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***Karakumosa* gen. nov., a new Central Asian genus of fossorial wolf spiders (Araneae: Lycosidae: Lycosinae)**

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Abstract: A new genus, *Karakumosa* gen. nov., is established to accommodate nine central Asian species of burrowing wolf spiders, of which seven are diagnosed and described as new: *K. badkhyzica* sp. nov. (♂♀, southern Turkmenistan), *K. gromovi* sp. nov. (♂♀, southern Uzbekistan), *K. repetek* sp. nov. (♂♀, eastern Turkmenistan), *K. shmatkoi* sp. nov. (♂♀, northern Caspian region and Azerbaijan), *K. tashkumyr* sp. nov. (♂, Kyrgyzstan), *K. turanica* sp. nov. (♂♀, Turkmenistan), *K. zyuzini* sp. nov. (♂♀, Uzbekistan). Two generic transfers are proposed: *Karakumosa alticeps* (Kroneberg, 1875), comb. nov. and *K. medica* (Pocock, 1889), comb. nov. (both ex *Hogna* Simon, 1885). Lectotypes are designated for *Tarentula alticeps* Kroneberg, 1875 (♂) and *T. medica* Pocock, 1889 (♂). The localities of all *Karakumosa* species are mapped, and an identification key is provided as well. A short overview of the fauna and diversity of the fossorial Lycosidae of Central Asia is given.

Keywords: Taxonomy - descriptions - identification key.

INTRODUCTION

Fossorial wolf spiders of the family Lycosidae Sundevall, 1833 of Central Asia have been studied inadequately and remain poorly understood taxonomically (for an overview see Logunov, 2010). Central Asia is here defined as the territory of traditional Middle Asia and Kazakhstan plus the northern Caspian region (Dagestan, Kalmykia, etc.), eastern Azerbaijan, and the neighbouring territories of western China, including Tibet, northern Pakistan, Afghanistan and Iran. To date, 30 species of burrowing lycosids have been recorded/described from Central Asia (Table 1) (Mikhailov, 2013; Otto, 2020; Roewer, 1955a; Song *et al.*, 1999; Zamani *et al.*, 2020; present data). However, many of the earlier records were based on doubtful identifications which are difficult to interpret and/or impossible to verify because the corresponding material is not accessible or its whereabouts is unknown. For instance, the species *Hogna alticeps* (Kroneberg, 1875), as it is listed now in the World Spider Catalog (2020), has been recorded from Central Asia many times (Andreeva, 1975, 1976; Kroneberg, 1875; Mikhailov & Fet, 1994; Ovtsharenko & Fet, 1980; Schmidt, 1895; Simon, 1899; Vlassov & Sytshevskaja, 1937; Zyuzin *et al.*, 1994), but the distribution and even the taxonomy of this species remain largely unresolved. As it is evident

from our study, the species is clearly neither a member of *Hogna* Simon, 1885, nor of *Lycosa* Latreille, 1804, and only few of the earlier records of *H. alticeps* actually correspond to this species. The same holds true for *Hogna medica* (Pocock, 1889), which was described from north-western Afghanistan (Pocock, 1889: sub *Tarentula medica*) and then reported once from Uzbekistan (Schmidt, 1895: sub *Lycosa medica*). Since then nobody has recorded this species from Central Asia again. The present paper attempts to bring some clarity to the taxonomy and distribution of these species, and to rectify their generic placement. The paraphyletic genera *Hogna* and *Lycosa* still remain two of those lycosid genera that are “used as a ‘dumping ground’ for wolf spiders that could not be satisfactory placed in other genera” (Murphy *et al.*, 2006: 585).

The aim of the present work is to propose a new genus of fossorial wolf spiders from Central Asia to accommodate nine distinct species. Two of these are here transferred from *Hogna*, and seven species are diagnosed and described as new. The localities of all species are mapped and an identification key to all of them is provided. Finally a short overview of the fauna of fossorial Lycosidae of Central Asia is given.

MATERIAL AND METHODS

A total of 114 specimens have been examined for the present paper. They were borrowed from or deposited in the following museums: BMNH = The Natural History Museum, London, UK (curator: J. Beccaloni); MHNG = Muséum d'histoire naturelle, Genève, Switzerland (curator: P.J. Schwendinger); MMUE = Manchester Museum, University of Manchester, Manchester, UK (curator: D.V. Logunov); ISEA = Institute of Systematics and Ecology of Animals, Novosibirsk, Russia (curator: G.N. Azarkina); PSU = Department of Invertebrate Zoology and Aquatic Ecology of the Perm State University, Perm, Russia (curator: S.L. Esyunin); ZISP = Zoological Institute of the Russian Academy of Sciences, St-Petersburg, Russia (curator: V.A. Krivokhatsky); ZMMU = Zoological Museum of the Moscow University, Moscow, Russia (curator: K.G. Mikhailov).

All SEM micrographs, except for Figs 9-11, were taken with the assistance of A.V. Nazarenko (Rostov-on-Don, Russia) by means of a Carl Zeiss EVO 40 XVP scanning electron microscope at the Center for Collective Usage 'Joint Centre of scientific and technological equipment of the Southern Scientific Centre of the Russian Academy of Sciences (research, development, approbation)', Rostov-on-Don, Russia. The SEM micrographs of *K. alticeps* (Figs 9-11) were taken by Yu.M. Marusik (Magadan, Russia) with a Jeol JSM-5200 stereo scanning electron microscope at the Zoological Museum, University of Turku, Finland; he also compiled some digital photos (Figs 17-21). The majority of digital photos (Figs 32-39, 44, 49-54, 59, 61, 70-72, 89-93, 103-106, 117, 122, 126, 127, 130, 136, 137, 140, 161-165, 171) were taken by V.Yu. Shmatko (Rostov-on-Don, Russia) using a Sony Alpha A6000 ILCE-6000 Camera attached either to a Mikmed-2 var. 2 microscope (for general appearances) or to a MBS-1 microscope with a VOLNA-9 Lens (for copulatory organs). Digital photos of the male bulbs of *K. alticeps* (Figs 12-16) were taken by A.A. Fomichev (Novosibirsk, Russia) with an Olympus DP74 camera attached to an Olympus SZX 16 stereomicroscope at the Altai State University, Barnaul, Russia. Some digital photographs (Figs 27, 77-80, 85, 159) were made by the first author at the World Museum of Liverpool (UK) using a Canon 6D Mark II Camera with a Canon MP-E 65mm lens with Helicon Remote ver. 3.9.7W to control the StackShot 3X Macro Rail and camera settings. Helicon Focus 6.8.0 was used as processing software. Distribution maps were produced by G.N. Azarkina (Novosibirsk, Russia) using the online mapping software SimpleMappr (Shorthouse, 2010).

The terminology of sclerites of the copulatory organs follows Zyuzin (1993), except for the term 'median apophysis' which is used *sensu* Griswold (1993) and Logunov (2010). The term 'palea' refers to a swollen, partially membranous part of the embolic division from which the synembolus and the embolus originate (Figs

9-13; Pl). Short spines occurring on the ventral surface of tarsi in some lycosine genera (e.g. *Lycosa*, *Zyuzicosa* Logunov, 2010; Figs 140-141) were referred to by Zyuzin (1990) as 'spinules', a term which is also adopted here. 'Chelicera length' refers to the frontal length of the basal cheliceral segment on intact specimens; chelicerae were not removed from the specimens. The clypeus is the area between the AMEs and the frontal margin of the carapace. The sequence of leg segment measurements is as follows: femur + patella + tibia + metatarsus + tarsus (total). The leg formula is given from longest to shortest leg. All measurements are in mm.

Abbreviations

AER	anterior row of eyes
AME	anterior median eye
ALE	anterior lateral eye
a.s.l.	above sea level
C	conductor
D	described
Distr.	district
E	embolus
IP	inner plate of the MA
MA	median apophysis
Mt	metatarsus
MT	median tooth of the MA
OP	outer plate of the MA
PE	proximal extension of the MA
Pl	palea
PLE	posterior lateral eye
PME	posterior median eye
Se	synembolus
SER	of second row of eyes (formed by PMEs)
St	subtegulum
T	tegulum
Tb	tibia
TL	type locality
Tr	tarsus
Vil.	village

TAXONOMIC PART

Family Lycosidae Sundevall, 1833 Subfamily Lycosinae Sundevall, 1833

Genus *Karakumosa* gen. nov.

Type species: *Karakumosa repetek* sp. nov. from the Repetek Reserve, Karakumy Desert, Turkmenistan, Central Asia (male holotype deposited in the ISEA).

Diagnosis: The genus *Karakumosa* gen. nov. belongs to the subfamily Lycosinae (*sensu* Zyuzin, 1993; see Dondale, 1986; Murphy *et al.*, 2006; Piacentini & Ramirez, 2019) and is most similar to *Zyuzicosa* Logunov, 2010 (see Logunov, 2010, 2012). Both genera have a bipartite/biramous synembolus, the same SER/AER ratio (more than 1.3), tarsi of all legs

with scopulae and spinules, and a prolatero-apical origin of the embolus. The new genus differs from all other Central Asian Lycosinae genera (see Logunov, 2010: table 2), including *Zyuzicosa*, by the following combination of characters: black ventral colour pattern of abdomen absent (Figs 25, 52, 91, etc.); median apophysis consisting of two flat plates (Figs 55, 118: OP, IP); synembolus with two acutely pointed lamellae (Figs 57, 98-99, 116, 118, 129, 149, 163, 175); epigynal atrium at least twice longer than wide; and septal pedicel absent (Figs 27, 44, 61, 72, 85, 96).

Etymology: The new generic name is composed of two parts: 'Karakum', referring to the regional name for the Karakumy Desert where the type species and some other species were discovered, combined with the ending of the generic name *Lycosa* (meaning 'tear like a wolf'; see Cameron, 2005: 303), to which the majority of large burrowing Holarctic wolf spiders are currently assigned. The generic name is feminine in gender.

Description: Large to very large fossorial wolf spiders, with body lengths 20.23 ± 3.23 (n=8) in males, and 22.9 ± 4.05 (n=7) in females.

Carapace: In both sexes relatively low, with a clearly marked gradual descent from cephalic region towards abdomen (Figs 26, 35, 54, 78, 138, 158), densely clothed with white or yellowish white setae, and with prominent dense white or yellowish marginal pubescence; all three characters are typical of lycosid burrowers (see Zyuzin, 1990).

Chelicerae: Large, vertical, their proximal halves/two-thirds of frontal side densely clothed with white or yellowish setae (Figs 32, 53, 79, 136); cheliceral groove with three promarginal and three retromarginal teeth (Figs 144, 177).

Eyes: AER procurved and distinctly (1.3-1.4 times) shorter than SER (Figs 32, 53, 136); PME/AME ratio 1.7-2.5.

Clypeus: Narrow, its height equal or 1.3-1.7 times shorter than AME diameter.

Labium: Visibly wider than long (length/width ratio 0.6-0.8).

Sternum: Ovoid, densely covered with white setae in both sexes (e.g. Figs 23, 49, 52, 137).

Abdomen: Venter in both sexes without black pattern (e.g. Figs 25, 52, 91), thus distinct from the majority of Palearctic burrowing lycosine genera described to date (see Simon, 1876; Logunov, 2010, 2012).

Legs: leg formula IV,I,II,III in both sexes, rarely IV,II,I,III in some males; all segments densely covered with white setae; in both sexes, metatarsi and tarsi I-II ventrally with well-developed scopulae and longitudinal rows of spinules (sometimes poorly visible; Figs 36, 63, 140), tarsi III-IV only with ventral longitudinal rows of spinules (in some specimens a scopula could be developed on lateral sides of segments only; Fig. 141).

Female pedipalp: With a single tarsal claw (e.g. Figs 26, 35, 138).

Female copulatory organs: Epigyne with a well pronounced longitudinal atrium being at least two times longer than wide; edges at proximal end of atrium forming two round convergent lips, these usually markedly sclerotized and darker (brown or russet) than nearby cuticle (e.g. Figs 27, 61, 85); septal pedicel absent; median septum essentially reduced to posterior transverse, slightly convex plate of variable shape (e.g. Figs 27, 96); spermathecae tube-shaped, only slightly wider than or of same width as narrow and short insemination ducts (e.g. Figs 28, 43, 62, 121).

Male pedipalp: Femur length equal to that of patella+tibia (Figs 15-16); cymbium symmetrical, twice as long as wide, with almost round alveolus (Fig. 65), its length about equal to that of palpal tibia; distal part of cymbium 1.1-1.3 times shorter than alveolus length (Fig. 65); cymbium with a cluster of blunt, rigid and straight bristles on its tips (Figs 45, 69) as typical of lycosid burrowers (Zyuzin, 1990, 1993).

Male copulatory organs: Subtegulum round and comparatively small, situated in proximal-mesal position (Figs 9, 46, 56, 98: St); tegulum round and broad, in unexpanded palp clearly visible only on prolateral-proximal side of bulbus (Figs 55, 98, 118: T); median apophysis wide (usually wider than long) and broad (Figs 9, 55, 118: OP, IP), folded along its proximal edge and consisting of two (outer and inner) flat plates, the outer plate bearing a proximal extension and a median tooth (Figs 56, 98: MT, PE); median tooth rarely singular and finger-shaped (Figs 30, 42), usually consisting of a lateral claw and a median edge bearing micro-teeth (indicated by arrow in Figs 123, 128) and in some species with a low serrate flange at its foot (indicated by arrow in Figs 125, 134, 152); synembolus biramous, with two acutely pointed lamellae (Figs 57, 98, 118: Se); a triangular hyaline conductor present, well-developed and pointed ventrad (Figs 12, 56, 118: C); embolus thin, with a rather wide and prominent pars pendula (Figs 4, 116, 129), its origin in a prolatero-apical position, with only the embolic tip visible in between or beneath branches of the synembolus in unexpanded palp (Fig. 57).

Comments: Within the Lycosoidea the transverse median apophysis is considered a typical feature of the Lycosidae (Griswold, 1993) and a synapomorphy of the Lycosinae (Dondale, 1986), although its shape varies. In *Karakumosa* gen. nov. the median apophysis is large and composite, consisting of two distinct plates that appear fused along their proximal edges: the outer and the inner plates (e.g. Figs 9, 56, 118: OP, IP). Such a complex structure of the median apophysis is currently regarded as unique within the Lycosinae and within the entire family Lycosidae. Of the lycosid genera known to us, only two have a comparably complex structure of the median apophysis: *Oculicosa* Zyuzin, 1993 (Logunov & Gromov, 2011: figs 1-2) and *Zyuzicosa* (Logunov, 2010: figs 34-39). The outer plate of the

median apophysis of *Karakumosa* gen. nov., with its proximal extension and median tooth of MA, looks like an apomorphic modification of the prominent transverse chitinous ridge of the median apophysis in *Oculicosa*. Obviously, both structures are homologous.

Another unique feature of *Karakumosa* gen. nov. is its biramous synembolus, consisting of two thin and very acutely pointed lamellae (e.g. Figs 4, 57, 67, 116). The only other lycosid genus with a comparable conformation of the synembolus is *Zyuzicosa* (Logunov, 2010: figs 64, 66), but in the latter genus it consists of one acutely pointed lamella and a wide, strongly sclerotized base.

In the absence of a phylogenetic analysis of the Palaearctic genera of Lycosidae (but see Murphy *et al.*, 2006; Piacentini & Ramírez, 2019), it is difficult to establish whether both unique features of *Karakumosa* gen. nov. are primitive or derived (they are likely to be derived). Yet, as a provisional hypothesis to be further tested, we consider both of them as the putative synapomorphies of *Karakumosa* gen. nov.

We speculate that if the genus *Karakumosa* gen. nov. was included in one of the two latest phylogenetic analyses of the Lycosidae based on DNA data (Murphy *et al.*, 2006; Piacentini & Ramírez, 2019), it would likely be placed either within the clade E (*sensu* Murphy *et al.*, 2006: figs 2-3), somewhere close to *Lycosa tarantula* (Linnaeus, 1758) and the clade E1, or within the Lycosinae (*sensu* Piacentini & Ramírez, 2019: fig. 4), in the branch containing the Palaearctic *Lycosa* species.

Composition: To date nine species are assigned to *Karakumosa* gen. nov.: *K. alticeps* (Kroneberg, 1875),

comb. nov. (♂♀, Uzbekistan and southern Kazakhstan), *K. badkhyzica* sp. nov. (♂♀, Turkmenistan), *K. gromovi* sp. nov. (♂♀, southern Uzbekistan), *K. medica* (Pocock, 1889), comb. nov. (♂♀, north-western Afghanistan), *K. repetek* sp. nov. (♂♀, Turkmenistan), *K. shmatkoi* sp. nov. (♂♀, northern Caspian region and Azerbaijan), *K. tashkumyr* sp. nov. (♂, Kyrgyzstan), *K. turanica* sp. nov. (♂♀, Turkmenistan), *K. zyuzini* sp. nov. (♂♀, Uzbekistan).

Distribution: Central Asia (Fig. 1): (semi)desert regions of the northern Caspian Region, eastern Azerbaijan, Kazakhstan, Kyrgyzstan, Uzbekistan, Turkmenistan and north-western Afghanistan; the occurrence of this genus in northern and north-eastern Iran and Tajikistan is very likely.

The genus is essentially restricted to the so-called Turan zoogeographic province (*sensu* Kryzhanovsky, 2002) (Fig. 1). It is the third genus of fossorial wolf spiders within the currently known Lycosinae that is confined to Central Asia (Table 1). The other two are *Oculicosa* (see Zyuzin, 1993; Logunov & Gromov, 2011: fig. 6) and *Zyuzicosa* (see Logunov 2010, 2012: map), but their ranges are markedly smaller and of a different configuration. *Karakumosa* gen. nov. seems to be a typical Turan genus (*sensu* Pravdin & Mishchenko, 1980) and an endemic to Central Asia; its geographical range lies within the Turan lowlands of the desert zone. We are unaware of any other Central Asian spider genus that has a distributional pattern similar to that of *Karakumosa* gen. nov.

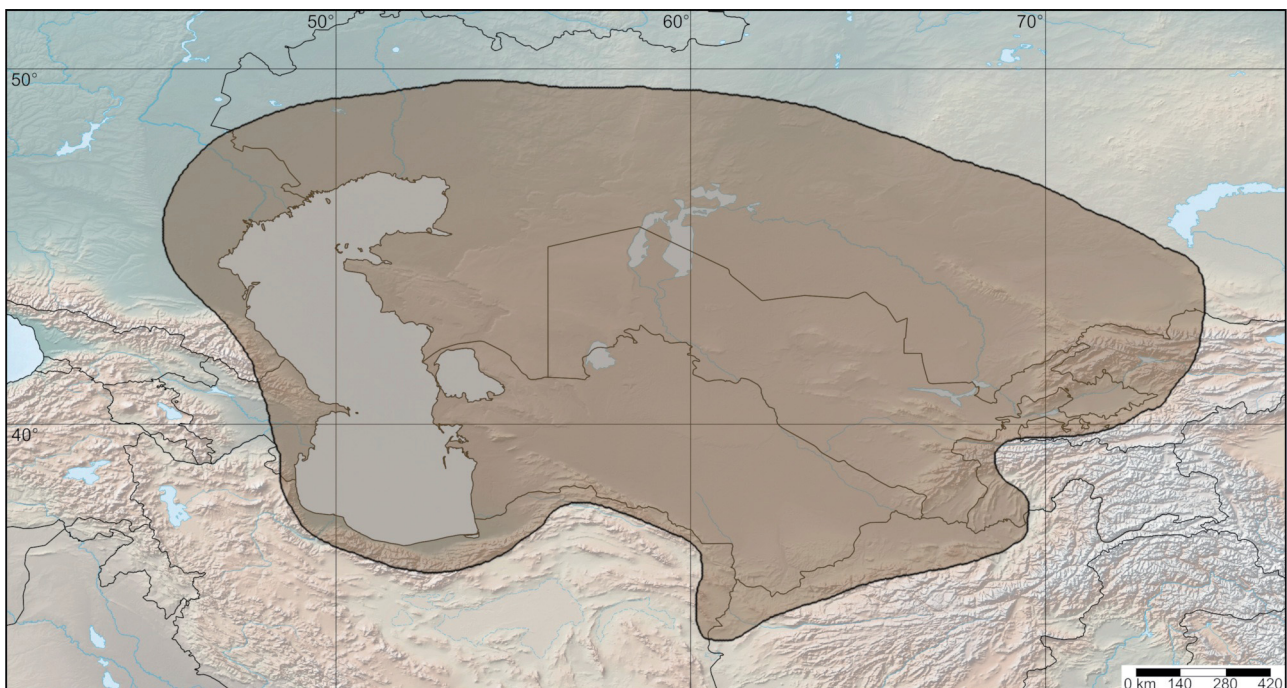


Fig. 1. Geographical range of the genus *Karakumosa* gen. nov.

Key to the species of *Karakumosa* gen. nov.

The female of *K. tashkumyr* sp. nov. remains unknown and thus is not included here.

1A	Males	2
1B	Females	10
2A	Proximal extension of median apophysis clearly hook-shaped (Figs 60, 118, 150)	3
2B	Proximal extension of median apophysis of a different shape (Figs 2, 46, 83, 98)	5
3A	Median tooth of median apophysis with a low serrate flange at its foot (indicated by arrow in Figs 125, 134, 152)	4
3B	Median tooth of median apophysis without such flange (Figs 66, 74-75) <i>gromovi</i> sp. nov.	
4A	Inner plate of median apophysis as wide as outer plate, clearly visible in ventral view (indicated by arrow in Fig. 148); tips of both synembolic lamellae markedly bent downward (Fig. 149)	<i>tashkumyr</i> sp. nov.
4B	Inner plate of median apophysis comparatively narrower and almost hidden beneath outer plate (indicated by arrow in Fig. 118); synembolic lamellae straight or with tips only slightly bent downward (Fig. 116)	<i>shmatkoi</i> sp. nov.
5A	Proximal extension of median apophysis prominent (Figs 46, 83, 98)	6
5B	Proximal extension of median apophysis not prominent (Fig. 174)	<i>zyuzini</i> sp. nov.
6A	Proximal extension of median apophysis spade/spatula-like, as wide as long (Figs 46, 98)	7
6B	Proximal extension of median apophysis wider than long (Figs 2, 83, 161)	8
7A	Median tooth of median apophysis finger-shaped (Figs 31, 42)	<i>badkhyzica</i> sp. nov.
7B	Median tooth of median apophysis bifurcated at its tip (Fig. 100)	<i>repetek</i> sp. nov.
8A	Median tooth of median apophysis flat, without a ventral bulge (Figs 5, 164)	9
8B	Median tooth of median apophysis with a ventral bulge (Fig. 87)	<i>medica</i>
9A	Proximal extension of median apophysis twice as wide as long, with a markedly pointed prolaterad-directed shoulder (Fig. 161); median tooth quadrangular (Fig. 164)	<i>turanica</i> sp. nov.
9B	Proximal extension of median apophysis triangular, with an obtuse prolaterad-directed shoulder (Fig. 12); median tooth triangular, with a serrate prolateral edge (Figs 5-8)	<i>alticeps</i>
10A	Edges of epigynal atrium subparallel or slightly bent outward (Figs 44, 61, 72, 85)	11
10B	Edges of epigynal atrium slanted to each other; atrium anteriorly clearly narrower than posteriorly (Figs 27, 96)	13
11A	Edges of epigynal atrium subparallel (Figs 61, 85), spermathecae as in Figs 62, 86	12
11B	Edges of epigynal atrium slightly bent outward (biconvex), atrium barrel-shaped (Fig. 44), spermathecae as in Fig. 43	<i>badkhyzica</i> sp. nov.
12A	Posterior transverse plate of epigyne in the shape of an inverted triangle (Figs 61, 72), spermathecae markedly widened anteriorly (Figs 62, 73)	<i>gromovi</i> sp. nov.
12B	Posterior transverse plate of epigyne anchor-shaped (Fig. 85), spermathecae not widened anteriorly, worm-shaped (Fig. 86)	<i>medica</i>
13A	Posterior transverse plate more or less anchor-shaped (Figs 27, 167-168), spermathecae curved anticlockwise or subparallel (Figs 28, 121, 166)	14
13B	Posterior transverse plate dumbbell-shaped (Fig. 96), spermathecae curved clockwise (Fig. 95) ...	<i>repetek</i> sp. nov.
14A	Epigynal atrium markedly narrowed at its anterior end, pawn-shaped (Figs 27, 122)	15
14B	Epigynal atrium much less narrower at its anterior end, with almost subparallel lateral edges (Figs 167, 179) ..	16

- 15A Posterior transverse plate of epigyne in the shape of a low inverted triangle, epigynal edges strongly sigmoid (Fig. 122); spermathecae markedly swollen in anterior portion (Fig. 121) *shmatkoi* sp. nov.
- 15B Posterior transverse plate of epigyne slightly procurved, epigynal edges indistinctly sigmoid (Fig. 27); spermathecae not swollen anteriorly (Figs 28-29) *alticeps*
- 16A Posterior transverse plate of epigyne with straight posterior margin (Fig. 179); spermathecae distinctly inclined towards each other (Fig. 182) *zyuzini* sp. nov.
- 16B Posterior transverse plate of epigyne anchor-shaped, with convex posterior margin (Fig. 167); spermathecae more or less parallel to each other (Fig. 166) *turanica* sp. nov.

***Karakumosa alticeps* (Kroneberg, 1875) comb. nov.**

Figs 2-29, 76

Tarentula alticeps Kroneberg, 1875: 40, pl. 4, fig. 28 (description of male and female; syntypes in the ZMMU).

Lycosa alticeps. – Schmidt, 1895: 449 (partim). – Zyuzin *et al.*, 1994: 4, 9.

Hogna alticeps. – Roewer, 1955b: 247.

Lectotype (designated here; Figs 17-21): ZMMU, Ta-1219; male; “Turkestan region” (no exact locality); no date; [A.P.] Fedchenko (Turkestan scientific expedition of the Imperial Society of Devotees of Natural Science).

Paralectotype: ZMMU, Ta-1218; 1 male; [KAZAKHSTAN], “Dyusebai” [well] (an unknown locality, apparently in Chardara Distr. of South Kazakhstan Area); no date; [A.P.] Fedchenko (Turkestan scientific expedition of the Imperial Society of Devotees of Natural Science). For information about other former syntypes of *T. alticeps*, see below under *K. turanica* sp. nov.

Other material: ISEA, 001.8403; 6 males, 1 female; KAZAKHSTAN, Zhambyl Area, Chu Distr., c. 9th km of road from Tole Bi (= Novotroitskoe) to Moyunkum, Chu river valley (c. 43°45'N, 73°46'E), sands; 31.V.-2.VI.1990; leg. A.A. Fedorov & A.A. Zyuzin. – MHNG; 2 males; same data. – ISEA 001.8404; 1 male, 1 female; KAZAKHSTAN, South Kazakhstan Area, Chardara Distr., Kyzyl-Kum Desert, Karatau Mt. Range, Karamola Mt. (c. 42°20'N, 67°45'E); [late May] 1994; leg. A.A. Zyuzin. – ZMMU; 1 male, 1 female; same data. – MMUE; 1 male, 1 female; same data. – MMUE; 1 male; KAZAKHSTAN, Turkestan Area, Syr Darya River valley, near Zhankel' Vil. (42°32'46.1"N, 68°10'42.7"E), tugay (= gallery forest), 191 m a.s.l.; 28.V.2017; leg. Yu.V. Dyachkov. – MMUE; 1 male; KAZAKHSTAN, Kyzylorda Area, Syr Darya River valley, near Tartogay Vil. (44°24'42.8"N, 66°16'40.1"E), tugay (= gallery forest), 142 m a.s.l.; 12.VI.2017; leg. Yu.V. Dyachkov. – MMUE; 1 male, 3 females; KAZAKHSTAN, Almaty Area, Ili Distr., near Kapchagay (on left side of road before reaching town (c. 43°50'17.3"N 76°58'14.9"E), sands; 25.-26.V.1990; leg. A.A. Zyuzin.

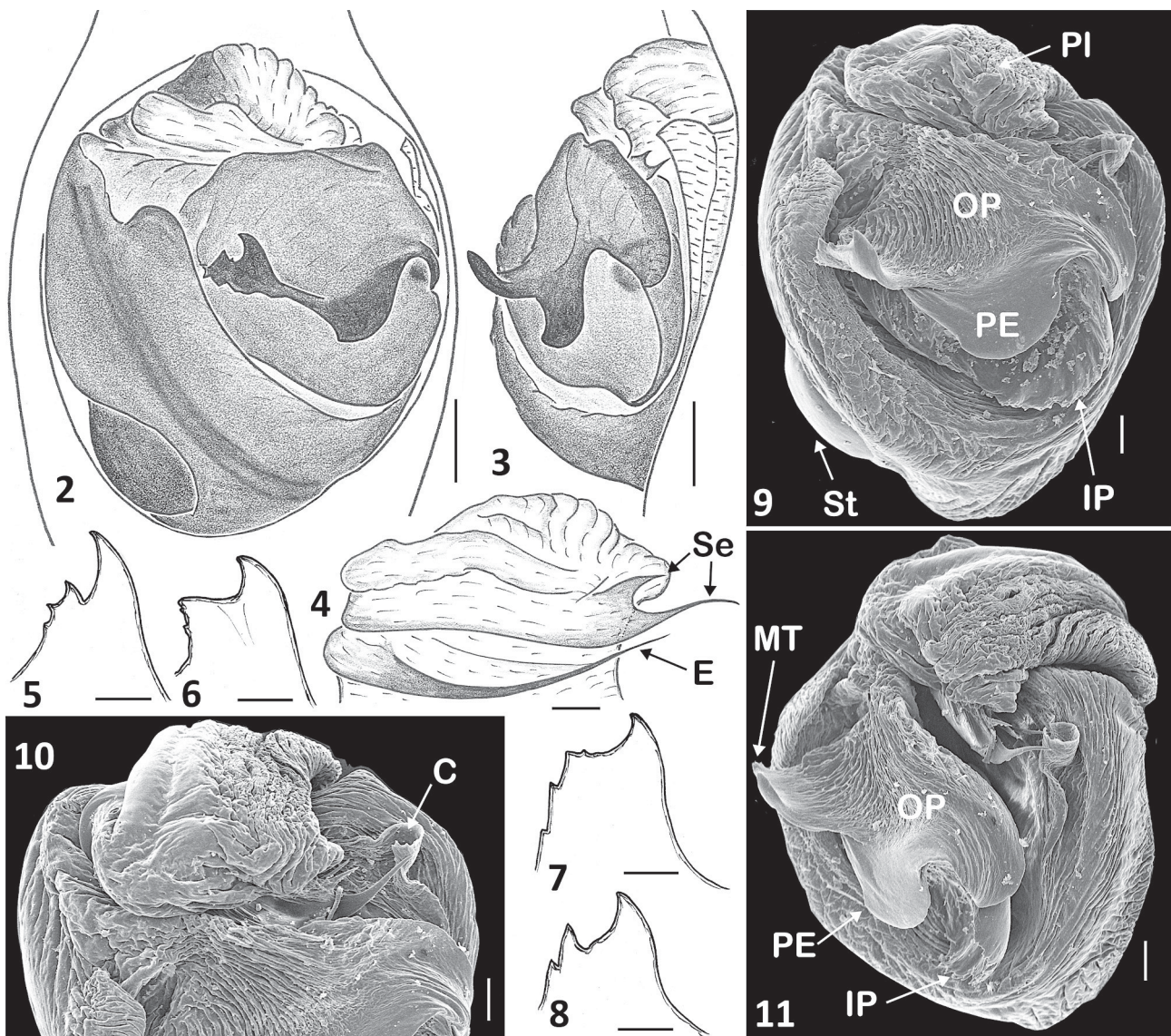
Etymology: According to Parker (1980) the specific

epithet could be translated as ‘high headed’, originating from the Latin ‘*altus*’ meaning high, and ‘*caput*’ meaning the head.

Diagnosis: The male of *K. alticeps* is most similar to that of *K. turanica* sp. nov., but can be easily distinguished by the narrower, obtuse prolaterad-directed shoulder of the proximal extension of the median apophysis of the palpal organ (wider and markedly pointed in *K. turanica* sp. nov.; Figs 2, 12 cf. Fig. 161) and by the comparatively smaller, triangular median tooth with a serrate median edge (wide and quadrangular in *K. turanica* sp. nov.; Figs 5-8 cf. Fig. 164). The female of *K. alticeps* is most similar to that of *K. shmatkoi* sp. nov., from which it can be distinguished by almost straight lateral edges of the epigynal atrium and by the narrow, slightly procurved posterior transverse plate (sigmoid edges and a low inverted triangle-shaped posterior transverse plate in *K. shmatkoi* sp. nov.; Fig. 27 cf. Figs 122, 139), as well as by the narrow, not swollen spermathecae (markedly swollen in *K. shmatkoi* sp. nov.; Fig. 28 cf. Fig. 121).

Description: Male (from Chu river valley; ISEA, 001.8403). **Measurements:** Carapace 10.00 long, 7.50 wide. Eye sizes and interdistances: AME 0.43, ALE 0.35, PME 1.10, PLE 1.05, AME-AME 0.25, AME-ALE 0.15, PME-PME 0.90, PME-PLE 1.90. Width of anterior eye row 2.10, of second row 2.80, of third row 3.40. Clypeus height 0.25; chelicera length 4.75. Abdomen 9.80 long, 6.50 wide. Length of leg segments: I 10.00 + 4.20 + 8.30 + 8.80 + 4.20 (35.50); II 8.50 + 4.20 + 7.60 + 8.70 + 4.50 (33.50); III 8.70 + 3.40 + 6.50 + 9.00 + 4.40 (32.00); IV 10.70 + 3.80 + 8.20 + 11.30 + 4.90 (38.90). Leg formula: IV, I, II, III.

Colouration in alcohol (Figs 22-23): Carapace brownish, with a wide median longitudinal yellowish white band of setae along the entire length of the carapace and two wide lateral brownish longitudinal bands of setae; carapace sides with wide marginal bands of white setae. Sternum light brown, densely covered with yellowish white setae. Maxillae brown. Labium brown, with a yellow tip. Chelicerae brown, proximal half of frontal side densely covered with yellowish white setae. Abdomen: dorsum densely covered with white setae, with a long, wide, yellow brownish cardiac mark outlined by a brown line;



Figs 2-11. *Karakumosa alticeps* (Kroneberg, 1875), left male palp; specimens from Chu river valley (2-4, 7-11) and Karamola Mt. (5-6). (2, 9) Bulbus, ventral view. (3, 11) Ditto, retrolateral view. (4) Embolic division, ventral view. (5-8) Median tooth of MA, proximal view. (10) Bulbus, apical view. Scale bars 0.25 mm (2-3), 0.1 mm (4-11). Abbreviations as explained in Material and methods.

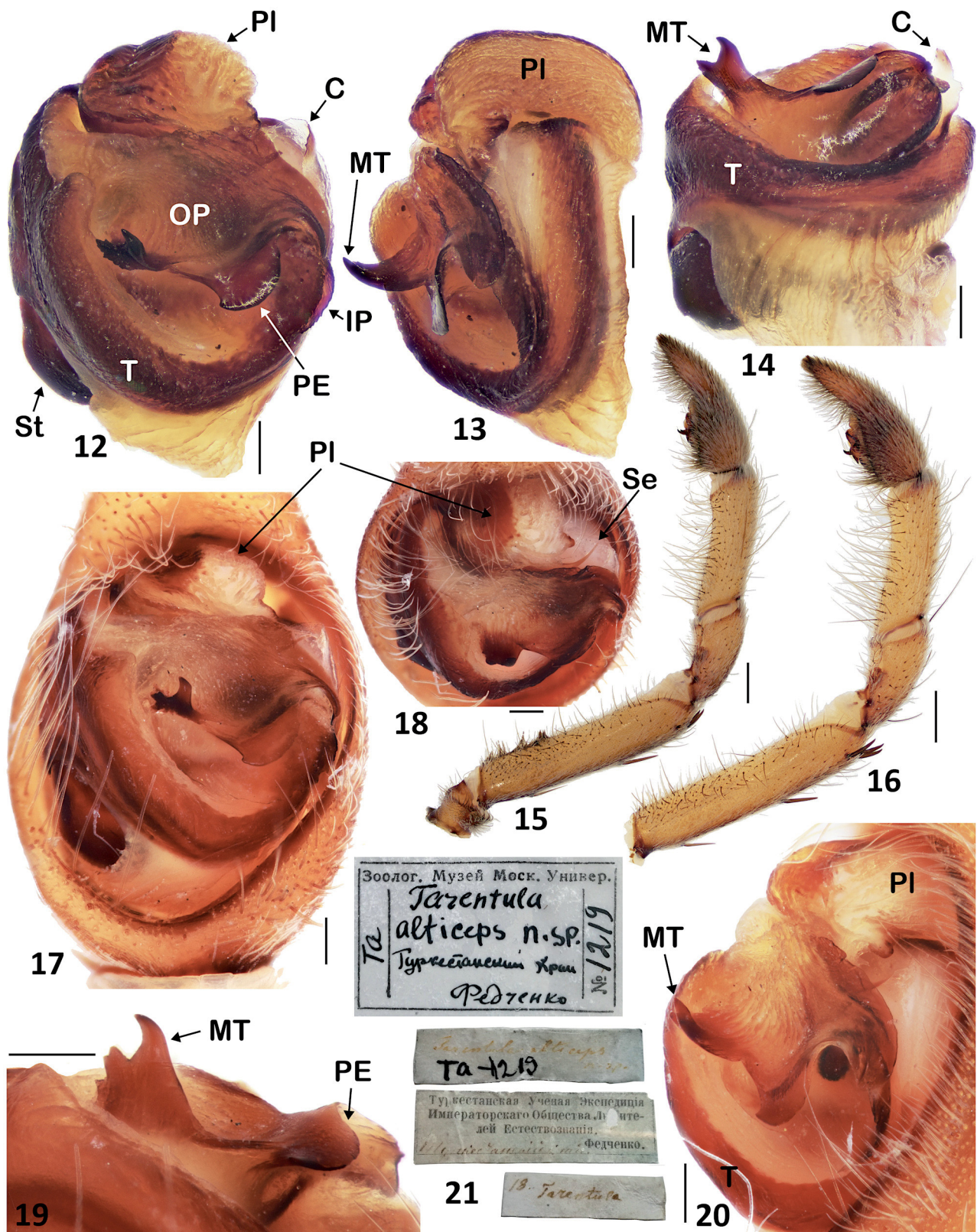
sides and venter densely covered with yellowish white setae. Book-lung covers yellow, covered with yellowish white setae. Spinnerets light brown. All legs yellow brownish, densely covered with white setae; Mt I and Tr I ventrally brown, but dorsally densely covered with white setae. Palp yellow, with brownish cymbium, densely covered with white setae.

Palp structure (Figs 2-20): Acutely pointed synembolic lamellae subparallel to each other; median tooth medium-sized, notched at its tip and with a serrate median edge; proximal extension wide and obtuse at its prolaterad-directed shoulder; inner plate large and ovoid, clearly visible in ventral view; conductor triangular, acutely pointed and bent at its tip.

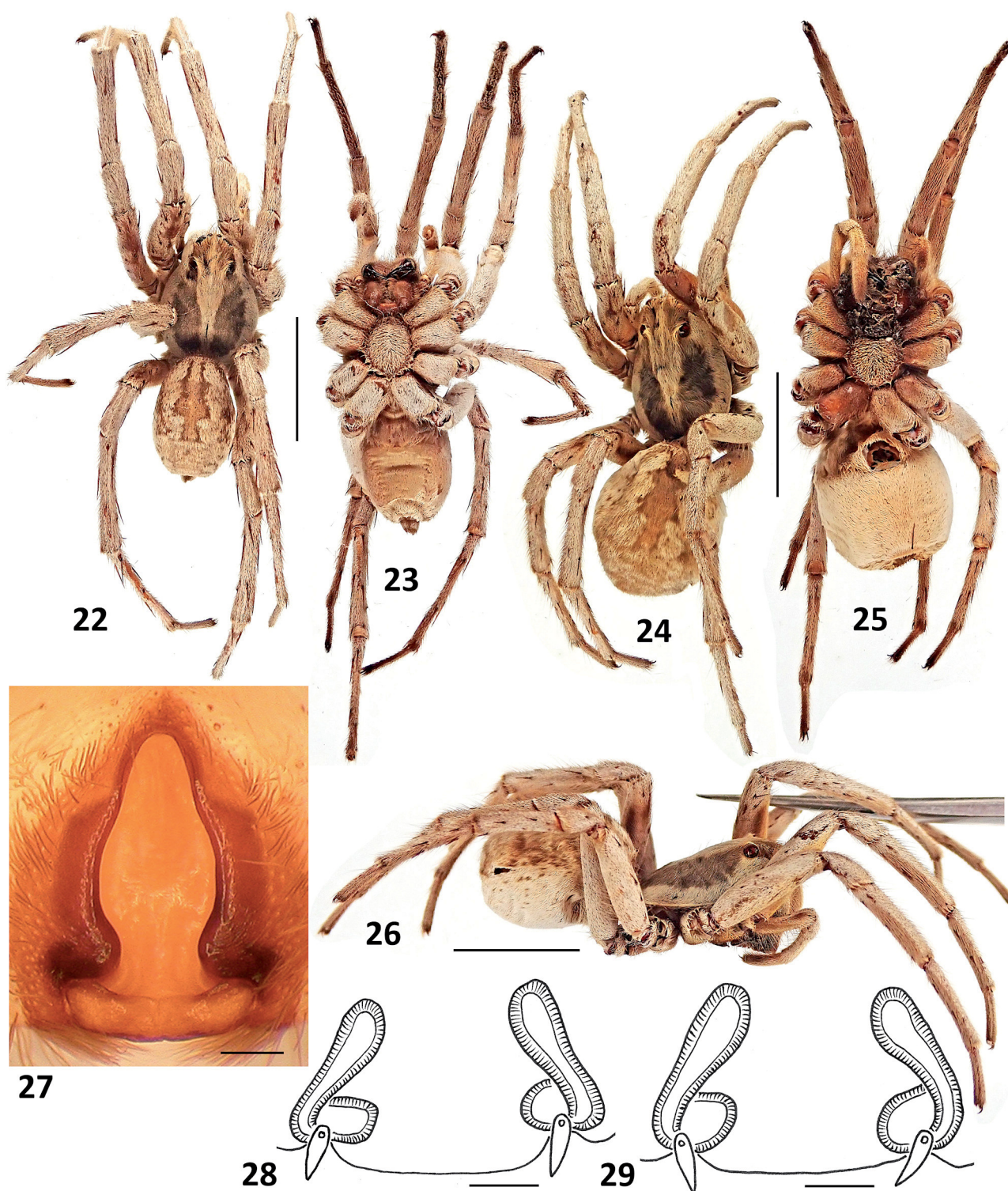
Female (from Chu river valley; ISEA, 001.8403).

Measurements: Carapace 10.70 long, 8.00 wide. Eye sizes and interdistances: AME 0.50, ALE 0.45, PME 1.20, PLE 1.15, AME-AME 0.35, AME-ALE 0.15, PME-PME 1.15, PME-PLE 2.55. Width of anterior eye row 2.35, of second row 3.15, of third row 3.80. Clypeus height 0.20; chelicera length 5.75. Abdomen 12.00 long, 9.80 wide. Length of leg segments: I 9.30 + 4.10 + 7.20 + 6.50 + 3.80 (30.90); II 8.70 + 4.10 + 6.40 + 6.10 + 3.80 (29.10); III 7.70 + 3.50 + 5.60 + 6.70 + 4.00 (27.50); IV 10.00 + 4.00 + 7.20 + 9.20 + 4.70 (35.10). Leg formula: IV, I, II, III.

Colouration in alcohol (Figs 24-26): Carapace brownish, densely covered with yellowish white setae and with two longitudinal bands of brownish setae; carapace sides with



Figs 12-21. *Karakumosa alticeps* (Kroneberg, 1875); male specimens from Tartogay Vil. (12-15) and Zhankel' Vil. (16), and the male lectotype (17-21). (12, 17) Left bulb, ventral view. (13, 20) Ditto, retrolateral view. (14, 19) Ditto, posterior view. (15, 16) Left male palp, retrolateral view. (18) Left bulb, apical view. (21) Original data labels of the lectotype. Scale bars 0.5 mm (15, 16), 0.2 mm (12-14, 17-20). Abbreviations as explained in Material and methods.



Figs 22-29. *Karakumosa alticeps* (Kroneberg, 1875); male (22-23) and female (24-28) from Chu river valley, and female (29) from Karamola Mt. (22, 24) Body, dorsal view. (23, 25) Ditto, ventral view. (26) Ditto, lateral view. (27) Epigyne, ventral view. (28-29) Vulva, dorsal view. Scale bars 1 cm (22-26), 0.25 mm (27-29).

wide marginal bands of white setae. Sternum brownish yellow, densely covered with white setae. Maxillae and labium brown. Chelicerae dark brown, proximal half of frontal side densely covered with yellowish white setae. Abdomen: dorsum densely covered with yellowish white setae and with a large, wide, brownish cardiac mark; sides and venter, including book-lung covers, densely covered with white setae. Spinnerets light brown. All legs and palps yellow, densely covered with white setae; tarsi of all legs and palps darker (brownish). Palps with a single claw at their tips.

Epigyne and vulva (Figs 27-29): Epigynal atrium twice as long as wide, markedly narrower at its anterior end and with only slightly sigmoid lateral edges; posterior transverse plate narrow and slightly procurved; spermathecae tube-shaped, not incrassate, directed antero-mediad, inclined towards each other.

Comments: The original type series of *Tarentula alticeps*, deposited in the ZMMU, consists of two species. Two syntype males (Ta-1218 and Ta-1219) were collected from today's southern Kazakhstan and are conspecific. In order to stabilize the species-group name *Tarentula alticeps*, one of them (Ta-1219; Figs 17-21) is here designated as the lectotype. Both males are conspecific with those collected from southern Kazakhstan together with females in the last two decades (see above under 'Other material'). Thus, there is no doubt about matching the sexes in this species.

The female paralectotype (Figs 165, 168) and juveniles of *Tarentula alticeps* were collected from present-day Uzbekistan (Ulus and Samarkand). This adult female differs from those of *K. alticeps* in having a much wider epigynal atrium (Fig. 168 cf. Fig. 27) and subparallel spermathecae (convergent in *K. alticeps*; Fig. 166 cf. Fig. 28). This female conforms to the description of *K. turanica* sp. nov. from Turkmenistan (see below; Figs 166-167). Hence, we assign the female paralectotype of *Tarentula alticeps* and its Uzbekistani records (Fig. 155) to *K. turanica* sp. nov.

Moreover, the immature syntypes of *T. alticeps* examined (Ta-1216) contain specimens of two different genera. One immature female has a brown, contrastingly coloured venter, which is typical of *Allohogna* Roewer, 1955a, *Lycosa* (s.str.), *Zyuzicosa* and some other burrowing wolf spiders, but that was never observed in *Karakumosa* gen. nov. It is additional evidence that the original type series of *Tarentula alticeps* is indeed not conspecific.

Distribution: Southern Kazakhstan (Kroneberg, 1875; Zyuzin *et al.*, 1994; present data) (Fig. 76); all the known records of *K. alticeps* lie in the same South-Turkestan Phytogeographic Province (see Pravdin, 1978 for further details). At one of the localities examined (Karamola Mt.), *K. alticeps* was found together with another large burrowing wolf spider, *Zyuzicosa turlanica* Logunov, 2010; see Logunov (2010, 2012) for further details about the latter species and its records.

Many of the earlier records of *K. alticeps* are in need of confirmation by re-examining the corresponding material, which was not available for the present study. For instance, the records from Uch-Adzhi (c. 38°05'N, 62°48'E) and Turkmenbashi (c. 40°02'N, 52°59'E) in Turkmenistan by Schmidt (1895: sub. *Lycosa alticeps*) most likely belong to *K. turanica* sp. nov., while his record from the Fergana region of Uzbekistan (no exact locality) could belong to *K. tashkumyr* sp. nov. The records of *K. alticeps* from Tajikistan (Kondara, Kvak, Varzob Canyon, Hissar Mt. Range, Ramit, Gandzhina) by Andreeva (1975, 1976: sub *Lycosa alticeps*) are likely based on misidentifications. To date we have been able to re-examine only two samples from Tajikistan that are deposited in the ZMMU (Ta-2916: 1 male from Kondara; Ta-2915: 3 females, 4 juveniles from Yavan-su Vil.) and earlier identified by Jan Buchar as *Lycosa alticeps*. Both samples turned out to be misidentified and in fact belong to *Zyuzicosa laetabunda* (Spassky, 1941).

***Karakumosa badkhyzica* sp. nov.**

Figs 30-48, 76

Lycosa alticeps (Kroneberg, 1875). – Ovtsharenko & Fet, 1980: 443. – Mikhailov & Fet, 1994: 508 (misidentification of specimens from Badkhyz).

Holotype: ISEA; male; TURKMENISTAN, Mary Velayat, c. 73 km NW of Serhetabat (= Kushka), Badkhyz (= Badkhyz) Reserve (c. 35°52'N, 61°40'E), cordon Kyzyl-Dzhar, clay slope; 10.-14.IV.1993; leg. A.A. Zyuzin.

Paratypes: ISEA; 3 females; collected together with the holotype. – ZMMU; 1 male, 1 female; same data. – MMUE; 1 male, 1 female; same data.

Etymology: The species epithet is latinized adjective derived from the name of the type locality, the Badkhyz (= Badkhyz) Reserve in Turkmenistan.

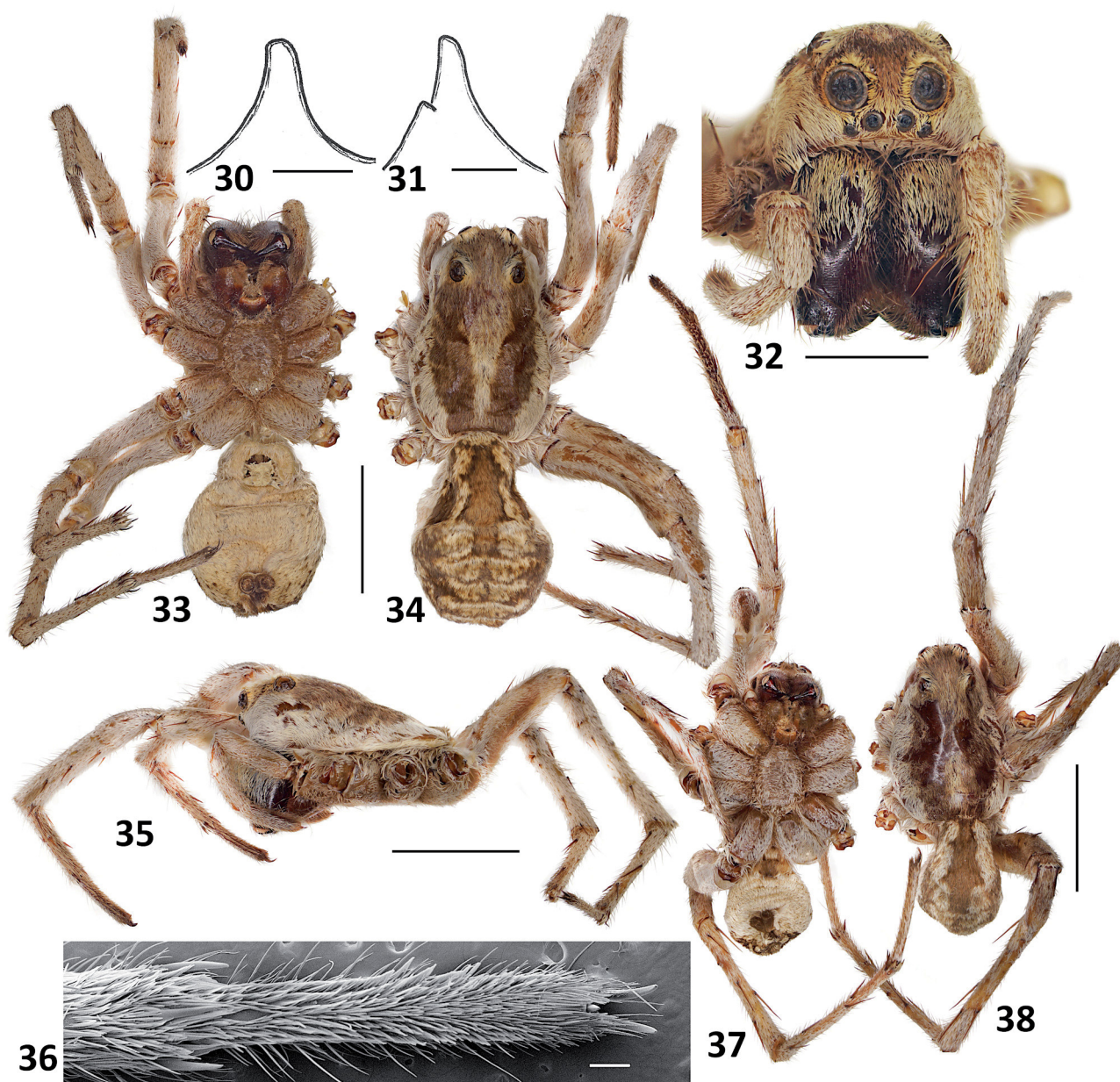
Diagnosis: The male of *K. badkhyzica* sp. nov. is most similar to that of *K. repetek* sp. nov. (Figs 94, 98, 102), but differs in having a smaller and narrower proximal extension of the MA (wide, spade-shaped in *K. repetek* sp. nov.; Figs 40, 46 cf. Fig. 98) and an undivided, finger-shaped median tooth (bifurcated in *K. repetek* sp. nov.; Figs 30-31, 42 cf. Figs 97, 100). The female of this species is similar to that of *K. medica* (Figs 85-86), but can be readily distinguished by a shorter epigynal atrium (Fig. 44) and by the shape of the spermathecae: anteriorly markedly swollen in *K. badkhyzica* sp. nov. (Fig. 43), worm-shaped, anteriorly not swollen in *K. medica* (Fig. 86).

Description: Male (paratype, MMUE). *Measurements:* Carapace 7.65 long, 4.50 wide. Eye sizes and interdistances: AME 0.40, ALE 0.34, PME 0.68, PLE 0.75, AME-AME 0.20, AME-ALE 0.10, PME-PME

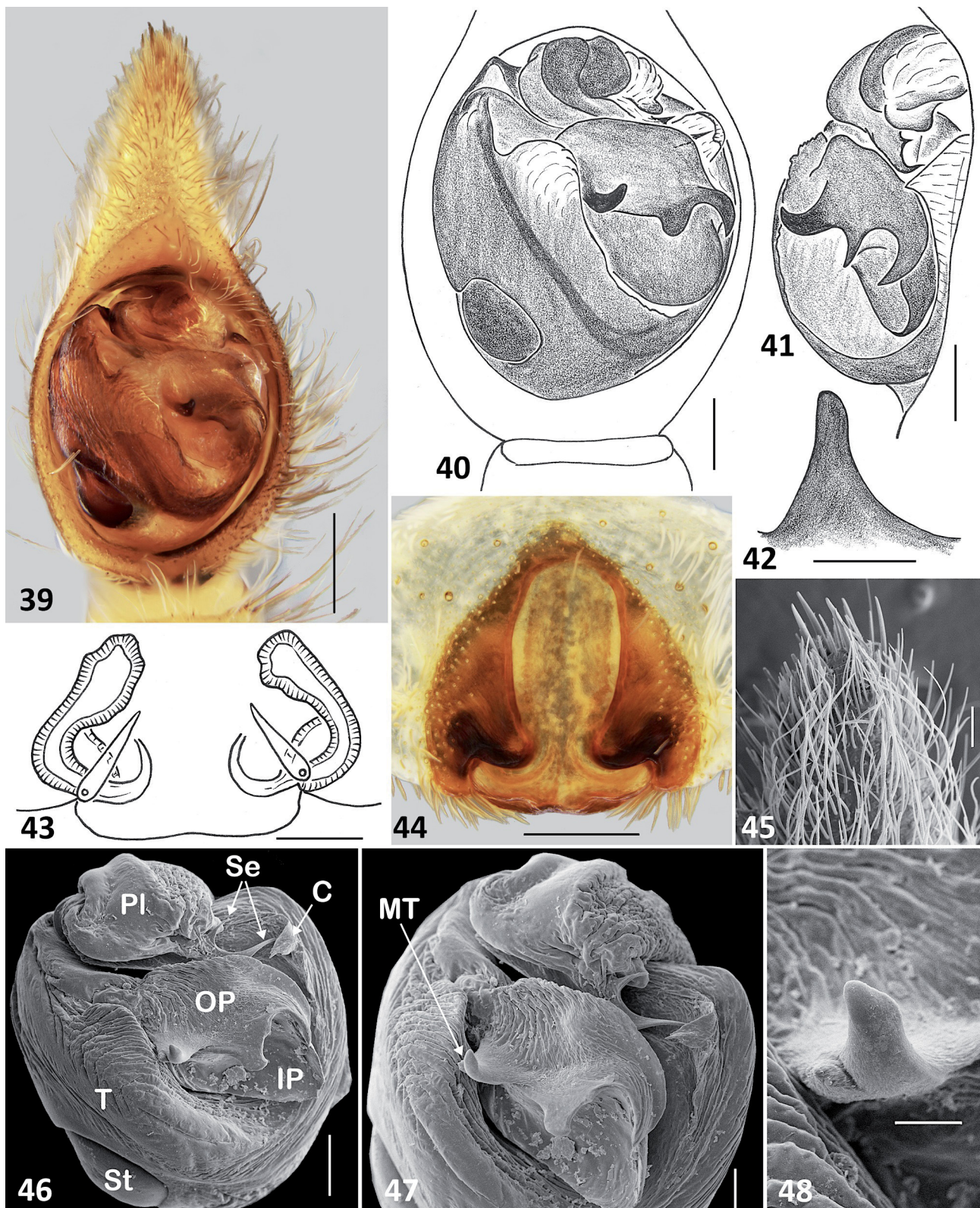
0.80 PME-PLE 0.85. Width of anterior eye row 1.63, of second row 2.30, of third row 2.20. Clypeus height 0.10; chelicera length 2.75. Abdomen 5.75 long, 3.25 wide. Length of leg segments: I 8.20 + 3.30 + 7.10 + 7.20 + 4.40 (30.20); II 7.80 + 3.40 + 6.20 + 7.50 + 3.70 (28.60); III 7.40 + 3.00 + 5.30 + 8.00 + 3.90 (27.60); IV 8.50 + 3.20 + 7.00 + 9.80 + 4.50 (33.00). Leg formula: IV, I, II, III.

Colouration in alcohol (Figs 37-38): Carapace brownish, with a wide median longitudinal yellowish white band of setae along entire length of carapace and with two wide lateral brown longitudinal bands of setae; carapace sides

with wide marginal bands of white setae. Sternum light brown, densely covered with white setae. Maxillae and labium brownish, with yellow tips. Chelicerae brown, proximal half of frontal side densely covered with white setae. Abdomen: dorsum densely covered with white setae, with a long, wide, yellow-brown cardiac mark; sides and venter densely covered with white setae. Book-lung covers yellow, covered with white setae. Spinnerets brown. All legs yellow, densely covered with white setae; Mt I and Tr I brown, also densely covered with white setae. Palp yellow, with the brownish cymbium, densely covered with white setae.



Figs 30-38. *Karakumosa badkhyzica* sp. nov.; male paratype (30-31, 37-38) and female paratype (32-35), MMUE. (30-31) Median tooth of MA, posterior view. (32) Female prosoma, frontal view. (33, 37) Body, ventral view. (34, 38) Ditto, dorsal view. (35) Female prosoma, lateral view. (36) Female tarsus I, ventral view. Scale bars 0.5 cm (33-35, 37-38), 0.3 mm (36), 0.25 cm (32), 0.1 mm (30, 31).



Figs 39-48. *Karakumosa badkhyzica* sp. nov.; male paratype, MMUE (39-42), male holotype (45-48) and female paratype (43-44). (39-40, 46) Bulbus, ventral view. (41) Ditto, retrolateral view. (42, 48) Median tooth of MA, posterior view. (43) Vulva, dorsal view. (44) Epigyne, ventral view. (45) Cymbium tip, dorsal view. (47) Bulbus, apical view. Scale bars 0.5 mm (39, 44), 0.25 mm (40-41, 43), 0.2 mm (45-47), 0.1 mm (42), 0.05 mm (48). Abbreviations as explained in Material and methods.

Palp structure (Figs 30-31, 39-42, 45-48): Acutely pointed synbolic lamellae diverging from each other; median tooth finger-shaped, in some specimens with a basal tooth; proximal extension narrow, spatula-like; inner plate large, with an extended retrolateral shoulder; conductor triangular, pointed at its tip.

Female (paratype, MMUE). **Measurements:** Carapace 8.70 long, 6.50 wide. Eye sizes and interdistances: AME 0.45, ALE 0.38, PME 0.88, PLE 0.95, AME-AME 0.25, AME-ALE 0.15, PME-PME 0.93, PME-PLE 1.20. Width of anterior eye row 1.93, of second row 2.68, of third row 3.30. Clypeus height 0.30; chelicera length 4.35. Abdomen 8.76 long, 6.40 wide. Length of leg segments: I 6.60 + 3.20 + 4.90 + 4.50 + 2.80 (22.00); II 6.50 + 3.20 + 4.30 + 4.30 + 2.70 (21.00); III 5.30 + 2.50 + 3.60 + 5.10 + 2.80 (19.30); IV 7.50 + 3.00 + 5.30 + 6.70 + 3.50 (26.00). Leg formula: IV, I, II, III.

Colouration in alcohol (Figs 32-35): Carapace yellow-brown, densely covered with white setae and with two paramedian longitudinal bands of brown setae. Sternum brownish yellow, densely covered with white setae. Maxillae and labium brown, with yellow tips. Chelicerae dark brown, proximal half of frontal side densely covered with yellowish white setae. Abdomen: dorsum densely covered with white setae, with a large, wide, brownish cardiac mark and with a brownish pattern of transverse lines; sides and venter, including book-lung covers, densely covered with white setae. Spinnerets brownish. All legs and palps yellow, densely covered with white setae; tarsi of all legs darker (brownish). Palps with a claw at their tips.

Epigyne and vulva (Figs 43-44): Epigynal atrium twice as long as wide, with lateral edges slightly biconvex; posterior transverse plate short, anchor-shaped; spermathecae tube-shaped, directed antero-medial, inclined towards each other, distinctly swollen in anterior portion.

Distribution: Only known from the type locality, the Badkhyz Reserve in Turkmenistan (Fig. 76).

Habitat: This species occurs in sparse pistache woodland, with an undergrowth dominated by bulbous bluegrass (*Poa bulbosa*) and sedge (*Carex pachystylis*) (Ovtsharenko & Fet, 1980: sub *Lycosa alticeps*).

Karakumosa gromovi sp. nov.

Figs 49-76

Holotype: ISEA; male; UZBEKISTAN, Surxondaryo Region, Baisun [= Boysun] Distr., c. 44 km SW of Denau [= Denov], SE foothills of Dzhetymkalyas Mt. Range (38°01'10.6"N, 67°28'06.3"E), c. 640 m. a.s.l.; 13.-14.V.1994; leg. A.V. Gromov.

Paratypes: ISEA; 1 female; collected together with the holotype. – ZMMU; 1 male, 1 female; same data. –

MMUE; 1 male, 1 female; same data. – ISEA; 1 female; from the type locality; 14.V.1994; leg. A.V. Gromov & A.A. Zyuzin.

Etymology: This species is dedicated to our friend and colleague, Mr Alexander V. Gromov (Bingen-am-Rhein, Germany), who collected the type specimens.

Diagnosis: In the hook-shaped proximal extension of the MA, the male of *K. gromovi* sp. nov. is most similar to males of *K. shmatkoi* sp. nov. (Figs 115-120) and *K. tashkumyr* sp. nov. (Figs 145-154), but can be readily distinguished by the absence of a low serrate flange at the foot of the median tooth (present in *K. tashkumyr* sp. nov.; Figs 74-75 cf. Figs 107-112 and Figs 152-154). In the straight, subparallel lateral edges of the epigynal atrium, the female of *K. gromovi* sp. nov. is most similar to that of *K. medica*, from which it can be distinguished by the triangular posterior transverse plate of the median septum and by the wider and shorter spermathecae (anchor-shaped posterior transverse plate and worm-shaped spermathecae in *K. medica*; Figs 61-62, 72-73 cf. Figs 85-86).

Description: Male (paratype in MMUE). **Measurements:** Carapace 9.50 long, 7.40 wide. Eye sizes and interdistances: AME 0.50, ALE 0.45, PME 1.20, PLE 1.00, AME-AME 0.20, AME-ALE 0.15, PME-PME 1.25, PME-PLE 1.50. Width of anterior eye row 2.00, of second row 2.80, of third row 3.50. Clypeus height 0.35; chelicera length 3.90. Abdomen 8.75 long, 6.25 wide. Length of leg segments: I 9.80 + 3.90 + 8.00 + 8.40 + 4.40 (34.50); II 9.40 + 3.90 + 7.50 + 8.80 + 4.00 (33.60); III 8.20 + 3.10 + 6.50 + 9.00 + 3.50 (30.30); IV 9.80 + 3.50 + 8.50 + 11.50 + 4.70 (38.00). Leg formula: IV, I, II, III.

Colouration in alcohol (Figs 49-50): Carapace brown, densely covered with white setae, with two wide longitudinal bands of yellow brownish setae. Sternum brownish yellow, densely covered with white setae. Maxillae and labium orange-coloured, with yellow tips. Chelicerae brown, proximal half of frontal side and lateral sides densely covered with white setae. Abdomen: dorsum densely covered with white setae, with a wide, yellow brownish cardiac mark and with a pattern consisting of yellow brownish transverse stripes and patches; sides and venter densely covered with white setae. Book-lung covers yellow, densely covered with white setae. Spinnerets yellowish grey. All legs brownish yellow, densely covered with white setae; Mt I-II and Tr I-II darker (brownish), also densely covered with white setae. Palp yellow, with brownish cymbium, densely covered with white setae.

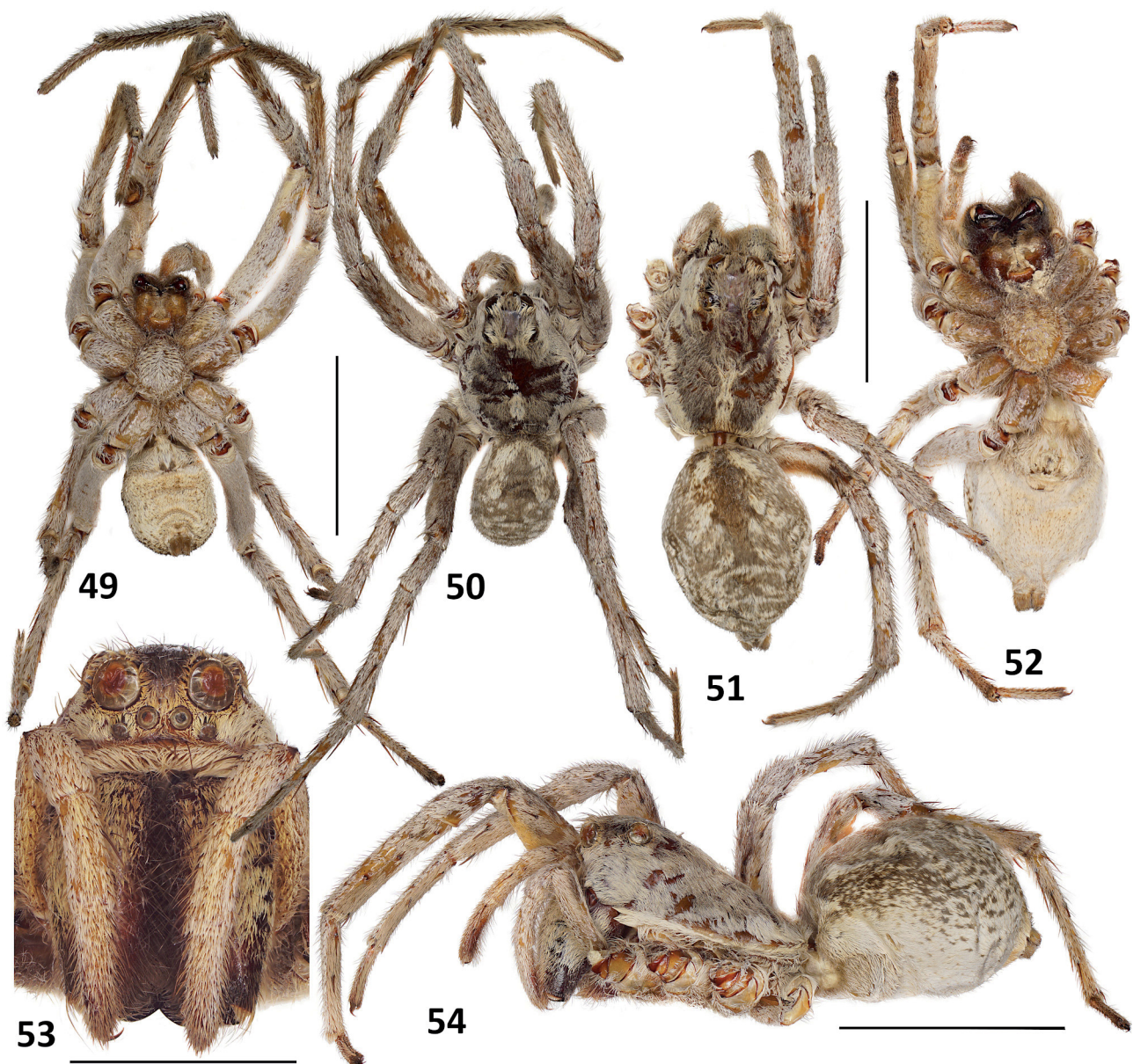
Palp structure (Figs 55-60, 64-69, 74-75): Acutely pointed synbolic lamellae subparallel to each other; median tooth markedly bifurcated; proximal extension wide and markedly hook-shaped; distance between proximal extension and median tooth short, equal to

width of proximal extension; inner plate transverse, with an extended, obtuse retrolateral shoulder; conductor triangular, obtuse at its tip.

Female (paratype in MMUE). *Measurements*: Carapace 12.00 long, 7.80 wide. Eye sizes and interdistances: AME 0.55, ALE 0.45, PME 1.30, PLE 1.20, AME-AME 0.25, AME-ALE 0.18, PME-PME 1.50, PME-PLE 1.70. Width of anterior eye row 2.00, of second row 3.15, of third row 4.00. Clypeus height 0.40; chelicera length 6.00. Abdomen 12.60 long, 9.40 wide. Length of leg segments: I 8.90 + 3.90 + 6.80 + 6.00 + 3.10 (28.70); II 8.90 + 3.80 + 6.10 + 6.00 + 3.00 (27.80); III 6.70 + 2.90

+ 5.20 + 6.30 + 2.90 (24.00); IV 8.50 + 3.50 + 6.90 + 8.00 + 3.80 (30.70). Leg formula: IV, I, II, III.

Colouration in alcohol (Figs 51-54, 70-71): Carapace brown, densely covered with white setae and with a well-marked pattern of two wide yellowish brownish longitudinal paramedian bands. Sternum yellow, densely covered with white setae. Maxillae and labium brown, with yellow tips. Chelicerae dark brown, proximal half of frontal side and lateral sides densely covered with yellowish white setae. Abdomen: dorsum densely covered with white setae, with a brownish cardiac mark and a pattern consisting of brownish transverse stripes,



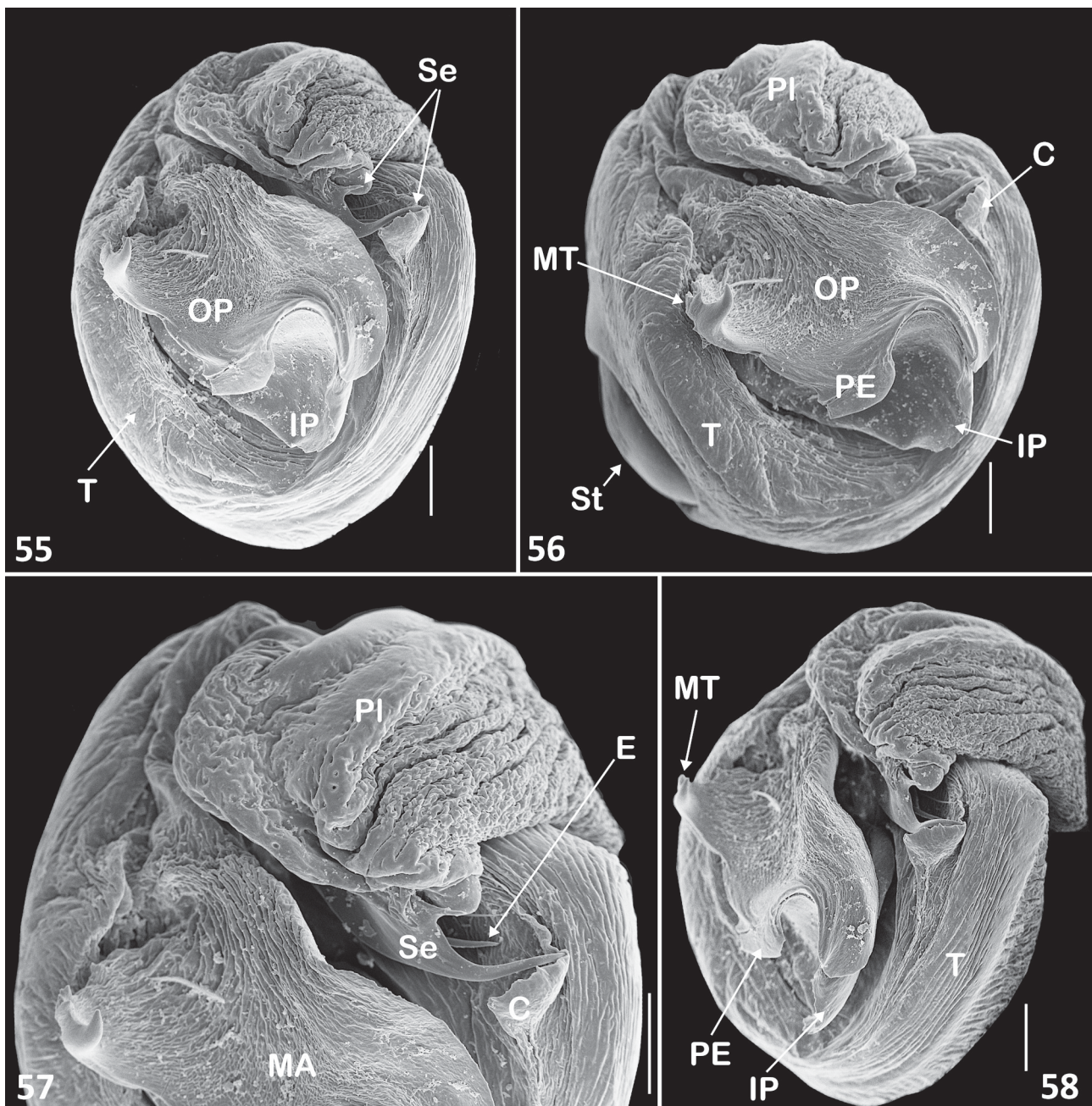
Figs 49-54. *Karakumosa gromovi* sp. nov.; male paratype (49-50) and female paratype (51-54). (49, 52) Body, ventral view. (50-51) Ditto, dorsal view. (53) Female prosoma, frontal view. (54) Female body, lateral view. Scale bars 1 cm (49-52, 54), 0.5 cm (53).

patches and speckles; sides and venter yellow, densely covered with white setae. Book-lung covers yellow, densely covered with white setae. Spinnerets greyish yellow. All legs yellow brownish, densely covered with white setae. Palp yellow brownish, densely covered with white setae, with a tarsal claw.

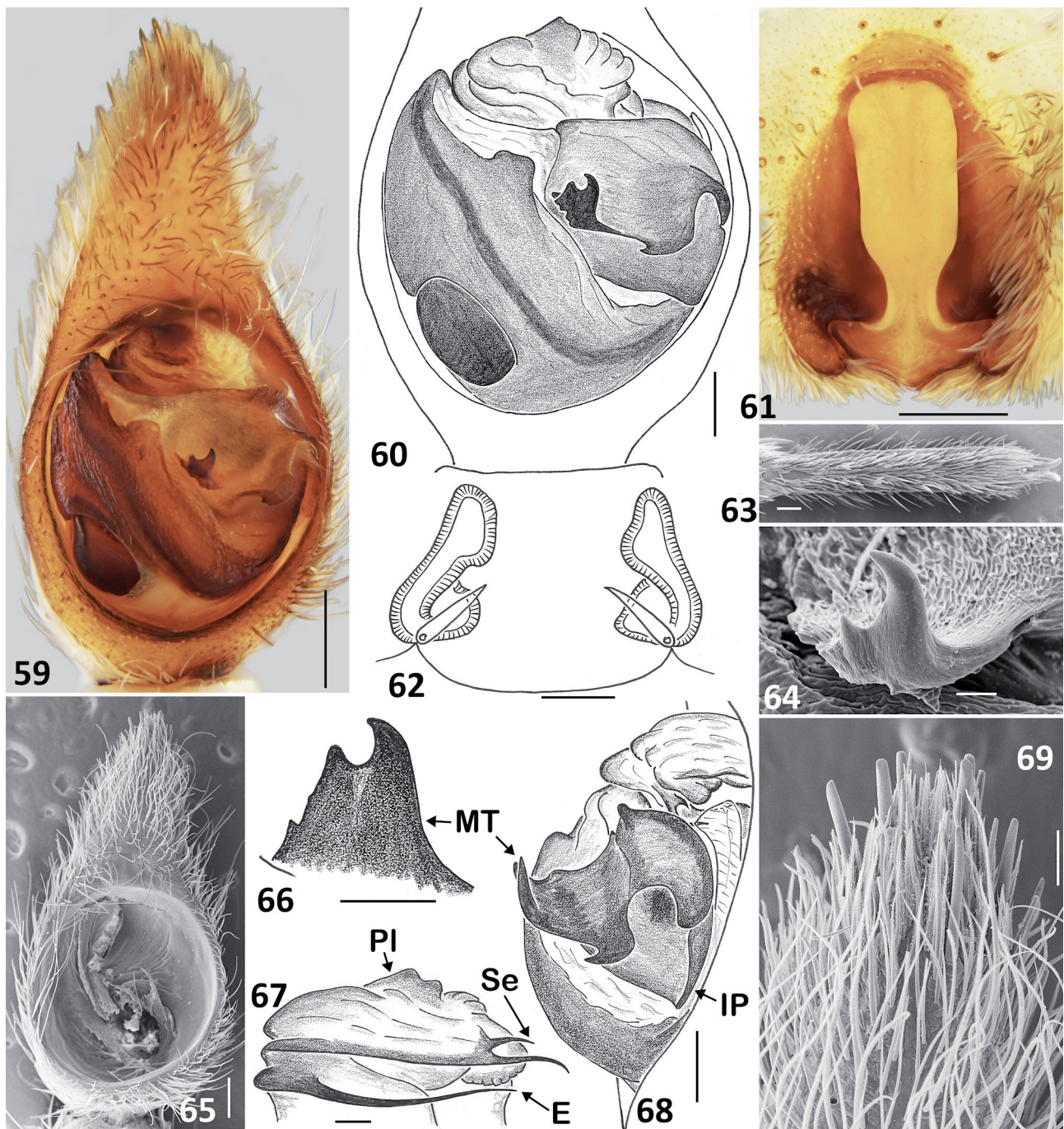
Epigyne and vulva (Figs 61-62, 72-73): Epigynal atrium twice as long as wide, with straight subparallel lateral edges; posterior transverse plate markedly triangular,

its posterior margin angular; spermathecae pear-shaped, their tips directed medio-anteriad, inclined towards each other.

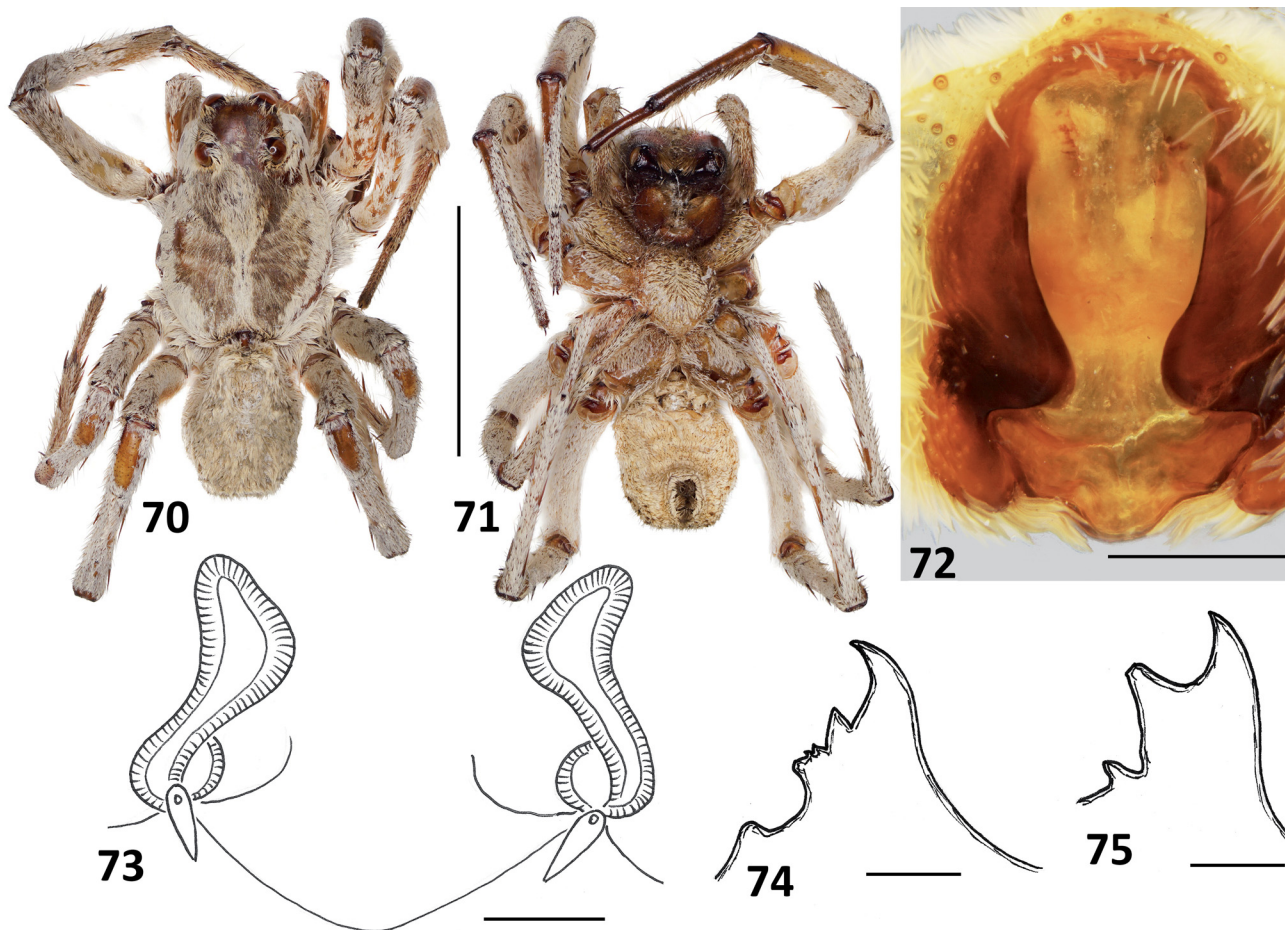
Distribution: Only known from the type locality in southern Uzbekistan (Fig. 76) where this species occurs together with another large burrowing wolf spider: *Zyuzicosa baisunica* Logunov, 2010; see Logunov (2010) for further information on the latter species.



Figs 55-58. *Karakumosa gromovi* sp. nov., bulbus of male paratype. (55) Ventral-retrolateral view. (56) Ventral view. (57) Apical view. (58) Retrolateral view. Scale bars 0.2 mm. Abbreviations as explained in Material and methods.



Figs 59-69. *Karakumosa gromovi* sp. nov.; male paratypes (59-60, 64-69) and paratype female (61-63). (59-60) Bulbus, ventral view. (61) Epigyne, ventral view. (62) Vulva, dorsal view. (63) Female tarsus I, ventral view. (64, 66) Median tooth of MA, posterior view. (65) Cymbium, ventral view. (67) Embolic division, ventral view. (68) Bulbus, retrolateral view. (69) Cymbium tip, dorsal view. Scale bars 0.5 mm (59, 61), 0.3 mm (63, 65), 0.25 mm (62), 0.1 mm (60, 66-69), 0.05 mm (64). Abbreviations as explained in Material and methods.



Figs 70-75. *Karakumosa gromovi* sp. nov.; male paratypes (74-75) and female paratype (70-73). (70) Body, dorsal view. (71) Ditto, ventral view. (72) Epigyne, ventral view. (73) Vulva, dorsal view. (74-75) Median tooth of MA, posterior view. Scale bars 1 cm (70-71), 0.5 mm (72), 0.25 mm (73), 0.1 mm (74-75).

***Karakumosa medica* (Pocock, 1889) comb. nov.**

Figs 76-88

Tarentula medica Pocock, 1889: 110, pl. 13, figs 1a-g (description of male and female; 1 adult male, 1 adult female and 1 immature syntypes in the BMNH).

Hogna media. – Roewer, 1955b: 249 (misspelling).

Lectotype (designated here): BMNH, BM 1887.51; male; AFGHANISTAN, Meshed/Tirp-hul [‘Kalla-idast-dargarri’; c. 34°42’N, 61°03’E]; no date [apparently June 1884]; leg. [J.E.T.] Aitchison.

Paralectotypes: BMNH, BM 1887.51; 1 female, 1 immature; collected together with the lectotype.

Etymology: Although the author (Pocock, 1889) did not explain the origin of the name, the species epithet presumably is the Latin adjective ‘medicus, -a, -um’ (= medical), likely referring to the fear of this spider expressed by local people; see under ‘Comments’ below.

Diagnosis: This species is similar to *K. badkhyzica* sp. nov. (Figs 39-48), but differs in having a wider proximal extension of the MA (Fig. 83), a longer epigynal

atrium (Fig. 85) and a different conformation of the spermathecae: worm-shaped in *K. medica* (Fig. 86) and markedly swollen anteriorly in *K. badkhyzica* sp. nov. (Fig. 43). See also comments above under ‘Diagnosis’ of *K. gromovi* sp. nov.

Description: Male (lectotype). *Measurements:* Carapace 13.00 long, 10.00 wide. Eye sizes and interdistances: AME 0.55, ALE 0.50, PME 1.30, PLE 1.25, AME-AME 0.30, AME-ALE 0.20, PME-PME 1.00, PME-PLE 2.45. Width of anterior eye row 2.50, of second row 3.40, of third row 4.20. Clypeus height 0.35; chelicera length 5.00. Abdomen 9.00 long, 6.40 wide. Length of leg segments: I 13.00 + 5.30 + 11.00 + 12.50 + 6.00 (47.80); II 12.60 + 5.30 + 10.50 + 12.50 + 5.50 (46.40); III 11.40 + 4.60 + 8.60 + 12.70 + 5.50 (42.80); IV 13.80 + 4.50 + 11.20 + 16.20 + 6.50 (52.20). Leg formula: IV, I, II, III.

Colouration in alcohol (Figs 81-82): Specimen damaged and shabby. Carapace dark russet, almost without white setae. Sternum orange-coloured, densely covered with white setae. Maxillae orange-coloured. Labium orange-

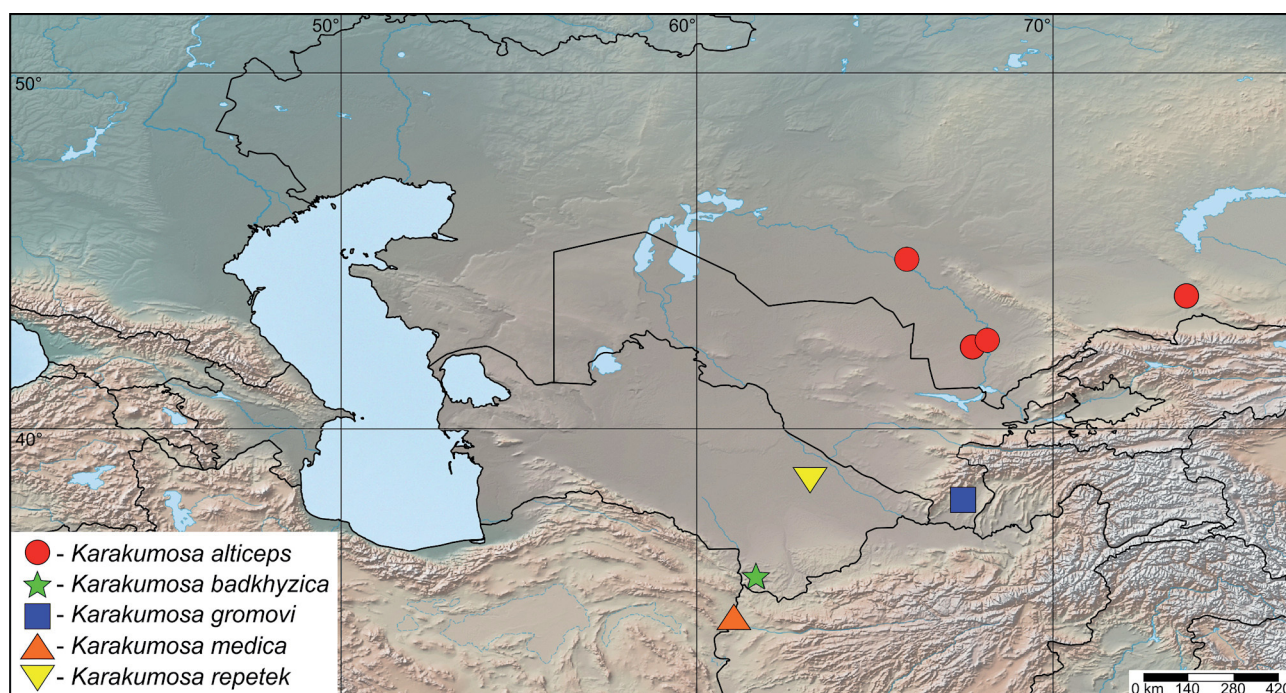


Fig. 76. Localities of five species in the genus *Karakumosa* gen. nov.

coloured, with a yellow tip. Chelicerae dark brown, their frontal sides covered with white setae. Abdomen: dorsum densely covered with white setae, with a yellow cardiac mark outlined by a brown line; sides and venter densely covered with yellowish white setae. Book-lung covers orange-coloured, densely covered with yellowish white setae. Spinnerets brown. All legs orange-coloured brownish, densely covered with white setae. Palps orange-coloured, densely covered with white setae.

Palp structure (Figs 83-84, 87-88; mirrored image of right palp): Acutely pointed synsymbolic lamellae slightly convergent towards each other; medina tooth markedly bifurcated; proximal extension wide and relatively short; inner plate transverse-ovoid; conductor triangular, pointed at its tip.

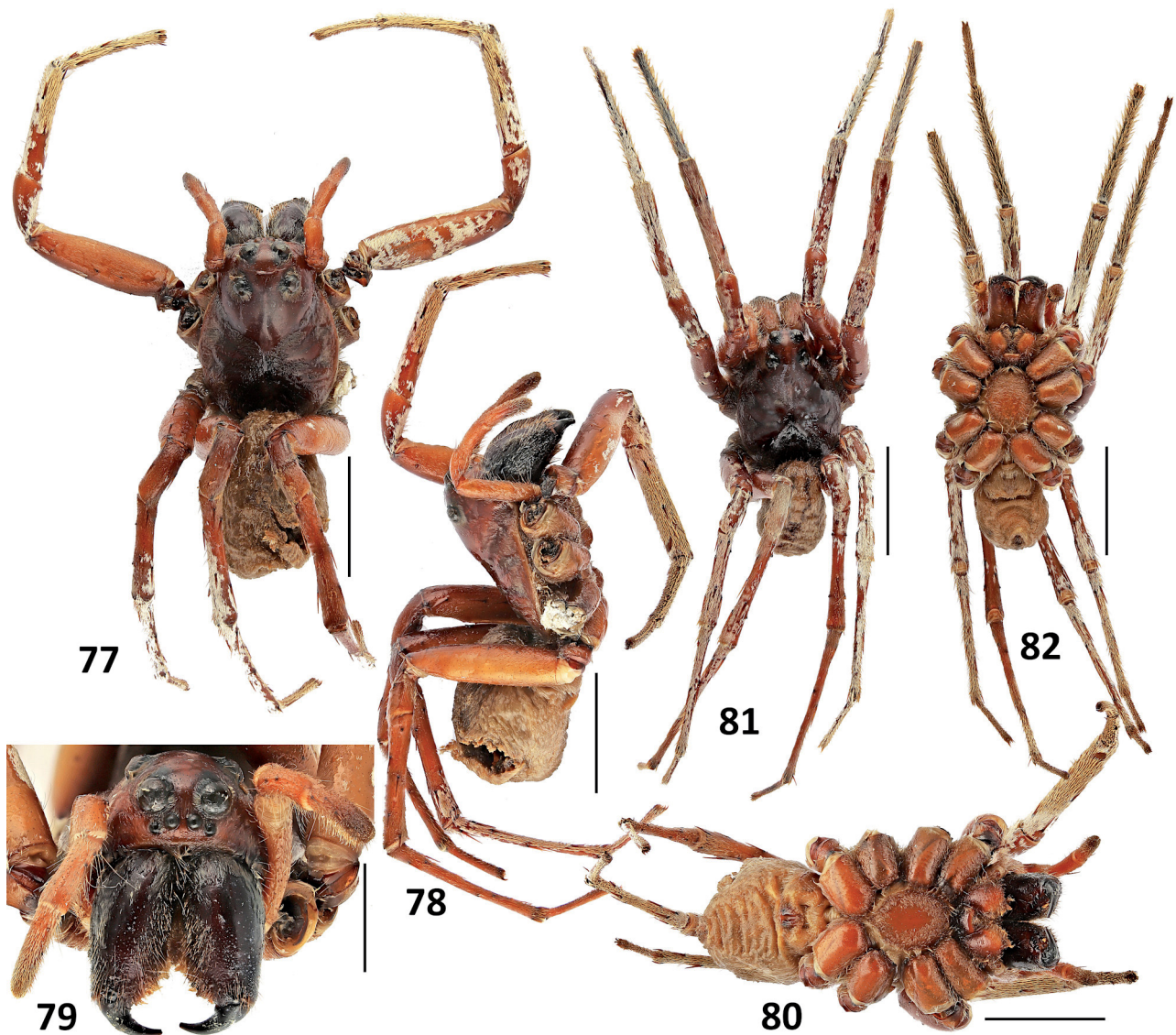
Female (paralectotype). Measurements: Carapace 14.70 long, 11.00 wide. Eye sizes and interdistances: AME 0.70, ALE 0.55, PME 1.70, PLE 1.20, AME-AME 0.35, AME-ALE 0.25, PME-PME 1.10, PME-PLE 3.10. Width of anterior eye row 3.00, of second row 4.25, of third row 5.10. Clypeus height 0.65; chelicera length 6.50. Abdomen 13.00 long, 9.50 wide. Length of leg segments: I 12.30 + 5.00 + 9.50 + 9.00 + 4.70 (40.50); II 11.50 + 5.30 + 8.80 + 9.20 (no segment) (?); III 10.30 + 5.20 + 7.40 + 9.50 + 5.20 (37.70); IV 13.30 + 5.50 + 9.80 + 13.00 + 6.10 (47.70). Leg formula: IV, I, II, III.

Colouration in alcohol (Figs 77-80): Specimen damaged and shabby. Carapace dark russet, almost without white setae. Sternum orange-coloured, densely covered with

white setae. Maxillae brownish orange-coloured. Labium brown-orange-coloured, with a yellow tip. Chelicerae dark brown, proximal part of frontal side and lateral sides covered with yellowish white setae. Abdomen damaged: dorsum densely covered with yellowish white setae, with no visible cardiac mark and colour pattern; sides and venter yellow, densely covered with yellowish white setae. Book-lung covers yellow, densely covered with yellowish white setae. Spinnerets brown. All legs orange-coloured, densely covered with yellowish white setae. Palps orange-coloured, densely covered with white setae.

Epigyne and vulva (Figs 85-86): Epigynal atrium three times as long as wide, with subparallel lateral edges; posterior transverse plate short, its posterior margin slightly bent (making the plate anchor-shaped); spermathecae tube-shaped, bent mediad and then directed antieriad.

Comments: In the original paper (Pocock, 1889: 111), the particulars of collecting the *Tarentula medica* types are described as follows: "...taken between Tirphul and Meshed in Persia". Later in the text, based on the collector's observations (J.E.T.A.), Pocock (1889) added that "At Kalla-idast-dargarri, June 8th, amongst the brick debris of the old buildings, and running in and out of the clay fissures in the soil, this spider occurred in large numbers, much to the horror of the natives - the Afghans and Persians holding it in great fear, as, they say, should it drop any of its excreta on the skin,



Figs 77-82. *Karakumosa medica* (Pocock, 1889); female paralectotype (77-80) and male lectotype (81-82). (77, 81) Body, dorsal view. (78) Ditto, lateral view. (79) Prosoma, frontal view. (80, 82) Body, ventral view. Scale bars 1 cm (77-78, 80-82), 0.5 cm (79).

the result is acute erysipelas, usually ending in death". Based on the map published by the Afghan Delimitation Commission (Aitchison, 1889), 'Kalla-idast-dargarri' seems to be a site lying some 14 km WNW of the present-day Kohsān, on the left bank of the Hari River in the Herat Province of Afghanistan (c. 34°42'N, 61°03'E). This site is here accepted as the type locality of *Tarentula medica*. We failed to find the geographic name 'Kalla-idast-dargarri' on contemporary maps.

Distribution: Only known from the type locality in north-western Afghanistan (Fig. 76). The record of this species by Schmidt (1895: 450; sub. *Lycosa medica*) from Uzbekistan, Qarshi (= Karschi; c. 38°51'N, 65°47'E) is doubtful and needs verification, because

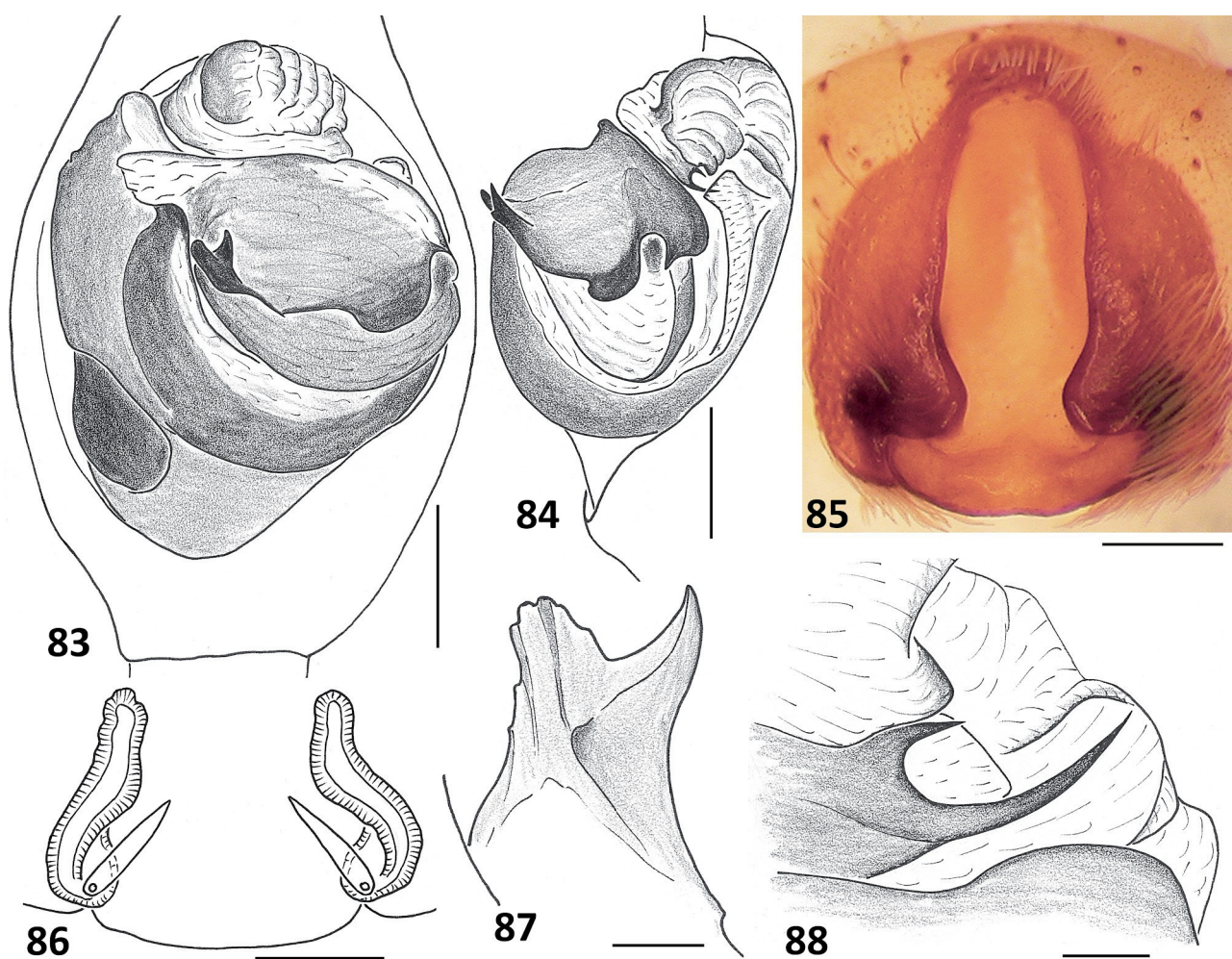
it more likely can be attributed to either *K. alticeps* or *K. gromovi* sp. nov. Unfortunately the whereabouts of Schmidt's specimens is unknown and they may be lost.

***Karakumosa repetek* sp. nov.**

Figs 76, 89-102

Holotype: ISEA, 001.4309; male; TURKMENISTAN, Repetek (c. 38°35'N, 63°11'E), on light near a house; 7.VIII.1972; leg. G.T. Kuznetsov.

Paratypes: ISEA, 001.4310; 2 males; from the type locality; 31.VIII.1972; leg. G.T. Kuznetsov. – ISEA, 001.4213; 1 female; from the type locality; 21.VII.1985; leg. V.Ya. Fet.



Figs 83-88. *Karakumosa medica* (Pocock, 1889); male lectotype (83-84, 87-88) and female paralectotype (85-86). (83) Bulbus, ventral view. (84) Ditto, retrolateral view. (85) Epigyne, ventral view. (86) Vulva, dorsal view. (87) Median tooth of MA, posterior view. (88) Synembolus, apical view. Scale bars 0.5 mm (83-86), 0.1 mm (87-88).

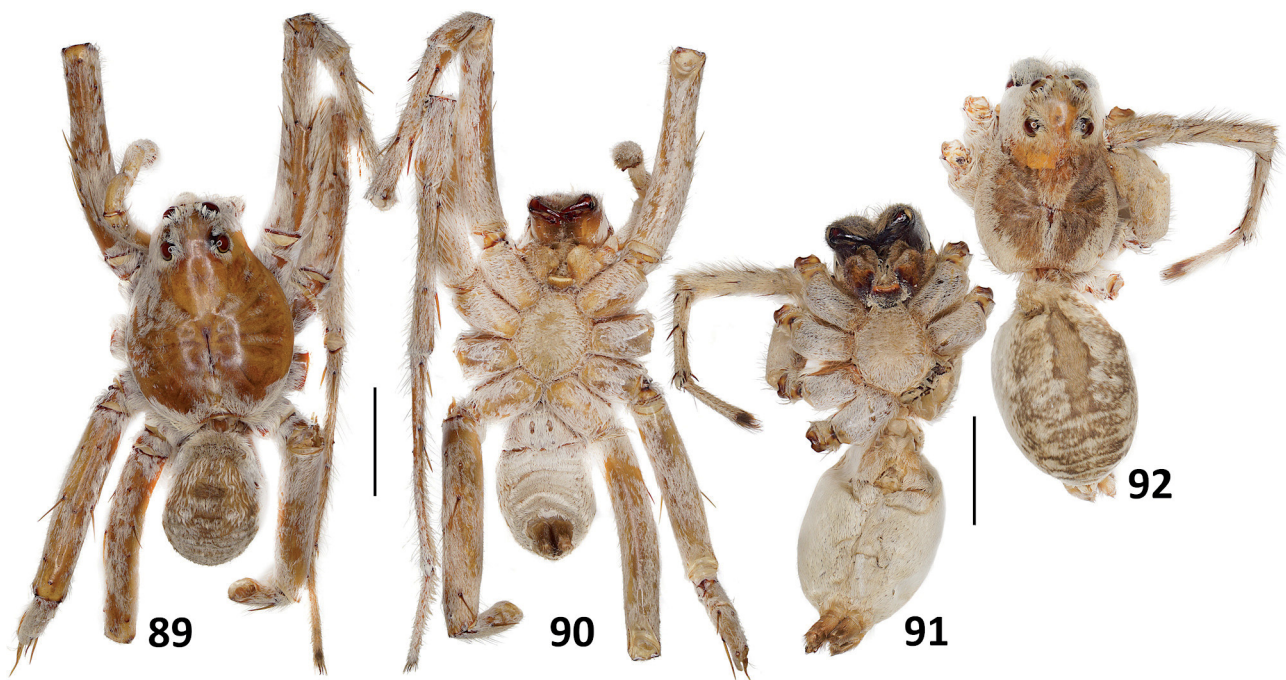
Etymology: The species epithet is a noun in apposition referring to the name of the type locality, the Repetek Reserve in Turkmenistan.

Diagnosis: The male of *K. repetek* sp. nov. is most similar to that of *K. badkhyzica* sp. nov. (Figs 40-42, 46-48), but differs in having a longer and wider, spade-like proximal extension of the MA (Fig. 98) and a bifurcated median tooth (spatula-like proximal extension and finger-like median tooth in *K. badkhyzica* sp. nov.; Fig. 42 cf. Fig. 100). In the slightly sigmoid lateral edges of the epigynal atrium, the female of *K. repetek* sp. nov. is most similar to that of *K. zyuzini* sp. nov., from which it differs in the shape of the posterior transverse plate (dumbbell-shaped vs. with straight posterior margin; Fig. 96 cf. Fig. 179) and in the curved vs. straight spermathecae (Fig. 95 cf. Fig. 182).

Description: Male (holotype). *Measurements:* Carapace 10.80 long, 8.00 wide. Eye sizes and interdistances:

AME 0.50, ALE 0.38, PME 1.10, PLE 0.90, AME-AME 0.13, AME-ALE 0.10, PME-PME 0.85, PME-PLE 1.05. Width of anterior eye row 1.90, of second row 2.70, of third row 3.35. Clypeus height 0.33; chelicera length 4.00. Abdomen 9.20 long, 5.30 wide. Length of leg segments: I 9.80 + 4.20 + 9.10 (distal segments missing); II 9.70 + 3.80 + 9.00 + 11.70 + 5.00 (39.20); III 9.70 (distal segments missing); IV 11.40 + 4.20 (distal segments missing).

Colouration in alcohol (Figs 89-90): Specimen damaged and shabby. Carapace yellow brownish, densely covered with white setae. Sternum yellow, densely covered with white setae. Maxillae and labium yellow, with white tips. Chelicerae yellowish brownish, their frontal and lateral sides densely covered with white setae. Abdomen: dorsum densely covered with white setae, with a poorly marked cardiac mark; sides and venter densely covered with white setae. Book-lung covers yellow, densely covered with white setae. Spinnerets yellow brownish.



Figs 89-92. *Karakumosa repetek* sp. nov.; male paratype (89-90) and female paratype (91-92). (89, 92). Body, dorsal view. (90, 91) Ditto, ventral view. Scale bars 0.5 cm.

All legs yellow brownish, densely covered with white setae. Palp yellow, densely covered with white setae.

Palp structure (Figs 93-94, 97-102; mirrored image of right palp): Acutely pointed synembolic lamellae convergent to each other or bent proximad; median tooth bifurcated at its tip; proximal extension wide and long, spade-like; inner plate transverse and relatively narrow, with an extended, obtuse retrolateral-proximal shoulder; conductor triangular, pointed at its tip.

Female (paratype). Measurements: Carapace 9.20 long, 7.20 wide. Eye sizes and interdistances: AME 0.53, ALE 0.35, PME 1.03, PLE 1.05, AME-AME 0.28, AME-ALE 0.10, PME-PME 1.15, PME-PLE 1.15. Width of anterior eye row 2.10, of second row 2.80, of third row 3.35. Clypeus height 0.40; chelicera length 5.25. Abdomen 11.00 long, 7.30 wide. Length of leg segments: I-II absent; III 7.20 + 3.50 + 4.80 + 6.50 + 4.00 (26.00); IV absent.

Colouration in alcohol (Figs 91-92): Damaged specimen with only one legs remaining. Carapace brownish yellow, densely covered with white setae; its dorsal side with a brownish colour pattern consisting of two wide longitudinal paramedian bands. Sternum yellow, densely covered with white setae. Maxillae and labium yellow-brown, with yellow tips. Chelicerae brown, their frontal and lateral sides densely covered with white setae. Abdomen: dorsum densely covered with white setae, with a yellowish brown cardiac mark and a brownish colour pattern consisting of transverse stripes; sides and venter densely covered with white setae. Book-

lung covers yellow, densely covered with white setae. Spinnerets yellow brownish. All legs brownish yellow, densely covered with white setae. Palps lost.

Epigyne and vulva (Figs 95-96): Epigynal atrium twice as long as wide, narrower at its proximal end and with slightly sigmoid lateral edges; posterior transverse plate dumbbell-shaped; spermathecae curved like a "C", bent mediad and tips directed anteriad.

Distribution: Only known from the type locality, the Repetek Reserve in Turkmenistan (Fig. 76).

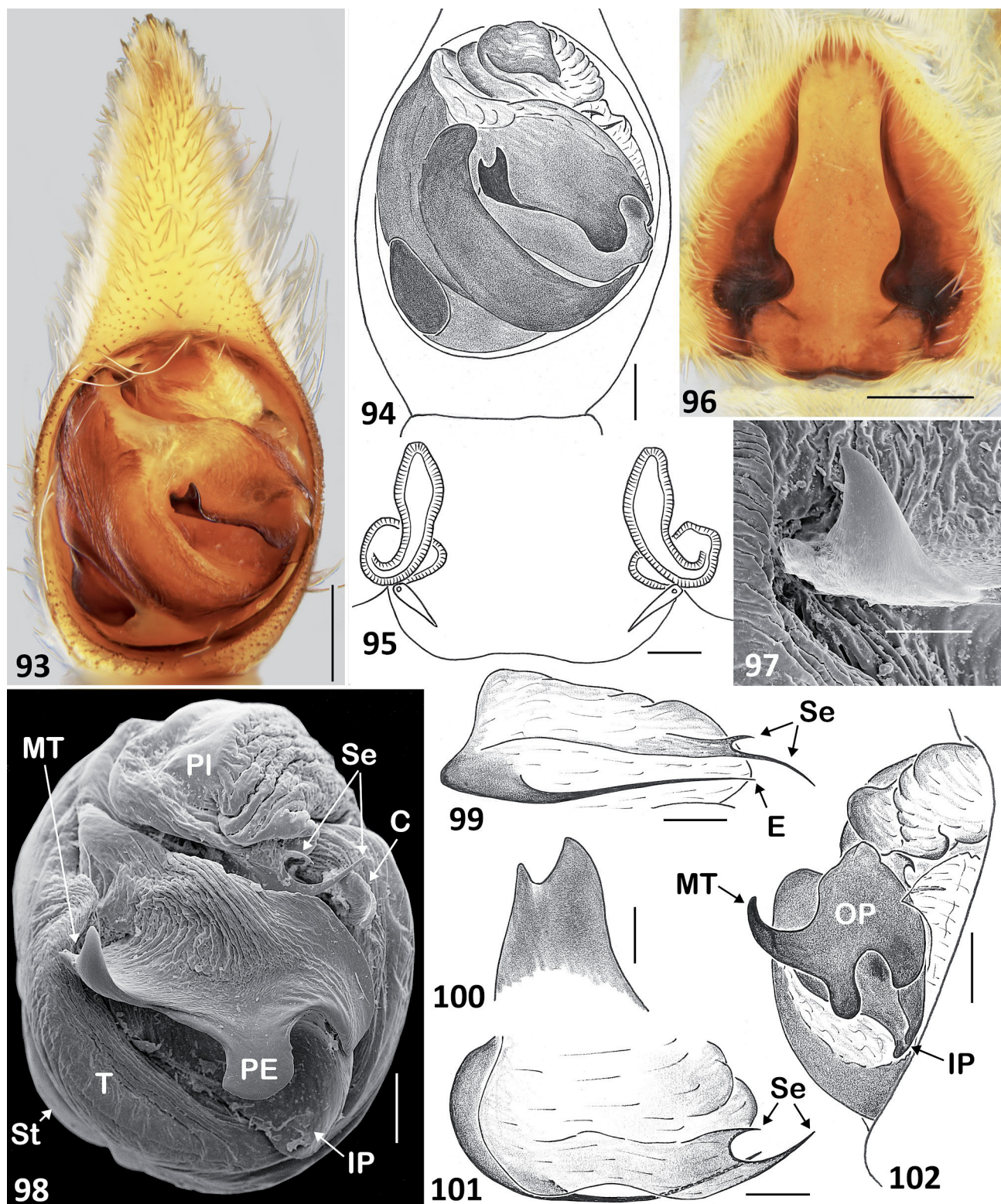
Karakumosa shmatkoi sp. nov.

Figs 103-141, 155

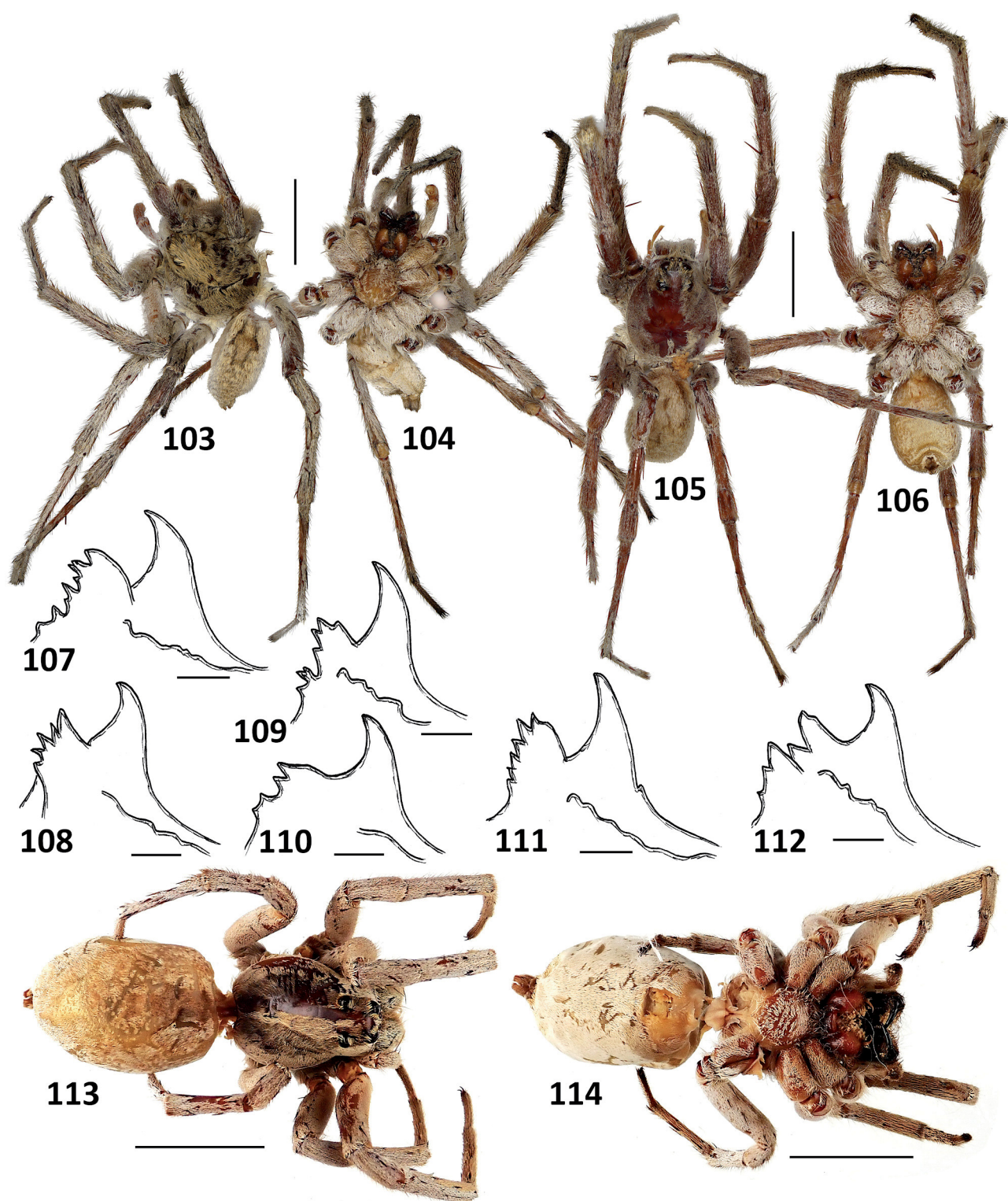
Lycosa alticeps (Kroneberg, 1875). – Schmidt, 1895: 450 (partim, misidentification). – Dunin, 1984: 55. – Minoransky & Ponomarev, 1984: 85-86 (all misidentifications). "*Lycosa*" sp. 1. – Ponomarev & Abdurakhmanov, 2014: 92-93. "*Lycosa*" sp. 2. – Ponomarev & Abdurakhmanov, 2014: 93.

Holotype: ZMMU; male (Figs 105-106, 128, 132-133); KAZAKHSTAN, Atyrau Province, c. 20 km NE of Ganyushkino Vil., Zhuzguntyube stow (46°43'1.4"N, 49°25'32.1"E); 6.VII.1977; leg. F.A. Saraev.

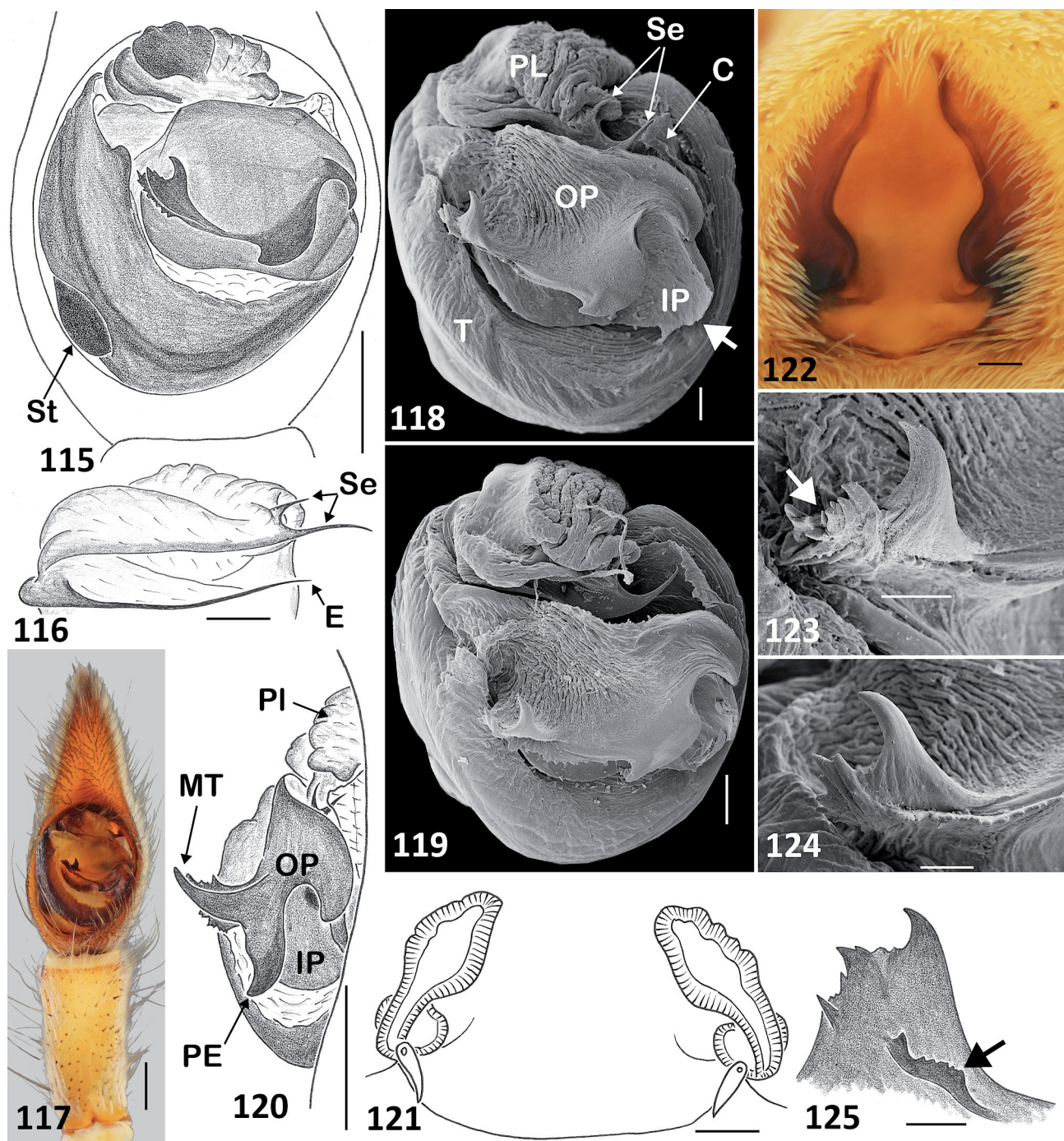
Paratypes: ZMMU; 1 female; same locality as for the holotype; 1.-10.VII.1977; leg. F.A. Saraev. – ISEA; 2 males; KAZAKHSTAN, Atyrau Province, Embinsk Distr., near Tengiz (46°23'49.9"N, 53°25'22.6"E); 8.VI.1986; leg. F.A. Saraev. – ZMMU; 1 male; KAZAKHSTAN, Atyrau Province, Embinsk Distr.,



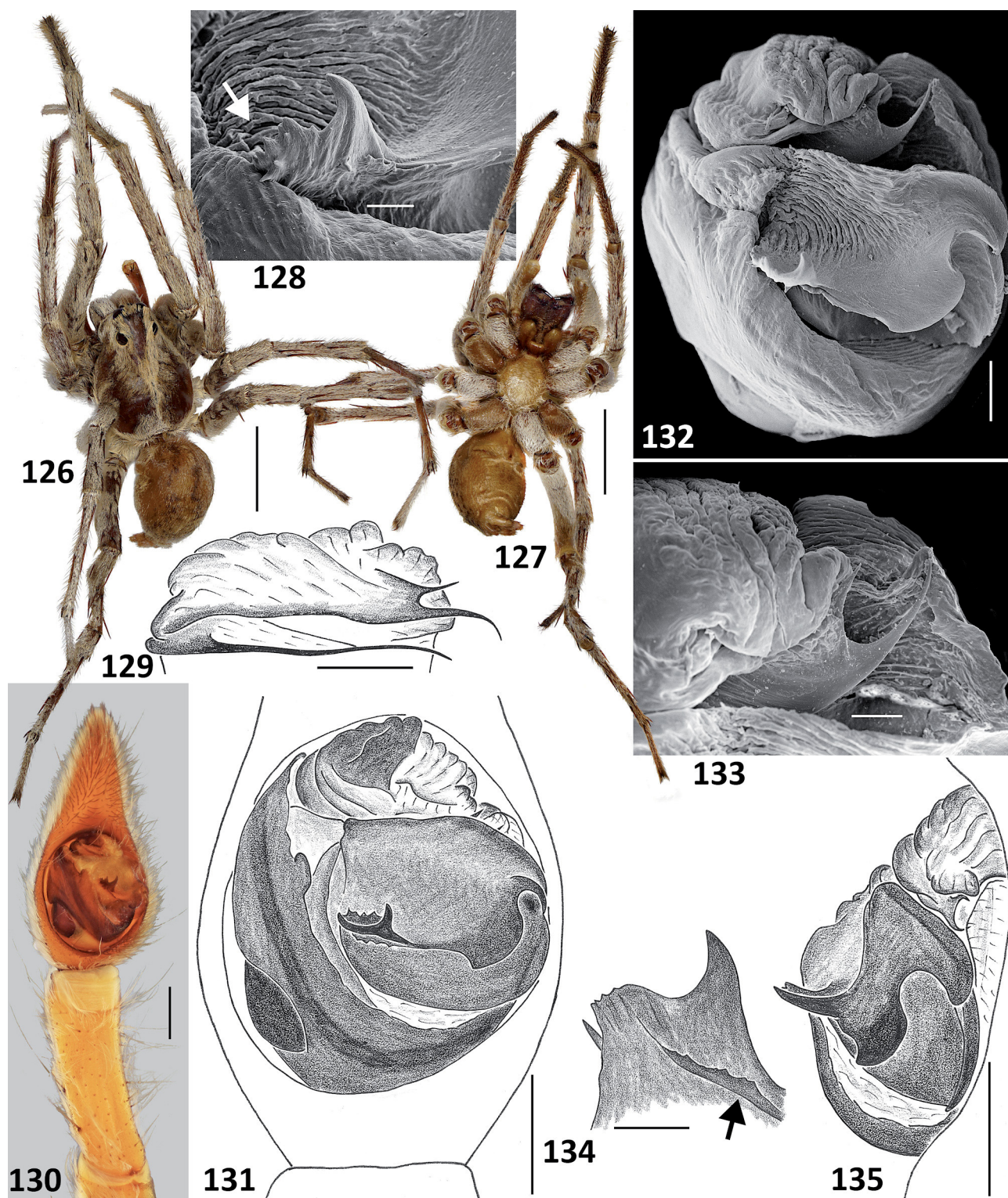
Figs 93-102. *Karakumosa repetek* sp. nov.; male holotype (97-98), male paratype (93-94, 99-102) and female paratype (95-96). (93-94, 98). Bulbus, ventral view. (95) Vulva, dorsal view. (96) Epigyne, ventral view. (97) Median tooth of MA, ventral view. (99) Embolic division, ventral view. (100) Median tooth of MA, posterior view. (101) Embolic division, apical view. (102) Bulbus, retrolateral view. Scale bars 0.5 mm (93, 96), 0.25 mm (94, 102), 0.2 mm (98), 0.1 mm (95, 97, 99-101). Abbreviations as explained in Material and methods.



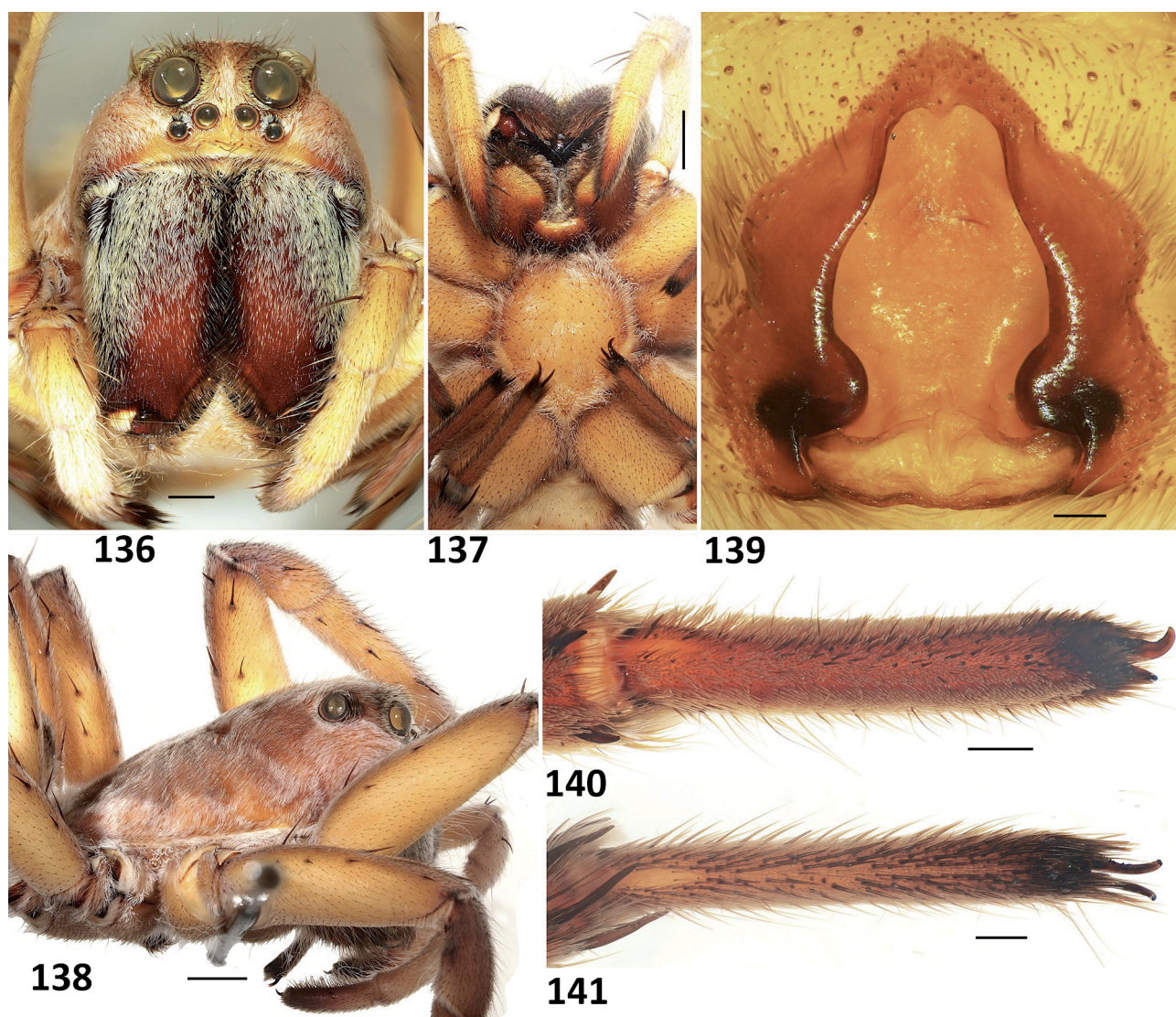
Figs 103-114. *Karakumosa shmatkoi* sp. nov.; male holotype (105-106), male paratype (103-104, 107-112) and female paratype (113-114); specimens from Kulaly Island (103-104, 109), Zhuzguntyube stow (105-106, 113-114), Mugodzhary Mts (107), Artezian Vil. (108, 110), Tengiz (111), Tyub-Karagan Peninsula (112). (103, 105, 113) Body, dorsal view. (104, 106, 114) Ditto, ventral view. (107-112) Median tooth of MA, posterior view. Scale bars 1 cm (103-106, 113-114), 0.1 mm (107-112).



Figs 115-125. *Karakumosa shmatkoi* sp. nov.; male paratypes (115-120, 123-125) and female paratype (121-122); specimens from Tyub-Karagan Peninsula (115-116, 118, 120, 123, 125), Island Kulaly (117), Zhuzguntyube stow (121-122) and Tengiz (119, 124). (115, 118-119) Bulbus, ventral view. (116) Embolic division. (117) Left male palp, ventral view. (120) Bulbus, retrolateral view. (121) Vulva, dorsal view. (122) Epigyne, ventral view. (123-125) Median tooth of MA, posterior view. Scale bars 0.25 mm (115, 117, 120, 122), 0.2 mm (118-119), 0.1 mm (116, 121, 123-125). Abbreviations as explained in Material and methods.



Figs 126-135. *Karakumosa shmatkoi* sp. nov.; male holotype (128, 132-133) and male paratype from Kalmykia, Utta Vil. (126-127, 129-131, 134-135). (126) Body, dorsal view. (127) Ditto, ventral view. (128, 134) Median tooth of MA, posterior view. (129) Embolic division. (130) Left male palp, ventral view. (131-132) Bulbus, ventral view. (133) Synembolus, apical view. (135) Bulbus, retrolateral view. Scale bars 1 cm (126-127), 0.5 mm (130-131, 135), 0.2 mm (132), 0.1 mm (128, 134).



Figs 136-141. *Karakumosa shmatkoi* sp. nov., female from Azerbaijan, Absheron peninsula. (136) Prosoma, frontal view. (137) Ditto, ventral view. (138) Ditto, lateral view. (139) Epigyne, ventral view. (140) Tarsus I, ventral view. (141) Tarsus IV, ventral view. Scale bars 2 mm (137-138), 1 mm (136), 0.5 mm (140-141), 0.2 mm (139).

near Koschagyl (46°48'17.3"N, 53°43'50"E); 19.-24.VI.1987; leg. F.A. Saraev. – ZMMU; 6 males; KAZAKHSTAN, Mangistau Province, Mangyshlak, c. 10 km S of Fort Shevchenko, shore of Tyub-Karagan Peninsula (44°26'19.9"N, 50°15'19.9"E), hilly sands, pitfall traps; 17.VI.2013; leg. G.M. Abdurakhmanov. – ZMMU; 3 males; KAZAKHSTAN, Mangistau Province, Mangyshlak, Island Kulaly (44°53'31.4"N, 50°03'13.2"E), fine hilly sands, hand collecting; 19.VI.2013; leg. G.M. Abdurakhmanov. – MHNG; 2 males; same data. – PSU; 1 male; KAZAKHSTAN, Aktope Province, c. 25 km ENE of Embi Vil., Mugodzhary Mts (c. 48°57'N, 58°39'E); 28.VI.2013; leg. A.O. Shkurikhin. – MMUE; 1 male; RUSSIA, Kalmykia, Yashkul Distr., c. 55 km NE of Yashkul Vil., near Utta Vil. (46°22'33.9"N, 46°01'18.5"E), hilly

sands with sparse vegetation; 12.VI.1975; leg. A.V. Ponomarev. – ZMMU; 2 males; RUSSIA, Kalmykia, Chernozemel'sk Distr., c. 65 km SE of Komsomol'sky Vil., near Artezian Vil. (44°57'29.5"N, 46°37'53.5"E); 1.-4.VII.1976; leg. E.A. Khachikov.

Other material: ZMMU; 1 female (Figs 136-141); AZERBAIJAN, Absheron Peninsula (no exact locality); no date and collector given.

Etymology: The species is dedicated to our friend and colleague, Mr Vladimir Yu. Shmatko (Rostov-on-Don, Russia), who has been collaborating with the second author (AVP) in spider studies for many years and who took the majority of digital photos of *Karakumosa* species given in the present paper.

Diagnosis: The male of *K. shmatkoi* sp. nov. is most similar to those of *K. gromovi* sp. nov. (Figs 59, 60, 64-69) and *K. tashkumyr* sp. nov. (Figs 142-154); it can be distinguished from the former by the presence of a low serrate flange at the foot of the median tooth (absent in *K. gromovi* sp. nov.; Figs 125, 134 cf. Figs 74-75), and from the latter by a narrower inner plate of the median apophysis, which is almost hidden under the outer plate (Figs 118-119 cf. Figs 148, 150) and by the shape of the synsymbolus (Fig. 116 cf. Fig. 149). In the sigmoid lateral edges of the epigynal atrium, the female is similar to those of *K. repetek* sp. nov. (Figs 95-96) and *K. zyuzini* sp. nov. (Figs 179, 182), from which it differs in the shape of the posterior transverse plate (developed as a low, inverted triangle; Fig. 122 cf. Fig. 96 and Fig. 179) and by the spermathecae being visibly swollen (Fig. 121 cf. Fig. 95 and Fig. 182). See also comments above under 'Diagnosis' of *K. alticeps*.

Description: Male (holotype). *Measurements:* Carapace 11.00 long, 9.30 wide. Eye sizes and interdistances: AME 0.45, ALE 0.40, PME 0.90, PLE 0.90, AME-AME 0.38, AME-ALE 0.15, PME-PME 1.20, PME-PLE 1.15. Width of anterior eye row 2.25, of second row 2.95, of third row 3.65. Clypeus height 0.35; chelicera length 4.00. Abdomen 10.50 long, 7.20 wide. Length of leg segments: I 10.00 + 5.00 + 9.80 + 10.00 + 4.80 (39.60); II 11.00 + 4.50 + 9.50 + 10.30 + 4.90 (40.20); III 10.00 + 3.80 + 7.60 + 9.80 + 4.20 (35.40); IV 12.00 + 4.10 + 9.70 + 13.50 + 5.40 (44.70). Leg formula: IV, II, I, III.

Colouration in alcohol (Figs 103-106, 126-127): Carapace dark brown, densely covered with yellowish white setae, without two wide brownish longitudinal paramedian bands. Sternum yellow-orange-coloured, densely covered with white setae. Maxillae and labium yellowish brown, with yellow tips. Chelicerae dark brown, their frontal and lateral sides densely covered with yellowish white setae. Abdomen: dorsum densely covered with white setae, with an indistinct cardiac mark outlined by brown lines; sides and venter yellow, densely covered with white setae. Book-lung covers yellow, densely covered with white setae. Spinnerets white. All legs yellow brownish, densely covered with white setae; metatarsi and tarsi of all legs ventrally darker (brown). Palp yellow, densely covered with white setae.

Palp structure (Figs 107-112, 115-120, 123-125, 128-135): Acutely pointed synsymbolic lamellae visibly convergent; median tooth developed as a large median claw with additional small teeth on its prolateral side and a prominent serrate ventral flange; proximal extension wide and hook-shaped; distance between proximal extension and median tooth wide, equal to two proximal extension widths; inner plate large, transverse-ovoid, its retrolateral shoulder extended and bent ventrad; conductor triangular, obtuse at its tip (pointed in other specimens).

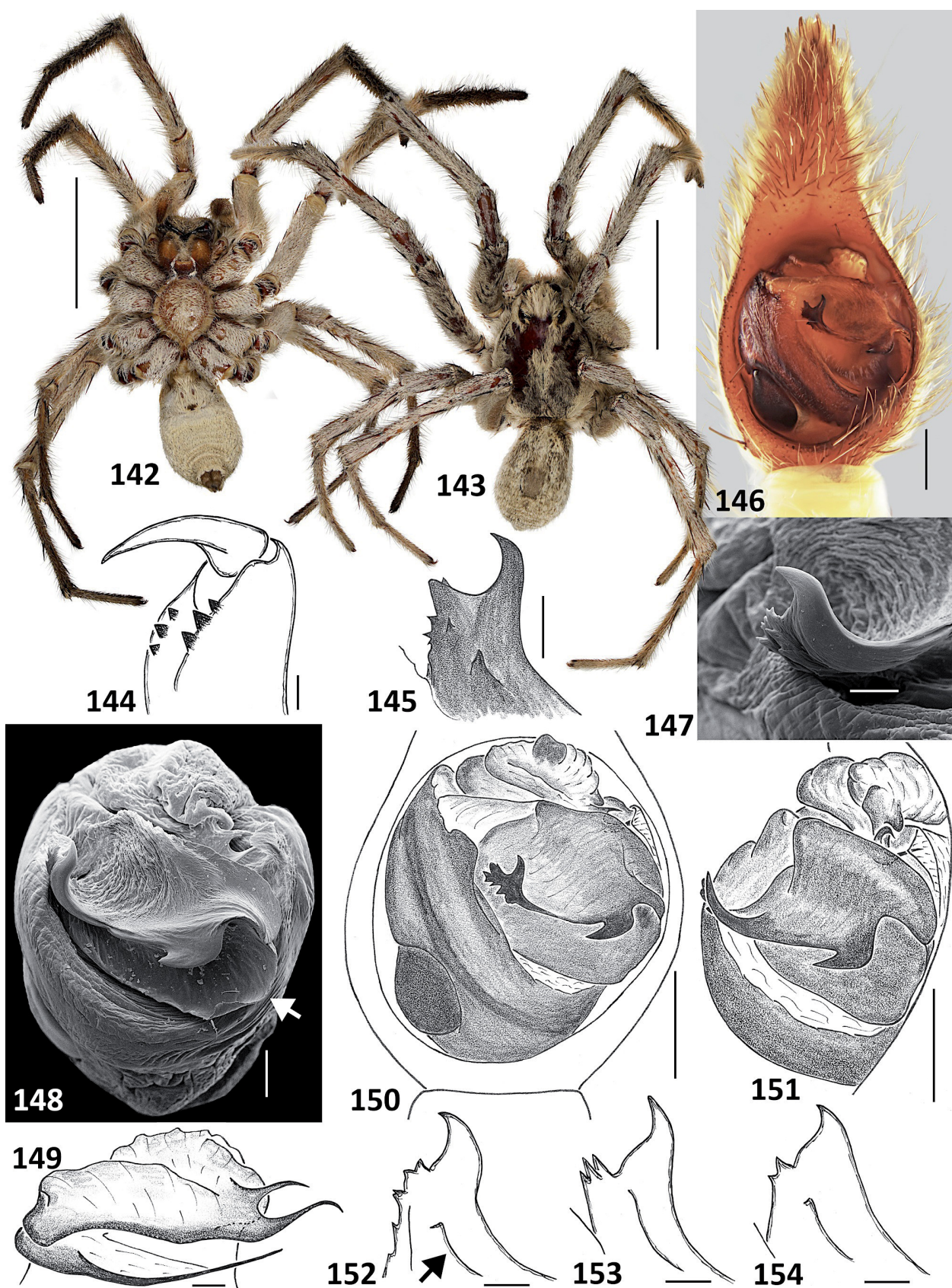
Female (paratype). *Measurements:* Carapace 11.50 long, 8.60 wide. Eye sizes and interdistances: AME 0.45, ALE 0.35, PME 1.15, PLE 1.00, AME-AME 0.30, AME-ALE 0.18, PME-PME 1.20, PME-PLE 1.45. Width of anterior eye row 2.00, of second row 3.15, of third row 3.90. Clypeus height 0.50; chelicera length 4.85. Abdomen 14.00 long, 11.00 wide. Length of leg segments: I 9.80 + 4.10 + 7.00 + 6.20 + 3.50 (30.60); II 8.70 + 3.50 + 6.70 + 6.30 + 3.60 (28.80); III 8.00 + 3.60 + 5.80 + 6.80 + 3.60 (27.80); IV 10.00 + 4.50 + 7.00 + 9.50 + 3.90 (34.90). Leg formula: IV, I, II, III.

Colouration in alcohol (Figs 113, 114): Damaged and shabby specimen with abdomen detached from carapace. Carapace brown, densely covered with yellowish white setae and with two longitudinal lateral bands of brownish setae; carapace sides with wide marginal bands of white setae. Sternum brownish, densely covered with white setae. Maxillae and labium brown, with yellowish tips. Chelicerae dark brown, proximal half of frontal side densely covered with yellowish white setae. Abdomen: dorsum densely covered with yellowish white setae and with a large, wide, brownish cardiac mark; sides and venter, including book-lung covers, densely covered with white setae. Spinnerets brown. All legs and palps brownish yellow, densely covered with white setae. Palps with a claw at their tips.

Epigyne and vulva (Figs 121-122, 139): Epigynal atrium twice as long as wide, with markedly sigmoid lateral edges (almost S-shaped); posterior transverse plate developed as a low, inverted triangle, its central part slightly elevated and pointed backwards; spermathecae straight and visibly swollen in anterior portion, directed antero-mediad, inclined towards each other.

Comments: The males of *K. shmatkoi* sp. nov. examined display a noticeable variation in the shape of the proximal extension of the pedipalp which has either an obtuse (Fig. 132) or pointed (Figs 118-119) median shoulder. In the latter case, the proximal extension varies in its width, being visibly narrower (Fig. 118) or wider (Fig. 119). It is possible that more than one closely related species are here placed under the name of *K. shmatkoi* sp. nov. Unfortunately, the available material does not allow us to scrutinize the problem further; currently only one variety is known from both sexes. The problem needs special attention in the future when more material of both sexes from a larger number of localities is available.

Distribution: Known from two localities in Kalmykia, Russia (Minoransky & Ponomarev, 1984: sub *Lycosa alticeps*; present data), and from several localities in western Kazakhstan (Ponomarev & Abdurakhmanov 2014: sub "*Lycosa*" sp. 1 & "*Lycosa*" sp. 2; present data) and Azerbaijan (Absheron Peninsula, Baku and Chilov Island) (Schmidt, 1895; Dunin, 1984: sub *L. alticeps*; present data) (Fig. 155).



Figs 142-154. *Karakumosa tashkumyr* sp. nov., male paratypes, in ISEA. (142) Body, ventral view. (143) Ditto, dorsal view. (144) Left chelicera, ventral view. (145, 147, 152-154) Median tooth of MA, posterior view. (146) Left male palp, ventral view. (148, 150) Bulbus, ventral view. (151) Ditto, retrolateral view. (149) Embolic division. Scale bars 1 cm (142-143), 0.5 cm (144, 146, 150-151), 0.2 mm (148), 0.1 mm (145, 147, 149, 152-154).

***Karakumosa tashkumyr* sp. nov.**

Figs 142-155

Holotype: ISEA, 001.8406; male; KYRGYZSTAN, Dzhalaalabad Area, N of Taşkomur (=Tash-Kumyr) (c. 41°23'N, 72°14'E), clay hills; 14.-15.VI.1992; leg. A.A. Fedorov & A.A. Zyuzin.

Paratypes: ISEA; 7 males; collected together with the holotype. – ZMMU; 2 males; same data. – MMUE; 2 males; same data. – MHNG; 1 male; same data.

Etymology: The species epithet is a noun in apposition referring to the name of the type locality, Tash-Kumyr in Kyrgyzstan.

Diagnosis: In the presence of a low serrate flange at the foot of the median tooth of the MA, this species is most similar to *K. shmatkoi* sp. nov. (Figs 107-112, 115-120, 123-125, 128-135). The males of *K. tashkumyr* sp. nov. can be readily distinguished by the relative size of the inner plate of the MA, which in the ventral view is comparatively narrower and almost hidden beneath the outer plate in *K. shmatkoi* sp. nov. and wider and clearly visible in *K. tashkumyr* sp. nov. (Fig. 148 cf. Fig. 118 and Fig. 119), and by the shape of the synembolus: both tips of the lamellae markedly bent downwards in *K. tashkumyr* sp. nov. vs. upper tip straight in *K. shmatkoi* sp. nov. (Fig. 149 cf. Fig. 116 and Fig. 129). The female of *K. tashkumyr* sp. nov. is unknown.

Description: Male (paratype, ISEA). *Measurements:* Carapace 12.00 long, 8.60 wide. Eye sizes and interdistances: AME 0.55, ALE 0.40, PME 1.10, PLE 1.20, AME-AME 0.30, AME-ALE 0.20, PME-PME 1.00, PME-PLE 1.50. Width of anterior eye row 2.55, of second row 3.35, of third row 4.00. Clypeus height 0.43; chelicera length 5.50. Abdomen 10.50 long, 6.80 wide. Length of leg segments: I 11.50 + 5.10 + 11.00 + 12.40 + 5.20 (45.20); II 11.50 + 4.80 + 10.20 + 12.40 + 5.40 (44.30); III 11.00 + 4.40 + 8.80 + 12.50 + 5.50 (42.20); IV 13.00 + 4.70 + 10.10 + 15.40 + 6.00 (49.20). Leg formula: IV, I, II, III.

Colouration in alcohol (Figs 142-143): Carapace brown, densely covered with yellowish white setae and with two wide brownish longitudinal bands. Sternum yellow-orange-coloured, densely covered with white setae. Maxillae half brownish and half yellow-orange-coloured. Labium brownish yellow, with a yellow tip. Chelicerae dark brown, their frontal and lateral sides densely covered with white setae. Abdomen: dorsum densely covered with white setae, with an indistinct brownish cardiac mark; sides and venter yellow, densely covered with white setae. Book-lung covers yellow, densely covered with white setae. Spinnerets yellow brownish. All legs yellow brownish, densely covered with white setae; metatarsi and tarsi of all legs ventrally darker (brownish). Palps yellow-orange-coloured, densely covered with white setae.

Palp structure (Figs 145-154): Acutely pointed synembolic lamellae bent downwards; median tooth developed as a large median claw with additional small teeth on its prolateral side and a prominent ventral flange looking like an additional tooth; proximal extension wide and hook-shaped; distance between proximal extension and median tooth wide, equal to two proximal extension widths; inner plate large, transverse-ovoid, its retrolateral shoulder bent ventrad; conductor triangular, obtuse at its tip.

Female. Unknown.

Distribution: Only known from the type locality, north of Taşkomur in Dzhalaalabad Area of Kyrgyzstan (Fig. 155).

***Karakumosa turanica* sp. nov.**

Figs 155-168

Tarentula alticeps Kroneberg, 1875: 40, pl. 4, fig. 28 (*partim*; misidentification of paralectotypes from Uzbekistan).

Lycosa alticeps (Kroneberg, 1875). – Simon, 1899: 479. – Vlassov & Sytshevskaja, 1937: 250. – Mikhialov & Fet, 1994: 508 (misidentification of specimens from Ashgabat).

Holotype: ZISP; 1 male; TURKMENISTAN, [Balkan Velayat], between Serdar (=Kyzyl-Arvat) and Iskander (c. 39°03'N, 56°07'E); 6.VI.1936; leg. S. Nenyukov.

Paratypes: ZISP; 2 females; “ex vil. Melnikova” near Ashgabad (c. 37°59'N, 58°20'E); summer and autumn, 1933; collector unknown.

Other material: ZMMU, Ta-1215; 1 female (paralectotype of *Tarentula alticeps*; Figs 165, 168); [UZBEKISTAN], “Ulus” [c. 39°34'N, 66°22'E]; no date; [A.P.] Fedchenko (Turkestan scientific expedition of the Imperial Society of Devotees of Natural Science). – ZMMU, Ta-1216; 1 subadult male, 3 immature females (paralectotypes of *Tarentula alticeps*); [UZBEKISTAN], Samarkand [c. 39°37'N, 66°57'E]; no date; leg. [A.P.] Fedchenko (Turkestan scientific expedition of the Imperial Society of Devotees of Natural Science).

Etymology: The specific epithet is latinized adjective derived from the name ‘Turan’, a historic region of Central Asia.

Diagnosis: The male of *K. turanica* sp. nov. is most similar to that of *K. alticeps*, but can be easily distinguished by a markedly pointed and wider median shoulder of the proximal extension (narrower and obtuse in *K. alticeps*; Fig. 161 cf. Fig. 2 and Fig. 12) and by the larger, quadrangular median tooth (smaller, triangular median tooth with a serrate prolateral edge in *K. alticeps*; Fig. 164 cf. Figs 5-8). The female of *K. turanica* sp. nov. is most similar to that of *K. zyuzini* sp. nov., from which it can be distinguished by an

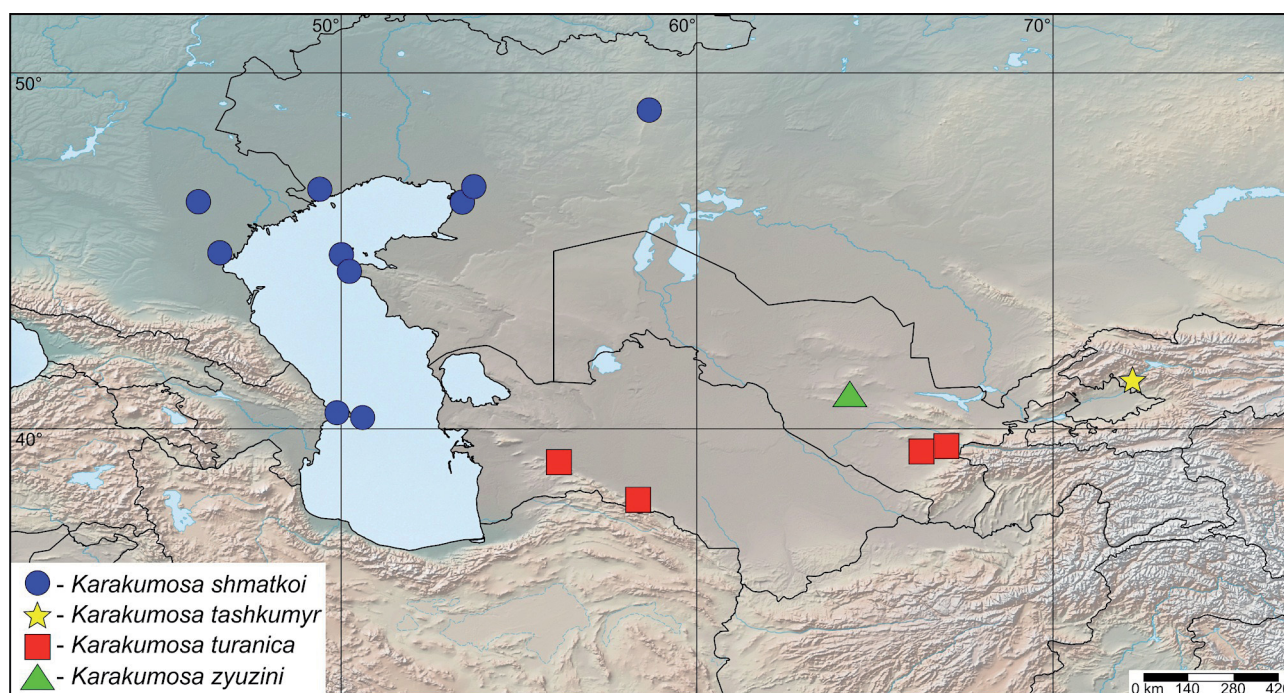


Fig. 155. Localities of four species in the genus *Karakumosa* gen. nov.

anchor-shaped posterior transverse plate (parallel-sided in *K. zyuzini* sp. nov.; Figs 167-168 cf. Fig. 179) and by spermathecae directed anteriorly (inclined antero-medial in *K. zyuzini* sp. nov.; Figs 165-166 cf. Fig. 182).

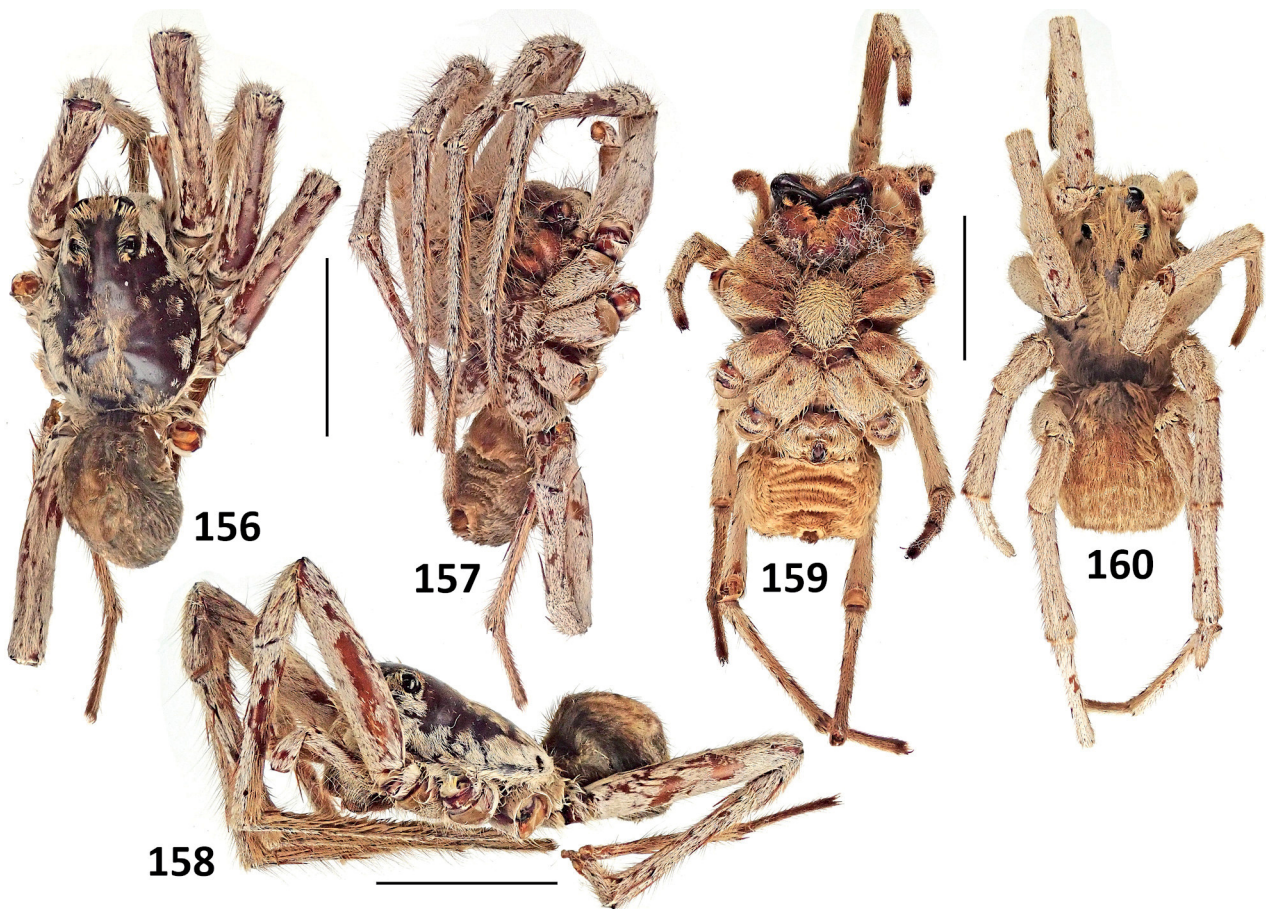
Description: Male (holotype). *Measurements:* Carapace 10.70 long, 8.50 wide. Eye sizes and interdistances: AME 0.45, ALE 0.45, PME 1.20, PLE 1.15, AME-AME 0.35, AME-ALE 0.15, PME-PME 1.00, PME-PLE 2.15. Width of anterior eye row 2.35, of second row 3.15, of third row 3.80. Clypeus height 0.45; chelicera length 4.70. Abdomen 8.80 long, 5.80 wide. Length of leg segments: I 11.10 + 4.00 + 9.40 + 11.50 + 4.60 (40.60); II 10.80 + 4.40 + 8.50 + 10.50 + 4.60 (38.80); III 11.10 + 3.80 + 7.50 + 11.10 + 4.30 (37.80); IV 12.10 + 3.80 + 9.10 + 12.60 + 5.50 (43.10). Leg formula: IV, I, II, III. *Colouration in alcohol* (Figs 156-158): Specimen in poor condition, damaged, shabby, with some legs and left palp missing. Carapace dark brown, densely covered with yellowish white setae; colour pattern of longitudinal brown stripes indiscernible due to poor condition. Sternum brown, densely covered with yellowish white setae. Maxillae and labium yellowish brown. Chelicerae dark brown, their frontal and lateral sides densely covered with yellowish white setae. Abdomen: dorsum densely covered with grey yellowish setae, with a poorly marked brownish cardiac mark; the frontal part of abdomen brownish; sides and venter, including book-lung covers, brownish, densely covered with yellowish white setae. Spinnerets yellow light brown. All legs light brown, densely covered with yellowish white setae. Palps

yellow-orange-coloured, densely covered with yellowish white setae.

Palp structure (Figs 161-164; mirrored image of right palp): Acutely pointed synembolic lamellae markedly convergent towards each other; median tooth large and wide; proximal extension wide and pointed at its median angle, distance between proximal extension and median tooth narrow, equal to or less than a proximal extension width; inner plate rather narrow, almost hidden beneath outer plate; conductor triangular, pointed at its tip.

Female (paratype). *Measurements:* Carapace 12.60 long, 9.60 wide. Eye sizes and interdistances: AME 0.55, ALE 0.60, PME 1.25, PLE 0.65, AME-AME 0.30, AME-ALE 0.15, PME-PME 1.40, PME-PLE 2.60. Width of anterior eye row 2.90, of second row 3.60, of third row 4.35. Clypeus height 0.45; chelicera length 6.60. Abdomen 10.00 long, 8.60 wide. Length of leg segments: I 10.00 + 4.60 + 8.00 + 7.50 + 4.00 (34.10); II 9.50 + 4.40 + 6.90 + 7.60 + 4.00 (32.40); III 8.50 + 3.90 + 6.30 + 7.70 + 3.80 (30.20); IV 10.80 + 4.50 + 8.30 + 11.00 + 4.70 (39.30). Leg formula: IV, I, II, III.

Colouration in alcohol (Figs 159-160): Carapace brown, densely covered with yellowish white setae, without two longitudinal paramedian bands of brownish setae; carapace margins with wide bands of yellowish white setae. Sternum brown, densely covered with yellowish white setae. Maxillae and labium brown, with yellowish tips. Chelicerae dark brown, proximal part of frontal side densely covered with yellowish white setae. Abdomen: dorsum brownish, densely covered with yellowish white



Figs 156-160. *Karakumosa turanica* sp. nov., male holotype (156-158) and female paratype (159-160). (156, 160) Body, dorsal view. (157, 159) Ditto, ventral view. (158) Ditto, lateral view. Scale bars 1 cm.

setae, with a poorly marked brownish cardiac mark; sides and venter, including book-lung covers, densely covered with yellowish white setae. Spinnerets brown. All legs and palps brownish yellow, densely covered with white setae; tips of all leg tarsi darker (brown). Palps with a claw at their tips.

Epigyne and vulva (Figs 165-168): Epigynal atrium twice as long as wide, with slightly sigmoid lateral edges; posterior transverse plate narrow, anchor-shaped, its posterior margin widely procurved; spermathecae tube-shaped and straight, directed antieriad.

Comments: Male and female specimens of *K. turanica* sp. nov. were not collected together and hence are matched provisionally, on the ground that (1) both sexes were collected from lowland sites of Turkmenistan lying relatively close to each other (Fig. 155), and (2) two other *Karakumosa* species known from the plains of Turkmenistan (*K. badkhyzica* sp. nov. and *K. repetek* sp. nov.; Fig. 76) are described from both sexes collected together; these are distinct from *K. turanica* sp. nov. The female paralectotype of *K. alticeps* (Figs 165, 168) turned out to be conspecific with female paratypes of

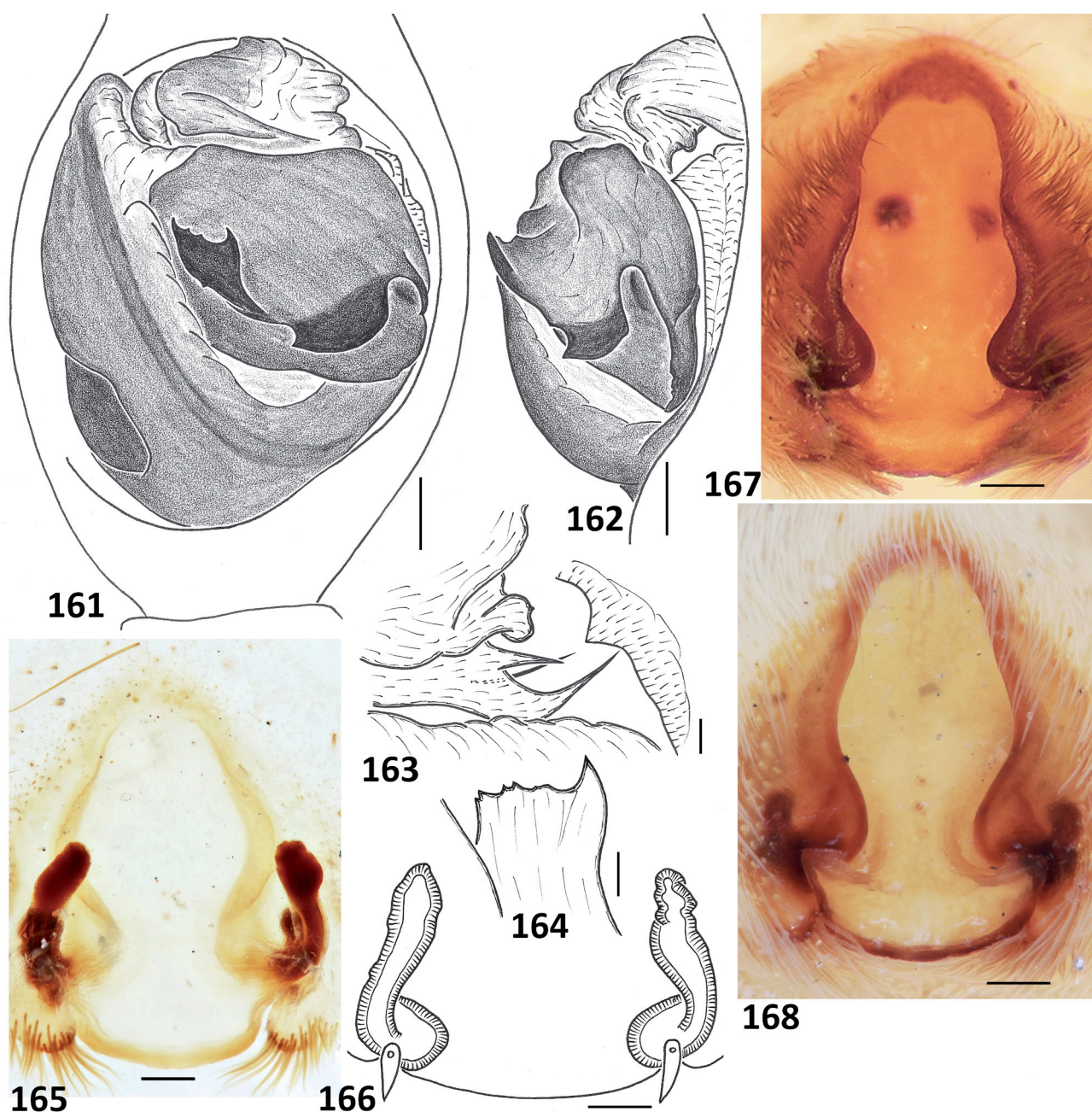
K. turanica sp. nov. (Figs 166-167), and therefore its record from Samarkand is included in the account of *K. turanica* sp. nov. See also 'Comments' above under *K. alticeps*.

Distribution: Known from a few localities in Turkmenistan and Uzbekistan (Fig. 155), but it is believed that the species is more widespread across the plains of Central Asia, within the so-called Turan zoogeographic province (*sensu* Kryzhanovsky, 2002). Besides, some of the old records of *Lycosa alticeps* from Turkmenistan by Schmidt (1895) could also belong to this species: viz., the records from Uch-Adzhi (c. 38°05'N, 62°48'E) and Turkmenbashi (c. 40°02'N, 52°59'E).

***Karakumosa zyuzini* sp. nov.**

Figs 155, 169-186

Holotype: ISEA, 001.8405; male; UZBEKISTAN, Navoiy Region, Kanimekh Distr., near Chengeldy (c. 40°56'44.1"N, 64°18'06.0"E), flat clay clough between sandy plots; 22.-23.V.1994; leg. A.A. Zyuzin.

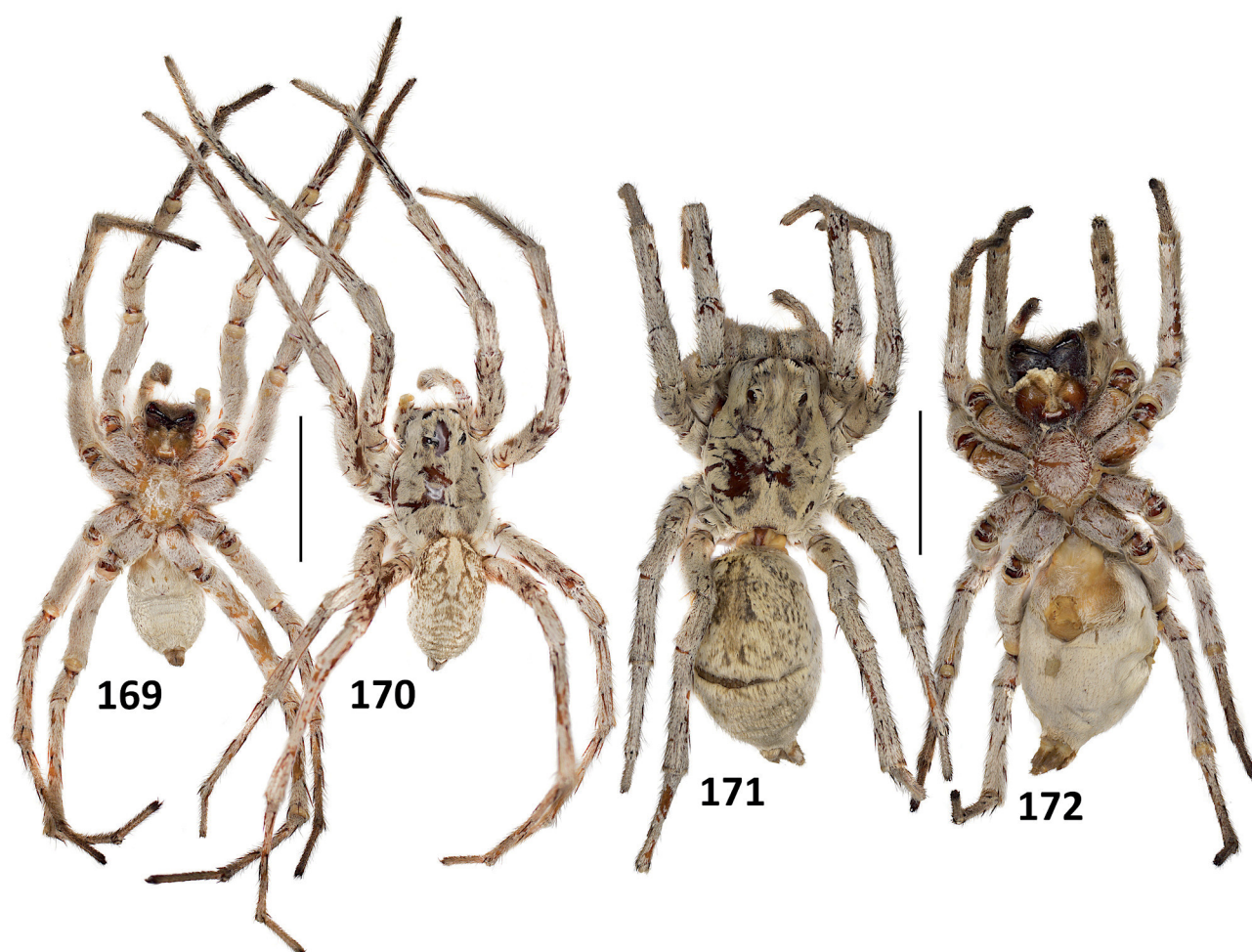


Figs 161-168. *Karakumosa turanica* sp. nov., male holotype (161-164), female paratype (166-167) and paralectotype of *Tarentula alticeps* newly identified as *K. turanica* (165, 168). (161) Bulbus, ventral view. (162) Ditto, retrolateral view. (163) Synembolus, apical view. (164) Median tooth of MA, posterior view. (165-166) Vulva, dorsal view. (167-168) Epigyne, ventral view. Scale bars 0.25 mm (161-162, 166), 0.2 mm (165, 167-168), 0.1 mm (163-164).

Paratypes: ISEA, 001.4188; 11 males, 3 females; collected together with the holotype. – ZMMU; 2 males, 2 females; same data. – MMUE; 3 males, 3 females; same data. – MHNG; 2 males, 2 females; same data.

Etymology: The species is dedicated to our friend and colleague, Dr Alexei A. Zyuzin (Almaty, Kazakhstan), an expert on the Lycosidae, who collected the type specimens of this species.

Diagnosis: The male of *K. zyuzini* sp. nov. can be readily distinguished from males of all other known *Karakumosa* species by the shape of the large, poorly marked proximal extension of the MA (Figs 174, 176). The female of *K. zyuzini* sp. nov. is most similar to that of *K. repetek* sp. nov. from which it differs in the shape of the posterior transverse epigynal plate (with straight posterior margin vs. dumbbell-shaped, Fig. 179 cf. Fig. 96) and the straight vs. C-curved spermathecae



Figs 169-172. *Karakumosa zyuzini* sp. nov., male paratype (169-170) and female paratype (171-172), in MMUE. (169, 171) Body, ventral view. (170, 172) Ditto, dorsal view. Scal bars 1 cm.

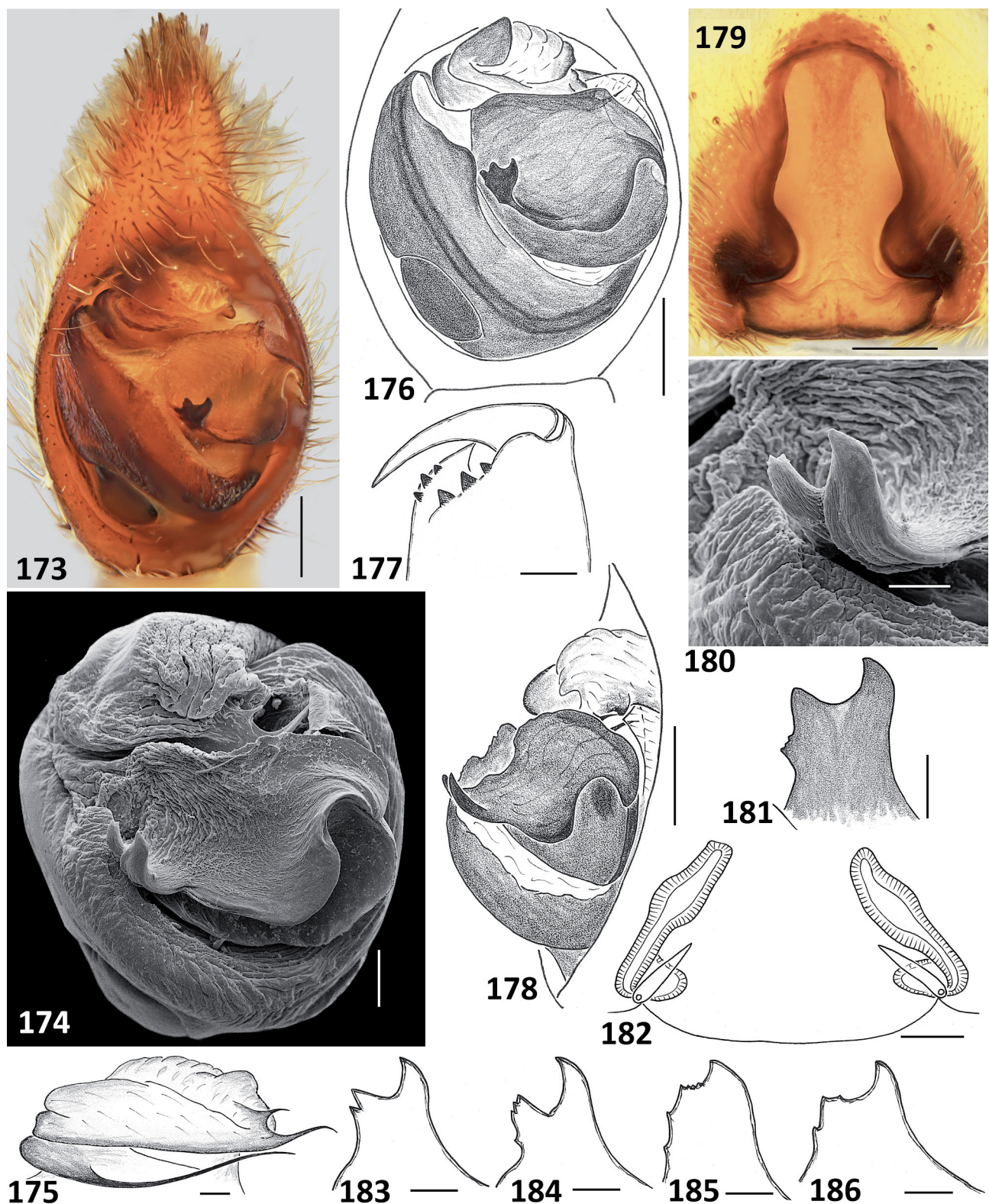
(Fig. 182 cf. Fig. 95). See also comments under 'Diagnoses' of *K. shmatkoi* sp. nov. and *K. turanica* sp. nov.

Description: Male (paratype, MMUE). *Measurements:* Carapace 10.50 long, 8.00 wide. Eye sizes and interdistances: AME 0.51, ALE 0.35, PME 1.00, PLE 0.90, AME-AME 0.25, AME-ALE 0.30, PME-PME 1.25, PME-PLE 1.40. Width of anterior eye row 2.00, of second row 3.00, of third row 3.90. Clypeus height 0.37; chelicera length 4.30. Abdomen 10.50 long, 6.30 wide. Length of leg segments: I 11.00 + 4.00 + 9.90 + 9.80 + 5.00 (39.70); II 10.50 + 3.80 + 9.10 + 10.00 + 4.80 (38.20); III 9.30 + 3.30 + 7.10 + 10.50 + 4.10 (34.30); IV 11.50 + 3.80 + 9.60 + 13.80 + 5.00 (43.70). Leg formula: IV, I, II, III.

Colouration in alcohol (Figs 169-170): Carapace brown, densely covered with white setae and with two poorly-marked wide brownish longitudinal paramedian bands. Sternum yellow, densely covered with white setae. Maxillae brownish yellow. Labium brownish yellow,

with yellow tip. Chelicerae brown, their frontal and lateral sides densely covered with white setae. Abdomen: dorsum densely covered with white setae, with a brownish colour pattern consisting of longitudinal lines outlining cardiac mark and transverse lines in rear half of dorsum; sides and venter yellow, densely covered with white setae. Book-lung covers yellow, densely covered with white setae. Spinnerets yellow brownish. All legs yellow brownish, densely covered with white setae; metatarsi and tarsi of all legs ventrally darker (brownish). Palp yellow brownish, densely covered with white setae. *Palp structure* (Figs 173-178, 180-181, 183-186): Acutely pointed synembolic lamellae both curved downwards and subparallel to each other; median tooth bifurcated, with a serrated prolateral edge; proximal extension large and ovoid, not distinct from margin of outer plate; inner plate large, transverse-ovoid; conductor triangular, pointed at its tip.

Female (paratype, MMUE). *Measurements:* Carapace 12.00 long, 9.70 wide. Eye sizes and interdistances:



Figs 173-186. *Karakumosa zyuzini* sp. nov., male paratype (173-176, 178, 180-181, 183-186) and female paratype (177, 179, 182), in MMUE. (173-174, 176) Bulbus, ventral view. (175) Embolic division. (177) Left female chelicera, ventral view. (178) Bulbus, retrolateral view. (179) Epigyne, ventral view. (180-181, 183-186) Median tooth of MA, posterior view. (182) Vulva, dorsal view. Scale bars 0.5 mm (173, 176-179), 0.25 mm (182), 0.2 (174), 0.1 mm (175, 180-181, 183-186).

AME 0.50, ALE 0.40, PME 1.00, PLE 1.00, AME-AME 0.40, AME-ALE 0.25, PME-PME 1.40, PME-PLE 1.60. Width of anterior eye row 2.40, of second row 3.00, of third row 4.25. Clypeus height 0.65; chelicera length 6.20. Abdomen 16.20 long, 12.00 wide. Length of leg segments: I 10.00 + 4.20 + 8.10 + 6.50 + 3.70 (32.50); II 9.40 + 4.10 + 7.40 + 7.10 + 3.60 (31.60); III 8.50 + 3.90 + 6.10 + 7.50 + 3.90 (29.90); IV 11.00 + 4.00 + 8.60 + 10.50 + 4.60 (38.70). Leg formula: IV, I, II, III.

Colouration in alcohol (Figs 171-172): Carapace dark brown, densely covered with yellowish white setae and with a poorly marked pattern of two wide brownish longitudinal paramedian bands. Sternum yellow-orange-coloured, densely covered with white setae. Maxillae and labium brown, with yellow tips. Chelicerae dark brown, their frontal and lateral sides densely covered with yellowish white setae. Abdomen: dorsum densely covered with yellowish white setae, with a brownish cardiac mark; sides and venter yellow, densely covered with white setae. Book-lung covers yellow, covered with white setae. Spinnerets yellow brownish. All legs yellow brownish, densely covered with white setae; metatarsi and tarsi of all legs darker (brownish). Palp yellow brownish, densely covered with white setae, carrying a tarsal claw.

Epigyne and vulva (Figs 179, 182): Epigynal atrium twice as long as wide, with almost subparallel, slightly sigmoid lateral edges; posterior transverse plate narrow and straight; spermathecae tube-shaped, slightly swollen in anterior part and straight, directed antero-medial, inclined towards each other.

Distribution: Only known from the type locality, Chengeldy in Navoiy Region of Uzbekistan (Fig. 155).

DISCUSSION

Karakumosa gen. nov. is part of a rather diverse and poorly studied fauna of the burrowing wolf spiders of Central Asia. To date 30 species in nine genera of fossorial Lycosidae have been recorded/described from Central Asia (Table 1), but their regional diversity is likely to be much higher. The only comparable regional Palaearctic fauna of fossorial lycosids is that of Europe, including the Mediterranean, from where 32 species in five genera are currently known (Nentwig *et al.*, 2020). The striking difference between the Central Asian and European faunas is the diversity of *Lycosa* Sundevall, 1833 accounting for 25 species in Europe and only three in Central Asia. At least 12 west-Mediterranean species of the *tarantula*-group of *Lycosa* have been recently revised (Planas *et al.*, 2013) and thus the observed regional differences in *Lycosa* diversity are not accidental. Each region has a unique, monotypic genus of fossorial lycosids: *Donacosa* Alderweireldt & Jocqué, 1991 known only from south-western Spain (see Alderweireldt & Jocqué, 1991) and *Oculicosa* confined

to the Ustyurt Plateau and the Kyzylkum Desert (see Logunov & Gromov, 2011).

Currently only three species of fossorial lycosids occur between Europe and Central Asia (Marusik *et al.*, 2000; World Spider Catalog, 2020; Zyuzin & Logunov, 2000): viz., the trans-Palaearctic *Alopecosa fabrilis* (Clerck, 1757), the eastern European - Central Asian *Allohogna singoriensis* (Laxmann, 1770) and the east-Mediterranean - Central Asian *Lycosa praegrandis* C.L. Koch, 1836. However, the taxonomy and distributional ranges of all of them are still in need of revision (e.g., see comments at the end of Table 1). Two common species are restricted to the eastern geographic limits of Europe only: *Geolycosa dunini* Zyuzin & Logunov, 2000 known from Transcaucasia (see Otto, 2020) and *Karakumosa shmatkoi* sp. nov. known from the eastern Caucasus and cis-Caspian regions (present data).

Among the Central Asian fossorial lycosids (Table 1) 13 species (42%) are only known from the respective type localities and/or the original descriptions. This can partly be attributed to the inadequate knowledge of Central Asian Lycosidae, but it could also reflect the presence of truly restricted ranges in many fossorial lycosids (e.g., McCrone, 1963; Fairweather, 1993; Marshall, 1995; etc.) as a result of their lower vagility and habitat specificity. These species are often confined to certain (semi)desert habitat types. In the absence of further survey data to clarify biogeographical and biological information about the majority of fossorial lycosids from Central Asia, except for *A. singoriensis* (see Wagner, 1868; Marikovski, 1956), the underlying causes of currently recognized localised distribution patterns in these spiders will remain unresolved.

Some earlier records of fossorial lycosids from that region are doubtful. For instance, *Hogna bergsoei* was described (but not illustrated) by Thorell (1875a: sub *Tarentula bergsoei*) from a single male from Derbent (Dagestan). Later it was reported from Baku (Azerbaijan) (L. Koch, 1878: sub *Lycosa bergsoei*). Based only on similarity in the body colouration of the five studied females from Turkmenistan (Kuldzha, Ashgabat and Kyzylkum desert) and the type described by Thorell, Schmidt (1895: 447) unreasonably identified and described them as *H. bergsoei*. Almost a hundred years later Dunin (1984) confirmed the occurrence of *H. bergsoei* in the Absheron Peninsula (Azerbaijan), but provided no illustration of the specimens he had studied. Neither Dunin (1984) nor previous authors explained how they were able to identify this species without a re-examination of its type. Despite the fact that these records have been accepted by some regional spider catalogues (Abdurakhmanov *et al.*, 2012; Mikhailov, 2013) and by the World Spider Catalog (2020) giving the distribution of this species as 'Caucasus (Russia, Azerbaijan), Central Asia', it is obvious that the taxonomic validity and all post-description records of *H. bergsoei* are in need of revision.

The case of *Vesubia vivax* (Thorell, 1875a) is similar

Table 1. The fossorial Lycosidae of Central Asia and their distribution.

Genera and species	Known sexes	Distribution	References
<i>Allohogna</i> Roewer, 1955a			
<i>A. singoriensis</i> (Laxmann, 1770)	♂♀	European part of Russia to NW China (Xinjiang) and Inner Mongolia, southward to Iran	Marusik <i>et al.</i> (2000), Zamani <i>et al.</i> (2020)
<i>Alopecosa</i> Simon, 1885			
<i>A. fabrilis</i> (Clerck, 1757)	♂♀	Trans-Palaearctic*	World Spider Catalog (2020)
<i>A. marikovskiyi</i> Logunov, 2013	♂♀	SE Kazakhstan (TL)	Logunov (2013)
<i>Geolycosa</i> Montgomery, 1904**			
<i>G. dunini</i> Zyuzin & Logunov, 2000	♂♀	Georgia, Armenia, Azerbaijan (TL)	Otto (2020), Zyuzin & Logunov (2000)
<i>G. vultuosa</i> (C.L. Koch, 1838)	♂♀	S and SE Europe, the Caucasus, Asia Minor, N Iran	Otto (2020), World Spider Catalog (2020), Zamani <i>et al.</i> (2020)
<i>Hogna</i> Simon, 1885			
<i>H. bergsoei</i> (Thorell, 1875a)***	♂♀	Dagestan (TL), E Azerbaijan, Turkmenistan	Thorell (1875a, b), Schmidt (1895), Dunin (1984)
<i>Karakumosa</i> gen. nov.			
<i>K. alticeps</i> (Kroneberg, 1875)	♂♀	SE Kazakhstan (TL)	Kroneberg (1875); present data
<i>K. badkhyzica</i> sp. nov.	♂♀	S Turkmenistan (TL)	Present data
<i>K. gromovi</i> sp. nov.	♂♀	S Uzbekistan (TL)	Present data
<i>K. medica</i> (Pocock, 1889)	♂♀	NW Afghanistan (TL)	Pocock (1889); present data
<i>K. repetek</i> sp. nov.	♂♀	E Turkmenistan (TL)	Present data
<i>K. shmatkoi</i> sp. nov.	♂♀	Azerbaijan, N cis-Caspian regions (TL)	Present data
<i>K. tashkumyr</i> sp. nov.	♂♀	Kyrgyzstan (TL)	Present data
<i>K. turanica</i> sp. nov.	♂♀	Turkmenistan (TL), SE Uzbekistan	Present data
<i>K. zyuzini</i> sp. nov.	♂♀	Uzbekistan (TL)	Present data
<i>Lycosa</i> Latreille, 1804****			
<i>L. aragogi</i> Nadolny & Zamani, 2017	♀	C Iran (TL)	Nadolny & Zamani (2017)
<i>L. asiatica</i> Sytshevskaja, 1980	♂♀	Tajikistan (TL)	Sytshevskaja (1980)
<i>L. praegrandis</i> C.L. Koch, 1836	♂♀	E Mediterranean to Central Asia	Zyuzin & Logunov (2000)
<i>Oculicosa</i> Zyuzin, 1993			
<i>O. supermirabilis</i> Zyuzin, 1993	♂♀	SW and SE Kazakhstan (TL), W Uzbekistan and NW Turkmenistan	Zyuzin (1993), Logunov & Gromov (2011)
<i>Vesubia</i> Simon, 1910			
<i>V. vivax</i> (Thorell, 1875a)***	♂♀	European part of Russia, NW Uzbekistan	Thorell (1875a,b), Schmidt (1895)
<i>Zyuzicosa</i> Logunov, 2010			
<i>Z. afghana</i> (Roewer, 1960)	♀	NE Afghanistan (TL)	Roewer (1960), Logunov (2010)
<i>Z. baisunica</i> Logunov, 2010	♂♀	SE Uzbekistan (TL)	Logunov (2010)
<i>Z. fulviventris</i> (Kroneberg, 1875)	♂♀	SE Uzbekistan (TL)	Kroneberg (1875), Logunov (2010)
<i>Z. gigantea</i> Logunov, 2010	♂	SE Uzbekistan (TL)	Logunov (2010)
<i>Z. kopetdaghensis</i> Logunov, 2012	♀	SW Turkmenistan (TL)	Logunov (2012)
<i>Z. laetabunda</i> (Spassky, 1941)	♂♀	Tajikistan (TL)	Spassky (1941), Spassky & Luppova (1945), Andreeva (1976), Logunov (2010, 2012)

Genera and species	Known sexes	Distribution	References
<i>Z. nenjukovi</i> (Spassky, 1952)	♂♀	Tajikistan (TL)	Spassky (1952), Andreeva (1976), Logunov (2012)
<i>Z. nessovi</i> Logunov, 2012	♂♀	Kyrgyzstan (TL)	Logunov (2012)
<i>Z. turlanica</i> Logunov, 2010	♂♀	S Kazakhstan (TL), SE Uzbekistan	Logunov (2010, 2012)
<i>Z. uzbekistanica</i> Logunov, 2010	♂♀	SE Uzbekistan (TL)	Logunov (2010, 2012)

- * Although the distribution of *A. fabrilis* is given in World Spider Catalog (2020) as trans-Palaearctic, it is likely that all the records of this species from southern regions of European Russia and central Asia actually belong either to *Alopecosa steppica* Ponomarev, 2007 or to *A. psammophila* Buchar, 2001. This matter requires special attention in the future.
- ** *Geolycosa atroscolopulata* Roewer, 1955a, described and recorded from northern Iran, is not a true member of the genus *Geolycosa* and therefore is excluded from the list of fossorial lycosids.
- *** At present, there is no evidence that this species is indeed fossorial, but other congeners of this genus are.
- **** The record of *Lycosa tarantula* (Linnaeus, 1758) from Iran (see Zamani *et al.*, 2020) beyond doubt is based on a misidentification and hence is not included in Table 1. According to Planas *et al.* (2013), *L. tarantula* is restricted to the northern part of the West Mediterranean, occurring from France to Italy.

to that of *H. bergsoei*. The species was described by Thorell (1875a, b: sub. *Tarentula vivax*) from a single female taken from an unknown locality in 'Südrussland' (German: southern Russia). Later Schmidt (1895: 457, sub *Lycosa vivax*) recorded this species from Nukus (Uzbekistan) on the basis of a male and female which he decided to be "in complete agreement with Thorell's description" apart from some varying measurements. It is unclear why the World Spider Catalog (2020) lists the distribution of *V. vivax* as 'Ukraine, Russia (Europe), Turkmenistan (?)', since neither Ukraine nor Turkmenistan were mentioned in any papers dealing with this species. As in the previous example, the taxonomic validity and the post-description records of *V. vivax* are in need of revision. Based on unpublished information from the colleague who re-examined the holotype of *V. vivax* (Yu. M. Marusik, personal communication, 27 March 2020), this species is actually a member of the genus *Alopecosa*.

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