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## NEW SPECIES OF CHRYSIDIDAE (HYMENOPTERA) FROM CENTRAL ASIA, RUSSIA AND IRAN. PART 2

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**Summary.** Eight new species are described from genus *Chrysis* Linnaeus: *C. belokobylskiji* **sp. n.** (Tajikistan, Kyrgyzstan, China, Mongolia), *C. gurkoi* **sp. n.** (Tajikistan), *C. chalybeia* **sp. n.** (Tajikistan), *C. milkoi* **sp. n.** (Kyrgyzstan), *C. hyalinopyga* **sp. n.** (Turkmenistan), *C. vittoriosai* **sp. n.** (Turkmenistan), *C. niehuisi* **sp. n.** (Tajikistan), *C. improba* **sp. n.** (Kazakhstan). A new synonym is proposed for *Chrysis* Linnaeus, 1761 (= *Plexichrysis* Balthasar, 1957, **syn. n.**). The status of *C. rutiliventris proba* Linsenmaier, 1959 (Pakistan) is raised to a specific rank, **stat. n.** A new name *C. balthasari* Rosa, **nom. n.** is proposed for *Plexichrysis amoena* Balthasar, 1953, secondary homonym in the genus *Chrysis*.

**Key words:** cuckoo wasps, taxonomy, new species, Palaearctic region.

**П. Роза. Новые виды ос-блестянок (Hymenoptera: Chrysididae) из Центральной Азии, России и Ирана. Часть 2 // Дальневосточный энтомолог. 2019. N 377. С. 1-25.**

**Резюме.** Описывается восемь новых видов из рода *Chrysis* Linnaeus: *C. belokobylskiji* **sp. n.** (Таджикистан, Кыргызстан, Китай, Монголия), *C. gurkoi* **sp. n.** (Таджикистан), *C. chalybeia* **sp. n.** (Таджикистан), *C. milkoi* **sp. n.** (Кыргызстан), *C. hyalinopyga* **sp. n.** (Туркменистан), *C. vittoriosai* **sp. n.** (Туркменистан), *C. niehuisi* **sp. n.** (Таджикистан), *C. improba* **sp. n.** (Казахстан). Предложена новая синонимия

для *Chrysis* Linnaeus, 1761 (= *Plexichrysis* Balthasar, 1957, **syn. n.**). Статус *C. rutiliventris proba* Linsenmaier, 1959, (Pakistan) поднят до видового уровня, **stat. n.** Новое название *C. balthasari* Rosa, **nom. n.** предложено для *Plexichrysis amoena* Balthasar, 1953 – вторичного омонима в роде *Chrysis*.

## INTRODUCTION

I recently began a revision of the Central Asian chrysidid fauna (Rosa, 2018a, 2018b, 2018c). This contribution to the Central Asian Chrysididae includes the description of eight new species from the genus *Chrysis* Linnaeus, 1761 and one replacement name for a secondary homonym in the genus *Chrysis*. Materials, methods, abbreviations of collectors and terms, depository museums and collections, as well as acknowledgements are the same given in the first part of this contribution (Rosa, 2018c) and Rosa *et al.* (2017b).

## TAXONOMY

### Tribe Chrysidini

#### Genus *Chrysis* Linnaeus, 1761

*Plexichrysis* Balthasar, 1957: 146, ♀ (type species *Plexichrysis amoena* Balthasar, 1957, by original designation and monotypy), **syn. n.**

#### *Chrysis belokobylskiji* Rosa, **sp. n.**

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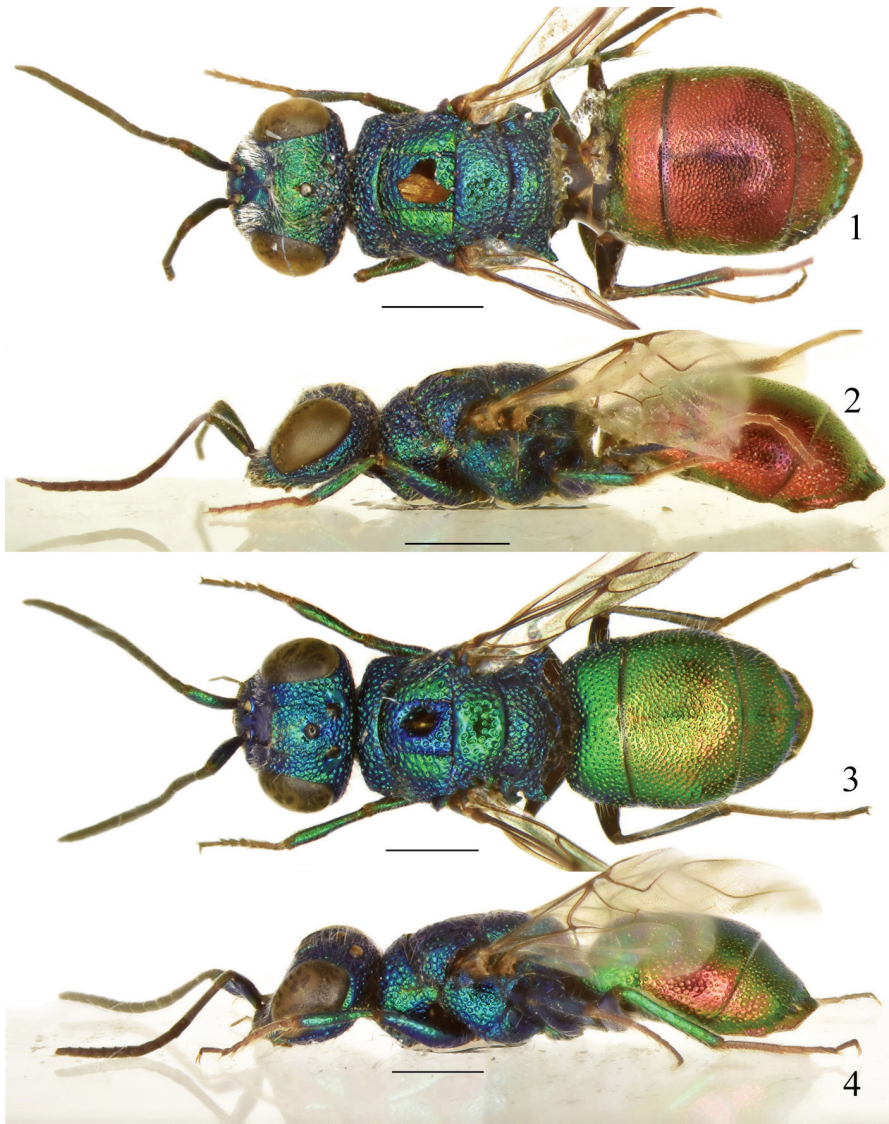
Figs 1–10, 51

SPECIMENS EXAMINED. Holotype – ♀, **Kyrgyzstan**: Naryn river near Karakolka, 3.IX 1963, P. Vtorov [ZIN]. Paratypes: **Tajikistan**: 1♀, Gissar Range, Anzob vill., 2700 m, 29.VII 1953, A. Tsvetajev [ZIN]. **China** (Qinghai): 1♂, Alyk-Nor lake, S slope of Burkhan Budda [= Budai Shan], end of May 1900, P. Kozlov [ZIN]. **Mongolia**: 1♀, Nogon-kub, N. Gobi, 1.VIII 1926, P. Kozlov [ZIN]; 1♂, 50 km E Ulanbalar Tuul, 22.VI 2003, leg. M. Halada [M. Halada coll., České Budějovice, Czech Rep.]; 1♀, 40 km SW of Uliastay, dunes, 18.VII 2005, leg. J. Halada [M. Halada coll.].

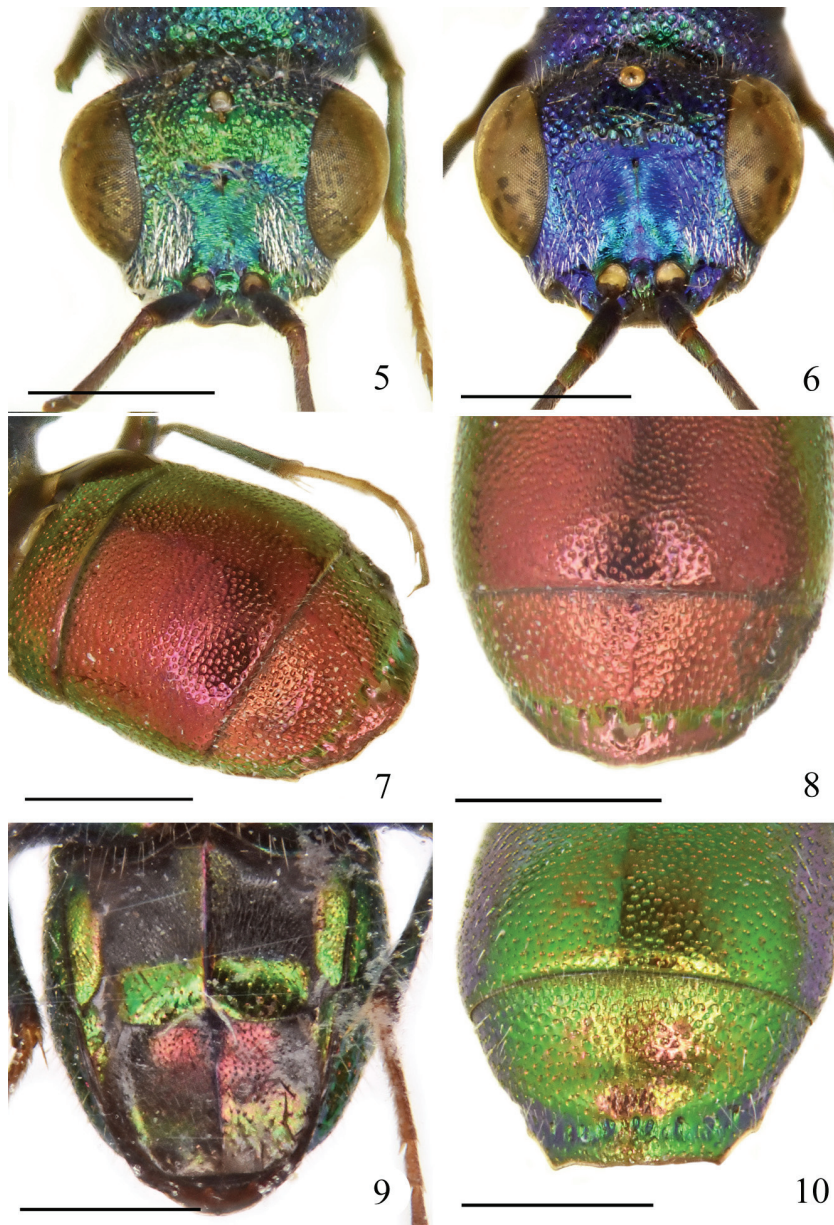
DIAGNOSIS. *Chrysis belokobylskiji* **sp. n.** belongs to the *C. pulchella* species group for: TFC strongly raised, M-like; F1 markedly elongate; T2 and T3 with moderate medial ridge; male genital capsule with slender gonocoxae (Fig. 51); shape of the apical margin of T3; large, quadrangular, almost fused black spots on S2. *C. belokobylskiji* **sp. n.** is close related to *C. personata* Semenov, 1967 for the bicoloured body, yet it can be separated by: smaller metasomal punctation, with scattered punctures and shining interstices; apical margin of the last tergum with basal tooth and lateral angle blunt, close to each other, medially almost straight with shallow undulations (Fig. 7–10), (*vs.* metasoma with large and coarse punctures, almost without interstices; apical margin of last tergum with marked basal and lateral teeth, medially biconvex in *C. personata*).

DESCRIPTION. *Female*. Body length 6.2–6.5 mm. Fore wing length 4.0–4.5 mm. OOL = 1.8 MOD; POL = 2.0 MOD; MS = 1.1 MOD; relative length of P:F1:F2:F3 = 1.0:1.3:1.0:1.0.

*Head*. In full face view, length 1.6 mm, width 1.9 mm. Apex of clypeus boomerang-shaped, bordered with a thick rim; TFC strong, M-like, with elongate branches almost



Figs 1–4. *Chrysis belokobylskiji* Rosa, **sp. n.**, paratype ♂: 1 – habitus, dorsal view; 2 – habitus, lateral view; paratype ♀: 3 – habitus, dorsal view; 4 – habitus, lateral view. Scale bar = 1.0 mm.



Figs 5–10. *Chrysis belokobylskiji* Rosa, **sp. n.**, paratype ♂: 5 – head, dorsal view; 7 – metasoma, postero-lateral view; paratype ♀: 8 – metasoma, posterior view; holotype ♀: 6 – head, frontal view; 9 – metasoma, ventral view; 10 – metasoma, posterior view. Scale bar = 1.0 mm.

encircling mid ocellus; scapal basin hollowed, transversally finally striated (in a paratype only with slight and irregular wrinkles); laterally with small, aligned punctures, following the orientation of median wrinkles; frons and vertex with medium-sized, subcontiguous punctures; with polished area lateral to posterior ocelli and ahead of mid ocellus; deep small pit ahead of mid ocellus. Subantennal distance about 1.0. Genal carina complete and extending to mandible joint, malar spaces finely and minutely punctate. Mandible simple, without inner tooth.

*Mesosoma*. Length 2.3 mm; width (PPW) 1.5 mm. Pronotum anteromedially slightly depressed, without distinctive anteromedian groove; irregularly punctate, with punctures of different diameter, denser at side; tiny punctures on interstices. Mesoscutum with shallow punctures; polished, shining interstices, with sparse tiny punctures; notauli and parapsidal lines deep. Mesoscutellum anteromedially polished, medially with sparser, small to medium (0.5 MOD) punctures; punctures smaller and denser towards axillary trough. Metanotum with denser, medium-sized, subreticulate punctures, without polished interstices. Mesopleuron with medium-sized, subreticulate punctures; episternal sulcus faint or a simple depression. Propodeal teeth unmodified, pointing backwards.

*Metasoma*. Length 3.2 mm. Punctuation geminate; scattered on T1, 1–2 PD apart, densely micropunctate on interstices. T2 with similar geminate punctures, anterodorsally denser, laterally and posteriorly scattered; longitudinal medial carina visible. T3 with dense punctuation, similar in pattern to T2; longitudinal median carina scarcely visible; slightly transversely bulging before pit row; apical margin medially continuous to weakly undulate, with acute lateral angles (blunt in paratypes) and basolateral blunt angles; pit row with small (0.5 MOD) and slightly elongate pits; post pit row area about 1.0 MOD long; black spots on S2 square, fused or medially with a very narrow purplish line.

*Coloration*. Head and mesosoma blue to green, metasoma red to greenish-golden. Body ventrally green, reddish on third sternum. Mandibles light brown, with metallic green reflections at base and darkened at apex. Scape, pedicel and T1 basally metallic green, other flagellomeres blackish. Legs green, with brown tarsomere. Tegulae metallic green. Wings hyaline with light brown nervures.

*Vestiture*. Long (1.0–2.0 MOD), sparse, erect and whitish setae on frons, vertex, mesosoma laterally, legs, metasoma laterally and ventrally.

*Male*. Similar to female, TFC only medially raised.

DISTRIBUTION. China (Qinghai), Tajikistan, Kyrgyzstan, Mongolia.

ETYMOLOGY. The specific epithet *belokobylskiji* (masculine name in genitive case) is named after Sergey A. Belokobylskij (St. Petersburg, Russia), who supported author's studies on Russian Chrysididae for several years.

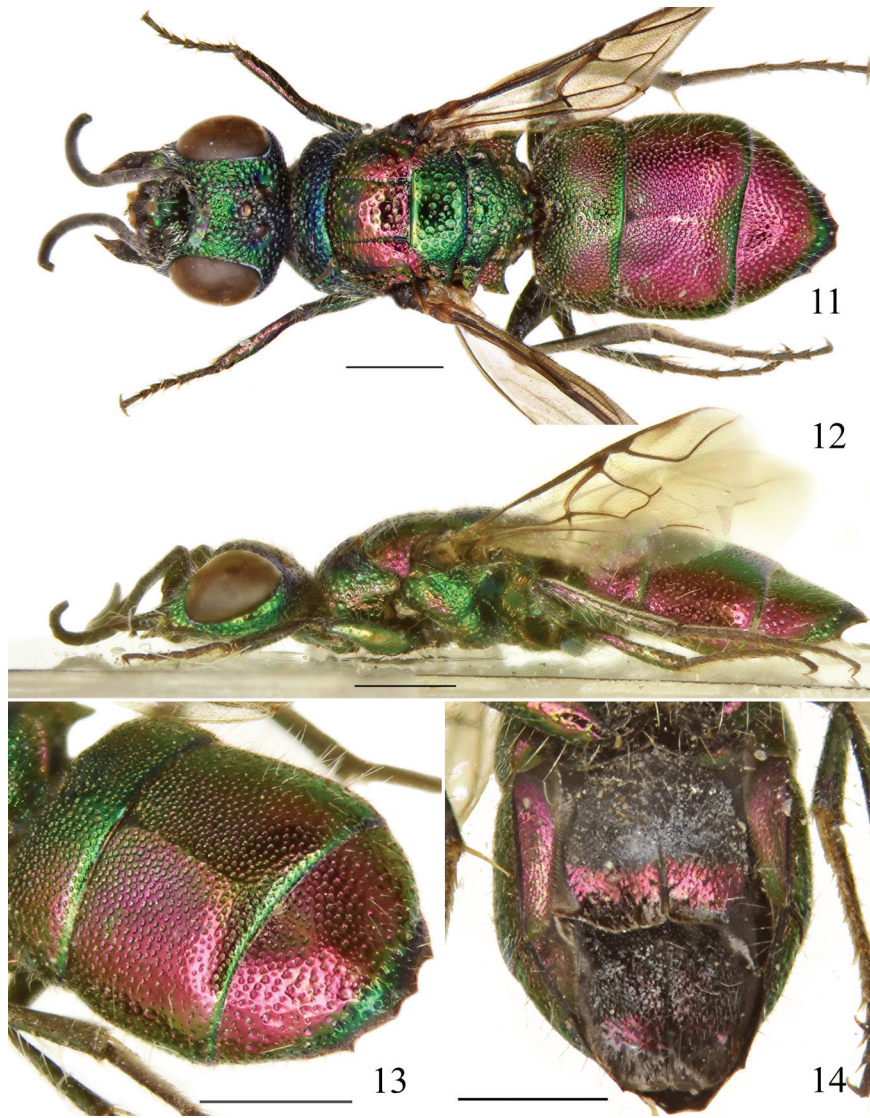
***Chrysis gurkoi* Rosa, sp. n.**

<http://urn:lsid:zoobank.org:pub:2742FC6D-E23B-455F-9182-AF8A5F9C8EFD>

Figs 11–14

SPECIMENS EXAMINED. Holotype – ♀: **Tajikistan**: W Pamir, Rushan Dst., 3400 m, 20–30.VII 2015, leg. V. Gurko & c. [ZIN].

DIAGNOSIS. *Chrysis gurkoi* **sp. n.** belongs to the *C. succincta* species group. It shows the typical habitus of Alpine species, with flattened body; shallow and sparse punctation; long erect setae on body and legs; darkened colouration. It is separated from all the other species of his group by its habitus, colouration, narrow ocelli and atypical short apical teeth of the T3.



Figs 11–14. *Chrysis gurkoi* Rosa, **sp. n.**, holotype ♀: 11 – habitus, dorsal view; 12 – habitus, lateral view; 13 – metasoma, postero-lateral view; 14 – metasoma, ventral view. Scale bar = 1.0 mm.

DESCRIPTION. *Female*. Body length 7.1 mm. Fore wing length 4.2 mm. OOL = 1.8 MOD; POL = 1.8 MOD; MS = 1.5 MOD; relative length of P:F1:F2:F3 = 1.0:1.5:0.9:0.8.

*Head*. In full face view, length 1.5 mm, width 2.0 mm. Apex of clypeus regularly concave; TFC faint; scapal basin deeply hollowed, medially polished; laterally with small punctures; frons and vertex with small to medium-sized punctures; on frons subcontiguous and without polished interstices, sparser on occiput; largely polished ahead of midocellus and laterally to posterior ocelli. Subantennal space less than 1.0 MOD. Genal carina complete and extending to mandible joint, malar spaces minutely punctate. Mandible toothless.

*Mesosoma*. Length 2.6 mm; width (PPW) 1.7 mm. Pronotum relatively short, with distinct anteromedian groove, as long as  $\frac{1}{2}$  of pronotal length; with punctures of different diameter and tiny punctures on interstices. Mesoscutum with shallow, sparse punctures, and large polished interstices; on lateral lobes with tiny punctures on interstices; notauli and parapsidal lines complete, as lines of deep punctures, decreasing from posterior to anterior margin. Mesoscutellum anteromedially largely polished, with shallow, small punctures, posteromedially larger; punctures smaller and denser towards axillary trough. Metanotum anteromedially polished, posterolaterally with dense, uneven, subreticulate punctures. Mesopleuron with medium-sized punctures; short and deep episternal sulcus. Propodeal teeth unmodified, subparallel, pointing backwards.

*Metasoma*. Length 3.2 mm. Punctuation on T1 with small, dense, geminate punctures, micropunctate on polished interstices. T2 malformed; anteromedially with smaller and denser punctures, becoming scattered towards margins; longitudinal medial carina present. T3 with longitudinal median carina scarcely visible; apical margin with four short, triangular teeth; medial teeth as angles, narrower; lateral ones pointed; post pit row area medially about 1.0 MOD long; S2 with fused, large black spots, covering  $\frac{3}{4}$  of sternum length.

*Coloration*. Typical colour pattern of *Chrysis succincta* Linnaeus, 1767, with rosy colour instead of red; propodeum and mesopleuron anteriorly rosy, apical margin of metasomal terga greenish. Body ventrally rosy to purplish. Mandibles brown, basally metallic green and subapically lighter. Scape and pedicel metallic green, flagellum black. Legs green to purplish; tarsomere brown. Tegulae brown. Wings hyaline with dark brown nervures.

*Vestiture*. Long, erect, whitish setae all over body and legs, laterally longer, up to 2.5–3.0 MOD.

*Male*. Unknown.

DISTRIBUTION. Tajikistan.

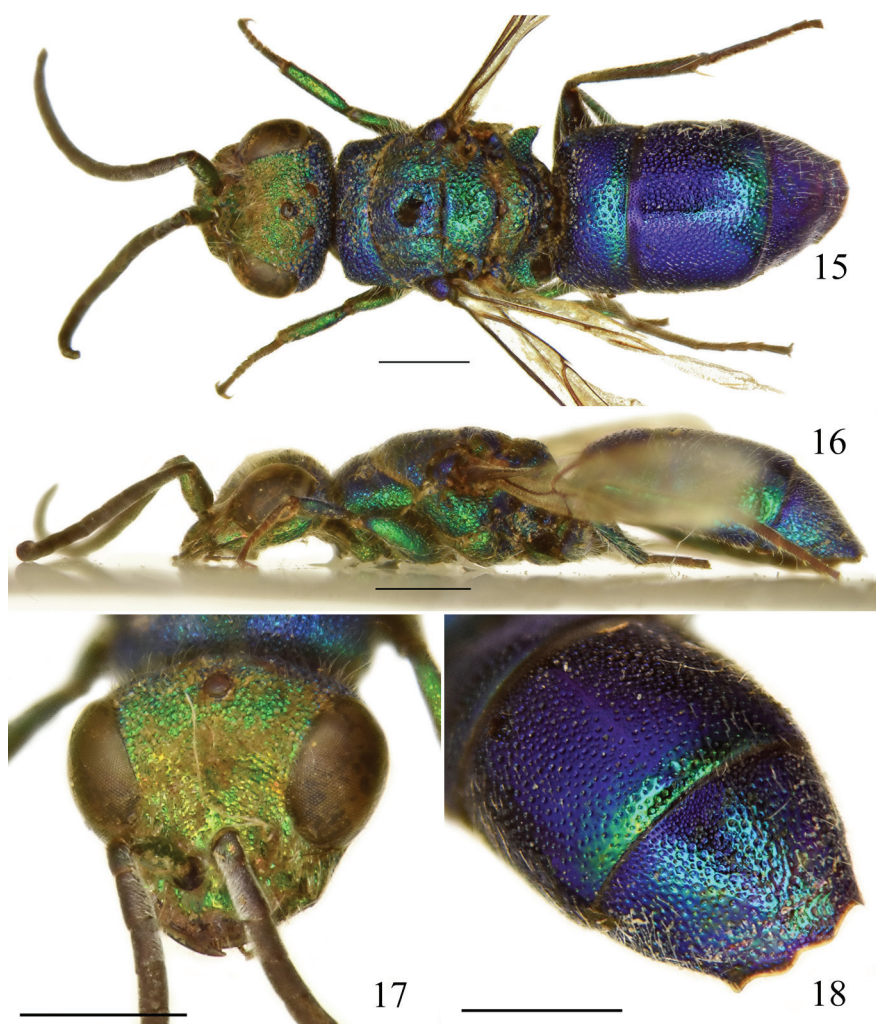
ETYMOLOGY. The specific epithet *gurkoi* (masculine name in genitive case) is named after the collector of this species, Vladimir O. Gurko (Ukraine).

***Chrysis chalybeia* Rosa, sp. n.**

<http://urn:lsid:zoobank.org:pub:4912ED99-D8AC-423B-9589-4D7682AF9DBB>

Figs 15–18, 53

SPECIMENS EXAMINED. Holotype – ♂: “Laudan, Samark[andskaya] obl., 17.VII 1912, leg. A. Kiritshenko” [West Tajikistan, Fann Mts., pass Laudan] [ZIN].



Figs 15–18. *Chrysis chalybeia* Rosa, **sp. n.**, holotype ♂: 15 – habitus, dorsal view; 16 – habitus, lateral view; 17 – head, frontal view; 18 – metasoma, postero-lateral view. Scale bar = 1.0 mm.

**DIAGNOSIS.** *Chrysis chalybeia* **sp. n.** belongs to the *C. bihamata* species group. It is related to *C. branicki* Radoszkowski, 1876 from Egypt, whose type has been recently found in Berlin and not in Krakow, where it was supposed to be housed. *C. chalybeia* **sp. n.** can be easily separated by elongate MS (2.0 MOD); body sculpture with smaller, relatively shallow punctures, and shining interstices; mesoscutellum anteromedially with small, dense micropunctures; T3, in dorsal view, triangularly shaped; in lateral view, slightly depressed before pit row; elongate post pit row area,



longer than 1.0 MOD; exceptionally elongate genitalia (Fig. 49). *C. branicki* conversely has short MS (about 1.0 MOD); all over body with large and subreticulate punctures, without shining interstices, including mesoscutellum; T3, in dorsal view, subrectangular and convex before pit row; in dorso-lateral view, short post pit row area (1.0 MOD); genitalia unmodified.

DESCRIPTION. *Male*. Body length 7.2 mm. Fore wing length 4.8 mm. OOL = 2.4 MOD; POL = 2.0 MOD; MS = 2.0 MOD; relative length of P:F1:F2:F3 = 1.0:1.3:0.9:0.9.

*Head*. In full face view, length 1.7 mm, width 1.9 mm. Apex of clypeus medially arched; TFC faint; scapal basin slightly hollowed, fully punctate, with no clear separation from frontal punctures; frons and vertex with small, reticulate punctures, without polished interstices. Malar spaces about 2.0 MOD, convergent. Subantennal distance about 1.0 MOD. Genal carina complete and extending to mandible joint, malar spaces minutely punctate. Mandible with inner tooth.

*Mesosoma*. Length 2.5 mm; width (PPW) 1.8 mm. Pronotum relatively short, along mid-line as long as metanotum, with anteromedian groove; punctures uneven, with tiny punctures on interstices. Mesoscutum with irregular, coarse punctures (0.1–0.4 MOD), partly confluent; narrow, polished interstices; on lateral lobes with smaller, irregular punctures; notauli and parapsidal lines complete, notauli visible as lines of small punctures. Mesoscutellum anteromedially densely and closely micropunctate as in the male of *Holopyga fervida* (Fabricius, 1781); laterally and posteriorly with shallow, small to medium-sized punctures, and broad, shining interstices. Metanotum anteromedially with large fovea; punctation coarse, denser, with uneven, subreticulate punctures. Mesopleuron with subconfluent medium-sized punctures, with deep, very short, episternal sulcus. Propodeal teeth divergent, pointing backwards.

*Metasoma*. Length 3.3 mm. Punctuation on T1 with small (0.3–0.4 MOD), sparse punctures, 1–3 PD apart, densely micropunctate on interstices. T2 with double punctuation, with punctures becoming scattered towards margins; longitudinal medial carina present. T3 with shallow punctures, medially subconfluent, with tiny punctures on interstices; longitudinal median carina scarcely visible; apical margin with two triangular lateral teeth and two median undulations; post pit row area longer than 1.0 MOD long; S2 with large, suboval black spots, medially close, not fused, separated by a narrow metallic line and covering about half sternum length.

*Coloration*. *Chrysis chalybeia* **sp. n.** is entirely blue steel, with green reflections on head, dorsally on mesosoma and posteriorly on metasomal terga. Body ventrally greenish. Mandibles dark brown, basally metallic green. Scape and pedicel metallic green, flagellum black. Legs green; tarsomere dark brown. Tegulae metallic blue. Wings slightly darkened, with dark brown nervures.

*Vestiture*. Long, erect, whitish setae all over body and legs, laterally longer, up to 2.5 MOD.

*Female*. Unknown.

DISTRIBUTION. Tajikistan.

ETYMOLOGY. The specific epithet *chalybeia* (feminine, adjective) is derived from Latin *chalybeius*, meaning “made of steel”.

***Chrysis milkoi* Rosa, sp. n.**

http://urn:lsid:zoobank.org:pub:EC346902-A67E-4D12-B407-07889E6D91DD

Figs 19–22

SPECIMENS EXAMINED. Holotype – ♀: **Kyrgyzstan**: S slope of Baybiche Too (Naryn region), 2800 m, 6–7.VIII 1995, leg. D. Milko [ZIN], specimen previously kindly donated by Maya Linsenmaier to P. Rosa.

DIAGNOSIS. *Chrysis milkoi* sp. n. belongs to the *C. bihamata* species group. It can be easily separated from all other known species by its body coloration, which is identical with *C. calimorpha* Mocsáry, 1882 of the *C. pulchella* group. Yet *C. milkoi* sp. n. is separated by ill-defined TFC, face distinctly elongate, apical margin of T3 with two angulated lateral teeth and medially almost straight, with two weak undulations (vs. well marked TFC, with elongate branches toward mid-ocellus, face squarish, apical margin of T3 biconvex, with an apicolateral angle, and lateral edge with a median tooth in middle, followed by a well-marked concavity in *C. calimorpha*).

DESCRIPTION. *Female*. Body length 9.0 mm. Fore wing length 4.0 mm. OOL = 2.2 MOD; POL = 1.9 MOD; MS = 1.0 MOD; relative length of P:F1:F2:F3 = 1:1:0.9:0.8.

*Head*. In full face view, length 3.0 mm, width 2.1 mm. Clypeus largely black and apically with thickened edge; straight at apex; subantennal space longer than 1.0 MOD. TFC slightly raised, vaguely U-inverted; scapal basin deeply hollowed, largely impunctate, laterally with irregular small to medium-sized punctures; frons and vertex with reticulate small to medium-sized punctures, without polished interstices; lateral to ocelli with large impunctate area. Malar space about 1.0 MOD, shorter than F1, convergent. Genal carina complete and extending to mandible joint. Mandible subapically toothed.

*Mesosoma*. Length 3.7 mm; width (PPW) 2.3 mm. In lateral view, mesosomal segments well separated by deep intersegmental sutures. Pronotum with weak anteromedian groove and double punctation. Mesoscutum with reticulate, medium-sized punctures, basally larger among notauli; on lateral lobes sparser, with double punctures; notauli and parapsidal lines complete, notauli as deep lines. Mesoscutellum anteromedially polished, posterolaterally with irregular subreticulate punctures. Metascutellum red, contrasting with blue anterior suture, blue axillary trough and propodeum; punctation reticulate and smaller than mesoscutellum. Mesopleuron with deep, complete episternal sulcus and even punctures. Propodeal teeth divergent.

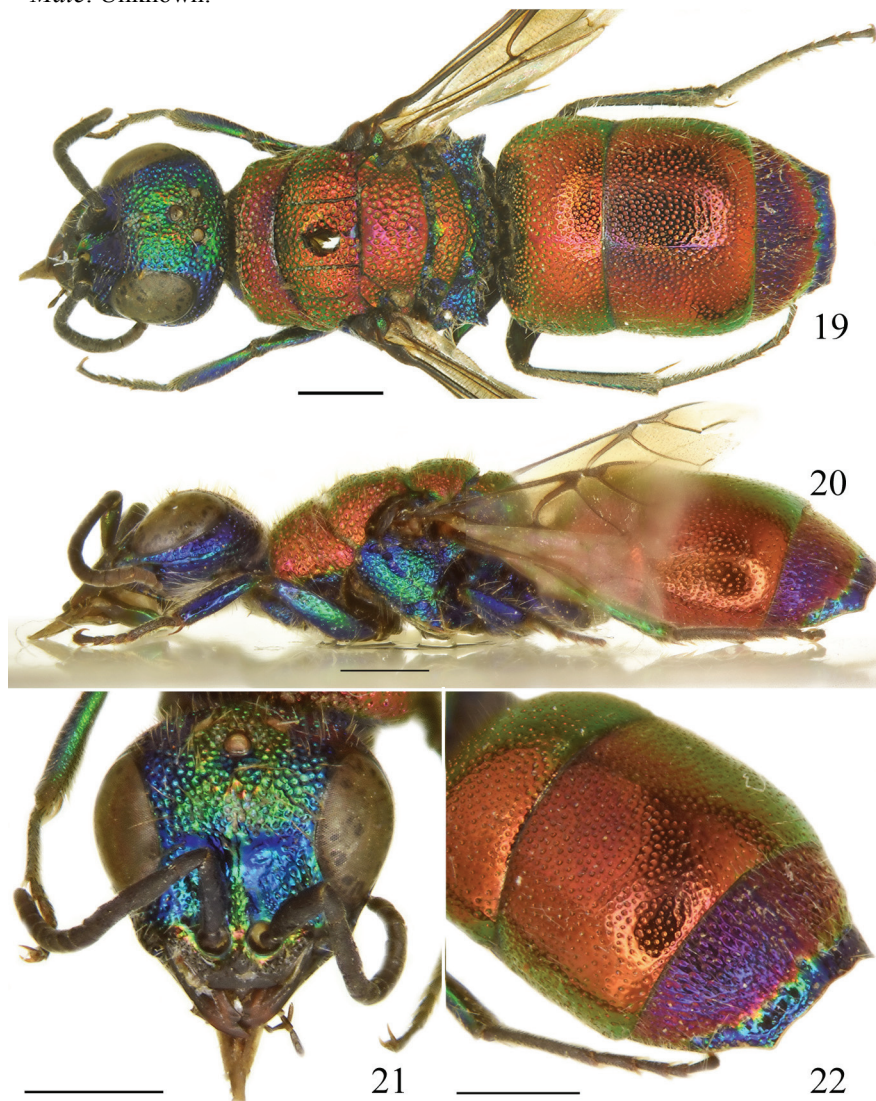
*Metasoma*. Length 3.7 mm. Punctation on T1 with small (0.3–0.4 MOD), sparse punctures, 1–3 PD apart, densely micropunctate on interstices. T2 anteromedially with double punctures, becoming largely scattered towards margins; longitudinal medial carina present. T3 with subconfluent punctures; longitudinal median carina present; apical margin with two triangular lateral angles and two median weak undulations; pits of the pit row small and shallow; post pit row area about 1 MOD long; S2 with large, suboval black spots, medially close, not fused, separated by a narrow metallic line and covering about 2/3 of entire sternum length.

*Coloration*. Head, mesosoma laterally and ventrally, and propodeum blue with green or golden green reflections; pronotum, mesonotum and metascutellum red; T1, T2 and T3, before pit row, red; apical margin of T3, from pit row, contrasting

blue; metasoma ventrally greenish. Mandibles dark brown, basally metallic green. Antennae black, with a feeble purple reflection on scapus. Legs green; tarsomere dark brown. Tegulae brown. Wings darkened with dark brown nervures.

*Vestiture.* Long, erect, whitish setae all over body and legs, laterally longer, up to 2.0 MOD.

*Male.* Unknown.



Figs 19–22. *Chrysis milkoi* Rosa, **sp. n.**, holotype ♀: 19 – habitus, dorsal view; 20 – habitus, lateral view; 21 – head, frontal view; 22 – metasoma, postero-lateral view. Scale bar = 1.0 mm.

DISTRIBUTION. Kyrgyzstan.

ETYMOLOGY. The specific epithet *milko* (masculine name in genitive case) is named after the Dmitry A. Milko (Bishkek, Kyrgyzstan), for the help provided during the author stay at the Institute of Biology and Pedology of the National Academy of Sciences of Kyrgyzstan.

***Chrysis hyalinopyga* Rosa, sp. n.**

<http://urn:lsid:zoobank.org:pub:C01D814E-320F-466D-A078-A49309BAFEFF>

Figs 23–26

SPECIMENS EXAMINED. Holotype – ♀, **Turkmenistan**: env. Ashgabat, 3.VIII 1931 [ZIN].

DIAGNOSIS. *Chrysis hyalinopyga* sp. n. belongs to the *C. rufitarsis* species group. It can be easily separated from all other species by shape of the last metasomal tergum, apically bordered with a broad hyaline rim. The only known species, within this group, with apical hyaline rim is *C. parthorum* Semenov, 1967, described from Iran. *Chrysis hyalinopyga* sp. n. can be separated from the latter for: apical margin of T3 medially straight (vs. noticeably bisinuate in *C. parthorum*); lateral emargination of T3, deeper and starting closer to basal margin than in *C. parthorum*; body colouration light green to golden (vs. distinctly darker and bicoulored, with red metasoma); squarish black spots on S2 (vs. rounded in *C. parthorum*).

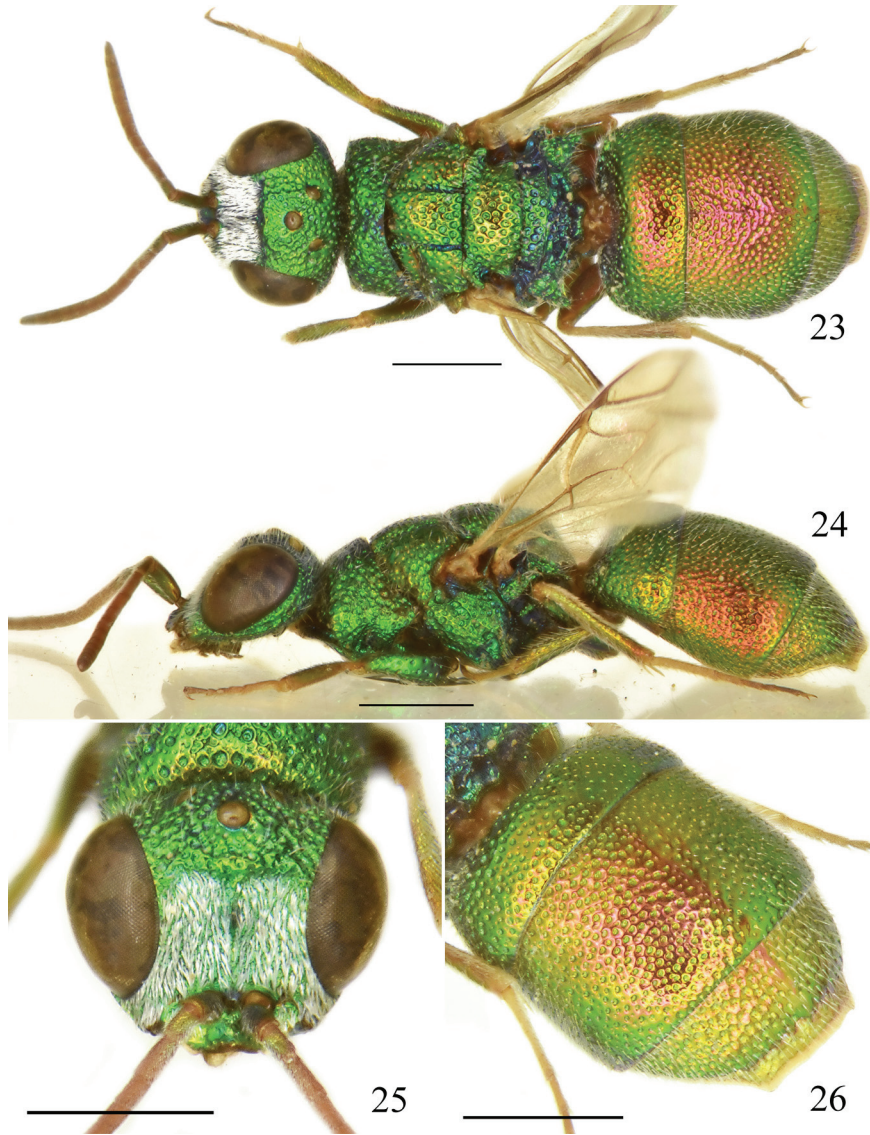
DESCRIPTION. Body length 6.1 mm. Forewing length 4.0 mm. *Female*. OOL = 1.6 MOD; POL = 2.0 MOD; MS = 1.1 MOD; relative length of P:F1:F2:F3 = 1.0:1.2:0.9:0.6.

*Head*. In full face view, length 1.4 mm, width 1.7 mm. Apex of clypeus arched, medially raised; TFC hardly raised and vaguely M-shaped, with two rami almost enclosing midocellus; scapal basin almost flat, overall densely covered with minute punctures, and with silvery, appressed setae; frons and vertex with irregular, small to medium-sized, contiguous to confluent punctures. Ocelli area distinctly raised on vertex. Malar space 1.0 MOD, shorter than F1. Mandibles with subapical tooth. Subantennal distance about 1.0 MOD. Genal carina fully developed to mandibular joint; malar spaces finely punctate.

*Mesosoma*. Length 2.3 mm; width (PPW) 1.6 mm. Pronotum anteromedially depressed, yet without a distinct groove; punctation irregular, with uneven punctures and tiny punctures on interstices. Mesoscutum basally with larger, closer punctures among notauli; lateral lobes with sparser punctures; notauli deep, formed by elongate subrectangular foveae. Mesoscutellum with even punctures, 1 PD apart, and polished interstices; anterolateral corners over axillary trough large and digitate. Metanotum very narrow, about one third of mesoscutellar length, with reticulate punctures. Mesopleuron with double punctation; episternal sulcus deep and complete. Propodeal teeth broad, divergent.

*Metasoma*. Length 2.7 mm. Punctation on T1 with small, even, medially scattered punctures, with small punctures on interstices; T2 with geminate punctures and shining interstices; anteromedially with larger, posteriorly with smaller and sparser punctures; median carina present on T2 and T3; T3 with punctation similar to the posterior half of T2; pits of the pit row small, round, yet very deep; post pit row area

about 1.0 MOD; apical margin of T3 with lateral triangular angles, medially straight; apical margin with broad hyaline rim. Black spots on S2 squarish, medially almost fused, covering about half sternum length.



Figs 23–26. *Chrysis hyalinopyga* Rosa, **sp. n.**, holotype ♀: 23 – habitus, dorsal view; 24 – habitus, lateral view; 25 – head, frontal view; 26 – metasoma, postero-lateral view. Scale bar = 1.0 mm.

*Coloration.* Head and mesosoma green; propodeum, notauli and axillary trough bluish; metasoma golden-greenish. Mandibles with metallic green reflections at base, medially testaceous, apically darker. Scape, pedicel and F1 greenish, the remaining flagellomeres light brown. Legs metallic red, yellowish on joints, tarsi light yellowish, slightly darkened at apex. Tegulae metallic green. Wings hyaline with light brown nervures.

*Vestiture.* Body with short (1.0 MOD), erect, whitish setae.

*Female.* Unknown.

DISTRIBUTION. Turkmenistan.

ETYMOLOGY. The specific epithet *hyalinopyga* (adjective) refers to the unusually broad hyaline edge of the third (anal) metasomal segment.

***Chrysis vittoriosai* Rosa, sp. n.**

http://urn:lsid:zoobank.org:pub:AA353241-731F-4A57-833B-CB89506FC5D3

Figs 27–30, 54

SPECIMENS EXAMINED. Holotype – ♂, **Turkmenistan**: Kara-Kala [=Makh-umkuli], 6.VII.1955, leg. A. Ponomareva [ZIN]. Paratypes: 1♂, same locality, 7.VII 1955 [ZIN]; 3♂, 9.VIII.1955 [ZIN, PRC]; 1♂, 10.VII 1955 [ZIN].

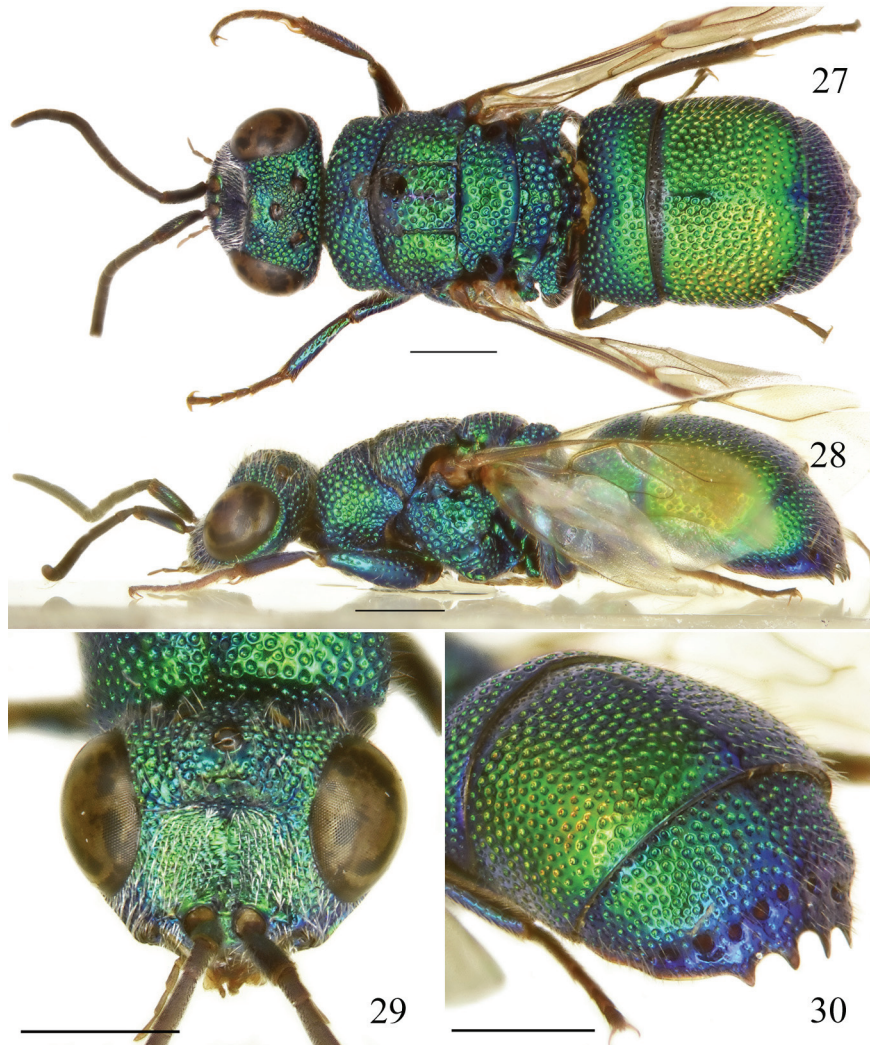
DIAGNOSIS. *Chrysis vittoriosai* sp. n. belongs to the *C. aestiva* species group. It is separated from *C. aestiva* Dahlbom, 1854, *C. aurelia* Balthasar, 1953, *C. maderi* Linsenmaier, 1959, *C. rosai* Arens, 2017 and *C. martinella* du Buysson, 1900 by elongate teeth on apical margin of T3 and shape of genital capsule; from *C. interjecta* du Buysson, 1895 by wider face; longer F1; deeper and larger metasomal punctures; third metasomal segment with no aligned pits of the pit row; inner apical teeth distinctly longer than lateral ones; body colouration and shape of genital capsule.

DESCRIPTION. Body length 7.5 mm. Fore wing length 5.0 mm. *Male*. OOL = 1.6 MOD; POL = 2.2 MOD; MS = 1.7 MOD; relative length of P:F1:F2:F3 = 1.0:1.7:1.1:0.9.

*Head.* In full face view, length 1.7 mm, width 2.2 mm. Apex of clypeus almost straight, bordered with a broad, brown rim (0.4 MOD); TFC straight, medially raised and laterally faint; brow distinctly swollen over scapal basin; scapal basin slightly hollowed, medially with a narrow, polished stripe; elsewhere densely punctate, with minute punctures of increasing diameter towards compound eye, and covered with silvery, appressed setae. Vertex with small, reticulate punctures almost polished in front of mid-ocellus, with a deep, narrow, elongate fovea lateral to posterior ocelli. Malar space long, 1.7 MOD, yet shorter than F1. Genal carina fully developed up to mandibular joint. Subantennal distance about 1 MOD. Mandible with subapical tooth.

*Mesosoma.* Length 3.0 mm; width (PPW) 2.1 mm. Pronotum anteromedially depressed, with relatively deep and narrow anteromedian groove, exceeding half pronotal length; reticulate punctation, with punctures twice as large as those on vertex, with scattered small punctures on interstices. Mesoscutum basally with larger punctures, denser and subreticulate; on lateral lobes with double punctation and punctures smaller than those on median lobe; notauli and parapsidal lines complete; notauli as

deep lines. Mesoscutellum with large, reticulate punctures (up to 0.5 MOD), with shining interstices; metascutellum with denser and larger punctures, without interstices. Mesopleuron with dense, irregular punctures; episternal sulcus well marked. Propodeal teeth small, subparallel and pointing backwards.



Figs 27–30. *Chrysis vittoriosai* Rosa, **sp. n.**, holotype ♂: 27 – habitus, dorsal view; 28 – habitus, lateral view; 29 – head, frontal view; 30 – metasoma, postero-lateral view. Scale bar = 1.0 mm.

*Metasoma.* Length 3.4 mm. Punctuation on T1 with large, scattered punctures, polished interstices with some shallow, tiny punctures. T2 with large, deep punctures,

with tiny punctures on interstices; punctures smaller and scattered on the posterior third; longitudinal median carina present. T3 with reticulate punctures; pits of the pit row large, round and deep, not aligned, because median ones are lifted up; median carina present. Black spots on S2 large, subrectangular, covering almost the whole sternum length, medially separated by a thin line.

*Coloration.* Body green to light blue; deep blue on the second half of T3, including pit row and apical teeth. T2 and anterior part of T3 from golden-greenish to red in some paratypes. Body ventrally green, darker to bluish on sterna. Mandibles brown, basally green. Scape, partly green, pedicel and flagellum black. Legs green with brown tarsi. Tegulae metallic green. Wings hyaline, with light brown nervures.

*Vestiture.* Body covered by short (1.0 MOD), erect, whitish setae.

*Female.* Unknown.

DISTRIBUTION. Turkmenistan.

ETYMOLOGY. The species is named after my father, Vittorio Rosa (Bernareggio, Italy), renowned Italian entomologist, who introduced me in the study of Entomology and Chrysididae in particular.

***Chrysis improba* Rosa, sp. n.**

<http://urn:lsid:zoobank.org:pub:AC7F07E6-0470-473C-BA6E-F2A8B9FA180E>

Figs 31–34, 52

SPECIMENS EXAMINED. Holotype – ♂, **Kazakhstan**: Balamurun, Karatau, 24–26.V 1913, leg. V. Koshantshikoff [ZIN].

DIAGNOSIS. *Chrysis improba* sp. n. appears somewhat related to the *C. maculicornis* species group for both F1 and F2 shorter than F3, and malar spaces shorter than 1.5 MOD. Nevertheless, *C. improba* sp. n. shows some unique diagnostic features that may argue for its inclusion species in a new, self-standing group: TFC strong, sharp, somewhat curved below, with three backwards pointing rami; verticaulus, after scrobal sulcus, distinctly carinate, sharp, seemingly a tooth, seen at oblique angle, head broad, distinctly triangularly shaped, with large POL (2.5 MOD), basolateral swelling of T3 as in the *C. inaequalis* group. The above mentioned characters easily separate *C. improba* sp. n. from any other species.

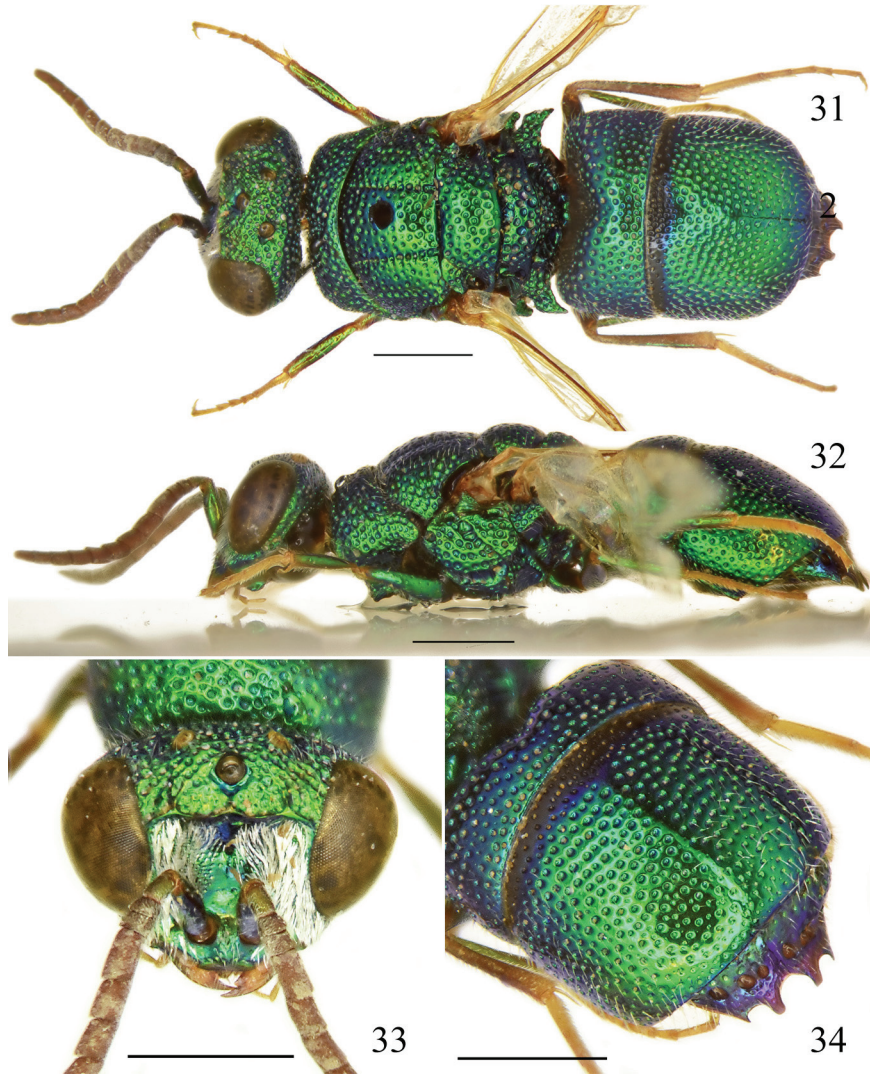
DESCRIPTION. Body length 6.7 mm. Fore wing length 4.0 mm. *Male.* OOL = 1.5 MOD; POL = 2.5 MOD; MS = 1.0 MOD; relative length of P:F1:F2:F3 = 1.0:0.5:0.5:1.5.

*Head.* In full face view, length 1.4 mm, width 2.0 mm. Apex of clypeus almost straight; TFC strong, prominent, laterally curved following eye margin, with three backwards pointing rami, one median and two lateral, almost enclosing mid-ocellus; scapal basin medially polished, laterally densely, minutely punctured, covered with dense, appressed, silvery setae; punctures among rami ill-defined and shallow; punctures on vertex and occiput small, reticulate. Malar space 1.0 MOD, as long as F1+F2, convergent. Subantennal distance about 1.0 MOD. Subgenal carina complete, extending to mandible joint. Mandible with subapical tooth.

*Mesosoma.* Length 2.7 mm; width (PPW) 2.1 mm. Pronotum anteromedially slightly depressed, without anteromedian groove; punctation double, subreticulate, with medium-sized punctures (about 0.3 MOD) and small punctures (0.1 MOD) on



interstices. Mesoscutum with medium-sized punctures (0.3 MOD), with polished, shining interstices, 1 PD apart, with sparse tiny, shallow dots; notauli and parapsidal lines complete; notauli with deep, round pits, decreasing from posterior to anterior margin. Mesoscutellum with punctation similar to posterior half of mesoscutum. Metanotum with larger, deeper, subreticulate punctures of different size, with anteromedian fovea. Mesopleuron with ventrally shallow punctures; episternal sulcus



Figs 31–34. *Chrysis improba* Rosa, **sp. n.**, holotype ♂: 31 – habitus, dorsal view; 32 – habitus, lateral view; 33 – head, frontal view; 34 – metasoma, postero-lateral view. Scale bar = 1.0 mm.

formed by deep, large, subrectangular foveae; verticaulus, after scrobal sulcus, seen at oblique angle in dorso-lateral view distinctly carinate, sharp. Propodeal teeth narrow, triangular, basally elongate, divergent and pointing backwards. Rs apically ending more than 1.0 MOD from anterior wing margin.

*Metasoma*. Length 2.7 mm. Double punctation on T1 with small and medium-sized, scattered punctures, about 1–3 PD apart, denser on margins, with tiny dots on interstices. T2 with double punctation, anterodorsally denser and posteriorly scattered with smaller punctures. T3 basolaterally with a convexity, somehow as in the *C. inaequalis* group; pits of the pit row large (0.5 MOD), round and deep; lateral teeth triangular and pointed; median ones larger and apically blunt. Median longitudinal carina present on T2 and T3. Black spots on S2 small, round, connected to lateral margins and medially largely separated, more than 1 MOD.

*Coloration*. Body green; T2 basally with a blue stripe; posterior half of T3 deep blue. Mandibles brown, basally greenish and medially lighter. Scape and pedicel metallic green, flagellum black. Legs green, tarsi yellowish. Tegulae metallic green. Wings transparent, with light brown to yellowish veins.

*Vestiture*. Body covered by sparse, short (1.0 MOD), semi-erect and whitish setae.

*Note*. The third segment is not completely visible, being partly retracted into the second one. Because of the rigidity of the unique known specimen, attempts to make the third segment visible appeared likely to result in irreparable damaging, and were therefore discarded.

*Female*. Unknown.

DISTRIBUTION. Kazakhstan.

ETYMOLOGY. The specific epithet *improba* (noun, feminine), from the Latin *improbus* (= disloyal), refers to the unclear systematic placement of this species.

#### ***Chrysis niehuisi* Rosa, sp. n.**

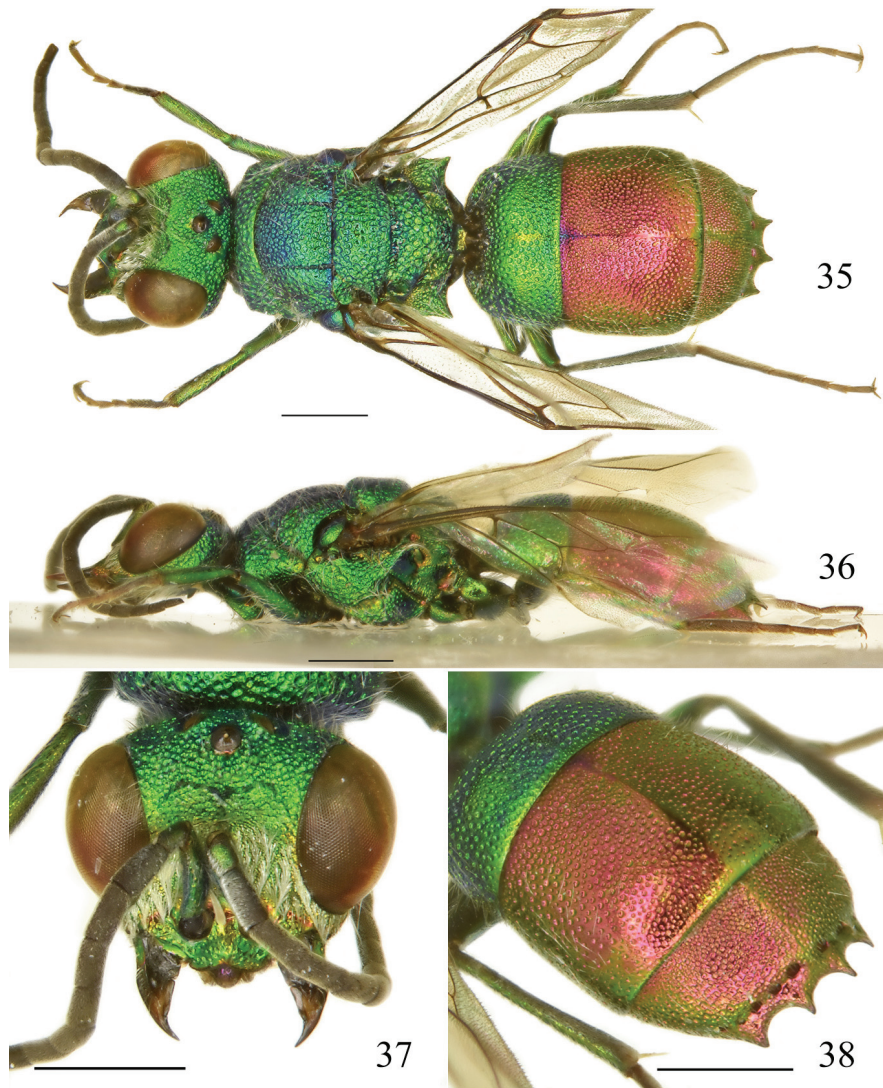
<http://urn:lsid:zoobank.org:pub:E4228A16-D131-41E1-BB51-7FCAEA90E325>

Figs 35–38, 55

SPECIMENS EXAMINED. Holotype – ♂, **Tajikistan**: W Pamir, Rushan Dst., 3400 m, 20–30.VII 2015, leg. V. Gurko & c. [ZIN]. Paratype – ♂, same data of holotype [PRC]

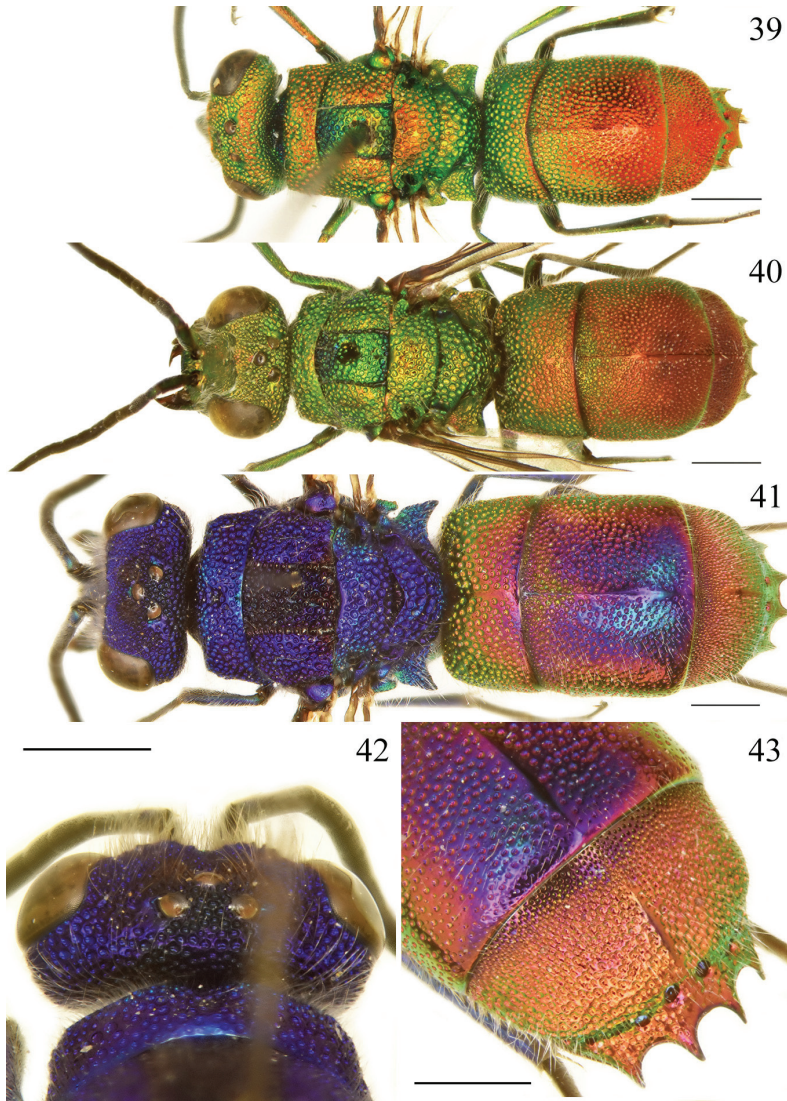
DIAGNOSIS. *Chrysis niehuisi* sp. n. belongs to the *C. ignita* species group, *C. ruddii* subgroup, for: short pronotum, its length less than one fourth of its width; F1 largely non-metallic; scapal basin with dense, appressed, white pubescence. *Chrysis niehuisi* sp. n. is related to *C. rutiliventris* Abeille de Perrin, 1879, from which it is separated by TFC undulate, M-shaped (*vs.* arched in *C. rutiliventris*); T3 with elongate, slender apical teeth (*vs.* short and basally broadened); elongate propodeal teeth (*vs.* shorter); body colouration green, with golden-rosy T2 and T3 (*vs.* blue head and mesosoma, and uniformly red metasoma). *C. niehuisi* sp. n. is separated from the Pakistani *C. proba* Linsenmaier, 1959, **stat. n.** (Figs 41–43) by complete TFC (*vs.* medially interrupted in *C. proba* (Fig. 42)); metasomal punctation denser and smaller (*vs.* larger and scattered); apical teeth of T3 less elongate than in *C. proba*; T1 concolorous with mesosoma, and strongly contrasting with the remaining

metasomal segments (vs. metasoma overall red to violet). The above-mentioned features also lead me to raise *C. proba* to specific rank. Other Asian species related to *C. niehuisi* **sp. n.** are *C. carnifex* Mocsáry, 1889 (from China: Shanxi), *C. crebropilosa* Tarbinsky, 2001 and *C. chlorochrysea* Tarbinsky, 2001 (both from Kyrgyzstan). *C. carnifex* is recognizable by sparse body punctation, in particular by



Figs 35–38. *Chrysis niehuisi* Rosa, **sp. n.**, holotype ♂: 35 – habitus, dorsal view; 36 – habitus, lateral view; 37 – head, frontal view; 38 – metasoma, postero-lateral view. Scale bar = 1.0 mm.

the even and sparse punctation on T2, shortened F1, and sharp, spiniform teeth of the last tergum; *C. crebropilosa* is recognizable by extremely elongate whitish setae all over the body; *C. chlorochrysea* (Figs 39–40), whose females are variable in colouration and may have green T1, is separated by shape of apical teeth of T3 (spiniform in males and basally larger in females, with wider intervals), punctation of T2 larger and sparser, and male genital capsule (Fig. 56).



Figs 39–43. 39, 40 – *Chrysis chlorochrysea* Tarbinsky: 39 – holotype ♀, habitus, dorsal view; 40 – ♂, habitus, dorsal view; 41–43 – *C. proba* Linsenmaier, holotype ♂: 41 – habitus, dorsal view; 42 – head, dorsal view; 43 – metasoma, postero-lateral view. Scale bar = 1.0 mm.

DESCRIPTION. Body length 8.0 mm. Fore wing length 5.8 mm. *Male*. OOL = 2.1 MOD; POL = 1.2 MOD; MS = 1.0 MOD; relative length of P:F1:F2:F3 = 1.0:1.5:1.4:1.3.

*Head*. In full face view, length 1.6 mm, width 2.2 mm. Apex of clypeus slightly arched; TFC strong, vaguely M-like, its distal margin ending close to eye margin; scapal basin with very dense and fine punctation, covered with dense, appressed, silvery setae; punctures on vertex and occiput small, reticulate. Malar space short 0.7 MOD, as long as one third of F1. Subantennal distance about 1.0 MOD. Subgenal carina complete, extending to mandible joint. Mandible without subapical tooth; in lateral view, mandible relatively thick, its sides gradually converging towards apex and basally only slightly concave.

*Mesosoma*. Length 2.8 mm; width (PPW) 1.9 mm. Pronotum anteromedially slightly depressed, without distinct anteromedian groove; punctation double, uneven, with larger punctures subcontiguous to subconfluent. Mesoscutum with dense, small to medium-sized punctures, with very narrow polished interstices; lateral area of mesoscutum with scattered punctures and tiny dots on polished interstices; notauli and parapsidal lines complete; notauli with deep, elongate pits, decreasing from posterior to anterior end. Mesoscutellum with punctation similar to mesoscutum, with slightly larger punctures. Metanotum with larger, subreticulate punctures of different size; on anterior margin with a row of elongate foveae. Mesopleuron with episternal sulcus formed by deep and large foveae. Propodeal teeth hardly divergent, pointing backwards.

*Metasoma*. Length 3.5 mm. T1 with medium-sized, scattered punctures, about 1–2 PD apart, denser on margins, with interstices covered by tiny punctures. T2 with double puncture, very dense anteromedially, scattered posteriorly and laterally, with larger polished interstices. T3 with small, even, very dense punctures, without polished interstices; pits of the pit row large (0.7 MOD), round and deep; apical teeth triangular, pointed, subequal in length, and with similar indenture. Median longitudinal carina present on T2 and T3. Black spots on S2 small, trapezoidal, connected to lateral margins, with oblique inner margins, medially largely separated (about 1 MOD), similar in shape to *C. impressa* Schenck, 1856.

*Coloration*. Head, mesosoma and T1 green; T2 and T3 red-rosy; metasoma ventrally golden-red. Paratype with darker bluish coloration on head, mesosoma, and T1; lighter greenish-rosy on T2 and T3. Mandibles brown, basally golden-green. Scape and pedicel metallic green, F1 basally slightly metallic, remaining flagellomeres black. Legs green, tarsi brown. Tegulae green. Wings hyaline, brownish around radial sector, veins brown.

*Vestiture*. Pubescence on vertex and dorsally on mesosoma dense, long (1.8 MOD), erect and whitish setae; metasoma laterally with long, erect setae; on femora and tibiae with sparse, erect and long setae.

*Female*. Unknown.

DISTRIBUTION. Tajikistan.

ETYMOLOGY. The specific epithet *niehuisi* (masculine name in genitive case) is named after Prof. Dr. Oliver Niehuis (Freiburg i. Br., Germany) in recognition of his work on cuckoo wasps.

***Chrysis balthasari* Rosa, nom. n.**

Figs 44–48

*Plexichrysis amoena* Balthasar, 1957: 147, ♀, nom. paeocc. nec *Chrysis amoena* Eversmann, 1858.

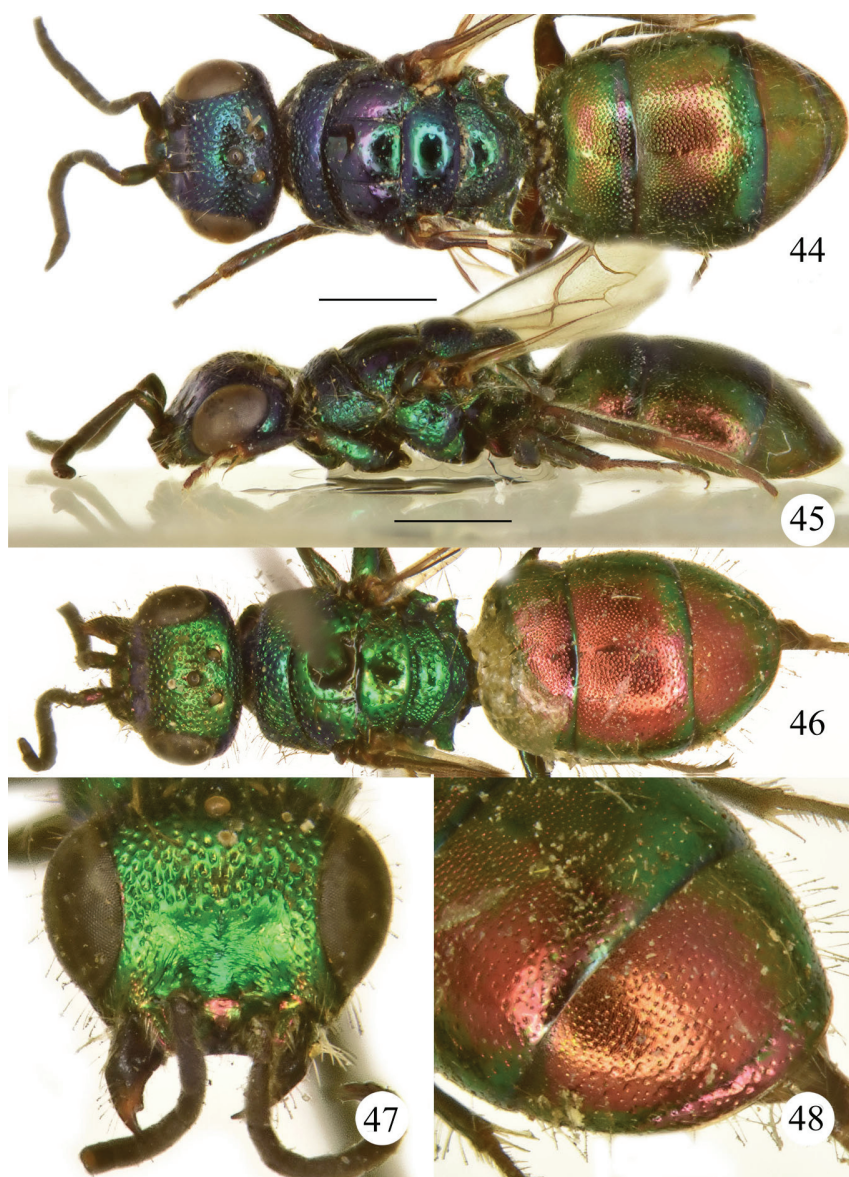
SPECIMENS EXAMINED. Holotype of *Plexichrysis amoena*, ♀, **Afghanistan**: Badakschan, Anjuman-Pass, 4200 m, 13.VIII 1952, leg. J. Klapperich [Prague]. Additional material. **Tajikistan**: E of Pamir, Zorkul lake, 1.VII 1976, leg. L.V. Pek [Bishkek] (Figs 44–45).

DIAGNOSIS. Balthasar (1957) described an unusual genus of Chrysidini, characterized by an amount of odd features, starting from the shape of the head, larger than wider, without TFC, with flattened and polished scapal basin. Balthasar (1957) stated that at first sight *Plexichrysis* may be confused with an Elampini genus, but the examination of the tarsal claws excludes this possibility. When I first examined a female specimen from Tajikistan of this odd species I had the same feeling. Moreover, I observed that *Pl. amoena* and *C. leleji* share most of the diagnostic characters described by Balthasar (1957), yet they clearly differ for the shape and punctuation of the head: scapal basin is distinctly transversely microridged in *C. leleji* (polished, somewhere with irregular wrinkles in *Pl. amoena*) and punctuation is characterized by shallow and scattered punctures, with large, polished interstices (vs. deeper and closer in *Pl. amoena*). Other shared characters, such as flattened body, shallow and sparse punctuation, long erect setae on body and legs, are typical of Alpine species. These two species very likely belong to the same species group found at high altitudes, characterized, among the others, by toothed mandible, toothless apical margin of T3, and microreticulation among metasomal punctures. Kimsey & Bohart (1991) synonymized *Pl. amoena* with *Spintharina tenellula* (Semenov, 1910), yet these two species are clearly separate by shape of the head, body punctuation, pit row, propodeal angles, etc. Pictures of *Sp. tenellula* are available in Rosa *et al.* (2017a) for comparison with pictures of the type of *Pl. amoena*, deposited at the Museum of Natural History in Prague (Figs 46–48). Kimsey & Bohart's (1991) synonymy is clearly misleading and no *Spintharina* matches the description of *Pl. amoena*. For this reason, waiting for future molecular systematic analysis, I propose here the new synonymy *Chrysis* Linnaeus, 1761 = *Plexichrysis* Balthasar, 1957, **syn. nov.** The type species *Plexichrysis amoena* Balthasar, 1957 became a secondary homonym of *Chrysis amoena* Eversmann, 1858. However, *C. amoena* Eversmann is the type species of the genus *Pentachrysis* Lichtenstein, 1876, which I consider as a valid genus, until new molecular analyses will clarify its phylogenetic placement. For entomologists who follow Linsenmaier's systematic, in which *Pentachrysis* is a subgenus of *Chrysis*, I propose the replacement name *Chrysis balthasari* Rosa, **nom. n.** for *C. amoena* (Balthasar).

DESCRIPTION. *Female*. Body length 6.0 mm. OOL = 1.8 MOD; POL = 2.5 MOD; MS = 1.3 MOD; relative length of P:F1:F2:F3 = 1.0:1.2:0.8:0.8.

*Head*. TFC absent; scapal basin slightly hollowed, covering almost full face width, largely polished, medially irregularly wrinkled; laterally with tiny, sparse punctures close to eye; frons and vertex with small, shallow scattered punctures and

polished interstices. Malar space longer than 1.0 MOD, slightly shorter than F1. Genal carina faint to vaguely visible close to mandible joint. Mandible with sub-apical tooth.



Figs 44–48. *Chrysis balthasari* Rosa, **nom. n.** (46–48 – holotype of *Plexichrysis amoena* Balthasar, 1957), ♀. 44, 45, Tajkistan. 44, 46 – habitus, dorsal view; 45 – habitus, lateral view; 47 – head, dorsal view; 48 – metasoma, poetero-lateral view. Scale bar = 1.0 mm.

*Mesosoma*. Pronotum shortened and anteromedially slightly depressed; irregularly punctate, punctures shallow, ill-defined, small to medium-sized, laterally partly subcontiguous. Mesoscutum with scattered, shallow, punctures, and polished interstices, with large polished areas, not transversely striate. Mesoscutellum largely polished, with very scattered, small-sized punctures, denser towards axillary trough. Metanotum anteromedially polished, laterally and posteriorly with denser, small punctures, subcontiguous towards axillary trough. Mesopleuron with faint episternal sulcus. Propodeal teeth unmodified.



Figs 49–56. Genital capsule, dorsal view: 49 – *Chrysis rubra* Rosa, **sp. n.**; 50 – *C. diadema* Rosa, **sp. n.**; 51 – *C. belokobylskiji* Rosa, **sp. n.**; 52 – *C. improba* Rosa, **sp. n.**; 53 – *C. chalybeia* Rosa, **sp. n.**; 54 – *C. vittoriosai* Rosa, **sp. n.**; 55 – *C. niehuisi* Rosa, **sp. n.**; 56 – *C. chlorochrysea* Tarbinsky. Scale bar = 1.0 mm.

*Metasoma*. Punctuation on T1 with small, dense, even punctures; posterior margin with a narrow, darker, and impunctate stripe. T2 anteromedially with similar punctuation, sparser to largely impunctate on posterior half, towards lateral and posterior margins; wrinkled microsculpture on interstices; impunctate stripe on posterior margin. T3 subovoid, with apical margin evenly arcuate, apically with narrow hyaline rim; pit row ill-defined, with shallow and small pits; post pit row area medially enlarged, as long as 1.0 MOD. Black spots on S2 subrectangular, medially separated by 2.0 MOD; sterna densely punctate, with reticulate microsculpture.



*Coloration.* Head and mesosoma light green (type) or dark blue with purplish reflections; metasoma golden-red (type), or depending on viewpoint, changing dorsally from red and golden to green and purple, laterally from red to purple. Body ventrally dark green. Scape and pedicel metallic green, flagellum black. Legs green; tarsomere brown. Tegulae dark with feeble metallic reflections. Wings hyaline with brown nervures.

*Male.* Unknown.

DISTRIBUTION. Afghanistan, Tajikistan.

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