation is used:

GRS – Gvardeysk District, railway stopping point “1271 km”;

GGO – Guryevsk District, Golubevo village;

GGU – Guryevsk District, Guryevsk, town green area;

GKV – Guryevsk District, near to Kosmodemyanskoe village;

KBG – Kaliningrad, arboretum of the Botanical Garden of Immanuel Kant Baltic Federal University;

KGA – Kaliningrad, city green area;

KPV – Kaliningrad, Pribrezhnyy township;

KRS – Kaliningrad, North Railway Station;

LAD – Ladushkin, near “Sosnovyy Bor” railway stopping point;

OZV – Ozersk District, Zhuchkovo village;

SGA – Svetlogorsk, town green area;

SMF – Svetlogorsk, mixed forest near the town;

YAN – Yantarnyy urban-type settlement;

ZCP – Zelenogradsk District, Curonian Spit;

ZGA – Zelenogradsk District, Zelenogradsk, town green area;

ZMO – Zelenogradsk District, Morskoe urban-type settlement, green area;

ZRS – Zelenogradsk District, Rybachiy urban-type settlement, green area.

The microscope slides were prepared using Faure-Berlese mounting fluid [Shaposhnikov, 1964]. The specimens were examined using Leica DM E light microscope, stereomicroscopes Nikon SMZ25 and Zeiss Stemi 2000. Aphid identifications were done with reference to authoritatively identified material from the collections of the Zoological Institute of the Russian Academy of Sciences.

Aphid taxonomic classification follows Shaposhnikov [1964]. In this classification Pterocommatinae is considered as a separate subfamily of Aphididae, and Drepanosiphidae includes several subfamilies.

The names of plant species are given according to the World Flora Online [www.worldfloraonline.org].

All reviewed microscope slides are deposited in the collections of the Zoological Institute of the Russian Academy of Sciences and Zoological Department of the Belarusian State University (Minsk, Belarus).

Abbreviations. Aphid morphs: al. – alate female, apt. – apterous female. Collectors: AM – A.R. Manukyan, AKh – A.I. Khalaim, AS – A.V. Stekolshchikov, SB – S.V. Buga.

### Order Homoptera Suborder Aphidinea Superfamily Adelgoidea Family Adelgidae *Adelges laricis* Vallot, 1836

**Records for the region.** *Larix* sp., without faunal data [Rupais, 1964].

*Adelges tardus* (Dreyfus, 1888)

**Records for the region.** *Picea abies* (L.) H. Karst., without faunal data, pseudo-fundatrices [Rupais, 1964].

*Adelges (Aphrastasia) pectinatae* (Cholodkovsky, 1888)

**Records for the region.** *Abies* sp., without faunal data [Rupais, 1964].

*Adelges (Cholodkovskya) viridanus* (Cholodkovsky, 1896)

**Records for the region.** *Larix* sp., Guryevsk Distr., Guryevsk [Rupais, 1964].

*Adelges (Dreyfusia) piceae* (Ratzeburg, 1844)

**Records for the region.** *Abies concolor* (Gordon et Glend.) Lindl. ex Hildebr., Guryevsk Distr. (Rodniki vill., 7.08.1962) [Rupais, 1964].

*Adelges (Sacchiphantes) abietis* (Linnaeus, 1758)

**Records for the region.** *Picea abies* (L.) H. Karst., *Picea glauca* (Moench) Voss, without faunal data [Rupais, 1964].

### Superfamily Phylloxeroidea Family Phylloxeridae *Phylloxera coccinea* (von Heyden, 1837)

**Material.** ZCP: apt., *Quercus robur* L., on underside of leaves, 12.08.1996 (SB); GGU: apt., *Quercus robur* L., on underside of leaves, 17.08.1998 (SB).

### Superfamily Aphidoidea Family Eriosomatidae Subfamily Eriosomatinae Tribe Eriosomatini *Eriosoma ulmi* (Linnaeus, 1758)

**Material.** KBG: al. (dead specimens), *Ulmus* sp., in specific leaf gall, 10.08.1995 (SB); GGU: apt., *Ribes rubrum* hort. cv., on thin roots, 14.08.1998 (SB).

**Records for the region.** *Ulmus glabra* Huds., *Ulmus* sp., without faunal data [Rupais, 1964, as

“*Schizoneura ulmi* L.”; without faunal data [Rupais, 1969]; *Ulmus* sp., Kaliningrad, the Botanical Garden of Immanuel Kant Baltic Federal University [Buga, 2020].

#### Tribe Tetraneurini

*Kaltenbachiella pallida* (Haliday, 1838)

**Records for the region.** *Ulmus glabra* Huds., *Ulmus minor* Mill., in various locations including Guryevsk Distr. (Vasilkovo vill.) [Rupais, 1964, as “*Schizoneura ulmi* L.”]; without faunal data [Rupais, 1969].

*Tetraneura ulmi* (Linnaeus, 1758)

**Records for the region.** *Ulmus glabra* Huds., *Ulmus minor* Mill., in various locations including Zelenogradsk Distr. (Roshchino vill.), Guryevsk Distr. (Nizovie vill.), Nesterov Distr. (Yasnaya Polyana vill.), Krasnoznamensk Distr. (Krasnoznamensk), and Yantarnyy urban-type settlement [Rupais, 1964, as “*Byrsocrypta ulmi* L.”]; without faunal data [Rupais, 1969].

#### Subfamily Pemphiginae

*Pachypappa vesicalis* Koch, 1856

**Records for the region.** *Populus alba* L., without faunal data [Rupais, 1964].

*Pemphigus bursarius* (Linnaeus, 1758)

**Records for the region.** *Populus nigra* L., in various locations including Gvardeysk Distr., Gvardeysk [Rupais, 1964].

*Pemphigus spyrothecae* Passerini, 1856

**Material.** KGA: al. (sexuparae), *Populus nigra* L. ‘Italica’ in spiral shape galls on leaf petioles, 14.25.08.1997, 16.08.1998 (SB).

**Records for the region.** *Populus nigra* L., in various locations including Gvardeysk Distr., Gvardeysk [Rupais, 1964].

#### Subfamily Prociphilinae

*Prociphilus (Stagona) pini* (Burmeister, 1835)

**Records for the region.** Without faunal data [Rupais, 1969, as “*Prociphilus crataegi* (Tullgr.)”].

*Prociphilus (Stagona) xylostei* (de Geer, 1773)

**Material.** KBG: al., *Lonicera* sp., on a growing shoot among wax flakes, 10.08.1995 (SB).

**Records for the region.** Without faunal data [Rupais, 1969]; *Lonicera* sp., Kaliningrad, the Botanical Garden of Immanuel Kant Baltic Federal University [Buga, 2020].

*Thecablus affinis* (Kaltenbach, 1843)

**Material.** KBG: al. (dead specimens), *Populus* sp., in specific leaf gall, 10.08.1995 (SB).

**Records for the region.** *Populus ×berolinensis* Dippel, in various locations including Krasnoznamensk

Distr., Krasnoznamensk [Rupais, 1964]; without faunal data [Rupais, 1969]; *Populus* sp., Kaliningrad, the Botanical Garden of Immanuel Kant Baltic Federal University [Buga, 2020].

#### Family Lachnidae

##### Subfamily Lachninae

*Lachnus roboris* (Linnaeus, 1758)

**Records for the region.** Without faunal data [Rupais, 1969].

##### Subfamily Eulachninae

*Cinara (Cupressobium) cupressi* (Buckton, 1881)

**Records for the region.** *Thuja* sp., Zelenogradsk Distr. (Kotelnikovo vill.), Gvardeysk Distr. (Krasnyy Yar vill.) [Rupais, 1964].

*Cinara (Schizolachnus) pineti* (Fabricius, 1781)

**Material.** KBG: apt., *Pinus mugo* Turra, on needles, 10.08.1995 (SB).

**Records for the region.** *Pinus* sp., Kaliningrad, the Botanical Garden of Immanuel Kant Baltic Federal University [Buga, 2020].

#### Family Thelaxidae

*Glyphina betulae* (Linnaeus, 1758)

**Records for the region.** *Betula* sp., without faunal data [Rupais, 1964]; without faunal data [Rupais, 1969].

*Thelaxes dryophila* (Schrank, 1801)

**Material.** KGA: apt., *Quercus robur* L., on underside of leaves, 8.08.1996 (SB).

**Records for the region.** *Quercus alba* L., Kaliningrad, the Botanical Garden of Immanuel Kant Baltic Federal University [Rupais, 1964]; without faunal data [Rupais, 1969].

#### Family Drepanosiphidae

##### Subfamily Calaphidinae

##### Tribe Calaphidini

*Betulaphis quadrituberculata* (Kaltenbach, 1843)

**Records for the region.** *Betula pendula* Roth, Kaliningrad, the Botanical Garden of Immanuel Kant Baltic Federal University [Rupais, 1964].

*Calaphis flava* (Mordvilko, 1928)

**Material.** KBG: al., *Betula pubescens* Ehrh., on underside of leaves, 10.08.1995 (SB).

**Records for the region.** *Betula* sp., Kaliningrad, the Botanical Garden of Immanuel Kant Baltic Federal University [Buga, 2020].

*Euceraphis betulae* (Koch, 1855)

**Material.** LAD: al., *Cicuta virosa* L. (accidentally), on basal leaf, 4.08.1982 (AS).



*Euceraphis punctipennis* (Zetterstedt, 1828)

**Material.** LAD: al., *Angelica sylvestris* L. (accidentally), on basal leaf, 12.08.1982 (AS); KBG: al., *Betula* sp., on underside of leaves, 10.08.1995 (SB); SMF: al., *Betula pendula* Roth, on underside of leaves, 11.08.1995 (SB); KGA: al., *Betula pendula* Roth, on underside of leaves, 14.08.1997 (SB).

**Records for the region.** *Betula* sp., without faunal data [Rupais, 1964]; without faunal data [Rupais, 1969]; *Betula* sp., Kaliningrad, the Botanical Garden of Immanuel Kant Baltic Federal University [Buga, 2020].

*Monaphis antennata* (Kaltenbach, 1843)

**Material.** KBG: al., *Betula* sp., on underside of leaves, 10.08.1995 (SB).

**Records for the region.** *Betula* sp., Kaliningrad, the Botanical Garden of Immanuel Kant Baltic Federal University [Buga, 2020].

*Symydobius oblongus* (von Heyden, 1837)

**Material.** KBG: apt., *Betula* sp., on bark of branches and twigs, 10.08.1995 (SB).

**Records for the region.** *Betula* sp., Kaliningrad, the Botanical Garden of Immanuel Kant Baltic Federal University [Buga, 2020].

**Tribe Panaphidini****Subtribe Myzocallidina***Myzocallis carpini* (Koch, 1855)

**Material.** ZGA: al., *Carpinus betulus* L., on underside of leaves, 13.08.1994, 14.08.1995 (SB); KGA: al., *Carpinus betulus* L., on underside of leaves, 14.08.1997 (SB).

**Records for the region.** *Carpinus betulus* L., without faunal data [Rupais, 1964, as “*Myzocallis coryli* Goetze”]; without faunal data [Rupais, 1969]; *Carpinus betulus* L., Kaliningrad, the Botanical Garden of Immanuel Kant Baltic Federal University [Buga, 2020].

*Myzocallis coryli* (Goeze, 1778)

**Material.** GGU: al., *Corylus avellana* L., on underside of leaves, 18.08.1994 (SB); SMF: al., *Corylus avellana* L., on underside of leaves, 11.08.1995 (SB).

**Records for the region.** *Corylus avellana* L., without faunal data [Rupais, 1964]; without faunal data [Rupais, 1969].

*Tuberculatus annulatus* (Hartig, 1841)

**Material.** SMF: al., *Quercus robur* L., on underside of leaves, 11.08.1995 (SB); GGU: al., *Quercus robur* L., on underside of leaves, 17.08.1998 (SB).

**Records for the region.** *Quercus robur* L., *Quercus macranthera* Fisch. et C.A. Mey. ex Hohen., *Quercus petraea* (Matt.) Liebl., without faunal data [Rupais, 1964]; without faunal data [Rupais, 1969].

*Tuberculatus neglectus* (Krzywiac, 1966)

**Material.** GGU: al., *Quercus petraea* (Matt.) Liebl., on underside of leaves, 18.08.1994 (SB); KBG: al., *Quercus petraea* (Matt.) Liebl., on underside of leaves, 10.08.1995 (SB).

**Records for the region.** *Quercus petraea* (Matt.) Liebl., Kaliningrad, the Botanical Garden of Immanuel Kant Baltic Federal University [Buga, 2020].

**Subtribe Panaphidina***Eucallipterus tiliae* (Linnaeus, 1758)

**Material.** LAD: al., *Aegopodium podagraria* L. (accidentally), on basal leaf, 12.08.1982 (AS); SGA: apt., *Tilia cordata* Mill., on underside of leaves, 17.08.1994 (SB); GGU: al., *Tilia cordata* Mill., on underside of leaves, 12.08.1998 (SB); KGA: apt., *Tilia cordata* Mill., on underside of leaves, 18.08.1998 (SB); YAN: al., *Tilia* sp., 3.07.2021 (AM); ZRV: al., *Tilia* sp., 6.07.2021 (AM).

**Records for the region.** *Tilia cordata* Mill., *Tilia europaea* L., *Tilia platyphyllos* Scop., in various locations including Chernyakhovsk Distr. (Chernyakhovsk), Guryevsk Distr. (Kamenka vill.), Zelenogradsk Distr. (Gorbatovka vill.), Ozersk Distr. (Yudino vill.), Kaliningrad [Rupais, 1964]; without faunal data [Rupais, 1969].

*Panaphis juglandis* (Goeze, 1778)

**Material.** GGU: al., *Juglans regia* L., on underside of leaves, 6.08.2016 (SB).

*Pterocallis alni* (de Geer, 1773)

**Records for the region.** *Alnus glutinosa* (L.) Gaertn., without faunal data [Rupais, 1964]; without faunal data [Rupais, 1969].

*Tinocallis (Eotinocallis) platani* (Kaltenbach, 1843)

**Material.** SGA: apt., *Ulmus laevis* Pall., on underside of leaves, 17.08.1994 (SB); GGU: al., *Ulmus laevis* Pall., on underside of leaves, 5.08.2016 (SB).

**Records for the region.** *Ulmus laevis* Pall., Guryevsk Distr. (Nizovie vill.), Nesterov Distr. (Yasnaya Polyana vill.) [Rupais, 1964]; without faunal data [Rupais, 1969].

**Tribe Therioaphidini***Appendiseta robiniae* (Gillette, 1907)

**Material.** GGU: al., *Robinia pseudoacacia* L., on underside of leaves, 5.08.2016 (SB).

**Subfamily Drepanosiphinae***Drepanosiphum platanoidis* (Schränk, 1801)

**Material.** SGA: al., *Acer pseudoplatanus* L., on underside of leaves, 17.08.1994 (SB); KBG: al., *Acer pseudoplatanus* L., on underside of leaves, 10.08.1995 (SB); GGU: al., *Betula pendula* Roth (accidentally), on underside of leaves, 12.08.1998 (SB); KGA: al., *Acer* sp., 28.06.2021 (AM).

**Records for the region.** *Acer pseudoplatanus* L., Ozersk Distr. (Yudino vill.), Kaliningrad, Guryevsk Distr. (Vasilkovo vill.) [Rupais, 1964]; without faunal data [Rupais, 1969]; *Acer pseudoplatanus* L., Kaliningrad, the Botanical Garden of Immanuel Kant Baltic Federal University [Buga, 2020].

**Subfamily Phyllaphidinae***Phyllaphis fagi* (Linnaeus, 1761)

**Records for the region.** *Fagus sylvatica* L., without faunal data [Rupais, 1964]; without faunal data [Rupais, 1969].

**Family Chaitophoridae****Subfamily Chaitophorinae****Tribe Chaitophorini***Chaitophorus caprae* (Mosley, 1841)

**Records for the region.** Without faunal data [Rupais, 1969].

*Chaitophorus leucomelas* Koch, 1854

**Records for the region.** Without faunal data [Rupais, 1969].

*Chaitophorus nassonowi* Mordvilko, 1894

**Records for the region.** Without faunal data [Rupais, 1969].

*Chaitophorus populeti* (Panzer, 1801)

**Material.** ZCP: apt., *Populus tremula* L., on leaf petioles and underside of leaves, 14.08.1996 (SB).

**Records for the region.** Without faunal data [Rupais, 1969].

*Chaitophorus populialbae* (Boyer de Fonscolombe, 1841)

**Records for the region.** *Populus alba* L., without faunal data [Rupais, 1964]; without faunal data [Rupais, 1969].

*Chaitophorus salicti* (Schrank, 1801)

**Material.** GKV: apt., *Salix caprea* L., on leaves and young shoots, 16.05.1997 (AKh); ZCP: apt., al., *Salix repens* L., *Salix cinerea* L., 19.06.1997 (AKh).

*Chaitophorus salijaponicus niger* Mordvilko, 1929

**Material.** ZCP: apt., al., *Salix repens* L., on leaves, 19.06.1997 (AKh); KGA: apt., *Salix* sp., on underside of leaves, 16.08.1998 (SB).

*Chaitophorus tremulae* Koch, 1854

**Records for the region.** Without faunal data [Rupais, 1969].

*Chaitophorus vitellinae* (Schrank, 1801)

**Records for the region.** Without faunal data [Rupais, 1969].

**Tribe Periphyllini***Periphyllus acericola* (Walker, 1848)

**Material.** SGA: al., *Acer pseudoplatanus* L., on underside of leaves, 17.08.1994 (SB).

**Records for the region.** Without faunal data [Rupais, 1969].

*Periphyllus aceris* (Linnaeus, 1761)

**Material.** KGA: al., *Acer platanoides* L., on underside of leaves, 14.08.1997 (SB).

**Records for the region.** *Acer platanoides* L., Krasnoznamen'sk Distr. (Fevralskoe vill.) [Rupais, 1964, as "*Periphyllus acer* L."]; without faunal data [Rupais, 1969].

*Periphyllus lyropictus* (Kessler, 1886)

**Material.** SGA: apt., *Acer platanoides* L., on underside of leaves, 17.08.1994, 11.08.1995 (SB).

*Periphyllus testudinaceus* (Ferne, 1852)

**Material.** SGA: apt., *Acer platanoides* L., on underside of leaves, 17.08.1994 (SB).

**Records for the region.** *Acer saccharinum* L., *Acer pseudoplatanus* L., *Acer platanoides* L., *Acer negundo* L., in various locations including Kaliningrad [Rupais, 1964]; without faunal data [Rupais, 1969, as "*Periphyllus villosus* (Hart.)"].

**Tribe Siphini***Laingia psammae* Theobald, 1922

**Material.** ZCP: apt., *Ammophila arenaria* (L.) Link, in naturally rolled leaves, 25.08.1997, 20.08.2000 (SB).

**Family Aphididae****Subfamily Pterocommatinae***Pterocomma pilosum* Buckton, 1879

**Material.** GKV: apt., *Salix purpurea* L., on shoot, 16.05.1997 (AKh).

*Pterocomma rufipes* (Hartig, 1841)

**Material.** ZCP: apt., *Salix xfragilis* L., on young shoots, 19.06.1997 (AKh).

**Records for the region.** Without faunal data [Rupais, 1969].

*Pterocomma salicis* (Linnaeus, 1758)

**Material.** OZV: apt., al., *Salix viminalis* L., on young shoots, 1.07.1997 (AKh); ZCP: al., *Salix myrsinifolia* Salisb., on shoot, 6.07.1997 (AKh); GRS: apt., *Salix cinerea* L., on young shoot, 27.07.1997 (AKh).

**Subfamily Aphidinae****Tribe Aphidini****Subtribe Rhopalosiphina***Hyalopterus pruni* (Geoffroy, 1762)

**Material.** LAD: apt., al., *Sium latifolium* L. (accidentally), on basal leaf, 12.08.1982 (AS); ZMO: apt., *Prunus* sp., 24.07.2021 (AM).

**Records for the region.** Without faunal data [Rupais, 1969].

*Rhopalosiphum nymphaeae* (Linnaeus, 1761)

**Records for the region.** Without faunal data [Rupais, 1969].

*Rhopalosiphum padi* (Linnaeus, 1758)

**Records for the region.** *Prunus padus* L., in numerous locations [Rupais, 1964]; without faunal data [Rupais, 1969].

**Subtribe Aphidina***Aphis craccivora* Koch, 1854

**Material.** GGU: apt., *Robinia pseudoacacia* L., on underside of leaves and growing shoots, 5.08.2016 (SB).

**Records for the region.** On various plants, including *Robinia pseudoacacia* L., without faunal data [Rupais, 1969].

*Aphis fabae fabae* Scopoli, 1763

**Material.** LAD: apt., al., *Cicuta virosa* L., on umbel rays, 4, 17.08.1982 (AS); al., *Daucus carota* L., on umbel rays, 8.08.1982 (AS); al., *Torilis japonica* (Houtt.) DC., on umbel rays, 9.08.1982 (AS); apt., al., *Angelica sylvestris* L., on umbel rays, 12, 15.08.1982 (AS); ZCP: al., *Valeriana officinalis* L., on umbel rays, 24.08.1998 (SB); al., *Hippophae rhamnoides* L., on growing shoots, 24.08.1998 (SB).

**Records for the region.** Without faunal data [Rupais, 1969].

*Aphis fabae evonymi* Fabricius, 1775

**Records for the region.** *Euonymus europaeus* L., Svetlyy urban county (Volochnavskoe vill., 21.07.1962), and Polesk Distr. (Zhuravlevka vill., 10.08.1962) [Rupais, 1964, as "*Aphis cognatella* Scop."]; without faunal data [Rupais, 1969, as "*Aphis cognatella* Scop."].

*Aphis fabae cirsiacanthoidis* Scopoli, 1763

**Material.** GGU: apt., *Philadelphus coronaries* L., on underside of leaves and growing shoots, 5.08.2016 (SB); GGO: apt., al., *Carduus* sp., 17.07.2021 (AM).

*Aphis farinosa* Gmelin, 1790

**Material.** GKV: apt., *Salix caprea* L., on leaves and young shoots, 16.05.1997 (AKh); ZCP: apt., oviparous female, *Salix repens* L., on apices of young shoots, 19.06.1997 (AKh).

*Aphis idaei* van der Goot, 1912

**Records for the region.** Without faunal data [Rupais, 1969].

*Aphis lambersi* (Börner, 1940)

**Material.** LAD: apt., *Daucus carota* L., on root collar and in leaf-sheath of basal leaves, 9.08.1982 (AS).

*Aphis pomi* de Geer, 1773

**Material.** ZCP: apt., *Malus sylvestris* (L.) Mill., on underside of leaves and growing shoots, 24.08.1997, 16.08.1998 (SB).

**Records for the region.** *Crataegus monogyna* Jacq., *Sorbus aucuparia* L., *Malus* sp., in various locations including Guryevsk Distr. (Razino vill., 13.08.1962), Zelenogradsk Distr. (Russkoe vill., 14.08.1962, and Zelenogradsk, 15.08.1962), Gvardeysk Distr. (Gvardeysk, 9.08.1962) [Rupais, 1964]; without faunal data [Rupais, 1969].

*Aphis ruborum* (Börner ex Börner et Schilder, 1931)

**Records for the region.** Without faunal data [Rupais, 1969].

*Aphis sambuci* Linnaeus, 1758

**Material.** KGA: apt., *Sambucus* sp., on leaf petioles, 18.08.1998 (SB).

**Records for the region.** *Sambucus nigra* L., in numerous locations [Rupais, 1964]; without faunal data [Rupais, 1969].

*Aphis subnitida* (Börner, 1940)

**Material.** apt., *Pimpinella saxifraga* L., on stem, umbel rays, leaf petioles in basal part of plant, basal part of stem, root collar and in leaf-sheath of basal leaves, 13, 18, 20.08.1982 (AS).

*Aphis urticata* Gmelin, 1790

**Material.** KRS: apt., *Urtica dioica* L., on stem, leaf petioles and underside of leaves, 12.08.1995 (SB).

*Aphis viburni* Scopoli, 1763

**Material.** ZCP: apt., *Viburnum opulus* L., on underside of leaves, 14.08.1996 (SB).

**Records for the region.** *Viburnum* sp., Svetlogorsk Distr. (Donskoe vill.), Chernyakhovsk Distr. (Kamenskoe vill.), Pravdinsk Distr. (Zheleznodorozhnyy), and Kaliningrad (the Botanical Garden of Immanuel Kant Baltic Federal University) [Rupais, 1964]; without faunal data [Rupais, 1969].

*Aphis (Bursaphis) schneideri* (Börner, 1940)

**Records for the region.** Without faunal data [Rupais, 1969]; *Ribes* spp., Zelenogradsk Distr., Zelenogradsk, 10.08.1996 [Rakauskas, 2003].

## Tribe Macrosiphini

## Subtribe Anuraphidina

*Anuraphis farfarae* (Koch, 1854)

**Material.** ZCP: apt., *Petasites spurius* (Retz.) Reichb., on underground parts of leaf petioles and underground shoots, 9.08.1996 (SB).

*Anuraphis subterranea* (Walker, 1852)

**Material.** LAD: apt., *Heracleum sphondylium* subsp. *sibiricum* (L.) Simonk., in leaf-sheath of basal leaves, on root collar and on roots, 6, 11.08.1982 (AS).

*Brachycaudus (Brachycaudus) helichrysi*  
(Kaltenbach, 1843)

**Material.** GGU: apt., *Jacobaea vulgaris* Gaertn., on underside of leaves and growing shoots, 4.07.1996 (SB); ZGA: apt., *Leucanthemum maximum* (Ramond) DC., on stems under inflorescences, 14.08.1997 (SB).

*Brachycaudus (Brachycaudus) spiraeae* Börner, 1932

**Records for the region.** *Spiraea alba* Du Roi and *Spiraea salicifolia* L., without faunal data; *Spiraea xbillardii* Hérincq, in various locations including Guryevsk Distr. (Vasilkovo vill.) and Baltiysk Distr. (Primorsk) [Rupais, 1964]; without faunal data [Rupais, 1969].

*Brachycaudus (Prunaphis) cardui* (Linnaeus, 1758)

**Records for the region.** Without faunal data [Rupais, 1969].

*Dysaphis crataegi* (Kaltenbach, 1843), s. l.

**Records for the region.** Without faunal data [Rupais, 1969].



*Dysaphis hirsutissima* (Börner, 1940)

**Material.** ZCP: apt., *Anthriscus sylvestris* (L.) Hoffm., on root collar, 24.08.1998 (SB).

**Subtribe Liosomaphidina***Cavariella aegopodii* (Scopoli, 1763)

**Material.** LAD: apt., *Sium latifolium* L., on stem near umbrella and umbel rays, 6.08.1982 (AS); apt., *Pimpinella saxifrage* L., in leaf-sheath, 17, 20.08.1982 (AS).

*Cavariella konoii* Takahashi, 1939

**Material.** LAD: apt., *Cicuta virosa* L., on leaves and umbel rays, 4.08.1982 (AS); apt., *Angelica sylvestris* L., on umbel rays, 12.08.1982 (AS).

*Cavariella pastinacae* (Linnaeus, 1758)

**Material.** LAD: apt., al., *Heracleum sphondylium* subsp. *sibiricum* (L.) Simonk., on umbel rays, 11, 18.08.1982 (AS); ZCP: al., *Salix ×fragilis* L., 25.06.1997 (AKh).

*Cavariella theobaldi* (Gillette et Bragg, 1918)

**Material.** LAD: apt., al., *Heracleum sphondylium* subsp. *sibiricum* (L.) Simonk., on umbel rays and basal part of stem, 6, 11, 16.08.1982 (AS); GKV: apt., *Salix caprea* L., on leaves, 16.05.1997 (AKh); ZCP: apt., al., *Salix ×fragilis* L., 25.06.1997 (AKh).

**Records for the region.** Without faunal data [Rupais, 1969].

*Hyadaphis foeniculi* (Passerini, 1860)

**Material.** LAD: apt., *Cicuta virosa* L., on leaves and umbel rays, 4.08.1982 (AS).

**Records for the region.** *Lonicera xylosteum* L., in various locations including of Yantarnyy urban-type settlement [Rupais, 1964, as "*Hyadaphis xylostei* Schr."]. The absence of this species in subsequent publication of Rupais [1969] suggests that it was later reidentified by the author as *Hyadaphis passerinii* (del Guercio, 1911). However, the lack of accurate data on this does not allow us to exclude this species from the list of fauna of Kaliningrad Region.

*Hyadaphis passerinii* (del Guercio, 1911)

**Record for the region.** Without faunal data [Rupais, 1969].

*Liosomaphis berberidis* (Kaltenbach, 1843)

**Material.** KBG: apt., *Berberis thunbergii* DC var. *atropurpurea* Chenault, on underside of leaves, 10.08.1995 (SB); ZGA: apt., *Berberis vulgaris* L., on underside of leaves, 14.08.1995 (SB); ZCP: apt., *Berberis vulgaris* L., on underside of leaves, 16.08.1998 (SB).

**Records for the region.** *Berberis* sp., in various locations including Kaliningrad, the Botanical Garden of Immanuel Kant Baltic Federal University [Rupais, 1964]; without faunal data [Rupais, 1969].

**Subtribe Myzina***Aulacorthum aegopodii* Börner, 1939

**Material.** GGU: apt., *Aegopodium podagraria* L., on underside of leaves, 5.08.2016 (SB).

*Myzus cerasi* (Fabricius, 1775)

**Material.** ZRV: apt., *Prunus* sp., 6.07.2021 (AM).

**Records for the region.** Without faunal data [Rupais, 1969].

*Myzus lythri* (Schrank, 1801)

**Records for the region.** Without faunal data [Rupais, 1969].

*Paramyzus heraclei* Börner, 1933

**Material.** LAD: apt., *Heracleum sphondylium* subsp. *sibiricum* (L.) Simonk., on lower side of leaves, 17.08.1982 (AS).

*Phorodon humuli* (Schrank, 1801)

**Material.** ZCP: apt., *Humulus lupulus* L., on underside of leaves, 14.08.1996 (SB).

**Records for the region.** Without faunal data [Rupais, 1969].

**Subtribe Macrosiphina***Acyrtosiphon caraganae* (Cholodkovsky, 1908)

**Records for the region.** *Caragana arborescens* Lam., in various locations including Kaliningrad, the Botanical Garden of Immanuel Kant Baltic Federal University [Rupais, 1964]; without faunal data [Rupais, 1969].

*Amphorophora rubi* (Kaltenbach, 1843)

**Records for the region.** Without faunal data [Rupais, 1969].

*Capitophorus similis* van der Goot, 1915

**Material.** ZCP: apt., *Petasites spurius* (Retz.) Reichb., on underside of leaves, 9.08.1996, 24.08.1997 (SB).

*Chaetosiphon (Pentatrachopus) tetrarhodum* (Walker, 1849)

**Records for the region.** Without faunal data [Rupais, 1969].

*Corylobium avellanae* (Schrank, 1801)

**Material.** SMF: al., apt., *Corylus avellana* L., on underside of leaves, 11.08.1995 (SB).

**Records for the region.** Without faunal data [Rupais, 1969].

*Cryptomyzus korschelti* Börner, 1938

**Records for the region.** *Ribes alpinum* L., Kaliningrad [Rupais, 1964]; without faunal data [Rupais, 1969].

*Cryptomyzus ribis* (Linnaeus, 1758)

**Records for the region.** *Ribes rubrum* L., Pravdinsk Distr. (Goncharovo vill.) [Rupais, 1964]; without faunal data [Rupais, 1969].

*Hyperomyzus lactucae* (Linnaeus, 1758)

**Records for the region.** Without faunal data [Rupais, 1969].

*Hyperomyzus (Hyperomyzella) rhinanthi*  
(Schouteden, 1903)

**Records for the region.** Without faunal data [Rupais, 1969].

*Hyperomyzus (Neonasonovia) picridis* (Börner, 1916)

**Records for the region.** Without faunal data [Rupais, 1969].

*Impatientinum asiaticum* Nevsky, 1929

**Material.** GGU: apt., *Impatiens parviflora* DC., on flower pedicels, 18.08.1994 (SB).

*Macrosiphoniella millefolii* (de Geer, 1773)

**Material.** ZCP: apt., *Achillea millefolium* L. s.l., on leaf petioles and underside of leaves, 4.08.1998 (SB).

*Macrosiphum rosae* (Linnaeus, 1758)

**Material.** KBG: apt., *Rosa* sp., on underside of leaves and growing shoots, 10.08.1995 (SB).

**Records for the region.** *Rosa rugosa* Thunb., *Rosa* sp., everywhere [Rupais, 1964, as "*Macrosiphon rosae* L."]; without faunal data [Rupais, 1969, as "*Macrosiphon rosa* L."]; *Rosa* sp., Kaliningrad, the Botanical Garden of Immanuel Kant Baltic Federal University [Buga, 2020].

*Megoura litoralis* F.P. Müller, 1952

**Material.** ZCP: apt., *Lathyrus japonicus* subsp. *maritimus* (L.) P.W. Ball, on leaf petioles and growing shoots, 14, 24.08.1997, 12.08.1998 (SB).

*Metopeurum fuscoviride* Stroyan, 1950

**Material.** KPV: apt., *Tanacetum* sp., 3.08.2021 (AM).

*Metopolophium dirhodum* (Walker, 1849)

**Records for the region.** Without faunal data [Rupais, 1969].

*Nasonovia ribisnigri* (Mosley, 1841)

**Records for the region.** Without faunal data [Rupais, 1969].

*Rhopalomyzus (Judenkoa) loniceræ* (Siebold, 1839)

**Records for the region.** *Lonicera tatarica* L., Kaliningrad, the Botanical Garden of Immanuel Kant Baltic Federal University, and Bagrationovsk Distr. (Yuzhnyy vill.) [Rupais, 1964]; without faunal data [Rupais, 1969].

*Sitobion fragariae* (Walker, 1848)

**Records for the region.** Without faunal data [Rupais, 1969, as "*Macrosiphum fragariae* (Walk.)"].

*Uroleucon (Uroleucon) achilleae* (Koch, 1855)

**Material.** ZCP: apt., *Achillea millefolium* L. s. l., on leaf petioles and underside of leaves, 4.08.1998 (SB).

*Uroleucon (Lambersius) erigeronense* (Thomas, 1878)

**Material.** KRS: apt., *Erigeron canadensis* L., on stem, leaf petioles and underside of leaves, 12.08.1995 (SB).

## Discussion

In the course of this study, 30 species and one subspecies of aphids were found in Kaliningrad Region, which were not previously recorded in this territory. Thus, to date, 110 species and two subspecies of aphids are known for the fauna of Kaliningrad Region. Comparison with the aphid fauna of nearby areas – Lithuania (364 species and one subspecies) [Rakauskas, 2014], Latvia (382 species) [Rupais, 1989] or much larger – of Poland (764 species) [Osiańczak, Hałaj, 2010, 2012; Wojciechowski et al., 2015] shows that, at the moment, we probably do not know more than a third of the species inhabiting the area.

Amongst Homoptera, aphids represent one of the most numerous in Europe group of alien insects [Wieczorek, 2011]. To date, at least four aphid species, *Acyrtosiphon caraganae*, *Appendiseta robiniae*, *Panaphis juglandis*, and *Uroleucon (Lambersius) erigeronense*, are present in the list of Aphididae species alien to Europe [Coeur d'acier et al., 2010].

The first ones, *Acyrtosiphon caraganae* and *Panaphis juglandis*, are known as originated from temperate regions of Asia, the other ones, *Appendiseta robiniae* and *Uroleucon erigeronense*, from North America [Wieczorek, 2011].

The geographical distribution of herbivorous insects is limited by the presence of their host plants. For the following aphid species, *Adelges piceae*, *A. pectinatae*, *Cinara cupressi*, *Cryptomyzus ribis*, *Myzus cerasi*, *Myzus lythri*, and *Pemphigus spyrothecae*, the main hosts were absent in the natural flora of the Kaliningrad Region. Therefore, we consider these 11 aphid species, constituting 10% of the total, are alien to the fauna of the region.

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# A new species of soldier beetles of the genus *Podistra* Motschulsky, 1839 (Coleoptera: Cantharidae) from the Northern Caucasus, with notes on distribution of the genus

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**Abstract.** A new species of soldier beetles of the genus *Podistra* Motschulsky, 1839, *P.* (s. str.) *makarova* sp. n., is described from the vicinity of Mount Elbrus, in Kabardino-Balkaria, Russia. The total number of *Podistra* species registered in the Northern Caucasus is thus raised to sixteen. Unlike many species of the genus in the area, males of the new taxon are winged and have developed elytra. Photos of the aedeagus of the holotype of *P.* (s. str.) *iugosa* Kazantsev, 2010 are given for the first time. Provided is a key to all *Podistra* species of the Northern Caucasus, with their distribution map.

**Key words:** Coleoptera, Cantharidae, Cantharinae, *Podistra*, new species, key to species, Palaearctic.

## Новый вид жуков-мягкотелок рода *Podistra* Motschulsky, 1839 (Coleoptera: Cantharidae) с Северного Кавказа с замечаниями о распространении рода

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**Резюме.** Из окрестностей горы Эльбрус, Кабардино-Балкария, описан новый вид жуков-мягкотелок рода *Podistra* Motschulsky, 1839: *P.* (s. str.) *makarova* sp. n. Общее число видов *Podistra*, зарегистрированных на Северном Кавказе, таким образом, увеличивается до шестнадцати. В отличие от многих представителей рода региона, самцы нового таксона крылаты и имеют развитые надкрылья. Впервые приведены фотографии эдеагуса голотипа *P.* (s. str.) *iugosa* Kazantsev, 2010. Дана определительная таблица всех видов *Podistra* Северного Кавказа, а также карта их распространения.

**Ключевые слова:** Coleoptera, Cantharidae, Cantharinae, *Podistra*, новый вид, определительная таблица, Палеарктика.

## Introduction

The soldier beetle genus *Podistra* Motschulsky, 1839 is widely distributed in the Holarctic realm, but lists less than 30 species [Delkeskamp, 1977; Kazantsev, 2023a]. At the same time *Podistra* is the second in terms of the number of species among the Caucasian cantharine genera after *Rhagonycha* Eschscholtz, 1830, and is represented in the Northern Caucasus by two subgenera, *Podistra* s. str. and *Hemipodistra* Ganglbauer, 1922, with just two species from *Hemipodistra* and 13 attributed to the nominotypical subgenus [Kazantsev, Brancucci, 2007; Kazantsev, 2011, 2023b].

The studies on this group of the family Cantharidae of the North Caucasus started in the first half of the 19<sup>th</sup> and the beginning of the 20<sup>th</sup> centuries [Motschulsky, 1839; Ganglbauer, 1922], and resumed last three decades [Kazantsev, 1992, 1998, 2001, 2010, 2023b]. The genus was found to be rather rich in species in the region, in contrast to other parts of its distribution area, including the southern macroslope of the Greater Caucasus and the Lesser Caucasus [Delkeskamp, 1977; Kazantsev, 2023a, b].

An opportunity to study new material collected in Kabardino-Balkaria, near Kashkatash Glacier, ca 25 km south-east of Mount Elbrus, and the re-analysis of the previously collected *Podistra* specimens, allows adding another species to *Podistra* s. str. Its description is presented below, along with a key to all species of the genus of the Northern Caucasus, which mostly follows the

recently published one [Kazantsev, 2023b], but reflects the hereby introduced changes.

## Material and methods

The studied beetles were glued on cardboard triangles. Before the examination, they were relaxed in water, then their detached abdomens were kept for several hours in 10% KOH at room temperature. The KOH treated aedeagi and terminal abdominal segments were then placed in micro vials with glycerin for photographing.

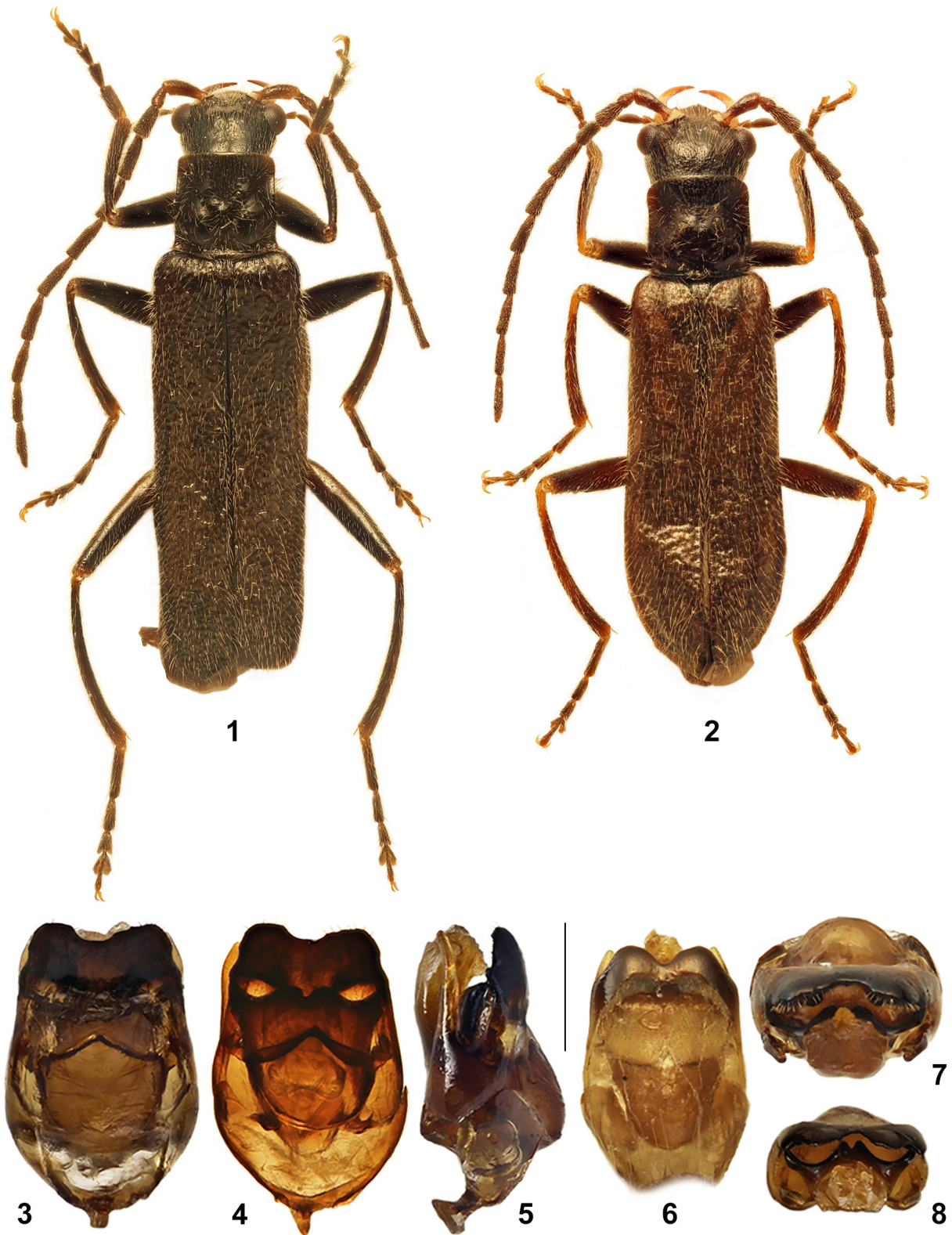
MSP-1 zoom stereoscopic dissecting microscope with 8–80 times magnification range was used for examination of diagnostic characters. Photographs were taken with a Canon EOS 6D camera and Canon MP-E 65 mm lens.

The following acronym is used the text: ICM – Insect Center (Moscow, Russia).

**Family Cantharidae Imhoff, 1856**  
**Subfamily Cantharinae Imhoff, 1856**  
**Tribe Cantharini Imhoff, 1856**  
**Genus *Podistra* Motschulsky, 1839**  
**Subgenus *Podistra* Motschulsky, 1839**

*Podistra* Motschulsky, 1839: 78. Type species *Podistra alpina* Motschulsky, 1839 (by monotypy).

= *Pseudoabsidia* Wittmer, 1969: 128, type species *Telephorus prolixus* Märkel, 1852 (original designation) (recent synonymy by Kazantsev [2023a]).



Figs 1–8. *Podistra* s. str., males, general view and aedeagi.  
 1, 3–5, 7 – *P. makarovaе* sp. n., holotype; 2, 6, 8 – *P. iugosa*. 1–2 – habitus (2 – after Kazantsev [2022]); 3–8 – aedeagi (holotypes): 3, 4, 6 – dorsally (4 – in passing light), 5 – laterally, 7–8 – apically. Scale bar for Figs 3–8 – 0.5 mm.

Рис. 1–8. *Podistra* s. str., самцы, общий вид и эдеагусы.  
 1, 3–5, 7 – *P. makarovaе* sp. n., голотип; 2, 6, 8 – *P. iugosa*. 1–2 – рабитус (2 – по [Kazantsev, 2022]); 3–8 – эдеагусы (голотипы): 3, 4, 6 – вид сверху (4 – в проходящем свете), 5 – вид сбоку, 7–8 – апикально. Масштабная линейка для рисунков 3–8 – 0.5 мм.



*Podistra* (s. str.) *makarovae* Kazantsev, sp. n.  
(Figs 1, 3–5, 7)

**Material.** Holotype, ♂ (ICM): ca 25 km SE of Mount Elbrus, Kabardino-Balkaria, Adyl-Suu River headwaters, Kashkatash Glacier, h~2488, 43°12'44"N 42°41'14"E (side moraine), 16.VII–5.VIII.2023, O. Makarova leg. Paratype: 1♂ (ICM), NW Caucasus, N Elbrus, Terskolak Pass, 2900–3000 m, 17.VIII.1992, G. Davidyan leg.

**Diagnosis.** *Podistra* (s. str.) *makarovae* sp. n. is similar to *P.* (s. str.) *iugosa* Kazantsev, 2010 from Skalistye Mountains in North Ossetia, differing in the greater size (8–8.2 mm vs 6–7 mm in *P. iugosa* males), slightly more convex eyes, relatively more elongate elytra (ca 4.3 times longer than pronotum vs 4 times longer in *P. iugosa*), almost right anterior pronotal angles (noticeably rounded in *P. iugosa*) and simple claws (Fig. 1) (provided with minute tooth at the anterior claw base in *P. iugosa* males), as well as in the shape of the dorsal plate of the aedeagus, with semi-rectangular incision, and the distinctly separated median dents of the laterophyses, as seen in apical view (Figs 3–5, 7) (vs triangular incision and approximate median laterophysal dents in *P. iugosa* (Figs 6, 8)).

**Description.** Male. Dark brown to black; antennomeres 1–2 and knees somewhat brownish (Fig. 1).

Head transverse, about as wide as pronotum. Eyes relatively small, spherical, interocular distance ca 2.25 times greater than eye diameter. Vertex in scarce punctation. Ultimate maxillary and labial palpomeres dissimilar in size and shape, with ultimate maxillary palpomere ca 3 times longer than wide, ca 1.1 times longer, but ca 1.1 times narrower than ultimate labial palpomere; ultimate maxillary palpomere widest at proximal third, while ultimate labial palpomere widest at base. Antennae filiform, reaching elytral two thirds; antennomere 3 ca 1.6 times longer than pedicel (antennomere 2) and ca 1.3 times shorter than antennomere 4; antennal pubescence short and semi-erect (Fig. 1).

Pronotum subquadrate, slightly longer than wide, almost straight anteriorly and at sides, with almost right anterior and minute acute posterior angles, with long erect pubescence; lateral bordering complete, somewhat less pronounced near posterior angles (Fig. 1).

Elytra elongate, ca 3 times longer than wide at humeri, slightly narrowing towards apices, entirely covering abdomen; elytral pubescence uniform, with relatively long erect or sub-erect hairs. Scutellum about as long as wide, slightly narrowing distally, broadly rounded at apex (Fig. 1).

Legs long and slender; femora and tibiae narrow, subequal in length. Tibiae slightly curved; tibial spurs relatively short; tarsi long, metatarsomere length ratio 3.7 : 2.2 : 1.5 : 1 : 2.2; in all tarsi tarsomeres 1–3 narrow, tarsomere 4 deeply cleft; all claws simple (Fig. 1).

Aedeagus elongate, noticeably narrowing distally, its dorsal plate with relatively broad, semi-rectangular incision at distal margin, laterally with a distinct dent meeting the latero-distal process of laterophyses; parameres elongate, about as long as the dorsal plate, relatively narrow, almost straight; laterophyses about as wide as dorsal plate, considerably shorter than dorsal plate and parameres, medially, in apical view, with a pair of relatively distant from each other and approximate to dorsal plate dents (Figs 3–5, 7).

Length: 8–8.2 mm; width (at humeri): 1.7–1.8 mm.

Female unknown.

The paratype from the northern side of Mount Elbrus, externally identical to the holotype, lacks aedeagus.

**Etymology.** The new species is named after Dr Olga Makarova (Moscow, Russia) who collected the type specimen.

**A key to *Podistra* species of the Northern Caucasus**

- 1(4). Laterophyses narrowing distally (subgenus *Hemipodistra*).
- 2(3). Laterophyses distally relatively broad, only ca 1.5 times narrower than dorsal plate. Body length 7.7 mm (Addala Mt., Bogoss Range, Dagestan, Russia, 2800–3100 m) ..... *P. motschulskyi* Kazantsev, 2001
- 3(2). Laterophyses distally relatively narrow, ca 2.2 times narrower than dorsal plate. Body length 5.4–7.2 mm (SW slopes of Shalbuzdag Mt., Dagestan, Russia, 3000–3300 m) ..... *P. savitskiorum* Kazantsev, 2001
- 4(1). Laterophyses widened distally (subgenus *Podistra* s. str.) (Figs 3–8).
- 5(18). Pronotum with incomplete lateral bordering (bordering wanting, or at least less distinct near hind angles).
- 6(11). Male elytra complete (Figs 1, 2). Pronotum dark brown, with narrow light anterior and posterior borders; elytra dark brown, broadly lighter at sides and suture.
- 7(8). Dorsal plate of aedeagus short, not surpassing laterophyses in length, with broad triangular incision distally; laterophyses relatively narrow distally, with inconspicuous median dents, as seen in apical view. Body length 6.8 mm (Elbrus Mt., Kabardino-Balkaria, Russia, 2900–3000 m) ..... *P. davidyani* Kazantsev, 2023
- 8(7). Dorsal plate of aedeagus long, noticeably surpassing laterophyses in length; laterophyses distally wide, with conspicuous median dents, approximate to dorsal plate, as seen in apical view.
- 9(10). Sutural light stripe attaining to elytral apices. Dorsal plate noticeably narrowed distally, with relatively narrow semicircular median incision, in apical view with double bulging; laterophyses with approximate median dents, as seen in apical view. Body length 6.5–8 mm (Teberda, Karachay-Cherkessia, Russia, 2900–3000 m) ..... *P. piceolineata* Pic, 1922
- 10(9). Sutural light stripe attaining only to elytral half. Dorsal plate noticeably less narrowed distally, with broader, but more shallow median incision, in apical view with triple bulging; laterophyses with widely separated median dents, as seen in apical view. Body length 7.5 mm (Elbrus Mt., Kabardino-Balkaria, Russia, 2900–3000 m) ..... *P. elbrusensis* Kazantsev, 2023
- 11(6). Male elytra considerably shortened.
- 12(13). Anterior part of head above reddish brown; pronotum testaceous, darkened at disc. Body length 7 mm (Fisht Mt., Adygeya, 2800 m) .....  
..... *P. rufomaculata* Kazantsev, 1998
- 13(12). Body dark brown to black, sometimes with lighter knees and antennal bases.
- 14(15). Dorsal plate distally with three incisions; laterophyses distally in apical view elaborately incised. Body length 6.2 mm (Abago Mt, Adygea, Russia, ca 2000 m) ..... *P. circassicola* Reitter, 1889
- 15(14). Dorsal plate distally with one incision; laterophyses distally in apical view simply bisinuate.
- 16(17). Aedeagus hardly longer than wide; its dorsal plate distally with relatively small semicircular incision. Body length 7 mm (Abago Mt., Adygea, Russia, ca 2000 m) ..... *P. starcki* Ganglbauer, 1922

- 17(16). Aedeagus noticeably longer than wide; its dorsal plate distally with broad triangular incision. Body length 7 mm (Addala Mt., Bogoss Range, Dagestan, Russia, 3500 m) ..... *P. alpina* Motschulsky, 1839
- 18(5). Pronotum with complete distinct lateral bordering (Figs 1, 2).
- 19(24). Elytra uniformly testaceous.
- 20(21). Aedeagus hardly longer than wide; its dorsal plate with rather deep triangular incision. Body length 8–10 mm (Northwestern Caucasus, Georgia, 300–2000 m) ..... *P. caucasica* Ganglbauer, 1922
- 21(20). Aedeagus noticeably longer than wide; its dorsal plate with shallow semicircular incision.
- 22(23). Laterophyses medially only slightly elevated. Body length 8–11 mm (Northwestern Caucasus, Georgia, 250–2000 m) ..... *P. unicolor* (Faldermann, 1835)
- 23(22). Laterophyses medially noticeably elevated. Body length 7.5–9.5 mm (Tkhab Mt., Krasnodar Region, Russia; Lagonaki Plateau, Adygea, Russia, 900–1200 m) ..... *P. arnoldii* Kazantsev, 1998
- 24(19). Elytra uniformly or partly dark brown to black.
- 25(26). Pronotum transverse, with convex sides. Female flightless, with greatly reduced elytra. Aedeagus oval, its dorsal plate distally narrowed and distal margin with small medial incision. Body length 6–8.5 mm (Zgid Mt., North Ossetia, Russia, 2800 m) ..... *P. ossetica* Kazantsev, 1998
- 26(25). Pronotum elongate, with straight sides.
- 27(28). Pronotum lighter at angles. – Femora distally and tibiae in most part testaceous. Dorsal plate of aedeagus noticeably narrowed distally; lateral angles of laterophyses extended beyond dorsal plate; laterophyses in apical view medially not approaching dorsal plate. Body length 6.8 mm (Zagedan Mt., Karachay-Cherkessia, Russia, 2000 m) ..... *P. cherkessica* Kazantsev, 1998

- 28(27). Pronotum uniformly black.
- 29(30). Smaller (6–7 mm), elytra shorter (ca 4 times longer than pronotum), anterior pronotal angles noticeably rounded; claws provided with minute tooth at the anterior claw base (Fig. 2); dorsal plate of the aedeagus with triangular incision, median laterophysal dents, as seen in apical view, approximate (Figs 6, 8) (Skalistye Mts, North Ossetia, Russia, 2750–3250 m) ..... *P. iugosa* Kazantsev, 2010
- 30(29). Larger (8–8.2 mm), elytra more elongate (ca 4.3 times longer than pronotum), anterior pronotal angles almost right; claws simple (Fig. 1); dorsal plate of aedeagus with semi-rectangular incision, median dents of laterophyses, as seen in apical view, distinctly separated (Figs 3–5, 7) (SE Elbrus Mt., Kabardino-Balkaria, Russia, 2488 m) ..... *P. makarova* sp. n.

## Discussion

A notable aspect of distribution of *Podistra* in the area is that the most of its species in the Greater Caucasus occur on its northern, rather than on the southern, macroslope – out of 18 species registered here, 16 are from its northern side, of which 14 are local endemics (Fig. 9). In the Lesser Caucasus that lies further south just one *Podistra* species has been registered [Kazantsev, Brancucci, 2007]. The rare occurrence of this genus south of the main range watershed may be explained by its ‘northern’ origin, when only very few of its members made it south, not capable of crossing the ridge when its distribution area was expanding. Besides, given that almost three fourths of all *Podistra* species worldwide occur in the Greater Caucasus, none of its members known from Asia Minor [Kazantsev, 2023a], it seems reasonable to conclude that its biodiversity hotspot is right here.

On the other hand, quite unsimilarly, the other two widespread Holarctic cantharine genera, *Cantharis* Linnaeus, 1758 and *Rhagonycha*, being well represented in the Caucasus (13 and 30 species accordingly), are noticeably more species-rich in Asia Minor, accounting for 23 and 61 species each [Kazantsev, Brancucci, 2007; Kazantsev, 2022]. Such distribution pattern suggests that *Cantharis* and *Rhagonycha*, on the one hand, and *Podistra*, on the other, being all related to one subfamily (Cantharinae) and one tribe (Cantharini) [Motyka et al., 2023], apparently must have originated in different places or at different times (or both). Unfortunately, the geological evidence for the area between the Greater Caucasus and the platform with Asia Minor, Iran and the Lesser Caucasus is not much informative to this end, as the two were separated by the sea or straits from the times of the epicontinental basin Paratethys until Mid-Late Miocene (8.5–7.0 Ma) [Ilyina et al., 2004; Palcu et al., 2021], preventing species expansion in either direction.

Representatives of *Podistra* are distributed and diversified predominantly on the northern slopes of the Greater Caucasus, many of them at high altitudes. It is clear that the settlement of the alpine level (with subsequent isolation and diversification) occurred after the Pleistocene glaciations, either from the forest belt or from sub-arid basins, where thermophilic fauna might have

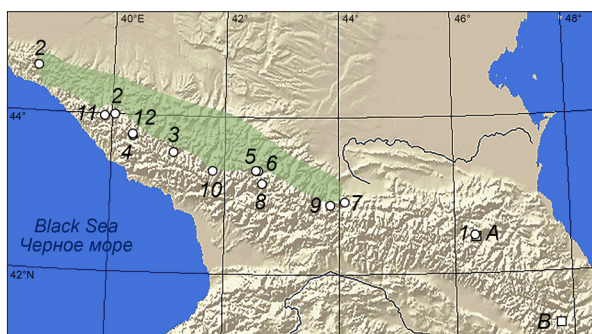


Fig. 9. Distribution of *Podistra* in the Northern Caucasus.

Circles 1–12 and shaded area – *Podistra* s. str., squares A, B – *P. (Hemipodistra)*. 1 – *P. alpina*; 2 – *P. arnoldii*; 3 – *P. cherkessica*; 4 – *P. circassicola*; 5 – *P. davidyani*; 6 – *P. elbrusensis*; 7 – *P. iugosa*; 8 – *P. makarova* sp. n.; 9 – *P. ossetica*; 10 – *P. picolineata*; 11 – *P. rufomaculata*; 12 – *P. starcki*; shaded area – *P. caucasica* and *P. unicolor*; A – *P. motschulskyi*; B – *P. savitskiorum* (after Kazantsev, [2023b], modified).

Рис. 9. Распространение *Podistra* на Северном Кавказе.

Круги 1–12 и заливка – *Podistra* s. str., квадраты A, B – *P. (Hemipodistra)*. 1 – *P. alpina*; 2 – *P. arnoldii*; 3 – *P. cherkessica*; 4 – *P. circassicola*; 5 – *P. davidyani*; 6 – *P. elbrusensis*; 7 – *P. iugosa*; 8 – *P. makarova* sp. n.; 9 – *P. ossetica*; 10 – *P. picolineata*; 11 – *P. rufomaculata*; 12 – *P. starcki*; заливка – *P. caucasica* и *P. unicolor*; A – *P. motschulskyi*; B – *P. savitskiorum* (по [Kazantsev, 2023b], с изменениями).

been preserved during glaciation periods. Therefore, it is obvious that the group is historically young, post-glacial. Perhaps this could be an argument in favour of the Eocene *Lycocerus* Gorham, 1889 [Kazantsev, 2018, 2020] rather than *Podistra*, although the two genera can only be reliably distinguished by the male genitalia, as already discussed in one of the previous papers [Kazantsev, 2018].

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## The first record of the genus *Agrypnus* Eschscholtz, 1829 (Coleoptera: Elateridae) in Mongolia

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**Abstract.** The genus *Agrypnus* Eschscholtz, 1829 (Coleoptera: Elateridae) and the species *A. murinus* (Linnaeus, 1758) are recorded for Mongolia for the first time. This species is widely distributed in the Palaearctic, mainly in Euro-Siberian region. Two specimens of *A. murinus* were collected in northeastern Mongolia (Töv Province), which is probably the southeasternmost border of the species range.

**Key words:** Coleoptera, Elateridae, *Agrypnus murinus*, first record, Mongolia.

### Первая находка рода *Agrypnus* Eschscholtz, 1829 (Coleoptera: Elateridae) в Монголии

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**Резюме.** Род *Agrypnus* Eschscholtz, 1829 (Coleoptera: Elateridae) и вид *A. murinus* (Linnaeus, 1758) впервые указаны для Монголии. Вид широко распространен в Палеарктике, преимущественно в Европе и Сибири. Два экземпляра *A. murinus* были собраны на северо-востоке Монголии (провинция Тове), что, вероятно, является юго-восточной границей ареала этого вида.

**Ключевые слова:** Coleoptera, Elateridae, *Agrypnus murinus*, первая находка, Монголия.

## Introduction

Elateridae is one of the largest families of Coleoptera, which comprises about 10000 species in the world [Lawrence, 1982; Costa et al., 2010]. The fauna of click-beetles of Mongolia includes 38 genera and almost 100 species from eight subfamilies [Jarzabek-Müller, Németh, 2014; Platia, 2017, 2018]. In comparison, fauna of two neighboring countries comprises the following number of taxa: 90 genera and 486 species in Russia, 120 genera and 574 species in China [Ormanova, Yaschenko, 2022]. Accordingly, the click-beetle fauna of Mongolia seems still poorly known and may contain much more species.

*Agrypnus* Eschscholtz, 1829 is one of the most species-rich elaterid genera (137 species) in the Palaearctic region [Cate, 2007]. In the Palaearctic this genus is most diverse in the mountainous regions of East Asia. Until now, *Agrypnus* was not known in Mongolia, although it is represented in neighboring countries: Russia (four species), Kazakhstan (one species), China (46 species). Here we report the first record of *Agrypnus* for Mongolia.

## Study area

Our study area (northeastern Mongolia, Töv Province, Môngönmorit District) is geographically distributed within the Kherlen River watershed, where Baruun Burk Mt. of the Khentii Mountain Range is located. Baruun Burk Mt. is situated at 184 km northeast from Ulaanbaatar (Fig. 1).

The altitude range of the Môngönmorit District is from 1523 to 1897 m above sea level. Mean annual air temperature is  $-3.7$  °C, monthly average air temperature is  $-27.7$  °C in January and  $+17$  °C in July. Mean annual precipitation and humidity are around 252 mm and 64%, respectively. The forest types are mesophyte herbaceous, steppe-characterized herbaceous, forest-meadow, Larix and Betula mixed forests [Tsogt, Lin, 2014] (Fig. 2).

## Material and methods

The specimens were sampled by manual collecting in 2021. Specimens were collected on the leaves of Betula shrubs in forest edge habitat (Fig. 2), and preserved in 96% ethanol. Images were taken with a Canon EOS 7D Mark II with a Canon 100 mm Macro lens, and processed using Zerene Stacker and Adobe Photoshop CC 2019 software. The material is deposited at the Institute of Biology, Mongolian Academy of Sciences (Ulaanbaatar, Mongolia).

### Subfamily Agrypninae Candèze, 1857

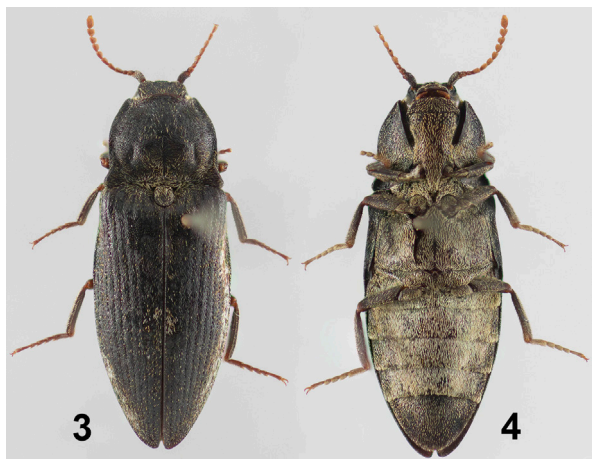
#### Tribe Agrypnini Candèze, 1857

#### Genus *Agrypnus* Eschscholtz, 1829

#### *Agrypnus murinus* (Linnaeus, 1758)

(Figs 3, 4)

**Material.** 2♂, Mongolia, Töv Prov., Môngönmorit Distr., forest edge with Betula bushes,  $48^{\circ}15'37.093''\text{N}$  /  $108^{\circ}25'24.772''\text{E}$ , 1582 m, 18.07.2021 (Ts. Ulzii).



Figs 1–4. of *Agrypnus murinus* in northeastern Mongolia, (Möngönmorit District), locality and habitus.

1 – collection site; 2 – habitat; 3–4 – male: 3 – dorsal view, 4 – ventral view.

Рис. 1–4. *Agrypnus murinus* в Северо-Восточной Монголии (район Менгенморьт), местонахождение и внешний вид самца.

1 – место сбора; 2 – биотоп; 3–4 – самец: 3 – дорсально, 4 – вентрально.

**Palearctic distribution.** Europe (almost all territory) and Asia (Turkey, Iran, Kazakhstan; Russia: East Siberia, Far East; China: Xinjiang; Mongolia).

**Notes.** Two more eastern records of *A. murinus* need confirmation, but seem not so dubious: Zabaykalskiy (around Nerchinsk) [Gebler, 1832] and Khabarovsk [Bessolitzina, 1974] regions, Russia.

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## A new species of *Dysdera* Latreille, 1804 (Aranei: Dysderidae) from South Ossetia, the Greater Caucasus

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**Abstract.** A new species, *Dysdera bakhanovi* sp. n., is described from South Ossetia based on a male specimen. The new species is closely related to the Pontic-Caspian *D. dunini* Deeleman-Reinhold, 1988, the Anatolian *D. anatoliae* Deeleman-Reinhold, 1988 and *D. krosis* Komnenov et Chatzaki, 2016, and can be grouped within the *anatoliae* species-group. Males from the *anatoliae* species-group can be defined by the following characters: numerous small pits on carapace, non-sclerotized posterior apophysis, shortened psemبولus bent anteriorly relative to the longitudinal axis of the bulb, and distal part of the psemبولus bent at an angle of 90° from the posterior apophysis. Illustrations of the new species are provided. Distributional records of all species from the *anatoliae* species-group are mapped.

**Key words:** Araneae, Dysderidae, new species, biodiversity, Greater Caucasus.

### Новый вид рода *Dysdera* Latreille, 1804 (Aranei: Dysderidae) из Южной Осетии, Большой Кавказ

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**Резюме.** Из Южной Осетии по самцу описан новый вид, *Dysdera bakhanovi* sp. n. Новый вид родственен понто-каспийскому виду *D. dunini* Deeleman-Reinhold, 1988 и двум видам из Малой Азии: *D. anatoliae* Deeleman-Reinhold, 1988 и *D. krosis* Komnenov et Chatzaki, 2016. *Dysdera bakhanovi* sp. n. образует вместе с этими видами группу видов *anatoliae*. Самцы видов, относящихся к группе видов *anatoliae*, могут быть определены по следующим признакам: многочисленные мелкие ямки на карапаксе, не хитинизированный задний отросток бульбуса, укороченный псемبولус, загнутый вперед относительно продольной оси бульбуса, и дистальная часть псемبولуса, отогнутая от заднего отростка бульбуса под углом в 90°. Приведены иллюстрации нового вида. Все находки видов группы *anatoliae* картированы.

**Ключевые слова:** Araneae, Dysderidae, новый вид, биоразнообразие, Большой Кавказ.

## Introduction

*Dysdera* Latreille, 1804 is the largest genus of Dysderidae, accounting for 312 (sub)species [World Spider Catalog, 2023]. Spiders of this genus are represented by the largest number of species in Canary Islands, Mediterranean and the Caucasus [World Spider Catalog, 2023]. In total, 26 species of *Dysdera* have been recorded or described from the Caucasus [Mikhailov, 2022]. Among these, 20 species (77%) are endemic [Dunin, 1992; Mikhailov, 2022; World Spider Catalog, 2023]. The majority of Caucasian representatives of the genus were described and studied by Dunin [1990, 1991, 1992].

South Ossetia is a small country in southern slopes of the Greater Caucasus. Ponomarev and Komarov [2015] reported three species of *Dysdera* from South Ossetia in their checklist: *D. dunini* Deeleman-Reinhold, 1988, *D. meschetiensis* Mcheidze, 1979 (= *D. tkibuliensis* Mcheidze, 1979), and an unidentified species (most likely, it is an undescribed species similar to *D. borealicaucasica* Dunin, 1991 (A.V. Ponomarev personal communication)). During a recent expedition to South Ossetia, I collected one undescribed species of *Dysdera* which is closely related to *D. dunini*. The aim of the present paper is to describe this new species.

## Material and methods

The specimen was hand-collected and preserved in 70% ethanol. It was photographed using an Olympus DP74 camera attached to an Olympus SZX16 stereomicroscope at the Altai State University (Barnaul, Russia). Photographs were taken in a dish with a white cotton at the bottom and filled with ethanol, or in a dish filled with a water based lubricant. Digital images were assembled using Zerene Stacker image stacking software.

All measurements are given in millimeters. Length of leg segments were measured on their dorsal sides. Leg measurements are shown as: femur, patella, tibia, metatarsus, tarsus (total length). Spination data are based on the examination of only one side of the body. The terminology for sclerites of the bulb and the format of the description follows Fomichev and Marusik [2021].

The holotype is deposited in the Institute of Systematics and Ecology of Animals of the Siberian Branch of the Russian Academy of Sciences (ISEA, Novosibirsk, Russia; curator G.N. Azarkina).

Abbreviations: AME – anterior median eyes, Mt – metatarsus, p – pro-lateral, PLE – posterior lateral eyes, PME – posterior median eyes, r – retrolateral, Ti – tibia, v – ventral.



Figs 1–7. *Dysdera bakhanovi* sp. n., male, general view and details of structure.

1 – habitus, dorsally; 2 – prosoma, laterally; 3 – whole palp, retrolaterally; 4–7 – left bulb: 4 – anterior view, 5 – posterior view, 6 – prolaterally, 7 – retrolaterally. *Ap* – posterior apophysis; *Se* – stem of the psembolus; *Tb* – terminal blades; *Te* – tegulum. Scale bars: 1 – 2 mm; 2–3 – 1 mm; 4–7 – 0.2 mm.

Рис. 1–7. *Dysdera bakhanovi* sp. n., самец, общий вид и детали строения.

1 – габитус, дорсально; 2 – головогрудь, латерально; 3 – целая пальпа, ретролатерально; 4–7 – левый бульбус: 4 – вид спереди, 5 – вид сзади, 6 – пролатерально, 7 – ретролатерально. *Ap* – задний отросток; *Se* – стемель псемболоуса; *Tb* – концевые лопасти; *Te* – тегулюм. Масштабные линейки: 1 – 2 мм; 2–3 – 1 мм; 4–7 – 0.2 мм.

#### Family Dysderidae C.L. Koch, 1837

#### Genus *Dysdera* Latreille, 1804

#### *Dysdera bakhanovi* sp. n.

(Figs 1–9)

**Material.** Holotype, ♂ (ISEA, 001.9544): South Ossetia, Tskhinval District, 2 km WNW from Grom vill., Adzula River valley, 42°10.284'N / 44°11.848'E, 950 m, pebbly river bank, 21–25.06.2021 (A.A. Fomichev).

**Diagnosis.** The male of the new species is similar to those of *D. anatoliae* Deeleman-Reinhold, 1988 (Turkey),

*D. dunini* (Turkey, Crimea and the Caucasus) and *D. krisis* Komnenov et Chatzaki, 2016 (Turkey and Greece) in having numerous small pits on carapace and shortened psembolus with its distal part bent at an angle of 90° from elliptical non-sclerotized posterior apophysis. The male of *D. bakhanovi* sp. n. can be distinguished from all above-mentioned species by slender and elongated tegulum with a length/width ratio of 1.8 (vs 0.9 in *D. anatoliae*, 1.2 in *D. dunini* and 1.5 in *D. krisis*; cf. Figs 6, 7 and fig. 103 in Deeleman-Reinhold and Deeleman [1988], figs 10A–E in





Figs 8–9. Localities of species from *Dysdera anatoliae* species-group.

8 – habitat of *D. bakhanovi* sp. n.; 9 – collection points: inverted triangle – *D. anatoliae*, circle – *D. bakhanovi* sp. n., triangles – *D. dunini*, squares – *D. krisis*.

Рис. 8–9. Местонахождения видов из видовой группы *Dysdera anatoliae*.

8 – биотоп *D. bakhanovi* sp. n.; 9 – точки находок: перевернутый треугольник – *D. anatoliae*, круг – *D. bakhanovi* sp. n., треугольники – *D. dunini*, квадраты – *D. krisis*.

Dunin [1992] and figs 25, 26 in Komnenov et al. [2016]). Additionally, the male of the new species differs from that of *D. anatoliae* by the flat anterior surface of the stem of the psembolus (vs swollen; cf. Fig. 6 and fig. 103 in Deeleman-Reinhold and Deeleman [1988]). The male of *D. bakhanovi* sp. n. differs from the male of *D. dunini* by the strongly shortened posterior apophysis, that is dorsally bent (vs elongated and straight posterior apophysis; cf. Figs 6, 7 and figs 10A–e in Dunin [1992]). Finally, the male of *D. bakhanovi* sp. n. can be distinguished from that of *D. krisis* by strongly shortened chelicerae with a carapace/chelicerae length ratio of 1.9 (vs 1.3; cf. Fig. 2 and fig. 21 in Komnenov et al. [2016]) and by the psembolus with 4 terminal blades (vs 3; cf. Figs 6, 7 and figs 29, 31 in Komnenov et al. [2016]).

**Description.** Male. Total length 7.2. Carapace: 4.3 long, 3.5 wide. Abdomen: 4.1 long, 2.7 wide. Chelicerae: 2.3 long. AME 0.23, PME 0.23, PLE 0.24. Colouration. Carapace and chelicerae dark cherry coloured. Carapace covered with numerous small pits. Sternum and labium orange-red. Endites and coxae orange. Legs and palps yellow-orange. Abdomen gray-beige. Spinnerets pale yellow. Leg measurements: I: 3.1, 2, 2.55, 2.6, 0.7 (10.95); II: 2.9, 1.85, 2.35, 2.55, 0.7 (10.35); III: 2.4, 1.4, 1.5, 2.2, 0.55 (8.05); IV: 3.05, 1.7, 2.2, 2.7, 0.65 (10.3). Leg spination: III: Ti p3, v2; Mt p6, r1, v2. IV: Ti p1, r1, v4; Mt p3, r2, v5.

Palp as shown in Figs 3–7. Femur 1.4 times longer than patella. Patella 1.3 times longer than tibia. Cymbium 1.2 times longer than tibia. Length/width ratio of the bulb 2.5. Posterior apophysis elliptical, non-sclerotized. Psembolus with its distal part bent at an angle of 90° from posterior apophysis. Apex of the psembolus splits into four terminal blades.

Female unknown.

**Etymology.** The new species is dedicated to Roman A. Bakhanov (Gorno-Altaysk, Russia), who helped to organize the expedition to South Ossetia, during which the holotype was collected.

## Discussion

Deeleman-Reinhold and Deeleman [1988] assigned all *Dysdera* species to nine species groups: *aculeata*, *asiatica*, *crocata*, *erythrina*, *festai*, *lata*, *longirostris*, *ninnii* and *punctata*. *Dysdera anatoliae* together with *D. dunini* were placed in the *longirostris* species-group comprising of eight species that are distributed in Mediterranean [Deeleman-

Reinhold, Deeleman, 1988]. These species were assigned to one species group based on the following features: large and flattened cephalic part of the carapace, spineless femora of all legs and bulbal posterior apophysis smaller in size than the distal part of psembolus [Deeleman-Reinhold, Deeleman 1988]. As a result, the *longirostris* species-group turned out to be very heterogeneous. For example, *D. granulata* Kulczyński, 1897 has a very small hook-like posterior apophysis, while *D. anatoliae* possesses a large ovoid posterior apophysis (cf. figs 76 and 103 in Deeleman-Reinhold and Deeleman [1988]). Another species similar to *D. anatoliae* and *D. dunini* is *D. krisis*, which was described from Greece [Komnenov et al., 2016]. Subsequently it was recorded in Turkey [Varol, Danişman, 2017]. *Dysdera anatoliae*, *D. dunini* and *D. krisis* can be united into one species-group by a number of characters: 1) numerous small pits on carapace (cf. figs 101 in Deeleman-Reinhold and Deeleman [1988] and figs 1a, c in Varol and Danişman [2017]); 2) shortened psembolus (cf. fig. 103 in Deeleman-Reinhold and Deeleman [1988], figs 10A–e in Dunin [1992] and figs 25, 26 in Komnenov et al. [2016]); 3) psembolus bent anteriorly relative to the longitudinal axis of the bulb; 4) distal part of the psembolus bent at an angle of 90° from the posterior apophysis; 5) non-sclerotized posterior apophysis. Other species from the *longirostris* species-group do not possess this set of characters and remain outside this group. For example, *D. punctocretica* Deeleman-Reinhold, 1988 described from the Greek Corfu Island and assigned to the *longirostris* species-group, has a carapace with numerous small pits (cf. fig. 90 in Deeleman-Reinhold and Deeleman [1988]) and rather similar conformation of the bulb, but possesses a large straight psembolus oriented along the longitudinal axis of the bulb (cf. fig. 93 in the same paper). The newly described species from South Ossetia belongs to the same species-group as *D. anatoliae*, *D. dunini* and *D. krisis*. I propose naming this species group as *Dysdera anatoliae* species-group. Members of the *anatoliae* species-group are distributed from the Sea of Marmara through Crimea and Turkey to the Absheron Peninsula (Fig. 9) [Dunin, 1992; Kovblyuk et al., 2008; Varol, Danişman, 2017]. *Dysdera dunini* is the most widespread species from this species-group. It is important to note that depictions of



the bulb of this species by different authors based on specimens from various regions, such as the Caucasus, Crimea and Turkey, are very different. For example, Dunin [1992: figs 10<sub>A</sub>–e], who studied the Caucasian specimens, has depicted psembolus with three terminal blades, while later Kovblyuk et al. [2008: figs 11, 12] provided drawings of the bulb of *D. dunini* from Crimea which clearly shows psembolus with two longitudinal ridges. Such differences may indicate that the Crimean specimens may actually belong to an undescribed species.

#### Key to the males of the *Dysdera anatoliae* species-group

1. Tegulum length/width ratio 1.8 ..... *D. bakhanovi* sp. n.  
– Tegulum length/width ratio 1.5 or less ..... 2
2. Psembolus with two terminal blades, scissors-like .....  
..... *D. krisis*  
– Psembolus with more than two terminal blades ..... 3
3. Chelicerae shortened (carapace/chelicerae length ratio  
of 2.1), posterior apophysis narrower than the distal  
part of psembolus ..... *D. anatoliae*  
– Chelicerae elongated (carapace/chelicerae length ratio  
of 1.8), posterior apophysis wider than the distal part  
of psembolus ..... *D. dunini*

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## Червонец непарный *Lycaena dispar* (Haworth, 1802) (Lepidoptera) – первая находка вида в фауне Полярного Урала (Россия)

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**Резюме.** В большинстве регионов северная граница ареала червонца непарного *Lycaena dispar* (Haworth, 1802) лежит в зоне смешанных хвойно-широколиственных лесов и на юге таежной зоны. Постепенное распространение на север *L. dispar* в последние два десятилетия освещено в литературе. Статья основана на полевых сборах в июле 2023 года, в ходе которых *L. dispar* был впервые обнаружен на восточном макросклоне Полярного Урала и в городской черте Воркуты. Представлены результаты исследования численности, встречаемости и особенностей биологии, обсуждаются вопросы партеногенеза и адаптации вида к условиям Заполярья и наиболее вероятные пути его проникновения на Полярный Урал и в Предуралье.

**Ключевые слова:** *Lycaena dispar*, распространение, Полярный Урал.

### Large copper *Lycaena dispar* (Haworth, 1802) (Lepidoptera) – the first record of the species in the fauna of the Polar Urals (Russia)

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**Abstract.** The north boundary of the large copper *Lycaena dispar* (Haworth, 1802) range extends in most regions in mixed coniferous-broad leaved forest zone and at the south of taiga zone. The gradual spread of *L. dispar* to the north has been observed in the last two decades in literature. The paper is based on July 2023 field material when *L. dispar* was discovered for the first time on the eastern macroslope of the Polar Urals and in the city of Vorkuta (Russia). Data on abundance, occurrence and bionomics are presented. Questions on parthenogenesis, adaptation of this species to conditions of the Arctic and the most likely routes of its penetration into the Polar Urals and Cis-Urals are discussed.

**Key words:** *Lycaena dispar*, distribution, Polar Urals.

## Введение

Червонец непарный *Lycaena dispar* (Haworth, 1802) – трансевразийский температурный вид, северная граница ареала которого в большинстве регионов проходит в зоне смешанных хвойно-широколиственных лесов и по южным окраинам тайги (рис. 1). Однако в последние два десятилетия наблюдается его постепенное распространение на север европейского субконтинента. Появились сведения о находках вида на Скандинавском полуострове [Lycaena..., 2023], где он до этого отсутствовал [Henriksen, Kreutzer, 1982; Kudrna et al., 2011; Tshikolovets, 2011]. В Восточной Финляндии *L. dispar* проник до Северного Приладожья и Прионежья, а единичные особи были зарегистрированы в подзоне северной тайги в Карелии (Костомукша, 64.58°N / 30.55°E) [Горбач, 2016]. Известны находки вида в подзоне средней тайги в Архангельской области (деревня Уйта, 63.01°N / 42.51°E) [Bolotov et al., 2015]. На северо-востоке Русской равнины к 2014 году вид достиг среднего течения Вычегды и в настоящее время успешно натурализовался в урбоденнозах Сыктывкара (61.65°N / 50.85°E) [Татаринов, 2016; Кулакова, Татаринов, 2019]. Эти данные свидетельствуют о высоком миграционном потенциале и адаптационных возможностях *L. dispar* в западной части ареала.

Отслеживание путей расселения температурного вида *L. dispar* на север является весьма актуальной задачей в рамках изучения глобальной проблемы натурализации чужеродных животных и растений на новых территориях в связи с современными климатическими флуктуациями и антропогенной трансформацией природных сообществ.

## Материал и методы

Работа основана на материалах, собранных 19–28 июля 2023 года в ходе полевых эколого-фаунистических исследований булавоусых чешуекрылых на восточном макросклоне Полярного Урала, среднее течение реки Сось, урочище Красный Камень, Ямало-Ненецкий автономный округ (66.90°N / 65.74°E).

Обследованы биотопы в долине реки Сось и все пояса растительности, выраженные на склонах и плоских вершинах гор в диапазоне высот от 86 до 634 м н.у.м. В выявленных местообитаниях *L. dispar* проводили визуальные количественные учеты имаго на трансектах [Pollard, Yates, 1993], длина и ширина которых колебалась от 300 до 1000 м и от 5 до 20 м соответственно в зависимости от типа и размеров фитоценозов, их мозаики и гипсометрического профиля местности.

Номенклатура булавоусых чешуекрылых представлена по каталогу чешуекрылых России [2019], русские названия растений – по монографической сводке Груздева с соавторами [1999].

Для создания карты местонахождений вида на территории Европы и Западной Сибири использовали QGIS версии 3.22 [QGIS..., 2022], для выгрузки рельефной карты [Relief Map, 2023] – SAS Planet [2018].

## Результаты

В июле 2023 года *L. dispar* был обнаружен авторами на восточном макросклоне Полярного Урала в урочище Красный Камень. От установленной ранее северной границы современного видового ареала на северо-востоке Русской равнины [Татарин, 2016] данную географическую точку отделяет около 900 км, а от достоверно известных местонахождений вида в Западной Сибири (Ханты-Мансийск (61.01°N / 69.03°E), Сургут (61.24°N / 73.37°E) [Луцаена..., 2023]) – около 700–750 км.

Основными местообитаниями *L. dispar* в указанном районе Полярного Урала служили хорошо увлажняемые смешанно-разнотравные луговины, в составе которых преобладали горец большой *Bistorta major*, аконит северный *Aconitum septentrionale*, живокость высокая *Delphinium elatum*, сабельник болотный *Comarum palustre*, гравилат речной *Geum rivale*, лабазник вязолистный *Filipendula ulmaria*, синюха остролепестная *Polemonium acutiflorum*, герань белоцветковая *Geranium albiflorum*, дудник лекарственный *Angelica archangelica*, купырь лесной *Anthriscus sylvestris*, чертополох курчавый *Carduus crispus*, вероника длиннолистная *Veronica longifolia*, чемерица Лобеля *Veratrum lobelianum*, валериана головчатая *Valeriana capitata*, иван-чай узколистный *Chamaenerion angustifolium*, вейник Лангсдорфа *Calamagrostis langsdorffii*. Данные фитоценозы широко распространены в хорошо увлажняемых ложбинах, вдоль ручьев, вездеходных дорог (рис. 2), по окраинам и рединам березово-еловых лесов и разнотравных ивняков (рис. 3) на левом берегу реки Сось (86 м н.у.м.). Немногочисленных бабочек регистрировали, кроме того, на приручьевых кустарничково-злаково-разнотравных луговины у подножия хребта Рай-Из.

Первые особи *L. dispar* были отмечены 19 июля 2023 года (рис. 4), когда подавляющее большинство видов булавоусых чешуекрылых горно-тундровых местообитаний уже закончило лёт, а в интразональных растительных сообществах имаго позднелетних видов – *Clossiana angarensis* (Ershoff, 1870), *C. selene* ([Denis et Schiffermuller], 1775), *C. thore* (Hubner, 1803), *Brenthis ino* (Rottemburg, 1775), *Issoria eugenia* (Eversmann, 1847), *Coenonympha tullia* (Muller, 1764), *Erebia euryale* (Esper, 1805), *Carterocephalus silvicola* (Meigen, 1829), *C. palaemon* (Pallas, 1771) и др. – были уже на пике активности. Бабочки *Lucaena dispar* в период лёта питались нектаром вероники длиннолистной (рис. 5), валерианы головчатой, горца большого, герани белоцветковой, гвоздики ползучей *Dianthus repens*.

Важно отметить, что в урочище Красный Камень были обнаружены не единичные особи *L. dispar*, а вы-

явлена относительно крупная популяционная группировка. Самая высокая плотность имаго – 21 экз./га – была установлена в ходе визуального учета 21 июля 2023 года на одной из трансект на левобережье реки Сось. В дальнейшем численность бабочек во всех местообитаниях постепенно снижалась, хотя их лёт, очевидно, продолжался еще некоторое время после завершения авторами полевых работ. В общей сложности с 19 по 28 июля 2023 года на площади около 7.5 км<sup>2</sup> было зарегистрировано 117 особей вида. Из этого числа 15 экземпляров были отловлены для пополнения энтомологической коллекции Института биологии Коми научного центра Уральского отделения РАН (Сыктывкар, Россия).

Интересной биологической особенностью выявленной полярноуральской группировки *L. dispar* являлось отсутствие в ее составе самцов, за весь период наблюдений в 2023 году были зафиксированы только самки. Все бабочки имели крупные размеры, длина переднего крыла отловленных экземпляров составила 20.5–21.5 мм, что сопоставимо с размерами особей в зоне экологического оптимума вида (Центральная Европа, средняя полоса России, юг Урала и Сибири, Приморье). Отметим, что бабочки в необионтной популяции Сыктывкара значительно мельче, длина их переднего крыла всего лишь 15.5–17.5 мм.

Несмотря на видимое отсутствие самцов, самки *L. dispar* оказались фертильными. Наблюдалась откладка яиц, и были в массе обнаружены яйца на крупных листьях щавеля конского *Rumex confertus*. На одном листе сверху можно было найти сразу до 30 яиц, отложенных по одному, группами по 2–5 штук (рис. 6) и цепочками вдоль центральной жилки до 10 штук, реже яйца откладывались на нижнюю сторону листовой пластинки по 1–3 штуки. Так как щавель конский в местных травянистых фитоценозах является адвентивным и пока малообильным видом, можно предположить, что такое большое количество яиц откладывалось на один лист растения разными самками. Кладок яиц на горец большой, который также указывается в качестве кормового растения гусениц [Коршунов, 2002; Львовский, Моргун, 2007; Tshikolovets, 2011] и очень обилён в растительных сообществах Полярного Урала, отмечено не было. Через 7–10 дней из собранных в садки яиц вывелись гусеницы.

Помимо урочища Красный Камень, на Полярном Урале 2 самки *L. dispar* были зафиксированы 29 июля 2023 года в городской черте Воркуты. На листьях щавеля конского, в большом количестве растущего у фасадов домов на центральных улицах города, во дворах и на пустырях, яйца данного вида также были многочисленны.

## Обсуждение

Учитывая отсутствие *L. dispar* в рассматриваемом районе Полярного Урала в 2019 году, когда мы в последний раз проводили здесь полевые исследования, а также численность и встречаемость этого вида в 2023 году, можно уверенно утверждать, что его заселение произошло в какой-то из летних сезонов с 2020 по 2022 год.





Рис. 1. Карта местонахождений *Lycaena dispar* на территории Европы и Западной Сибири.

I – данные Глобального информационного фонда по биоразнообразию (GBIF) [Lycaena..., 2023]; II – местонахождения вида по литературным данным [Круликовский, 1895; Шхашамиев, 1973; Чарушина, Шернин, 1974; Кумаков, Коршунов, 1979; Мигранов, 1991; Моргун, 2003; Усков, 2005; Тихомиров, 2006; Tsvetkov, 2006; Костерин и др., 2007; Матвеев, 2007; Князев, 2009; Блинушов и др., 2010; Богданов, 2011; Козлов, Алтухова, 2012; Антипова, 2013; Татарин, Горбунов, 2014; Bolotov et al., 2015; Кутенкова и др., 2015; Горбач, 2016; Миронов, 2016; Мазуров, 2017; Аникин, Володченко, 2020; Корб и др., 2020; Бакка, Пестов, 2021]; III – материал коллекции Сибирского зоологического музея Института систематики и экологии животных Сибирского отделения РАН (Новосибирск, Россия); IV – находки вида авторами на северо-востоке Русской равнины; V – обсуждаемые находки вида: 1 – урочище Красный Камень, 2 – Воркута.

Fig. 1. Map of *Lycaena dispar* localities in Europe and Western Siberia.

I – data from the Global Biodiversity Information Facility [Lycaena..., 2023]; II – species localities according to literature data [Krukivskiy, 1895; Shkhashamishv, 1973; Charushina, Shernin, 1974; Kumakov, Korshunov, 1979; Migranov, 1991; Morgun, 2003; Uskov, 2005; Tikhomirov, 2006; Tsvetkov, 2006; Kosterin et al., 2007; Matveev, 2007; Knyazev, 2009; Blinushov et al., 2010; Bogdanov, 2011; Kozlov, Altukhova, 2012; Antipova, 2013; Tatarinov, Gorbunov, 2014; Bolotov et al., 2015; Kutenkova et al., 2015; Gorbach, 2016; Mironov, 2016; Mazurov, 2017; Anikin, Volodchenko, 2020; Korb et al., 2020; Bakka, Pestov, 2021]; III – information from collection of the Siberian Zoological Museum of the Institute of Systematics and Ecology of Animals, Siberian Branch of the Russian Academy of Sciences (Novosibirsk, Russia); IV – finds of the species by the authors in the north-east of the Russian Plain; V – discussed localities: 1 – Red Stone natural boundary, 2 – Vorkuta.

Нам не удалось найти каких-либо опубликованных сведений на эту тему. Поэтому установить год появления этого вида на Полярном Урале не представляется возможным.

На восточный макросклон Полярного Урала *L. dispar*, по всей видимости, проник со стороны Западно-Сибирской равнины, а именно с юга вдоль русла Оби, и по интразональным низкорным местообитаниям затем постепенно расселился в облесенной долине реки Сось. Этим путем сюда в летний период регулярно залетают представители температурной лепидоптерофауны: *Pieris rapae* (Linnaeus, 1758), *Gonepteryx rhamni* (Linnaeus, 1758), *Polyommatus icarus* (Rottemburg, 1775), *Argynnis paphia* (Linnaeus, 1758), *A. aglaja* (Linnaeus, 1758) и др. Далее *Lycaena dispar* распространялся на запад через Сось-Елецкий перевал и до Воркуты по железнодоржым веткам Сейда – Лабитнанги и Сейда – Воркута и связанным с ними антропогенным ме-

стообитаниям. Быстрому продвижению вида в данном направлении, очевидно, способствовали лучшая прогреваемость участков с рудеральной растительностью и наличие кормовой базы гусениц – заносного сорного шавеля конского. Расселение *L. dispar* в заполярные районы со стороны Русской равнины мы считаем маловероятным, так как он обязательно был бы обнаружен авторами в таежной зоне Республики Коми во время многолетних регулярных полевых исследований, при инвентаризации фауны особо охраняемых природных территорий и проведении мероприятий по ведению региональной Красной книги. Перспективные на сегодняшний день методы молекулярно-генетических исследований, основанные на выделении гаплотипов вида, позволяют выявить и конкретизировать пути расселения *L. dispar* на Полярный Урал, как это было показано для западноевропейских популяций исследуемого вида [Lai, Pullin, 2004].



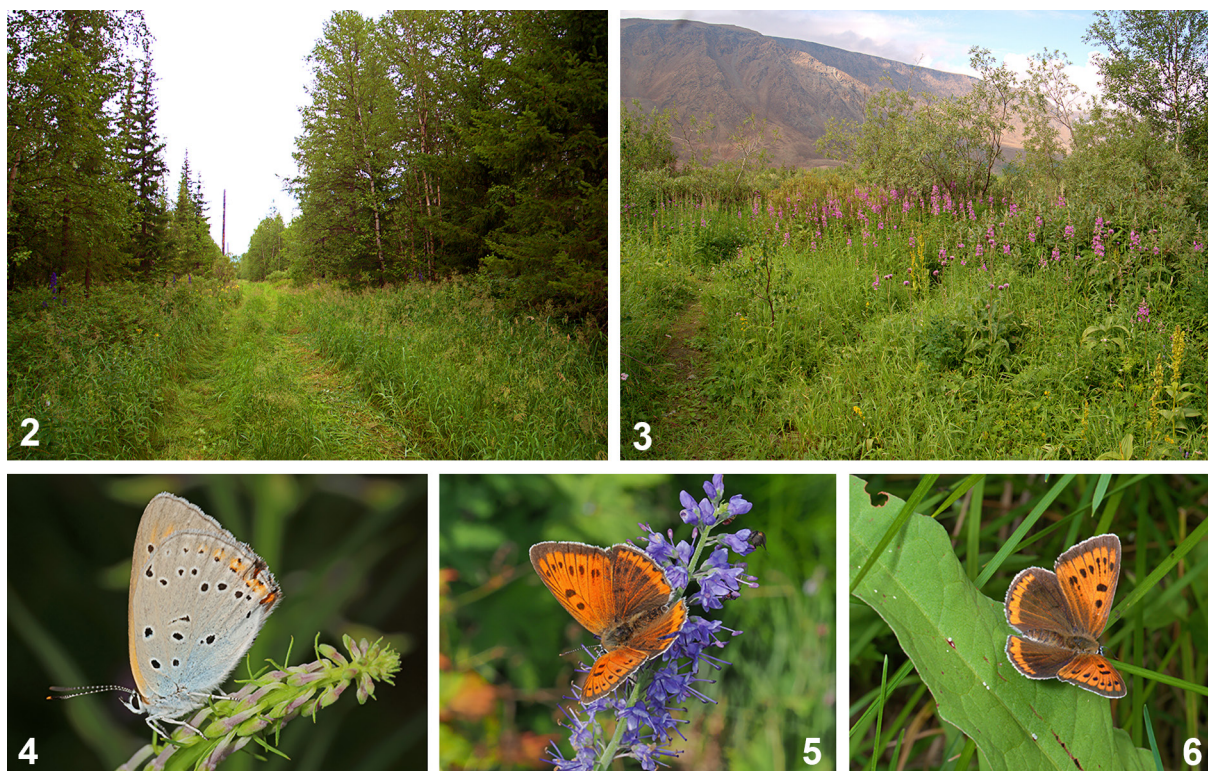


Рис. 2–6. Местаобитания *Lycaena dispar* на восточном макросклоне Полярного Урала (урочище Красный Камень) и самки в природе. 2–3 – биотопы: 2 – вездеходная дорога вдоль березово-елового леса в долине реки Сось, 3 – луговина на опушке разнотравного ивняка на левом берегу реки Сось напротив хребта Рай-Из; 4–6 – самки: 4 – на соцветии иван-чая узколистного, 5 – кормящаяся нектаром вероники длиннолистной, 6 – на листе щавеля конского, вдоль центральной жилки листовой пластинки видны отложенные яйца.

Figs 2–6. Habitats of *Lycaena dispar* on the eastern macroslope of the Polar Urals (Red Stone natural boundary) and females in nature. 2–3 – habitats: 2 – all-terrain vehicle road along the birch-spruce forest in the Sob River valley, 3 – meadow at the edge of mixed-grass willow forest on the Sob River left bank opposite the Ray-Iz Ridge; 4–6 – females: 4 – on the inflorescence of *Chamaenerion angustifolium*, 5 – feeding on *Veronica longifolia*, 6 – on leaf of *Rumex confertus*, eggs are visible along the central vein of the leaf blade.

По данным сайта «Бабочки Кавказа и юга России» [Тихонов и др., 2023], гусеницы *L. dispar* очень устойчивы к низким температурам и способны развиваться при температуре воздуха +4 °С. Очевидно, эта биологическая особенность лежит в основе успешной выживаемости вида в череде относительно теплых летних периодов и мягких зим, наблюдавшихся на Полярном Урале в последнее десятилетие, и может способствовать его натурализации в местных природных сообществах в ближайшем будущем.

В заключение кратко коснемся вопроса об отсутствии самцов в описываемой полярноуральской популяционной группировке *L. dispar*. На данном этапе исследований мы не склонны строить каких-то конкретных предположений на этот счет, но кажется маловероятным, чтобы в течение недели, когда проводились полевые исследования, среди сотни зарегистрированных особей не было бы выявлено ни одного самца при условии их наличия. Возможно, здесь стали размножаться неоплодотворенные самки. Случаи партеногенеза среди чешуекрылых в условиях Крайнего Севера известны. Например, у арктической волнянки *Gynaephora relictus* O. Bang-Naas, 1927 (= *lugens* Kozhantshikov, 1948) достоверно установлен факт выхода гусениц из неоплодотворенных яиц [Дубатов, Василенко, 1988; Dubatolov, 1997]. Также заметим, что урочище Красный Камень

является типовым местонахождением сатириды *Oeneis patrushevae* Korshunov, 1985, местная популяция которой, по нашим многолетним наблюдениям, образована только фертильными самками [Татарин, 2016].

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## Новые данные по распространению жужелиц подрода *Cryobius* Chaudoir, 1838 рода *Pterostichus* Bonelli, 1810 (Coleoptera: Carabidae) из южной части Алтая

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**Резюме.** Дано переописание малоизвестного вида *Pterostichus* (*Cryobius*) *kuraicus* Shilenkov, 2000 на основании материала, собранного на юго-западном макросклоне хребта Монгольский Алтай (первое указание для Китая). Приведены уточненные сведения о *P.* (*Cryobius*) *shilenkovi* Erjomin et Kabak, 1991 с гор Южного Алтая (Казахстан).

**Ключевые слова:** Coleoptera, Carabidae, *Pterostichus*, Алтай, Россия, Казахстан, Синьцзян-Уйгурский автономный район, Китай.

### New data on distribution of carabid-beetles of the subgenus *Cryobius* Chaudoir, 1838, the genus *Pterostichus* Bonelli, 1810 (Coleoptera: Carabidae) from the southern part of the Altai

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**Abstract.** A little-known species, *Pterostichus* (*Cryobius*) *kuraicus* Shilenkov, 2000, is redescribed on the material collected in south-western slopes of the Mongolian Altai range, Xinjiang-Uygur autonomous region of China (first record for China). External characters and structures of male genitalia, including that of the aedeagus and the endophallus, as well as the apical gonocoxites are figured for the first time. Geographic variation and bionomics in the southern part of the specific area are discussed. Additionally, the corrected data on the distribution and type specimens are provided for *P.* (*Cryobius*) *shilenkovi* Erjomin et Kabak, 1991 from the Southern Altai mountains (Eastern Kazakhstan), the photos of external and genital characters of paratypes are given.

**Key words:** Coleoptera, Carabidae, *Pterostichus*, Altai, Russia, Kazakhstan, Xinjiang-Uygur Autonomous Region, China.

Подрод *Cryobius* Chaudoir, 1838 является одной из самых богатых видами и трудных в систематическом отношении групп рода *Pterostichus* Bonelli, 1810. Представители этого голарктического аркто-альпийского подрода, помимо прочего, широко распространены в горах Южной Сибири и Монголии, включая Алтае-Саянскую горную систему, но не заходят ни в горы Саур-Тарбагатай, ни на восточные хребты Тянь-Шаня (Богда-Ола, Баркольтаг, Мэчин-Ула и Карлыктаг). С территории китайской части Алтая представители *Cryobius* до сих пор не были известны. Ниже приводится переописание малоизвестного вида этого подрода (*P. kuraicus* Shilenkov, 2000), собранного недавно на юго-западных склонах хребта Монгольский Алтай (Синьцзян-Уйгурский автономный район Китая), а также уточняются данные по распространению *P.* (*Cryobius*) *shilenkovi* Erjomin et Kabak, 1991 с гор Южного Алтая (Казахстан). Обзор алтайских видов подрода на основе накопленного к настоящему времени материала требует отдельного масштабного исследования и в задачи данной публикации не входит.

Изученные материалы хранятся в коллекциях Зоологического института РАН (ЗИН, Санкт-Петербург, Россия), Московского педагогического государственного университета (МПГУ, Москва, Россия), Института систематики и экологии животных Сибирского отделения Российской академии наук (ИСЭЖ, Новосибирск, Россия), научного отдела Катон-Карагайского государ-

ственного национального природного парка (ККГНПП, Катон-Карагай, Казахстан) и в рабочей коллекции И.А. Белоусова и И.И. Кабака (сВК, Санкт-Петербург, Россия).

При описании были сделаны следующие измерения экземпляров: длина тела – от переднего края верхней губы до вершины надкрылий; ширина головы (НВ) – включая глаза; длина переднеспинки (РЛ) – вдоль медиальной линии; длина надкрылий (ЕЛ) – от вершины щитка до вершины длинного надкрылья; ширина переднеспинки (РШ) и надкрылий (ЕШ) – в наиболее широких частях. Количество изученных препаратов гениталий приведено в скобках после числа экземпляров.

*Pterostichus* (*Cryobius*) *kuraicus* Shilenkov, 2000  
(Рис. 1, 2, 4–14, 7–10, 18–19)

*Pterostichus* (*Cryobius*) *kuraicus* Shilenkov, 2000: 54 (типичное местонахождение: «ЮВ Алтай, Курайский хребет, южный склон»). Дудко, Зинченко, 2009: 193 (верховья реки Сарымсакты, 2100–2800 м (альпийско-тундровый пояс) (~49°01'37"N / 85°42'55"E); северный склон Курчумского хребта, 10 км 3 горы Аксубас, 2400 м (альпийско-тундровый пояс) (~48°56'30"N / 85°44'37"E); верховья реки Тополёвка, 2300 м (альпийско-тундровый пояс) (~48°56'14"N / 85°44'09"E); хребты Курчумский и Сарымсакты в Восточном Казахстане, а также Катунский, Северо-Чуйский, Курайский хребты и хребет Чихачёва; Дудко и др., 2010: 1319 (ЮВ Алтай: хребты Шапшальский, Чихачёва и



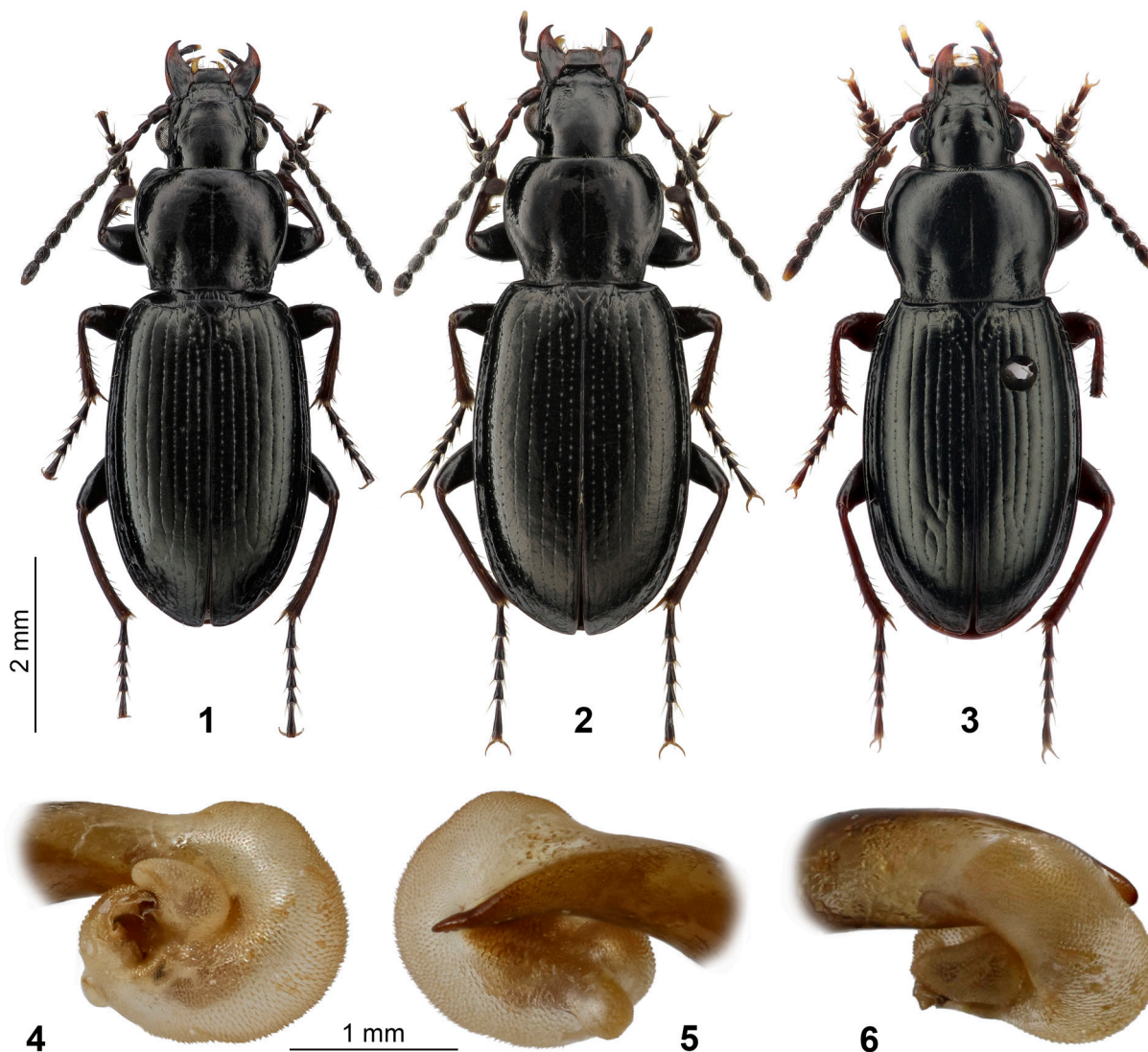


Рис. 1–6. *Pterostichus (Cryobius) spp.*, самцы, общий вид и эндофаллус. 1–2, 4–6 – *P. kuraicus*: 1 – экземпляр с гор к востоку от озера Канас, 2 – экземпляр с горы Кештау; 4–5 – эндофаллус экземпляра с горы Кештау, вид сбоку, 6 – то же, вид сверху; 3 – *P. shilenkovi*, паратип из типового местонахождения.

Figs 1–6. *Pterostichus (Cryobius) spp.*, males, general view and endophallus.

1–2, 4–6 – *P. kuraicus*: 1 – specimen from the left bank of the Kanas Lake, 2 – specimen from the Keshtau Mt., 4–5 – endophallus of the specimen from the Keshtatau Mt., lateral view, 6 – same, dorsal view; 3 – *P. shilenkovi*, paratype from the type locality.

Южно-Чуйский, плоскогорье Уюк (гора Майтобе и верховья реки Кальджин-Куль)); Габдуллина, 2016: 53 («верховья реки Сарымсақты» (по Дудко, Зинченко [2009])).

Здесь и далее: при приведении местонахождений из литературных источников отсутствующие в них географические координаты восстановлены мной.

**Материал.** Казахстан: 1♂ (1) (ИСЭЖ), SW Altai, Kurtshumskiy Ridge, 10 km WSW of Aksubas Mt., pass in the sources of Topolyovka River, ca. 48°56'14"N / 85°44'09"E, 2550 m, tundra, 4.07.1997 (R.Yu. Dudko, V.K. Zintshenko); 6♂ (6) (у одного самца изучен эндофаллус), 2♀ (ККГНПП, СВК), S slope of Southern Altai Ridge, Takyr Mt., 48°02'07"N / 86°31'56"E, 2793 m, 8.07.2021 (V.M. Vorobyov); 3♂ (3), 6♀ (2) (ККГНПП, СВК), S Altai, Sarymsakty Ridge, Tautekeli – Sarymsakty Pass, 49°02'07"N / 85°44'35"E, 2700 m, 26.07.2021 (V.M. Vorobyov).

Китай: 8♂ (6) (у двух самцов изучены эндофаллусы), 6♀ (3) (ЗИН, МПГУ, ИСЭЖ, СВК), Xinjiang, S Altai Mts, Keshtau Mt., ENE Qinghe, 46°46'46"N / 90°46'28"E, 46°46'16"N / 90°46'36"E, 3160–3345 m, 12.08.2013 (I.I. Kabak); 1♂ (генеральный), 5♀ (1) (СВК), Xinjiang, Altay Ridge, N of Kom (= Nemu) vill., 48°37'36"N / 87°25'40"E, 3015 m, alpine meadows,

2.08.2015 (I.I. Kabak); 3♂ (3), 1♀ (1) (СВК), Xinjiang, Altai Mts, left bank of Kanas Lake, 48°44'13"N / 87°04'42"E, 2645 m, near snow, 15.07.2019 (I.I. Kabak).

**Замечания.** Этот малоизвестный вид был описан по одной самке с южных склонов Курайского хребта [Шиленков, 2000]. Позднее он был указан из нескольких пунктов Центрального, Южного и Юго-Восточного Алтая, однако переописание вида, в том числе детали строения гениталий самца и самки, до сих пор опубликовано не было.

**Переописание** (на основании материала с китайской части хребта Монгольский Алтай). Тело слабовыпуклое, стройное (рис. 1, 2), усики и ноги средней длины. Длина тела 5.8–7.1 (6.6) мм. Верх черный, мандибулы, усики и ноги буроватые, дистальная половина мандибул, основание первых четырех члеников усиков, голени и часто лапки осветлены, красноватые; максиллярные щупики черные, только дистальная

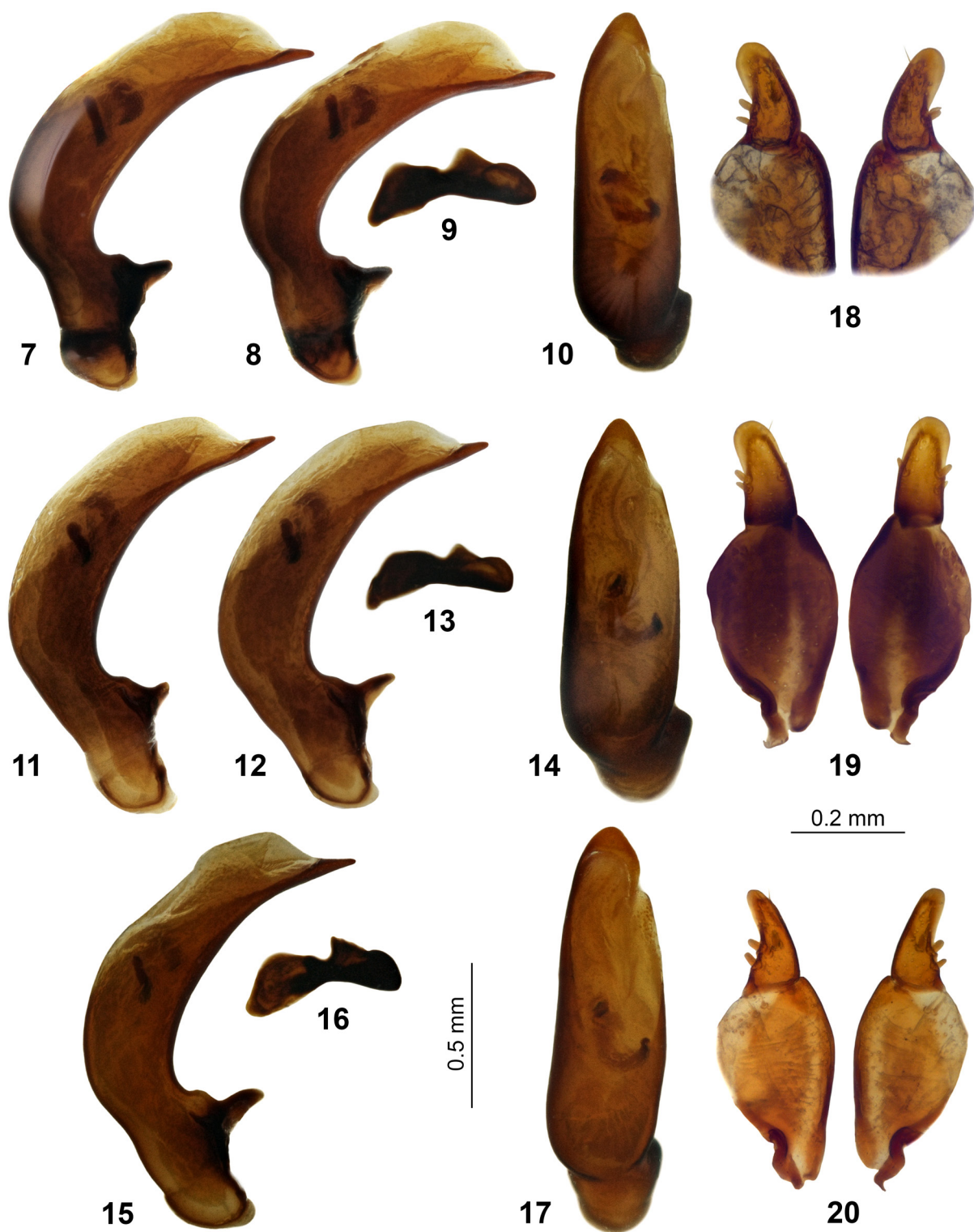


Рис. 7–20. *Pterostichus (Cryobius)* spp., гениталии.  
 7–14, 18–19 – *P. kuraicus*: 7–10, 18 – экземпляры с гор к востоку от озера Канас, 11–14, 19 – экземпляры с горы Кештау; 15–17, 20 – *P. shilenkovi*, паратипы из типового местонахождения. 7–8, 10–12, 14–15, 17 – медиальная доля эдеагуса; 9, 13, 16 – правая парамера; 7–9, 11–13, 15–16 – вид сбоку; 10, 14, 17 – вид сверху; 18–20 – гонококситы, вид снизу.  
 Figs 7–20. *Pterostichus (Cryobius)* spp., genitalia.  
 7–14, 18–19 – *P. kuraicus*: 7–10, 18 – specimens from the left bank of the Kanas Lake, 11–14, 19 – specimens from the Keshatau Mt.; 15–17, 20 – *P. shilenkovi*, paratypes from the type locality. 7–8, 10–12, 14–15, 17 – median lobe of the aedeagus; 9, 13, 16 – right paramera; 7–9, 11–13, 15–16 – lateral view; 10, 14, 17 – dorsal view; 18–20 – gonocoxites, ventral view.





Рис. 21–22. Биотопы *Pterostichus (Cryobius) kuraicus*.  
21 – горы к востоку от озера Канас; 22 – гора Кештау.  
Figs 21–22. Biotopes of *Pterostichus (Cryobius) kuraicus*.  
21 – mountains on the left bank of the Kanas Lake; 22 – Keshtau Mt.

половина последнего членика желтая. Верх со слабым оливковым отливом. Низ черный или черно-бурый.

Голова нормальной для представителей подрода толщины,  $PW/HW = 1.31–1.42$  (1.36). Глаза довольно сильно выступают. Верх головы выпуклый, лобные ямки неглубокие, длинные, явственно заходят за уровень середины глаз, впереди сильнее вдавлены. Поверхность головы гладкая, рассеянная пунктировка развита только в лобных вдавлениях. Клипеофронтальный шов посередине сглажен. Усики заходят за уровень основания переднеспинки одним-двумя члениками, их 2-й членик снизу с одной хетой, реже без хет.

Переднеспинка довольно узкая, сердцевидная,  $PW/PL = 1.2–1.35$  (1.29), ее максимальная ширина у середины, боковые края равномерно и довольно сильно округлены на большем протяжении, в базальной четверти с отчетливой выемкой и несколькими насечками. Передний край слегка или отчетливо вогнут, передние углы короткие, округленные, слабо или умеренно выступают. Базальный край примерно равен по ширине апикальному, посередине вогнут, у базальных вдавлений выступает. Задние углы прямые или слегка тупые, на вершине чаще всего резкие, реже – притуплены. Диск посередине слабо выпуклый, гладкий или в легких и редких поперечных морщинках. Боковая окантовка узкая по всей длине, боковые края слабо приподняты. Внутренние базальные вдавления переднеспинки длинные, в центральной части резко вдавлены, не отделены от базального края переднеспинки (у особей с северо-запада ареала) или ограничены сзади выпуклостью (у большинства особей с юго-востока), в неглубокой неправильной пунктировке; внешние вдавления узкие, неглубокие, у одного экземпляра с северо-запада и большинства особей с юго-востока едва различимые; складка в задних углах очень слабая. Базальное поперечное вдавление неразличимо. Краевых щетинконосных пор две пары – перед серединой и в задних углах; у двух экземпляров из юго-восточной части ареала

(гора Кештау) имеется одна дополнительная передняя краевая пора. Медиальная линия глубокая, в центральной части вдавлена, заметно не достигает переднего края и основания.

Надкрылья вытянутые, овальные,  $EL/EW = 1.5–1.59$  (1.55),  $EL/PL = 2.51–2.74$  (2.63),  $EW/PW = 1.29–1.39$  (1.34), их максимальная ширина у середины или немного за серединой. Боковые края равномерно округлены вперед и назад. Предвершинная выемка не выражена, вершины надкрылий обычно совместно округлены, реже вершина каждого надкрылья слегка притуплена. Плечи отчетливые, плечевой зубчик маленький, едва заходит за контур бокового края, обычно сглажен на вершине. Базальная окантовка узкая, дуговидно изогнутая или почти прямая на большем протяжении. Боковой кант узкий, почти равномерной ширины, лишь едва расширен в средней части. Диск надкрылий слабо выпуклый, вдоль шва уплощен. Бороздки отчетливо пунктированы, умеренно глубокие. Третий промежуток обычно с 2, реже с 3 или 4 мелкими дисковыми порами. Прищитковая бороздка не слабее остальных, прищитковая пора имеется. Умбиликальные поры обычно разделены на две группы: в передней чаще всего 5 близко расположенных пор (у особей из парка Канас иногда их 6, редко – 7), в задней – от 3 до 5 обычно сильнее раздвинутых пор. У отдельных экземпляров одна из пор расположена у середины бокового края. Седьмая бороздка с одной преапикальной порой, еще одна мелкая пора расположена у вершинного угла каждого надкрылья.

Микроскульптура очень слабая, у самцов на голове и переднеспинке обычно неразличима, на надкрыльях изодиаметрическая, покровы умеренно блестящие, с едва различимым оливковым металлическим отливом.

Бока груди в неглубокой рассеянной пунктировке. Переднегрудь грубо и умеренно густо пунктирована, ее отросток окантован. Эпистерны заднегрудки едва длиннее своей ширины по переднему краю. Бока первых двух видимых стернитов брюшка морщинистые. Парамедиальных хет одна пара.

Медиальная доля эдеагуса в латеральной проекции довольно широкая, ее вентральный край сильно вогнутый, апикальная ламелла короткая, почти прямая (рис. 7, 8, 11, 12). В дорсальной проекции эдеагус равномерно сужен к вершине, апикальная ламелла симметричная, треугольная, округлена на вершине (рис. 10, 14). Правая пара слабо изогнута, дистальная часть у особей с северо-запада длинная, сужена к вершине (рис. 9), у юго-восточных – короткая, широко округленная (рис. 13). Вооружение эндофаллуса состоит из двух небольших склеритов, расположенных поперечно в средней части тубуса эдеагуса, из которых проксимальный большой, узкий, С-образно изогнутый, направленный выпуклой стороной к вентральному краю, дистальный более короткий и широкий, слабее изогнут и не так сильно пигментирован (рис. 7, 8, 10–12, 14). Эндофаллус по форме напоминает улитку, отросток на его левой стороне большой (рис. 4–6).

Апикальный гонококсит (рис. 18, 19) распластан по краям, широко округлен на вершине, с двумя шипиками на внешнем крае и одним на дорсальной поверхности.

**Географическая изменчивость.** Особи с юго-востока известного ареала вида (гора Кештау) отличаются от особей из северо-западной части хребта Монгольский Алтай в среднем более крупным размером (6.8 vs 6.4 мм), пропорционально более длинными и широкими надкрыльями ( $EL/PL = 2.69$  vs 2.63,  $EW/PW = 1.36$  vs 1.32), бороздки которых слабее развиты, а промежутки совершенно плоские (рис. 1, 2). Однако эти состояния признаков имеются и в популяциях из северной части ареала вида (в границах России и Казахстана), то есть не связаны с распространением.

**Диагноз.** По строению эдеагуса (равномерно вогнутый посередине вентральный край и симметричная



треугольная апикальная ламелла в сочетании с наличием двух склеритов эндофаллуса, из которых проксимальный большой, С-образно изогнутый) рассматриваемый таксон близок к *P. shilenkovi* [Еремин, Кабак, 1991]. *Pterostichus kuraicus* легко отличается от него признаками петрофильной специализации (надкрыля и переднеспинка узкие, уплощенные, ноги и усики сравнительно длинные), темными конечностями и щупиками, слабее изогнутыми боковыми краями переднеспинки, внешние базальные вдавления которой сильнее выражены, а их область отчетливо пунктирована, слабее выпуклыми промежутками надкрылий, отсутствием плечевого зубчика (ср. рис. 1, 2 и рис. 3), а также более развитой микроскульптурой надкрылий. Эдеагус *P. kuraicus* в дистальной четверти слабее и менее равномерно отогнут вентрально (ср. рис. 7, 8 и 11, 12 с рис. 15). Апикальный гонококсит сильнее распластан по краям, широко округлен на вершине (ср. рис. 18, 19 с рис. 20).

**Распространение.** Высокогорные районы Центрального, Южного и Юго-Восточного Алтая от Северо-Чуйского хребта на севере до Курчумского хребта и плоскогорья Укок на юге (Россия и Казахстан). На территории Китая (первое указание) *P. kuraicus* населяет высокогорья хребта Монгольский Алтай от района озера Канас на северо-западе до горы Кештау на юго-востоке.

**Местообитания.** В северо-западной части хребта Монгольский Алтай вид собран на альпийских лугах под камнями у снежников на высотах 2645–3015 м (рис. 21), в юго-восточной части этого хребта – на крутом каменистом склоне и на вершинном водоразделе в осыпях и под камнями среди низкотравной альпийской растительности в пределах высот от 3160 до 3345 м (рис. 22).

*Pterostichus (Cryobius) shilenkovi*  
Erjomin et Kabak, 1991  
(Рис. 3, 15–17, 20)

*Pterostichus (Cryobius) shilenkovi* Erjomin et Kabak, 1991: 139, рис. 1, 3 (типичное местонахождение: «Южный Алтай, гребень хребта Азутау, 30 км на северо-восток от пос. Алексеевка, на высоте 2100 м»). Дудко, Зинченко, 2009: 193 (10 км ЮВ с. Урунхайка, 2200–2400 м (альпийско-тундровый пояс) (~48°46'05"N / E86°08'50"E); 10 км ЮВ с. Матабай, 2200–2300 м (альпийско-тундровый пояс) (~48°37'25"N / 85°44'43"E); хребет Азутау; гора Лямин Белок на Западном Алтае).

**Материал.** 3♂ (3), 2♂ (1), паратипы (МПУ, СВК), «В Казахстан, Ю Алтай, гребень хр. Азутау, 30 км СВ Алексеевки, 2100 м, у снега, 26.07.1996, И. Кабак leg.» (~48°37'17"N / 85°46'03"E, 2165 м), "Paratypus *Pterostichus (Cryobius) shilenkovi* sp. n., 1991 Erjomin et Kabak".

**Замечания.** Вид был описан по моим сборам, сделанным на хребте Азутау в 1986 году [Еремин, Кабак, 1991], но в типовую серию были включены также экземпляры, собранные во время этой же экспедиции на горе Лямин Белок в Западном Алтае (Восточный Казахстан). Второе местонахождение, как показало изучение дополнительного материала, населено другим, очень близким таксоном подрода *Cryobius*. Кроме того, при публикации описания *P. shilenkovi* произошла техническая ошибка, и изображения гениталий самцов оказались перепутанными (рисунки 2 и 3 на странице 140).

Голотип *P. shilenkovi* находился в рабочей коллекции П.К. Ерёмина и после его безвременной кончины, судя по всему, был утерян. Особи с хребта Азутау и с горы Лямин Белок в его коллекции также могли быть перепутаны. Эдеагус, показанный в первоописании на рисунке 2, очень похож на эдеагус экземпляра с хребта Азутау, который П.К. Ерёмин передал в коллекцию ЗИН под названием *Pterostichus (Cryobius) altaiensis* Poppius, 1906. Географическая этикетка этого экземпляра ошибочна, очень вероятно, что его определение также неверно. В целях внесения ясности и сохранения стабильности номенклатуры я привожу здесь фотографии габитуса (рис. 3) и гениталий (рис. 15–17, 20) паратипов *P. shilenkovi* из типового местонахождения, которые хранятся в нашей рабочей коллекции (СВК) и путаница с этикетками которых исключена.

Поскольку мне не удалось изучить голотип *Pterostichus (Cryobius) altaiensis* Poppius, 1906, я не могу судить о близости к нему *P. shilenkovi*, так же, как и о принадлежности популяции с горы Лямин Белок к *P. altaiensis*, хотя вероятность этого не исключена.

**Распространение.** *Pterostichus shilenkovi* в настоящий момент известен только с хребта Азутау. Между этим районом и горой Лямин Белок (где обитает близкородственный таксон) расположено несколько хребтов Южного и Юго-Западного Алтая, на которых эти виды не найдены, хотя собраны другие представители подрода *Cryobius*.

**Местообитание.** Горные низкотравные луга на высотах 2160–2444 м, часто у тающего снега.

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## To the knowledge of the genus *Aphthonoides* Jacoby, 1885 (Coleoptera: Chrysomelidae: Galerucinae: Alticini) from Malaysia and Indonesia

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**Abstract.** Four new species of the genus *Aphthonoides* Jacoby, 1885 are described: *A. bukittinggiensis* sp. n. (from Indonesia), *A. tambunanensis* sp. n., *A. trusmadiensis* sp. n. (from Malaysia) from the *beccarii* species-group, and *A. pseudosabahensis* sp. n. (from Malaysia) from the *laticollis* species-group. The figures of general views, aedeagi and spermathecae are given for them and the majority of related species. A new identification key to species of the genus *Aphthonoides* from Sundaland and the Philippines is given. Two new species-group (the *beccarii* and the *laticollis*) are proposed. The species of the *laticollis* group have the wide pronotum (more than 1.45 times as wide as long) with lateral margins nearly straight, converging anteriorly; anterior setigerous pore on lateral margin of the pronotum not or very slightly protrude outwards; basal margin of the pronotum strongly convex; male protarsomere I not or very slightly enlarged. Species of the *beccarii* group have the narrower pronotum (1.35 or less times as wide as long) with lateral margins straight or rounded, not converging anteriorly; anterior setigerous pore on lateral margin of the pronotum distinctly protrude outwards; basal margin of the pronotum slightly convex; male protarsomere I distinctly enlarged. The geographical distribution of *A. beccarii* Jacoby, 1885 and *A. laticollis* Heikertinger, 1940 has been clarified. The latter species is recorded for Malaysia for the first time.

**Key words:** Coleoptera, Chrysomelidae, Galerucinae, *Aphthonoides*, Indonesia, Malaysia, Borneo, Sumatra, new species.

### К познанию жуков-листоедов рода *Aphthonoides* Jacoby, 1885 (Coleoptera: Chrysomelidae: Galerucinae: Alticini) Малайзии и Индонезии

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**Резюме.** Описано четыре новых вида жуков-листоедов рода *Aphthonoides* Jacoby, 1885: *A. bukittinggiensis* sp. n. (из Индонезии), *A. tambunanensis* sp. n., *A. trusmadiensis* sp. n. (из Малайзии) из группы видов *beccarii* и *A. pseudosabahensis* sp. n. (из Малайзии) из группы видов *laticollis*. Для них и большинства родственных видов приведены фотографии габитуса и полового аппарата. Дана новая определительная таблица для видов рода *Aphthonoides* из Сулаванды и с Филиппин. Предложены две новые видовые группы (*beccarii* и *laticollis*). У видов группы *laticollis* переднеспинка широкая (ширина более чем в 1.45 раза превышает длину), с почти прямыми боковыми сторонами, сходящимися вперед; передняя щетинконосная пора на боковом крае переднеспинки не выступает или очень слабо выступает наружу; базальный край переднеспинки сильно выпуклый; первый членик передних лапок самца не увеличен или очень незначительно увеличен. У видов группы *beccarii* переднеспинка более узкая (ширина в 1.35 раза или менее превышает длину), с боковыми сторонами прямыми или закругленными, не сходящимися вперед; передняя щетинконосная пора на боковом крае переднеспинки отчетливо выдается наружу; базальный край переднеспинки слабо выпуклый; первый членик передних лапок самца отчетливо увеличен. Уточнено географическое распространение *A. beccarii* Jacoby, 1885 и *A. laticollis* Heikertinger, 1940. Последний вид впервые указан для Малайзии.

**Ключевые слова:** Coleoptera, Chrysomelidae, Galerucinae, *Aphthonoides*, Индонезия, Малайзия, Борнео, Суматра, новые виды.

The genus *Aphthonoides* was described by Jacoby [1885] with type species *Aphthonoides beccarii* Jacoby, 1885 from Java. Heikertinger [1940] provided a detailed description of the genus, described several species (including from the region under consideration: *A. fulmeki* Heikertinger, 1940 and *A. laticollis* Heikertinger, 1940 from Sumatra) and gave the first key to known at that time *Aphthonoides* species. Relatively recently, the fundamental work devoted to this genus was published by Döberl [2005]. In this work all known species of this genus were reviewed, as well as diagnostic characters of the genus, a key for all known species and a bibliography were given.

The genus *Aphthonoides* including 33 species known at this time (excluding those described in this work) is

widely distributed in the Oriental region from India to the Philippines and partly in the Palearctic region (two species from Japan and several Chinese species are distributed along Palearctic and Oriental border). *Aphthonoides* can be distinguished from other Alticini genera by the structure of hind leg with the long sword like spur which longer than the hind tarsus and connected to a very short tibia.

Although this genus was revised and keyed by Döberl [2005] the studying of the *Aphthonoides* fauna of Sundaland should not be considered complete. There are no species of this genus in the Catalogue of the Malaysian Chrysomelidae [Mohamedsaid, 2004]. After Döberl's work, the paper with description of a new species from Borneo has been published [Medvedev, Romantsov, 2014].

Further examination of the material collected by the author in Malaysia and Indonesia allows to describe four new species and to give new identification keys to species from Sundaland and the Philippines.

## Material and methods

All measurements were made using an ocular grid mounted on MBS-20 stereomicroscope. Measurements of all segments were taken at their widest part, unless otherwise specifically stated. All the proportions of antennomeres and tarsomeres are given in standard units (1 standard unit = 0.025 mm). All photos were taken by the author using a Canon EOS 80D digital camera with a combined Canon EF 70–200 mm f/4.0L IS USM and inverted Canon EF-S 24mm F2.8 STM lenses (to photograph aedeagi and spermathecae Canon Extender EF 1.4 X II was additionally used). Images at different focal planes were combined using Zerene Stacker Professional 1.04 software.

The following abbreviations are used for depository places of types:

PR – private collection of Pavel Romantsov (St Petersburg, Russia);

ZIN – Zoological Institute of the Russian Academy of Sciences (St Petersburg, Russia).

### *Aphthonoides beccarii* Jacoby, 1885 (Figs 1, 11–13, 43, 44, 58)

**Material.** 1♂, 1♀ (PR), “Indonesien, Sumatra II., West Sumatra Prov., 16 km W Bukittinggi, Maninjau Lake, h~527-610 m, S 0°17'08", E 100°13'46" S 0°17'07", E 100°13'55", 11.II.2018 P. Romantsov leg.”; 3♂, 1♀ (PR), the same data, but “12.II.2014”; 7♂, 1♀ (PR), “Indonesien, Sumatra II., West Sumatra Prov., 16 km W Bukittinggi, Maninjau Lake; h~695-790 m, S 0°16'18", E 100°14'00" S 0°16'22", E 100°14'11", 13.II.2018 P. Romantsov leg.”

Type material is not examined, but image of the type specimen is available in free access on the website of the Harvard University [https://mczbase.mcz.harvard.edu/name/Aphthonoides%20beccarii].

**Differential diagnosis.** *Aphthonoides beccarii* has elongate body, about 2 times as long as wide or slightly more; narrow pronotum with lateral margins not converging anteriorly, anterior setigerous pore on lateral margin of pronotum distinctly protrude outwards and slightly rounded basal margin with middle of pronotal base very weakly protruded; protarsomere I usually enlarged in males (see a key below). For other *Aphthonoides* species from the studied region having similar characteristics, I propose the name *beccarii* species-group. Moreover, within this group there is a complex of species that have short, wide, just 4 times longer than wide or shorter (usually 3.3–3.7 times) aedeagus which is strongly curved in middle in lateral view. This complex includes *A. beccarii*, *A. fulmeki* Heikertinger, 1940 and *A. bukittinggiensis* sp. n. Of them *A. beccarii* and *A. fulmeki* have aedeagus compressed before rounded apex in dorsal view and with tip not bent down in lateral view (Figs 11–13, 20–22), contrary to *A. bukittinggiensis* sp. n. having aedeagus with straight margins before triangular apex bearing distinct, sharp tooth and with hook-shaped tip bent down in lateral view (Figs 14–16). Moreover, *A. beccarii* easily differs from *A. fulmeki* in the pronotum with almost straight or very slightly rounded lateral margins, contrary to *A. fulmeki* having the pronotum with lateral margins distinctly diverging anteriorly. See also a key.

**Notes.** The distribution of this species needs clarification. When this paper was already accepted for publication I was able to study the specimens from Luzon and Mindanao on the basis of which Medvedev [2004] recorded *A. beccarii* from the Philippines. All these specimens were not dissected and Medvedev indicated that he was not sure in their identification. After dissected them, it turned out that they all belong to another species, most likely not described yet.

**Distribution.** China (Hupeh, Fukien), Japan (Kyushu), Java, Sumatra, Taiwan, Thailand.

### *Aphthonoides bergeali* Döberl, 2005 (Figs 45, 46, 59)

**Material.** Type material is not examined.

**Differential diagnosis.** After Döberl [2005] this species differs from the majority of other species in surface of elytra punctate-striate with punctures fading behind middle and is most similar to *A. sumatranus* Döberl, 2005. However, *A. bergeali* can be distinguished from the latter in the aedeagus distinctly widened before apex (Figs 45, 46), contrary to *A. sumatranus* having the aedeagus with almost parallel sides, very slightly widened before apex (Figs 54, 55). This species belongs to the *beccarii* species-group. See also a key.

**Distribution.** Sumatra.

### *Aphthonoides bukittinggiensis* sp. n. (Figs 2, 14–16, 35)

**Material.** Holotype, ♂ (ZIN): “Indonesien, Sumatra II., West Sumatra Prov., 16 km W Bukittinggi, Maninjau Lake, h~527-610 m, S 0°17'08", E 100°13'46" S 0°17'07", E 100°13'55", 11.II.2018 P. Romantsov leg.”; Paratypes: 5♂, 1♀ (PR), the same data as holotype; 4♂, 1♀ (PR), the same locality and collector, but “12.II.2014”; 1♂, 5♀ (PR), “Indonesien, Sumatra II., West Sumatra Prov., 16 km W Bukittinggi, Maninjau Lake; h~695-790 m, S 0°16'18", E 100°14'00" S 0°16'22", E 100°14'11", 13.II.2018 P. Romantsov leg.”; 2♂, 2♀ (PR), the same data, but “14.II.2014”.

**Description.** Holotype. Dorsal side of body black. Antennae brown, gradually darkened starting antennomere VII. Legs brown with claws darkened. Underside of body dark brown. Body length 1.15 mm. General view as in Fig. 2.

Body oblong-oval (about 1.9 times as long as wide), dorsal side glabrous. Frons and vertex microsculptured and sparsely punctate. Penultimate maxillary palpomere very slightly enlarged, apical palpomere with sharp apex. Frontoclypeus triangular, at margins clearly limited by grooves. Genae moderately long, about 2 times shorter than transverse diameter of eye and about 2.3 times shorter than longitudinal diameter of eye. Nasal keel relatively wide, distinctly convex longitudinally. Frontal tubercles slightly convex, rectangular; frontal lines straight, distinctly impressed. Eyes medium size, convex, weak oval (1.17 times as long as wide); interocular space as wide as transverse diameter of eye. Antennae 1.15 times shorter than body length. Antennomere I large, club-shaped; antennomere II enlarged, other antennomeres cylindrical, last antennomere pointed at apex. Length ratio of antennomeres I–XI as 4 : 4 : 3 : 3 : 3.5 : 3.5 : 4 : 4 : 4.5 : 4.5 : 6.

Pronotum transverse, 1.2 times as wide as long (widest at anterior half, its lateral margins slightly constricted at basal third), almost 1.37 times narrower than elytra at level of humeral calli. Anterior margin almost straight, basal margin slightly rounded with middle of pronotal base very weakly protruded: ratio of total pronotal length across middle to length at posterior corners level 0.2. Lateral margins almost straight with bordering distinctly widened in anterior third, bearing anterior setigerous



Figs 1–6. *Aphthonoides*, males, general view.

1 – *A. beccarii*; 2 – *A. bukittingiensis* sp. n., holotype; 3–4 – *A. burckhardti*: 3 – light form, 4 – dark form; 5 – *A. fulmeki*; 6 – *A. laticollis*.

Рис. 1–6. *Aphthonoides*, общий вид самцов.

1 – *A. beccarii*; 2 – *A. bukittingiensis* sp. n., голотип; 3–4 – *A. burckhardti*: 3 – светлая форма, 4 – темная форма; 5 – *A. fulmeki*; 6 – *A. laticollis*.

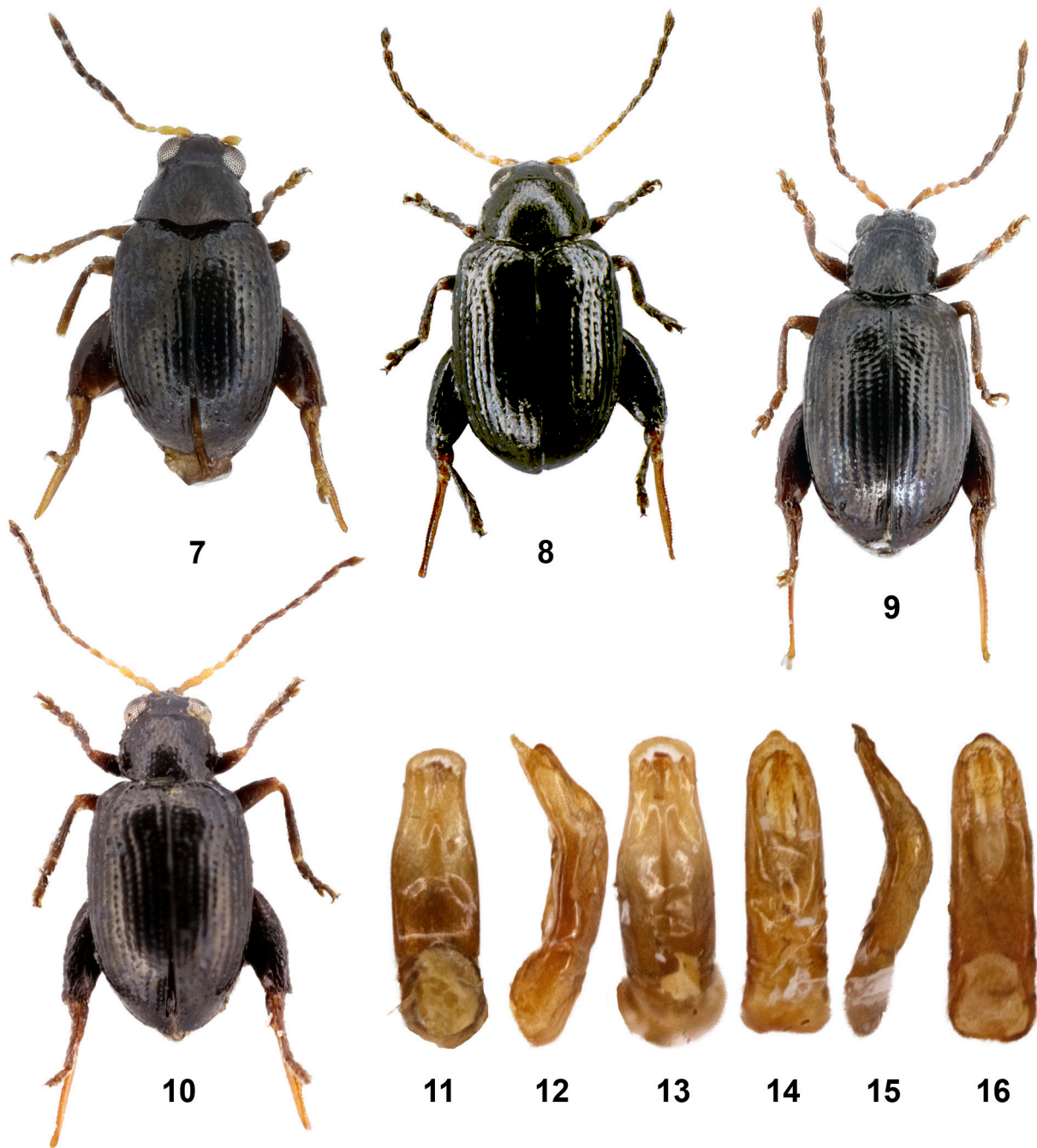
pore distinctly protruded outwards. Anterior and posterior margins unbordered, lateral margins bordered. Anterior corners very slightly rounded and thickened; posterior corners obtuse. All corners with setigerous pore bearing long pale seta (longer at posterior corners). Pronotal surface densely and mostly longitudinally strigose and finely punctured.

Scutellum transverse (about 2 times as wide as long) with rounded apex. Surface lustrous and impunctate. Elytra about 1.35 times as long as wide, slightly widened at posterior third with narrowly rounded apices. Humeral calli well developed. Elytra with 8 regular rows of punctures (except scutellar row). Scutellar rows

with 8 punctures, row V short, not reach elytral base, other rows regular with well impressed punctures, interspaces narrow, flat, but a few lateral ones distinctly convex. Epipleura moderately wide at anterior quarter, gradually narrowing towards apex. Epipleural surface lustrous. Wings present, but somewhat shortened, not reaching elytral apex.

Legs robust with strongly thickened posterior femora. Posterior tibiae very short and provided with characteristic for genus apical spur. Tarsomere I of front and middle legs enlarged, not narrower than tarsomere III. Claws appendiculate. Anterior coxal cavities open posteriorly. Pygidium convex, with rounded apex.





Figs 7–16. *Aphthonoides*, males, general view and aedeagi.

7 – *A. pseudosabahensis* sp. n., holotype; 8 – *A. sabahensis*, holotype; 9 – *A. tambunanensis* sp. n., holotype; 10 – *A. trusmadiensis* sp. n., holotype; 11–13 – *A. beccarii*; 14–16 – *A. bukittinggiensis* sp. n., holotype. 7–10 – habitus; 11–16 – aedeagi: 11, 14 – dorsal view, 12, 15 – lateral view, 13, 16 – ventral view.

Рис. 7–16. *Aphthonoides*, общий вид самцов и эдеагусы.

7 – *A. pseudosabahensis* sp. n., голотип; 8 – *A. sabahensis*, голотип; 9 – *A. tambunanensis* sp. n., голотип; 10 – *A. trusmadiensis* sp. n., голотип; 11–13 – *A. beccarii*; 14–16 – *A. bukittinggiensis* sp. n., голотип. 7–10 – габитус; 11–16 – эдеагусы: 11, 14 – вид сверху, 12, 15 – вид сбоку, 13, 16 – вид снизу.

Aedeagus comparatively short and wide (Figs 14–16), about 3.3 times as long as wide; in dorsal view with straight margins before triangular apex bearing distinct sharp tooth. In lateral view aedeagus rather strongly curved in middle with hook-shaped tip bent down. Underside of aedeagus with distinct, deep lanceolate longitudinal impression in apical half. Length of aedeagus about 0.5 mm, width 0.15 mm.

Paratypes. Males are similar to the holotype, females have protarsomere I narrower than protarsomere III. Some paratypes

have antennae darkened starting from antennomere VI. Spermatheca as in Fig. 35. Body length 1.13–1.55 mm.

**Differential diagnosis.** *Aphthonoides bukittinggiensis* sp. n., having the narrow pronotum with lateral margins not converging anteriorly, anterior setigerous pore on lateral margin of the pronotum distinctly protruding outwards and slightly rounded basal margin with middle of pronotal base very weakly protruded, belongs to the *beccarii*

species-group. Within this group *A. bukittingiensis* **sp. n.** together with *A. beccarii* and *A. fulmeki* forms a species complex with the aedeagus short, wide and strongly curved in middle. This new species differs from others congeners in a unique combination of characters: pronotum with lateral margins not diverging anteriorly; elytral surface punctate-striate with punctures distinct up to apex; the aedeagus is with straight lateral margins before triangular apex bearing distinct, sharp tooth and with hook-shaped tip bent down in lateral view (Figs 14–16); protarsomere I is enlarged and legs brown. See also a key and differential diagnosis for *A. beccarii*.

**Distribution.** Sumatra.

**Etymology.** The name of the new species refers to the type locality situated near Bukittinggi town.

*Aphthonoides burckhardti* Döberl, 2005  
(Figs 3, 4, 17–19, 36, 60)

**Material.** 1♀ (PR), "MALAYSIA, N Borneo, Sabah, Keningau dist., Trus Madi Mt., h~1250m, N 05°26'35", E 116°27'5", 24-27.III.2012 P. Romantsov leg"; 1♂ (PR), the same data, but "09.III.2013"; 1♂ (PR), "MALAYSIA, N Borneo, Sabah, Keningau dist., Trus Madi Mt., h~1160m, N 05°25'58", E 116°26'22", 8.IV.2013 P. Romantsov leg"; 2♀ (PR), the same data, but "28.II.2014"; 1♀ (PR), "MALAYSIA, N Borneo, Sabah, Keningau dist., Trus Madi Mt., river h~830m, N 05°27'37", E 116°26'52", 26.II.2014 P. Romantsov leg".

Type material is not examined.

**Differential diagnosis.** After Döberl [2005], this species has dorsal side of the body uniformly yellow-brown with labrum blackish and apical 4–5 antennomeres slightly obscured. Among *Aphthonoides* collected by me on Borneo (Sabah), there are several specimens that are completely consistent with the rest of the characteristics of this species given in the Döberl's article (including shape of aedeagus). But they have dorsal side of body from dark brown (Fig. 3) to almost black (Fig. 4). The shape of their spermathecae (Figs 36, 60) is also similar. Until the type is studied, I believe that these specimens belong to *A. burckhardti*. See also a key.

**Distribution.** Borneo (Sabah).

*Aphthonoides fulmeki* Heikertinger, 1940  
(Figs 5, 20–22, 37, 61)

**Material.** 8♂, 6♀ (PR), "Indonesien, Sumatra II., North Sumatra Prov, Sidebuk-Debuk Place, h~1490-1800m, N 03°13'37", E 098°30'02" N 03°14'11", E 098°29'41", 6-8.IV.2017 P. Romantsov leg"; 7♂, 6♀ (PR), the same locality, but "3-4.II.2018"; 5♂, 3♀ (PR), "Indonesien, Sumatra II., North Sumatra Prov, Sidebuk-Debuk Place, h~1400-1670m, N 03°13'17", E 098°30'43" N 03°12'55", E 098°31'00", 15.III.2020 P. Romantsov leg".

Type material is not examined, but image of the type specimen is available in free access on the Global Biodiversity Information Facility website [<https://www.gbif.org/occurrence/1322683660>].

**Differential diagnosis.** This species belongs to the complex of species within the *beccarii* species-group with the aedeagus short, wide, and strongly curved in middle. *Aphthonoides fulmeki* can be easily distinguished from other species in the pronotum with lateral margins distinctly diverging anteriorly. See also a key and differential diagnoses for *A. beccarii* and *A. bukittingiensis* **sp. n.**

**Note.** This species was described from Sumatra (near Berastagi town). During my Sumatra expeditions, I collected this species near its type locality many times. There are no records of this species being found in other places.

**Distribution.** Sumatra.

*Aphthonoides laticollis* Heikertinger, 1940  
(Figs 6, 38, 52, 53, 62)

**Material.** 1♀ (PR), "Indonesien, N Sumatra, Aceh Prov, Ketambe Vill., h~414-550 m., N 03°41'01", E 097°39'16" N 03°41'26", E 097°39'27", 25.III.2017 P. Romantsov leg"; 1♂ (ZIN), "MALAYSIA, Benon Mts, 15 km. E. Kampong Dong, 700m 3,53N, 102.01E, 1.IV.1998 Dembický and Pacolátko leg".

**Differential diagnosis.** Based on the original description [Heikertinger, 1940], this species differs from other *Aphthonoides* known at that time in its very wide pronotum (more than 1.5 times as wide as long) with anterior setigerous pore on lateral margin not protruding outwards and in the body shape reminiscent of *Aphthona* species. I propose names the *laticollis* species-group for species with such characters. This group includes *A. laticollis*, *A. pseudosabahensis* **sp. n.**, *A. sabahensis* Medvedev et Romantsov, 2014 and *A. warchalowskii* Döberl, 2005. The differences between species of this group are given in a key below. See also differential diagnoses for *A. pseudosabahensis* **sp. n.** and *A. sabahensis*.

**Notes.** The above specimen from Malaysia has the aedeagus which almost completely corresponds to those in *A. laticollis* (Figs 52, 53).

**Distribution.** Sumatra, Peninsular Malaysia (new record).

*Aphthonoides pseudosabahensis* **sp. n.**  
(Figs 7, 23–25, 39)

**Material.** Holotype, ♂ (PR): "MALAYSIA, N Borneo, Sabah, Keningau dist., Trus Madi Mt., h~1160m, N 05°25'58", E 116°26'22", 28.II.2014 P. Romantsov leg". Paratypes: 1♀ (ZIN), "MALAYSIA, N Borneo, Sabah, Keningau dist., Trus Madi Mt., h~1250m, N 05°26'35", E 116°27'5", 12-27.III.2013 P. Romantsov leg"; 1♀ (PR), "MALAYSIA, N Borneo, Sabah, Keningau dist., Trus Madi Mt., river h~830m, N 05°27'37", E 116°26'52", 27.II.2014 P. Romantsov leg".

**Description.** Holotype. Dorsal side of body black. Antennae with antennomeres I–III brown, antennomeres IV and V gradually darkened, rest of antennomeres black. Legs dark brown with somewhat lighter tibiae and tarsi. Underside of body dark brown. Body length 1.25 mm. General view as in Fig. 7.

Body oval (about 1.8 times as long as wide), dorsal side glabrous. Frons and vertex microsculptured and sparsely punctate. Penultimate maxillary palpomere distinctly enlarged, apical palpomere small, conical with sharp apex. Frontoclypeus triangular, clearly limited at margins by grooves. Genae moderately short, about 3 times shorter than transverse diameter of eye and about 4 times shorter than longitudinal diameter of eye. Nasal keel moderately wide, raised in middle. Frontal tubercles slightly convex, rectangular, with lustrous upper surface; frontal lines straight, distinctly impressed. Eyes medium size, convex, oval (1.33 times as long as wide); interocular space about 1.3 times as wide as transverse diameter of eye. Antennae short, about 1.6 times shorter than body length. Antennomere I large, club-shaped; antennomere II enlarged, antennomere II–IV cylindrical, rest of antennomeres slightly enlarged, last antennomere pointed at apex. Length ratio of antennomeres I–XI as 4 : 3 : 2 : 2.5 : 3 : 3 : 3.5 : 3.5 : 4 : 4 : 6.

Pronotum transverse, 1.58 times as wide as long (widest on base), with lateral margins converging anteriorly; about 1.2 times narrower than elytra at level of humeral calli. Anterior margin almost straight, basal margin rounded with middle of pronotal base distinctly protruded: ratio of total pronotal length across middle to length at posterior corners level 0.27. Lateral margins almost straight, but slightly notched before protruding anterior corners. Lateral bordering slightly widened in anterior third,

bearing setigerous pore on anterior corners which distinctly protruded outwards. Anterior and posterior margins unbordered, lateral margins bordered. Posterior corners obtuse. All corners with setigerous pore bearing long pale seta (longer at posterior corners). Pronotal surface slightly longitudinally strigose and finely punctured.

Scutellum transverse (about 2 times as wide as long), with rounded apex. Surface lustrous and impunctate. Elytra about 1.35 times as long as wide, slightly widened at posterior third with slightly rounded apices. Humeral calli well developed. Elytra with 9 regular rows of punctures (except scutellar row). Scutellar rows with 10 punctures, rows V and VI short, not reaching elytral base, other rows regular with well impressed punctures. Interspaces narrow, 2 interspaces near suture flat, next 3 ones convex, 3 lateral ones strongly convex. Epipleura moderately wide at anterior quarter, gradually narrowing towards apex. Epipleural surface lustrous. Wings present, but strongly shortened, noticeably not reaching elytral apex.

Legs robust with strongly thickened posterior femora. Posterior tibiae very short and provided with characteristic apical spur. Tarsomere I of front and middle legs very slightly enlarged, about 1.3 times narrower than tarsomere III. Claws appendiculate. Anterior coxal cavities open posteriorly. Pygidium convex with rounded apex.

Aedeagus comparatively short (Figs 23–25), 5.7 times as long as wide; in dorsal view with straight margins before triangular apex bearing small sharp tooth. In lateral view aedeagus slightly curved. Underside of aedeagus with longitudinal impression starting almost from base, rather deep in basal third, then gradually expanded to apical third where it becomes wide and shallow, almost flat. Length of aedeagus 0.57 mm, width 0.1 mm.

Paratypes. Females are similar to the holotype, but have lighter legs with protarsomere I somewhat narrower and more convex interspaces on elytra. Body length 1.5 mm. Spermatheca as in Fig. 39.

**Differential diagnosis.** *Aphthonoides pseudosabahensis* sp. n., having wide pronotum with lateral margins converging anteriorly, anterior setigerous pore on lateral margin of pronotum slightly protruding outwards and distinctly rounded basal margin of the pronotum with middle of pronotal base strongly protruded, belongs to the *laticollis* species-group and is most similar to *A. laticollis* and *A. sabahensis*. This new species differs from others congeners in a unique combination of characters: antennae relatively short, about 1.65 times shorter than body length; anterior setigerous pore on lateral margin of the pronotum slightly but distinctly protruding outwards; basal margin of the pronotum is less convex with the distance from level of posterior corners to the middle of posterior border 0.25–0.27 times of total length of the pronotum; apex of the aedeagus is triangular with pointed tip, in lateral view apical half of the aedeagus is almost straight (Figs 23–25). See also a key.

**Distribution.** Borneo (Sabah).

**Etymology.** The species name refers to similarity with *A. sabahensis*.

*Aphthonoides sabahensis* Medvedev et Romantsov, 2014  
(Figs 8, 26–28, 40)

**Material.** 1♂, holotype (ZIN), "MALAYSIA, N Borneo, Sabah, Keningau dist., Trus Madi Mt., h~1250m, N 05°26'35", E 116°27'5", 17.III.2012 P. Romantsov leg"; 1♂, paratype (PR), the same data, but "10.IV.2013"; 1♀ (PR), the same data as paratype.

**Differential diagnosis.** This species having wide oval body, pronotum with lateral margins nearly straight,

converging anteriorly and with anterior setigerous pore on lateral margin of the pronotum not protruding outwards, as well as distinctly rounded basal margin of the pronotum with middle of pronotal base strongly protruded, belongs to the *laticollis* species-group and is similar to *A. laticollis* and *A. pseudosabahensis* sp. n. *Aphthonoides sabahensis* differs from the latter in longer antennae; anterior setigerous pore on lateral margin of the pronotum not protruding outwards and in more rounded basal margin of the pronotum. *Aphthonoides sabahensis* having the aedeagus wavy curved before apex in lateral view is very similar to *A. laticollis* from Sumatra with a similar structure of the aedeagus and with which the authors [Medvedev, Romantsov, 2014] did not compare it in the description. But *A. laticollis* has the pronotum somewhat wide and the narrower aedeagus slightly laterally compressed before the apex in dorsal view, less wavy before the apex in lateral view (Figs 52, 53), contrary to *A. sabahensis* having the pronotum somewhat narrower and the wider aedeagus slightly laterally compressed in the middle in dorsal view, strongly wavy before the apex in lateral view (Figs 26–28). Spermathecae in these species have a similar structure but with some differences (Figs 38, 40). See also a key.

**Distribution.** Borneo (Sabah).

*Aphthonoides sumatranus* Döberl, 2005  
(Figs 54, 55, 63)

**Material.** Type material is not examined.

**Differential diagnosis.** Based on Döberl [2005] this species differs from the majority of other species in the surface of elytra punctate-striate with punctures fading behind middle and is most similar to *A. bergeali*. However, *A. sumatranus* can be distinguished from the latter in the aedeagus with almost parallel sides, very slightly widened before apex (Figs 54, 55), contrary to *A. bergeali* having the aedeagus distinctly widened before apex (Figs 11–13, 43, 44). This species belongs to the *beccarii* species-group. See also a key.

**Distribution.** Sumatra.

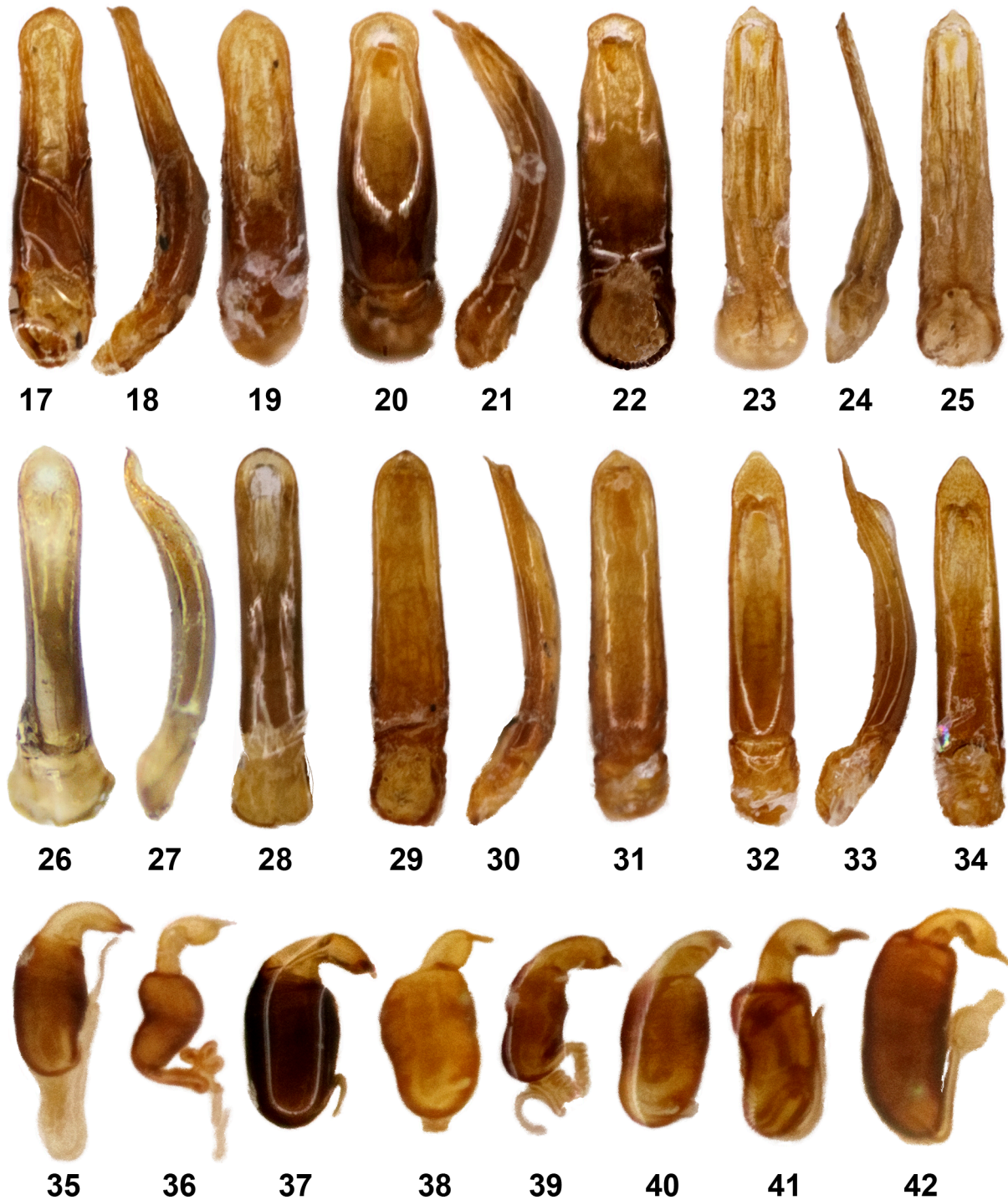
*Aphthonoides tambunanensis* sp. n.  
(Figs 9, 29–31, 41)

**Material.** Holotype, ♂ (PR): "MALAYSIA, N Borneo, Sabah, ~16 km NW Tambunan, Crocker Range, h~1660-1950m N 05°48'47", E 116°20'16" N 05°49'32", E 116°20'27", 07.III.2014 P. Romantsov leg". Paratypes: 1♂ (ZIN), "MALAYSIA, N Borneo, Sabah, ~16 km NW Tambunan, Crocker Range, h~1660m, N 05°48'53", E 116°20'27", 16.IV.2013 P. Romantsov leg"; 1♀ (PR), the same data as holotype.

**Description.** Holotype. Dorsal side of body black, underside dark brown. Antennae with two basal antennomeres brown, next antennomeres gradually darkened. Legs brown with posterior femora darkened. Body length 1.7 mm. General view as in Fig. 9.

Body elongate, 2.06 times as long as wide, dorsal side glabrous. Frons and vertex microsculptured and sparsely punctate. Penultimate maxillary palpomere distinctly enlarged, apical palpomere narrow, conical. Frontoclypeus triangular, clearly limited at margins by grooves. Genae long, about 1.2 times shorter than transverse diameter of eye and about 1.4 times shorter than longitudinal diameter of eye. Nasal keel narrow, convex. Frontal tubercles slightly convex, rectangular; frontal lines straight, distinctly impressed. Eyes medium size, convex, weak oval (1.17 times as long as wide); interocular space as wide as transverse



Figs 17–42. *Aphthonoides*, aedeagi and spermathecae.

17–19, 36 – *A. burckhardtii*; 20–22, 37 – *A. fulmeki*; 23–25, 39 – *A. pseudosabahensis* sp. n.: 23–25 – holotype, 39 – paratype; 26–28, 40 – *A. sabahensis* (26–28 – holotype); 29–31, 41 – *A. tambunanensis* sp. n.: 29–31 – holotype, 41 – paratype; 32–34, 42 – *A. trusmadiensis* sp. n.: 32–34 – holotype, 42 – paratype; 35 – *A. bukittinggiensis* sp. n., paratype; 38 – *A. laticollis*. 17–34 – aedeagi; 35–42 – spermathecae. 17, 20, 23, 26, 29, 32 – dorsal view; 18, 21, 24, 27, 30, 33 – lateral view; 19, 22, 25, 28, 31, 34 – ventral view.

Рис. 17–42. *Aphthonoides*, эдеагусы и сперматеки.

17–19, 36 – *A. burckhardtii*; 20–22, 37 – *A. fulmeki*; 23–25, 39 – *A. pseudosabahensis* sp. n.: 23–25 – голотип, 39 – паратип; 26–28, 40 – *A. sabahensis* (26–28 – голотип); 29–31, 41 – *A. tambunanensis* sp. n.: 29–31 – голотип, 41 – паратип; 32–34, 42 – *A. trusmadiensis* sp. n.: 32–34 – голотип, 42 – паратип; 35 – *A. bukittinggiensis* sp. n., паратип; 38 – *A. laticollis*. 17–34 – эдеагусы; 35–42 – сперматеки. 17, 20, 23, 26, 29, 32 – вид сверху; 18, 21, 24, 27, 30, 33 – вид сбоку; 19, 22, 25, 28, 31, 34 – вид снизу.

diameter of eye. Antennae about 1.45 times shorter than body length. Antennomere I large, club-shaped; antennomere II enlarged, other antennomeres cylindrical, last antennomere pointed at apex. Length ratio of antennomeres I–XI as 7 : 4 : 2 : 3 : 4 : 4 : 5 : 5 : 4 : 4 : 6.

Pronotum slightly transverse, about 1.12 times as wide as long, about 1.5 times narrower than elytra at level of humeral calli. Anterior margin almost straight, basal margin slightly rounded with middle of pronotal base very weakly protruded: ratio of total pronotal length across middle to length at posterior corners level 0.2. Lateral margins with bordering slightly widened at anterior half, noticeably notched before posterior corners. Anterior corners bearing setigerous pore distinctly protruded outwards. Anterior and posterior margins unbordered, lateral margins bordered. Posterior corners obtuse. All corners with setigerous pore bearing long pale seta (longer at posterior corners). Pronotal surface densely and mostly longitudinally strigose and finely punctured.

Scutellum transverse (about 1.3 times as wide as long), with rounded apex. Surface lustrous and impunctate. Elytra about 1.5 times as long as wide, slightly widened at posterior third with narrowly rounded apices. Humeral calli well developed. Elytra with 9 regular rows of punctures (except scutellar row). Scutellar rows with 8 punctures, row V short, not reach elytral base, other rows regular with well impressed punctures. Interspaces narrow, 2 interspaces near suture flat, next 3 ones convex, 3 lateral ones strongly convex. Epipleura moderately wide at anterior quarter, gradually narrowing towards apex. Epipleural surface lustrous. Wings present, but somewhat shortened, not reaching elytral apex.

Legs robust, with strongly thickened posterior femora. Posterior tibiae very short and provided with characteristic apical spur. Tarsomere I of front and middle legs elongate, slightly narrower than tarsomere III. Claws appendiculate. Anterior coxal cavities open posteriorly. Pygidium convex with rounded apex.

Aedeagus (Figs 29–31) 5.2 times as long as wide; with very weak curved lateral margins and wide triangular apex in dorsal view. In lateral view aedeagus gently curved. Underside of aedeagus with indistinct, wide, longitudinal impression before apex. Length of aedeagus 0.65 mm, width 0.125 mm.

Paratypes. Male is similar to the holotype but with slightly darkened legs; female is similar to the holotype but has less elongate body, protarsomere I somewhat narrower and more convex interspaces on elytra. Body length 1.62 mm in female and 1.8 mm in male. Spermatheca with wide vasculum with slightly curved lateral margins and longer apical part (Fig. 41).

**Differential diagnosis.** *Aphthonoides tambunanensis* sp. n., having narrow pronotum with anterior setigerous pore on lateral margin distinctly protruding outwards and slightly rounded basal margin, belongs to the *beccarii* species-group and is most similar to *A. burckhardti* and *A. trusmadiensis* sp. n. This new species differs from *A. burckhardti* in dorsal side of body black and the longer aedeagus. *Aphthonoides tambunanensis* sp. n. differs from *A. trusmadiensis* sp. n. in the wider aedeagus (5.2–5.3 times as long as wide) with wide triangular apex in dorsal view and gently curved in lateral view. In contrast, *A. trusmadiensis* sp. n. has the narrower aedeagus (6.1–6.5 times as long as wide) with the narrow triangular apex; in lateral view the aedeagus is slightly sinuate in apical third. In addition, all these three species differ in the shape of the spermatheca (Figs 36, 41, 42). See also a key.

**Distribution.** Borneo (Sabah).

**Etymology.** The name of the new species refers to the type locality situated near the town of Tambunan.

*Aphthonoides trusmadiensis* sp. n.  
(Figs 10, 32–34, 42)

**Material.** Holotype, ♂ (ZIN): "MALAYSIA, N Borneo, Sabah, Keningau dist., Trus Madi Mt., river h~830m, N 05°27'37", E 116°26'52", 27.II.2014 P. Romantsov leg". Paratypes: 2♂, 1♀ (PR), "MALAYSIA, N Borneo, Sabah, Keningau dist., Trus Madi Mt., h~1250m, N 05°26'35", E 116°27'5", 10.IV.2013 P. Romantsov leg"; 1♀ (PR), the same locality, but "11.IV.2013 P. Romantsov leg"; 2♀ (PR), "MALAYSIA, N Borneo, Sabah, Keningau dist., Trus Madi Mt., N 05°26'35", E 116°27'5" N 05°27'37", E 116°26'52", h~1250-830 m, 26.II.2014 P. Romantsov leg"; 3♂, 1♀ (PR), the same data as holotype.

**Description.** Holotype. Dorsal side of body black. Antennae with three basal antennomeres brown, next antennomeres gradually darkened. Legs strongly darkened with pale joints. Underside of body blackish. Body length 1.9 mm. General view as in Fig. 10.

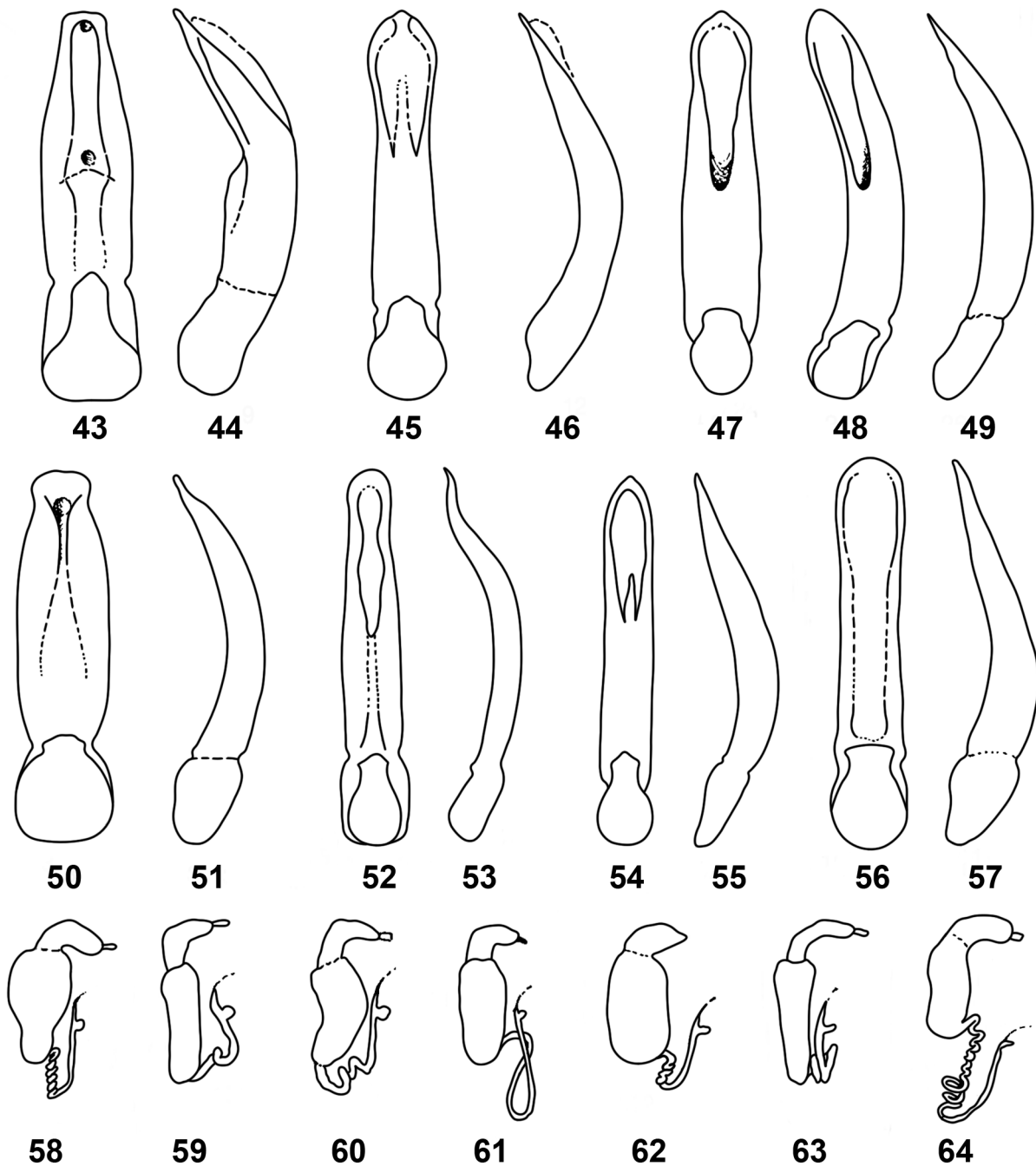
Body elongate, 2.14 times as long as wide, dorsal side glabrous. Frons and vertex microsculptured and sparsely punctate. Penultimate maxillary palpomere slightly enlarged; apical palpomere relatively large, approximately equal in length to previous palpomere and only slightly narrower. Frontoclypeus acute triangular, clearly limited at margins by grooves. Genae long, about 1.65 times shorter than transverse diameter of eye and about 2 times shorter than longitudinal diameter of eye. Nasal keel narrow, convex. Frontal tubercles slightly convex, narrow; frontal lines indistinct. Eyes medium size, convex, weak oval (1.2 times as long as wide); interocular space as wide as transverse diameter of eye. Antennae about 1.48 times shorter than body length. Antennomere I large, club-shaped; antennomere II slightly enlarged, other antennomeres cylindrical, last antennomere pointed at apex. Length ratio of antennomeres I–XI as 7 : 4 : 3 : 3 : 4.5 : 4 : 5 : 5 : 4 : 4 : 6.

Pronotum transverse, about 1.24 times as wide as long (broadest in middle part), about 1.5 times narrower than elytra at level of humeral calli. Anterior margin almost straight, basal margin slightly rounded with middle of pronotal base very weakly protruded: ratio of total pronotal length across middle to length at posterior corners level 0.2. Lateral margins with bordering approximately of same width throughout. Anterior corners bearing setigerous pore slightly but distinctly protruded outwards. Anterior and posterior margins unbordered, lateral margins bordered. Posterior corners obtuse. All corners with setigerous pore bearing long pale seta (longer at posterior corners). Pronotal surface densely and mostly longitudinally strigose and finely punctured.

Scutellum transverse (about 1.5 times as wide as long), with rounded apex. Surface lustrous and impunctate. Elytra about 1.5 times as long as wide, slightly widened at posterior third with narrowly rounded apices. Humeral calli well developed. Elytra with 9 regular rows of punctures (except scutellar row). Scutellar rows with 9 punctures, row V short, not reach elytral base, other rows regular with well impressed punctures. Interspaces narrow, 2 interspaces near suture flat, next 4 ones slightly convex, 2 lateral ones distinctly convex. Epipleura moderately wide at anterior quarter, gradually narrowing towards apex. Epipleural surface lustrous. Wings present, not shortened.

Legs robust, with strongly thickened posterior femora. Posterior tibiae very short and provided with characteristic apical spur. Tarsomere I of front and middle legs enlarged: slightly elongate (about 1.33 times as long as wide) in protarsomere I and more elongate (about 1.65 times as long as wide) in mesotarsomere I; distinctly expanded (not narrower than tarsomere III) in both of these pairs of legs. Claws appendiculate. Anterior coxal cavities open posteriorly. Pygidium convex with rounded apex.

Aedeagus (Figs 32–34) 6.5 times as long as wide; with almost straight lateral margins and narrow triangular apex in dorsal view. In lateral view aedeagus slightly sinuate at apical third. Underside of aedeagus with distinct lanceolate impression in apical third. Length of aedeagus 0.65 mm, width 0.1 mm.



Figs 43–64. *Aphthonoides*, aedeagi and spermathecae (after Döberl [2005]).

43–44, 58 – *A. beccarii*; 45–46, 59 – *A. bergeali*; 47–49, 60 – *A. burckhardti*; 50–51, 61 – *A. fulmeki*; 52–53, 62 – *A. laticollis*; 54–55, 63 – *A. sumatranus*; 56–57, 64 – *A. warchalowskii*. 43–57 – aedeagi; 58–64 – spermathecae. 43, 45, 47, 48, 50, 52, 54, 56 – ventral view; 44, 46, 49, 51, 53, 55, 57 – lateral view.

Рис. 43–64. *Aphthonoides*, эдеагусы и сперматеки (по [Döberl, 2005]).

43–44, 58 – *A. beccarii*; 45–46, 59 – *A. bergeali*; 47–49, 60 – *A. burckhardti*; 50–51, 61 – *A. fulmeki*; 52–53, 62 – *A. laticollis*; 54–55, 63 – *A. sumatranus*; 56–57, 64 – *A. warchalowskii*. 43–57 – эдеагусы; 58–64 – сперматеки. 43, 45, 47, 48, 50, 52, 54, 56 – вид снизу; 44, 46, 49, 51, 53, 55, 57 – вид сбоку.

Paratypes. Males are similar to the holotype but some of them have slightly pales legs; females are similar to the holotype but has less elongate body, protarsomere I noticeable narrower and more convex interspaces on elytra. Body length 1.62–1.8 mm. Spermatheca with wide and long vasculum having almost straight lateral margins and short apical part (Fig. 42).

**Differential diagnosis.** *Aphthonoides trusmadiensis* sp. n., having the narrow pronotum with the anterior setigerous pore on lateral margin distinctly protruding outwards and slightly rounded basal margin, belongs to the *beccarii* species-group and is most similar to *A. burckhardti* and *A. tambunanensis* sp. n. This new species differs



from *A. burckhardti* in dorsal side of body black, legs darkened and the longer aedeagus. *Aphthonoides trusmadiensis* sp. n. differs from *A. tambunanensis* sp. n. in the narrower aedeagus (6.1–6.5 times as long as wide) with the narrow triangular apex in dorsal view; in lateral view the aedeagus is slightly sinuate at apical third. In contrast, *A. tambunanensis* sp. n. has the wider aedeagus (5.2–5.3 times as long as wide) with the wide triangular apex in dorsal view and gently curved in lateral view. In addition, all these three species differ in the shape of the spermatheca (Figs 36, 41, 42). See also a key.

**Distribution.** Borneo (Sabah).

**Etymology.** The name of the new species refers to the type locality on mountain Trus Madi.

*Aphthonoides warchalowskii* Döberl, 2005  
(Figs 56, 57, 64)

**Material.** Type material is not examined.

**Differential diagnosis.** Based on Döberl [2005] this species has the wide pronotum (2.45 times as wide as long) with lateral margins converging anteriorly and I guess it has to belong to the *laticollis* species-group. This species differs from others members of this group in punctures in elytral rows fading behind middle and in the shape of the aedeagus (Figs 56, 57). See also a key.

**Distribution.** The Philippines.

#### A preliminary key to species of the genus *Aphthonoides* from Indonesia, Malaysia and the Philippines

- 1(8). Pronotum wider, more than 1.45 times as wide as long, with lateral margins nearly straight, converging anteriorly (pronotum wider on base than on apex). Anterior setigerous pore on lateral margin of pronotum not or very slightly protruding outwards. Basal margin of pronotum rather strongly rounded with middle of pronotal base distinctly protruded: ratio of total pronotal length across middle to length at posterior corners level about 0.3. Antennae long (about 1.45 times shorter than body length). Body oval, usually less elongate. Protarsomere I of male not or very slightly enlarged. Dorsal side of body black .....  
..... *A. laticollis* species-group
- 2(3). Species from Sumatra and Peninsular Malaysia. Pronotum more than 1.5 times as wide as long with lateral margins somewhat more strongly converging anteriorly (1.25–1.35 times wider on base than on apex). Antennae and legs dark with slightly lighter tibiae, basal antennomeres IV–V yellow. Aedeagus narrow, slightly laterally compressed before apex in dorsal view and slightly wavy before apex in lateral view (Figs 52, 53). Body length 1.4–1.75 mm .....  
..... *A. laticollis*
- 3(2). Species from Borneo and Philippines. Pronotum 1.45–1.5 times as wide as long with lateral margins somewhat less strongly converging anteriorly (1.1–1.25 times wider on base than on apex).
- 4(5). Species from the Philippines. Elytral surface punctate-striate with punctures fading behind middle. Dorsum piceous, antennae and legs yellow brown, metafemora and labrum darkened. Aedeagus with rounded apex; weak curved in lateral view (Figs 56, 57). Body length 1.3 mm ..... *A. warchalowskii*
- 5(4). Species from Borneo. Elytral surface punctate-striate with punctures distinct to apex.
- 6(7). Antennae shorter (about 1.65 times shorter than body length). Anterior setigerous pore on lateral margin of pronotum slightly but distinctly protruding outwards. Basal margin of pronotum less rounded with middle of pronotal base weakly protruded: ratio of total pronotal length across middle to length at posterior corners level 0.25–0.27. Apical half of aedeagus almost straight in lateral view; apex triangular with pointed tip (Figs 23–25). Body length 1.37–1.43 mm .....  
..... *A. pseudosabahensis* sp. n.
- 7(6). Antennae longer (about 1.45 times shorter than body length). Anterior setigerous pore on lateral margin of pronotum not protruding outwards. Basal margin of pronotum more rounded with middle of pronotal base distinctly protruded: ratio of total pronotal length across middle to length at posterior corners level 0.31–0.34. Aedeagus slightly laterally compressed in the middle in dorsal view and strongly wavy before apex in lateral view; apex rounded, with small tooth (Figs 26–28). Body length 1.4–1.56 mm ..... *A. sabahensis*
- 8(1). Pronotum narrower, 1.35 or less times as wide as long, with lateral margins straight or rounded, not converging anteriorly. Anterior setigerous pore on lateral margin of pronotum distinctly protruding outwards. Body usually more elongate. Basal margin of pronotum slightly rounded with middle of pronotal base weakly protruded: ratio of total pronotal length across middle to length at posterior corners level 0.2 (or less). Protarsomere I of male distinctly enlarged. Dorsal side of body black, dark brown or yellow .....  
..... *A. beccarii* species-group
- 9(10). Lateral margins of pronotum distinctly diverging anteriorly. Antennae and legs dark, basal 4–5 antennomeres yellow. Pronotum long and narrow (1.1–1.15 times as wide as long and 1.5–1.6 times narrower than elytra at level of humeral calli), with sinuous lateral margins in dorsal view (Fig. 5). Protarsomere I moderately enlarged about as wide as protarsomere III. Body strongly elongate, 2.1–2.2 times as long a wide. Body length 1.5–1.8 mm. Aedeagus compressed before rounded apex, rather sharply bent in middle, with indistinct narrow longitudinal impression in apical part on underside (Figs 20–22, 50, 51) ..... *A. fulmeki*
- 10(11). Lateral margins of pronotum straight or slightly rounded, not diverging anteriorly, broadest usually in middle. Pronotum somewhat shorter, 1.2–1.3 times as wide as long. Species from Sumatra and Borneo.
- 11(14). Elytral surface punctate-striate with punctures fading behind middle.
- 12(13). Pronotum 1.3 times as wide as long with lateral margins straight and subparallel. Dorsal side of body black, antennae and legs yellow; labrum and metafemora brownish. Protarsomere I of male not enlarged. Aedeagus distinctly widened before pointed apex (Figs 54, 55). Body length 1.4 mm .....  
..... *A. sumatranus*

- 13(12). Pronotum about 1.35 times as wide as long, with lateral margins slightly rounded, broadest in middle. Dorsal side of body piceous to blackish, labrum, antennae and legs yellow, metafemora piceous with apex light (Fig. 1). Protarsomere I of male slightly enlarged. Aedeagus with almost parallel sides, very slightly widened before pointed apex (Figs 11–13, 45, 46). Body length 1.45–1.65 mm ..... *A. bergeali*
- 14(11). Elytral surface punctate-striate with punctures distinct to apex.
- 15(18). Aedeagus rather sharply bent in middle.
- 16(17). Aedeagus compressed before very widely rounded (sometimes almost blunted) apex with wavy lateral margins in dorsal view and tip not bent down in lateral view. Underside of aedeagus with not quite distinct, rather wide longitudinal impression in apical half (Figs 43, 44). Pronotum 1.21–1.3 times as wide as long with almost straight or very slightly rounded lateral margins. Protarsomere I slightly enlarged, about 1.2–1.25 times narrower than protarsomere III. Dorsal side of body piceous to black; antennae and legs brown with 5–7 apical antennomeres, basal half of femora and sometimes partly tibiae darkened. Body length 1.35–1.5 mm ..... *A. beccarii*
- 17(16). Aedeagus with straight margins before triangular apex bearing distinct, sharp tooth in dorsal view and with hook-shaped tip bent down in lateral view. Underside of aedeagus with distinct, deep lanceolate longitudinal impression in apical half (Figs 14–16). Protarsomere I about as wide as protarsomere III. Pronotum 1.2–1.29 times as wide as long with almost straight lateral margins. Dorsal side of body black; antennae and legs brown with 5–6 apical antennomeres and claw tarsomere darkened. Body length 1.13–1.55 mm ..... *A. bukittingiensis* **sp. n.**
- 18(15). Aedeagus gently bent in basal quarter. Protarsomere I enlarged, not narrower or slightly wider than protarsomere III. Pronotum with almost straight or very slightly rounded lateral margins. Species from Borneo. Three similar species distinguishable only by structure of aedeagus and spermatheca.
- 19(20). Dorsal side of body yellow-brown or dark brown to almost black, antennae and legs brown with 4–8 apical antennomeres and metafemora in variant degrees darkened (Figs 3, 4). Antennomere II less elongate and more swollen. Aedeagus shorter (about 4.6 times as long as wide), narrowed before extended apex with curved lateral margins in dorsal view (Figs 17–19, 47–49). Pronotum 1.21–1.28 times as wide as long. Vasculum of spermatheca narrow with sinuate lateral margins and long apical part (Figs 36, 60) ..... *A. burckhardti*
- 20(19). Dorsal side of body black, legs darkened with pale joints. Aedeagus longer.
- 21(22). Antennae with yellow basal antennomeres, darkened from antennomere V; legs strongly darkened with pale joints (Fig. 10). Antennomere II more elongate and somewhat less swollen. Aedeagus (Figs 32–34) somewhat narrower, 6.1–6.5 times as long as wide, with almost straight lateral margins and narrow triangular apex in dorsal view. In lateral view aedeagus slightly sinuate in apical third. Pronotum 1.23–1.25 times as wide as long, with lateral margins not or very slightly notched before posterior corners. Vasculum of spermatheca wide with almost straight lateral margins and short apical part (Fig. 42). Body length 1.65–1.97 mm ..... *A. trusmadiensis* **sp. n.**
- 22(21). Antennae with yellow basal antennomeres, blackened from antennomere III; legs dark brown to brown with pale joints (Fig. 9). Antennomere II less elongate and somewhat more swollen. Aedeagus (Figs 29–31) somewhat wider, 5.2–5.3 times as long as wide, with very weak curved lateral margins and wide triangular apex in dorsal view. In lateral view aedeagus gently curved. Pronotum 1.12–1.19 times as wide as long, with lateral margins noticeably notched before posterior corners. Vasculum of spermatheca wide with slightly curved lateral margins and longer apical part (Fig. 41). Body length 1.62–1.8 mm ..... *A. tambunanensis* **sp. n.**

The presented key can be used only as a preliminary. It is necessary to study the type material of all known species, which may require making certain adjustments to this key. Moreover, I believe that it covers not all existing species. At present, when many previously difficult of approach areas of Malaysia and Indonesia became available to researchers, it should be expected finding many new species of this genus.

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## Data to the knowledge of the Lycaenidae fauna (Lepidoptera) in Afghanistan

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**Abstract.** In total, 63 specimens of Lycaenidae collected in high altitude of the Bamyan Province, Waras District, vicinity of Doabi, a less explored area of Afghanistan from lepidopterological point of view, are evaluated. The material represents seven polyommata (*Afarsia hanna* (Evans, 1932), *Alpherakya bellona* (Grum-Grshimailo, 1888), *A. yakavlangi* (Tshikolovets, Pljushch, Pak et Skrylnik, 2018), *Aricia agestis* ([Schifferrmüller], 1775), *Eumedonia eumedon bamiana* (Tshikolovets, Pljushch et Skrylnik, 2018), *Polyommatus bilucha* (Moore, 1884), *P. icarus* (Rottemburg, 1775)), one scolitantidine (*Turanana laspura* (Evans, 1932)) and one callophrydine (*Satryium hazarajatica* Krupitsky, Pljushch et Pak, 2018) lycaenid butterfly species, all of them are briefly annotated. The species *Polyommatus nadirus* (Moore, 1884) is discussed. These results the following nomenclatural actions and changes: *Eumedonia eumedon bamiana* **comb. n.**; *Polyommatus muetingi* (Bálint, 1993), **sp. reinst.** from the synonymy of *Polyommatus nadira* (Moore, 1865) Tshikolovets, Pljusch et Skrylnik, 2018; lectotype is designated for *Lycaena nadira* Moore, 1884; *Afarsia sieversi nadira* (Moore, 1884), **comb. n.** = *Polyommatus sieversi felicia* Evans 1932, **syn. n.**

**Key words:** nomenclature, taxonomy, Lycaenidae, Eumaeini, Polyommata, Scolitantidina, Bamyan Province, Afghanistan.

### Материалы к познанию фауны Lycaenidae (Lepidoptera) Афганистана

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**Резюме.** На больших высотах в провинции Бамиан (район Варас, окрестности Доаби), наименее изученной с лепидоптерологической точки зрения территории Афганистана, собрано 63 экземпляра Lycaenidae: 7 видов из подтрибы Polyommatina (*Afarsia hanna* (Evans, 1932), *Alpherakya bellona* (Grum-Grshimailo, 1888), *A. yakavlangi* (Tshikolovets, Pljusch, Pak et Skrylnik, 2018), *Aricia agestis* ([Schifferrmüller], 1775), *Eumedonia eumedon bamiana* (Tshikolovets, Pljusch et Skrylnik, 2018), *Polyommatus bilucha* (Moore, 1884), *P. icarus* (Rottemburg, 1775)), 1 вид из подтрибы Scolitantidina (*Turanana laspura* (Evans, 1932)) и 1 вид из подсемейства Theclinae, подтрибы Callophrydina (*Satryium hazarajatica* Krupitsky, Pljushch et Pak, 2018). Даны замечания по таксономии и распространению каждого таксона. В результате предложены следующие номенклатурные акты: *Eumedonia eumedon bamiana* **comb. n.**; *Polyommatus muetingi* (Bálint, 1993), **sp. reinst.** восстановлен из младших синонимов *Polyommatus nadira* (Moore, 1865) Tshikolovets, Pljusch et Skrylnik, 2018; обозначен лектотип для *Lycaena nadira* Moore, 1884; *Afarsia sieversi nadira* (Moore, 1884), **comb. n.** = *Polyommatus sieversi felicia* Evans 1932, **syn. n.**

**Ключевые слова:** номенклатура, таксономия, Lycaenidae, Eumaeini, Polyommata, Scolitantidina, Бамиан, Афганистан.

## Introduction

Afghanistan is a country difficult to access. Nevertheless the butterfly fauna there is not the least known in the Palaearctic region. This is due to two splendid monographs authored by the Japanese [Sakai, 1981], and most recently by a team of Ukrainian lepidopterists [Tshikolovets et al., 2018]. These monographs showed how special the butterfly fauna of Afghanistan is, so of course the research continued despite the difficulties [Krupitsky et al., 2018, 2021, 2022].

The second author spent two summer months of 2021 in Afghanistan for exploring the Lepidoptera fauna. Present paper reports on the samples originating from the Bamyan Province, the vicinity of Doabi village, Waras District (33.98568°N / 66.65215°E) (Fig. 1), where an interesting Lycaenidae material has been harvested in the period of July 1–10 at elevation of 3300–3400 meters (Figs 2–4).

Species discussed are listed in alphabetical order according to subfamily, tribal, subtribal, generic and species-group names. The species recorded are fully

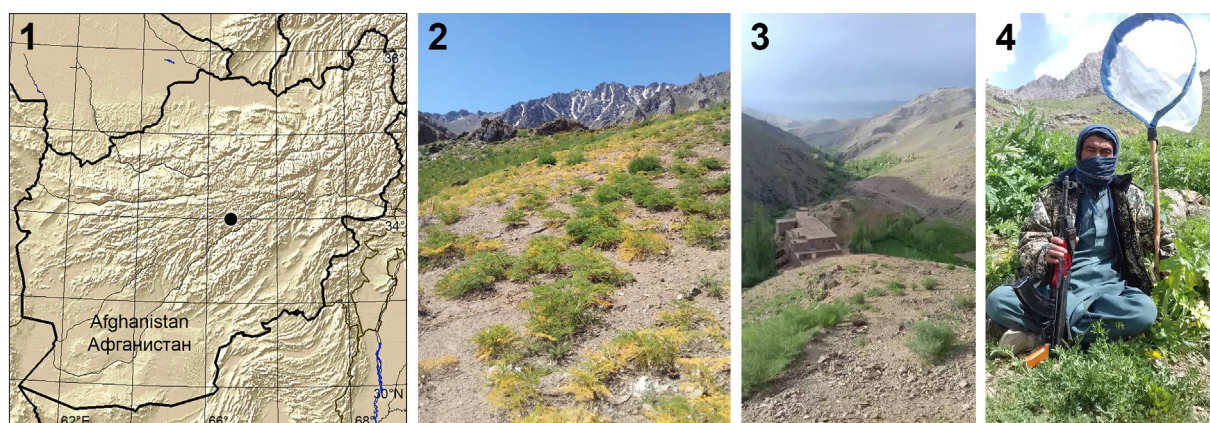
referred as appearing in the monographs of Sakai [1981] and Tshikolovets et al. [2018]. The amount of material is given for each species, which have been examined and are preserved in the Hungarian Natural History Museum (HNHM, Budapest, Hungary). Dissections were prepared when they are turned to be necessary as outlined in [Higgins, 1975]. Remarks are given for each taxon discussing nomenclatural or taxonomic questions.

**Subfamily Polyommatinae**  
**Tribe Polyommatini Swainson, 1827**  
**Subtribe Polyommatina Swainson, 1827**  
*Afarsia hanna* (Evans, 1932)  
 (Figs 5, 6)

*Vacciniina iris hanna* Evans: Sakai, 1981: 127, pl. 43, figs 12–13, 15; D'Abbrera, 1993: 492, figs "V. iris hanna, ♂R" (designated as lectotype by Bálint [1999: 34]), "V. iris hanna, ♂V" (paralectotype).

*Plebejus hanna* (Evans, 1932): Tshikolovets et al., 2018: 138, pl. 24, figs 21–24.

**Material.** 2♂.



Figs 1–4. Geographical origin of the material and its collector.

1 – collection site; 2–3 – the locality above the Doabi village: 2 – habitat, view northwards to the mountain ridge over 3300 m, 3 – habitat, view southwards from the collecting site down to the valley; 4 – equipped local lepidopterist above Doabi village.

Рис. 1–4. Географическое происхождение исследованного материала и его сборщик.

1 – место сбора; 2–3 – местонахождение выше села Доаби: 2 – биотоп, вид на север, на горный хребет высотой более 3300 м, 3 – биотоп, вид на юг с места сбора вниз на долину; 4 – экипированный местный лепидоптеролог выше села Доаби.

**Notes.** The genus *Afarsia* Korb et Bolshakov, 2011 (replacement name of *Farsia* Zhdanko, 1992 (nec *Farsia* Amsel, 1961, Pyralidae) with the type species “*Lycaena hyrcana* Lederer, 1869” (misidentification) by original designation = *Lycaena sieversi* Christoph, 1873), was recognized subsequently and the species was placed there [Tuzov et al., 2000; Talavera et al., 2012]. Less known species, identification is problematic. The relatively large size, dorsal wing surface with no bronze shine with a large discoidal spot and the dark ventral wing surfaces could help to associate the specimens with the type material illustrated [D’Abrera, 1993]. It is remarked that the distributional records available in the literature for the species need caution, because of the large similarity of the congeneric taxa identifications could be erroneous [Tshikolovets et al., 2018].

*Alpherakya bellona* (Grum-Grshimailo, 1888)  
(Figs 7, 8)

*Polyommatus devanica* Moore, 1874 (!): Sakai, 1981: 236, pl. 44, figs 38–50.

*Polyommatus bellona* Grum-Grshimailo, 1888: D’Abrera, 1993: 505, figs “*P. Bellona* ♂R” and “*P. Bellona* ♂V” (lectotype designated by Bálint [1999: 19]).

*Polyommatus devanicus bellonus* (Grum-Grshimailo, 1888): Tshikolovets et al., 2018: 148, pl. 29, figs 24–26.

*Polyommatus devanicus kohibabaensis* Sakai, 1981: Tshikolovets et al., 2018: 148, pl. 29, figs 13–16.

*Polyommatus devanicus tshikolovetsi* Bálint, 1999: Tshikolovets et al., 2018: 148, pl. 29, figs 17–20.

*Alpherakya bellona* (Grum-Grshimailo, 1881): Bálint, 2022: 76.

**Material.** 6♂, 3♀.

**Notes.** The taxa *A. bellona* and *A. devanica* were distinguished on species level, and placed the nominal taxa *kohibabaensis* and *tshikolovetsi* under the former species as junior synonyms [Bálint, 2022]. The species *A. bellona* was not yet recorded in the Waras District, which is actually the most southwestern record of the species.

*Alpherakya yakavlangi*  
(Tshikolovets, Pljushch, Pak et Skrylnik, 2018)  
(Figs 9, 10)

*Polyommatus sartus yakavlangi* Tshikolovets, Pljushch, Pak et Skrylnik, 2018: Tshikolovets et al., 2018: 147, pl. 29, figs 34–36.

*Alpherakya yakavlangi* (Tshikolovets, Pljushch, Pak et Skrylnik, 2018): Bálint, 2022: 81.

**Material.** 2♂, 1♀.

**Notes.** The genus *Alpherakya* Zhdanko, [1996] (type species *Lycaena sarta* Alpheraky, 1881, by original designation) was recognized [Tuzov et al., 2000; Talavera et al., 2012]. The nominal taxon *Polyommatus sartus yakavlangi* has been described as a subspecies of *Alpherakya sarta* (Alphéraky, 1881) on the basis of the male holotype and six paratypes (four males, and two females) all collected in “Baimyan prov., Yakawlang distr., Kotsak vill. Circ. 2800” in the beginning of July. It was noted that the taxon morphologically is indeed closer to *A. sarta* than to *A. rupala* (Evans, 1925), but on the basis of genitalia and wing traits, and the perfect isolation of the taxa *A. sarta* and *A. yakavlangi*, they were considered as distinct species [Bálint, 2022]. The record published here provides new data for geographical and altitudinal occurrences: it is somewhat 100 km more south and in 400–500 m higher than the type locality.

*Aricia agestis* ([Schifferrmüller], 1775)  
(Figs 11, 12)

*Aricia agestis nazira* (Moore, 1865): Sakai, 1981: 126, pl. 42, figs 19–23.

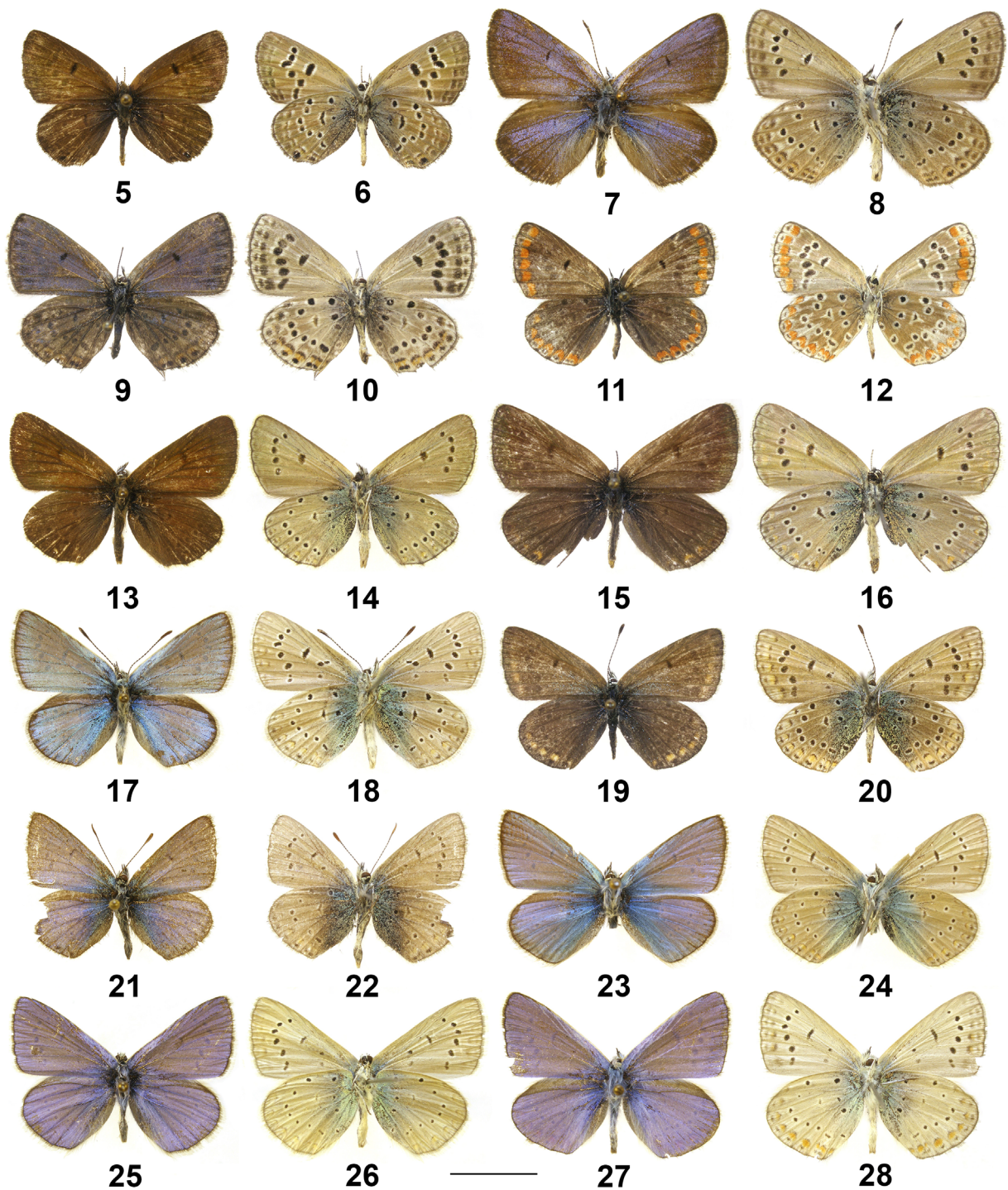
*Plebejus agestis agestis* ([Denis & Schifferrmüller], 1775): Tshikolovets et al., 2018: 140, pl. 24, figs 29–31, 36.

*Plebejus agestis nazira* (Moore, 1865): Tshikolovets et al., 2018: 140, pl. 24, figs 24, 33–35.

**Material.** 1♀.

**Notes.** The genus *Aricia* [Reichenbach], 1817 (type species *Papilio agestis* [Schifferrmüller], 1775, by subsequent designation of Tutt [1906]) was recognized [Tuzov et al., 2000; Talavera et al., 2012]. *Aricia agestis* is a species





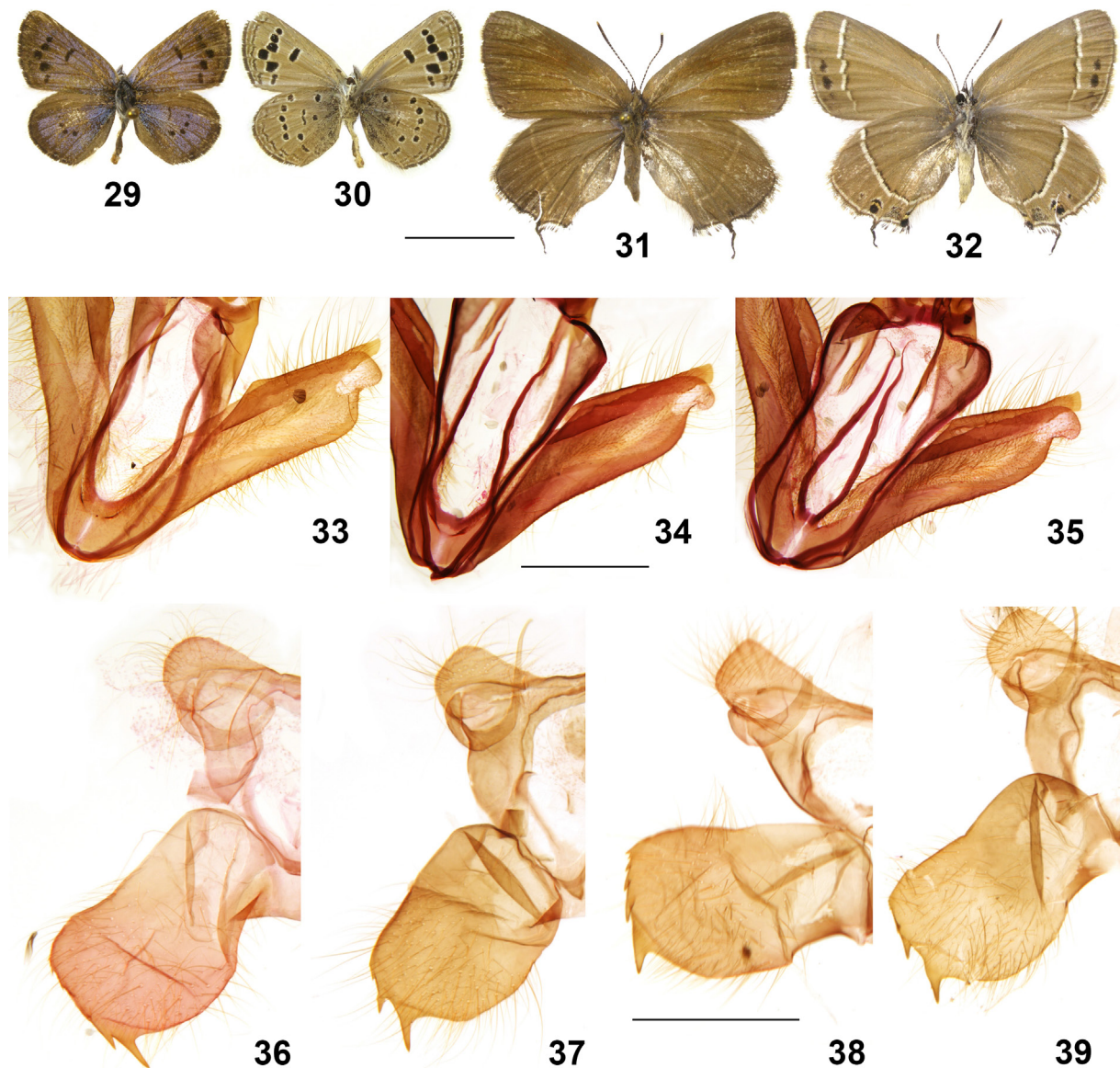
Figs 5–28. Lycaenidae species from Afghanistan.

5–6 – *Afarsia hanna*, male (Doabi village); 7–8 – *Alpherakya bellona*, male (Doabi village); 9–10 – *Alpherakya yakavlangi*, male (Doabi); 11–12 – *Aricia agestis*, female (Doabi village); 13–16 – *Eumedonia eumedon bamiana* (Doabi village): 13–14 – male, 15–16 – female; 17–20 – *Polyommatus bilucha* (Doabi village): 17–18 – male, 19–20 – female; 21–24 – *Polyommatus muetingi*: 21–22 – male, holotype (Kabul), 23–24 – male (Salang Pass); 25–28 – *Polyommatus icarus*, males (Doabi village): 25–26 – specimen with darker ventral wing surface colouration and more developed pattern, 27–28 – specimen with lighter ventral wing surface colouration and more developed pattern. Odd-numbered figures – dorsal view, even-numbered figures – ventral view. Scale bar 1 cm. Photographs and composition by G. Katona.

Рис. 5–28. Виды семейства Lycaenidae из Афганистана.

5–6 – *Afarsia hanna*, самец (село Доаби); 7–8 – *Alpherakya bellona*, самец (село Доаби); 9–10 – *Alpherakya yakavlangi*, самец (село Доаби); 11–12 – *Aricia agestis*, самка (село Доаби); 13–16 – *Eumedonia eumedon bamiana* (село Доаби): 13–14 – самец, 15–16 – самка; 17–20 – *Polyommatus bilucha* (село Доаби): 17–18 – самец, 19–20 – самка; 21–24 – *Polyommatus muetingi*: 21–22 – самец, голотип (Кабул), 23–24 – самец (перевал Саланг); 25–28 – *Polyommatus icarus*, самцы (село Доаби): 25–26 – экземпляр с более темной окраской вентральной поверхности крыла и рудиментарным рисунком, 27–28 – экземпляр с более светлой окраской вентральной поверхности крыла и более развитым рисунком. Рисунки с нечетной нумерацией – вид сверху, рисунки с четной нумерацией – вид снизу. Масштабная линейка 1 см. Фотографии и составление Г. Катоны.





Figs 29–39. Lycaenidae species and male genitalia.

29–30 – *Turanana laspura*, male (Doabi village, Afghanistan): 29 – dorsal view, 30 – ventral view; 31–32 – *Satyrium hazarajatica*, male (Doabi village, Afghanistan): 31 – dorsal view, 32 – ventral view; 33–35 – male genitalia of *Eumedonia eumedon* mounted on microscopic slides showing the anterior part with vinculum and in full one of the valvae: 33 – *E. eumedon* (Austria), 34–35 – *E. e. bamiana* (Afghanistan); 36–39 – male genitalia of *Turanana laspura* mounted on microscopic slides showing one part of the symmetric organ: 36 – specimen from “Turkestan”, 37 – specimen from Khorog, Tajikistan, 38–39 – specimens from Doabi village, Afghanistan. Scale bars: 29–32 – 1 cm; 33–35 – 2 mm; 36–39 – 1.1 mm. Photographs 29–32 by G. Katona, 33–39 by Zs. Bálint; composition by G. Katona.

Рис. 29–39. Виды семейства Lycaenidae и гениталии самцов.

29–30 – *Turanana laspura*, самец (село Доаби, Афганистан): 29 – вид сверху, 30 – вид снизу; 31–32 – *Satyrium hazarajatica*, самец (село Доаби, Афганистан): 31 – вид сверху, 32 – вид снизу; 33–35 – гениталии самцов *Eumedonia eumedon* на предметных стеклах, передняя часть с винкулюмом и одна из вальв полностью: 33 – *E. e. eumedon* (Австрия), 34–35 – *E. e. bamiana* (Афганистан); 36–39 – гениталии самцов *Turanana laspura* на предметных стеклах, показывающие часть симметричного органа: 36 – экземпляр из “Turkestan”, 37 – экземпляр из Хорога, Таджикистан, 38–39 – экземпляр из села Доаби, Афганистан. Масштабные линейки: 29–32 – 1 см; 33–35 – 2 мм; 36–39 – 1.1 мм. Авторы фотографий: 29–32 – Г. Катона, 33–39 – Ж. Балинт; составление Г. Катона.

described from the Vienna region (Austria) as *Papilio agestis* in an influential book of lepidopterology [Bálint, 2023]. It has a wide distribution from British Isles, from the Atlantic coast of Europe, via the Russian-Ukrainian steppes to Kazakhstan and Mongolia. *Aricia agestis* is a forest-steppe species which has been adapted to habitats of anthropogenic influences. In the Mediterranean region

*A. agestis* occurs together with its sister species *A. cramera* (Eschscholtz, 1821), what primarily may be distinguished by the more extensive orange colouration of the wing surfaces and some genitalia traits [Higgins, 1975].

For the Afghani populations, the species-group names *agestis* and *nazira* have been applied. The description of *Polyommatus nazira* Moore, 1865 was based on the

material of unstated number of specimen(s) with unstated sex collected in Kunawur (= Kinnaur, India). The lectotype has been designated on the basis of a syntypic male and the nominal taxon was considered as a subjective synonym of *Arícia agestis* [Bálint, 1999]. The lectotype matches perfectly with the male phenotype of the first brood of *A. agestis*, therefore there is no ground to apply the name suggesting that it represents a distinct population restricted to the provinces Baghlan, Kabul, Panjshir, Parwan and Wardak. The Waras record is the most southern known occurrence of the species in Afghanistan, and has a remarkable submarginal pattern formed by vivid orange lunules, somewhat reminiscent to *A. cramera*. Further studies are necessary to evaluate whether it is an aberrant individual or there is a *cramera*-like taxon which needs to be named.

*Eumedonia eumedon bamiana*  
(Tshikolovets, Pljushtch, Pak et Skrylnik, 2018), **comb. n.**  
(Figs 13–16, 34, 35)

*Plebejus eumedon bamianus* Tshikolovets, Pljushtch, Pak et Skrylnik, 2018: Tshikolovets et al., 2018: 139, pl. 23, figs 38–40.

**Material.** 4♂, 1♀ (HNHM, Tóth numbers 2185, 2186).

**Notes.** The genus *Eumedonia* Forster, 1938 (type species *Papilio eumedon* Esper, 1780, by original designation) was recognized [Tuzov et al., 2000; Talavera et al., 2012]. The species *Eumedonia eumedon* has been described from the vicinity of Erlangen (Germany) and has a wide distribution in the Palaearctic region from Europe, via the Russian-Ukrainian steppes and Siberia to the Pacific coast. It is a forest-steppe polyommata lycaenid specialized to Geranium inhabiting mesophilous meadows and marshlands, and has two ecotypes (cf. Eitschberger, Steiniger [1975]).

In the HNHM there are 530 specimens of *E. eumedon* representing the entire range of the species. On the basis of this material the taxon *E. eumedon bamiana* seems to be indeed unique. By the authors [Tshikolovets et al., 2018: 139] a good diagnosis is presented listing several characters, as: 1) “complete absence of white stripe on hindwing underside”; 2) “very weakly developed orange submarginal spots on hindwing, and especially on forewing on which they are obsolescent”; 3) “on hindwing these orange elements are very small and more widely separated” mentioning that “in all other subspecies they are significantly bigger and brighter; and finally, 4) “the black lunules edging submarginal spots are very weak and vestigial”. Character 1 is remarkable as in all known *E. eumedon* populations in the Himalaya region possess the white stripe (HNHM vouchers; [Tshikolovets, Pagés, 2016]). However in populations from Europe, Russia and Mongolia this character is not exclusive, as phenotypes with and without white stripe occur in the same location (HNHM vouchers; [Tshikolovets et al., 2009]). Characters 2–4 are especially obvious in the Doabi material, as in all the specimens these elements of the wing ventral surfaces are indeed vestigial.

In general, Polyommata male genitalia often provide good quantitative, sometimes qualitative characters for species discrimination. The male genitalia of *E. eumedon* is well documented [Higgins, 1975; Fernández-Rubio, 1976; Nekrutenko, 1985; Jakšič, 1998]. The Doabi specimens

have typical *Eumedonia* male genitalia with a developed membranous inner lobe and wider rounded apex, whilst the outer part is sclerotized with an angular terminus (Figs 33–35).

We presume that the lack of the white stripe associated with strongly reduced submarginal pattern with the genitalia trait mentioned are genetically coded characters and reflect a different biological species of *Eumedonia* which is distributed in the Bamyan Province. However this observation needs further supporting evidences. The record published here provides new data for geographical occurrence: it is somewhat 100 km south of the type locality.

*Polyommatus bilucha* (Moore, 1884)  
(Figs 17–20)

*Polyommatus eros bilucha* (Moore, 1884): Sakai, 1981: 128, pl. 43, fig. 55.

*Polyommatus bilucha* (Moore, 1884): Tshikolovets et al., 2018: 154, pl. 28, figs 1–6.

**Material.** 20♂, 7♀.

**Notes.** Most of the specimens documented as *P. eros bilucha* actually represent different taxa [Sakai, 1981; Tshikolovets et al., 2018], and with *P. icadius* (Grum-Grshimailo, 1890) it forms a sister-clade of *P. icarus* (Rottemburg, 1775) [Vodolazhsky et al., 2011]. The species is relatively small with the forewing costa length in males 13–16 mm and in females 12–16 mm. Male dorsal wing surfaces are gleaming silvery blue (“brilliant, glossy, opalised, lilacine cobalt-blue” [Moore, 1884: 24]) with delicate forewing discoidal line, females are brown with slight blue basal suffusion, pale orange submarginal lunules, and well visible forewing discoidal spot. Ventral wing surfaces are highly *icarus*-reminiscent with forewing discal spot and basal suffusion of gleaming green scales. The intensity of the ventral wing surface markings is variable.

The taxon *Lycaena bilucha* has been described by Moore in 1884 on the basis of an unstated number of male specimens from “Chaman, S. Beluchistan (April)”, deposited “In coll. Ind. Mus., Calcuta” (National Zoological Museum, Kolkata). The lectotype was designated on the basis of a male from “Chaman, 5. 80” deposited in the Natural History Museum (NHMUK, London, UK) [Bálint, 1999]. A further male syntype has been pictured, what is now a paralectotype [Sheela et al., 2019]. We remark that the month of collecting indicated by the labels of these formerly syntype specimens does not match with the original description. We have the opinion that the type material consisted several specimens collected in various months, and the collecting time was not precisely registered by Moore. It is well known that the Lepidoptera material of Frederick Moore (1830–1907), containing syntypes of taxa he collected and described in the subcontinent India, landed chiefly in the NHMUK [Horn et al., 1990]).

*Polyommatus muetingi* (Bálint, 1993), **sp. reinst.**  
(Figs 21–24)

*Polyommatus eros bilucha* Moore, 1884: Sakai, 1981: 233, pl. 43, figs 48–54.

*Polyommatus nadirus* (Moore, 1884): Tshikolovets et al., 2018: 154, pl. 26, figs 49–54.



**Material.** 3♂, 1♀ (type material of *Agrodiaetus muetingi*; see [Bálint, 1993]), male (“Salang pass”).

**Notes.** The sympatric and congeneric Afghanistani species documented under the name *Polyommatus nadirus* [Tshikolovets et al., 2018] is somewhat similar to *P. bilucha* discussed above, but has a somewhat longer forewing outer margin resulting a more pointed apex, male dorsal forewing ground colour is gleaming sky blue and the ventral wing surface basal suffusion is also blue in both sexes. As the name *Lycaena nadira* Moore, 1884 represents an other species as we outline below, the valid name for this species is *Polyommatus muetingi* (Bálint, 1993), **sp. reinst.**, as according to our best knowledge this is the senior name available for the species.

The name *Lycaena nadira* was proposed on the basis of an unstated number of female specimens collected at Kabul, deposited in the “Indian Museum, Calcutta” [Moore, 1884]. One of the females (syntype) has been documented under the type registration number No. 3573/1 [Sheela et al., 2019: 147]. This specimen is hereby designated here as the lectotype of *Lycaena nadira* to objectively fix the name. The specimen represents the taxon documented as *Plebejus sieversi felicia* (Evans, 1932) [Tshikolovets et al., 2018]. The species *Lycaena sieversi* Christoph, 1877 and its related taxa have been placed in the genus *Afarsia* (Talavera et al., 2012), what results *Afarsia sieversi nadira* (Moore, 1884), **comb. n.** and *Lycaena nadira* Moore, 1884 = *Polyommatus sieversi felicia* Evans, 1932, **syn. n.**

*Polyommatus icarus* (Rottemburg, 1775)  
(Figs 25–28)

*Polyommatus icarus fugitiva* Butler, 1881: Sakai, 1981: 127, 233, pl. 43, figs 29–32, 35–47.

*Polyommatus icarus fugitivus* (Butler, 1881): Tshikolovets et al., 2018: 149, pl. 27, figs 1–8, 10–12.

**Material.** 8♂, 1♀.

**Notes.** The difficulty what corroborates the taxonomy of Afghanistani *P. icarus* populations has been remarked, that because of their phenotypic plasticity there, it is difficult to apply the available names [Tshikolovets et al., 2018]. Seven male specimens of the examined material have no orange pattern in the submarginal area and have extensive blue basal suffusion in the hindwing ventral surface. They match with the specimens from the Joshanak Valley illustrated as figures 6 (male) and 8 (female) documented in the literature [Tshikolovets et al., 2018]. One of the males is identical with the specimen from Panjaw illustrated as figure 40 in another book [Sakai, 1981]. These specimens, including the ones from Doabi, are most reminiscent to the Central Asian *P. icarus*-like phenotype documented as *Polyommatus kashgarensis* Moore, 1890 [Tuzov et al., 2000].

The cold-shock experiments on *P. icarus* revealed that the most stable wing pattern elements of the ventral wing surface are the submarginal orange lunules and the blue suffusion of the scales in the basal area, whilst the black spots are highly sensitive [Kertész et al., 2017; Piszter et al., 2019, 2023], resulting some polyommatine phenotypes known to occur in extremely high altitudes [Bálint, 1995]. In drier and warmer climatic conditions *P. icarus* does not show these remarkable alterations but display variations

of the orange lunulation, the basal blue suffusion, and a versatility of ventral wing surface ground colour with tendency for whitening [Artemyeva, 2005, 2007]. It is important to breed *P. icarus* under warm-shock experiment and analyse the results.

**Subtribe Scolitantidina Tutt, 1907**

*Turanana laspura* (Evans, 1932)

(Figs 29, 30, 38, 39)

*Turanana cytis laspura* (Evans, 1932): Sakai, 1981: 229, pl. 42, figs 35–37, 41–44.

*Turanana laspura laspura* (Evans, 1932): Tshikolovets et al., 2018: 123, pl. 25, figs 31–36.

**Material.** 5♂, 1♀ (HNHM, genitalia preparation Tóth numbers 2179, 2180).

**Notes.** The nomenclature and the taxonomy of the genus *Turanana* Bethune-Baker, 1916 (type species: *Lycaena cytis* Christoph, 1877, by original designation) inhabiting the Central Asian mountain systems is complex. Besides the five monotypic brown species three further species have been recorded which have dorsally blue males [Tshikolovets et al., 2018]. The largest one amongst them is documented under the species-group name “*laspura*”, described as *Polyommatus cytis laspura* on the basis of an unstated number of male and female specimens from “Chitral” having pale lavender blue male upperside forewing with “3 discal spots in addition to the spot end cell” (= three additional postmedian spots to the discoidal spot) [Evans, 1932: 227]. The *laspura* phenotype has been documented as figures 35–36 (“Mt. Khwajaghar” and “Bala-Kuran”, respectively) in Sakai [1981] and as figure 32 (“Anjuman valley”) in Tshikolovets et al. [2018].

The Bamyian male forewing dorsal surfaces are dark violet blue and patterned by five-six black postmedian spots. The hindwing dorsal surface has also postmedian spots what supposedly lack on *laspura* syntypes as this trait is not mentioned in the original description. This phenotype has been documented as figure 41 (“Korpetaw”) in Sakai [1981]. In Scolitantidina, the dorsal wing surface pattern composed using black melanin pigment can be highly variable intraspecifically. For example, in *Maculina arion* (Linnaeus, 1758), there are individuals of the same population having dorsal wing surfaces without pattern or individuals with postmedian region heavily black spotted (HNHM vouchers). The origin of this phenotypic plasticity is not yet known, but the key factor is provided during the time spent in the ant hill in larval or pupal stage.

The scolitantidine male genitalia often display diagnostic characters [Higgins, 1975; Coutsis, 2004, 2005, 2006]. Beside two Bamyian specimens, one male from “Turkestan” (HNHM, Tóth no. 2181) and one male from “Chorog” (HNHM, Tóth no. 2182) (Figs 36, 37) have been examined and dissected. The Turkestanian and the Pamirian specimens have no hindwing dorsal surface pattern, the wings are pure blue. We could not find any characteristic trait what could support to discriminate the phenotypes with or without hindwing dorsal surface pattern, and three versus five-six forewing postmedian spots: the valval shape of all the investigated specimens is wide, rectangle-shaped and the costa terminal part after



the angle is serrated (Figs 35–38). The valval shape and the degree of costal dentation are probably variable as indicated by the figure 45 of Zhdanko [2000].

#### Subfamily Theclinae Swainson, 1827

##### Tribe Eumaeini Doubleday, 1847

##### Subtribe Callophryidina Tutt, 1907

*Satyrium hazarajatica* Krupitsky, Pljuschch et Pak, 2018  
(Fig. 31, 32)

*Satyrium skrylniki* Krupitsky, Pljuschch et Pak, 2015; Tshikolovets et al., 2018: 103, pl. 20, figs 25–28 (misidentification).

*Satyrium hazarajatica* Krupitsky, Pljuschch et Pak, 2018: Krupitsky et al., 2018: 263, pl. 1, fig 2, pl. 2, fig. 1, pl. 3, fig. 1.

**Material.** 1♂.

**Notes.** This is a poorly known species, belonging to the *Satyrium deria* (Moore, 1865) species-group, representing to the close relatives of *Satyrium sassanides* (Kollar, [1849]) (type species of *Superflua* Strand, 1910) [Krupitsky et al., 2015; 2018]. The identification is based on differential characters given by the original description [Krupitsky et al., 2018: 263]: “*S. (S.) hazarajatica* sp. n. can be differentiated from other members of the *S. (S.) deria* species group by larger size, pale fringe on hindwing, pale underside of wings, and postdiscal band with reduced dark suffusion (fringe dirty or brownish white; underside of wings darkened; postdiscal band underlain by dark line in all three closely related species)”. However the Central Asian *S. deria* and *S. skrylniki* cannot be distinguished on the basis of these quantitative characters (see the figure *S. sassanides deria* in D’Abrera [1993] and figures in Tshikolovets et al. [2018]). Further investigations are necessary to check statistically whether the characters used here to identify the taxon are indeed diagnostic and the possible synonymy of *S. deria* and *S. skrylniki* can be excluded. The record published here provides new data for geographical and altitudinal occurrences: it is somewhat 100 km more south and in elevation it is 600 m higher than the type locality.

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## New and interesting records of comb-clawed beetles (Coleoptera: Tenebrionidae: Alleculinae) in the European part of Russia and the Caucasus

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**Abstract.** New data on distribution of rare and little-known species of comb-clawed beetles (Tenebrionidae: Alleculinae) in the European part of Russia and the Caucasus are presented. *Allecula morio* (Fabricius, 1787) is recorded for Russia for the first time; Crimean Peninsula is the easternmost border of its range. Information about three very rare species, *Gonodera luperus luperus* (Herbst, 1783), *Hymenalia smirnovi* Dubrovina, 1978 and *Hymenalia morio* (L. Redtenbacher, 1849), is given; the record of the second species is the only reliable and confirmed by material from Ulyanovsk Region. *Gonodera pulcherrima* (Faldermann, 1837) is recorded for the Greater Caucasus for the first time. *Mycetochara (Ernocharis) armeniaca* Novák, 2022 is firstly recorded in Georgia. Information on distribution and bionomics of *Omophlus (Phibalus) subalpinus* (Ménétriés, 1832) is given; the species is very local and inhabits small limestone steppe areas in Stavropol Region, Karachay-Cherkessia, Kabardino-Balkaria and Ingushetia at 700–3000 m. All species are illustrated as well as male genitalia.

**Key words:** distribution, Coleoptera, Tenebrionidae, Alleculinae, Russia, Caucasus.

### Новые и интересные находки жуков-пыльцеедов (Coleoptera: Tenebrionidae: Alleculinae) в европейской части России и на Кавказе

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**Резюме.** Представлены новые данные о распространении редких и малоизвестных видов жуков-пыльцеедов (Tenebrionidae: Alleculinae) в европейской части России и на Кавказе. *Allecula morio* (Fabricius, 1787) впервые указан для фауны России; Крымский полуостров является самой восточной границей его ареала. Приведены сведения о трех очень редких видах – *Gonodera luperus luperus* (Herbst, 1783), *Hymenalia smirnovi* Dubrovina, 1978 и *Hymenalia morio* (L. Redtenbacher, 1849); находка последнего вида является единственной достоверной и подтвержденной материалом из Ульяновской области. *Gonodera pulcherrima* (Faldermann, 1837) впервые указан для Большого Кавказа. *Mycetochara (Ernocharis) armeniaca* Novák, 2022 впервые зарегистрирован в Грузии. Приведены сведения о распространении и биотопах *Omophlus (Phibalus) subalpinus* (Ménétriés, 1832): вид встречается очень локально и населяет небольшие участки известняковых степей в Ставропольском крае, Карачаево-Черкесии, Кабардино-Балкарии и Ингушетии на высоте 700–3000 м. Даны изображения всех видов, включая гениталии самцов.

**Ключевые слова:** распространение, Coleoptera, Tenebrionidae, Alleculinae, Россия, Кавказ.

## Introduction

Comb-clawed beetles more or less satisfactorily studied in Russia in general, but representatives of the subfamily Alleculinae from the south of Russia (including the Russian Caucasus) need revision. Most of publications on the taxonomy of alleculine beetles of the Greater Caucasus dates back to the late 19<sup>th</sup> – early 20<sup>th</sup> centuries. The most significant works with information on comb-clawed beetles from the European part of Russia and the Caucasus were published in the 20<sup>th</sup> century by Russian researchers [Ogloblin, Znojko, 1950; Striganova, 1961; Dubrovina, 1968, 1976, 1978, 1982; Iablokoff-Khznorian, 1976, 1983; Dubrovina et

al., 1979; Dubrovin, Kompantseva, 1990, 1992]. Several taxonomic and faunistic data on the Caucasian alleculine beetle were published by German entomologist Muche [1964, 1971, 1972]. Some important papers on comb-clawed beetles from the Caucasus were presented by Novák [2011, 2013, 2016, 2018, 2020a–c, 2022, 2023] and Nabozhenko with coauthors [Nabozhenko et al., 2010; Arzanov et al., 2019; Nabozhenko, 2022]. Isaev and Egorov [2000] compiled the annotated list of comb-clawed beetles from Ulyanovsk Region of Russia with clear localities. Egorov and coauthors [Egorov, 2019; Egorov, Semionenkov, 2023] added a brief information about Alleculinae of the Chuvash Republic. Interesting faunistic data on Alleculinae of steppe Cis-Ural region of



Russia (Orenburg and Bashkortostan) are presented by Nemkov [2011] and Kozminykh [2015]. Nikitsky [2019] added faunistic and ecological information about comb-clawed beetles from Moscow Region.

Below we present a new data on distribution and morphological structures of adults for some rare and little-known species. Images for the majority of species are given for the first time.

## Material and methods

Specimens were studied using binocular microscopes Micromed MC-4 Zoom Led and Micromed MC-5 Zoom Led. Beetle photographs were taken with a Canon EOS 5D Mark IV Body, Canon MP-E65MM F2.8 Macro lens and Canon Macro Twin Lite MT-26X-RT flash bulb, and stacking was done using Stack-shot 3X with enlarged macro rails s/n 3734; the photosystem is installed on a Kaiser Copy Stand RS 1 reproduction machine. Images were stacked in Helicon Focus 7.7.4 Pro. Images of beetles and their structures are not scaled.

The studied material is deposited in the following collections and museums:

PCMN – private collection of Maxim Nabozhenko (Rostov-on-Don, Russia);

PCRKh – private collection of Roman Khryapin (Moscow, Russia);

ZIN – Zoological Institute of the Russian Academy of Sciences (St Petersburg, Russia);

ZMMSU – Zoological Museum of the M.V. Lomonosov Moscow State University (Moscow, Russia).

### Tribe Alleculini Laporte, 1840

#### Subtribe Alleculina Laporte, 1840

*Allecula morio* (Fabricius, 1787)

(Figs 1–4)

**Material.** 1♂ (ZIN), Russia, Crimea, Simferopol Distr., 1.1 km SE Mramornoe, W foothills of Chatyrdag Mt., 738 m, 44°48'21.0"N / 34°16'27.3"E, Fagus forest, 8.06.2022 (A.S. Prosvirov).

**Distribution.** Europe [Novák, 2020a]. This species was known on the territory of the former USSR only from western regions of the Ukraine and Belarus [Dubrovina et al., 1979]. Series of larvae were found in Transcarpathian Region (now the Ukraine) in rotten beech wood in 1972, and adults were subsequently hatched from larvae [Dubrovina et al., 1979]. The species is recorded for Crimea and Russia for the first time. Crimean Peninsula is the easternmost border of the range.

*Hymenalia smirnovi* Dubrovina, 1978

(Figs 5, 6, 8, 10–12)

**Material.** 1♂, holotype (ZMMSU), “Ворошиловгр. обл. Меловский р-н Стрелецкая степь выпас, в почв. пробе 17.VI.1973 Л. Прохорова” (Cyrillic, handwritten) (now: Russia, Lugansk People's Republic, Melovoe Distr., Lugansk State Nature Reserve, “Streltsovskaya steppe” sector, grazing, 49°17'59"N / 40°05'46"E, in soil sample), “Holotypus *Hymenalia caraboides* М. Дубровина, “*Hymenalia smirnovi* Dubrovina sp. n.”

**Distribution.** The species is very rare, known only from the type locality [Dubrovina, 1978].

*Hymenalia morio* (L. Redtenbacher, 1849)

(Figs 7, 9, 13–15)

**Material.** 1♂ (ZIN), Russia, Ulyanovsk Region, Novospasskoe Distr., Vasil'evka, saline steppe, 17.07.1999 (A.Yu. Isaev).

**Distribution.** Central and southern Europe: Austria, Hungary, Slovakia, Russia (steppe Cis-Ural region, Ulyanovsk Region). Isaev and Egorov [2000] indicated the mentioned above specimen as *Hymenalia* sp. This species was listed for the steppe Cis-Ural region by Nemkov [2011] and Kozminykh [2015] (with reference to Nemkov [2011]). The mentioned above record is the only reliable and confirmed by material. The species is very rare, at least in Russia. It was known on the territory of the former USSR only in the western Ukraine [Dubrovina, 1978].

### Subtribe Gonoderina Seidlitz, 1896

*Gonodera luperus luperus* (Herbst, 1783)

(Figs 16, 17, 20–22)

**Material.** 1♂ (ZMMSU), “Теллерман Ворон. 1.6.51 Г. Коралькова” (Russia, Voronezh Region, Tellermanovskiy, 51°21'59"N / 42°02'50"E); 1♀ (ZIN), Russia, Ulyanovsk Region, Sengiley Distr., Shipovka, under Ulmus bark, 23.06.2022 (A.V. Kovalev).

**Notes.** Striganova [1961] indicated that larvae of *G. luperus* are widely distributed in forest-steppe and steppe zones and the Caucasus. However, Striganova did not breed adults from these larvae, and the species (at least records of imagoes) is extremely rare in Russia and is known from only several localities. Therefore, we cannot confirm the accuracy of her data. Dubrovina et al. [1979] collected *G. luperus* and its larvae on the territory of the former USSR only in the Ciscarpathian (vicinity of Lvov, the Ukraine).

**Distribution.** British Isles, Europe from the Atlantic coast [Novák, 2020a] to the South Urals in Russia. This species was listed for Ulyanovsk Region by Isaev and Egorov [2000] and the steppe Cis-Ural region by Nemkov [2011] and Kozminykh [2015] (with reference to Nemkov [2011]).

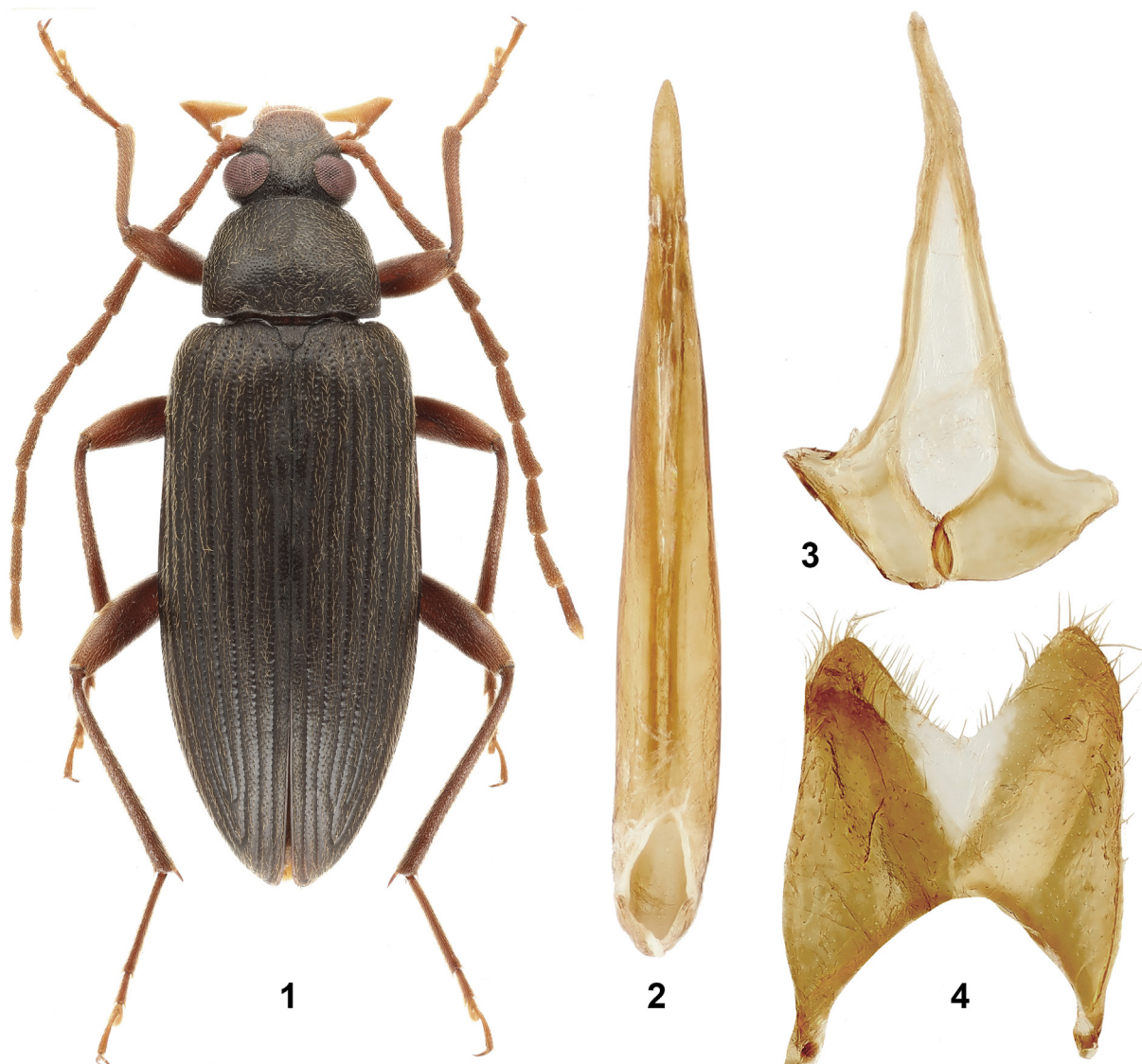
*Gonodera pulcherrima* (Faldermann, 1837)

(Figs 18, 19, 23–25)

**Material.** 2♂, 1♀ (ZIN), “Kaukas Leder”; 2♂ (ZIN), “Caucasus Thana-Thal E. König” (Georgia, Tana River valley S of Gori); 3♂, 1♀ (ZIN), South Ossetia, Dzau Distr., Verkhniy Erman, 42°30'45"N / 44°15'56"E, 2350–2400 m, 16.06.2023 (M.V. and S.V. Nabozhenko, O.S. Guskova).

**Bionomics.** Dubrovina et al. [1979] collected larvae of this species under litter in a coniferous-deciduous mountain forest near Borjomi. Other specimens were collected in deciduous low mountain forests. We collected adults of *G. pulcherrima* in subalpine zone by mowing method. Beetles sat on long dry shoots of cereals.

**Distribution.** This species was known only from the Lesser Caucasus and Surami Range connecting Greater and Lesser Caucasus. In addition to the mentioned above localities, this species is also known from Borjomi [Dubrovina et al., 1979]. It was described from Surami Range as *Euboes viridis* Allard, 1877 [Allard, 1877; Schneider, Leder, 1878]. Mařan [1944] mentioned two specimens with labels “Caucasus”. Medvedev [1965] erroneously listed *G. pulcherrima* for Ciscaucasia; nobody



Figs 1–4. *Allecula morio*, male, Crimea.

1 – habitus; 2 – aedeagus ventrally; 3 – spiculum gastrale; 4 – inner sternite VIII.

Рис. 1–4. *Allecula morio*, самец, Крым

1 – габитус; 2 – эдеагус вентрально; 3 – гастральная спикула; 4 – внутренний стернит VIII.

collected this species in Russia. The first record for South Ossetia and the Greater Caucasus.

#### Subtribe Mycetocharina Gistel, 1848

*Mycetochara (Ernocharis) armeniaca* Novák, 2022  
(Figs 26–23)

**Material.** 2♂, 1♀ (PCRKh), Georgia, Tsalka Distr., Chapaevka (Kavta), 21.05.2015 (R.A. Khryapin).

**Bionomics.** Adults were collected in mountain steppe on grass and soil (information of the collector Roman Khryapin). This is an unusual habitat for *Mycetochara* because the majority of species are associated with forests and adults can be found on tree trunks at night.

**Distribution.** This species was known only from Western and Central Armenia [Novák, 2022]. New record for Georgia.

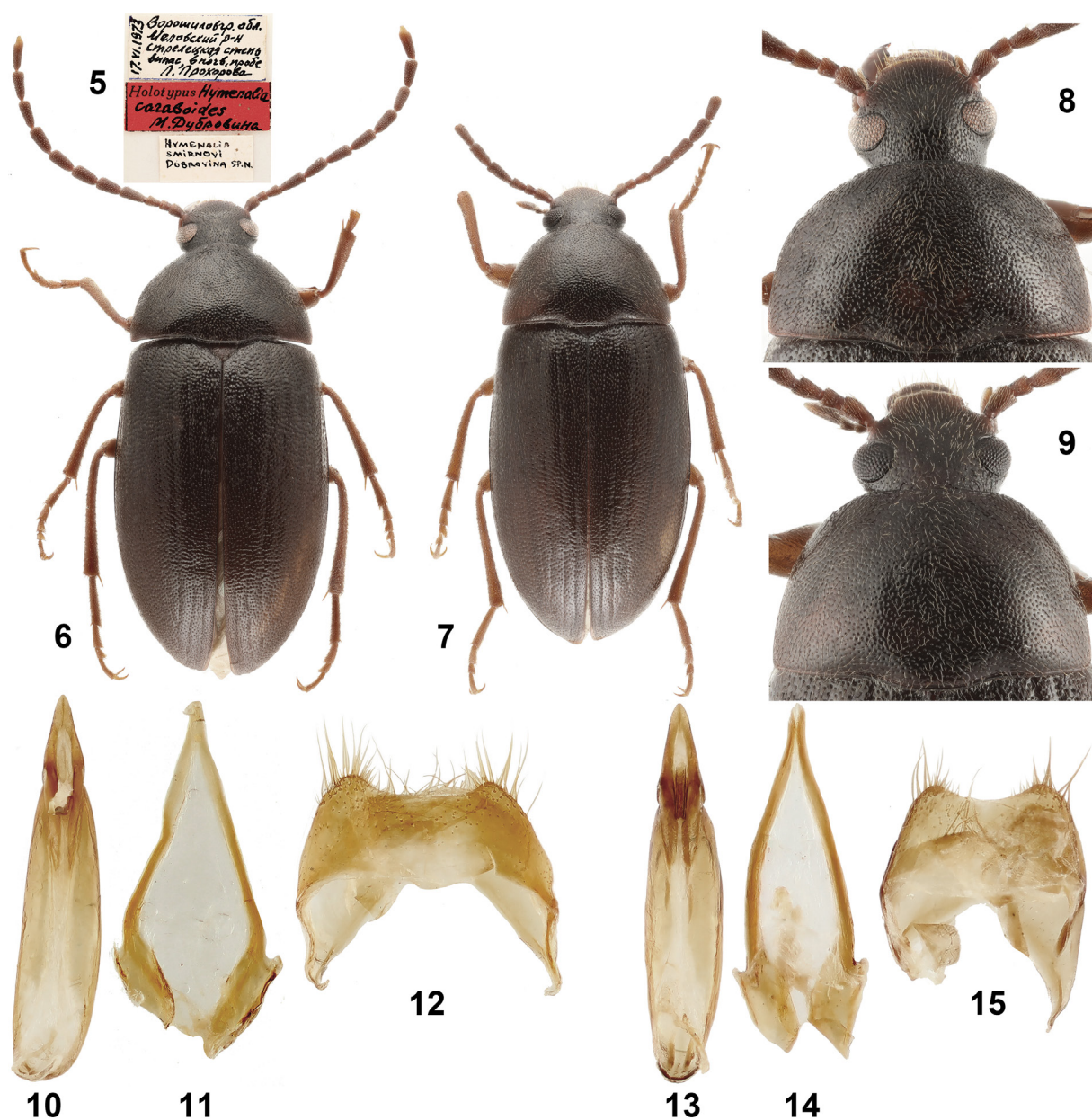
#### Tribe Cteniopodini Solier, 1835

*Omophlus (Phibalus) subalpinus* (Ménétriés, 1832)  
(Figs 33–37)

**Material.** 2♂ (ZIN), Russia, Karachay-Cherkessia, Kandelyabr Ridge, 3000 m, 29.09.1956 (Kurnakov); 1♂ (PCMN), Russia, Karachay-Cherkessia, Dzhalogchat (vicinity of the glacier W of the Alibek Pass), 16.08.1998 (D.G. Kasatkin). 29♂, 1♀ (ZIN, PCMN), Russia, Ingushetia, “Erzi” Reserve base, 42°49′54″N / 44°54′17″E, meadows, 1335 m, 11–14.06.2023 (M.V. and S.V. Nabozhenko, O.S. Guskova, M.A. Gadaborsheva).

**Bionomics.** The species is confined to limestone outcrops from 700 to 3000 m. Muche [1972] collected imagoes on Fabaceae in limestone steppe on the Borgustanskiy Range near Podkumok village. We found multiple beetles in Ingushetia in a small limestone steppe area (approximately 20 × 20 meters), mainly on *Festuca*. The species is very local and occurs infrequently, which was also noted by Muche [1972].





Figs 5–15. *Hymenalia* spp., males, habitus and details of structure.  
5, 6, 8, 10–12 – *H. smirnovi*, holotype; 7, 9, 13–15 – *H. morio*. 5 – labels of the holotype; 6, 7 – habitus; 8, 9 – head and pronotum; 10, 13 – aedeagus ventrally; 11, 14 – spiculum gastrale; 12, 15 – inner sternite VIII.

Рис. 5–15. *Hymenalia* spp., самцы, габитус и детали строения.

5, 6, 8, 10–12 – *H. smirnovi*, голотип; 7, 9, 13–15 – *H. morio*. 5 – этикетки голотипа; 6, 7 – габитус; 8, 9 – голова и переднеспинка; 10, 13 – эдеагус вентрально; 11, 14 – гастральная спикула; 12, 15 – внутренний стернит VIII.

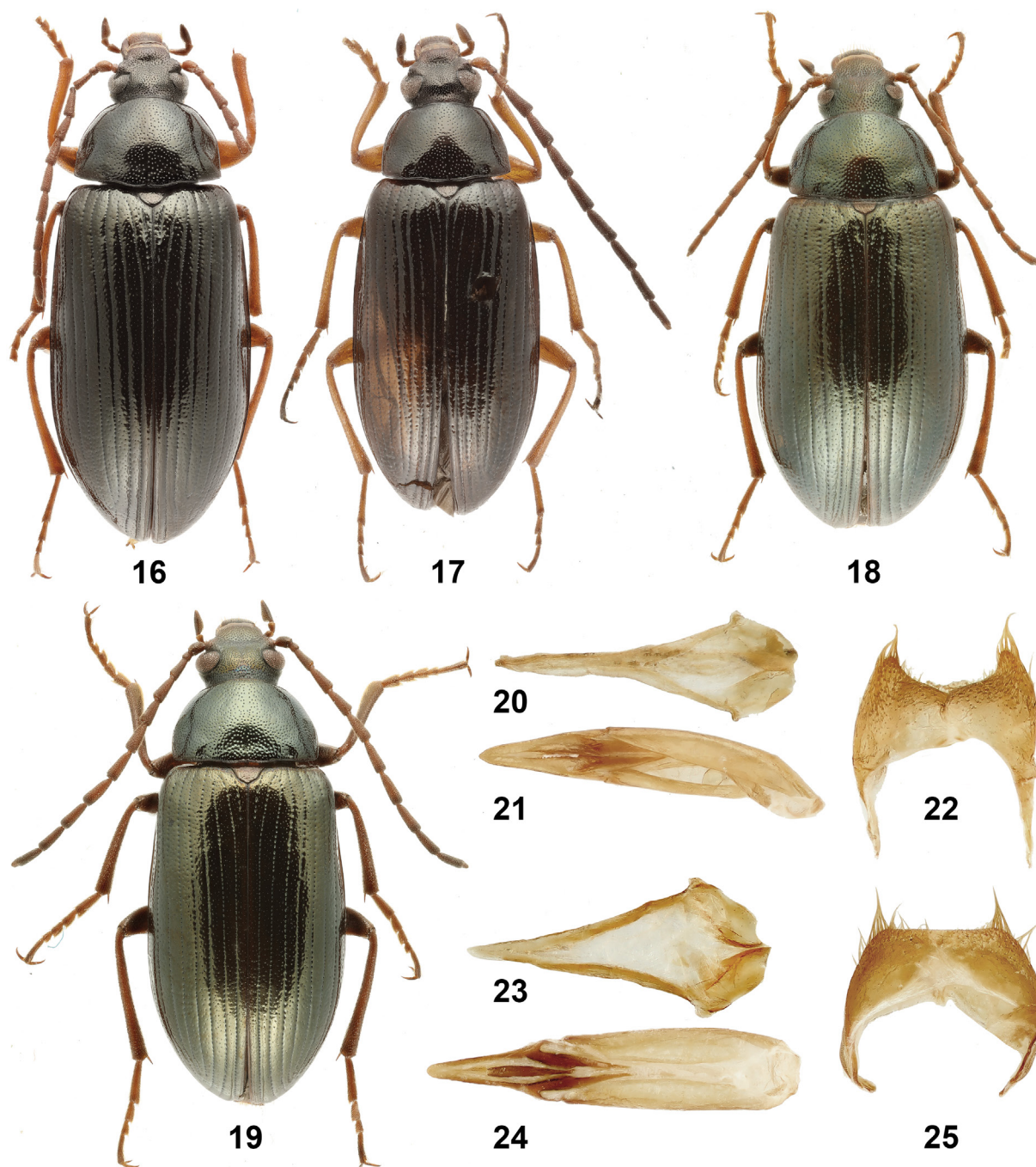
**Distribution.** Russia: Stavropol Region, Karachay-Cherkessia, Kabardino-Balkaria, Ingushetia. This little-known species was described from the alpine zone of the Caucasus, “Alpes du Caucase” [Ménétriés, 1832]. Baudi di Selve [1877], Seidlitz [1896] and Reitter [1906] listed this species from the Caucasus without details. Ogloblin and Znojko [1950] indicated the distribution of *O. subalpinus* as mountains of the Caucasus (without distinct localities), at high 1200–1800 m. Muche [1964] mentioned the species from the Caucasus. Later he collected adults near Itkol boarding house in Kabardino-Balkaria at 2100–2600 m,

in Dzhemagat canyon in the Karachay-Cherkess Republic and Podkumok in Stavropol Region [Mucho, 1972].

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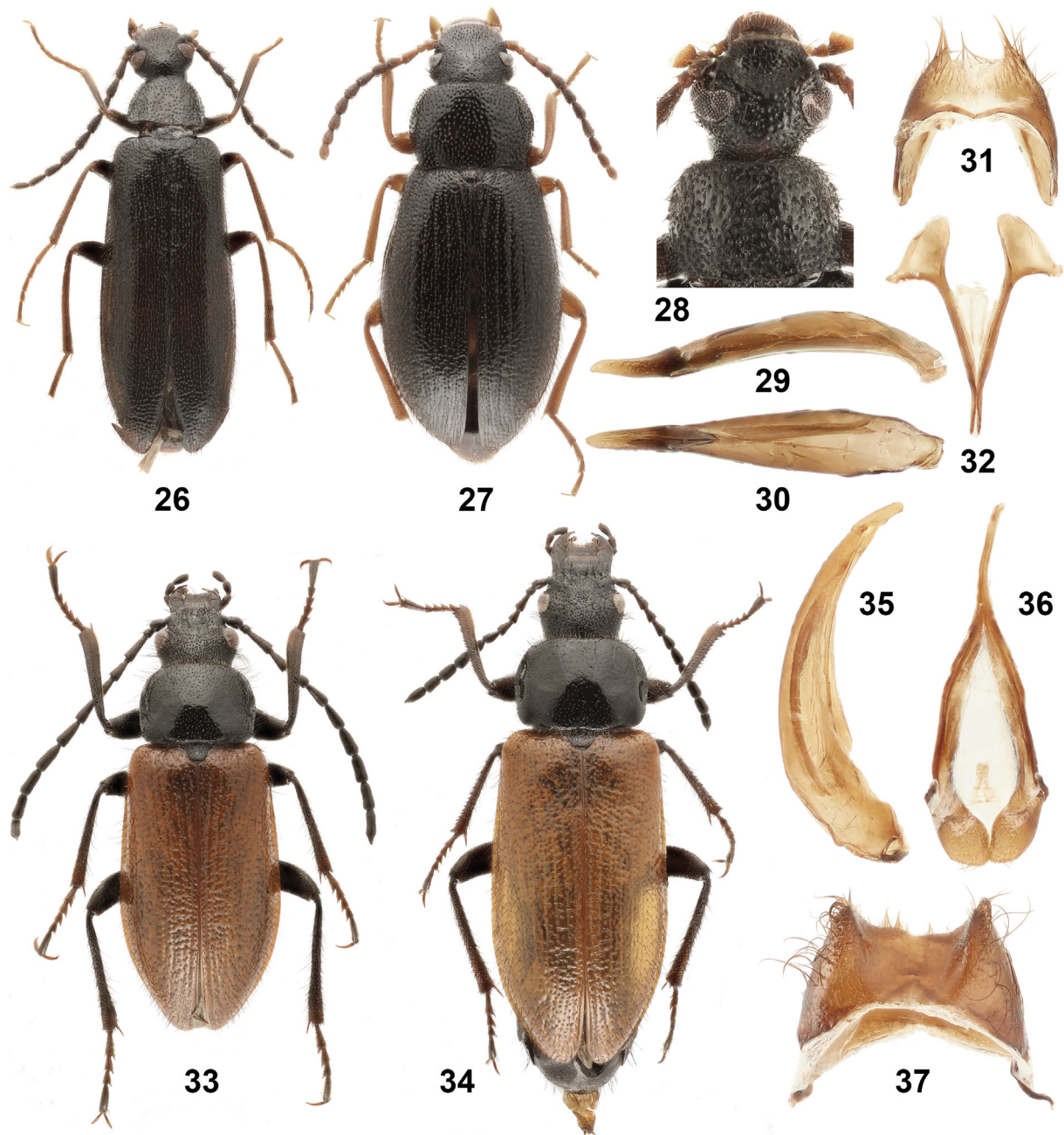




Figs 16–25. *Gonodera* spp., habitus and details of structure.  
 16, 17, 20–22 – *G. luperus luperus*; 18, 19, 23–25 – *G. pulcherrima*. 16, 18 – habitus of females; 17, 19 – habitus of males; 20, 23 – spiculum gastrale; 21, 24 – aedeagus ventrally; 22, 25 – male inner sternite VIII.  
 Рис. 16–25. *Gonodera* spp., габитус и детали строения.  
 16, 17, 20–22 – *G. luperus luperus*; 18, 19, 23–25 – *G. pulcherrima*. 16, 18 – габитус самок; 17, 19 – габитус самцов; 20, 23 – гастральная спикула; 21, 24 – аedeagus вентрально; 22, 25 – внутренний стернит VIII самца.

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Figs 26–37. Alleculinae from the Caucasus, habitus, details of structure.

26–32 – *Mycetochara armeniaca*; 33–37 – *Omophlus subalpinus*. 26, 33 – habitus, male; 27, 34 – habitus, female; 28 – head and pronotum, male; 29, 35 – aedeagus laterally; 30 – aedeagus ventrally; 31, 37 – male sternite VIII (abdominal ventrite 6); 32, 36 – spiculum gastrale.

Рис. 26–37. Alleculinae с Кавказа, габитус и детали строения.

26–32 – *Mycetochara armeniaca*; 33–37 – *Omophlus subalpinus*; 26, 33 – габитус, самец; 27, 34 – габитус, самка; 28 – голова и переднеспинка, самец; 29, 35 – эдеагус латерально; 30 – эдеагус вентрально; 31, 37 – внутренний стернит VIII самца (абдоминальный вентрит 6); 32, 36 – гастральная спикула.

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## Review of the genus *Cassidibracon* Quicke, 1987 and related taxa of the *Plesiobracon* group of genera (Hymenoptera: Braconidae: Braconinae)

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**Abstract.** Members of several genera of the *Plesiobracon* genus-group are reclassified. A new species, *Cassidibracon vannoorti* sp. n. from South Africa, and two new genera, *Isomerosoma* gen. n. (type species *Bracon subacaudatus* Granger, 1949) and *Reticulotergus* gen. n. (type species *Cassidibracon indicus* Narendran et Rema, 1994), are described. *Pseudochivinia* Long et van Achterberg, 2023, stat. n. recently described as a subgenus of *Bracon* Fabricius, 1804 is considered a valid genus. The genus *Triaspidoagastra* Granger, 1949, syn. n. is synonymised with *Esenga* Cameron, 1906. The new replacement name *Bracon vitobiasi* Long et van Achterberg, nom. n. is proposed for the junior primary homonym *Bracon tobiasi* Long et van Achterberg, 2023 (nec Papp, 1965). The following new combinations are given: *Esenga lutea* (Granger, 1949), comb. n. (from *Triaspidoagastra*), *Esenga testacea* (Granger, 1949), comb. n. (from *Triaspidoagastra*), *Lyricibracon nigerianus* (Quicke, 1988), comb. n. (from *Rugosibracon* Quicke, 1988), *Pseudochivinia vitobiasi* (Long et van Achterberg, 2023), comb. n. (from *Bracon*), *Sculptolobus repens* (Gupta, 2014), comb. n. (from *Cassidibracon* Quicke, 1987), *Scutibracon gracillariae* (Quicke, 2012), comb. n. (from *Cassidibracon*), *Scutibracon malabaricus* (Narendran, 1994), comb. n. (from *Cassidibracon*), *Scutibracon sumodani* (Narendran et Madhavikutty, 1994), comb. n. (from *Cassidibracon*), and *Trigastrotheca notata* (Szépligeti, 1914), comb. n. (from *Habrobracon* Ashmead, 1895). Lectotypes are designated for *Bracon subacaudatus* Granger, 1949 and *Triaspidoagastra lutea* Granger, 1949.

**Key words:** Old World, *Plesiobracon* group, reclassification, new genera, new species, new combinations.

### Обзор рода *Cassidibracon* Quicke, 1987 и близких к нему таксонов группы *Plesiobracon* (Hymenoptera: Braconidae: Braconinae)

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**Резюме.** Реклассифицированы представители нескольких родов группы *Plesiobracon*. Описаны новый вид, *Cassidibracon vannoorti* sp. n. из ЮАР, и два новых рода, *Isomerosoma* gen. n. (типовой вид *Bracon subacaudatus* Granger, 1949) и *Reticulotergus* gen. n. (типовой вид *Cassidibracon indicus* Narendran et Rema, 1994). Таксон *Pseudochivinia* Long et van Achterberg, 2023, stat. n., описанный как подрод рода *Bracon* Fabricius, 1804, рассматривается в качестве валидного рода. Род *Triaspidoagastra* Granger, 1949, syn. n. синонимизирован с *Esenga* Cameron, 1906. Для младшего первичного омонима *Bracon tobiasi* Long et van Achterberg, 2023 (nec Papp, 1965) предлагается новое замещающее название *Bracon vitobiasi* Long et van Achterberg, nom. n. Предложены новые комбинации: *Esenga lutea* (Granger, 1949), comb. n. (из *Triaspidoagastra*), *Esenga testacea* (Granger, 1949), comb. n. (из *Triaspidoagastra*), *Lyricibracon nigerianus* (Quicke, 1988), comb. n. (из *Rugosibracon* Quicke, 1988), *Pseudochivinia vitobiasi* (Long et van Achterberg, 2023), comb. n. (из *Bracon*), *Sculptolobus repens* (Gupta, 2014), comb. n. (из *Cassidibracon* Quicke, 1987), *Scutibracon gracillariae* (Quicke, 2012), comb. n. (из *Cassidibracon*), *Scutibracon malabaricus* (Narendran, 1994), comb. n. (из *Cassidibracon*), *Scutibracon sumodani* (Narendran et Madhavikutty, 1994), comb. n. (из *Cassidibracon*) и *Trigastrotheca notata* (Szépligeti, 1914), comb. n. (из *Habrobracon* Ashmead, 1895). Для видов *Bracon subacaudatus* Granger, 1949 и *Triaspidoagastra lutea* Granger, 1949 обозначены лектотипы.

**Ключевые слова:** Старый Свет, группа *Plesiobracon*, реклассификация, новые роды, новый вид, новые комбинации.

## Introduction

Comprising more than 3200 valid species and about 200 valid genera, Braconinae is the largest subfamily of the family Braconidae by the number of described taxa (Yu et al. [2016] and my own calculations based on later publications). At the same time, tribal classification and phylogenetic hypotheses of the subfamily remain very preliminary [Chen, van Achterberg, 2019; Quicke et al., 2023]. In addition to the large number of taxa that require consideration, the development of the supergeneric classification is further complicated by the presence of

massive “dustbin” genera with fuzzy diagnoses [Belshaw et al., 2001], i.e. *Bracon* Fabricius, 1804, *Iphiaulax* Förster, 1863, *Digonogastra* Viereck, 1912, *Cyanopterus* Haliday, 1835, and *Campyloneurus* Szépligeti, 1900 (comprising more than 950, 300, 250, almost 130, and 115 valid species, accordingly).

The most modern and complete key to the Old World genera of Braconinae was presented by Quicke [1987]. The primary difficulty of using this key is that since its publication, 45 new Old World genera of braconines have been described. Identification difficulties are the source of various errors, primarily in the generic attribution of newly

described species. When describing new genera, errors in identifying closely related genera lead to overestimation of the number and strength of diagnostic characters of the new taxa. Finally, the risk of describing new synonyms of already known genera is increased. One of the groups of genera complicated for diagnostic research is the *Plesiobracon* group. The taxa of this group are characterised by distinct morphological characters, but due to the large number of included genera and their morphological diversity, their identification is problematic.

The *Plesiobracon* group was established by van Achterberg [1983] and initially included three genera, *Plesiobracon* Cameron, 1903, *Carinibracon* van Achterberg, 1983, and *Kenema* van Achterberg, 1983 (junior synonym of *Trigastrotheca* Cameron, 1906). Currently it comprises at least 20 genera (Prof. C. van Achterberg, personal communication), i.e., in addition to above mentioned, *Acrocerilia* van Achterberg, 1989, *Ancilibracon* Quicke, 1989, *Cassidibracon* Quicke, 1987, *Crinibracon* Quicke, 1988, *Esenga* Cameron, 1906, *Esengoides* Quicke, 1989, *Gelasinibracon* Quicke, 1989, *Hemiglyptinus* Shenefelt, 1978, *Lyricibracon* Quicke, 1988, *Pappobracon* Tobias, 2000, *Piliferolobus* Yang et Chen, 2006, *Psilolobus* van Achterberg, 1985, *Rugosibracon* Quicke, 1988, *Sculptolobus* Yang, van Achterberg et Chen, 2008, *Scutibracon* Quicke et Walker, 1989, *Simplicibracon* Quicke, 1988, *Testudobracon* Quicke, 1986, and *Triaspidoagastra* Granger, 1949. In addition, the diagnosis of the group has expanded so much that the genera *Acgorium* Sharkey et Quicke, 2020, *Pseudochivinina* Long et van Achterberg, 2023, *Stephanobracon* Ranjith et Quicke, 2016, and *Uncobracon* Papp, 1996 also may be included there.

In fact, distinctive features of the members of the *Plesiobracon* group in its current composition are the presence of a well-defined, high mid-longitudinal keel on the propodeum, more or less strong sclerotisation of

the metasomal tergites and (or) other characters, which combination makes it possible to confidently separate these genera from the genus *Bracon*. Redefining the taxonomic concept and composition of this group of genera requires considerable work, of which an important stage should be clarification of diagnoses of the included taxa. Having studied the type material of a large part of the genera of this group, I discovered that the species included in the genus *Cassidibracon* require reclassification. This article is devoted to solving this small problem, which, however, affects a large part of the *Plesiobracon* group of genera.

## Material and methods

Morphological nomenclature follows Quicke [1987] and van Achterberg [1993] with additions as described in Samartsev and van Achterberg [2021]. Terms used for carinae, impressions, and areas of the metasomal tergites are summarised in Figs 1, 2.

Morphological terms used in the text: OD – maximum diameter of lateral ocellus; OOL – ocular-ocellar distance; POL – postocellar distance; T1–T7 – 1<sup>st</sup>–7<sup>th</sup> metasomal tergites.

Museum acronyms:

AEI – American Entomological Institute, Utah State University (Logan, USA);

BMNH – Natural History Museum (London, UK);

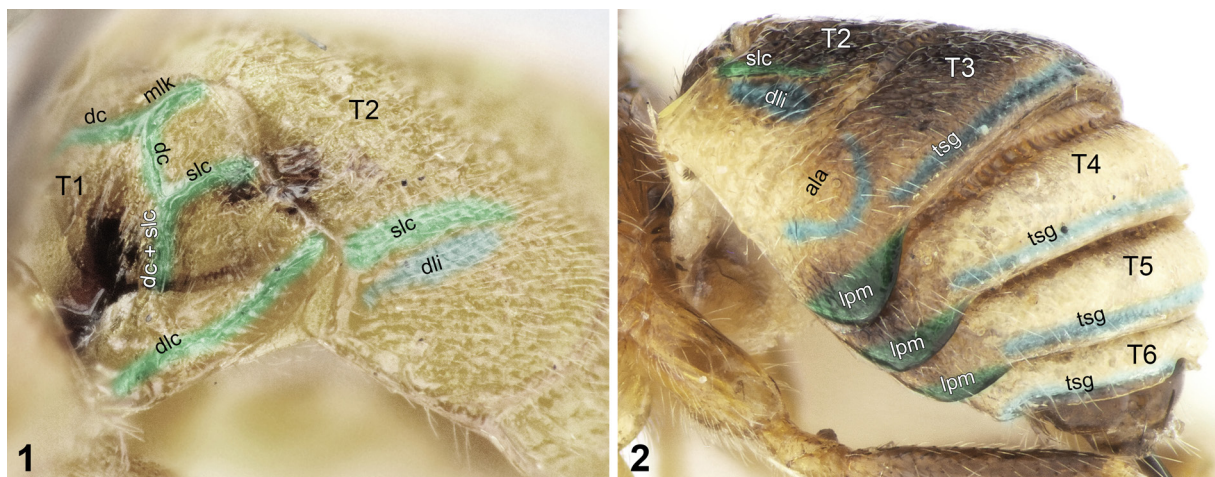
HNHM – Hungarian Natural History Museum (Budapest, Hungary);

MCZ – Museum of Comparative Zoology, Harvard University (Cambridge, USA);

MIIZ – Museum and Institute of Zoology, Polish Academy of Sciences (Warszawa, Poland);

MNB – Natural History Museum (Berlin, Germany);

MNHN – National Museum of Natural History (Paris, France);



Figs 1–2. Features of the metasomal structure of Braconinae.

1 – *Cassidibracon vanmoorti* sp. n., female, holotype; 2 – *Testudobracon longicaudis*, female. ala – anterolateral area; dc – dorsal carina; dlc – dorsolateral carina; dli – dorsolateral impression; lpm – laterally protruding posterior margin of tergite; mlk – mid-longitudinal keel; slc – sublateral carina; T1–T6 – 1<sup>st</sup>–6<sup>th</sup> metasomal tergites; tsg – transverse subapical groove.

Рис. 1–2. Детали строения метасомы Braconinae.

1 – *Cassidibracon vanmoorti* sp. n., самка, голотип; 2 – *Testudobracon longicaudis*, самка. ala – антеролатеральное поле; dc – дорсальный гребень; dlc – дорсолатеральный гребень; dli – дорсолатеральное вдавление; lpm – латерально выступающий задний край тергита; mlk – продольный срединный киль; slc – сублатеральный гребень; T1–T6 – 1–6-й тергиты метасомы; tsg – предвершинная поперечная бороздка.



RMNH – Naturalis Biodiversity Center (Leiden, the Netherlands);

SAMC – South African Museum, Iziko Museums of South Africa (Cape Town, South Africa);

USNM – National Museum of Natural History, Smithsonian Institution (Washington DC, USA);

ZISP – Zoological Institute of the Russian Academy of Sciences (Saint Petersburg, Russia).

Images of the following species were provided upon requests: *Esenga ovata* Cameron, 1906 – by S. van Noort (SAMC) [van Noort, 2023]; *Esengoides crenulatus* Quicke, 1989 – by Ch.W. Farnum (MCZ; © President and Fellows of Harvard College); *Trigastrotheca tridentata* (Enderlein, 1920) – by S.A. Belokobylskij (ZISP).

Distribution of species is listed mainly according to Yu et al. [2016].

### Group diagnosis and composition of considered species

In order to determine the generic affiliations of species of *Cassidibracon* and related genera, it was necessary to consider all genera of the *Plesiobracon* group, with only a few exceptions. Several genera were not included in the consideration, i.e. *Psilolobus*, *Stephanobracon*, and *Syntomernus* Enderlein, 1920 (recently revised by Samartsev and Ku [2020]) which are well-separated by the presence of large anterolateral areas on T3, and also the variable, but distinct genus *Sculptolobus*. The latter genus is separated by the combination of the developed malar suture, the straight fore wing vein 1-SR + M, rounded anterolateral areas on T2, and the entirely granulate body [Samartsev, van Achterberg, 2021]. Finally, the genus *Hemiglyptinus* was not included in the analysis, because its type was not studied. The latter genus is distinguished by the absence of a mid-longitudinal carina on the propodeum anteriorly, a short and relatively strongly transverse T2, the face prominent around toruli and the toruli with two (ledge-like) carinae (Prof. C. van Achterberg, personal communication).

Apart from the characters common to the Braconini, the taxa included in the analysis possess the following common character states: notauli deeply impressed (at least) anteriorly; mid-longitudinal keel on propodeum very high (developed only apically or complete); vein r-m shorter than vein 2-SR (except *Trigastrotheca*); dorsolateral carinae of T1 developed (except *Reticulotergus* **gen. n.**); anterolateral areas absent on T3–T6 or very weakly developed only on T3 (except *Trigastrotheca*); apical margins of T3 and posterior tergites thick.

#### Key to the selected genera of the *Plesiobracon* group

1. Mesoscutum medially reticulate-granulate, foveate-granulate, or finely rugose (Figs 195, 279). Hypostomal carina strongly protruding, lamelliform (Figs 192, 276). – Mesoscutum evenly setose. Median area of metanotum with complete median carina. Apical visible tergite (T5 or T6) of female posteriorly with large protuberances. Ovipositor sheath much shorter than metasoma (0.2–0.25 times as long as fore wing) ..... 2
- Mesoscutum medially smooth or weakly granulate posteriorly or along notauli (if weakly reticulate-granulate, then T1 without dorsal carinae; *Reticulotergus* **gen. n.**, Figs 220, 221). Hypostomal carina slightly protruding; if forming thick hook-like tooth, then ovipositor sheath about as long as metasoma or longer (*Uncobracon*, some *Testudobracon*) ..... 3
2. Face medially granulate. Malar suture deep (Fig. 192). Vertex granulate, weakly longitudinally impressed (Fig. 188). Fore wing vein r-m shorter than 2-SR (Fig. 190). Metasoma with 6 dorsally visible tergites (Fig. 194). Anterolateral areas on T3–T5 absent. T6 with large submedioposterior and lateroposterior protuberances (Fig. 199) ..... *Lyricibracon*
- Face medially transversely rugose, granulate-rugose, or rugulose (Fig. 278). Malar suture weakly impressed or deep only below eye (Fig. 276). Vertex rugose or granulate-rugose, without mid-longitudinal impression. Fore wing vein r-m longer than 2-SR. Metasoma with 5 dorsally visible tergites (Fig. 283). Anterolateral areas on T3–T5 large, with inner sides separated by crenulate furrows. T5 with large median and lateroposterior protuberances separated by submedial emarginations (Fig. 284); in male, evenly rounded posteriorly (Fig. 285) ..... *Trigastrotheca*
3. Malar suture absent or weakly impressed, sometimes deep below eye, but shallow near mandible (Figs 45, 54, 113, 206, 252, 265). – Malar space granulate or granulate-rugulose. Toruli not anteriorly protruding in dorsal view (somewhat protruding in some *Uncobracon*) ..... 4
- Malar suture deep and complete (Figs 68, 79, 158, 218). – T3 without wide anterolateral areas. Hind tibia without transverse subapical row of thick setae. Ovipositor sheath less than 0.7 times as long as hind tibia and less than 0.26 times as long as fore wing ..... 10
4. T4–T7 concealed and less sclerotised than T3 (Figs 119, 121). Apical margins of T3–T5 without transverse subapical grooves. T2 with complete sublateral weakly converging carinae extending on T3 (Figs 100, 109, 121). – T1 with deep mid-longitudinal impression, its dorsal carinae medially absent; sublateral carinae of T1 absent or strongly developed and reaching its posterior margin ..... *Esenga* (= *Triaspidoagastra* **syn. n.**)
- At least T4 or T4–T6 as strongly sclerotised as T3 and not concealed (Fig. 47). Apical margins of T3–T5 with deep and crenulate transverse subapical grooves. T2 with incomplete sublateral carinae not extending on T3 ..... 5
5. Face with wide and projecting dorsally above level of toruli mid-longitudinal carina (Figs 41, 45, 53). Tarsal claws with rounded basal lobe (Fig. 59). Sublateral converging carinae of T1 strongly developed, going from dorsal carinae to posterior margin of T1 (Figs 1, 46, 62). – Middle flagellomeres 0.95–1.2 times as long as wide. Dorsal carinae of T1 complete, connected with hind margin of tergite by a mid-longitudinal ruga. Ovipositor sheath 0.35–0.85 times as long as hind tibia, 0.1–0.3 times as long as fore wing. Tarsi distinctly shortened ..... *Cassidibracon*

- Face with shallow and not projecting dorsally mid-longitudinal carina (Figs 205, 264, 265; except *Pseudochivinia* **stat. n.**). Tarsal claws with angularly protruding basal lobe (Figs 212, 271). Sublateral converging carinae of T1 absent ..... 6
6. Median area of T2 very narrow, sharply elevated, and extending into incomplete mid-longitudinal keel (Figs 208, 213). – Fifth segment of hind tarsus about 0.8 times as long as second segment. T2 with long, more or less strongly converging sublateral carinae. Posterior margins of T3 and T4 laterally more or less roundly protruding. T6 not emarginated posteriorly. Ovipositor sheath 3.5–8 times as long as hind tibia, 1–1.3 times as long as fore wing ..... *Plesiobracon*
- Median area of T2, if presented, relatively wide and not strongly elevated or with smoothed margins; mid-longitudinal keel of T2 absent (Fig. 267). – Hind tibia without subapical row of thick setae or at most with 1 thick seta apicoposteriorly ..... 7
7. Posterior margins of T3–T5 or T3–T6 laterally roundly protruding (Figs 2, 269). T6 medially more or less deeply emarginated, with submedioposteriorly protruding lamella (Figs 272, 273). Median lobe of mesoscutum very strongly protruding (dorsal view in Fig. 268). – T1 without or with weak mid-longitudinal impression. Spiracle located in middle or behind middle of T2. Suture between T2 and T3 more or less curved medially. T2 with long sublateral carinae, medially 0.95–1.15 times as long as T3. Ovipositor sheath 0.3–0.9 times as long as fore wing ..... *Testudobracon*
- Posterior margins of T3–T6 laterally (almost) straight (Fig. 254). T6 medially at most very weakly emarginated. Median lobe of mesoscutum not or weakly protruding (dorsal view in Fig. 58). – Ovipositor sheath 0.1–0.6 times as long as fore wing ..... 8
8. Hypostomal carina forming thick hook-like tooth near base of mandible. Dorsal area of clypeus prominent. Frons smooth or weakly granulate only in lower part. – Dorsal carinae of T1 incomplete or complete. T2 medially 0.8–1.25 times as long as T3. Ovipositor sheath 0.4–0.6 times as long as fore wing ..... *Uncobracon*
- Hypostomal carina not forming thick hook-like tooth near base of mandible (Fig. 252). Dorsal area of clypeus flattened. Frons entirely (weakly) granulate. – T1 with distinct mid-longitudinal impression. Median area of T2 absent. T2 medially 1.3–1.7 times as long as T3. Suture between T2 and T3 almost straight. Ovipositor sheath 0.1–0.4 times as long as fore wing ..... 9
9. Fore wing vein r-m absent. Frons strongly impressed submedially (behind antennae). Face projecting upwards between toruli, widened and flattened, in upper part with mid-longitudinal carina. Mesoscutum widely setose only along notauli. Vein 1-SR + M straight. Dorsal carinae of T1 absent ..... *Pseudochivinia* **stat. n.**
- Fore wing vein r-m developed (Fig. 250). Frons shallowly impressed submedially (behind antennae). Face with not projecting upwards mid-longitudinal carina (Fig. 251). Mesoscutum entirely evenly setose (Fig. 258). Vein 1-SR + M weakly curved anteriorly (Fig. 250). Dorsal carinae of T1 high and almost complete (Fig. 259) ..... *Simplicibracon*
- 10(3). Metasoma with 6 dorsally visible tergites (Figs 75, 87). T1 with long mid-longitudinal keel connecting complete dorsal carinae with posterior margin of T1 (Figs 74, 86). Apex of ovipositor modified (Figs 66, 83), with wide blunt or dorsally roundly protruding nodus (in *Crinibracon striatus*, also lower valve ventrally roundly protruding). – Basal lobe of claws not angularly protruding anteriorly (Fig. 82). T2 with strong complete mid-longitudinal keel ..... *Crinibracon*
- Metasoma with at most 5 dorsally visible tergites, T4 and T5 more or less retracted and concealed under T3. T1 without mid-longitudinal keel (dorsal carinae of T1 absent or complete). Apex of ovipositor acute, not roundly protruding dorsally and ventrally ..... 11
11. T2 with relatively wide (half as wide to about as wide as median area of T1) longitudinal median area separated by deep furrows (Figs 151, 173). – Median impression on mesopleuron absent or deep and pit-like. Sublateral converging carinae of T1 strongly developed and reaching its posterior margin or absent (but in this case median area of tergite laterally compressed); dorsal carinae absent. Metasoma mostly smooth, with strongly developed T2 and T3. T2 with long and weakly s-shaped sublateral carinae, medially 1.4–2.6 times as long as T3. Basal width of T2 0.8–1.3 times its median length. Apical margins of T3–T6 without transverse subapical grooves. Vein 3-SR 0.8–1.2 times vein 2-SR .. *Gelasinibracon*
- Median area of T2, if developed, small and elongate-triangular, much less than 0.5 times as wide as median area of T1 ..... 12
12. T2 with strong complete mid-longitudinal keel (Fig. 185). Mesoscutum anteromedially widely glabrous (Fig. 181). – Vertex with deep mid-longitudinal sulcus. Sublateral converging carinae of T1 absent, but median area of T1 laterally compressed (Fig. 186); dorsal carinae of T1 absent. T2 without sublateral carinae ..... *Isomerosoma* **gen. n.**
- T2 without complete mid-longitudinal keel (Figs 11, 26, 232). Mesoscutum entirely evenly setose (Fig. 233) ..... 13
13. Sublateral carinae of T1 strongly developed, complete (Figs 36, 126, 138). Mesopleuron medially with deep pit-like impression (Fig. 34) or with shallow, but anteriorly foveate precoxal sulcus (Fig. 148). – Vertex with shallow mid-longitudinal impression or deep sulcus. Propodeum with a tubercle above spiracle. T2 often with weakly developed incomplete mid-longitudinal carina ..... 14
- Sublateral carinae of T1 absent (Figs 11, 220, 234). Median impression on mesopleuron indistinct ..... 15
14. Notauli deep posteriorly (Figs 19, 33). Mesopleuron with deep pit medially and without precoxal sulcus (Fig. 34). Dorsal carinae of T1 distinct (Fig. 36). Posterior margin of T5 without protruding lamella (Fig. 27). Apex of ovipositor with weak dorsal nodus (Fig. 28) ..... *Ancilibracon*

- Notauli shallow posteriorly (Figs 123, 135). Mesopleuron without pit medially and with weakly impressed precoxal sulcus (Fig. 136). Dorsal carinae of T1 absent (Figs 126, 138). Posterior margin of T5 with protruding lamella, medially weakly emarginated (Figs 128, 137). Apex of ovipositor without dorsal nodus (Figs 128, 141) ..... *Esengoides* 15(13). Basal width of T2 1.7–2 times its median length (Fig. 222). Dorsolateral carinae of T1 absent or weakly differentiated ..... 16
- Basal width of T2 1.1–1.4 times its median length. Dorsolateral carinae of T1 well developed. – Vein 1-SR + M weakly curved anteriorly. T2 medially 1.3–1.6 times as long as T3 ..... 17
16. Mesoscutum medially reticulate-granulate (Fig. 221), propleuron and mesopleuron with weak coriaceous sculpture (Fig. 223), metasoma reticulate-rugose (Fig. 222). Vein 1-SR + M weakly curved anteriorly (Fig. 217). T2 medially about 0.8 times as long as T3. Vertex medially weakly longitudinally impressed (Fig. 215) ..... *Reticulotergus* **gen. n.**
- Mesosoma entirely smooth, metasoma rugulose-punctate or coriaceous. Vein 1-SR + M straight. T2 medially 1.1–1.4 times as long as T3. Vertex medially not impressed ..... *Scutibracon* sec Quicke et Walker, 1989 17(15). Males. Scape sub-globose (Figs 5, 9). Propodeum with a tubercle above spiracle. T2 with short sublateral carinae (Figs 11, 13). Vein 1-SR + M very long, 4 times vein m-cu (Fig. 4) ..... *Acrocerilia*
- Scape not globose (Figs 226, 237). Propodeum without a tubercle above spiracle (Fig. 241). T2 with long sublateral carinae (Figs 231, 244). Vein 1-SR + M shorter, about 2.5 times vein m-cu (Figs 227, 238) ....  
..... *Scutibracon*

## Taxonomic treatments

This section provides information about the sources of taxonomic concepts (including literature and examined specimens, if available) on which the key to genera presented above is based. Species not listed below were not included in the analysis. In order to provide terminologically unified, consistent information on all diagnostic characters discussed in this article, descriptions or redescriptions are given for all considered genera and a large part of species which type material was available for examination (despite the fact that the descriptions of many of these taxa are quite complete for accurate identification). Redescriptions are not provided for species of the easily distinguishable genera *Testudobracon*, *Trigastrotheca*, and *Uncobracon*, for which recent and more complete literature is available, and for the genus *Plesiobracon*, which deserves a special study.

### Genus *Acrocerilia* van Achterberg, 1989

*Acrocerilia* van Achterberg, 1989: 79 (type species *Acrocerilia pachynervis* van Achterberg, 1989). Quicke, Ingram, 1993: 304.

**Composition and distribution.** *Acrocerilia pachynervis* van Achterberg, 1989 (Philippines), *A. tricolor* Quicke et Ingram, 1993 (Australia).

**Redescription.** Male (female unknown). Head. Toruli somewhat protruding in dorsal view. Vertex without mid-longitudinal sulcus, weakly longitudinally impressed. Face evenly convex, medially without triangular area above clypeus, with complete, but weak mid-longitudinal carina. Malar suture deep and smooth. Clypeus flattened, with weakly protruding ventral rim; separated from face by weak dorsal carina; clypeal sulcus absent, dorsal clypeal margin sharp.

Antenna. Scape sub-globose.

Mesosoma. Median lobe of mesoscutum not protruding (dorsal view). Notauli very deep anteriorly, impressed posteriorly, smooth. Mesoscutum evenly, but sparsely setose. Median impression on mesopleuron vague. Metanotum with medially elevated median area and with incomplete, but shortly going on median area median carina. Propodeum with a tubercle above spiracle.

Wings. Angle between veins C + SC + R and 1-SR 60–70°. Vein r-m shorter than 2-SR. Vein 1-SR + M weakly curved anteriorly. Wing membrane evenly setose at base of hind wing.

Legs. Hind tibia without subapical row of thick setae. Claws with acute angularly protruding basal lobe.

Metasoma with 5 dorsally visible tergites. T1 with weak mid-longitudinal impression, developed dorsolateral carinae, complete dorsal carinae, and without sublateral carinae. T2 without both median area and mid-longitudinal keel; with deep crenulated dorsolateral impressions, and with short parallel sublateral carinae; spiracle located in middle of T2. Suture between T2 and T3 weakly curved. Anterolateral areas small and hardly developed only on T3. Posterior margins of T3 and T4 laterally weakly roundly protruding, T5 with transverse crenulate subapical groove.

Sculpture. Head and mesosoma mostly smooth, metasomal tergites rugose or areolate-rugose.

### *Acrocerilia pachynervis* van Achterberg, 1989 (Figs 3–13)

*Acrocerilia pachynervis* van Achterberg, 1989: 81.

**Material.** 1♂, holotype, (RMNH, INS.108893), "Philippines, Kidapawan, VIII. 1983, No. 3", "ex prepupa of *Acrocercops cramerella* on rambutan", "ex prepupa of *Acrocercops cramerella* on rambutan, C.I.E.A 16554", "Kidapawan, August 1983", "CI 1, Hagonay, Qanao delfur", "♀ *Acrocerilia* gen. nov. *pachynervis* sp. nov., C. van Achterberg, 1987 Holotype".

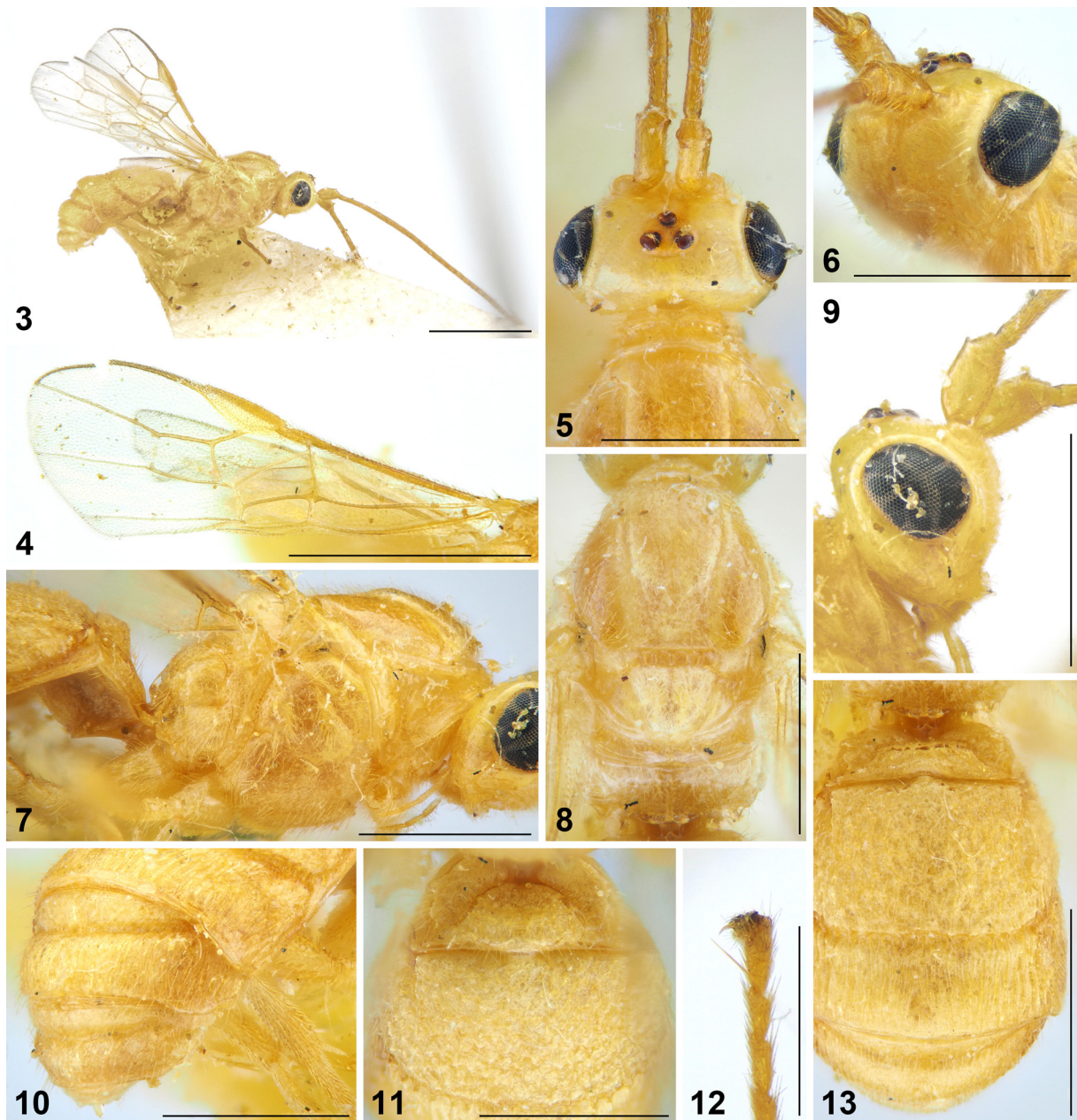
**Redescription.** Male. Body length 3.5 mm; fore wing length 2.8 mm.

Head. Width of head (dorsal view) 1.9 times its median length. Transverse diameter of eye (dorsal view) 2.7 times as long as temple. OOL 3× OD; POL 1.3× OD; OOL 2.2× POL. Frons with deep mid-longitudinal groove. Longitudinal diameter of eye in lateral view 1.3 times its transverse diameter; transverse diameter of eye 2.5 times minimum width of temple, hind margins of eye and temple broadened ventrally. Face width 1.8 times combined height of face and clypeus. Maxillary palp longer than eye, but shorter than head.

Antenna with 32 antennomeres. First flagellomere 2.9 times as long as its apical width, middle and penultimate flagellomeres 1.9–2 times as long as wide.

Mesosoma 1.5 times as long as its maximum height. Transverse pronotal sulcus shallow, but complete, weakly crenulate. Mesoscutum 1.2 times its median length (dorsal view). Notauli united posteriorly. Scutellar sulcus 0.25 times as long as scutellum. Mesepimeral sulcus crenulate, mesopleural pit deep, furrow-like. Metapleural sulcus smooth. Propodeal spiracle vertical, located behind middle of propodeum. Mid-longitudinal keel on propodeum complete, with short transverse rugae. Mid-longitudinal impression on propodeum deep, complete, and smooth.





Figs 3–13. *Acrocerilia pachynervis*, male, holotype.

3 – habitus, lateral view; 4 – fore wing; 5–6, 9 – head: 5 – dorsal view, 6 – anterolateral view, 9 – lateral view; 7–8 – mesosoma: 7 – lateral view, 8 – dorsal view; 10 – T4 and T5, dorsolateral view; 11 – T1 and T2, dorsal view; 12 – apex of middle tarsus; 13 – metasoma, dorsal view. Scale bars: 3–4 – 1 mm; 5–11, 13 – 0.5 mm; 12 – 0.25 mm.

Рис. 3–13. *Acrocerilia pachynervis*, самец, голотип.

3 – общий вид сбоку; 4 – переднее крыло; 5–6, 9 – голова: 5 – вид сверху, 6 – вид спереди/сбоку, 9 – вид сбоку; 7–8 – мезосома: 7 – вид сбоку, 8 – вид сверху; 10 – T4 и T5, вид сверху/сбоку; 11 – T1 и T2, вид сверху; 12 – вершина средней лапки; 13 – метасома, вид сверху. Масштабные линейки: 3–4 – 1 мм; 5–11, 13 – 0.5 мм; 12 – 0.25 мм.

**Wings.** Vein r arising from basal 0.4 of pterostigma. Vein 1-R1 1.6 times as long as pterostigma. Marginal cell reaching apex of wing. Vein 3-SR 1.9× vein r, 0.4× vein SR1, 1.4× vein 2-SR. Vein 1-M 0.5× vein 1-SR + M, 2.1× vein m-cu, 1.8 times as long as vein cu-a. Vein 2-SR + M 0.35× vein 2-SR, 0.65× vein m-cu. Vein 1-SR + M weakly curved anteriorly. Vein cu-a interstitial. Hind wing vein r-m interstitial.

**Legs.** Hind femur 3.3 times as long as wide. Hind tibia 1.5 times as long as hind femur, its inner spur 0.35 times as long

as hind basitarsus. Hind tarsus as long as hind tibia. Fifth segment of hind tarsus 0.4 times as long as hind basitarsus and 0.8 times as long as second segment.

**Metasoma.** Median length of T1 0.45 times its apical width. T2 medially 1.5 times as long as T3; basal width of T2 1.3 times its median length.

**Sculpture.** Head and mesosoma mostly smooth; face granulate; mesoscutum medioposteriorly weakly granulate to smooth; propodeum hardly coriaceous to smooth. T1 weakly

rugulose laterally; its median area posteriorly rugose; T2 areolate-rugose to striate; T3 and T4 striate with vague granulosity; T5 rugulose to granulate-rugulose.

Colouration. Body pale ochre yellow. Antenna reddish yellow, but apical flagellomeres lighter coloured; maxillary palp yellow; mesoscutal lobes with brownish yellow patches; tegulae pale yellow. Wing membrane yellowish hyaline proximally, weakly darkened distally; pterostigma brownish yellow, veins yellowish brown.

### Genus *Ancilbracon* Quicke, 1989

*Ancilbracon* Quicke, 1989: 295 (type species *Ancilbracon townesi* Quicke, 1989).

**Composition and distribution.** *Ancilbracon bakeri* Quicke, 1989 (Malaysia), *A. townesi* Quicke, 1989 (Malaysia).

**Redescription.** Female. Head. Toruli somewhat protruding (dorsal view). Vertex with deep mid-longitudinal sulcus. Face medially evenly convex, without triangular area above clypeus, with weak mid-longitudinal carina. Clypeus flattened, with weakly protruding ventral rim; dorsal clypeal margin sharp, dorsal carina absent; clypeal sulcus absent. Malar suture deep and smooth. Hypostomal carina not or slightly protruding.

Mesosoma. Median lobe of mesoscutum not protruding. Notauli very deep (but medially shallow in *A. bakeri*), crenulate. Mesoscutum evenly setose. Mesopleuron medially with deep pit. Metanotum with incomplete or complete median carina. Propodeum with a tubercle above spiracle.

Wings. Angle between veins C + SC + R and 1-SR 60–70°. Vein r-m shorter than vein 2-SR. Vein 1-SR + M weakly curved anteriorly. Wing membrane evenly setose in base of hind wing. Hind wing vein r-m antefurcal.

Legs. Hind tibia without subapical row of thick setae, sometimes with one thick seta apicoposteriorly. Claws with acute angularly protruding basal lobe.

Metasoma with strongly developed T2 and T3, but T4 and T5 thick and projecting outside T3. T1 with weak or deep mid-longitudinal impression, strong dorsolateral carinae, complete dorsal carinae, and strongly developed, complete sublateral carinae. Median area of T2 absent or weakly elevated, small, elongate-triangular, and extending into short and weak mid-longitudinal keel. Dorsolateral impressions of T2 more or less developed, sublateral carinae short and parallel. Spiracle located in anterior part of T2. Suture between T2 and T3 almost straight, medially weakly curved anteriorly or posteriorly. T3–T5 without anterolateral areas. Posterior margins of T3–T6 laterally straight, in *A. bakeri* with deep and crenulate transverse subapical grooves on T3–T6. Apical tergite without projections or incisure. Ovipositor sheath 0.1–0.15 times as long as fore wing. Apex of ovipositor acute, with weak nodus and ventral serration.

Sculpture. Head and mesosoma smooth, metasoma areolate to foveate or areolate-rugose.

### A key to species of the genus *Ancilbracon*

1. Median area of T2 very short and narrow, extending into short mid-longitudinal keel. Apical margin of T3 with deep and crenulate transverse subapical groove. Longitudinal diameter of eye 2.3 times as long as malar space (front view) ..... *A. bakeri*  
– Median area and mid-longitudinal keel of T2 absent. Apical margin of T3 without transverse subapical groove. Longitudinal diameter of eye 2.8 times as long as malar space (front view). – Flagellum brown, but apical flagellomeres lighter coloured ..... *A. townesi*

### *Ancilbracon bakeri* Quicke, 1989 (Figs 14–26)

*Ancilbracon bakeri* Quicke, 1989: 296.

**Material.** 1♀, paratype (USNM), Malaysia, “Sandakan Borneo Baker”, “Paratype *Ancilbracon bakeri* Quicke 1989”.

**Redescription.** Female. Body length 2.5 mm; fore wing length 2.4 mm.

Head. Width of head (dorsal view) 1.9 times its median length. Transverse diameter of eye (dorsal view) 2.4 times as long as temple. OOL 2.2× OD; POL 1× OD; OOL 2.2× POL. Frons with very deep mid-longitudinal groove and shallow impressions behind antennae. Longitudinal diameter of eye in lateral view 1.5 times its transverse diameter; transverse diameter of eye 3 times minimum width of temple, hind margins of eye and temple slightly broadened ventrally. Face width 1.2 times combined height of face and clypeus; 2.7 times width of hypoclypeal depression. Width of hypoclypeal depression 0.8 times distance from depression to eye. Height of clypeus 0.4 times width of hypoclypeal depression. Longitudinal diameter of eye 2.3 times as long as malar space (front view). Maxillary palp shorter than eye.

Antenna with 22 antennomeres. First flagellomere 1.6 times as long as its apical width, middle flagellomeres 1.4 times as long as wide.

Mesosoma 1.2 times as long as its maximum height. Transverse pronotal sulcus deep, wide, and crenulate. Mesoscutum width 1.3 times its median length (dorsal view). Notauli very deep anteriorly and posteriorly, shallow medially, not united posteriorly. Scutellar sulcus 0.3 times as long as scutellum. Mesepimeral sulcus smooth, mesopleural pit deep. Metanotum with complete median carina. Metapleural sulcus crenulate. Propodeal spiracle vertical, located behind middle of propodeum. Mid-longitudinal keel on propodeum complete, with short transverse rugae; mid-longitudinal impression weak and complete.

Wings. Angle between veins C + SC + R and 1-SR 65–70°. Vein r arising from basal 0.35 of pterostigma. Vein 1-R1 1.5 times as long as pterostigma. Marginal cell 3.4 times as long as distance from its apex to apex of wing. Vein 3-SR 1.9× vein r, 0.35× vein SR1, 1.5× vein 2-SR. Vein 1-M 0.9× vein 1-SR + M, 2.3× vein m-cu, 2.4 times as long as vein cu-a. Vein 2-SR + M 0.3× vein 2-SR, 0.4× vein m-cu. Vein 1-SR + M weakly curved anteriorly. Vein cu-a weakly postfurcal.

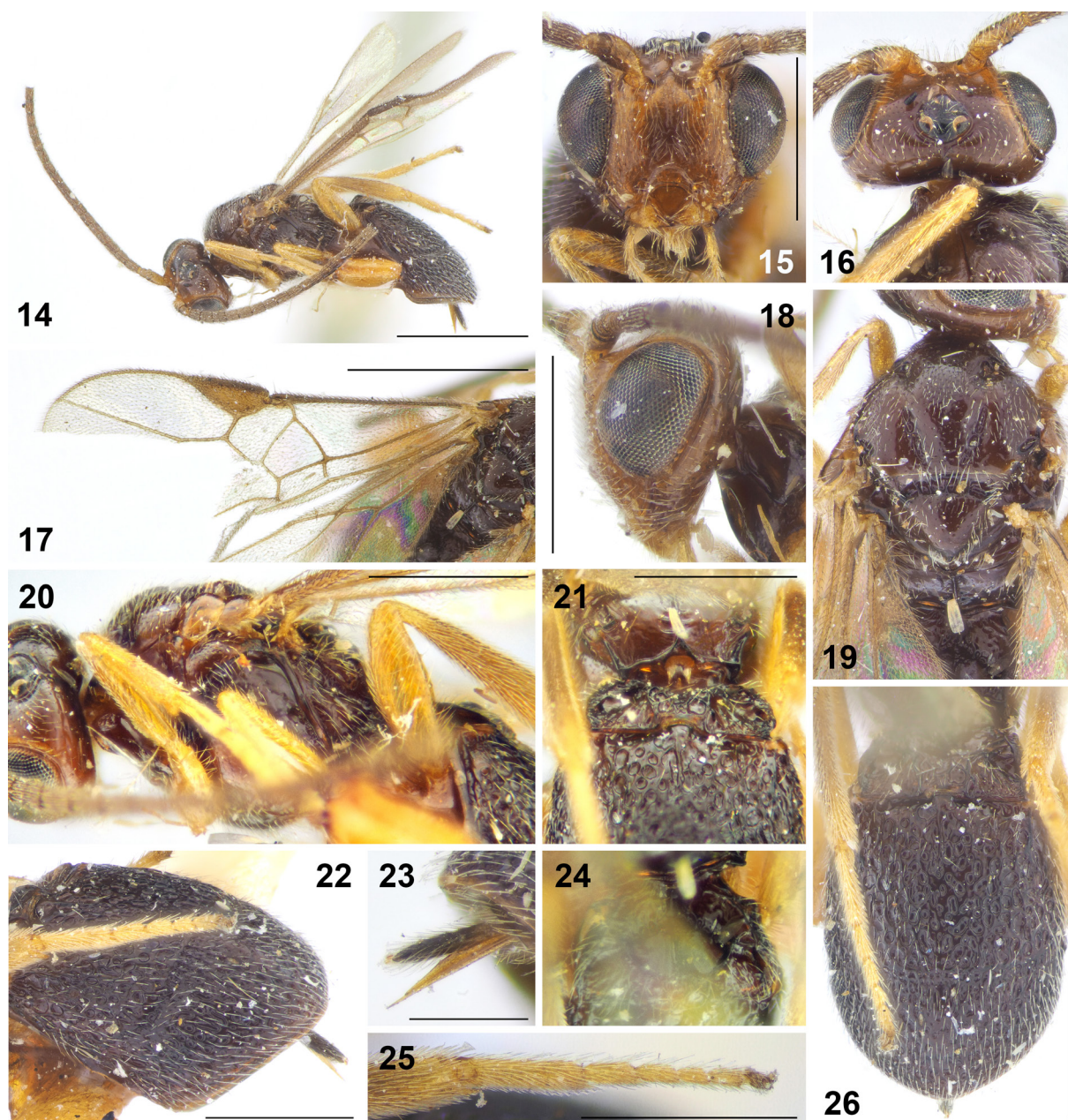
Legs. Fore tibia without thick spines. Hind femur 2.9 times as long as wide. Hind tibia 6.4 times as long as wide, 1.5 times as long as hind femur, its inner spur 0.4 times as long as hind basitarsus. Hind tarsus 0.9 times as long as hind tibia. Fifth segment of hind tarsus 0.4 times as long as hind basitarsus and 0.95 times as long as second segment.

Metasoma. Median length of T1 0.6 times its apical width. T1 with deep mid-longitudinal impression, complete dorsal carinae, and strongly developed sublateral carinae. T2 medially 1.2 times as long as T3; basal width of T2 1.1 times its median length. Median area of T2 small, elongate-triangular, weakly elevated, extending into weak incomplete mid-longitudinal keel. Suture between T2 and T3 weakly curved. Posterior margin of T3 with deep and crenulate transverse subapical groove. Ovipositor sheath 0.45 times as long as hind tibia and 0.13 times as long as fore wing. Apex of ovipositor acute, with dorsal side weakly subapically protruding and with weak ventral serration.

Sculpture. Head and mesosoma smooth. T1 weakly rugulose laterally, its median area posteriorly rugose; T2 and T3 areolate-rugose.

Colouration. Body mainly dark brown. Head frontally and around eyes yellowish brown. Antenna brown, scape dorsally yellowish brown. Maxillary palp brownish yellow. Legs brownish yellow; hind tibia medially brown. Wing membrane weakly darkened, pterostigma and veins brown.





Figs 14–26. *Ancilbracon bakeri*, female, paratype.

14 – habitus, lateral view; 15–16, 18 – head: 15 – front view, 16 – dorsal view, 18 – lateral view; 17 – fore wing; 19–20 – mesosoma: 19 – dorsal view, 20 – lateral view; 21, 24 – T1, dorsal view; 22 – T2 and T3, dorsolateral view; 23 – apex of ovipositor; 25 – hind tarsus; 26 – metasoma, dorsal view. Scale bars: 14, 17 – 1 mm; 15–16, 18–22, 25–26 – 0.5 mm; 23 – 0.25 mm.

Рис. 14–26. *Ancilbracon bakeri*, самка, паратип.

14 – общий вид сбоку; 15–16, 18 – голова: 15 – вид спереди, 16 – голова, вид сверху, 18 – вид сбоку; 17 – переднее крыло; 19–20 – мезосома: 19 – вид сверху, 20 – вид сбоку; 21, 24 – T1, вид сверху; 22 – T2 и T3, вид сверху/сбоку; 23 – вершина яйцеклада; 25 – задняя лапка; 26 – метасома, вид сверху. Масштабные линейки: 14, 17 – 1 мм; 15–16, 18–22, 25–26 – 0.5 мм; 23 – 0.25 мм.

*Ancilbracon townesi* Quicke, 1989  
(Figs 27–38)

*Ancilbracon townesi* Quicke, 1989: 296.

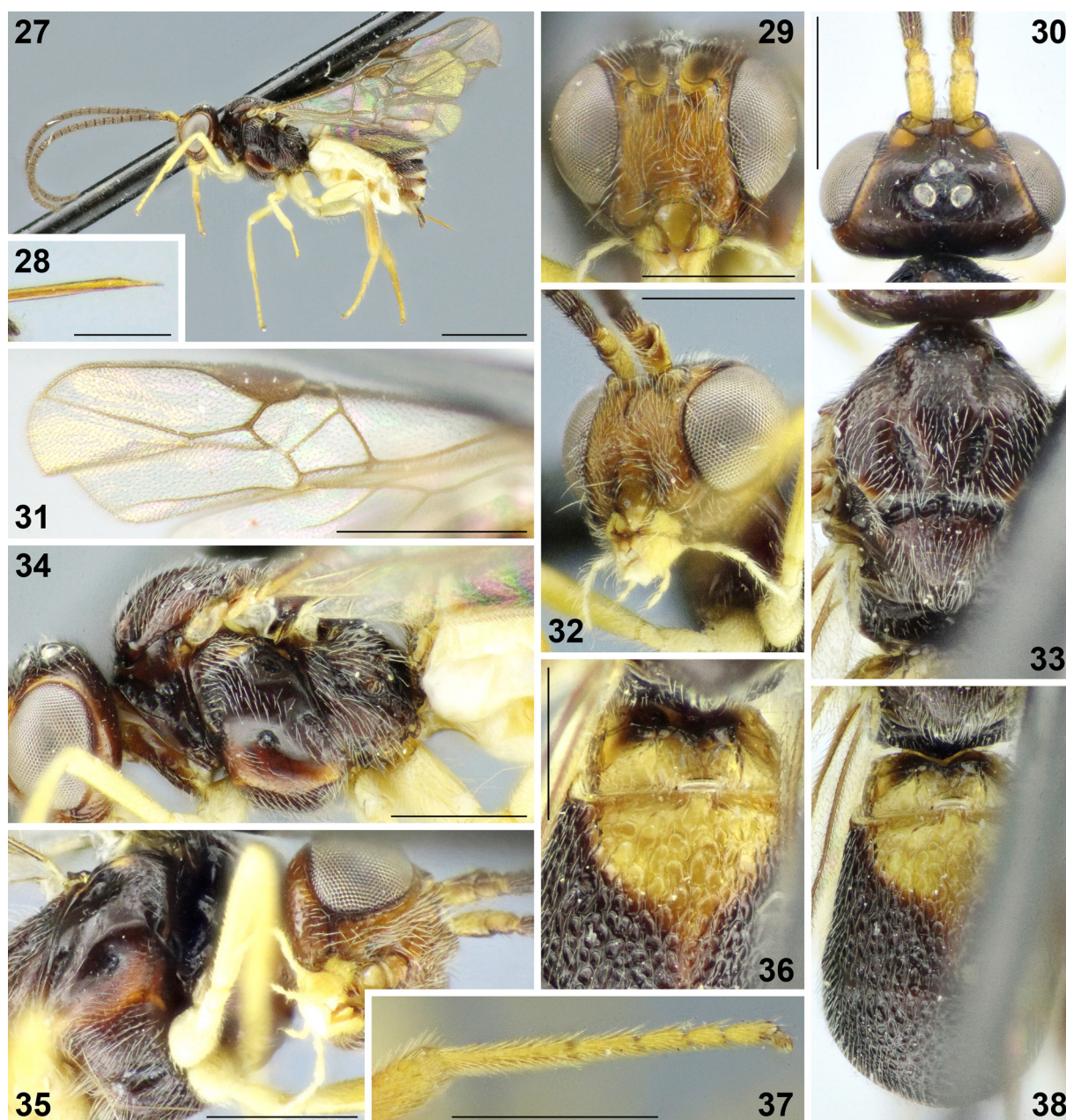
**Material.** 1♀, holotype (AEL), "Pasoh Forest Res., Negri S., Malaysia, 1.10.80 forest, P. & M. Becker", "Holotype *Ancilbracon townesi* Quicke 1980".

**Redescription.** Female. Body length 3.1 mm; fore wing length 2.8–3 mm.

**Head.** Width of head (dorsal view) 1.9 times its median length. Transverse diameter of eye (dorsal view) 2.2 times as

long as temple. OOL 2.1× OD; POL 0.6× OD; OOL 3–3.3× POL. Frons with deep mid-longitudinal groove, not impressed behind antennae. Longitudinal diameter of eye in lateral view 1.5 times its transverse diameter; transverse diameter of eye 3.2 times minimum width of temple, hind margins of eye and temple broadened ventrally. Face width 1.1 times combined height of face and clypeus; 2.3 times width of hypoclypeal depression. Width of hypoclypeal depression 0.9 times distance from depression to eye. Height of clypeus 0.55 times width of hypoclypeal depression. Longitudinal diameter of eye





Figs 27–38. *Ancilbracon townesi*, female, holotype.

27 – habitus, lateral view; 28 – apex of ovipositor; 29–30, 32 – head: 29 – front view, 30 – dorsal view, 32 – anterolateral view; 31 – fore wing; 33–34 – mesosoma: 33 – dorsal view, 34 – lateral view; 35 – head and mesosoma, ventrolateral view; 36 – T1 and T2, dorsal view; 37 – hind tarsus; 38 – metasoma, dorsal view. Scale bars: 27, 31 – 1 mm; 28 – 0.25 mm; 29–30, 32–38 – 0.5 mm.

Рис. 27–38. *Ancilbracon townesi*, самка, голотип.

27 – общий вид сбоку; 28 – вершина яйцеклада; 29–30, 32 – голова: 29 – вид спереди, 30 – вид сверху, 32 – вид спереди/сбоку; 31 – переднее крыло; 33–34 – мезосома: 33 – вид сверху, 34 – вид сбоку; 35 – голова и мезосома, вид снизу/сбоку; 36 – T1 и T2, вид сверху; 37 – задняя лапка; 38 – метасома, вид сверху. Масштабные линейки: 27, 31 – 1 мм; 28 – 0.25 мм; 29–30, 32–38 – 0.5 мм.

2.8 times as long as malar space (front view). Maxillary palp shorter than eye.

Antenna with 26–28 antennomeres. First flagellomere 1.7 times as long as its apical width, middle and penultimate flagellomeres 1.5 and 1.4–1.6 times as long as wide, respectively.

Mesosoma 1.2–1.3 times as long as its maximum height. Transverse pronotal sulcus deep, wide, and crenulate. Mesoscutum width 1.3 times its median length (dorsal view). Notauli deep anteriorly, very deep and (almost) united posteriorly. Scutellar sulcus 0.3 times as long as scutellum. Mesepimeral sulcus crenulate,

mesopleural pit deep, furrow-like. Metanotum with incomplete median carina. Metapleural sulcus crenulate. Propodeal spiracle vertical, located behind middle of propodeum. Mid-longitudinal keel on propodeum complete, with short transverse rugae; mid-longitudinal impression weak and complete.

Wings. Angle between veins C + SC + R and 1-SR 60–70°. Vein r arising from basal 0.4 of pterostigma. Vein 1-R1 1.7 times as long as pterostigma. Marginal cell 9.7 times as long as distance from its apex to apex of wing. Vein 3-SR 2.1–2.2× vein r, 0.35–0.4× vein SR1, 1.4–1.6× vein 2-SR. Vein 1-M

0.8× vein 1-SR + M, 2.5× vein m-cu, 2.6 times as long as vein cu-a. Vein 2-SR + M 0.3× vein 2-SR, 0.5× vein m-cu. Vein 1-SR + M weakly curved anteriorly. Vein cu-a weakly postfurcal.

Legs. Fore tibia with thick spines apically. Hind femur 2.9 times as long as wide. Hind tibia 1.4 times as long as hind femur, with 1 thick seta apicoposteriorly, its inner spur 0.35 times as long as hind basitarsus. Hind tarsus 0.97 times as long as hind basitarsus and 0.9 times as long as second segment.

Metasoma. Median length of T1 0.6 times its apical width. T1 with weak mid-longitudinal impression, complete dorsal carinae, and strongly developed sublateral carinae. T2 medially 1.3 times as long as T3, basal width of T2 1.1 times its median length. Median area and mid-longitudinal keel of T2 absent. Suture between T2 and T3 medially curved backward. Posterior margins of T3–T5 without transverse subapical grooves. Ovipositor sheath 0.4 times as long as hind tibia and 0.11–0.14 times as long as fore wing. Apex of ovipositor acute, with dorsal side weakly subapically protruding and with weak ventral serration.

Sculpture. Head and mesosoma smooth, face medially punctate to smooth. T1 laterally smooth, its median area posteriorly areolate-rugose; T2 and T3 areolate to foveate, T4 and T5 weakly rugose.

Colouration. Head dorsally, mesosoma, and metasomal tergites dark brown. Scape yellow, ventrally brown; flagellum brown, apical flagellomeres lighter-coloured. Head mostly brown; maxillary palp pale yellow. Tegulae yellowish brown. Legs yellow, hind tibia medially brown. Wing membrane weakly darkened; pterostigma and wing veins brown. T1 laterally and posteriorly and basal triangle patch on T2 yellow; pleural parts of metasoma pale yellow.

### Genus *Cassidibracon* Quicke, 1987

*Cassidibracon* Quicke, 1987: 142 (type species *Cassidibracon castus* Quicke, 1987).

**Composition and distribution.** *Cassidibracon castus* Quicke, 1987 (Sierra Leone), *C. vanmoorti* sp. n. (South Africa).

Five species described in the genus *Cassidibracon* are transferred to other genera. *Cassidibracon gracillariae* Quicke, 2012, *C. malabaricus* Narendran, 1994, and *C. sumodani* Narendran et Madhavikutty, 1994 are assigned to the genus *Scutibracon* while the new genus *Reticulotergus* gen. n. is established for *C. indicus* Narendran et Rema, 1994. Their position and morphology are discussed in the corresponding genera below. The fifth species, *Sculptolobus repens* (Gupta, 2014), **comb. n.**, is reclassified to the genus *Sculptolobus*, because of the developed mid-longitudinal elevation on the face, the straight fore wing vein 1-SR + M, strongly developed, rounded anterolateral areas on T2, and the widely sculptured mesosoma [Gupta, Naveen, 2014].

**Redescription.** Female. Head. Toruli not protruding in dorsal view. Vertex without mid-longitudinal sulcus. Face weakly mid-longitudinally elevated, with wide mid-longitudinal carina projecting on frons between toruli. Clypeus flattened or prominent, with protruding ventral rim; dorsal clypeal margin sharp, with more or less developed dorsal carina, clypeal sulcus absent. Malar suture weakly impressed or more deep below eye and shallow near mandible, smooth. Hypostomal carina not protruding below mandible.

Mesosoma. Median lobe of mesoscutum strongly protruding (dorsal view). Notauli very deep anteriorly, impressed posteriorly. Mesoscutum evenly setose. Median impression on mesopleuron absent. Metanotum with incomplete or complete median carina. Mid-longitudinal impression on propodeum absent.

Wings. Angle between veins C + SC + R and 1-SR 55–75°. Vein r-m shorter than vein 2-SR. Vein 1-SR + M curved anteriorly. Vein cu-a interstitial. Wing membrane evenly setose at base of hind wing. Hind wing vein r-m interstitial.

Legs. Hind tibia with subapical transverse row of spiny setae or with just few thick setae subapically. Claws with moderately large and rounded basal lobe.

Metasoma with at least 5 dorsally visible tergites. T1 with distinct mid-longitudinal impression, developed dorsolateral carinae, and with complete dorsal carinae connected with hind margin of tergite by a short mid-longitudinal keel and strongly developed sublateral carinae. Median area of T2 absent or weakly defined, small, and elongate-triangular; mid-longitudinal keel absent or weak and incomplete; sublateral carinae of T2 long; dorsolateral impressions not or weakly impressed; anterolateral areas absent. Spiracle located in anterior part of T2, in its dorsum. Suture between T2 and T3 almost straight or weakly curved. Anterolateral areas of T3–T5 absent. Posterior margins of T3–T5 with deep, crenulate transverse subapical grooves; laterally (almost) straight. Apical tergite of normal shape. Ovipositor sheath 0.1–0.3 times as long as fore wing. Apex of ovipositor with weak nodus and developed ventral serration.

Sculpture. Head and mesosoma mainly smooth with weak coriaceous sculpture. Metasomal tergites longitudinally rugose to rugulose.

### *Cassidibracon castus* Quicke, 1987

(Figs 39–50)

*Cassidibracon castus* Quicke, 1987: 143.

**Material.** 1♀, paratype (BMNH), Sierra Leone, "Paratype", Lumley, Freetown, Sierra Leone, Sept. 1981, D. Quicke, "*Cassidibracon* sp., Braconinae, Det. D. Quicke 1983", "Paratype *Cassidibracon castus* Quicke, Braconinae, Det. D. Quicke 1987".

**Redescription.** Female. Body length 5.7 mm; fore wing length 5 mm.

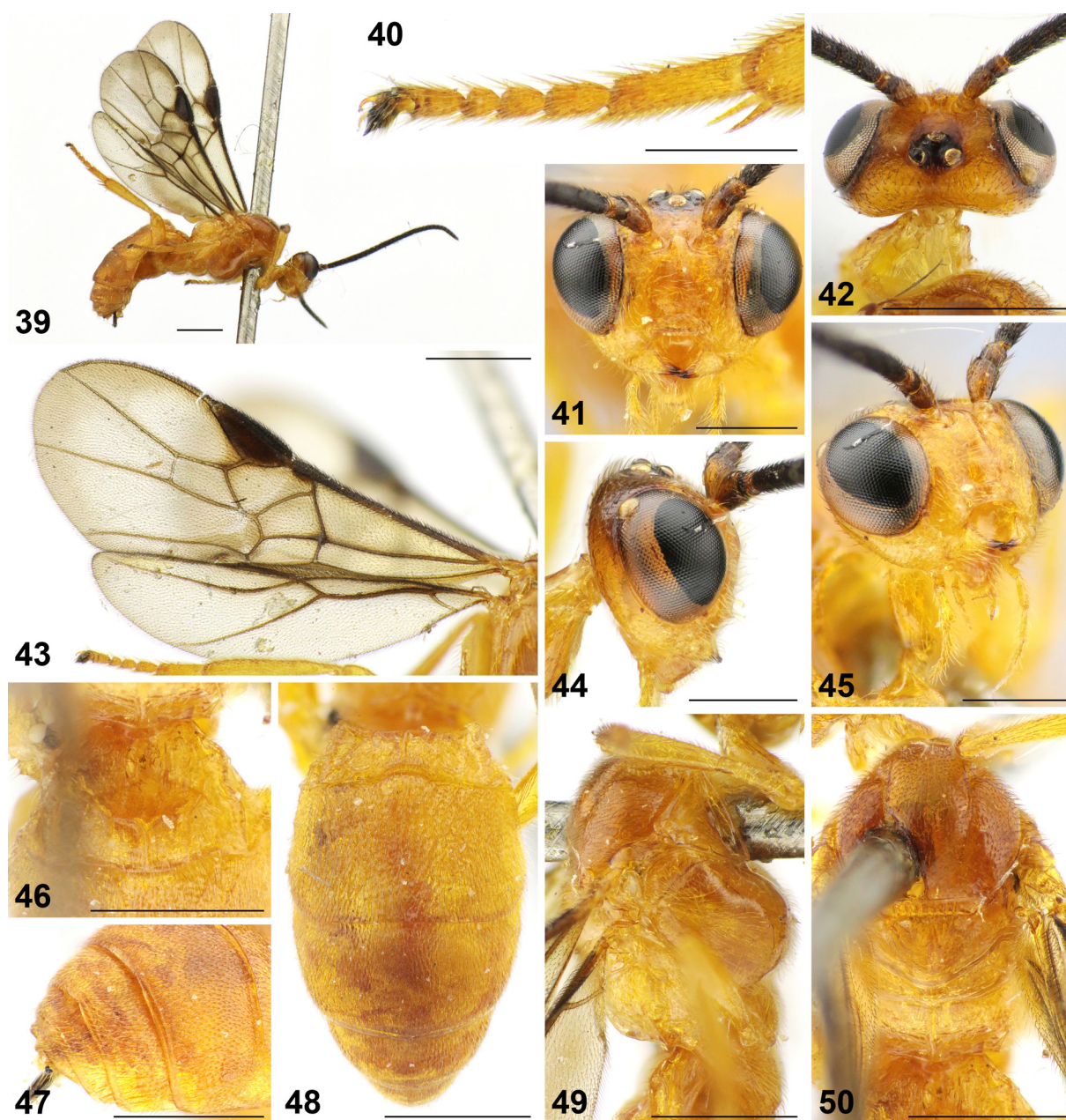
Head. Width of head (dorsal view) 2 times its median length. Transverse diameter of eye (dorsal view) 2.7 times as long as temple. OOL 2.2× OD; POL 1.2× OD; OOL 1.9× POL. Frons not impressed behind antennae, with weak, psi-like mid-longitudinal groove. Longitudinal diameter of eye in lateral view 1.3 times its transverse diameter; transverse diameter of eye 3.5 times minimum width of temple, hind margins of eye and temple slightly broadened ventrally. Face medially with almost indistinctly elevated smoothed triangle area above clypeus; with projecting upwards, wide, medially impressed mid-longitudinal carina. Face width 1.3 times combined height of face and clypeus; 2 times width of hypoclypeal depression. Width of hypoclypeal depression 1.3 times distance from depression to eye. Clypeus flattened, with weakly protruding ventral rim, clypeal sulcus absent, dorsal clypeal margin sharp, height of clypeus 0.4 times width of hypoclypeal depression. Longitudinal diameter of eye 3.4 times as long as malar space (front view). Malar suture weakly impressed. Maxillary palp shorter than eye.

Antenna with 32 antennomeres. First flagellomere 1.6 times as long as its apical width, middle and penultimate flagellomeres 1.2 and 1.6 times as long as wide, respectively.

Mesosoma 1.4 times as long as its maximum height. Transverse pronotal sulcus deep and wide, crenulate anteriorly. Mesoscutum evenly setose, its width 1.1 times median length (dorsal view). Notauli very deep anteriorly, impressed and not united posteriorly. Scutellar sulcus 0.2 times as long as scutellum. Mesepimeral sulcus crenulate, mesopleural pit deep, furrow-like. Median area of metanotum with complete median carina. Metapleural sulcus crenulate. Propodeal spiracle vertical, located in middle of propodeum, weakly protruding. Mid-longitudinal keel on propodeum complete, branching.

Wings. Angle between veins C + SC + R and 1-SR 55–60°. Vein r arising from basal 0.4 of pterostigma. Vein 1-R1 1.4 times as long as pterostigma. Marginal cell about 9 times as long as distance





Figs 39–50. *Cassidibracon castus*, female, paratype.

39 – habitus, lateral view; 40 – hind tarsus; 41–42, 44–45 – head: 41 – front view, 42 – dorsal view, 44 – lateral view, 45 – anterolateral view; 43 – wings; 46 – T1, dorsal view; 47 – T3–T6, dorsolateral view; 48 – metasoma, dorsal view; 49–50 – mesosoma: 49 – lateral view, 50 – dorsal view. Scale bars: 39, 42–43, 46–50 – 1 mm; 40–41, 44–45 – 0.5 mm.

Рис. 39–50. *Cassidibracon castus*, самка, паратип.

39 – общий вид сбоку; 40 – задняя лапка; 41–42, 44–45 – голова: 41 – вид спереди, 42 – вид сверху, 44 – вид сбоку, 45 – вид спереди/сбоку; 43 – крылья; 46 – T1, вид сверху; 47 – T3–T6, вид сверху/сбоку; 48 – метасома, вид сверху; 49–50 – мезосома: 49 – вид сбоку, 50 – вид сверху. Масштабные линейки: 39, 42–43, 46–50 – 1 мм; 40–41, 44–45 – 0.5 мм.

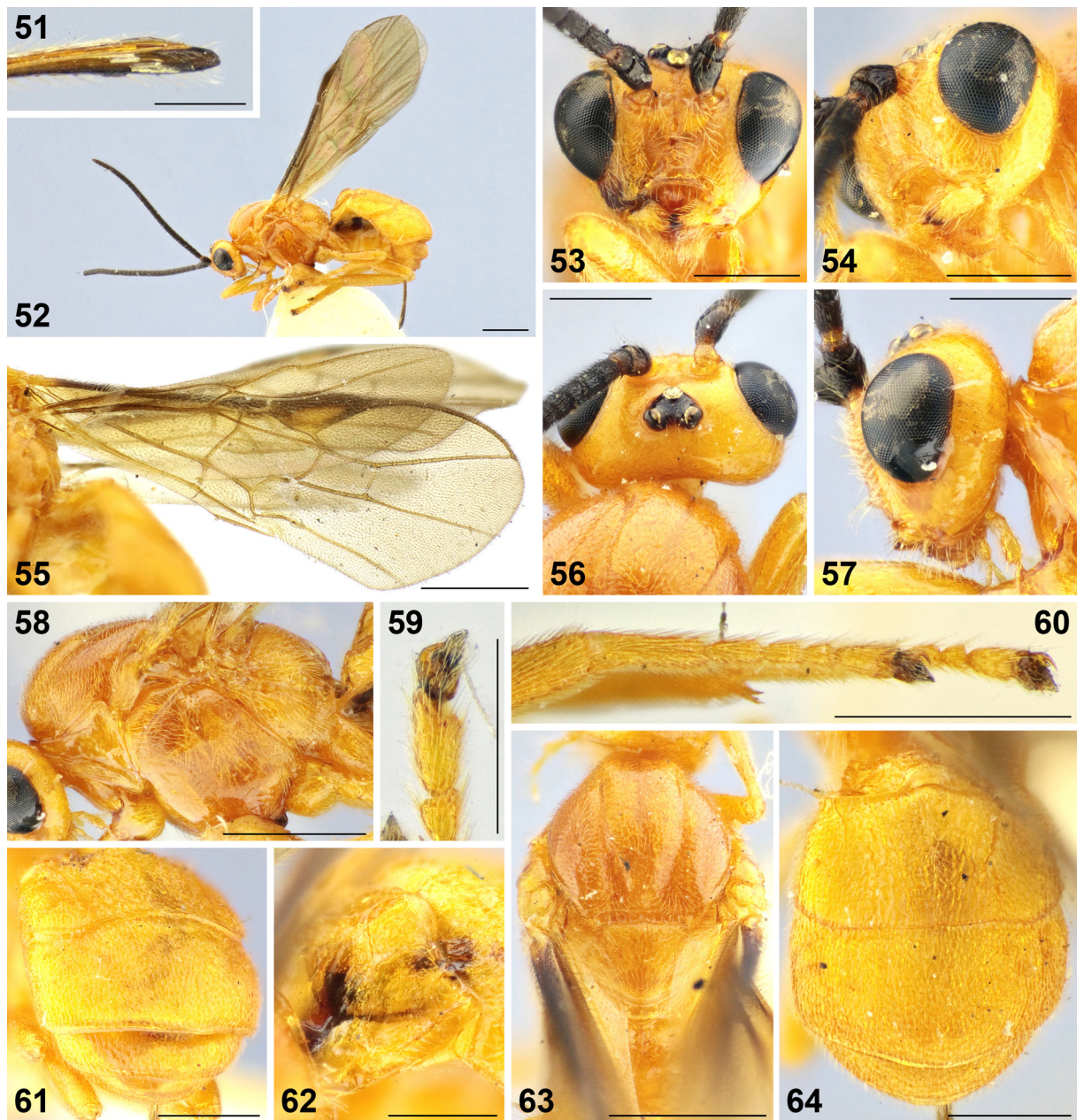
from its apex to apex of wing. Vein 3-SR 2.5× vein r, 0.3× vein SR1, 1.2× vein 2-SR. Vein 1-M 0.7× vein 1-SR + M, 2.2× vein m-cu, 1.7 times as long as vein cu-a. Vein 2-SR + M 0.4× vein 2-SR, 0.75× vein m-cu.

Legs. Fore tibia with transverse apical row of thick setae. Hind femur 3.3 times as long as wide. Hind tibia 1.3 times as long as hind femur, with subapical transverse row of spiny setae, its inner spur 0.45 times as long as hind basitarsus. Hind tarsus 0.9 times as long as hind tibia. Fifth segment of hind tarsus 0.5 times as long as hind basitarsus and 1.2 times as long as second segment.

Metasoma. Median length of T1 0.6 times its apical width. T2 medially 1.3 times as long as T3; basal width of T2 1.4 times its median length. Median area and mid-longitudinal keel of T2 absent. Suture between T2 and T3 almost straight. Posterior margins of T3–T6 laterally straight. Ovipositor sheath 0.35 times as long as hind tibia and 0.1 times as long as fore wing. Apex of ovipositor without nodus and with ventral serration [Quicke, 1987].

Sculpture. Frons, face, and malar space granulate; genae weakly coriaceous; vertex hardly coriaceous to smooth. Mesosoma mostly smooth; mesoscutum medially weakly granulate; metanotum





Figs 51–64. *Cassidibracon vannoorti* sp. n., females.

51, 54–56, 59–60, 63–64 – paratype; 52–53, 57–58, 61–62 – holotype. 51 – apex of ovipositor; 52 – habitus, lateral view; 53–54, 56–57 – head: 53 – front view, 54 – anterolateral view, 56 – dorsal view, 57 – lateral view; 55 – wings; 58, 63 – mesosoma: 58 – lateral view, 63 – dorsal view; 59 – apex of hind tarsus; 60 – hind tarsus; 61 – T2–T5, dorsolateral view; 62 – T1, dorsolateral view; 64 – metasoma, dorsal view. Scale bars: 51 – 0.25 mm; 52, 55, 58, 60–61, 63–64 – 1 mm; 53–54, 56–57, 59, 62 – 0.5 mm.

Рис. 51–64. *Cassidibracon vannoorti* sp. n., самки.

51, 54–56, 59–60, 63–64 – паратип; 52–53, 57–58, 61–62 – голотип. 51 – вершина яйцеклада; 52 – общий вид сбоку; 53–54, 56–57 – голова: 53 – вид спереди, 54 – вид спереди/сбоку, 56 – вид сверху, 57 – вид сбоку; 55 – крылья; 58, 63 – мезосома: 58 – вид сбоку, 63 – вид сверху; 59 – вершина задней лапки; 60 – задняя лапка; 61 – T2–T5, вид сверху/сбоку; 62 – T1, вид сверху/сбоку; 64 – метасома, вид сверху. Масштабные линейки: 51 – 0.25 мм; 52, 55, 58, 60–61, 63–64 – 1 мм; 53–54, 56–57, 59, 62 – 0.5 мм.

crenulate; propodeum anteriorly weakly granulate, hardly coriaceous posteriorly, medially with tree-like rugosity. Coxae smooth. T1 laterally rugose, its median area rugulose; T2 longitudinally rugose to rugulose; T3–T6 rugulose.

Colouration. Body mostly orange; malar space, palps, propleuron, tegulae, propodeum, and legs with yellow tint. Antenna black. Wing membrane brownish darkened (darker distally), pterostigma and wing veins brown.

#### *Cassidibracon vannoorti* sp. n.

(Figs 51–64)

**Material.** Holotype, ♀ (BMNH, NHMUK015215293): South Africa, “E. Cape Prov. Catberg. 15–30.i.1933.”; “S. Africa. R.E. Turner. Brit. Mus. 1933-108.” Paratypes: 1♀ (BMNH, NHMUK015215294), same labels as in holotype; 1♀ (BMNH, NHMUK010634738), “E. Cape Prov. Catberg. 1–10.ii.1933.”; “S. Africa. R.E. Turner. Brit. Mus. 1933-139.”

**Description.** Female. Body length 5.2–5.3 mm; fore wing length 5.2–5.6 mm.

**Head.** Width of head (dorsal view) 1.9–2 times its median length. Transverse diameter of eye (dorsal view) 1.6–1.8 times as long as temple. OOL 1.9–2.3× OD; POL 1.1–1.2× OD; OOL 1.8× POL. Frons with deep mid-longitudinal groove and shallow impressions behind antennae. Longitudinal diameter of eye in lateral view 1.4 times its transverse diameter; transverse diameter of eye 1.7–1.8 times minimum width of temple, hind margins of eye and temple parallel or broadened ventrally. Face medially with almost indistinctly elevated smoothed triangle area above clypeus; with projecting upwards mid-longitudinal carina. Face width 1.5–1.7 times combined height of face and clypeus, 1.9–2.3 times width of hypoclypeal depression. Width of hypoclypeal depression 1.2–1.4 times distance from depression to eye. Clypeus prominent, dorsal clypeal margin with weak dorsal carina; height of clypeus 0.3–0.4 times width of hypoclypeal depression. Longitudinal diameter of eye 2.6–2.9 times as long as malar space (front view). Malar suture deep below eye, weak near mandible, smooth. Maxillary palp shorter than eye.

**Antenna** with 31–32 antennomeres. First flagellomere 1.4–1.5 times as long as its apical width, middle and penultimate flagellomeres 0.95–1.1 and 1.2–1.5 times as long as wide, respectively.

**Mesosoma** 1.3 times as long as its maximum height. Transverse pronotal sulcus deep and wide, crenulate anteriorly. Mesoscutum evenly setose, its width 1.1–1.2 times its median length. Notauli very deep anteriorly, impressed and almost united posteriorly. Scutellar sulcus 0.1–0.2 times as long as scutellum. Mesepimeral sulcus smooth, mesopleural pit weak, furrow-like. Median area of metanotum with incomplete median carina. Metapleural sulcus crenulate. Propodeal spiracle vertical, located in middle of propodeum, weakly protruding. Mid-longitudinal keel on propodeum complete, branching.

**Wings.** Angle between veins C + SC + R and 1-SR 70–75°. Vein r arising from basal 0.4 of pterostigma. Vein 1-R1 1.4–1.5 times as long as pterostigma. Marginal cell 6.9–7.4 times as long as distance from its apex to apex of wing. Vein 3-SR 2.9–3× vein r, 0.3–0.35× vein SR1, 1.1–1.3× vein 2-SR. Vein 1-M about 0.75× vein 1-SR + M, 1.9–2.1× vein m-cu, 1.5–1.6 times as long as vein cu-a. Vein 2-SR + M 0.45–0.5× vein 2-SR, 0.75–1.05× vein m-cu.

**Legs.** Fore tibia with wide longitudinal row of long thick setae. Hind femur 3.2–3.8 times as long as wide. Hind tibia 1.3–1.5 times as long as hind femur, with 2 thick setae subapically. Hind tarsus 0.80–0.85 times as long as hind tibia, its inner spur 0.45 times as long as hind basitarsus. Fifth segment of hind tarsus 0.55–0.6 times as long as hind basitarsus, 1.1–1.2 times as long as second segment.

**Metasoma.** Median length of T1 0.5–0.6 times its apical width. T2 medially 1–1.1 times as long as T3; basal width of T2 about 1.3 times its median length. Median area of T2 small, weakly separated, elongate-triangular, extending into weak incomplete mid-longitudinal keel. Suture between T2 and T3 weakly curved. Only posterior margin of T3 laterally weakly roundly protruding. Ovipositor sheath 0.8–0.85 times as long as hind tibia and 0.23–0.27 times as long as fore wing. Apex of ovipositor with weak nodus and distinct ventral serration.

**Sculpture.** Face and genae weakly granulate, frons and malar space granulate, vertex hardly coriaceous to smooth; mesoscutum and scutellum smooth, metanotum crenulate, propodeum weakly coriaceous, with tree-like rugosity on apical half, with transverse rugae along mid-longitudinal keel in basal half; coxae smooth; T1 laterally rugose, its median area smooth, T2 longitudinally rugose to rugulose, T3 rugose to rugulose, T4 rugulose to granulate-rugulose, T5 granulate-rugulose.

**Colouration.** Body ochre yellow, but mesosoma darker coloured; antenna and ocellar triangle black; maxillary palp yellow;

tegulae reddish yellow. Wing membrane brownish darkened, yellowish basally; pterostigma brownish yellow with brown front side and patch apically; wing veins yellowish brown.

**Diagnosis.** The differences between two known species of *Cassidibracon* are presented in the dichotomy below.

1. Longitudinal diameter of eye 3.4 times as long as malar space (front view). Face width 1.3 times combined height of face and clypeus. Transverse diameter of eye 2.7 times (dorsal view) and 3.5 times (lateral view) as long as temple. Median area of metanotum with complete median carina. T2 medially 1.3 times as long as T3. Ovipositor sheath 0.35 times as long as hind tibia and 0.1 times as long as fore wing. Median area and mid-longitudinal keel of T2 absent. Pterostigma brown ..... *C. castus*  
– Longitudinal diameter of eye 2.6–2.9 times as long as malar space (front view). Face width 1.5–1.7 times combined height of face and clypeus. Transverse diameter of eye 1.6–1.8 times (dorsal view) and 1.7–1.8 times (lateral view) as long as temple. Median area of metanotum with incomplete median carina. T2 medially 1–1.1 times as long as T3. Ovipositor sheath 0.8–0.85 times as long as hind tibia and 0.23–0.27 times as long as fore wing. Median area of T2 small, weakly separated, elongate-triangular, extending into weak incomplete mid-longitudinal keel. Pterostigma brownish yellow with brown front side and patch apically ..... *C. vannoorsti* **sp. n.**

**Etymology.** The species is named in honour of Dr Simon van Noort whose help was crucial in determining the statuses of *Esenga*, *Cassidibracon*, and *Triaspidogastra*.

### Genus *Crinibracon* Quicke, 1988

*Crinibracon* Quicke, 1988: 411 (type species *Crinibracon malayensis* Quicke, 1988). Gupta et al., 2016: 282.

= *Platybracon* Yang, Chen et Liu, 2008: 61 (nec Szépligeti, 1900: 49) (type species *Platybracon sinicus* Yang, Chen et Liu, 2008). Kittel, Quicke, 2015: 197 (as a junior synonym of *Crinibracon*).

**Composition and distribution.** *Crinibracon chromusae* Gupta et van Achterberg, 2016 (India), *C. indicus* Quicke, 1988 (India), *C. malayensis* Quicke, 1988 (Malaysia, Oriental China), *C. sinicus* (Yang, Chen et Liu, 2008) (Oriental China), *C. striatus* Quicke, 1988 (Papua New Guinea).

**Redescription.** Female. Head. Toruli somewhat protruding in dorsal view. Vertex (very) weakly longitudinally impressed behind ocelli. Face evenly convex, without elevated area above clypeus, with strong mid-longitudinal carina in upper part. Clypeus flattened, with weakly protruding ventral rim, dorsal clypeal margin sharp, dorsal carina absent or weak, clypeal sulcus absent. Malar suture deep and smooth. Hypostomal carina not or slightly protruding below mandible.

**Mesosoma.** Median lobe of mesoscutum weakly protruding (dorsal view). Notauli deep, crenulate. Mesoscutum evenly setose. Median impression on mesopleuron vague. Median area of metanotum with incomplete median carina. Propodeal spiracle weakly protruding or with a tubercle above it.

**Wings.** Angle between veins C + SC + R and 1-SR 50–60°. Vein r-m shorter than vein 2-SR. Vein 1-SR + M weakly curved anteriorly. Wing membrane evenly setose at base of hind wing. Hind wing vein r-m (weakly) antefurcal.

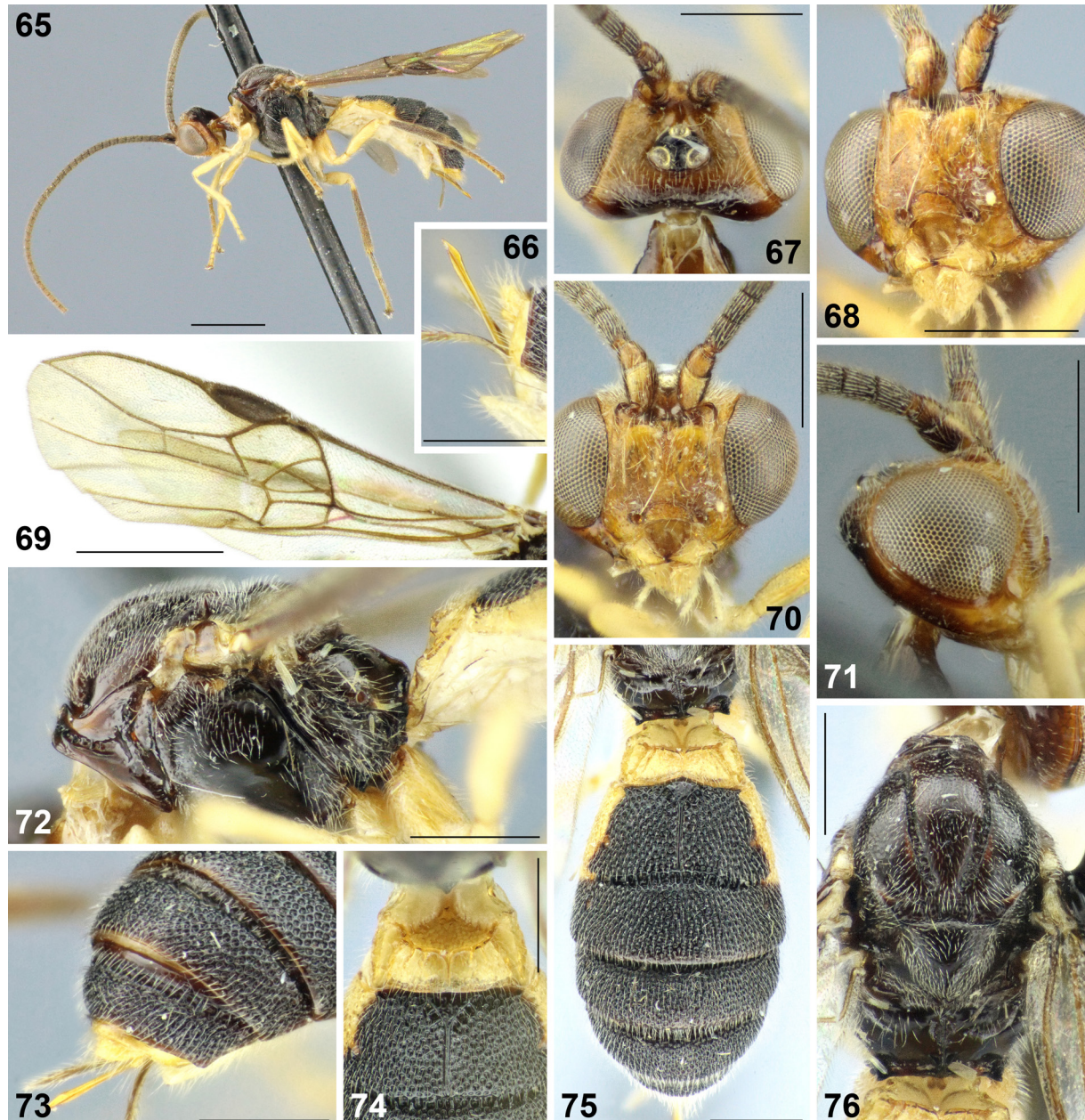


Legs. Fore tibia at most with weakly thickened setae and only subapically. Hind tibia without subapical row of thick setae. Claws with rounded or weakly angular basal lobe.

Metasoma with 6 dorsally visible tergites. T1 with weak mid-longitudinal impression, developed dorsolateral carinae, complete dorsal carinae, with short mid-longitudinal keel between dorsal carinae and hind margin of tergite; sublateral carinae absent. T2 with strong (almost) complete mid-longitudinal keel, deep crenulate dorsolateral impressions, and long sublateral carinae. Spiracle located at middle of T2.

Suture between T2 and T3 (weakly) curved. Anterolateral areas of T3–T6 absent. Posterior margins of T3–T6 laterally straight, with shallow weakly crenulate transverse subapical grooves (except *C. malayensis*). Ovipositor sheath 0.1–0.2 times as long as fore wing. Apex of ovipositor variable, with blunt dorsal nodus or dorsally roundly expanded dorsal valve and ventral valve with developed ventral serration or smooth and ventrally roundly expanded.

Sculpture. Head and mesosoma mostly smooth, metasomal tergites rugose or densely foveate.



Figs 65–76. *Crinibracon malayensis*, female, paratype.

65 – habitus, lateral view; 66 – ovipositor, lateral view; 67–68, 70–71 – head: 67 – dorsal view, 68 – anterolateral view, 70 – front view, 71 – lateral view; 69 – fore wing; 72, 76 – mesosoma: 72 – lateral view, 76 – dorsal view; 73 – T4–T6, dorsolateral view; 74 – T1 and T2, dorsal view; 75 – metasoma, dorsal view. Scale bars: 65, 69 – 1 mm; 66–68, 70–76 – 0.5 mm.

Рис. 65–76. *Crinibracon malayensis*, самка, паратип.

65 – общий вид сбоку; 66 – яйцеклад, вид сбоку; 67–68, 70–71 – голова: 67 – вид сверху, 68 – вид спереди/сбоку, 70 – вид спереди, 71 – вид сбоку; 69 – переднее крыло; 72, 76 – мезосома: 72 – вид сбоку, 76 – вид сверху; 73 – T4–T6, вид сверху/сбоку; 74 – T1 и T2, вид сверху; 75 – метасома, вид сверху. Масштабные линейки: 65, 69 – 1 мм; 66–68, 70–76 – 0.5 мм.



*Crinibracon malayensis* Quicke, 1988  
(Figs 65–76)

*Crinibracon malayensis* Quicke, 1988: 412.

**Material.** 1♀, paratype (AEI), "Pasoh Forest Res., Negri S., Malaysia, III.27.78 forest, P. & M. Becker", "Paratype *Crinibracon malayensis* Det. D. Quicke 1987".

**Redescription.** Female. Body length 4.2 mm; fore wing length 3.7 mm.

**Head.** Width of head (dorsal view) 1.8 times its median length. Toruli somewhat protruding in dorsal view. Transverse diameter of eye (dorsal view) 3.7 times as long as temple. OOL 1.7× OD; POL 0.7× OD; OOL 2.4× POL. Frons with very deep mid-longitudinal groove and shallow impressions behind antennae. Longitudinal diameter of eye in lateral view 1.2 times its transverse diameter. Transverse diameter of eye (lateral view) 6 times minimum width of temple, hind margins of eye and temple broadened ventrally. Face evenly convex, in upper half with strong mid-longitudinal carina. Face width 1.2 times combined height of face and clypeus, 2.5 times width of hypoclypeal depression. Width of hypoclypeal depression as large as distance from depression to eye. Clypeus flattened, with weakly protruding ventral rim, clypeal sulcus absent, dorsal clypeal margin sharp; height of clypeus 0.4 times width of hypoclypeal depression. Longitudinal diameter of eye 3.4 times as long as malar space (front view). Malar suture deep, smooth. Maxillary palp much shorter than eye.

**Antenna.** First flagellomere 1.6 times as long as its apical width, middle flagellomeres 1.4 times as long as wide.

**Mesosoma** 1.3 times as long as its maximum height. Transverse pronotal sulcus deep and very wide, crenulate. Mesoscutum evenly setose, its width 1.2 times median length (dorsal view). Notauli deep, not united posteriorly. Scutellar sulcus 0.3 times as long as scutellum. Median impression on mesopleuron indistinct, mesepimeral sulcus weakly crenulate, mesopleural pit furrow-like. Median area of metanotum with incomplete median carina. Metapleural sulcus crenulate. Propodeum with a tubercle above spiracle, the latter round, located behind middle of propodeum. Mid-longitudinal keel on propodeum complete, with short transverse rugae.

**Wings.** Vein r arising from basal 0.3 of pterostigma. Vein 1-R1 1.7 times as long as pterostigma. Marginal cell 9 times as long as distance from its apex to apex of wing. Vein 3-SR 2.2× vein r, 0.45× vein SR1, 1.5× vein 2-SR. Vein 1-M 0.7× vein 1-SR + M, 2.5× vein m-cu, 2.1 times as long as vein cu-a. Vein 2-SR + M 0.4× vein 2-SR, 0.95× vein m-cu. Vein 1-SR + M curved anteriorly. Vein cu-a weakly postfurcal.

**Legs.** Fore tibia with no thick spines. Hind femur 3.9 times as long as wide. Hind tibia 1.5 times as long as hind femur, without subapical row of thick setae, its inner spur 0.35 times as long as hind basitarsus. Hind tarsus as long as hind tibia. Fifth segment of hind tarsus 0.5 times as long as hind basitarsus and as long as second segment. Claws with weakly protruding angular basal lobe.

**Metasoma.** Median length of T1 0.7 times its apical width. T2 medially 1.2 times as long as T3; basal width of T2 1.5 times its median length. T2 with strongly elevated small triangular median area and strong mid-longitudinal keel. Posterior margins of T3–T6 with no transverse subapical grooves. Ovipositor sheath 0.65 times as long as hind tibia and 0.18 times as long as fore wing. Apex of ovipositor with wide blunt dorsal nodus and with ventral serration.

**Sculpture.** Head and mesosoma mostly smooth, propodeum apically rugose, metanotum rugose. Median area of T1 weakly rugose. T2–T6 densely foveate.

**Colouration.** Scape rusty, laterally brown, flagellum dark brown. Head mostly yellowish brown; vertex and ocellar triangle brown; maxillary palps pale yellow. Mesosoma, metasoma dorsally, middle tarsus, hind tibia, and hind tarsus dark brown; tegulae yellowish brown; legs mostly, T1 and lateral sides of T2 yellow. Wing membrane brownish darkened, pterostigma and veins brown.

*Crinibracon striatus* Quicke, 1988  
(Figs 77–88)

*Crinibracon striatus* Quicke, 1988: 413.

**Material.** 1♀, holotype (AEI), "Baiyer R., N. Guinea, XII.24–26.1978, 1100 m. J. Sedlacek", "Holotype *Crinibracon striatus* Quicke, Braconinae, Det. D. Quicke 1986".

**Redescription.** Female. Body length 5.2 mm; fore wing length 5.4 mm.

**Head.** Width of head (dorsal view) 2 times its median length. Toruli somewhat protruding in dorsal view. Transverse diameter of eye (dorsal view) 2.5 times as long as temple. OOL 2.5× OD; POL 1.1× OD; OOL 2.2× POL. Frons with very deep mid-longitudinal groove. Longitudinal diameter of eye in lateral view 1.2 times its transverse diameter. Transverse diameter of eye (lateral view) 3.2 times minimum width of temple, hind margins of eye and temple sub-parallel. Face evenly convex, in upper half with strong mid-longitudinal carina. Face width 1.2 times combined height of face and clypeus, 3 times width of hypoclypeal depression. Width of hypoclypeal depression 0.7 times distance from depression to eye. Clypeus flattened, with weakly protruding ventral rim, clypeal sulcus absent, dorsal clypeal margin sharp; height of clypeus 0.65 times width of hypoclypeal depression. Longitudinal diameter of eye 2.3 times as long as malar space (front view). Malar suture deep, smooth. Maxillary palp longer than eye, but shorter than head.

**Antenna.** First flagellomere 2.1 times as long as its apical width, middle flagellomeres 1.4 times as long as wide.

**Mesosoma** 1.4 times as long as its maximum height. Transverse pronotal sulcus deep and wide, areolate anteriorly. Mesoscutum evenly setose, its width 1.1 times its median length (dorsal view). Notauli deep, almost united posteriorly. Scutellar sulcus 0.2 times as long as scutellum. Median impression on mesopleuron indistinct, mesepimeral sulcus smooth, mesopleural pit deep. Median area of metanotum with incomplete median carina. Metapleural sulcus smooth. Propodeal spiracle vertical, located behind middle of propodeum, weakly protruding. Mid-longitudinal keel on propodeum complete, with short transverse rugae.

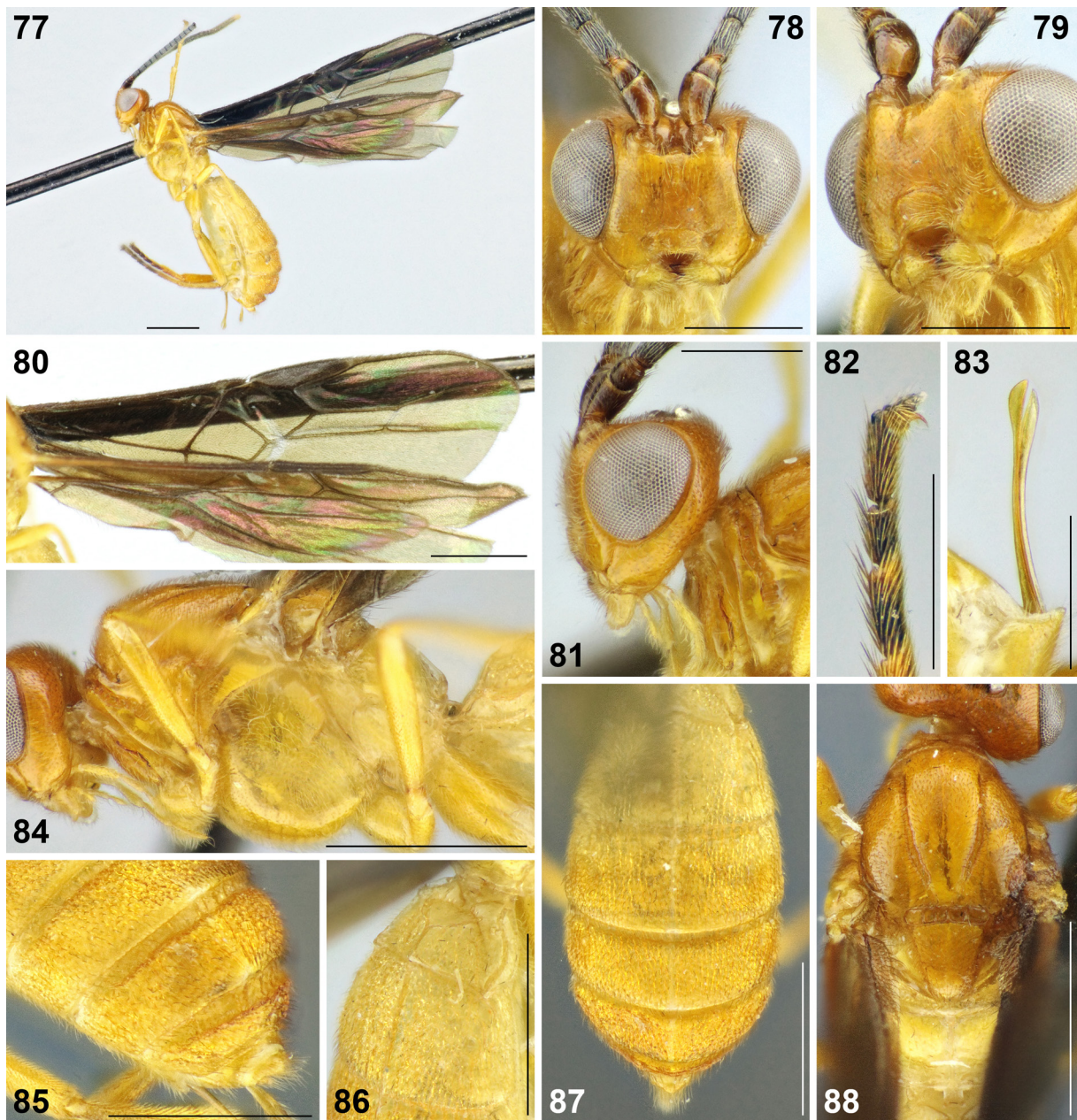
**Wings.** Vein r arising from basal 0.35 of pterostigma. Vein 1-R1 1.3 times as long as pterostigma. Marginal cell 8 times as long as distance from its apex to apex of wing. Vein 3-SR 2.6× vein r, 0.7× vein SR1, 2.2× vein 2-SR. Vein 1-M 0.8× vein 1-SR + M, 1.8× vein m-cu, 2.8 times as long as vein cu-a. Vein 2-SR + M 0.5× vein 2-SR, 0.7× vein m-cu. Vein 1-SR + M weakly curved anteriorly proximally. Vein cu-a interstitial.

**Legs.** Fore tibia with weakly thickened spines subapically. Hind femur 3.7 times as long as wide. Hind tibia 1.6 times as long as hind femur, without subapical row of thick setae, its inner spur 0.3 times as long as hind basitarsus. Hind tarsus almost as long as hind tibia. Fifth segment of hind tarsus 0.45 times as long as hind basitarsus and 0.7 times as long as second segment. Claws with not protruding, blunt basal lobe.

**Metasoma.** Median length of T1 0.6 times its apical width. T2 medially 1.1 times as long as T3; basal width of T2 1.2 times its median length. Median area of T2 absent, mid-longitudinal keel strong, extending on T3. Posterior margins of T3–T6 with shallow, weakly crenulate transverse subapical grooves. Ovipositor sheath 0.3 times as long as hind tibia and 0.08 times as long as fore wing. Apex of ovipositor with dorsally roundly protruding upper valve and ventrally roundly protruding lower valve.

**Sculpture.** Head and mesosoma smooth. T1 weakly rugulose to rugose; T2–T6 with weakening longitudinally rugose-punctate sculpture.

**Colouration.** Body mostly reddish yellow to rusty. Head ventrally, mesopleuron and propodeum, legs, and T1 and T2 yellow. Hind tarsus, ocellar triangle, and most of antenna brown. Flagellum brown with pale yellow subapical flagellomeres (apices of antennae absent). Wing membrane brownish darkened, pterostigma and wing veins brown.



Figs 77–88. *Crinibracon striatus*, female, holotype.

77 – habitus, lateral view; 78–79, 81 – head: 78 – front view, 79 – anterolateral view, 81 – lateral view; 80 – fore wing; 82 – apex of hind tarsus; 83 – ovipositor, lateral view; 84, 88 – mesosoma: 84 – lateral view, 88 – dorsal view; 85 – T4–T6, dorsolateral view; 86 – T1 and T2, dorsolateral view; 87 – metasoma, dorsal view. Scale bars: 77, 80, 84–88 – 1 mm; 78–79, 81–83 – 0.5 mm.

Рис. 77–88. *Crinibracon striatus* Quicke (голотип, самка, АЕИ).

77 – общий вид сбоку; 78–79, 81 – голова: 78 – вид спереди/сбоку, 79 – вид спереди/сбоку, 81 – вид сбоку; 80 – переднее крыло; 81 – голова, вид сбоку; 82 – вершина задней лапки; 83 – яйцеклад, вид сбоку; 84, 88 – мезосома: 84 – вид сбоку, 88 – вид сверху; 85 – T4–T6, вид сверху/сбоку; 86 – T1 и T2, вид сверху/сбоку; 87 – метасома, вид сверху. Масштабные линейки: 77, 80, 84–88 – 1 мм; 78–79, 81–83 – 0.5 мм.

### Genus *Esenga* Cameron, 1906

*Esenga* Cameron, 1906: 36 (type species *Esenga ovata* Cameron, 1906).

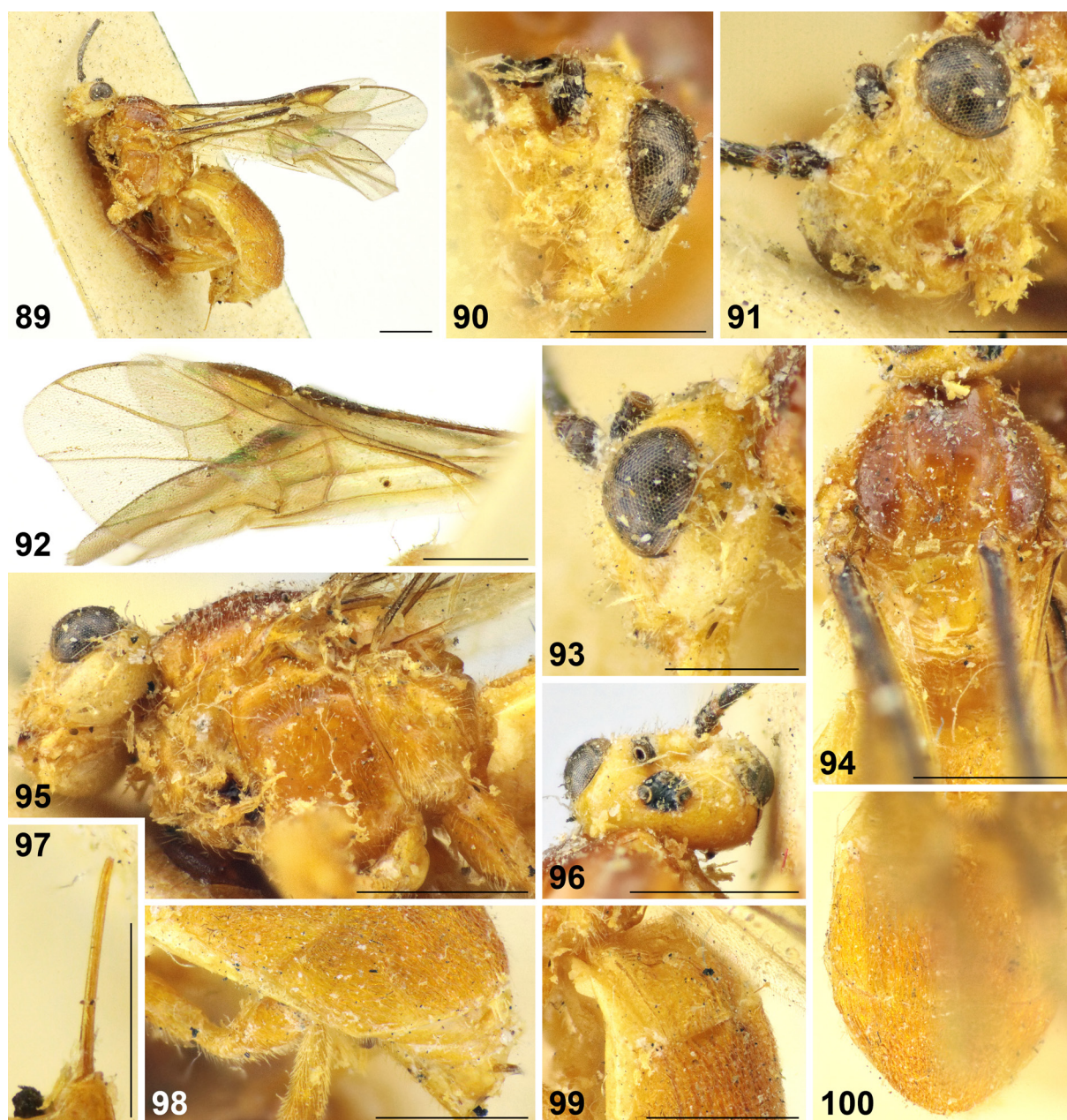
= *Triaspidoastra* Granger, 1949: 86 (type species *Triaspidoastra testacea* Granger, 1949), **syn. n.**

**Note.** Since the morphological differences between their type species are too weak (see below), *Triaspidoastra* is considered here a junior synonym of *Esenga*.

**Composition and distribution.** *Esenga ovata* Cameron, 1906 (Zimbabwe), *E. lutea* (Granger, 1949), **comb. n.** (Madagascar), *E. testacea* (Granger, 1949), **comb. n.** (Madagascar).

**Redescription.** Female. Head. Toruli not protruding in dorsal view. Vertex without mid-longitudinal sulcus. Face not mid-longitudinally elevated, with projecting upwards between toruli, widened and elevated in upper part mid-longitudinal carina. Clypeus flattened or prominent, with protruding ventral rim; dorsal clypeal margin sharp or smoothed, with more or





Figs 89–100. *Esenga lutea* comb. n., female, lectotype.

89 – habitus, lateral view; 90–91, 93, 96 – head: 90 – front view, 91 – anterolateral view, 93 – lateral view, 96 – dorsal view; 92 – wings; 94–95 – mesosoma: 94 – dorsal view, 95 – lateral view; 97 – ovipositor, lateral view; 98 – apex of metasoma, dorsolateral view; 99 – T1, dorsolateral view; 100 – T2 and T3, dorsal view. Scale bars: 89, 92, 94–96, 98–100 – 1 mm; 90, 91, 93, 97 – 0.5 mm.

Рис. 89–100. *Esenga lutea* comb. n., самка, лектотип.

89 – общий вид сбоку; 90–91, 93, 96 – голова: 90 – вид спереди, 91 – вид спереди/сбоку, 93 – вид сбоку, 96 – вид сверху; 92 – крылья; 94–95 – мезосома: 94 – вид сверху, 95 – вид сбоку; 97 – яйцеклад, вид сбоку; 98 – вершина метасомы, вид сверху/сбоку; 99 – T1, вид сверху/сбоку; 100 – T2 и T3, вид сверху. Масштабные линейки: 89, 92, 94–96, 98–100 – 1 мм; 90, 91, 93, 97 – 0.5 мм.

less developed dorsal carina, clypeal sulcus absent. Malar suture absent. Hypostomal carina not protruding below mandible.

Mesosoma. Median lobe of mesoscutum strongly protruding (dorsal view). Notauli deep. Mesoscutum medially glabrous. Median impression on mesopleuron absent. Metanotum with incomplete median carina. Propodeum with weak tubercle above spiracle.

Wings. Angle between veins C + SC + R and 1-SR 60–75°. Vein r-m shorter than vein 2-SR. Vein 1-SR + M weakly curved anteriorly. Wing membrane evenly setose in base of hind wing (or sparsely near vein cu-a). Hind wing vein r-m interstitial.

Legs. Fore tibia with weakly thickened longitudinal and transverse apical rows of long setae. Hind tibia with subapical transverse row of thick setae. Claws with acutely protruding basal lobe.

Metasoma with coarsely sclerotised T1–T3, T4–T7 more or less concealed. T1 with deep mid-longitudinal impression and developed dorsolateral carinae; dorsal carinae of T1 absent, sublateral carinae absent or complete. Median area and mid-longitudinal keel of T2 absent; dorsolateral impressions absent or weakly impressed; sublateral carinae long and extending on T3. Spiracle located in anterior part of T2. Anterolateral areas



absent or weakly defined by very shallow impressions only on T3. T3 narrowed posteriorly. Posterior margins of T3–T6 laterally straight, without transverse subapical grooves. Ovipositor sheath less than 0.1 times as long as fore wing.

Sculpture. Head and mesosoma mostly smooth, T1–T3 areolate-rugose to rugose, posterior tergites smooth.

#### A key to species of the genus *Esenga*

1. Temple broadened behind eyes (dorsal view), head behind eyes almost as wide as at the level of eyes. Vein C + SC + R reddish yellow. Vein cu-a postfurcal. Vein 1-M 1–1.1× vein 1-SR + M ..... *E. testacea* **comb. n.**
- Temple not broadened, but roundly narrowed behind eyes (dorsal view), head behind eyes distinctly less wide than at the level of eyes. Vein C + SC + R brown. Vein cu-a interstitial. Vein 1-M 0.90–0.95× vein 1-SR + M ..... *E. ovata* / *E. lutea* **comb. n.**

**Comments.** All three species are very similar to each other, and due to the scarcity of the material it is not possible to select reliable diagnostic characters. Almost all available for comparison characters (including proportions of the body parts) are identical in *E. ovata* and *E. lutea*. The only, minute, difference is in colouration: the head of *E. ovata* is dorsally brown while in *E. lutea* it is entirely yellow (except for stemmaticum). However, type specimens of both species are in very bad condition (and the large part of the body of *E. ovata* has a changed colour). In addition, only images of the holotype of *E. ovata* were examined in the current study. More material is required to decide whether *E. ovata* and *E. lutea* are synonyms or separate species.

#### *Esenga lutea* (Granger, 1949), **comb. n.** (Figs 89–100)

*Triaspidoagastra lutea* Granger, 1949: 88.

**Material.** 1♀, lectotype (here designated) (MNHN, EY19236), “♀”, “MNHN, Paris EY19236”, “Madagascar dr Sicard”, “Museum Paris, Coll. J. De Gaulle 1919”, “Lectotype”, “*Triaspidoagastra lutea* Granger, 1949”, “*Triaspidoagastra lutea* Granger, det. Belokobylskij, 2016”, “MNHN Paris”.

As indicated by Dr C. Villemant (personal communication), the second syntype female is absent in the MNHN collection.

**Redescription.** Female. Body length 5.5 mm; fore wing length 5.3 mm.

Head. Width of head (dorsal view) 1.8 times its median length. Transverse diameter of eye (dorsal view) 1.4 times as long as temple. OOL 2.7× OD; POL 1.6× OD; OOL 1.7× POL. Frons not impressed behind antennae, with 2 submedian longitudinal grooves. Longitudinal diameter of eye in lateral view 1.5 times its transverse diameter; transverse diameter of eye 1.1 times minimum width of temple, hind margins of eye and temple slightly broadened dorsally. Face width 1.9 times combined height of face and clypeus, 2.3 times width of hypoclypeal depression. Width of hypoclypeal depression as large as distance from depression to eye. Clypeus prominent, with protruding ventral rim, clypeal sulcus smoothed, height of clypeus 0.3 times width of hypoclypeal depression. Longitudinal diameter of eye 2.1 times as long as malar space (front view).

Antenna. First flagellomere 1.3 times as long as its apical width, middle flagellomeres 0.9 times as long as wide.

Mesosoma 1.4 times as long as its maximum height. Mesoscutum 1.2 times its median length (dorsal view). Median lobe of mesoscutum with strongly angularly protruding anterolateral angles (dorsal view). Notauli very deep anteriorly, impressed

and not united posteriorly. Scutellar sulcus 0.1 times as long as scutellum. Mesepimeral sulcus weakly crenulate, mesopleural pit weakly impressed. Metapleural sulcus smooth. Propodeal spiracle vertical, located in middle of propodeum. Mid-longitudinal keel on propodeum complete, branching posteriorly.

Wings. Vein r arising from middle of pterostigma. Vein 1-R1 1.3 times as long as pterostigma. Marginal cell 3.9 times as long as distance from its apex to apex of wing. Vein 3-SR 2.7× vein r, 0.3× vein SR1, 0.9× vein 2-SR. Vein 1-M 0.9× vein 1-SR + M, 2.5× vein m-cu, 2.1× vein cu-a. Vein 2-SR + M 0.55× vein 2-SR, 1.1× vein m-cu. Vein cu-a interstitial. Wing membrane evenly setose at base of hind wing. Legs. Hind femur 3.2 times as long as wide. Hind tibia 1.4 times as long as hind femur. Claws with small acute subapical protuberance.

Metasoma. Median length of T1 0.6 times its apical width. Sublateral carinae of T1 strongly developed, reaching posterior margin of tergite. T2 medially 1.1 times as long as T3, basal width of T2 1.3 times its median length. Suture between T2 and T3 weakly curved. Ovipositor sheath 0.15 times as long as hind tibia, 0.05 times as long as fore wing.

Sculpture. Head and mesosoma mostly smooth; malar space granulate; propodeum with tree-like rugosity in apical two thirds. T1 laterally rugose, its median area areolate-rugose posteriorly; T2 and T3 areolate-rugose to rugose, T4–T6 almost smooth.

Colouration. Body mostly yellowish brown. Head, maxillary palp, prothorax, tegulae, scutellum, legs, T1 and metasomal sternites yellow. Antenna and ocellar triangle brownish black. Wing membrane weakly darkened, pterostigma yellow with brownish front side, wing veins yellowish brown to brown.

**Notes.** *Esenga lutea* possibly represents a junior synonym of *E. ovata*.

#### *Esenga ovata* Cameron, 1906 (Figs 101–109)

*Esenga ovata* Cameron, 1906: 36.

**Material.** 1♀, holotype (SAMC, SAM-HYM-P002455), Zimbabwe, “Type”, “Rhodesia, Sebakwe / D. Dods. Nov. 1901”, “*Esenga ovata* Cam. Type Rhodesia”, “*Esenga ovata* Cameron C. van Achterberg, 1979 Holotype”, “Imaged WaspWeb LAS 4.9 SAMC 2019”.

**Notes.** According to the description, the type locality of the species is “Cape”. However, as the type label was written by P. Cameron himself (the hand recognised by C. van Achterberg) it must be assumed that the type locality was erroneously indicated in the description.

#### *Esenga testacea* (Granger, 1949), **comb. n.** (Figs 110–122)

*Triaspidoagastra testacea* Granger, 1949: 87.

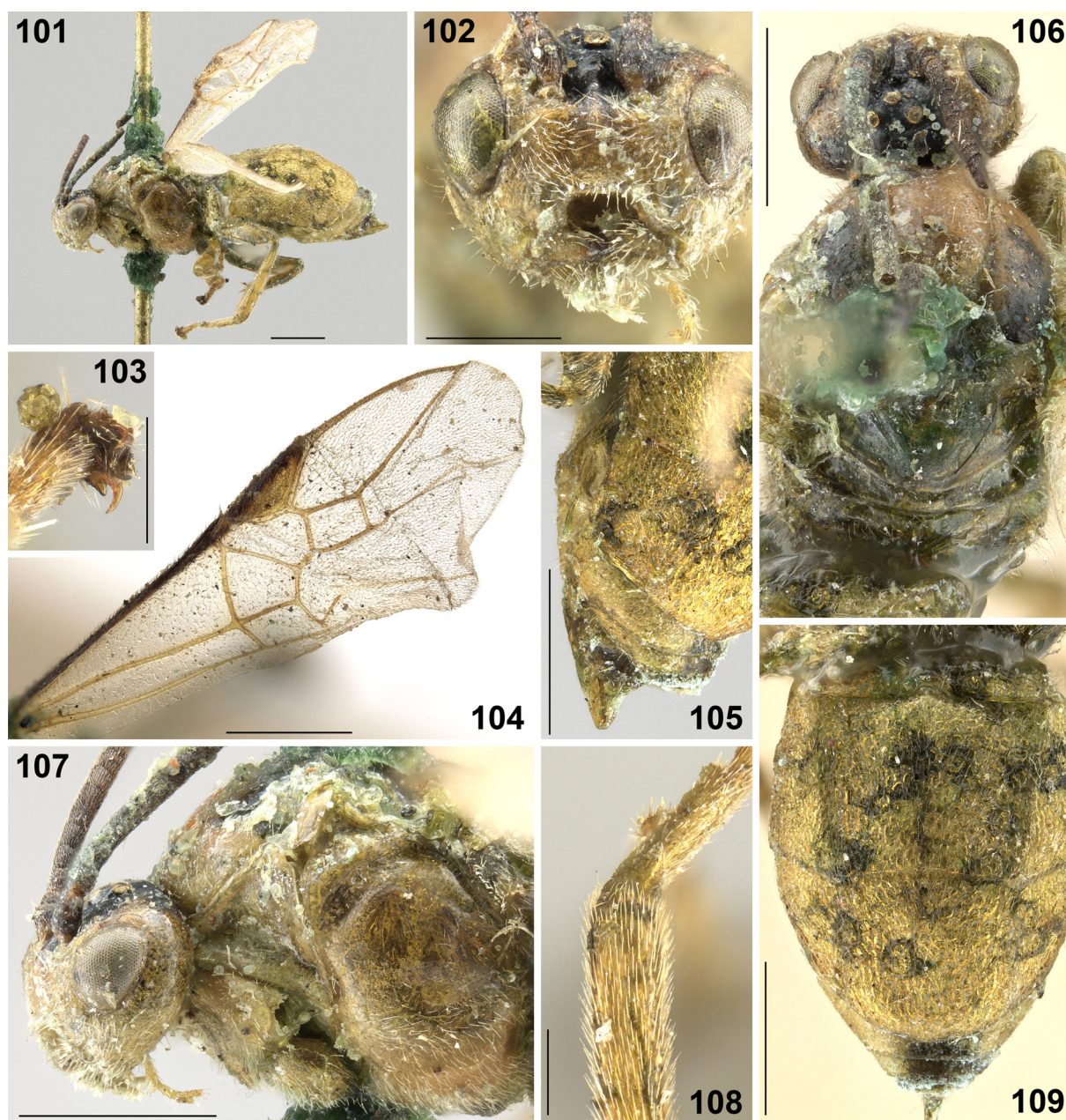
**Material.** 1♀, lectotype (designated here) (MNHN, EY19237), “♀”, “MNHN, Paris EY19237”, “Madagascar Bekily Rég. sud de l’île”, “Muséum Paris 1-[19]39, A. Seyrig”, “33”, “Type”, “Lectotype”, “*Triaspidoagastra testacea* Granger, 1949”, “*Triaspidoagastra testacea* Granger, det. Belokobylskij, 2016”, “MNHN Paris”.

Four paralectotype females located at MNHN were not examined (same locality and collector data as in the lectotype: EY19238, 01.1937; EY19239, 06.1936; EY19240, 01.1937; EY19241, 05.1940). Six syntypes were indicated in the original publication, but the sixth female was not found in the MNHN collection (Dr C. Villemant, personal communication).

**Redescription.** Female. Body length 7.1–7.2 mm; fore wing length 7–7.3 mm.

Head. Width of head (dorsal view) 1.8–1.9 times its median length. Transverse diameter of eye (dorsal view) 1–1.1 times as long as temple. OOL 3.2–3.8× OD; POL 1.8–2× OD; OOL 1.8–1.9× POL. Frons not impressed behind antennae, with 2 submedian longitudinal grooves. Longitudinal diameter of eye in lateral view 1.4–1.5 times its transverse diameter; transverse diameter of eye 0.9–1.1 times minimum width of temple, hind margins of eye and temple slightly broadened dorsally. Face width





Figs 101–109. *Esenga ovata*, female, holotype.

101 – habitus, lateral view; 102 – head, front view; 103 – apex of hind tarsus; 104 – fore wing; 105 – apex of metasoma, lateral view; 106–107 – mesosoma: 106 – dorsal view, 107 – lateral view; 108 – apex of hind tibia; 109 – metasoma, dorsal view. Scale bars: 101, 103–107, 109 – 1 mm; 102 – 0.5 mm; 108 – 0.25 mm.

Рис. 101–109. *Esenga ovata*, самка, голотип.

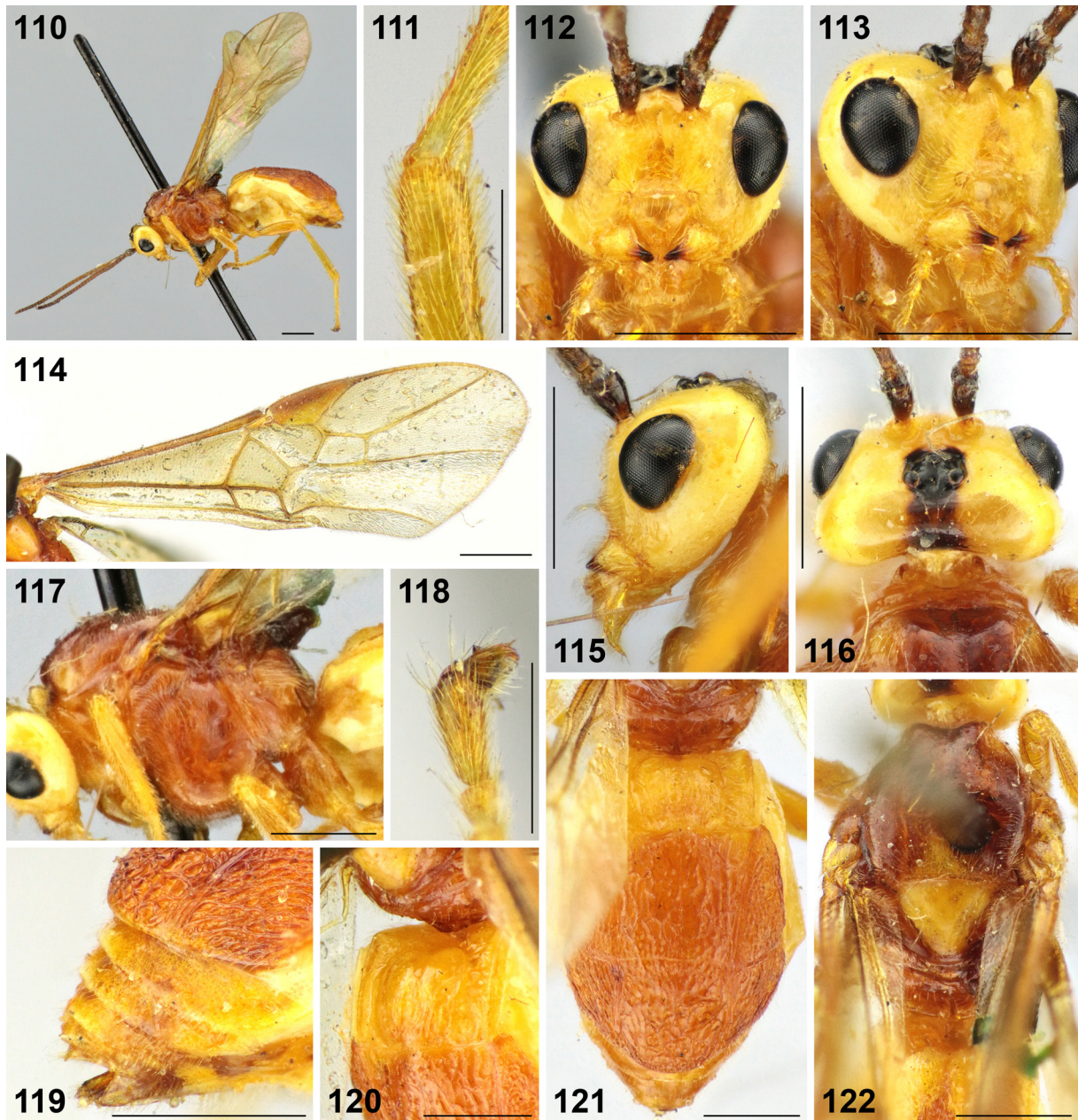
101 – общий вид сбоку; 102 – голова, вид спереди; 103 – вершина задней лапки; 104 – переднее крыло; 105 – вершина метасомы, вид сбоку; 106–107 – мезосома: 106 – вид сверху, 107 – вид сбоку; 108 – вершина задней голени; 109 – метасома, вид сверху. Масштабные линейки: 101, 103–107, 109 – 1 мм; 102 – 0.5 мм; 108 – 0.25 мм.

1.9–2 times combined height of face and clypeus; 2–2.1 times width of hypoclypeal depression. Width of hypoclypeal depression 1.2–1.4 times distance from depression to eye. Clypeus prominent, with protruding ventral rim, clypeal sulcus smoothed, height of clypeus 0.25–0.3 times width of hypoclypeal depression. Longitudinal diameter of eye 1.9–2 times as long as malar space (front view).

Antenna with 33–35 antennomeres. First flagellomere 1.3–1.4 times as long as its apical width, middle and penultimate flagellomeres 1–1.1 and 1.3–1.4 times as long as wide, respectively.

Mesosoma 1.3 times as long as its maximum height. Mesoscutum 1–1.1 times its median length (dorsal view). Median lobe of mesoscutum with strongly angularly protruding anterolateral angles (dorsal view). Notauli very deep anteriorly, impressed and not united posteriorly. Scutellar sulcus 0.05–0.1 times as long as scutellum. Mesepimeral sulcus smooth, mesopleural pit deep. Metapleural sulcus weakly crenulate. Propodeal spiracle vertical, located at middle of propodeum, propodeum with a tubercle above spiracle. Mid-longitudinal keel on propodeum complete, simple.





Figs 110–122. *Esenga testacea* comb. n., female, lectotype.

110 – habitus, lateral view; 111 – apex of hind tibia; 112–113, 115–116 – head: 112 – front view, 113 – anterolateral view, 115 – lateral view, 116 – dorsal view; 114 – fore wing; 117, 122 – mesosoma: 117 – lateral view, 122 – dorsal view; 118 – apex of hind tarsus; 119 – apex of metasoma, lateral view; 120 – T1, dorsolateral view; 121 – metasoma, dorsal view. Scale bars: 110, 112–117, 119–122 – 1 mm; 111, 118 – 0.5 mm.

Рис. 110–122. *Esenga testacea* comb. n., самка, лектотип.

110 – общий вид сбоку; 111 – вершина задней голени; 112–113, 115–116 – голова: 112 – вид спереди, 113 – вид спереди/сбоку, 115 – вид сбоку, 116 – вид сверху; 114 – переднее крыло; 117, 122 – мезосома: 117 – вид сбоку, 122 – вид сверху; 118 – вершина задней лапки; 119 – вершина метасомы, вид сбоку; 120 – T1, вид сверху/сбоку; 121 – метасома, вид сверху. Масштабные линейки: 110, 112–117, 119–122 – 1 мм; 111, 118 – 0.5 мм.

Wings. Vein r arising from basal 0.45 of pterostigma. Vein 1-R1 1.4–1.5 times as long as pterostigma. Marginal cell 3.2–5.9 times as long as distance from its apex to apex of wing. Vein 3-SR 2.9–3.3× vein r, 0.3× vein SR1, 1.2–1.3× vein 2-SR. Vein 1-M 1–1.1× vein 1-SR+M, 2.2–2.3× vein m-cu, 2.4–2.5× vein cu-a. Vein 2-SR+M 0.65–0.7× vein 2-SR, about 0.9× vein m-cu. Vein 1-SR+M weakly curved anteriorly. Vein cu-a postfurcal. Hind wing membrane with sparsely setosity near vein cu-a.

Legs. Hind femur 3.4–3.7 times as long as wide. Hind tibia 1.5–1.6 times as long as hind femur, its inner spur about 0.45 times

as long as hind basitarsus. Hind tarsus about 0.7 times as long as hind tibia. Fifth segment of hind tarsus about 0.6 times as long as hind basitarsus and 1.2 times as long as second segment. Claws with small acute subapical protuberance.

Metasoma. Median length of T1 0.75–0.85 times its apical width. Sublateral carinae of T1 absent. T2 medially about as long as T3, basal width of T2 1.3–1.4 times its median length. Suture between T2 and T3 weakly curved. Ovipositor sheath 0.15–0.2 times as long as hind tibia and 0.04–0.06 times as long as fore wing.



Sculpture. Head and mesosoma mostly smooth; malar space granulate-rugulose; propodeum medioposteriorly weakly rugose to smooth. T1 laterally rugose, its median area longitudinally rugose posteriorly; T2 and T3 areolate-rugose to rugose, T4–T6 almost smooth.

Colouration. Head and metasoma ventrally yellow; antenna mostly brown, flagellum medially with rusty tint; scape, ocellar triangle, and vertex medially dark brown; tegulae, scutellum, legs, T1, and T4–T7 reddish yellow. Wing membrane weakly darkened, pterostigma yellow with brownish front side, wing veins brown apically, but yellowish brown basally.

### Genus *Eseingoides* Quicke, 1989

*Eseingoides* Quicke, 1989: 299 (type species *Eseingoides crenulatus* Quicke, 1989).

**Composition and distribution.** *Eseingoides crenulatus* Quicke, 1989 (Solomon Islands), *E. fulvus* Quicke, 1989 (Australia).

According to the description, *E. yunnanensis* Chen et Yang, 2006 has an ovipositor 0.7 times as long as the fore wing and, as it may be seen on the pictures, strong anterolateral areas on T3, and a smoothed or absent malar suture. Because of these character states *E. yunnanensis* is to be excluded from the genus *Eseingoides*, it possibly belongs to the genus *Psilolobus*.

**Redescription.** Female. Head. Toruli somewhat protruding in dorsal view. Vertex at most very weakly longitudinally impressed behind ocelli. Face evenly convex. Clypeus flattened, with (weakly) protruding ventral rim; dorsal clypeal margin sharp, dorsal carina and clypeal sulcus absent. Malar suture deep and smooth. Hypostomal carina slightly protruding below mandible.

Mesosoma. Median lobe of mesoscutum not protruding (dorsal view). Notauli very deep and crenulate anteriorly, impressed and smooth posteriorly. Mesoscutum evenly setose. Precoxal sulcus weakly impressed and foveate anteriorly. Median area of metanotum with incomplete median carina. Propodeum with a tubercle above spiracle.

Wings. Angle between veins C + SC + R and 1-SR 50–60°. Vein r-m shorter than vein 2-SR. Vein 1-SR + M straight or weakly curved anteriorly. Wing membrane evenly setose in base of hind wing. Hind wing vein r-m antefurcal.

Legs. Fore tibia only apically with thick spines. Hind tibia without subapical row of thick setae. Claws with large rounded basal lobe with small acute subapical protuberance.

Metasoma with 5 dorsally visible tergites. T1 with weak mid-longitudinal impression and developed dorsolateral carinae; dorsal carinae absent, sublateral carinae strongly developed, complete. T2 with deep dorsolateral impressions and short sublateral carinae; median and anterolateral areas indistinct. Spiracle located at middle of T2. Suture between T2 and T3 straight. T3–T5 without anterolateral areas. Posterior margins of T3–T6 laterally straight, on T5 with crenulate transverse subapical grooves. T5 with wide protruding lamella, medially weakly emarginated. Ovipositor sheath 0.1–0.15 times as long as fore wing. Apex of ovipositor acute, without dorsal nodus and with weak ventral serration.

Sculpture. Head and mesosoma smooth, metasomal tergites rugose.

**Note.** A key to the species of the genus *Eseingoides* is presented by Quicke [1989].

### *Eseingoides crenulatus* Quicke, 1989 (Figs 123–129)

*Eseingoides crenulatus* Quicke, 1989: 300.



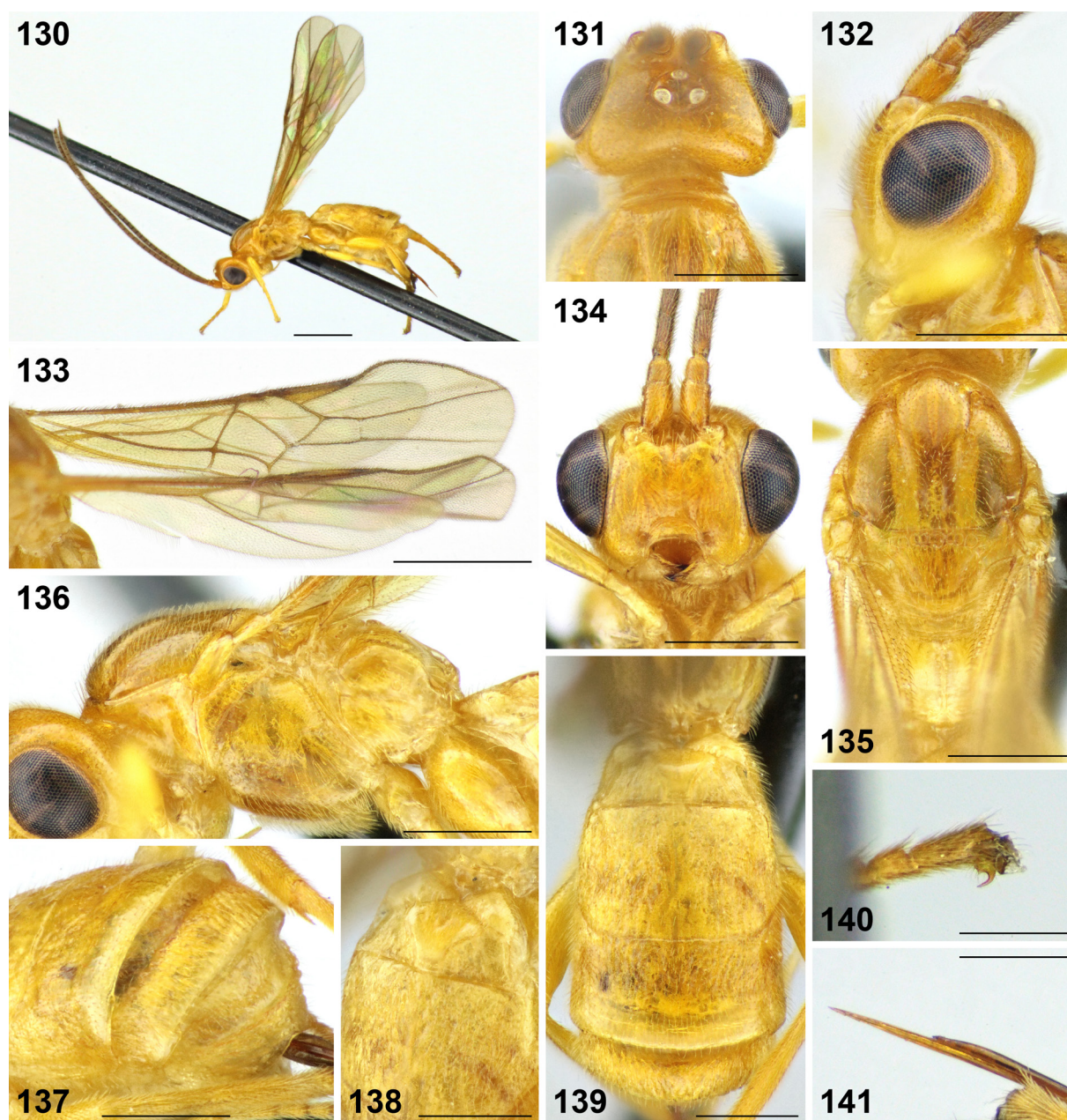
Figs 123–129. *Eseingoides crenulatus*, female, holotype.

123, 127 – habitus: 123 – dorsal view, 127 – lateral view; 124–125 – head: 124 – front view, 125 – anterolateral view; 126 – T1, dorsolateral view; 128 – metasoma, lateral view; 129 – fore wing. Scale bars: 123, 127–129 – 1 mm; 124–126 – 0.5 mm.

Рис. 123–129. *Eseingoides crenulatus*, самка, голотип.

123, 127 – общий вид: 123 – сверху, 127 – сбоку; 124–125 – голова: 124 – вид спереди, 125 – вид спереди/сбоку; 126 – T1, вид сверху/сбоку; 128 – метасома, вид сбоку; 129 – переднее крыло. Масштабные линейки: 123, 127–129 – 1 мм; 124–126 – 0.5 мм.





Figs 130–141. *Esengoides fulvus*, female, paratype.

130 – habitus, lateral view; 131–132, 134 – head: 131 – dorsal view, 132 – lateral view, 134 – front view; 133 – fore wing; 135–136 – mesosoma: 135 – dorsal view, 136 – lateral view; 137 – T3–T5, dorsolateral view; 138 – T1, dorsolateral view; 139 – metasoma, dorsal view; 140 – apex of hind tarsus; 141 – apex of ovipositor. Scale bars: 130, 133 – 1 mm; 131–132, 134–139 – 0.5 mm; 140–141 – 0.25 mm.

Рис. 130–141. *Esengoides fulvus*, самка, паратип.

130 – общий вид сбоку; 131–132, 134 – голова: 131 – вид сверху, 132 – вид сбоку, 134 – вид спереди; 133 – переднее крыло; 135–136 – мезосома: 135 – вид сверху, 136 – вид сбоку; 137 – T3–T5, вид сверху/сбоку; 138 – T1, вид сверху/сбоку; 139 – метасома, вид сверху; 140 – вершина задней лапки; 141 – вершина яйцеклада. Масштабные линейки: 130, 133 – 1 мм; 131–132, 134–139 – 0.5 мм; 140–141 – 0.25 мм.

*Esengoides fulvus* Quicke, 1989  
(Figs 130–141)

*Esengoides fulvus* Quicke, 1989: 301.

**Material.** 1♀, paratype (AEI), Australia, Queensland, Bamaga, "Australia, N. Qld. Bamaga II.20.84 J. Sedlacek Rain forest", "Paratype *Esengoides fulus* Quicke".

**Redescription.** Female. Body length 3.4–3.9 mm; fore wing length 3.6–4 mm.

**Head.** Width of head (dorsal view) 1.9 times its median length. Transverse diameter of eye (dorsal view) 2 times as long as

temple. OOL 2.4–2.7× OD; POL 0.8–0.9× OD; OOL 2.9–3× POL. Frons slightly convex, with deep mid-longitudinal groove. Vertex very weakly longitudinally impressed behind ocelli. Longitudinal diameter of eye in lateral view 1.3 times its transverse diameter; transverse diameter of eye 2.3 times minimum width of temple, hind margins of eye and temple slightly broadened ventrally. Face width 1.4 times combined height of face and clypeus; 2.4 times width of hypoclypeal depression. Width of hypoclypeal depression 1.1 times distance from depression to eye. Height of clypeus 0.35 times width of hypoclypeal depression. Longitudinal diameter

of eye 2.3 times as long as malar space (front view). Maxillary palp longer than eye, but shorter than head.

Antenna with 35–37 antennomeres. First flagellomere 2.5 times as long as its apical width, middle and penultimate flagellomeres 1.4 and 1.7–1.8 times as long as wide, respectively.

Mesosoma 1.6–1.7 times as long as its maximum height. Transverse pronotal sulcus deep anteriorly and posteriorly, shallow medially, crenulate. Mesoscutum 1.1 times its median length (dorsal view). Scutellar sulcus about 0.2 times as long as scutellum. Mesepimeral sulcus crenulate, mesopleural pit deep, furrow-like. Metapleural sulcus smooth. Propodeal spiracle round, located behind middle of propodeum. Propodeum with weak complete mid-longitudinal impression. Mid-longitudinal keel on propodeum complete, with short transverse rugae.

Wings. Vein r arising from basal about 0.35 of pterostigma. Vein 1-R1 1.6 times as long as pterostigma. Marginal cell 8.5 times as long as distance from its apex to apex of wing. Vein 3-SR 1.5–1.9× vein r, 0.25–0.35× vein SR1, 1.1–1.2× vein 2-SR. Vein 1-M 0.7× vein 1-SR + M, 1.6× vein m-cu, 2× vein cu-a. Vein 2-SR + M 0.2× vein 2-SR, 0.25× vein m-cu. Vein 1-SR + M weakly curved anteriorly. Vein cu-a interstitial.

Legs. Fore tibia with thick spines apically. Hind femur 2.8 times as long as wide. Hind tibia 1.4 times as long as hind femur, its inner spur 0.45 times as long as hind basitarsus. Hind tarsus about as long as hind tibia. Fifth segment of hind tarsus 0.5 times as long as hind basitarsus and 1.1 times as long as second segment.

Metasoma. Median length of T1 0.5 times its apical width. T2 medially 1.3 times as long as T3. Basal width of T2 1.3–1.5 times its median length. T2 with hardly distinct in posterior part of tergite mid-longitudinal carina. Ovipositor sheath about 0.6 times as long as hind tibia and 0.1–0.15 times as long as fore wing.

Sculpture. Head and mesosoma almost entirely smooth; face weakly punctate, propodeum posteriorly hardly coriaceous. T1 laterally rugulose, its median area obliquely rugulose posteriorly. T2 and T3 longitudinally rugose, T4 longitudinally rugose to rugulose, T5 weakly sub-transversely rugulose.

Colouration. Body mostly light ochre yellow. Vertex, mesosoma (except propleuron and propodeum) yellowish brown; tegulae yellow. Scape rusty, ventrally brown, flagellum reddish brown. Wing membrane weakly darkened, pterostigma brownish yellow with brown patches basally and apically, wing veins yellowish brown.

### Genus *Gelasinibracon* Quicke, 1989

*Gelasinibracon* Quicke, 1989: 297 (type species *Gelasinibracon sedlaceki* Quicke, 1989). Samartsev, 2019: 76.

= *Pappobracon* Tobias in Belokobyl'skij, Tobias, 2000: 150 (as a subgenus of the genus *Bracon*) (type species *Bracon nodulosus* Papp, 1998). Samartsev, 2019: 76 (as a subgenus of *Gelasinibracon*).

**Composition and distribution.** *Gelasinibracon (Gelasinibracon) sedlaceki* Quicke, 1989 (Papua New Guinea), *G. (G.) simplicicaudatus* Quicke, 1989 (Papua New Guinea), *G. (Pappobracon) nodulosus* (Papp, 1998) (Palaeartic: Far East).

**Redescription.** Female. Head. Toruli not protruding in dorsal view. Vertex with or without mid-longitudinal sulcus. Face evenly convex. Clypeus flattened, ventral rim not protruding or protruding; dorsal carina absent or weak, clypeal sulcus absent or impressed, dorsal clypeal margin sharp or smoothed. Malar suture deep, smooth. Hypostomal carina not or slightly protruding below mandible.

Mesosoma. Median lobe of mesoscutum not or weakly protruding (dorsal view). Notauli deep anteriorly. Mesoscutum evenly setose. Median impression on mesopleuron absent or deep, pit-like. Median area of metanotum with incomplete or complete median carina. Propodeal spiracle not protruding.

Wings. Angle between veins C + SC + R and 1-SR variable, 40–70°. Vein r-m shorter than vein 2-SR. Vein 1-SR + M weakly curved anteriorly. Wing membrane evenly setose at base of hind wing. Hind wing vein r-m (strongly) antefurcal or interstitial.

Legs. Fore tibia with longitudinal and transverse apical rows of thick setae or only with weakly thickened spines sub-apically. Hind tibia without subapical row of thick setae or with 2 thick setae subapically. Claws with acute or blunt angularly protruding basal lobe.

Metasoma with 5 dorsally visible tergites (but T4 and T5 more or less retracted in the subgenus *Gelasinibracon*). T1 with weak or without mid-longitudinal impression and with developed dorsolateral carinae; dorsal carinae absent, sublateral carinae absent (but median area of T1 laterally compressed) or strongly developed and complete. Median area of T2 longitudinal, about half as wide or almost as wide as median area of T1, delineated by deep furrows and sharp margin. Mid-longitudinal keel of T2 absent. Dorsolateral impressions of T2 deep or shallow, sublateral carinae long, anterolateral areas absent. Spiracle located in anterior part or at middle of T2. Suture between T2 and T3 strongly curved medially. Anterolateral areas of T3–T5 absent. Posterior margins of T3–T5 with no transverse subapical grooves, laterally straight or weakly roundly protruding. Ovipositor sheath 0.1–0.15 times as long as fore wing. Apex of ovipositor with developed dorsal nodus and notch and ventral serration or smooth.

Sculpture. Body mostly smooth.

**Notes.** The key to the subgenera and species of *Gelasinibracon* was published earlier [Samartsev, 2019].

### *Gelasinibracon (Gelasinibracon) sedlaceki* Quicke, 1989 (Figs 142–153)

*Gelasinibracon sedlaceki* Quicke, 1989: 298.

**Material.** 1♀, paratype (AEI), Papua New Guinea, "Wau, N. Guinea, 1250 m. II.13-III.13.79 J. Sedlacek, "Paratype *Gelasinibracon sedlaceki* Quicke, 1989".

**Redescription.** Female. Body length 3.3 mm (Quicke [1989]: 3.1–3.5 mm); fore wing length 4 (3.9–4.2) mm.

Head. Width of head (dorsal view) 1.9 times its median length. Transverse diameter of eye (dorsal view) 2.4 times as long as temple. OOL 2.2–2.3× OD; POL 0.8–0.9× OD; OOL 2.4–2.9× POL. Frons with deep mid-longitudinal groove and shallow impressions behind antennae. Vertex with deep mid-longitudinal sulcus. Longitudinal diameter of eye in lateral view 1.4 times its transverse diameter, transverse diameter of eye 3.4 times minimum width of temple, hind margins of eye and temple slightly broadened ventrally. Face width 1.2 times combined height of face and clypeus; 2.4 times width of hypoclypeal depression. Width of hypoclypeal depression 0.95 times distance from depression to eye. Clypeus with not protruding ventral rim, clypeal sulcus absent, dorsal clypeal margin sharp, height of clypeus 0.45 times width of hypoclypeal depression. Longitudinal diameter of eye 2.8 times as long as malar space (front view). Maxillary palp shorter than eye.

Antenna with 29–35 antennomeres. First flagellomere 1.6 times as long as its apical width, middle and penultimate flagellomeres 1.3 and 1.7–1.9 times as long as wide, respectively.

Mesosoma 1.3 times as long as its maximum height. Transverse pronotal sulcus shallow, but complete and crenulate. Mesoscutum 1.2 times its median length (dorsal view). Scutellar sulcus 0.2 times as long as scutellum. Mesopleuron with deep pit in the middle. Mesepimeral sulcus smooth, mesopleural pit furrow-like. Metanotum with incomplete median carina. Metapleural sulcus smooth. Propodeal spiracle vertical, located at middle of propodeum. Mid-longitudinal keel on propodeum complete, with short transverse rugae; mid-longitudinal impression complete and shallow.

Wings. Angle between veins C + SC + R and 1-SR 60–65°. Vein r arising from basal 0.45–0.5 of pterostigma. Vein 1-R1





Figs 142–153. *Gelasinibracon (Gelasinibracon) sedlaceki*, female, paratype.

142 – habitus, lateral view; 143–144, 146 – head: 143 – dorsal view, 144 – lateral view, 146 – front view; 145 – fore wing; 147–148 – mesosoma: 147 – dorsal view, 148 – lateral view; 149, 151 – metasoma: 149 – dorsolateral view, 151 – dorsal view; 150 – T1, dorsal view; 152 – apex of hind tarsus; 153 – apex of ovipositor. Scale bars: 142, 145 – 1 mm; 143–144, 146–151, 153 – 0.5 mm; 152 – 0.25 mm.

Рис. 142–153. *Gelasinibracon (Gelasinibracon) sedlaceki*, самка, паратип.

142 – общий вид сбоку; 143–144, 146 – голова: 143 – вид сверху, 144 – вид сбоку, 146 – вид спереди; 145 – переднее крыло; 147–148 – мезосома: 147 – вид сверху, 148 – вид сбоку; 149, 151 – метасома: 149 – вид сверху/сбоку, 151 – вид сверху; 150 – T1, вид сверху; 152 – вершина задней лапки; 153 – вершина яйцеклада. Масштабные линейки: 142, 145 – 1 мм; 143–144, 146–151, 153 – 0.5 мм; 152 – 0.25 мм.

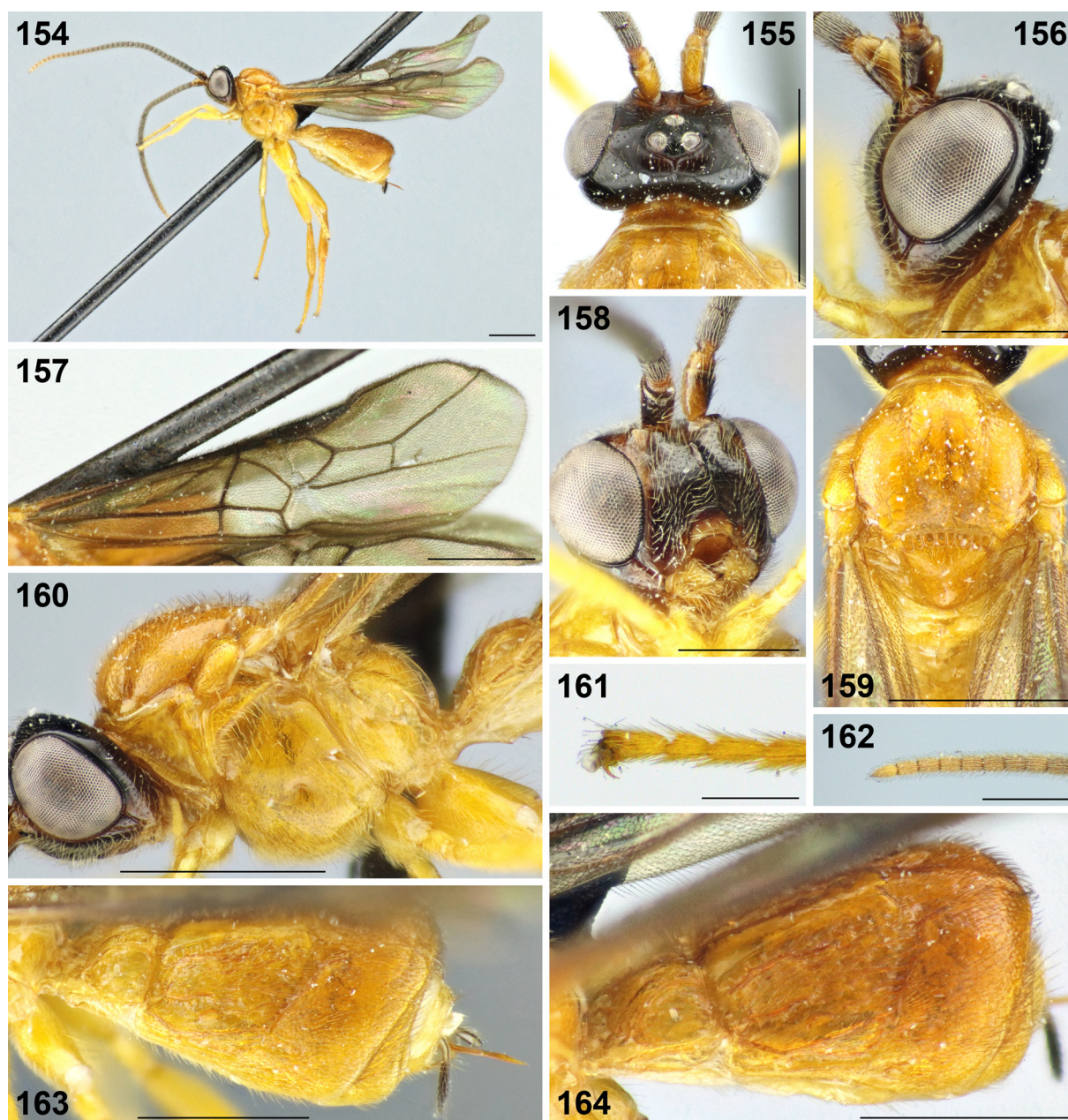
1.8 times as long as pterostigma. Marginal cell 6.3 times as long as distance from its apex to apex of wing. Vein 3-SR 1.8–2× vein r, 0.25–0.35× vein SR1, 1.1–1.2× vein 2-SR. Vein 1-M 0.85× vein 1-SR + M, 1.8× vein m-cu, 2.2× vein cu-a. Vein 2-SR + M 0.35× vein 2-SR, 0.6× vein m-cu. Vein 1-SR + M weakly curved anteriorly. Vein cu-a interstitial. Hind wing vein r-m antefurcal.

Legs. Fore tibia with weakly thickened spines sub-apically. Hind femur 3.3 times as long as wide. Hind tibia 1.5 times as long as hind femur, with 2 thick setae subapically, its inner spur 0.35 times as long as hind basitarsus. Hind tarsus about as long as

hind tibia. Fifth segment of hind tarsus 0.35 times as long as hind basitarsus and 0.7 times as long as second segment. Claws with large, protruding, and blunt basal lobe.

Metasoma. Median length of T1 0.7 times its apical width. T1 with weak mid-longitudinal impression. Sublateral carinae of T1 strongly developed, complete. T2 medially 2.6 times as long as T3. Basal width of T2 0.8 times its median length. Median area of T2 about half as wide as median area of T1, separated by smooth furrows. Suture between T2 and T3 curved backward, smooth. Posterior margins of T3–T5 laterally weakly roundly protruding.





Figs 154–164. *Gelasinibracon (Gelasinibracon) simplicicaudatus* paratype.

154 – habitus, lateral view; 155–156, 158 – head: 155 – dorsal view, 156 – lateral view, 158 – anterolateral view; 157 – fore wing; 159–160 – mesosoma: 159 – dorsal view, 160 – lateral view; 161 – middle leg, apex of tarsus; 162 – apex of antenna; 163 – metasoma, dorsolateral view; 164 – T1–T4, dorsolateral view. Scale bars: 154–155, 157, 159–160, 163–164 – 1 mm; 156, 158, 162 – 0.5 mm; 161 – 0.25 mm.

Рис. 154–164. *Gelasinibracon (Gelasinibracon) simplicicaudatus*, самка, паратип.

154 – общий вид сбоку; 155–156, 158 – голова: 155 – вид сверху, 156 – вид сбоку, 158 – вид спереди/сбоку; 157 – переднее крыло; 159–160 – мезосома: 159 – вид сверху, 160 – вид сбоку; 161 – средняя нога, вершина лапки; 162 – апикальные членики усика; 163 – метасома, вид сверху/сбоку; 164 – T1–T4, вид сверху/сбоку. Масштабные линейки: 154–155, 157, 159–160, 163–164 – 1 мм; 156, 158, 162 – 0.5 мм; 161 – 0.25 мм.

Ovipositor sheath 0.4 times as long as hind tibia and 0.1 times as long as fore wing. Apex of ovipositor with dorsal nodus and deep notch (looking bidental) and with ventral serration.

Sculpture. Body mostly smooth; T2 sparsely areolate to foveate on sides.

Colouration. Body mostly light brownish yellow. Head and mesosoma dorsally with darker brownish tint. Scape rusty, ventrally brown; flagellum brown; maxillary palps pale yellow; tegulae yellow. Wing membrane brownish darkened, pterostigma and wing veins brown.

*Gelasinibracon (Gelasinibracon) simplicicaudatus*  
Quicke, 1989  
(Figs 154–164)

*Gelasinibracon simplicicaudatus* Quicke, 1989: 298.

**Material.** 1♀, paratype (AEI), Papua New Guinea, “Bulolo, N. Guinea, II.13–III.13.79 900 m. J. Sedlacek, “Paratype *Gelasinibracon simplicicaudatus* Quicke, 1989”.

**Redescription.** Female. Body length 4.6 mm (Quicke [1989]: 4.1–4.5 mm); fore wing length 5 (4.3–5.2) mm.

Head. Width of head (dorsal view) 2 times its median length. Transverse diameter of eye (dorsal view) 2.5 times as long as temple. OOL 2× OD; POL 0.8× OD; OOL 2.5× POL. Frons weakly emarginate, with deep mid-longitudinal groove. Vertex with deep mid-longitudinal sulcus. Longitudinal diameter of eye in lateral view 1.3 times its transverse diameter; transverse diameter of eye (lateral view) 3.7 times minimum width of temple, hind margins of eye and temple slightly broadened ventrally. Face width 1.1 times combined height of face and clypeus; 2.5 times width of hypoclypeal depression. Width of hypoclypeal depression 0.95 times distance from depression to eye. Clypeus with not protruding ventral rim, clypeal sulcus absent, dorsal clypeal margin sharp, height of clypeus 0.5 times width of hypoclypeal depression. Longitudinal diameter of eye 2.8 times as long as malar space (front view). Maxillary palp shorter than eye.

Antenna with 35–38 antennomeres. First flagellomere 1.3 times as long as its apical width, middle and penultimate flagellomeres 1.4 and 1.5–1.6 times as long as wide, respectively.

Mesosoma 1.3–1.4 times as long as its maximum height. Transverse pronotal sulcus shallow, but complete, crenulate. Median lobe of mesoscutum weakly protruding (dorsal view). Width of mesoscutum 1.2 times its median length (dorsal view). Notauli deep anteriorly, absent and not united posteriorly. Scutellar sulcus 0.2 times as long as scutellum. Mesopleuron with deep pit in the middle. Mesepimeral sulcus smooth, mesopleural pit deep, furrow-like. Metanotum with incomplete median carina. Metapleural sulcus weakly crenulate. Propodeal spiracle vertical, located in middle of propodeum. Mid-longitudinal keel on propodeum complete, with short transverse rugae; mid-longitudinal impression absent.

Wings. Angle between veins C + SC + R and 1-SR 65–70°. Vein r arising from basal 0.4–0.45 of pterostigma. Vein 1-R1 1.6 times as long as pterostigma. Marginal cell 4 times as long as distance from its apex to apex of wing. Vein 3-SR 1.9–2.1× vein r, 0.4–0.5× vein SR1, 1.2–1.3× vein 2-SR. Vein 1-M 0.8× vein 1-SR + M, 2.1× vein m-cu, 1.8× vein cu-a. Vein 2-SR + M 0.25× vein 2-SR, 0.5× vein m-cu. Vein 1-SR + M curved anteriorly. Vein cu-a interstitial. Hind wing vein r-m strongly antefurcal.

Legs. Fore tibia with weakly thickened spines sub-apically. Hind femur 3.6 times as long as wide. Hind tibia 1.4 times as long as hind femur, without subapical row of thick setae, its inner spur 0.35 times as long as hind basitarsus. Hind tarsus nearly as long as hind tibia. Fifth segment of hind tarsus 0.35 times as long as hind basitarsus and 0.7 times as long as second segment. Claws with protruding and more or less acute basal lobe.

Metasoma. Median length of T1 0.6 times its apical width. T1 with weak mid-longitudinal impression. Sublateral converging carinae of T1 strongly developed, complete. T2 medially 1.5 times as long as T3. Basal width of T2 1.1 times its median length. Median area of T2 about half as wide as median area of T1, separated by crenulate furrows. Suture between T2 and T3 strongly curved medially, crenulate. Posterior margins of T3–T5 laterally weakly roundly protruding. Ovipositor sheath 0.4 times as long as hind tibia and 0.1 times as long as fore wing. Apex of ovipositor acute, with smoothed nodus (dorsal side weakly protruding subapically) and no ventral serration.

Sculpture. Body mostly smooth; T2 laterally areolate-rugose.

Colouration. Similar to *G. sedlaceki*, but with dark brown head, lighter coloured apical flagellomeres, and yellowish brown hind tibia and tarsus.

*Gelasinibracon (Pappobracon) nodulosus* (Papp, 1998)  
(Figs 165–174)

*Bracon (Foveobracon) nodulosus* Papp, 1998: 102.

*Bracon (Pappobracon) nodulosus*: Belokobylskij, Tobias, 2000: 150 (in key).

*Gelasinibracon (Pappobracon) nodulosus*: Samartsev, 2019: 76.

**Material.** 1♀, holotype (HNHM, 123429), North Korea, Gangwon-do, Kumgang Mountain, Lake Samilpo, 18.06.1988 (O. Merkl, G. Szél); 1♀ (ZISP, KS.A0137), Japan, Kumamoto, Momiki, 700 m, Izumi-mura, 20.07.1992 (V.N. Makarkin); 1♂ (ZISP, Hym.KS\_0005184), South Korea, Gyeongsangnam-do, Sancheong-gun, 30 km NNW of Jinju, forest, 800 m, 12.06.2002 (S.A. Belokobylskij); 1♀ (ZISP, Hym.KS\_0005190), 1♂ (ZISP, Hym.KS\_0005191), same data as for preceding, but 29.06.2002; 1♀ (ZISP, Hym.KS\_0005185), same data as for preceding, but 10.07.2002.

**Redescription.** Female. Body length 1.7–2.4 mm; fore wing length 2–2.4 mm.

Head. Width of head (dorsal view) 1.8–1.9 times its median length. Transverse diameter of eye (dorsal view) 1.8–2 times as long as temple. OOL 2.3–2.8× OD; POL 1.1–1.3× OD; OOL 2.1–2.4× POL. Frons not impressed behind antennae, with deep mid-longitudinal groove. Vertex without mid-longitudinal sulcus. Longitudinal diameter of eye in lateral view 1.4–1.5 times its transverse diameter; transverse diameter of eye (lateral view) 1.9–2.2 times minimum width of temple, hind margins of eye and temple broadened ventrally. Face width 1.2–1.3 times combined height of face and clypeus; 2.1–2.4 times width of hypoclypeal depression. Width of hypoclypeal depression 1.1–1.2 times distance from depression to eye. Clypeus flattened, with weakly protruding ventral rim, clypeal sulcus absent, dorsal clypeal margin more or less sharp, height of clypeus 0.3 times width of hypoclypeal depression. Longitudinal diameter of eye 2.5–2.8 times as long as malar space (front view). Maxillary palp longer than eye, but shorter than head.

Antenna with 18–19 antennomeres. First flagellomere 2.7–3.1 times as long as its apical width, middle and penultimate flagellomeres 2.3–2.6 and 2.4–2.6 times as long as wide, respectively.

Mesosoma 1.4–1.5 times as long as its maximum height. Transverse pronotal sulcus deep, crenulate. Median lobe of mesoscutum not protruding (dorsal view). Mesoscutum 1.2 times its median length (dorsal view). Notauli deep anteriorly, shallow posteriorly. Scutellar sulcus 0.1–0.15 times as long as scutellum. Median impression on mesopleuron indistinct. Mesepimeral sulcus smooth, mesopleural pit deep. Median area of metanotum with complete median carina. Metapleural sulcus not deep, smooth. Propodeal spiracle round, located at middle of propodeum. Mid-longitudinal keel developed in apical third of propodeum, simple; mid-longitudinal impression deep and crenulate.

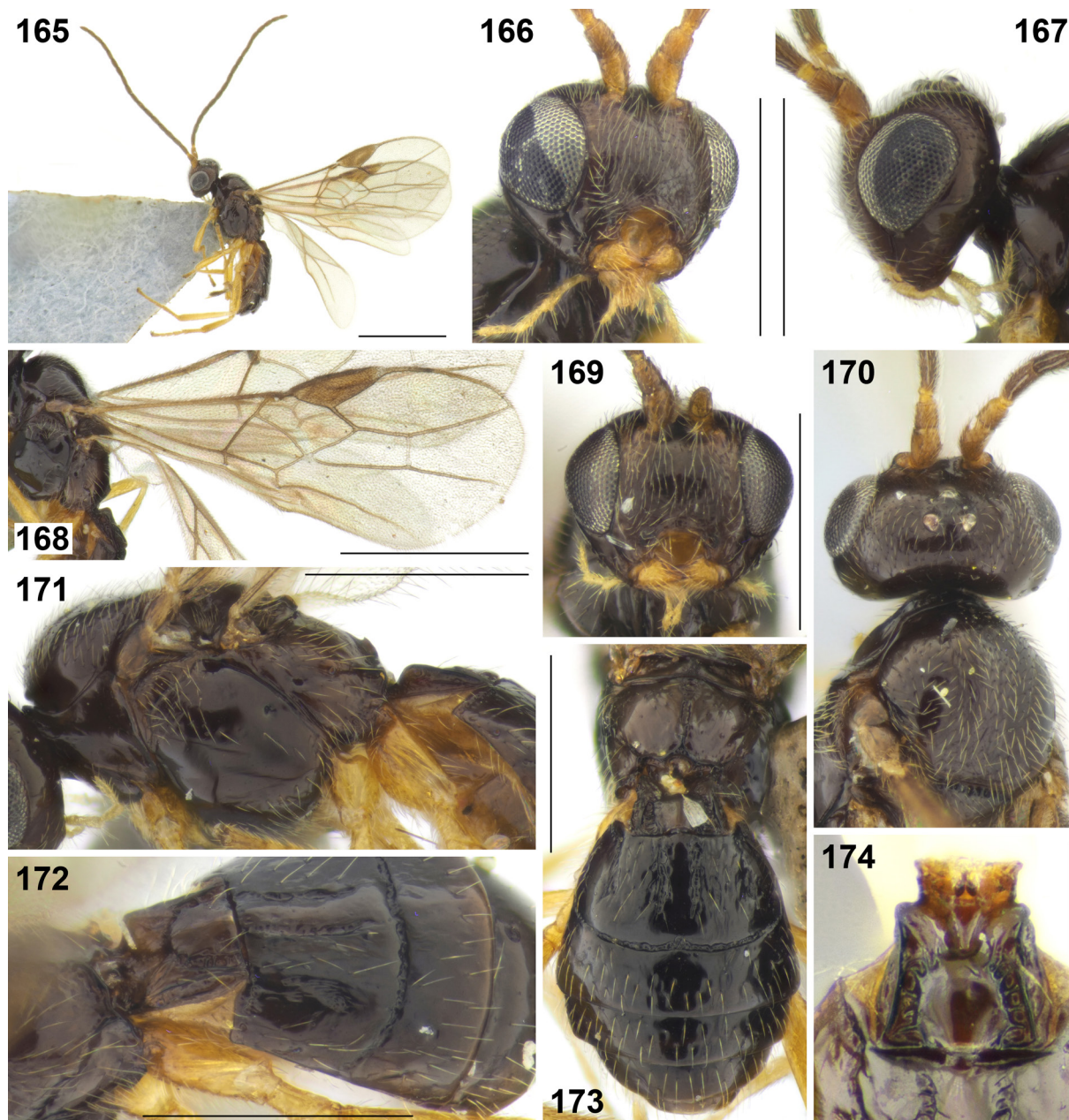
Wings. Angle between veins C + SC + R and 1-SR 40–55°. Vein r arising from basal 0.4 of pterostigma. Vein 1-R1 1.3–1.4 times as long as pterostigma. Marginal cell 5–15 times as long as distance from its apex to apex of wing. Vein 3-SR 1.5× vein r, 0.45–0.5× vein SR1, 0.9–1× vein 2-SR. Vein 1-M 0.65–0.75× vein 1-SR + M, 1.6× vein m-cu, 2.5–2.6× vein cu-a. Vein 2-SR + M 0.1× vein 2-SR, 0.15–0.2× vein m-cu. Vein 1-SR + M weakly curved anteriorly. Vein cu-a interstitial. Hind wing vein r-m interstitial.

Legs. Fore tibia with longitudinal and transverse apical rows of thick setae. Hind femur 3.7–3.9 times as long as wide. Hind tibia 8–8.6 times as long as wide, 1.5–1.6 times as long as hind femur, its inner spur 0.3 times as long as hind basitarsus. Hind tarsus 0.95 times as long as hind tibia. Fifth segment of hind tarsus 0.45–0.47 times as long as hind basitarsus and 0.85–0.95 times as long as second segment. Claws with acute angularly protruding basal lobe.

Metasoma. Median length of T1 0.9–1.05 times its apical width. T1 with no mid-longitudinal impression. Sublateral carinae of T1 absent, but median area of tergite laterally compressed. T2 medially 1.4 times as long as T3. Basal width of T2 1.2–1.3 times its median length. Median area of T2 almost as wide as median area of T1, separated by crenulate furrows. Suture between T2 and T3 strongly curved, crenulate. Posterior margins of T3–T6 laterally straight. Ovipositor sheath 0.5–0.55 times as long as hind tibia and 0.14–0.15 times as long as fore wing. Apex of ovipositor acute, dorsal side weakly protruding, ventral serration indistinct.

Sculpture. Body entirely smooth.





Figs 165–174. *Gelasinibracon (Pappobracon) nodulosus*, female.

165 – habitus, lateral view; 166–167, 169–170 – head: 166 – anterolateral view, 167 – lateral view, 169 – front view, 170 – dorsal view; 168 – fore wing; 171 – mesosoma, lateral view; 172–173 – metasoma: 172 – dorsolateral view, 173 – dorsal view; 174 – T1, dorsal view. Scale bars: 165, 168 – 1 mm; 166–167, 169–174 – 0.5 mm.

Рис. 165–174. *Gelasinibracon (Pappobracon) nodulosus*, самка.

165 – общий вид сбоку; 166–167, 169–170 – голова: 166 – вид спереди/сбоку, 167 – вид сбоку, 169 – вид спереди, 170 – вид сверху; 168 – переднее крыло; 171 – мезосома, вид сбоку; 172–173 – метасома: 172 – вид сверху/сбоку, 173 – вид сверху; 174 – T1, вид сверху. Масштабные линейки: 165, 168 – 1 мм; 166–167, 169–174 – 0.5 мм.

**Colouration.** Body dark brown; scape brownish yellow; maxillary palps yellow; legs brownish yellow. Wing membrane weakly darkened, pterostigma brown, wing veins pale brown.

**Male.** Transverse diameter of eye (dorsal view) 1.8–2.6 times as long as temple. OOL 2.9–3.2× OD; POL 1.4–1.7× OD; OOL 1.9–2× POL. Face width 1.3–1.6 times combined height of face and clypeus. Middle and penultimate flagellomeres 2.8–2.9 and 2.9 times as long as wide, respectively. Mesosoma 1.5–1.6 times as long as its maximum height. Hind femur 4–4.5 times as long as wide. Hind tibia 9–10.2 times as long as wide. Otherwise similar to female.

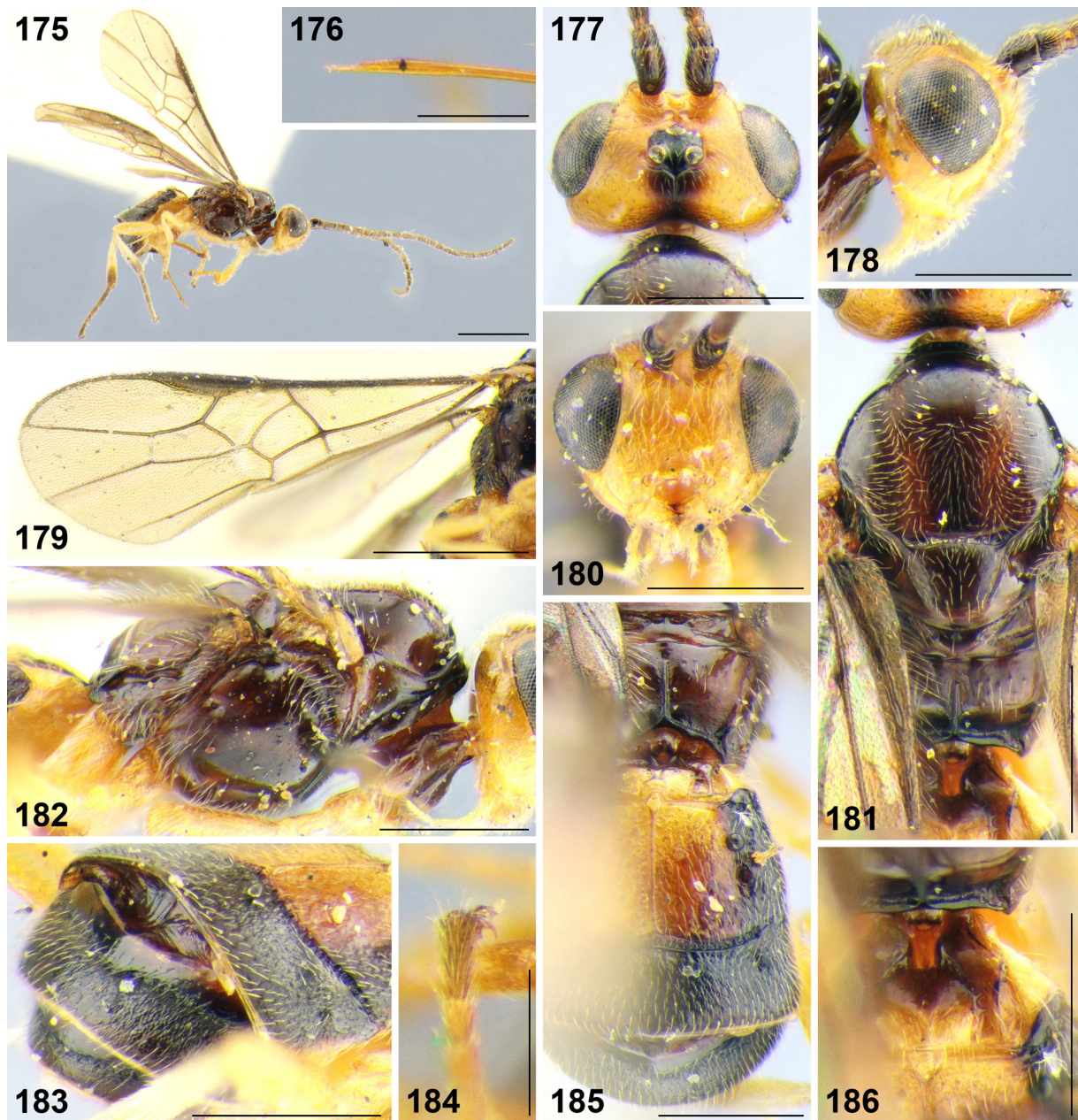
#### Genus *Isomerosoma* gen. n.

Type species *Bracon subacaudatus* Granger, 1949.

**Composition and distribution.** *Isomerosoma subacaudatum* (Granger, 1949), **comb. n.** (Madagascar).

**Description.** Female. Head. Toruli strongly protruding anterolaterally (dorsal view). Vertex with deep mid-longitudinal sulcus. Face evenly convex, without elevated area above clypeus, with complete, but weak mid-longitudinal carina. Clypeus flattened, with weakly protruding ventral rim; dorsal clypeal





Figs 175–186. *Isomerospoma subacaudatum* gen. et comb. n., female, lectotype.

175 – habitus, lateral view; 176 – apex of ovipositor; 177–178, 180 – head: 177 – dorsal view, 178 – lateral view, 180 – front view; 179 – fore wing; 181–182 – mesosoma: 181 – dorsal view, 182 – lateral view; 183 – T3–T5, dorsolateral view; 184 – apex of hind tarsus; 185 – propodeum and metasoma, dorsal view; 186 – T1, dorsal view. Scale bars: 175, 179 – 1 mm; 176, 184 – 0.25 mm; 177–178, 180–183, 185–186 – 0.5 mm.

Рис. 175–186. *Isomerospoma subacaudatum* gen. et comb. n., самка, лектотип.

175 – общий вид сбоку; 176 – вершина яйцеклада; 177–178, 180 – голова: 177 – вид сверху, 178 – вид сбоку, 180 – вид спереди; 179 – переднее крыло; 181–182 – мезосома: 181 – вид сверху, 182 – вид сбоку; 183 – T3–T5, вид сверху/сбоку; 184 – вершина задней лапки; 185 – проподоум и метасома, вид сверху; 186 – T1, вид сверху. Масштабные линейки: 175, 179 – 1 мм; 176, 184 – 0.25 мм; 177–178, 180–183, 185–186 – 0.5 мм.

margin sharp, without both dorsal carina and clypeal sulcus. Malar suture deep and smooth. Hypostomal carina slightly protruding below mandible.

Mesosoma. Median lobe of mesoscutum weakly protruding (dorsal view). Notauli deep anteriorly, absent posteriorly, smooth. Mesoscutum widely setose on notauli and posteriorly, anteromedially widely glabrous. Median impression on mesopleuron absent. Metanotum with incomplete median carina.

Wings. Angle between veins C + SC + R and 1-SR 55–60°. Vein r-m shorter than vein 2-SR. Vein 1-SR + M distinctly curved

anteriorly. Wing membrane evenly setose in base of hind wing. Hind wing vein r-m antefurcal.

Legs. Fore tibia only subapically with weakly thickened spiny setae. Hind tibia without subapical row of thick setae. Claws with small rectangular basal lobe.

Metasoma with 5 dorsally visible tergites. T1 basally with crenulate mid-longitudinal impression, with very distantly separated dorsolateral carinae, and without both dorsal and sublateral carinae (but median area of T1 laterally compressed and apically with short and weak median keel). Median area of T2

strongly elevated, very small, elongate-triangular, and extending into strong complete mid-longitudinal keel. Dorsolateral impressions of T2 shallow, foveate, sublateral carinae absent. Spiracle located in middle of T2, distinctly in its dorsum. Suture between T2 and T3 curved. Anterolateral areas of T3–T5 indistinct. Posterior margins of T3–T5 without transverse subapical grooves, laterally straight. Apical tergite without projections or incisure. Ovipositor very short; its apex acute, dorsal nodus absent, ventral serration weak.

Sculpture. Head and mesosoma smooth, metasomal tergites weakly granulate.

**Diagnosis.** *Isomerosoma* gen. n. is most similar to the genus *Crinibracon*. Differences between these taxa are listed below.

1. Vertex with deep mid-longitudinal sulcus. Notauli shallow. Mesoscutum widely setose on notaular area and posteriorly, but with widely glabrous median lobe. Dorsal carinae of T1 absent, mid-longitudinal keel very short. T2 without sublateral carinae. Metasoma with 5 dorsally visible tergites. Apex of ovipositor simple ..... *Isomerosoma* gen. n.
- Vertex at most weakly mid-longitudinally impressed. Notauli deep. Mesoscutum evenly setose. Dorsal carinae of T1 complete, fused with hind margin of tergite by a mid-longitudinal keel. T2 with long sublateral carinae. Metasoma with 6 dorsally visible tergites. Apex of ovipositor distinctly dorsally expanded ..... *Crinibracon*

**Etymology.** From the Greek “ἴσμερής” (“equally divided”) and “σῶμα” (“body”), because the longitudinal structures, i.e. the sulcus on vertex and the keels on propodeum, T1, and T2, imaginary divide the wasp’s body in the sagittal plane. Gender neuter.

*Isomerosoma subacaudatum* (Granger, 1949), **comb. n.**  
(Figs 175–186)

*Bracon subacaudatus* Granger, 1949: 73.

**Material.** 1♀, lectotype (designated here) (MNHN EY19054), “♀”, “Madagascar Ranomafana”, “Muséum Paris, X-38, A. Seyrig”, “30”, “Lectotype”, “Museum Paris ex coll. J. Barbier in Ch. Granger”, “*Bracon subacaudatus* Granger, 1949”, “MNHN Paris”.

The second syntype female (paralectotype) with the inventory number EY19053 (MNHN, Madagascar, Ankaratra, 02.1939, A. Seyrig) was not examined.

**Redescription.** Female. Body length 2.9 mm; fore wing length 3.1 mm.

Head. Width of head (dorsal view) 2 times its median length. Transverse diameter of eye (dorsal view) 2.4 times as long as temple. OOL 2.3× OD; POL 1× OD; OOL 2.3× POL. Frons with very deep mid-longitudinal groove and shallow impressions behind antennae. Longitudinal diameter of eye in lateral view 1.3 times its transverse diameter, transverse diameter of eye 2.6 times minimum width of temple, hind margins of eye and temple broadened ventrally. Face width 1.3 times combined height of face and clypeus; 2.6 times width of hypoclypeal depression. Width of hypoclypeal depression 0.8 times distance from depression to eye. Height of clypeus 0.45 times width of hypoclypeal depression. Longitudinal diameter of eye 2.2 times as long as malar space (front view). Maxillary palp as long as eye height.

Antenna with 30 antennomeres. First flagellomere 1.7 times as long as its apical width, middle and penultimate flagellomeres 1.6 and 1.8 times as long as wide, respectively.

Metasoma 1.5 times as long as its maximum height. Transverse pronotal sulcus deep and smooth. Mesoscutum

1.2 times its median length (dorsal view). Mesepimeral sulcus smooth, mesopleural pit deep, wide, and separated from mesepimeral sulcus. Metapleural sulcus smooth. Propodeal spiracle round, located behind middle of propodeum, not protruding. Mid-longitudinal keel on propodeum complete, simple, lying in complete shallow mid-longitudinal impression.

Wings. Vein r arising from basal 0.4 of pterostigma. Vein 1-R1 1.3 times as long as pterostigma. Marginal cell 15 times as long as distance from its apex to apex of wing. Vein 3-SR 1.5× vein r, 0.4× vein SR1, 1.1× vein 2-SR. Vein 1-M 0.6× vein 1-SR + M, 1.7× vein m-cu, and 1.7 times as long as vein cu-a. Vein 2-SR + M 0.25× vein 2-SR, 0.45× vein m-cu. Vein 1-SR + M curved anteriorly. Vein cu-a interstitial.

Legs. Hind femur 3.3 times as long as wide. Hind tibia 1.4 times as long as hind femur. Hind tarsus as long as hind tibia. Its inner spur 0.3 times as long as hind basitarsus. Fifth segment of hind tarsus 0.4 times as long as hind basitarsus and 0.9 times as long as second segment.

Metasoma. Median length of T1 0.6 times its apical width. T2 medially 1.5 times as long as T3; basal width of T2 1.3 times its median length. Ovipositor sheath 0.35 times as long as hind tibia and 0.1 times as long as fore wing.

Sculpture. Head and mesosoma entirely smooth. T1 mostly smooth, its median area weakly foveate posteriorly, T2 weakly granulate to smooth, T3 weakly granulate, T4 and T5 granulate.

Colouration. Head brownish yellow, malar space and maxillary palp yellow. Scape dark brown, flagellum brown. Mesosoma dark brown, but lighter coloured along notauli; tegulae yellowish brown. Wing membrane weakly brownish darkened; pterostigma and wing veins brown. Legs mostly yellow; hind tibia pale yellow with brown apex, hind tarsus brown. Metasomal tergites brownish black; median area of T1 and T2 medially between sublateral impressions brownish yellow.

### Genus *Lyricibracon* Quicke, 1988

*Lyricibracon* Quicke, 1988: 414 (type species *Lyricibracon bicolorus* Quicke, 1988). Ranjith et al., 2017: 423.

**Composition and distribution.** *Lyricibracon bicolorus* Quicke, 1988 (Brunei), *L. jenningsi* Ranjith, 2017 (India), *L. nigerianus* (Quicke, 1988), **comb. n.** (Nigeria).

**Redescription.** Female. Head. Toruli somewhat protruding in dorsal view. Vertex weakly mid-longitudinally impressed. Face evenly convex. Clypeus flattened, with weakly protruding ventral rim; dorsal carina and clypeal sulcus absent, dorsal clypeal margin sharp. Malar suture deep, smooth. Hypostomal carina strongly protruding, lamelliform.

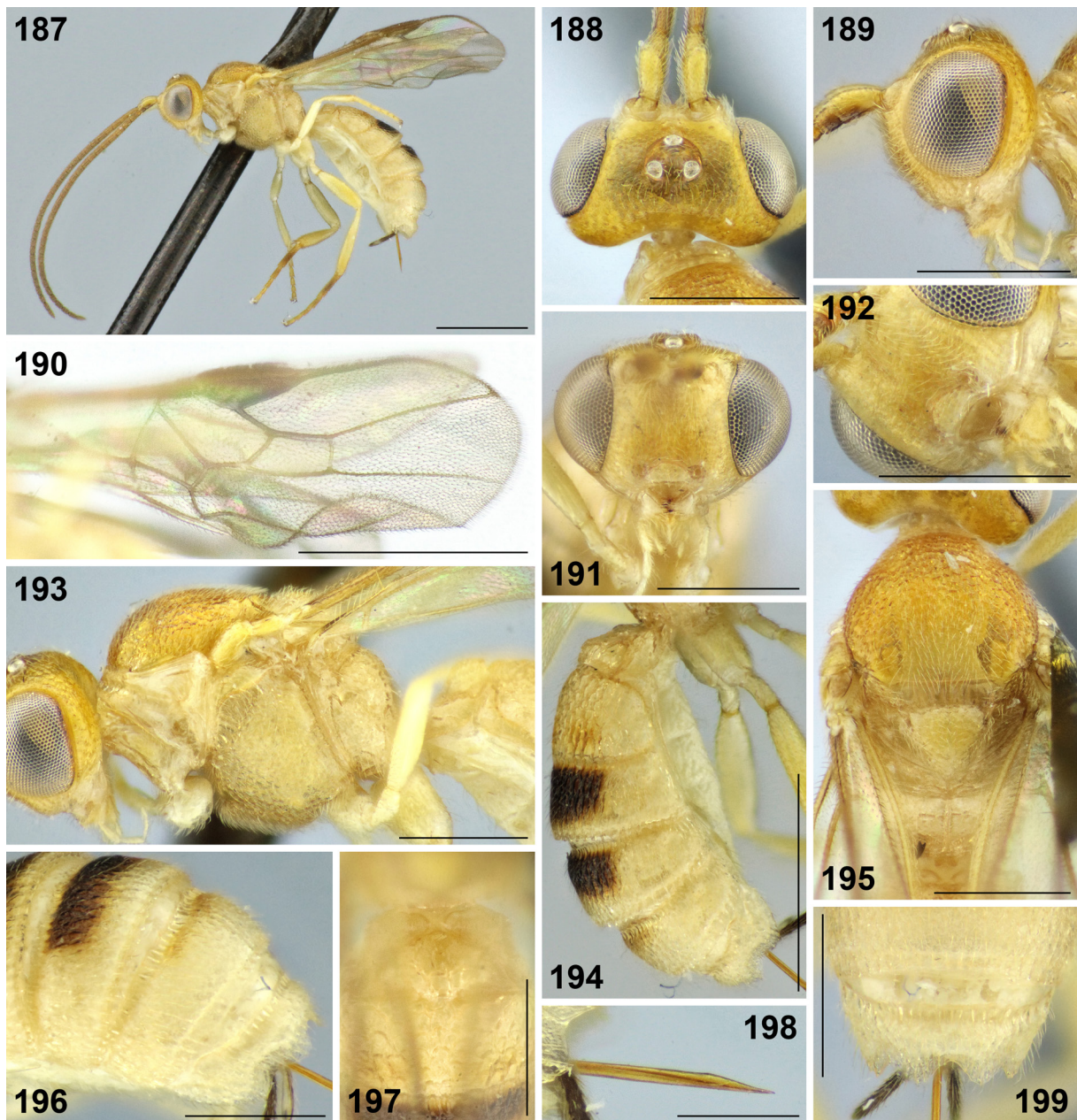
Mesosoma. Median lobe of mesoscutum weakly protruding (dorsal view). Notauli deep anteriorly, shallow posteriorly, rugose. Mesoscutum evenly setose. Precoxal sulcus vaguely impressed (*Lyricibracon bicolorus*: well developed [Quicke, 1988]). Median area of metanotum medially elevated, with high complete median carina. Propodeal spiracle not protruding.

Wings. Angle between veins C + SC + R and 1-SR 50–70°. Vein r-m shorter than vein 2-SR. Vein 1-SR + M straight or slightly curved anteriorly. Wing membrane evenly setose at base of hind wing or glabrous near vein cu-a. Hind wing vein r-m interstitial or weakly antefurcal.

Legs. Fore tibia with sparse longitudinal and transverse apical rows of thick setae (*Lyricibracon bicolorus*: without transverse row [Quicke, 1988]). Hind tibia without subapical row of thick setae. Claws with acute angularly protruding basal lobe.

Metasoma with 6 dorsally visible tergites. T1 without mid-longitudinal impression, with developed dorsolateral carinae and complete dorsal carinae; sublateral carinae absent, but median area of T1 laterally compressed. Median area and





Figs 187–199. *Lyricibracon nigerianus* **comb. n.**, female, paratype.

187 – habitus, lateral view; 188–189, 191–192 – head: 188 – dorsal view, 189 – lateral view, 191 – front view, 192 – anterolateral view; 190 – fore wing; 193, 195 – mesosoma: 193 – lateral view, 195 – dorsal view; 194 – metasoma, lateral view; 196 – T4–T6, dorsolateral view; 197 – T1, dorsal view; 198 – apex of ovipositor; 199 – T6, dorsal view. Scale bars: 187, 190, 194 – 1 mm; 188–189, 191–193, 195–197, 199 – 0.5 mm; 198 – 0.25 mm.

Рис. 187–199. *Lyricibracon nigerianus* **comb. n.**, самка, паратип.

187 – общий вид сбоку; 188–189, 191–192 – голова: 188 – вид сверху, 189 – вид сбоку, 191 – вид спереди, 192 – вид спереди/сбоку; 190 – переднее крыло; 193, 195 – мезосома: 193 – вид сбоку, 195 – вид сверху; 194 – метасома, вид сбоку; 196 – T4–T6, вид сверху/сбоку; 197 – T1, вид сверху; 198 – вершина яйцеклада; 199 – T6, вид сверху. Масштабные линейки: 187, 190, 194 – 1 мм; 188–189, 191–193, 195–197, 199 – 0.5 мм; 198 – 0.25 мм.

mid-longitudinal keel of T2 absent; sublateral carinae absent or short. Spiracle located at middle of T2. Suture between T2 and T3 almost straight. T3–T6 without anterolateral areas, their posterior margins with crenulate transverse subapical grooves. T6 with large lateroposterior and often (sub-)medioposterior protuberances. Ovipositor sheath about 0.2 times as long as fore wing. Apex of ovipositor with weak nodus and weak ventral serration.

Sculpture. Head and mesosoma widely granulate, metasomal tergites rugose.

*Lyricibracon nigerianus* (Quicke, 1988), **comb. n.**  
(Figs 187–199)

*Rugosibracon nigerianus* Quicke, 1988: 416.

**Material.** 1♀, paratype (AEI), "Zaruma, Nigeria, Sept. 74 W. State, J. T. Medler"; "Paratype *Rugosibracon nigerianus* Quicke, Braconinae Det. D. Quicke 1987".

**Redescription.** Female. Body length 3.3 mm; fore wing length 2.7 mm.

Head. Width of head (dorsal view) 2 times its median length. Transverse diameter of eye (dorsal view) 2.7 times as long as temple.

OOL 2.3× OD; POL 1.2× OD; OOL 2× POL. Frons with weak mid-longitudinal groove and shallow impressions behind antennae. Longitudinal diameter of eye in lateral view 1.2 times its transverse diameter; transverse diameter of eye 4 times minimum width of temple, hind margins of eye and temple parallel. Face width 1.2 times combined height of face and clypeus; 2.3 times width of hypoclypeal depression. Width of hypoclypeal depression as large as distance from depression to eye. Height of clypeus 0.45 times width of hypoclypeal depression. Longitudinal diameter of eye 2.8 times as long as malar space (front view). Maxillary palp shorter than eye.

Antenna with 31 antennomeres. First flagellomere 1.9 times as long as its apical width, middle and penultimate flagellomeres 1.6 and 2 times as long as wide, respectively.

Mesosoma 1.4 times as long as its maximum height. Transverse pronotal sulcus deep and wide, crenulate. Width of mesoscutum 1.3 times its median length (dorsal view). Notauli not united posteriorly. Scutellar sulcus 0.3 times as long as scutellum. Mesepimeral sulcus crenulate, mesopleural pit deep. Metapleural sulcus weakly crenulate. Propodeal spiracle round, located in middle of propodeum. Mid-longitudinal keel on propodeum complete, simple; mid-longitudinal impression complete and shallow.

Wings. Vein r arising from basal 0.45 of pterostigma. Vein 1-R1 1.7 times as long as pterostigma. Marginal cell 7 times as long as distance from its apex to apex of wing. Vein 3-SR 1.4× vein r, 0.3× vein SR1, 1.2× vein 2-SR. Vein 1-M 0.7× vein 1-SR+M, 2.2× vein m-cu, 1.8× vein cu-a. Vein 2-SR+M 0.8× vein 2-SR, 1.4× vein m-cu. Vein cu-a interstitial. Wing membrane evenly setose in base of hind wing.

Legs. Hind femur 3.4 times as long as wide. Hind tibia 1.3 times as long as hind femur, its inner spur 0.35 times as long as hind basitarsus. Hind tarsus 1.1 times as long as hind tibia. Fifth segment of hind tarsus 0.4 times as long as hind basitarsus and 0.75 times as long as second segment.

Metasoma. Median length of T1 0.5 times its apical width. T2 medially 1.2 times as long as T3; basal width of T2 1.6 times its median length. T6 with large submedioposterior and lateroposterior protuberances. Ovipositor sheath 0.6 times as long as hind tibia and 0.2 times as long as fore wing.

Sculpture. Face, frons, and vertex granulate; genae coriaceous; malar space granulate-rugulose. Pronotum weakly granulate, propleuron almost smooth; mesoscutum, scutellum, and mesopleuron foveate-granulate; metanotum rugose; propodeum rugose anteriorly, granulate posteriorly. Coxae hardly coriaceous to smooth. T1 laterally rugose, with posteriorly areolate-rugose median area; T2 and T3 areolate-rugose; T4 areolate-rugose to granulate-rugose; T5–T6 granulate-rugulose.

Colouration. Body pale yellow. Scape brownish yellow, ventrally brown, flagellum and hind tarsus brown. Head dorsally, face medially, and mesoscutum (brownish) yellow. Tegulae yellow. T3 and T4 medially with wide brown patches. Wing membrane weakly darkened, pterostigma and veins brown.

Male (not examined). Posterior margin of T6 medially straight [Quicke, 1988].

**Note.** This species is transferred from *Rugosibracon* to *Lyticibracon* because of the following differences between these genera. The holotype of the type species of *Rugosibracon*, *R. maculithorax* Quicke, 1988 (female, AEI), has been studied.

1. Face medially not mid-longitudinally elevated. Malar suture deep. Hypostomal carina strongly protruding below base of mandible. Vein 1-SR+M (almost) straight. Median lobe of mesoscutum weakly protruding (dorsal view). T2 without sublateral carinae (or with short carinae: *L. jenningsi* Ranjith, 2017). Posterior margins of T3–T6 laterally straight ..... *Lyticibracon*

– Face medially weakly elevated mid-longitudinally. Malar suture absent. Hypostomal carina slightly protruding below base of mandible. Vein 1-SR+M distinctly curved anteriorly. Median lobe of mesoscutum strongly protruding (dorsal view). T2 with long parallel sublateral carinae. Posterior margins of T3–T6 laterally protruding and acutely pointed ..... *Rugosibracon*

### Genus *Plesiobracon* Cameron, 1903

*Plesiobracon* Cameron, 1903: 123 (type species *Plesiobracon carinatus* Cameron, 1903).

**Composition and distribution.** *Plesiobracon carinatus* Cameron, 1903 (Malaysia), *P. cincticauda* (Enderlein, 1920) (Indonesia), *P. vierecki* (Strand, 1912) (Papua New Guinea).

**Redescription.** Female. Head. Toruli somewhat protruding in dorsal view. Vertex without mid-longitudinal sulcus. Face weakly mid-longitudinally elevated. Clypeus flattened or prominent, with weakly protruding ventral rim; dorsal carina absent or weak, clypeal sulcus absent. Malar suture weakly impressed. Hypostomal carina not protruding below mandible.

Mesosoma. Median lobe of mesoscutum weakly or strongly protruding (dorsal view). Notauli deep anteriorly, shallow posteriorly, smooth. Mesoscutum widely glabrous anteromedially, with setae at notaulic area and posteriorly. Median impression on mesopleuron indistinct. Median area of metanotum with incomplete median carina.

Wings. Angle between veins C + SC + R and 1-SR 60–70°. Vein r-m shorter than vein 2-SR. Vein 1-SR+M weakly curved anteriorly. Wing membrane glabrous or sparsely setose at base of hind wing.

Legs. Fore tibia with longitudinal and transverse apical rows of thick setae. Hind tibia with subapical transverse row of spiny setae. Claws with large triangular lobe.

Metasoma with 7 dorsally visible tergites (but T6–T7 distinctly retracted). T1 with distinct mid-longitudinal impression, developed dorsolateral carinae, incomplete or weak dorsal carinae, and without sublateral carinae. Median area of T2 strongly elevated, narrow, elongate-triangular, extending into incomplete mid-longitudinal keel. T2 with long more or less converging sublateral carinae. Spiracle located in anterior part of T2. Suture between T2 and T3 almost straight. T3–T6 without anterolateral areas; with deep and crenulate transverse subapical grooves. Posterior margins of T3 and T4 laterally weakly roundly protruding. Ovipositor sheath 1–1.3 times as long as fore wing. Apex of ovipositor with developed dorsal nodus and ventral serration.

Sculpture. Head and mesosoma mostly smooth, metasomal tergites longitudinally rugose.

*Plesiobracon carinatus* Cameron, 1903  
(Figs 200, 204, 205, 208, 209, 211–213)

*Plesiobracon carinata* Cameron, 1903: 123. Van Achterberg, 1983: 186 (lectotype designation).

**Material.** 1♀, lectotype (BMNH, NHMUK\_010888614), Malaysia, "Type", "Kuching Feb. 3 1902", "Cameron Coll. 1903-121.", "*Plesiobracon Carinata* Cam. Type Borneo.", "♀ *Plesiobracon carinata* Cameron, C. van Achterberg, 1981, Lectotype", "B.M. Type Hym. 3c.603".

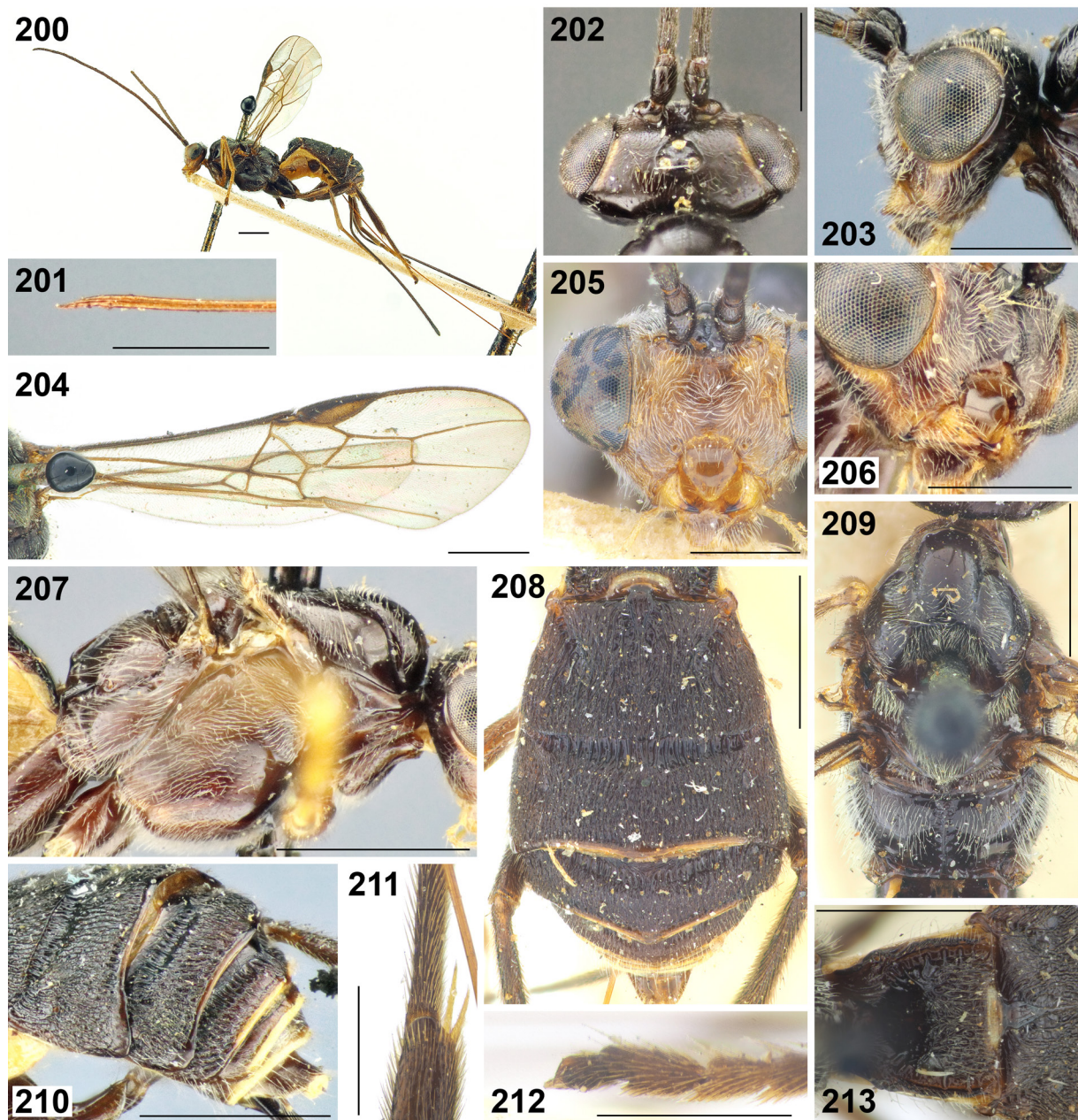
*Plesiobracon cincticauda* (Enderlein, 1920)  
(Figs 201–203, 206, 207, 210)

*Campyloneurus cincticauda* Enderlein, 1920: 104.

*Plesiobracon cincticauda*: Quicke, van Achterberg, 1990: 255.

**Material.** 1♀, holotype (MIIZ), Indonesia, "Dohrn Sumatra Liangagas", "Type", "*Campyloneurus cincticauda* Type Enderl. ♀ Dr. Enderlein det. 1919", "♀ *Campyloneurus cincticauda* Enderlein C. van Achterberg, 1990, Holotype".





Figs 200–213. *PlesioBracon* species, females.

200, 204–205, 208–209, 211–213 – *P. carinatus*, lectotype; 201–203, 206–207, 210 – *P. cincticauda*, holotype. 200 – habitus, lateral view; 201 – apex of ovipositor; 202–203, 205–206 – head: 202 – dorsal view, 203 – lateral view, 205 – front view, 206 – anterolateral view; 204 – fore wing; 207, 209 – mesosoma: 207 – lateral view, 209 – dorsal view; 208 – metasoma, dorsal view; 210 – T3–T6, dorsolateral view; 211 – apex of hind tibia; 212 – apex of hind tarsus; 213 – T1, dorsal view. Scale bars: 200, 204, 207, 210 – 1 mm; 201–203, 205–206, 208–209, 211–213 – 0.5 mm.

Рис. 200–213. Виды рода *PlesioBracon*, самки.

200, 204–205, 208–209, 211–213 – *P. carinatus*, лектотип; 201–203, 206–207, 210 – *P. cincticauda*, голотип. 200 – общий вид сбоку; 201 – вершина яйцеклада; 202–203, 205–206 – голова: 202 – вид сверху, 203 – вид сбоку, 205 – вид спереди, 206 – вид спереди/сбоку; 204 – переднее крыло; 207, 209 – мезосома: 207 – вид сбоку, 209 – вид сверху; 208 – метасома, вид сверху; 210 – T3–T6, вид сверху/сбоку; 211 – вершина задней голени; 212 – вершина задней лапки; 213 – T1, вид сверху. Масштабные линейки: 200, 204, 207, 210 – 1 мм; 201–203, 205–206, 208–209, 211–213 – 0.5 мм.

**Genus *Pseudochivinia***  
**Long et van Achterberg, 2023, stat. n.**

*Pseudochivinia* Long et van Achterberg in Long et al., 2023: 532 (as a subgenus of *Bracon* Fabricius, 1804) (type species *Bracon tobiasi* Long et van Achterberg, 2023).

**Composition and distribution.** *Pseudochivinia vitobiasi* (Long et van Achterberg), **nom. et comb. n.** (= *B. tobiasi* Long et van Achterberg, 2023) (Vietnam).

**Redescription.** Female. Head. Toruli not protruding in dorsal view. Vertex without mid-longitudinal sulcus. Face with median triangular area weakly and narrowly elevated above clypeus; mid-



longitudinal carina distinct in upper half of face, projecting upwards between toruli, in upper part widened and flattened. Clypeal sulcus absent, dorsal clypeal margin sharp. Malar suture absent.

Mesosoma. Median lobe of mesoscutum weakly protruding (dorsal view). Notauli weakly impressed anteriorly, absent posteriorly. Mesoscutum along notauli widely setose. Median impression on mesopleuron absent. Median area of metanotum with incomplete median carina.

Wings. Angle between veins C + SC + R and 1-SR 80–85°. Vein r-m absent. Vein 1-SR + M straight. Wing membrane evenly setose in base of hind wing; vein r-m weakly antefurcal.

Legs. Hind tibia with 1 thick seta subapically. Claws with acute angularly protruding basal lobe.

Metasoma with partly retracted, but dorsally visible T6–T7. T1 with deep, crenulate mid-longitudinal impression, developed dorsolateral carinae, without dorsal and sublateral carinae. Median area, mid-longitudinal keel, and sublateral carinae of T2 absent; dorsolateral impressions of T2 deep, weakly diverging, and rugose. Spiracle located in anterior part of T2. Suture between T2 and T3 almost straight. Anterolateral areas weakly defined only on T3, with inner sides separated by shallow grooves. Posterior margins of T3–T6 without transverse subapical grooves, laterally straight. Ovipositor sheath 0.13 times as long as fore wing. Apex of ovipositor with developed dorsal nodus, weak notch, and ventral serration.

Sculpture. Head and mesosoma mostly smooth, metasomal tergites longitudinally rugose.

**Note.** *Pseudochivinia* differs from the genus *Bracon* by the presence of an elevated median area on the face, a high, lamella-like, mid-longitudinal keel on the propodeum, a deep mid-longitudinal impression of T1 and weak, but distinct anterolateral areas on T3. According to these characters, the taxon *Pseudochivinia* is included in the *Plesiobracon* group as a separate genus; its differences from the most similar genus *Simplicibracon* (listed in the key couplet 9 above) currently do not allow me to consider it a subgenus of the latter.

*Pseudochivinia vitobiasi*

(Long et van Achterberg), **nom. et comb. n.**

*Bracon* (*Pseudochivinia*) *tobiasi* Long et van Achterberg, 2023: 534 (nec Papp, 1965: 411).

**Note.** After consultation and with the consent of the authors of the published name, in accordance with article 50.1.1. of the International Code of Zoological Nomenclature [1999], *Bracon tobiasi* Long et van Achterberg, 2023 is renamed here to *Bracon vitobiasi* Long et van Achterberg, **nom. n.** The new replacement name is given in memory of Prof. V.I. Tobias. The new combination is proposed by the author of this paper.

**Genus *Reticulotergus* gen. n.**

Type species *Cassidibracon indicus* Narendran et Rema, 1994.

**Composition and distribution.** *Reticulotergus indicus* (Narendran et Rema, 1994), **comb. n.** (India).

**Description.** Female. Head. Toruli not protruding in dorsal view. Vertex weakly mid-longitudinally impressed. Face evenly convex, without elevated area above clypeus, with distinct mid-longitudinal carina. Clypeus flattened, with not protruding ventral rim; dorsal clypeal margin sharp, without dorsal carina and with impressed clypeal sulcus. Malar suture deep and smooth. Hypostomal carina not protruding below mandible.

Mesosoma. Median lobe of mesoscutum weakly protruding (dorsal view). Notauli very deep anteriorly, impressed posteriorly, weakly crenulate. Mesoscutum evenly setose. Median impression on mesopleuron absent. Median area of metanotum with incomplete median carina.

Wings. Angle between veins C + SC + R and 1-SR 65–70°. Vein r-m shorter than vein 2-SR. Vein 1-SR + M weakly curved anteriorly. Wing membrane evenly setose at base of hind wing.

Legs. Hind tibia without subapical row of thick setae. Claws with acute angularly protruding basal lobe.

Metasoma with 5 dorsally visible tergites. T1 without mid-longitudinal impression, with weakly separated dorsolateral carinae, without dorsal carinae (but median area elevated on their place) and without sublateral carinae. Median area, mid-longitudinal keel, and sublateral carinae of T2 absent; dorsolateral impressions shallow. Spiracle in anterior part of T2. Suture between T2 and T3 curved. Anterolateral areas of T3–T6 indistinct. Posterior margins of T3–T5 with deep crenulate transverse subapical grooves, laterally weakly protruding. Apex of ovipositor with weak nodus and distinct ventral serration.

Sculpture. Propleuron and mesopleuron weakly coriaceous; coxae very weakly coriaceous; mesoscutum medially reticulate-granulate; metasomal tergites irregularly reticulate-rugose.

**Note.** The new genus is most similar to *Acrocerilia* and *Scutibracon* and especially to the taxon concept of the latter proposed by Quicke and Walker [1989]. The most marked characters that distinguish *Reticulotergus* **gen. n.** from related taxa are the sculptured mesosoma, the absence of both dorsal and sublateral carinae of T1, and the short and strongly transverse T2. Comparative diagnosis of the new genus is given in the key to genera above.

**Etymology.** From the Latin nouns “reticulus” (“a little net”, “network”) and “tergum” (“back”, “surface”), because of remarkable reticulate sculpture of the body. Gender masculine.

*Reticulotergus indicus*

(Narendran et Rema, 1994), **comb. n.**  
(Figs 214–223)

*Cassidibracon indicus* Narendran et Rema in Narendran et al., 1994: 130.

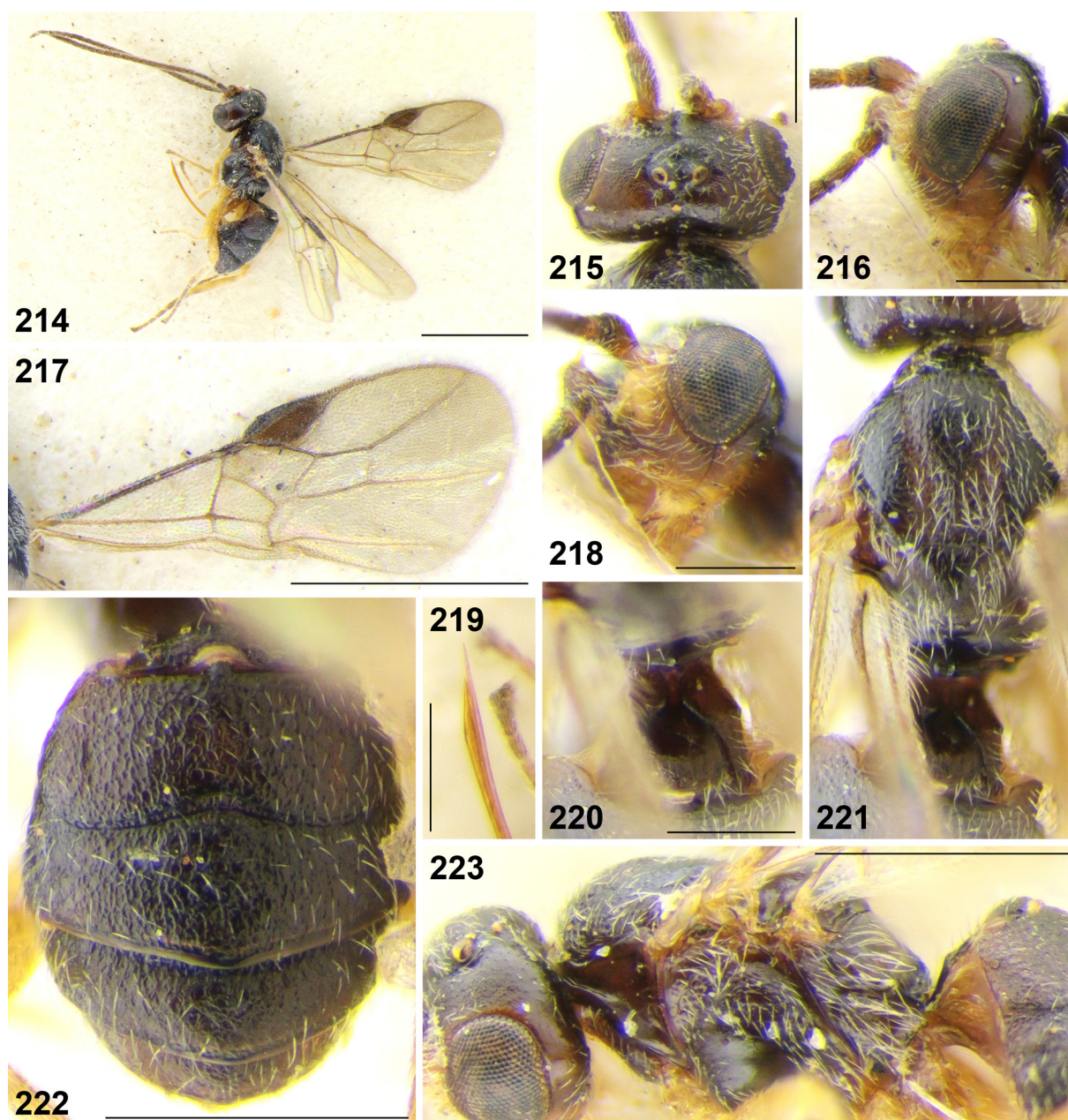
**Material.** 1♀, holotype (HNHM, 153289), “India: Kerala, C.U. Campus, T.C. Narendran, 11.XI.1987”, “♀ *Cassidibracon indicus* sp. nov. Det. Narendran, T.C. & Rema C.G. 1994”, “Holotypus”, “Holotype”, “Hym. Typ.No.12036. Museum Budapest”.

**Redescription.** Female. Body length 1.8 mm; fore wing length 2 mm.

Head. Width of head (dorsal view) 2 times its median length. Transverse diameter of eye (dorsal view) 2 times as long as temple. OOL 2.3× OD; POL 1.2× OD; OOL 1.9× POL. Frons not impressed behind antennae, with deep mid-longitudinal groove. Longitudinal diameter of eye in lateral view 1.4 times its transverse diameter; transverse diameter of eye 2.5 times minimum width of temple, hind margins of eye and temple slightly broadened ventrally. Face width 1.7 times combined height of face and clypeus; 2.8 times width of hypoclypeal depression. Height of clypeus 0.3 times width of hypoclypeal depression. Maxillary palp shorter than eye.

Antenna with 24 antennomeres. First flagellomere 2.8 times as long as its apical width, middle and penultimate flagellomeres 2 and 2.1 times as long as wide, respectively.

Mesosoma 1.3 times as long as its maximum height. Transverse pronotal sulcus smooth, deep anteriorly, shallow posteriorly. Width of mesoscutum 1.4 times its median length (dorsal view). Notauli very deep anteriorly, impressed and united posteriorly. Scutellar sulcus 0.15 times as long as scutellum.



Figs 214–223. *Reticulotergus indicus* gen. et comb. n., female, holotype.

214 – habitus, lateral view; 215–216, 218 – head: 215 – dorsal view, 216 – lateral view, 218 – anterolateral view; 217 – fore wing; 219 – apex of ovipositor; 220 – T1, dorsal view; 221, 223 – mesosoma: 221 – dorsal view, 223 – lateral view; 222 – metasoma, dorsal view. Scale bars: 214, 217 – 1 mm; 215–216, 218–221 – 0.25 mm; 222–223 – 0.5 mm.

Рис. 214–223. *Reticulotergus indicus* gen. et comb. n., самка, голотип.

214 – общий вид сбоку; 215–216, 218 – голова: 215 – вид сверху, 216 – вид сбоку, 218 – вид спереди/сбоку; 217 – переднее крыло; 219 – верхушка яйцеклада; 220 – T1, вид сверху; 221, 223 – мезосома: 221 – вид сверху, 223 – вид сбоку; 222 – метасома, вид сверху. Масштабные линейки: 214, 217 – 1 мм; 215–216, 218–221 – 0.25 мм; 222–223 – 0.5 мм.

Median impression on mesopleuron absent. Mesepimeral sulcus smooth, mesopleural pit deep and separated from mesepimeral sulcus. Metapleural sulcus smooth. Propodeal spiracle protruding, located behind middle of propodeum. Mid-longitudinal keel occupying apical half of propodeum, simple.

Wings. Vein r arising from basal 0.35 of pterostigma. Vein 1-R1 1.4 times as long as pterostigma. Marginal cell 4.2 times as long as distance from its apex to apex of wing. Vein 3-SR 2.3× vein r, 0.4× vein SR1, 1.2× vein 2-SR. Vein 1-M 0.7× vein 1-SR + M, 1.9× vein m-cu, 1.8× vein cu-a. Vein 2-SR + M 0.4× vein 2-SR,

0.8× vein m-cu. Vein 1-SR + M weakly curved anteriorly. Vein cu-a weakly postfurcal. Hind wing vein r-m antefurcal.

Legs. Fore tibia subapically with wide brush of long thick setae. Hind femur 3.5 times as long as wide. Hind tibia 1.4 times as long as hind femur, its inner spur 0.3 times as long as hind basitarsus. Hind tarsus as long as hind tibia. Fifth segment of hind tarsus 0.45 times as long as hind basitarsus and 0.9 times as long as second segment.

Metasoma. Median length of T1 0.8 times its apical width. T2 medially 0.8 times as long as T3. Basal width of T2 1.8 times



its median length. Ovipositor sheath 0.6 times as long as hind tibia and 0.2 times as long as fore wing.

Sculpture. Face, frons, and malar space granulate. Mesoscutum medially reticulate-granulate; scutellum, propodeum, and metanotum smooth. T1 laterally smooth, its median area weakly granulose posteriorly; T2–T4 irregularly reticulate-rugose, T5 granulate-rugulose.

Colouration. Body mostly dark brown. Head with brown face and genae and with brownish yellow mouth parts and patches below toruli. Legs brownish yellow; all tarsi and hind tibia mostly brown; tegulae yellowish brown. Wing membrane brownish darkened, pterostigma and wing veins brown.

### Genus *Scutibracon* Quicke et Walker, 1989

*Scutibracon* Quicke et Walker, 1989: 19 (type species *Microbracon hispae* Viereck, 1913).

**Composition and distribution.** *Scutibracon fujianensis* Wang et Chen, 2010 (China: Fujian), *S. gracillariae* (Quicke, 2012), **comb. n.** (India), *S. hispae* (Viereck, 1913) (Bangladesh, Oriental China), *S. malabaricus* (Narendran, 1994), **comb. n.** (India), *S. sumodani* (Narendran et Madhavikutty, 1994), **comb. n.** (India). The new proposed combinations are based on the sufficient correspondence of the diagnostic characters of these species to those of the type species of the genus *Scutibracon*.

**Notes.** The material underlying the description of the genus *Scutibracon* was attributed by the authors to the type species based on comparison with the holotype. However, the morphological characters that can be seen in photographs of the holotype in Chan et al. [2023] differ significantly from the description of *S. "hispae"* sec Quicke et Walker (which has the straight fore wing vein 1-SR + M and the short, strongly transverse T2). Thus, the description of the genus is based on a misidentification of the material and the diagnosis of the genus should be corrected.

The genus *Piliferolobus* [Chen, Yang, 2006] may be a synonym of *Scutibracon*, but the brief description does not allow to make a certain conclusion about its status.

**Redescription.** Female. Head. Toruli strongly anterolaterally protruding in dorsal view. Vertex without mid-longitudinal sulcus. Face evenly convex. Clypeus flattened, with protruding ventral rim, dorsal clypeal margin sharp; dorsal carina absent, clypeal sulcus deep or absent. Malar suture deep. Hypostomal carina slightly protruding below mandible.

Mesosoma. Median lobe of mesoscutum not protruding (dorsal view). Notauli more or less deep anteriorly, shallow posteriorly, smooth. Mesoscutum evenly setose. Median impression on mesopleuron indistinct. Median area of metanotum with incomplete or complete median carina.

Wings. Angle between veins C + SC + R and 1-SR 60–80°. Vein r-m shorter than vein 2-SR. Vein 1-SR + M weakly curved anteriorly (straight in *S. hispae* sec Quicke et Walker, 1989). Wing membrane evenly setose at base of hind wing.

Legs. Fore tibia with longitudinal and transverse apical rows of thick setae. Claws with more or less protruding basal lobe.

Metasoma with 4 or 5 dorsally visible tergites. T1 without mid-longitudinal impression, with developed dorsolateral carinae, complete dorsal carinae, and without sublateral carinae. Median area of T2 absent or developed (elongate-triangular), mid-longitudinal keel absent. T2 with long s-shaped sublateral carinae. Spiracle located in anterior part or in middle of T2. Suture between T2 and T3 almost straight or curved. T3–T5 without anterolateral areas, with posterior margins laterally straight or roundly protruding, with or without transverse subapical grooves.

Ovipositor sheath 0.2–0.25 times as long as fore wing. Apex of ovipositor with (weak) dorsal nodus and ventral serration.

Sculpture. Head and mesosoma mainly smooth, metasoma with rugose and punctate sculpture.

### A key to species of the genus *Scutibracon*

1. Basal width of T2 1.7 times its median length. T2 medially 1.1 times as long as T3. Vein 1-SR + M straight or weakly curved posteriorly ..... *S. "hispae"* sec Quicke et Walker, 1989
- Basal width of T2 1.1–1.4 times its median length. T2 medially 1.3–1.6 times as long as T3. Vein 1-SR + M weakly curved anteriorly ..... 2
2. Legs very slender, hind tarsus about 0.9 times as long as mesosoma. – Metasoma with 4 dorsally visible tergites ..... *S. hispae* (Viereck, 1913)
- Legs less slender, hind tarsus 0.6–0.7 times as long as mesosoma ..... 3
3. T2 with elongate-triangular median area. Median area of metanotum (dorsal view) with incomplete median carina. Metasoma with 4 dorsally visible tergites. Apical margins of T3 and T4 without transverse subapical grooves ..... *S. malabaricus* (Narendran, 1994), **comb. n.**
- T2 without median area. Median area of metanotum (dorsal view) with complete high median carina. Metasoma with 5 dorsally visible tergites. Apical margins of T3–T5 with deep, crenulate transverse subapical grooves. – T5 with wide protruding lamella ..... 4
4. T2 medially 1.5 times as long as T3. Middle flagellomeres about 2 times as long as wide ..... *S. sumodani* (Narendran et Madhavikutty, 1994), **comb. n.**
- T2 medially 1.3 times as long as T3. Middle flagellomeres 1.4–1.5 times as long as wide ..... 5
5. Antenna with about 30 antennomeres. Vein cu-a postfural ..... *S. fujianensis*
- Antenna with about 24 antennomeres. Vein cu-a interstitial ..... *S. gracillariae* (Quicke, 2012), **comb. n.**

*Scutibracon fujianensis* Wang et Chen, 2010

*Scutibracon fujianensis* Wang et Chen in Wang et al., 2010: 58.

*Scutibracon gracillariae* (Quicke, 2012), **comb. n.**

*Cassidibracon gracillariae* Quicke in Quicke et al., 2012: 139.

*Scutibracon hispae* (Viereck, 1913)

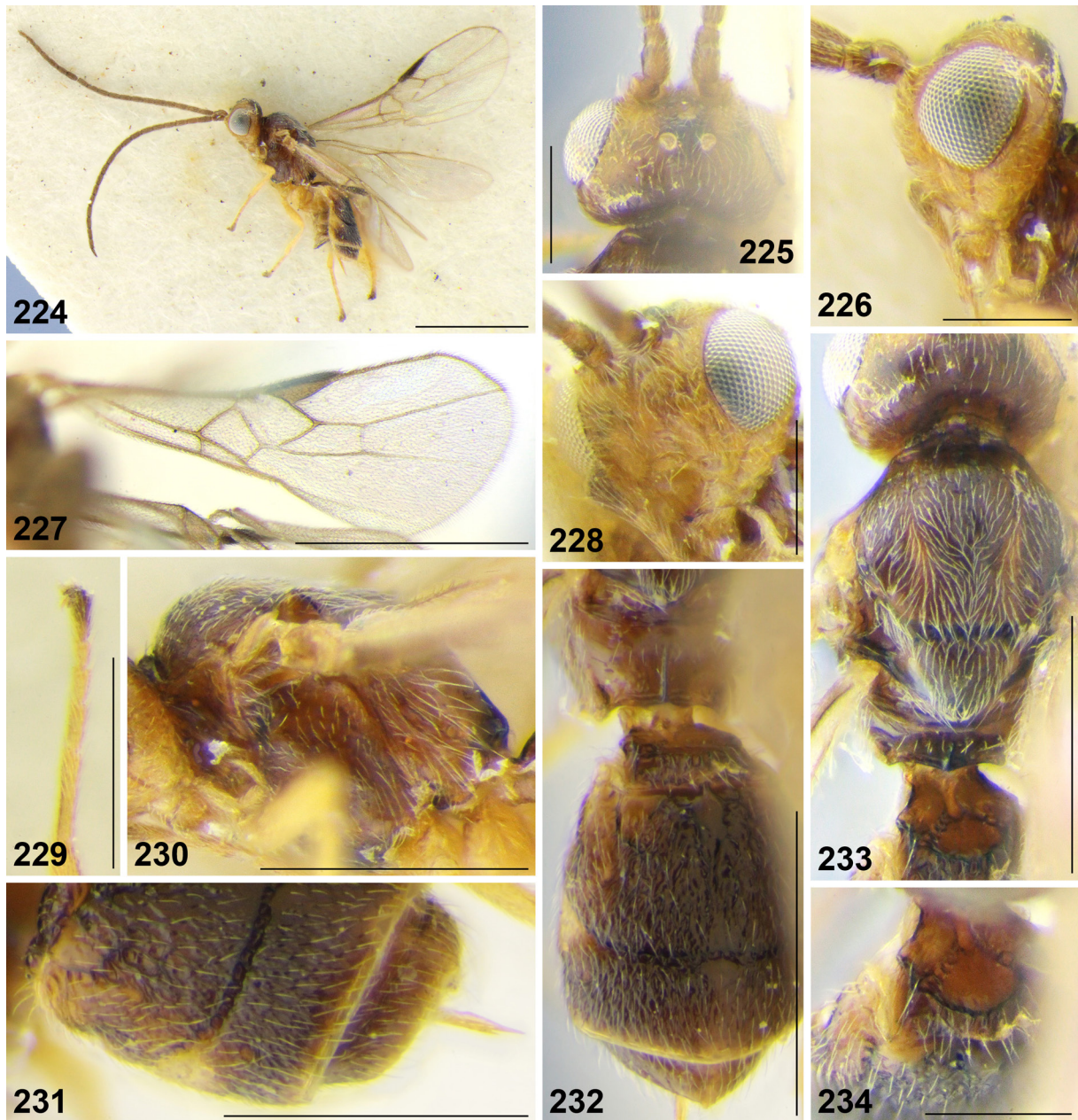
*Microbracon hispae* Viereck, 1913: 642. Quicke, Walker, 1989: 23 (transferred to *Scutibracon*).

**Note.** The photographs of the holotype are available at the “Integrated insect types database of Taiwanese species” [Chan et al., 2023].

*Scutibracon malabaricus* (Narendran, 1994), **comb. n.**  
(Figs 224–234)

*Cassidibracon malabaricus* Narendran in Narendran et al., 1994: 130.





Figs 224–234. *Scutibracon malabaricus* comb. n., female, holotype.

224 – habitus, lateral view; 225–226, 228 – head: 225 – dorsal view, 226 – lateral view, 228 – anterolateral view; 227 – fore wing; 229 – hind tarsus; 230, 233 – mesosoma: 230 – lateral view, 233 – dorsal view; 231–232 – metasoma: 231 – dorsolateral view, 232 – dorsal view; 234 – T1, dorsal view. Scale bars: 224, 227 – 1 mm; 225–226, 228, 234 – 0.25 mm; 229–233 – 0.5 mm.

Рис. 224–234. *Scutibracon malabaricus* comb. n., самка, голотип.

224 – общий вид сбоку; 225–226, 228 – голова: 225 – вид сверху, 226 – вид сбоку, 228 – вид спереди/сбоку; 227 – переднее крыло; 229 – задняя лапка; 230, 233 – мезосома: 230 – вид сбоку, 233 – вид сверху; 231–232 – метасома: 231 – вид сверху/сбоку, 232 – вид сверху; 234 – T1, вид сверху. Масштабные линейки: 224, 227 – 1 мм; 225–226, 228, 234 – 0.25 мм; 229–233 – 0.5 мм.

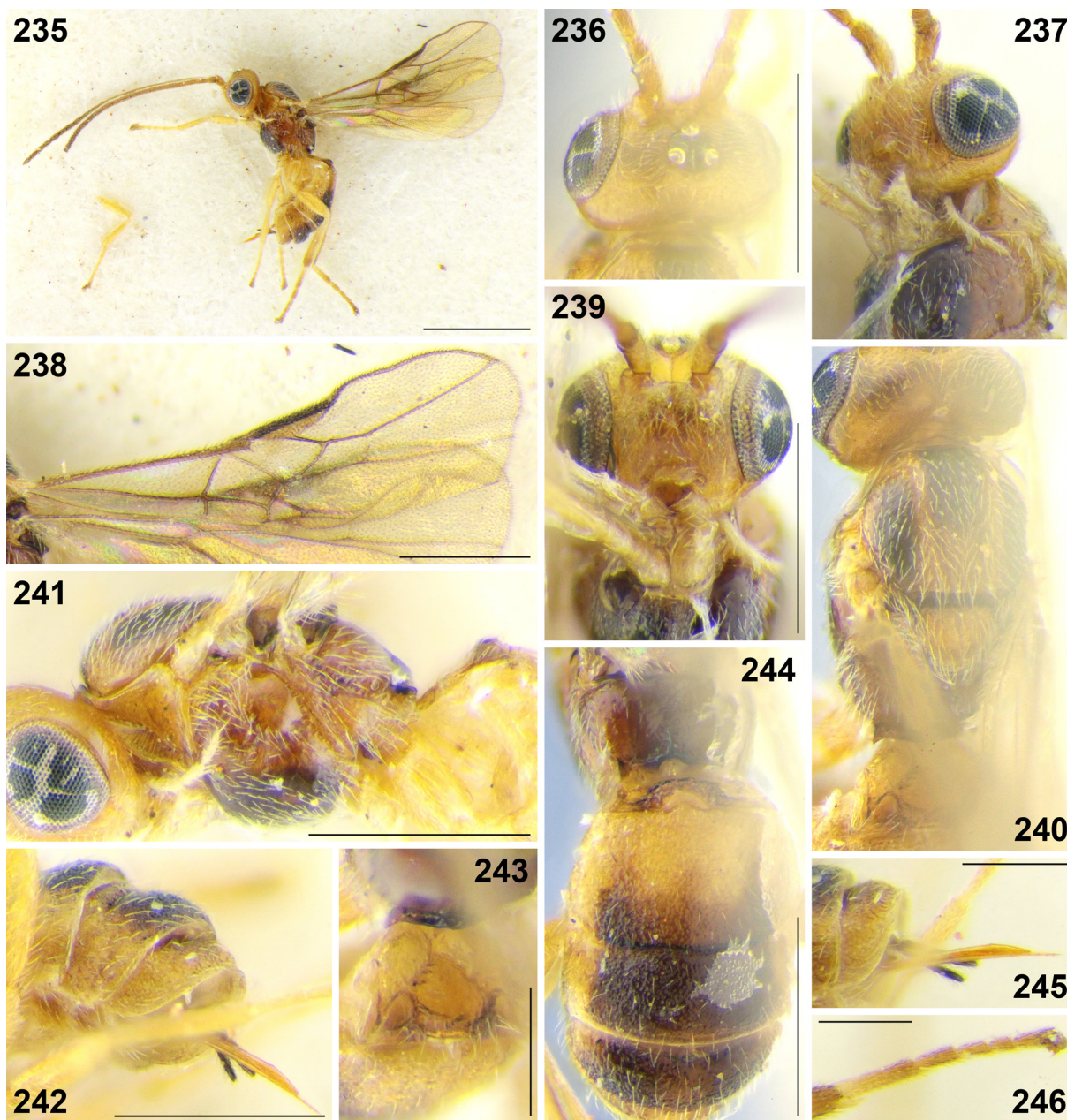
**Material.** 1♀, holotype (HNHM, 153290), "India: Kerala, Aralam farm, T.C. Narendran, 31.X.1988", "♀ *Cassidibracon malabaricus* sp. n. Det. Narendran, T.C. 1994", "Holotypus", "Holotype", "Hym. Typ.No.12037. Museum Budapest".

**Redescription.** Female. Body length 1.7 mm; fore wing length 2 mm.

Head. Width of head (dorsal view) 1.9 times its median length. Transverse diameter of eye (dorsal view) 2.4 times as long as temple. OOL 2.5× OD; POL 1.4× OD; OOL 1.8× POL. Frons impressed behind antennae, with shallow mid-longitudinal groove.

Longitudinal diameter of eye in lateral view 1.3 times its transverse diameter; transverse diameter of eye 2.3 times minimum width of temple, hind margins of eye and temple broadened ventrally. Face width 1.3 times combined height of face and clypeus; 2.2 times width of hypoclypeal depression. Width of hypoclypeal depression 1.2 times distance from depression to eye. Clypeal sulcus absent, height of clypeus 0.25 times width of hypoclypeal depression. Longitudinal diameter of eye 2.6 times as long as malar space (front view). Maxillary palp longer than eye, but shorter than head.





Figs 235–246. *Scutibracon sumodani* comb. n., female, holotype.

235 – habitus, lateral view; 236–237, 239 – head: 236 – dorsal view, 237 – anterolateral view, 239 – front view; 238 – fore wing; 240–241 – mesosoma: 240 – dorsal view, 241 – lateral view; 242 – T3–T5, dorsolateral view; 243 – T1, dorsolateral view; 244 – metasoma, dorsal view; 245 – apex of ovipositor; 246 – hind tarsus. Scale bars: 235 – 1 mm; 236–242, 244 – 0.5 mm; 243, 245–246 – 0.25 mm.

Рис. 235–246. *Scutibracon sumodani* comb. n., самка, голотип.

235 – общий вид сбоку; 236–237, 239 – голова: вид сверху, 237 – вид спереди/сбоку, 239 – вид спереди; 238 – переднее крыло; 240–241 – мезосома: 240 – вид сверху, 241 – вид сбоку; 242 – T3–T5, вид сверху/сбоку; 243 – T1, вид сверху/сбоку; 244 – метасома, вид сверху; 245 – вершина яйцеклада; 246 – задняя лапка. Масштабные линейки: 235 – 1 мм; 236–242, 244 – 0.5 мм; 243, 245–246 – 0.25 мм.

Antenna with 21 antennomeres. First flagellomere 2 times as long as its apical width, middle and penultimate flagellomeres 2 and 2.4 times as long as wide, respectively.

Mesosoma 1.4 times as long as its maximum height. Transverse pronotal sulcus deep and smooth. Width of mesoscutum 1.3 times its median length (dorsal view). Scutellar sulcus 0.15 times as long as scutellum. Mesepimeral sulcus smooth, mesopleural pit deep, separated from mesepimeral sulcus. Median area of metanotum with incomplete median carina. Metapleural sulcus weakly crenulate. Propodeal spiracle round, located

behind middle of propodeum, not protruding. Mid-longitudinal keel developed in apical two thirds of propodeum, simple; mid-longitudinal impression absent.

Wings. Vein r arising from basal 0.4 of pterostigma. Vein 1-R1 1.7 times as long as pterostigma. Marginal cell 25 times as long as distance from its apex to apex of wing. Vein 3-SR 1.6× vein r, 0.3× vein SR1, 1× vein 2-SR. Vein 1-M 0.9× vein 1-SR + M, 2.2× vein m-cu, 3× vein cu-a. Vein 2-SR + M 0.35× vein 2-SR, 0.7× vein m-cu. Vein 1-SR + M weakly curved anteriorly proximally. Vein cu-a interstitial. Hind wing vein r-m antefurcal.

Legs. Fore tibia with longitudinal and transverse apical rows of thick setae. Hind femur 3.6 times as long as wide. Hind tibia 1.5 times as long as hind femur, its inner spur 0.3 times as long as hind basitarsus. Hind tarsus 1.1 times as long as hind tibia. Fifth segment of hind tarsus 0.5 times as long as hind basitarsus and 0.95 times as long as second segment. Claws with shortly protruding and blunt basal lobes.

Metasoma with 4 dorsally visible tergites. Median length of T1 0.8 times its apical width. T2 medially 1.6 times as long as T3; basal width of T2 1.1 times its median length. Median area of T2 weakly elevated, elongate-triangular, much longer than wide, with sharp crenulate margin. T2 with long s-shaped sublateral carinae delineating weakly elevated anterolateral areas with smoothed sculpture. Spiracle located in anterior part of T2. Suture between T2 and T3 curved. Posterior margins of T3 and T4 without transverse subapical grooves, laterally straight. Ovipositor sheath 0.7 times as long as hind tibia and 0.2 times as long as fore wing.

Sculpture. Head and mesosoma mainly smooth. Face medially below toruli and frons weakly granulate; mesoscutum granulate along notauli. T1 smooth with rugae only along dorsal carinae; T2 rugose, T3 rugose to rugulose, T4 rugulose to almost smooth.

Colouration. Head yellowish brown with brown patches on frons, stemmaticum, and vertex; maxillary palps pale yellow. Antenna brown. Mesosoma reddish brown with brown patches on mesoscutal lobes, scutellum, ventral side of mesopleuron, and propodeum; tegulae yellow. Metasoma dorsally brown; T2 and T3 anterolaterally and posterior margins of T3 and T4 yellowish brown. Wing membrane weakly darkened, pterostigma brown, veins pale brown.

#### *Scutibracon sumodani*

(Narendran et Madhavikutty, 1994), **comb. n.**

(Figs 235–246)

*Cassidibracon sumodani* Narendran et Madhavikutty in Narendran et al., 1994: 129.

**Material.** 1♀, holotype (HNHM, 153291), "India: Kerala, C.U. Campus, T.C. Narendran, 1990"; "♀ *Cassidibracon sumodani* sp. nov. Det. Narendran, T.C. & Madhavi 1994"; "Holotypus", "Holotype"; "Hym. Typ. No. 12038. Museum Budapest".

**Redescription.** Female. Body length 1.9 mm; fore wing length 1.8 mm.

Head. Width of head (dorsal view) 1.9 times its median length. Transverse diameter of eye (dorsal view) 2.9 times as long as temple. OOL 2.6× OD; POL 1.2× OD; OOL 2.1× POL. Frons slightly convex, with deep mid-longitudinal groove. Longitudinal diameter of eye in lateral view 1.3 times its transverse diameter; transverse diameter of eye 2.8 times minimum width of temple, hind margins of eye and temple broadened ventrally. Face width 1.2 times combined height of face and clypeus; 2.7 times width of hypoclypeal depression. Width of hypoclypeal depression 0.95 times distance from depression to eye. Clypeal sulcus absent, height of clypeus 0.4 times width of hypoclypeal depression. Longitudinal diameter of eye 2.4 times as long as malar space (front view). Maxillary palp as long as eye height.

Antenna with 23 antennomeres. First flagellomere 2.7 times as long as its apical width, middle and penultimate flagellomeres 2.1 and 2.1 times as long as wide, respectively.

Mesosoma 1.4 times as long as its maximum height. Transverse pronotal sulcus deep and crenulate. Width of mesoscutum 1.2 times its median length (dorsal view). Scutellar sulcus 0.2 times as long as scutellum. Mesepimeral sulcus smooth, mesopleural pit deep, separated from mesepimeral sulcus. Median area of metanotum medially elevated, with complete high median carina. Metapleural sulcus weakly crenulate. Propodeal spiracle located behind middle of propodeum, weakly protruding. Mid-longitudinal keel developed in apical two thirds of propodeum, with short transverse rugae. Mid-longitudinal impression on propodeum absent.

Wings. Vein r arising from basal 0.45 of pterostigma. Vein 1-R1 1.7 times as long as pterostigma. Marginal cell 4.7 times as long as distance from its apex to apex of wing. Vein 3-SR 1.6× vein r, 0.3× vein SR1, 1.2× vein 2-SR. Vein 1-M 0.8× vein 1-SR + M, 2.1× vein m-cu, 2.4× vein cu-a. Vein 2-SR + M 0.35× vein 2-SR, 0.55× vein m-cu. Vein 1-SR + M straight. Vein cu-a weakly postfurcal. Hind wing vein r-m antefurcal.

Legs. Fore tibia with longitudinal and transverse apical rows of thick setae. Hind femur 2.8 times as long as wide. Hind tibia 1.5 times as long as hind femur, its inner spur 0.4 times as long as hind basitarsus. Hind tarsus 1.1 times as long as hind tibia. Fifth segment of hind tarsus 0.5 times as long as hind basitarsus and 0.9 times as long as second segment. Claws with acute angularly protruding basal lobe.

Metasoma with 5 dorsally visible tergites. Median length of T1 0.5 times its apical width. T2 medially 1.5 times as long as T3. Basal width of T2 1.4 times its median length. Median area of T2 absent. T2 with long s-shaped carinae delineating weakly elevated anterolateral areas. Spiracle located in middle of T2. Suture between T2 and T3 almost straight. Posterior margins of T3–T5 with deep crenulate transverse subapical grooves, laterally straight. T5 with wide protruding lamella. Ovipositor sheath 0.75 times as long as hind tibia and 0.2 times as long as fore wing.

Sculpture. Face weakly granulate below toruli and laterally, genae weakly granulate; frons, vertex, and malar space smooth; coxae coriaceous; mesosoma mostly smooth, propodeum posteriorly coriaceous; T1 laterally granulate-rugulose, its median area posteriorly rugose; T2–T5 densely irregularly punctate.

Colouration. Ground colour of body brownish yellow. Scape yellowish brown, flagellum yellowish brown basally, darkening apically. Maxillary palp pale yellow. Mesosoma reddish brown with yellowish brown prothorax, margins of mesoscutal lobes and scutellum; mesopleuron ventrally and patches on mesoscutal lobes dark brown; tegulae brownish yellow. Metasoma yellow with brown patches on posterior half of T2 and medially on T3–T5. Wing membrane brownish darkened, pterostigma brown, wing veins pale brown.

#### Genus *Simplicibracon* Quicke, 1988

*Simplicibracon* Quicke, 1988: 416 (type species *Simplicibracon maculigaster* Quicke, 1988). Maetô, 1991: 303.

**Composition and distribution.** *Simplicibracon curticaudis* Maetô, 1991 (Japan), *S. maculigaster* Quicke, 1988 (Oriental China), *S. nigritarsus* Quicke et Ingram, 1993 (Australia).

**Redescription.** Female. Head. Toruli not protruding in dorsal view. Vertex without mid-longitudinal sulcus. Face weakly mid-longitudinally elevated. Clypeus flattened, with weakly protruding ventral rim, dorsal carina and clypeal sulcus absent, dorsal clypeal margin sharp. Malar suture weakly impressed. Hypostomal carina not protruding below mandible.

Mesosoma. Median lobe of mesoscutum weakly protruding (dorsal view). Notauli deep and crenulate. Mesoscutum evenly setose. Median impression on mesopleuron absent. Median area of metanotum with incomplete median carina.

Wings. Angle between veins C + SC + R and 1-SR 65–70°. Vein r-m shorter than vein 2-SR. Vein 1-SR + M weakly curved anteriorly. Wing membrane evenly setose at base of hind wing.

Legs. Fore tibia with wide row of long thick setae. Hind tibia without subapical row of thick setae. Claws with acute angularly protruding basal lobe.

Metasoma with 6 dorsally visible tergites. T1 with distinct mid-longitudinal impression, developed dorsolateral carinae, and complete dorsal carinae; sublateral carinae of T1 absent. Median area and mid-longitudinal keel of T2 absent; dorsolateral impressions deep, sublateral carinae short. Spiracle located in anterior part of T2. Suture between T2



and T3 straight or medially curved backward. Anterolateral areas developed only on T3, wide, weakly defined by shallow impressions. Posterior margins of T3–T6 with deep, crenulate transverse subapical grooves, laterally straight. T6 medially weakly emarginated. Ovipositor sheath 0.1–0.4 times as long as fore wing. Apex of ovipositor with developed dorsal nodus and ventral serration.

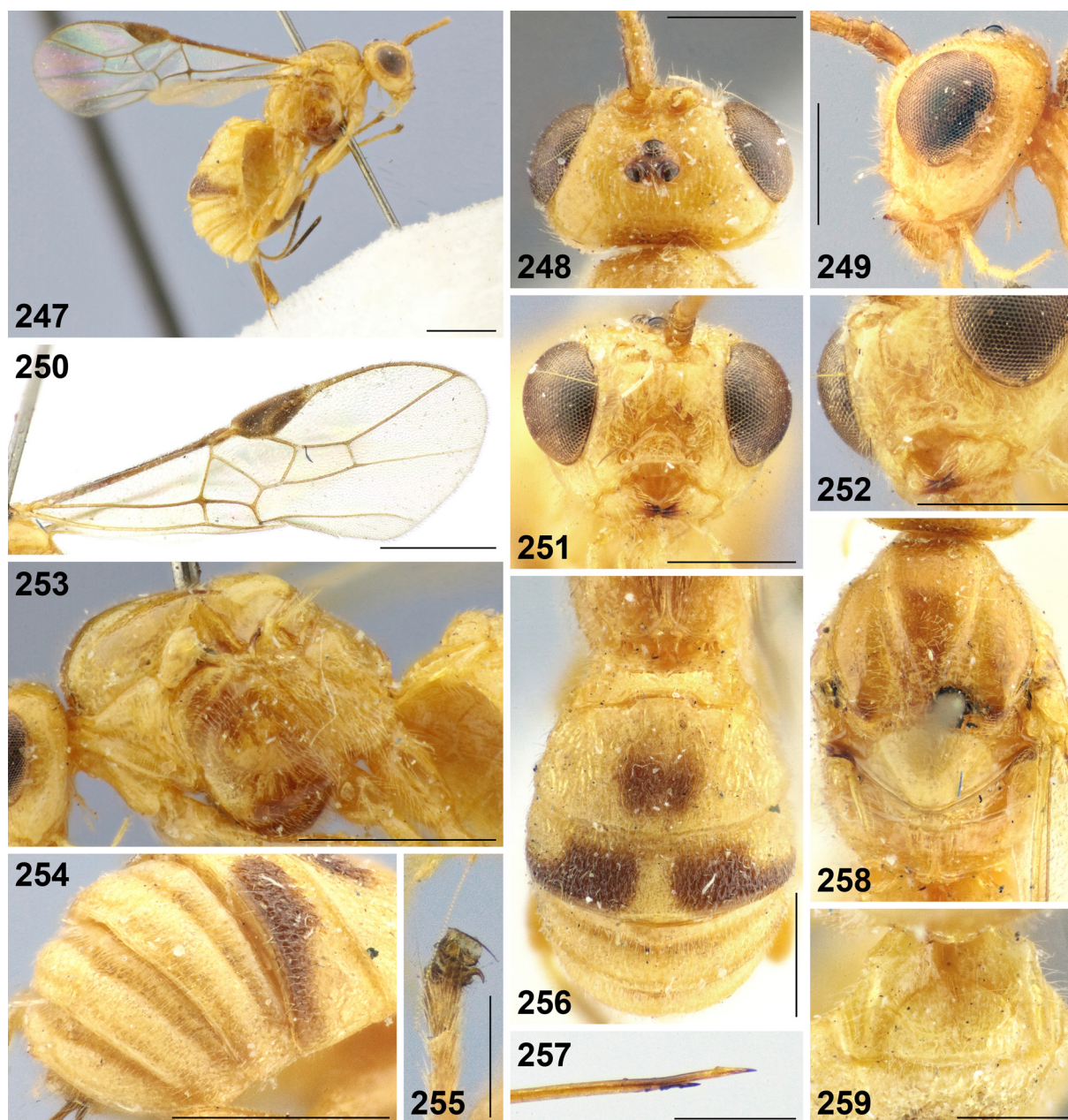
Sculpture. Head and mesosoma mainly smooth, metasomal tergites rugose.

*Simplicibracon curticaudis* Maetò, 1991

*Simplicibracon curticaudis* Maetò, 1991: 304.

*Simplicibracon maculigaster* Quicke, 1988  
(Figs 247–259)

*Simplicibracon maculigaster* Quicke, 1988: 417.



Figs 247–259. *Simplicibracon maculigaster*, female, holotype.

247 – habitus, lateral view; 248–249, 251–252 – head: 248 – dorsal view, 249 – lateral view, 251 – front view, 252 – anterolateral view; 250 – fore wing; 253, 258 – mesosoma: 253 – lateral view, 258 – dorsal view; 254 – T3–T6, dorsolateral view; 255 – apex of hind tarsus; 256 – metasoma, dorsal view; 257 – apex of ovipositor; 259 – T1, dorsal view. Scale bars: 247, 250, 253–254 – 1 mm; 248–249, 251–252, 256, 258–259 – 0.5 mm; 255, 257 – 0.25 mm.

Рис. 247–259. *Simplicibracon maculigaster*, самка, голотип.

247 – общий вид сбоку; 248–249, 251–252 – голова: 248 – вид сверху, 249 – вид сбоку; 251 – вид спереди, 252 – вид спереди/сбоку; 250 – переднее крыло; 253, 258 – мезосома: 253 – вид сбоку, 258 – вид сверху; 254 – T3–T6, вид сверху/сбоку; 255 – вершина задней лапки; 256 – метасома, вид сверху; 257 – вершина яйцеклада; 259 – T1, вид сверху. Масштабные линейки: 247, 250, 253–254 – 1 мм; 248–249, 251–252, 256, 258–259 – 0.5 мм; 255, 257 – 0.25 мм.

**Material.** 1♀, holotype (BMNH), Taiwan, "Formosa, Sauter", "Koshun 1908.II".

**Redescription.** Female. Body length 4.3 mm; fore wing length 4.2 mm.

Head. Width of head (dorsal view) 1.7 times its median length. Transverse diameter of eye (dorsal view) 2.1 times as long as temple. OOL 3× OD; POL 1× OD; OOL 3× POL. Frons with shallow impressions behind antennae and deep mid-longitudinal groove. Longitudinal diameter of eye in lateral view 1.3 times its transverse diameter; transverse diameter of eye 2.2 times minimum width of temple, hind margins of eye and temple slightly broadened ventrally. Face width 1.3 times combined height of face and clypeus; 1.9 times width of hypoclypeal depression. Width of hypoclypeal depression 1.5 times distance from depression to eye. Height of clypeus 0.45 times width of hypoclypeal depression. Longitudinal diameter of eye 2.7 times as long as malar space (front view). Maxillary palp longer than eye, but shorter than head.

Antenna. First flagellomere 2 times as long as its apical width.

Mesosoma 1.2 times as long as its maximum height. Transverse pronotal sulcus deep and wide, crenulate. Width of mesoscutum 1.2 times its median length (dorsal view). Notauli united posteriorly. Scutellar sulcus 0.1 times as long as scutellum. Mesepimeral sulcus smooth, mesopleural pit deep. Metapleural sulcus smooth. Propodeal spiracle vertical, located before middle of propodeum, weakly protruding. Mid-longitudinal keel on propodeum simple, complete, with weak mid-longitudinal impression in upper half.

Wings. Angle between veins C + SC + R and 1-SR 65–70°. Vein r arising from basal 0.3 of pterostigma. Vein 1-R1 1.5 times as long as pterostigma. Marginal cell 5.8 times as long as distance from its apex to apex of wing. Vein 3-SR 1.9× vein r, 0.4× vein SR1, 1.4× vein 2-SR. Vein 1-M 0.75× vein 1-SR + M, 2.2× vein m-cu, 1.8× vein cu-a. Vein 2-SR + M 0.35× vein 2-SR, 0.65× vein m-cu. Vein 1-SR + M weakly curved anteriorly. Vein cu-a interstitial. Hind wing vein r-m weakly postfurcal.

Legs. Fore tibia with wide row of long thick setae. Hind femur 3.2 times as long as wide. Hind tibia 1.4 times as long as hind femur, without subapical row of thick setae, its inner spur 0.45 times as long as hind basitarsus. Hind tarsus 0.85 times as long as hind tibia. Fifth segment of hind tarsus 0.45 times as long as hind basitarsus and as long as second segment.

Metasoma. Median length of T1 0.6 times its apical width. T2 medially 1.7 times as long as T3, basal width of T2 1.4 times its median length. Ovipositor sheath 1.7 times as long as hind tibia and 0.4 times as long as fore wing.

Sculpture. Head and mesosoma mostly smooth; malar space granulate, frons weakly granulate; propodeum very weakly coriaceous and weakly rugose medioposteriorly. T1 weakly rugulose, its median area posteriorly rugose; T2 longitudinally rugose to rugulose, T3–T5 rugulose, T6 rugulose-punctate.

Colouration. Body mainly pale ochre yellow. Scape reddish brown, flagellum yellowish brown. Maxillary palp and tegulae yellow. Ocellar triangle, patch on vertex, three patches on mesoscutum, mesopleuron, and hind tibia and tarsus yellowish brown. Patches on T2 and T3 brown. Wing membrane weakly darkened, pterostigma brown, wing veins yellowish brown.

### Genus *Testudobracon* Quicke, 1986

*Testudobracon* Quicke, 1986: 25 (type species *Testudobracon niger* Quicke, 1986). Maetô, 1991: 305; Sheeba et al., 2017: 332; Mai et al., 2023: 486.

**Composition and distribution.** *Testudobracon alius* Long, 2023 (Vietnam), *T. asphondyliae* Haider et Shujaiddin, 2004 (India), *T. athashi* Ranjith, 2017 (India), *T. australicolorus* Quicke et Ingram, 1993 (Australia), *T. descensus* Long, 2023 (Vietnam), *T. flavus* Wang, Chen et He, 2003 (East China), *T. gibbosa* Yang et Chen, 2006

(Central and East China), *T. grandiventris* Wang, Chen et He, 2003 (East China), *T. guangxinensis* Wang, Chen et He, 2003 (South China), *T. imitator* Long, 2023 (Vietnam), *T. longicaudis* Maetô, 1991 (Japan), *T. malabaricus* Sheeba, 2017 (India), *T. niger* Quicke, 1986 (Indonesia), *T. phiaoacus* Long, 2023 (Vietnam), *T. pleuralis* (Ashmead, 1906) (Oriental China, South Korea, Japan), *T. shameeri* Ranjith, 2017 (India), *T. tatyanae* Quicke et Ingram, 1993 (Australia), *T. travencorensis* Sheeba, 2017 (India), *T. unicolorus* Quicke et Ingram, 1993 (Australia), *T. watanabei* Yang et Chen, 2006 (Oriental China).

**Redescription.** Female. Head. Toruli weakly or strongly protruding in dorsal view. Vertex at most very weakly longitudinally impressed behind ocelli. Face evenly convex or weakly elevated mid-longitudinally. Clypeus variable, flattened, prominent, or weakly swollen, with (weakly) protruding ventral rim, dorsal carina absent or weak, clypeal sulcus impressed or absent, dorsal clypeal margin sharp or smoothed. Malar suture absent or weakly impressed. Hypostomal carina not protruding or forming thick hook-like tooth below mandible.

Mesosoma. Median lobe of mesoscutum strongly protruding (dorsal view), often with anteriorly projecting anterolateral angles. Notauli deep anteriorly. Mesoscutum evenly setose or mostly glabrous with setae only on notaulic area and on posterior part. Median impression of mesopleuron indistinct. Median area of metanotum with incomplete median carina.

Wings. Angle between veins C + SC + R and 1-SR 55–70°. Vein r-m shorter than vein 2-SR. Vein 1-SR + M weakly curved anteriorly. Wing membrane evenly setose at base of hind wing.

Legs. Fore tibia with more or less developed longitudinal and transverse apical rows of thick setae. Hind tibia without subapical transverse row of thick setae. Claws with acutely protruding basal lobe.

Metasoma with 6 dorsally visible tergites. T1 often with distinct mid-longitudinal impression. Dorsolateral carinae of T1 (weakly) developed, dorsal carinae absent or more or less developed, sublateral carinae absent. Median area of T2 absent or developed, usually longitudinal, stronger separated anteriorly, smoothed posteriorly. Dorsolateral impressions and sublateral carinae of T2 more or less developed. Spiracle located in middle or behind middle of T2. Suture between T2 and T3 curved or almost straight. Anterolateral areas absent or weakly defined only on T3. Posterior margins of T3–T6 often with deep and crenulate transverse subapical grooves, laterally roundly protruding. T6 medially emarginated, with submedioposteriorly protruding lamella. Ovipositor sheath 0.5–1.1 times as long as fore wing. Apex of ovipositor with dorsal nodus and ventral serration.

Sculpture. Head and mesosoma mostly smooth or granulate, metasomal tergites with rugose sculpture.

### *Testudobracon pleuralis* (Ashmead, 1906) (Figs 260–263, 265, 266, 268–272)

*Chelonogastra pleuralis* Ashmead, 1906: 196. Maetô, 1991: 306.

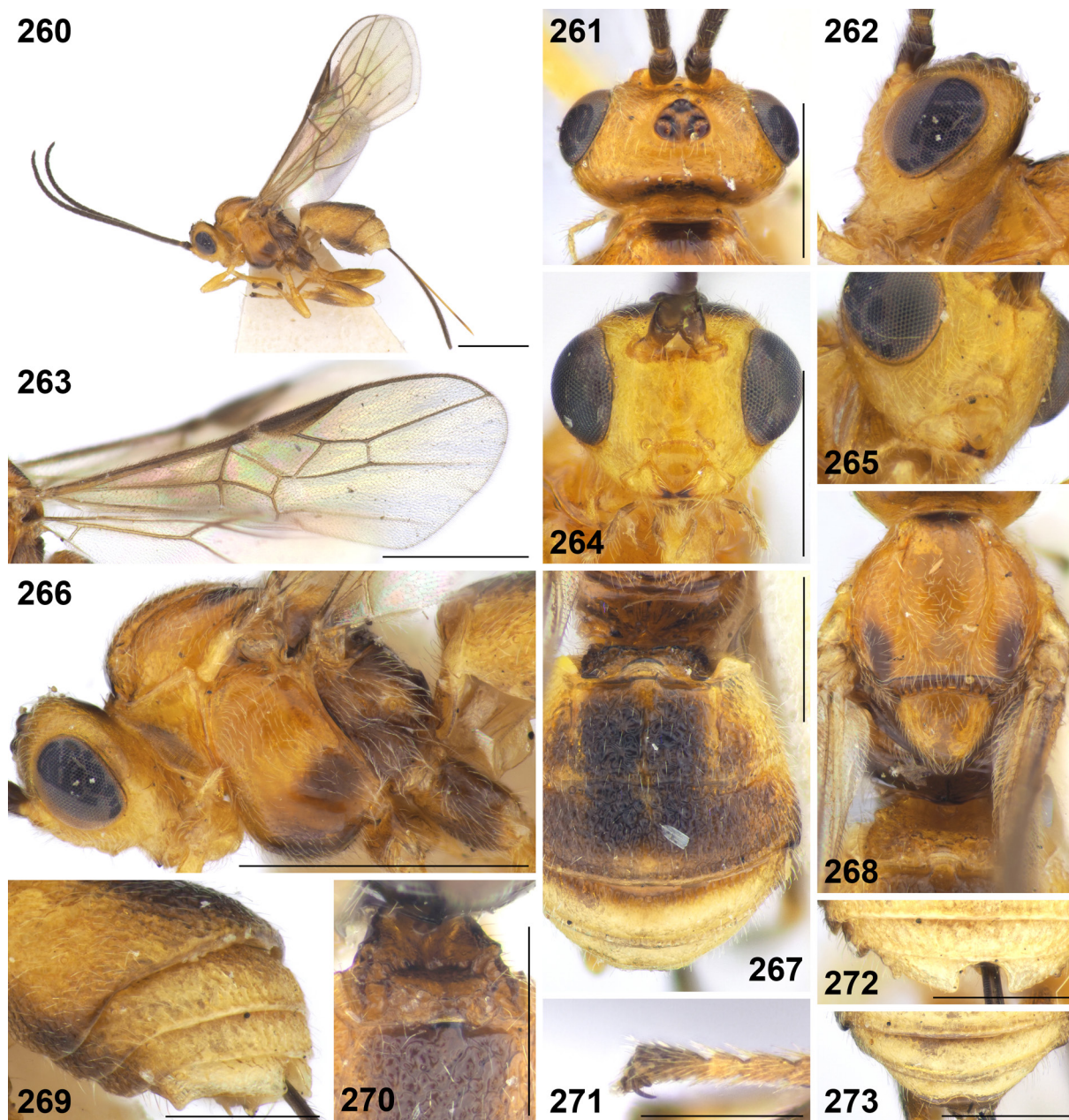
**Material.** 1♀ (ZISP, Hym.KS\_0005157), Japan, Kyushu, Fukuoka Prefecture, Fukuoka, Hibaru, 12.07.1992 (V.N. Makarkin); 2♀ (ZISP, Hym.KS\_0005010, Hym.KS\_0005154), 2♂ (ZISP, Hym.KS\_0005155–0005156), Japan, Honshu, Ibaraki Prefecture, Tsukuba, 10.10.1999 (S.A. Belokobylskij).

### *Testudobracon longicaudis* Maetô, 1991 (Figs 264, 267, 273)

*Testudobracon longicaudis* Maetô, 1991: 309.

**Material.** 1♀ (ZISP, Hym.KS\_0005158), Japan, Kyushu, Fukuoka Pref., Fukuoka, Hibaru, 12.07.1992 (V.N. Makarkin); 1♀ (ZISP, Hym.KS\_0005011), Japan, Honshu, Tsukuba, 19.09.1999 (S.A. Belokobylskij).





Figs 260–273. *Testudobracon* species, females.

260–263, 265–266, 268–272 – *T. pleuralis*; 264, 267, 273 – *T. longicaudis*. 260 – habitus, lateral view; 261–262, 264–265 – head: 261 – dorsal view, 262 – lateral view, 264 – front view, 265 – anterolateral view; 263 – fore wing; 266, 268 – mesosoma: 266 – lateral view, 268 – dorsal view; 267 – metasoma, dorsal view; 269 – T3–T6, dorsolateral view; 270 – T1, dorsolateral view; 271 – apex of hind tarsus; 272–273 – T6, dorsal view. Scale bars: 260, 263, 266 – 1 mm; 261–262, 264–265, 267–270, 272–273 – 0.5 mm; 271 – 0.25 mm.

Рис. 260–273. Виды рода *Testudobracon*, самки.

260–263, 265–266, 268–272 – *T. pleuralis*; 264, 267, 273 – *T. longicaudis*. 260 – общий вид сбоку; 261–262, 264–265 – голова: 261 – вид сверху, 262 – вид сбоку, 264 – вид спереди, 265 – вид спереди/сбоку; 263 – переднее крыло; 266, 268 – мезосома: 266 – вид сбоку, 268 – вид сверху; 267 – метасома, вид сверху; 269 – T3–T6, вид сверху/сбоку; 270 – T1, вид сверху/сбоку; 271 – вершина задней лапки; 272–273 – T6, вид сверху. Масштабные линейки: 260, 263, 266 – 1 мм; 261–262, 264–265, 267–270, 272–273 – 0.5 мм; 271 – 0.25 мм.

### Genus *Trigastrotheca* Cameron, 1906

*Trigastrotheca* Cameron, 1906: 32 (type species *Trigastrotheca trilobata* Cameron, 1906). Quicke et al., 2017: 96.

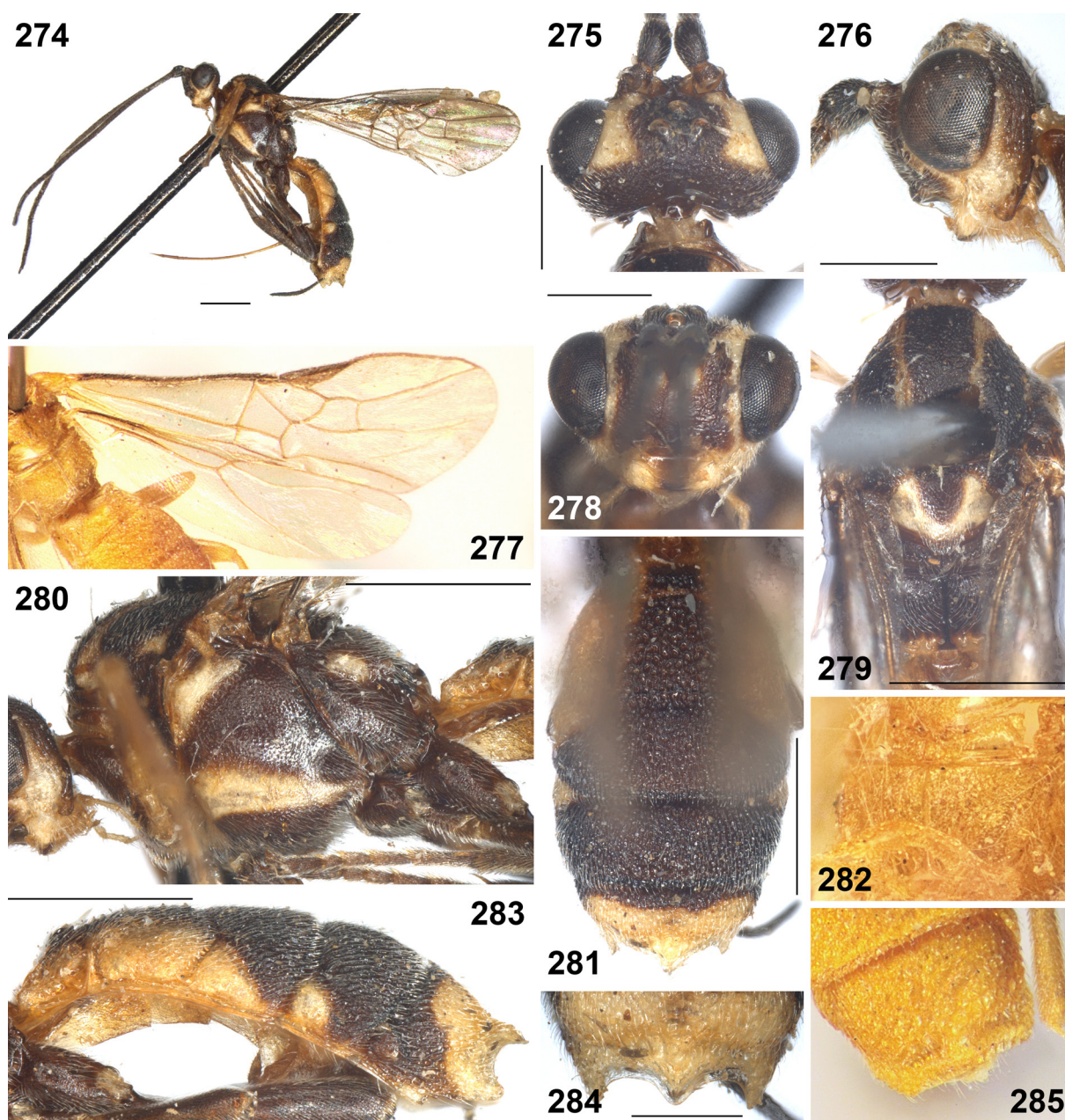
= *Coelodontus* Roman, 1912: 246 (type species *Ichneumon costator* Thunberg, 1822). Quicke, 1987: 133 (as a synonym of *Trigastrotheca*).

= *Kenema* van Achterberg, 1983: 188 (type species *Kenema quickei* van Achterberg, 1983). Quicke, 1987: 133 (as a synonym of *Trigastrotheca*).

= *Odontopygia* Enderlein, 1920: 60 (type species *Odontopygia tridentata* Enderlein, 1920). Quicke, 1987: 133 (as a synonym of *Trigastrotheca*).

**Composition and distribution.** *Trigastrotheca doiphukhaensis* Raweearamwong, Quicke et Butcher, 2020 (Thailand [Raweearamwong et al., 2020]), *T. inermis* (Guérin-Ménéville, 1848) (Ethiopia, South Africa), *T. laikipiensis* Quicke, 2005 (Kenya), *T. luzonensis* Quicke et Butcher,





Figs 274–285. *Trigastrotheca* species.

274–276, 278–281, 283–284 – *T. tridentata*, female, holotype; 277, 282, 285 – *T. notata* comb. n., male, holotype. 274 – habitus, lateral view; 275–276, 278 – head: 275 – dorsal view, 276 – lateral view, 278 – front view; 277 – fore wing; 279–280 – mesosoma: 279 – dorsal view, 280 – lateral view; 281, 283 – metasoma: 281 – dorsal view, 283 – lateral view; 282 – metanotum and propodeum, dorsal view; 284–285 – T5, dorsal view. Scale bars: 274, 279–281, 283 – 1 mm; 275–276, 278, 284 – 0.5 mm.

Рис. 274–285. Виды рода *Trigastrotheca*.

274–276, 278–281, 283–284 – *T. tridentata*, самка, голотип; 277, 282, 285 – *T. notata* comb. n., самец, голотип. 274 – общий вид сбоку; 275–276, 278 – голова: 275 – вид сверху, 276 – вид сбоку, 278 – вид спереди; 277 – переднее крыло; 279–280 – мезосома: 279 – вид сверху, 280 – вид сбоку; 281, 283 – метасома: 281 – вид сверху, 283 – вид сбоку; 282 – метанотум и проподоум, вид сверху; 284–285 – T5, вид сверху. Масштабные линейки: 274, 279–281, 283 – 1 мм; 275–276, 278, 284 – 0.5 мм.

2017 (Philippines), *T. maetoi* Quicke et Butcher, 2017 (Indonesia), *T. nigricornis* Cameron, 1910 (South Africa), *T. notata* (Szépligeti, 1914), **comb. n.** (Equatorial Guinea), *T. pariyanonthae* Quicke et Butcher, 2017 (Thailand), *T. quickei* (van Achterberg, 1983) (Sierra Leone), *T. romani* Quicke, 2005 (= *Ichneumon costator* Thunberg, 1822 nec Donovan, 1810) (South Africa), *T. rugosa* (Szépligeti,

1914) (Tanzania), *T. serrata* (van Achterberg et Sigwalt, 1987) (Senegal), *T. sureeratae* Quicke et Butcher, 2017 (Thailand), *T. tricolor* Quicke et Ingram, 1993 (Australia), *T. tridentata* (Enderlein, 1920) (Indonesia), *T. trilobata* Cameron, 1906 (Zimbabwe).

**Redescription.** Female. Head. Toruli strongly protruding in dorsal view. Vertex without mid-longitudinal sulcus. Clypeus weakly swollen, with not protruding ventral rim, not separated

from face by dorsal carina, clypeal sulcus absent, dorsal clypeal margin sharp. Malar suture weakly impressed or deep only below eye. Hypostomal carina strongly protruding, lamelliform.

Mesosoma. Median lobe of mesoscutum weakly protruding (dorsal view). Notauli deep anteriorly, shallow posteriorly. Mesoscutum evenly setose. Precoxal sulcus vaguely impressed. Median area of metanotum with complete median carina.

Wings. Angle between veins C + SC + R and 1-SR 60–80°. Fore wing vein r-m longer than vein 2-SR. Vein 1-SR + M straight. Wing membrane evenly setose at base of hind wing.

Legs. Hind tibia without subapical row of thick setae. Claws with acute angularly protruding basal lobe.

Metasoma with 5 dorsally visible tergites. T1 with deep mid-longitudinal impression, developed dorsolateral carinae, complete and almost reaching posterior margin of tergite dorsal carinae; sublateral carinae absent, but median area of tergite laterally compressed. Median area and mid-longitudinal keel of T2 absent; sublateral carinae short or long. Spiracle located at middle of T2. Suture between T2 and T3 weakly curved. T3–T5 with large anterolateral areas proximally separated by crenulate furrows. Posterior margins of T3–T5 laterally straight, without transverse subapical grooves. T5 with large median and lateroposterior protuberances separated by submedial emarginations. Ovipositor sheath 0.2–0.25 times as long as fore wing. Apex of ovipositor with developed dorsal nodus and ventral serration.

Sculpture. Head and mesosoma widely with rugulose sculpture, metasomal tergites rugose.

Male. T5 evenly rounded posteriorly.

*Trigastrotheca luzonensis* Quicke et Butcher, 2017

*Trigastrotheca luzonensis* Quicke et Butcher in Quicke et al., 2017: 98.

*Trigastrotheca nigricornis* Cameron, 1910

*Trigastrotheca nigricornis* Cameron, 1910: 439.

**Material.** 1♀, holotype (MNB), South Africa, “12943”, “Capland, Krebs S.”; “*Trigastrotheca nigricornis* Cam. Type.”

*Trigastrotheca notata* (Szépligeti, 1914), **comb. n.**  
(Figs 277, 282, 285)

*Habrobracon notatus* Szépligeti, 1914: 186.

**Material.** 1♂, holotype (MNB), Equatorial Guinea, “Span. Guinea Nkolentangan, X1.07–V.08. G. Teßmann S.G.”; “Equatorial Guinea”, “*Habrobracon notatus* sp. n. det. Szépligeti”, “*Habrobracon notatus* sp. n.”; “Type”, “Lectotypus ♂ *Habrobracon notatus* sp. n. Szépl. 1914. des. Papp J. 2007”.

**Note.** Designation of the type specimen as a lectotype by J. Papp is unnecessary and invalid, because the original description does not imply more than one specimen in the type material. In addition, a single male specimen in the MNB collection is labeled as a “type”. The new combination is proposed based on the complete correspondence of the diagnostic characters of this species to the genus *Trigastrotheca*.

*Trigastrotheca quickei* (van Achterberg, 1983)

*Kenema quickei* van Achterberg, 1983: 188.

*Trigastrotheca rugosa* (Szépligeti, 1914)

*Habrobracon rugosus* Szépligeti, 1914: 186.

*Kenema rugosa*: Quicke, Koch, 1990: 219.

*Trigastrotheca rugosa*: Quicke, Stanton, 2005: 187.

**Material.** 1♂, holotype (after Quicke and Koch [1990: 219]) (MNB), Tanzania, “D. O. Afrika 1.06 3000–4000 m, Kilimandscharo, Schröder S.”; “Tanzania”, “*Habrobracon rugosus* sp. n. det. Szépligeti”, “*Habrobracon rugosus* sp. n.”; “Type”, “Lectotypus ♂ *Habrobracon rugosus* sp. n. Szépl. 1914. des. Papp J. 2007”.

*Trigastrotheca serrata* (van Achterberg et Sigwalt, 1987)

*Kenema serrata* van Achterberg et Sigwalt, 1987: 453.

*Trigastrotheca serrata*: Quicke, Stanton, 2005: 187.

*Trigastrotheca tridentata* (Enderlein, 1920)

(Figs. 274–276, 278–281, 283, 284)

*Odontopygia tridentata* Enderlein, 1920: 60.

*Trigastrotheca tridentata*: Quicke, van Achterberg, 1990: 262.

**Material.** 1♀, holotype (MIIZ), Indonesia, “Sumatra, Soekaranda”.

*Trigastrotheca luzonensis* Quicke et Butcher, 2017

*Trigastrotheca luzonensis* Quicke et Butcher in Quicke et al., 2017: 98.

### Genus *Uncobracon* Papp, 1996

*Uncobracon* Papp, 1996: 168 (type species *Bracon apoderi* Watanabe, 1933). Samartsev, 2018: 249.

**Composition and distribution.** *Uncobracon apoderi* (Watanabe, 1933) (Palaeartic: Far East), *U. belokobylskii* Samartsev, 2018 (Palaeartic: Far East), *U. eurysulcatus* (Li, He et Chen, 2020) (South China [Li et al., 2020]), *U. longwangshanensis* (Li, He et Chen, 2020) (East China [Li et al., 2020]), *U. pappi* (Tobias, 2000) (Palaeartic: Far East), *U. tricoloratus* (Tobias, 2000) (Palaeartic: Far East).

**Redescription.** Female. Head. Toruli not or weakly protruding in dorsal view. Vertex without mid-longitudinal sulcus. Face evenly convex or weakly elevated mid-longitudinally. Clypeus more or less prominent, with strongly protruding ventral rim; dorsal carina absent, clypeal sulcus impressed or absent, dorsal clypeal margin sharp or smoothed. Malar suture weakly impressed (but often distinct). Hypostomal carina forming thick hook-like tooth.

Mesosoma. Median lobe of mesoscutum not or weakly protruding (dorsal view). Notauli deep anteriorly, impressed posteriorly, smooth. Mesoscutum with setae only along notauli or with lobes entirely, but sparsely setose. Median impression of mesopleuron absent. Median area of metanotum with incomplete or complete median carina.

Wings. Angle between veins C + SC + R and 1-SR 70–80°. Vein r-m shorter than vein 2-SR. Vein 1-SR + M curved anteriorly. Wing membrane evenly setose at base of hind wing.

Legs. Hind tibia without subapical transverse row of thick setae. Claws with acute angularly protruding basal lobe.

Metasoma with 6 dorsally visible tergites. Dorsolateral carinae of T1 developed, dorsal carinae incomplete or complete, sublateral carinae absent (but median area of T1 sometimes laterally compressed). Median area of T2 absent or weakly defined, longitudinal; mid-longitudinal keel absent. Dorsolateral impressions of T2 shallow or deep, sublateral carinae absent or more or less developed; anterolateral areas absent. Spiracle located in middle or in anterior part of T2. Suture between T2 and T3 (weakly) curved. T3–T6 without anterolateral areas, with laterally straight posterior margins, and with or without transverse subapical grooves. Ovipositor sheath 0.38–0.55 times as long as fore wing. Apex of ovipositor with distinct dorsal nodus and ventral serration.

Sculpture. Head and mesosoma mostly smooth, metasomal tergites often strongly sculptured at least on T2.



*Uncobracon apoderi* (Watanabe, 1933)

*Bracon apoderi* Watanabe, 1933: 180. Belokobylskij, Tobias, 2000: 119.

*Uncobracon apoderi*: Papp, 1996: 168; Tan et al., 2012: 65; Samartsev, 2018: 254.

= *Bracon dahuricus* Telenga, 1936: 396; Belokobylskij, Tobias, 2000: 119 (lectotype designation; synonymised with *B. apoderi*).

**Material.** 1♀, lectotype of *Bracon dahuricus* (ZISP, INS\_HYM\_0002795), Russia, Primorskiy Region, "Vladivostok Sedanka Malaise" and "20/7 30" (on the reverse side), "*Bracon dahuricus* sp. n. det. Shestakov", "Lectotypus *Bracon dahuricus* Tel design. Tobias 1999", "*Uncobracon apoderi* Wat. det. Papp J. 2001"; 1♀ (ZISP, KS.A0063), Russia, Primorskiy Region, Vladivostok, Okeanskaya, forest, forest edges, 30.07.2001 (S.A. Belokobylskij); 1♀ (ZISP, KS.A0062), Russia, Primorskiy Region, Sukhanovka, 10 km SW of Slavyanka, forest, glades, 7.08.2013 (S.A. Belokobylskij).

*Uncobracon belokobylskii* Samartsev, 2018

*Uncobracon belokobylskii* Samartsev, 2018: 249.

**Material.** 1♀, holotype (ZISP), Russia, Primorskiy Region, 10 km SE of Partizansk, Novitskoe, forest, glades, 3–4.08.2013 (S.A. Belokobylskij); 1♂ (ZISP, Hym.KS\_0005227), Russia, Primorskiy Region, Partizansk, Novitskoe, 43.049°N / 133.225°E, 9.06.2016 (S.A. Belokobylskij).

*Uncobracon pappi* (Tobias, 2000)

*Bracon pappi* Tobias, 2000 in Belokobylskij, Tobias, 2000: 121.

*Uncobracon pappi*: Tan et al., 2012: 65; Samartsev, 2018: 254.

**Material.** 1♀, paratype (ZISP), Russia, Primorskiy Region, 20 km ESE of Spassk-Dalniy, Siniy Ridge, forest, forest openings, 16.07.1998 (S.A. Belokobylskij).

*Uncobracon tricoloratus* (Tobias, 2000)

*Bracon tricoloratus* Tobias, 2000 in Belokobylskij, Tobias, 2000: 120.

*Uncobracon tricoloratus*: Samartsev, 2018: 254.

**Material.** 1♀, holotype (ZISP), Russia, Primorskiy Region, vicinity of Spassk-Dalniy, forest border, glades, 8.08.1996 (S.A. Belokobylskij); 1♀, paratype (ZISP), Russia, Primorskiy Region, 20 km ESE of Spassk-Dalniy, forest, forest openings, 15.07.1995, (S.A. Belokobylskij).

## Discussion

The aim of this work was to distinguish *Cassidibracon* and related genera and substantiate their composition. The taxa were considered based on the criteria that were established during their description [van Achterberg, 1983, 1989; Quicke, 1987, 1988, 1989; Quicke, Walker, 1989]. It is important to note that majority of the genera under consideration are represented by one to three morphologically very similar species (except *Crinibracon* and *Scutibracon* with five species each, *Uncobracon* with seven species, and the larger genera *Trigastrotheca* and *Testudobracon*), and, therefore, the taxonomic concepts of these genera are quite strict. Further study will possibly lead to a blurring of the boundaries between a number of these genera and their synonymisation or rank lowering to subgenera. Thus, the limits of the genus *Gelasinibracon* had to be expanded to include the subgenus *Pappobracon*, which is characterised by the long, distinctly projecting T4 and T5 [Samartsev, 2019], while transferring the species with developed median area of T2 (*Scutibracon malabaricus*) or reduced dorsolateral carinae of T1 and the transverse T2

(*S. "hispaе"* sec Quicke et Walker) considerably expanded the diagnosis of the genus *Scutibracon* in the current study.

The data obtained during the current work do not allow me to make certain assumptions about the proximity of the considered genera. Ten genera from the couplets 11–17 of the presented key appear to be quite morphologically similar and probably forming a separate group of genera. The most distinctive genus of this group is *Ancilibracon* characterised by a strong malar suture, a deep longitudinal impression on the vertex, development of impressions of the mesopleuron, dorsal and dorsolateral carinae on T1, strongly shortened and retracted T4–T6, and very short ovipositor sheath.

However, morphological analysis also shows that other genera of the *Plesiobracon* group are morphologically very diverse and their unification is hardly justified. Thus, classification of this set of genera requires further elaboration involving a larger number of genera and molecular methods. Hopefully, the presented key and illustrations will help to correctly identify representatives of the considered genera when conducting new studies.

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