

New species of Middle Asian *Longitarsus* Latreille with discussion of their subgeneric placement (Coleoptera: Chrysomelidae)

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Abstract

The subgenus *Testergus* Weise of *Longitarsus* Latreille is redefined based on the characters of male genitalia and four new species are described and illustrated: *L. borisi* sp. nov. (Tadzhikistan), *L. danilevskyi* sp. nov. (Kazakhstan), *L. igori* sp. nov. (Tadzhikistan), and *L. nadiae* sp. nov. (Kirgizstan). The lectotypes for *L. fuscoaeneus* Redtenbacher, *L. tmetopterus* Jacobson and *L. nurataicus* Palij are designated. A key to the known *Testergus* species from Greece, Caucasus and Middle Asia is provided.

Key words: Chrysomelidae, flea beetle, *Longitarsus*, *Testergus*, *Truncatus*

Introduction

Testergus Weise is the only commonly accepted subgenus within *Longitarsus* Latreille. It was proposed (Weise 1893) for two Caucasian species, *L. lederi* Weise and *L. pubescens* Weise. Weise (1893) failed to designate a type species. Bechyné (1957) elevated *Testergus* to genus and designated *L. lederi* as the type species. Konstantinov & Vandenberg (1996) being unaware of Bechyné paper, erroneously designated *L. lederi* again. Bechyné (1957) and Warchalowski (1996) both attributed the name *Longitarsus* to Berthold (1827) but, this name in Berthold's publication is not accompanied by a description or indication and remains a *nomen nudum*. The first indication in the form of a combination of the generic name with an available species-group name was provided for *Longitarsus* by Latreille in 1829. Weise (1893), Bechyné (1957), Lopatin (1977), and Warchalowski (1996) separated *Longitarsus* s.str. and *Testergus* by the following characters of the latter taxon: fused elytra, absence of hind wings and humeral calli, and lateral sides of elytra so convex and bent ventrally that their lateral margins are not visible from above (Figs. 1, 2).

Another subgenus, *Truncatus*, was proposed by Palij (1970) with *Longitarsus zeravshanicus* Palij as the type species, but he was not aware of *Testergus* and characterized *Truncatus* using the same characters: elytra short, not covering all abdominal tergites (from one to three tergites are visible from above). He also mentioned that the first metatarsomere was less than half the length of the metatibia and therefore shorter than in *Longitarsus* s. str. Lopatin (1977) considered the type species of *Truncatus* to be synonymous with *L. tmetopterus* Jacobson, thereby synonymizing *Truncatus* with *Testergus*.

As currently understood, *Testergus* is exclusively Palearctic (Map 1) and has a large radiation in the Mediterranean and especially in the mountains of Middle and Central Asia. However, many *Longitarsus* species occurring in tropical Asia and North and Central America share character states used to characterize *Testergus*. All of them (fused elytra, convex laterally, and without humeral calli) are consequences of wing reduction, which occurs as an adaptation to life in the mountains or in relatively dense substrates, such as leaf litter and moss. Most Middle Asian *Testergus* occur at relatively low altitudes (600–2000m), with adults in early spring. Wing reduction and its consequences are known not only in *Longitarsus*, but in many other leaf beetle groups (e. g. *Aphthona* Chevrolat, *Phyllotreta* Chevrolat and many others). They are also widespread outside of leaf beetles as noted years ago by G. G. Jacobson (1899). Obviously, such characters have evolved independently in many distantly related groups and cannot be used to characterize higher taxa. As a result, lists of *Testergus* species published by various authors differ dramatically (Warchalowski 1996, 2003, Lopatin, Alexandrovic and Konstantinov 2004). *Testergus*, as currently understood, is a mixture of unrelated species and species groups, and is in need of recharacterization and reclassification.

Material and methods

Morphological terminology follows Konstantinov & Vandenberg (1996) and Konstantinov (1998a). The following are abbreviations for the collections: DCAG - Manfred Döberl collection, Abensberg, Germany; NHMW - Natural History Museum, Vienna, Austria; USNM - National Museum of Natural History, Washington DC, USA; ZMAS - Zoological Institute, St. Petersburg Russia.

Subgenera and species groups in *Longitarsus*

As previously shown for *Aphthona* (Konstantinov 1998b), the shape of the median lobe of the aedeagus can be useful to diagnose species groups in large genera of flea beetles. Two groups of this kind occur among species previously classified in *Testergus*. One includes a

number of species with various degrees of wing reduction. Among them is *L. lederi*, the type species of *Testergus*, and *L. fuscoaeneus* Redtenbacher, the species with the largest range and nearly full wings. The species of this group are characterized by the following: dorsum black with or without metallic lustre; median lobe of aedeagus relatively stocky, parallel sided in ventral view and straight or slightly convex in lateral view, with apex abruptly rounded, with or without denticle-like structure; ventral side of median lobe with deep groove in middle. A unique character, the ventral groove with very thin and membranous sides, which sometimes bend inside the groove, is shared by the majority of species, except for *L. sogdianus* Lopatin and *L. borisi* sp. nov.

This narrows the concept of *Testergus*. Many other species traditionally included in *Testergus* differ dramatically in the shape of the median lobe of the aedeagus and do not share the other characters used above to diagnose the subgenus. They are excluded from *Testergus*.

***Testergus* Weise**

(Figs. 1–66)

Testergus Weise, 1893:1013 [(proposed as subgenus, type species *Longitarsus lederi* Weise, 1893, Caucasus, by subsequent designation of Bechyné (1957)]. Konstantinov, 1992:41 (key for Middle Asian species).

Truncatus Palič, 1970:10 (proposed as subgenus, type species *Longitarsus zeravshanicus* Palič, 1970 = *tmetopterus* Jacobson, 1893, Central Asia, by original designation). - Lopatin, 1977:210 (synonymized).

List of *Testergus* species occurring in Caucasus and Middle Asia

L. fuscoaeneus Redtenbacher, 1849

Type locality: Austria

L. lederi Weise, 1893

Type locality: Northwestern Caucasus

L. pubescens Weise, 1893

Type locality: Northwestern Caucasus

L. sengloki Konstantinov, 1994 (in Lopatin and Konstantinov 1994)

Type locality: South central Tadzhikistan, Senglock mountain ridge.

L. sogdianus Lopatin, 1956

Type locality: Tadzhikistan, Kulyabskaya oblast', Pushta-Mazor ridge

Host plant: *Cousinia* sp.

L. tmetopterus Jacobson, 1893

Type locality: Kazakhstan, Jany-Kurgan: Fluss Sansar

L. borisi sp. nov.

Type locality: Tadjikistan, 30 km N. Nurek

L. danilevskyi sp. nov.

Type locality: Kazakhstan, 140 km NW Alma-Ata, Kolshengel

L. igori sp. nov.

Type locality: Tadjikistan, Gandzhino

L. nadiae sp. nov.

Type locality: Kirgizstan, Kirgizsky mountains, Tswou Aryk

Key to *Testergus* species from Greece, Caucasus, and Middle Asia

Longitarsus excipennis Lopatin, *L. turkomanorum* Lopatin (Lopatin 1967) and *L. joisiphi* Konstantinov currently excluded from *Testergus*, are included in this key for practical reasons. Other species previously included in *Testergus* constitute a natural group that will be treated separately. *Longitarsus truncatellus* Weise known from Greece and Israel (Warchalowski 2003) clearly belongs to *Testergus* and thus included in the key.

1. Median lobe of aedeagus slightly impressed in middle, with shallow longitudinal impressions laterally 2
- Median lobe of aedeagus deeply impressed in middle, without longitudinal impressions laterally 3
- 2(1). Frontal calli sharply delineated from vertex. Median lobe of aedeagus gradually narrowing towards apex. Apex without denticle-like structure (Fig. 5).....
.....*L. excipennis* Lopatin
- Frontal calli poorly delineated from vertex. Median lobe of aedeagus abruptly narrowing towards apex. Apex with denticle-like structure (Fig. 16).....
.....*L. turkomanorum* Lopatin
- 3(1). Apical margins of elytra normally convex, leaving none or only small part of abdominal tergite exposed. Humeral calli poorly developed or absent. Elytral base much wider than pronotal base 4
- Apical margins of elytra concave, leaving large part of abdominal tergite exposed. Humeral calli absent. Elytral base nearly as wide as pronotal base 7
- 4(3). Wings absent or present. Median lobe of aedeagus strongly concave laterally (Fig. 6). Ventral groove of median lobe of aedeagus with sharp longitudinal ridge. Spermathecal duct without coils (Fig. 26)..... *L. fuscoaeneus* Redtenbacher
- Wings absent. Median lobe of aedeagus straight or only slightly concave laterally. Ventral groove of median lobe of aedeagus without longitudinal ridge. Spermathecal duct with coils (except for *L. joisiphi*, see Fig. 35)..... 5
- 5(4). Elytron with long hairs, visible at relatively low magnification. Ventral groove of median lobe of aedeagus with low and short ridges apically (Fig. 10)
.....*L. pubescens* Weise

- Elytron with tiny hairs, visible only at high magnification. Ventral groove of median lobe of aedeagus without ridges apically 6
- 6(5). Elytra with maximum width near middle. Ventral groove of median lobe of aedeagus wide in middle (Fig. 11)..... *L. lederi* Weise
- Elytra with maximum width anterior to middle. Ventral groove of median lobe of aedeagus narrow in middle (Fig. 15)..... *L. truncatellus* Weise
- 7(4). Median lobe of aedeagus slender, evenly curved in lateral view (Fig. 8). Abdominal sternite 8 in female visibly sclerotized apically and laterally (Fig. 37).....
..... *L. josiphi* Konstantinov
- Median lobe of aedeagus robust, nearly straight in lateral view. Abdominal sternite 8 in female membranous apically and laterally (Figs. 34, 41, 52, 57)..... 8
- 8(7). Dorsum with reddish tint. Apex of median lobe of aedeagus straight and relatively thick in lateral view (Fig. 12) *L. sengloki* Konstantinov
- Dorsum without reddish tint. Apex of median lobe of aedeagus curved and thin in lateral view..... 9
- 9(8). Apex of median lobe of aedeagus without denticle-like structure 10
- Apex of median lobe of aedeagus with denticle-like structure..... 11
- 10(9). Dorsum with greenish tint. Antennomeres 2 to 4 dark, as dark as antennomeres 1 and 5. Tibiae dark. Apex of median lobe of aedeagus flat or concave (Fig. 9). Anterior apex of tignum abruptly expanded, much wider than posterior apex (Fig. 31)
..... *L. nadiae* sp. nov.
- Dorsum black, without greenish tint. Antennomeres 2 to 4 light, lighter than antennomeres 1 and 5. Tibiae light. Apex of median lobe of aedeagus convex (Fig. 14). Anterior apex of tignum gradually expanded, not wider than posterior apex (Fig. 52) *L. tmetopterus* Jacobson
- 11(9). Dorsum dark brown. Legs yellow, pro- and mesotibia nearly as light as pro- and mesofemora. Spermathecal duct basally projecting away from direction of receptacle (Figs. 17, 49) 12
- Dorsum black with metallic lustre. Legs brown, pro- and mesotibia slightly darker than pro- and mesofemora. Spermathecal duct basally projecting in direction of receptacle (Fig. 31) 13
- 12(11). Ventral groove of median lobe of aedeagus nearly parallel sided (Fig. 3). Length of coiled part of spermathecal duct greater (Fig. 17)..... *L. borisi* sp. nov.
- Ventral groove of median lobe of aedeagus wide apically, narrowing abruptly towards middle (Fig. 13). Length of coiled part of spermathecal duct smaller (Fig. 49)..... *L. sogdianus* Lopatin
- 13(11). Punctuation on pronotum nearly as coarse as punctuation on elytra. Apical declivity of elytra with sparse short setae. Denticle-like structure on apex of median lobe of aedeagus narrow. Ventral groove of median lobe of aedeagus narrowing abruptly towards apical third of median lobe (Fig. 7). Spermathecal pump without well

- developed border between vertical and horizontal parts. Vertical part very short (Fig. 31). *L. igori* sp. nov.
- Punctuation on pronotum much finer than punctuation on elytra. Apical declivity of elytra without sparse short setae. Denticle-like structure on apex of median lobe of aedeagus wide. Ventral groove of median lobe of aedeagus narrowing abruptly towards basal third of median lobe (Fig. 4). Spermathecal pump with well developed border between vertical and horizontal parts. Vertical part long (Fig. 22)
..... *L. danilevskyi* sp. nov.

***Longitarsus borisi* sp. nov.**

(Figs. 3, 17–21).

Description. Length 1.62 mm, width 0.81 mm. Dorsum dark brown without metallic reflection, pronotum as dark or slightly lighter than elytra. Legs yellowish, pro- and mesotibia nearly as light as pro- and mesofemora, metafemur darker than pro- and mesofemora and metatibia. Antennae light, gradually darkened apically starting with antennomere 5.

Vertex strongly shagreened. Antennal callus slightly lighter and higher than vertex, not delineated from vertex by supracallinal sulcus. Surface of antennal calli moderately shiny, lacking sculpture. Frontal ridge moderately wide and flat in lateral view, not narrowing from middle to anterofrontal ridge. Anterofrontal ridge in middle thicker than frontal ridge. Second antennomere as long as third, slightly shorter than fourth.

Pronotum width/length ratio 1.24, basally nearly as wide as apically. Lateral side convex, with oblique denticle, maximum width slightly anterior to middle. Anterolateral callosity low, with obtuse denticle, much lower anteriorly than posteriorly. Posterolateral callosity low, wide. Punctures small, shallow, poorly defined. Interspaces shiny, without wrinkles or punctures.

Scutellum rounded on top. Elytron without humeral callus; maximum width in males nearly in middle. Apex slightly concave. Punctures size vary (in holotype elytral punctures are larger than those on pronotum, in paratypes equal to those on pronotum), their diameter slightly less than or about equal to interpunctal distance. Interspaces shiny, without wrinkles or punctures.

Male first protarsomere 1.66 times longer than wide, wide in middle, 1.25 times longer than second, 1.66 times longer than third and 0.9 times longer than fourth (visible) protarsomere. Male metatibia 5 times as long as wide, straight in dorsal view, with denticles directed perpendicular to its length. First metatarsomere of male 2 times shorter than metatibia. Tarsal claw thin, lacking denticle. Metatibial spur as long as third metatarsomere.

Median lobe of aedeagus parallel sided, with deep groove ventrally. Groove only slightly wider apically, basally as wide as in middle. Apex with well developed denticle-

like structure. In lateral view, apex slightly sinuous, tip curved ventrally. In lateral view, median lobe slightly curved (Fig. 3).

Spermatheca with receptacle posteriorly nearly as wide as anteriorly, separated from pump only by sharp border. Internal side of receptacle convex, external nearly straight. Pump with vertical and horizontal parts poorly separated, vertical much shorter than horizontal. Internal side of horizontal part slightly convex. Spermathecal duct basally projecting away from direction of receptacle, forming many coils distally (more than any other species studied in this paper). Tignum arrowhead shaped posteriorly, wider than anteriorly, nearly parallel sided to anterior end, slightly widening there. Vaginal palpus posteriorly curved medially and laterally. Abdominal tergites 1 to 3 completely sclerotized. Tergite 1 with clusters of deep pores laterally.

Comments. *Longitarsus borisi* has two unique characters which separate it from all other *Testergus* treated in this paper: the coiled part of the spermathecal duct is unusually long (Fig. 17) and the posterior part of the vaginal palpus is curved both medially and laterally (Fig. 19). *Longitarsus borisi* is most similar to *L. sogdianus*, particularly in the general shape of the spermatheca and the spermathecal duct basally projecting away from a direction of the receptacle (Figs. 17, 49). It can be distinguished from *L. sogdianus* by the median lobe of its aedeagus in which the ventral groove is nearly parallel sided and the median lobe is slightly curved in lateral view. In *L. sogdianus*, the median lobe is straight in lateral view, and the ventral groove is much wider apically than medially and basally (Fig. 3). The length of the coiled part of the spermathecal duct is greater in *L. borisi* than that in *L. sogdianus*.

Etymology. This species is named after Boris Korotyayev, who collected the holotype.

Type material. Holotype ♂: Tadjikistan, Curkhu mountain ridge, 30 km N. Nurek, Korotyayev, 11.V.1983 (ZMAS). Paratypes ♂, ♀: Xr. Khozrati-sho (Khazratisho mountain ridge), Tadjikistan, 1300-1600m, Gur'eva, 12.V.1962 (ZMAS, USNM). Paratype ♂, the same labels as previous paratypes except for Kryzhanovsky, 1.V.1962 (ZMAS).

***Longitarsus danilevskyi* sp. nov.**

(Figs. 4, 22–25)

Description. Length 1.41–2.00 mm, width 0.69–1.04 mm. Dorsum black with light bronze reflection, pronotum concolorous with elytra. Legs brown, pro- and mesotibia lighter than pro- and mesofemora, metafemur as dark as pro- and mesofemora. Antennae brown, with 3 to 5 basal antennomeres slightly lighter.

Vertex strongly shagreened. Antennal callus as dark, but higher than vertex, not delineated from vertex by supracallinal sulcus. Surface of antennal calli shiny, lacking sculpture. Frontal ridge moderately wide and flat in lateral view, narrowing from middle to anterofrontal ridge. Anterofrontal ridge in middle thicker than frontal ridge. Second antennomere longer than third, as long as fourth.

Pronotum width/length ratio 1.31, wider basally than apically. Slightly convex laterally, without denticle, maximum width near base. Anterolateral callosity low, with obtuse denticle, much lower anteriorly than posteriorly. Posterolateral callosity low, wide. Punctures small, shallow, poorly defined. Interspaces shiny, without wrinkles or punctures.

Scutellum rounded on top. Elytron without humeral callus; maximum width in males nearly in middle, in females posterior to middle to near posterior margin. Apex greatly concave, more so in females than in males. Punctures larger than those on pronotum, their diameter slightly less than or about equal to interpunctal distance. Interspaces shiny, without wrinkles or punctures.

Male first protarsomere 1.33 times longer than wide, wide in middle, 1.00 times longer than second, 1.14 times longer than third and 0.66 times longer than fourth (visible) protarsomere. Male metatibia 4.77 times as long as wide, curved in dorsal view, with denticles directed posteriorly. First metatarsomere of male 2.04 times shorter than metatibia. Tarsal claw thin, lacking denticle. Metatibial spur as long as third metatarsomere.

Median lobe of aedeagus slightly narrowing in middle, with deep groove ventrally. Ventral groove of the median lobe narrowing abruptly to basal third of median lobe. Apex with wide, less developed denticle-like structure. In lateral view, apex strongly sinuous with impression at apical 0.25, tip curved ventrally. In lateral view, median lobe straight.

Spermatheca with receptacle wider posteriorly than anteriorly, separated from pump by distinct border. Internal side of receptacle convex, external slightly concave. Pump with vertical and horizontal parts well separated, vertical nearly as long as horizontal. Internal side of horizontal part sinuous. Spermathecal duct basally projecting in direction of receptacle, forming coils distally. Tignum arrowhead shaped posteriorly, wider than anteriorly, nearly parallel sided to anterior end, slightly widening there. Abdominal sternite 8 in female membranous apically and laterally. Vaginal palpus nearly straight medially, widening anteriorly, laterally forming an angle at posterior third. Abdominal tergites 1 to 3 completely sclerotized. Tergite 1 with clusters of deep pores laterally.

Comments. *Longitarsus danilevskyi* is most similar to *L. igori* from which it can be distinguished by the punctation on the pronotum being much finer than that on the elytra and the denticle-like structure on the apex of the median lobe of the aedeagus being wide and less developed than that in *L. igori*. (Fig. 7).

Etymology. This species is named after Mikhail Danilevsky, who collected the only known specimens.

Type material. Holotype ♂: Kazakhstan, 140 km NW Alma-Ata, Kolshengel, 600m, 15.IV.2002, Leg. M. Danilevsky (USNM). Paratypes 19 specimens with same label as holotype (17 USNM, 2 ZMAS).

***Longitarsus igori* sp. nov.**

(Figs. 7, 31–34)

Description. Length 1.26–3.04 mm, width 0.65–1.15 mm. Dorsum black with light bronze reflection, pronotum concolorous with elytra. Legs brown, pro- and mesotibia lighter than pro- and mesofemora, metafemur as dark as pro- and mesofemora. Antennae brown, with 3 to 5 basal antennomeres lighter.

Vertex strongly shagreened. Antennal callus as dark, but higher than vertex, not delineated from vertex by supracallinal sulcus. Surface of antennal calli shiny, lacking sculpture. Frontal ridge moderately wide and flat in lateral view, narrowing from middle to anterofrontal ridge. Anterofrontal ridge in middle thicker than frontal ridge. Second antennomere longer than third, as long as fourth.

Pronotum width/length ratio 1.35, wider basally than apically. Slightly convex laterally, without denticle, maximum width near base. Anterolateral callosity low, with obtuse denticle, much lower anteriorly than posteriorly. Posterolateral callosity low, wide. Punctures large, shallow, poorly defined. Interspaces shiny, with some irregularly shaped wrinkles.

Scutellum rounded on top. Elytron without humeral callus; maximum width in males nearly in middle, in females near posterior margin. Apex greatly concave, more so in females than in males. Punctures nearly as large as those on pronotum, their diameter slightly less than or about equal to interpunctal distance. Interspaces shiny, with some wrinkles and punctures.

Male first protarsomere 1.57 times longer than wide, wide in middle, 1.12 times longer than second, 1.12 times longer than third and 0.73 times longer than fourth (visible) protarsomere. Male metatibia 5.08 times as long as wide, curved in dorsal view, with denticles directed posteriorly. First metatarsomere of male 1.96 times shorter than metatibia. Tarsal claw thin, lacking denticle. Metatibial spur as long as third metatarsomere.

Median lobe of aedeagus slightly narrowing in middle, with deep groove ventrally. Ventral groove of the median lobe narrowing abruptly to apical third of median lobe. Apex with narrow, well developed denticle-like structure. In lateral view, apex strongly sinuous, without impression at apical 0.25, tip curved dorsally. In lateral view, median lobe straight.

Spermatheca with receptacle posteriorly nearly as wide as anteriorly, separated from pump only in degree of sclerotization. Internal side of receptacle convex, external straight. Pump with vertical and horizontal parts poorly separated, vertical much shorter than horizontal. Internal side of horizontal part evenly curved. Spermathecal duct basally projecting in direction of receptacle, forming coils distally. Tignum arrowhead shaped posteriorly, wider than anteriorly, nearly parallel sided to anterior end, slightly widening there. Abdominal sternite 8 in female membranous apically and laterally. Vaginal palpus medially curved posteriorly and anteriorly, not widening anteriorly, laterally evenly curved. Abdominal tergites 1 to 3 completely sclerotized. Tergite 1 with clusters of deep pores laterally.

Comments. *Longitarsus igori* can be separated from all known *Testergus* by its unique spermathecal pump which lacks a well developed border between the vertical and horizontal parts. *Longitarsus igori* is most similar to *L. danilevskyi*. It can be distinguished from *L. danilevskyi* (in addition to the unique spermathecal pump) by the hair on the apical declivity of the elytra; the punctation on the pronotum being nearly as coarse as that on the elytra; the denticle-like structure on the apex of the median lobe of the aedeagus being relatively narrow and better developed than that in *L. danilevskyi*. (Fig. 4).

Etymology. This species is named after Igor Lopatin, who collected the only known specimens.

Type material. Holotype ♂: Southern Tadzhikistan, Gandzhino, 9.IV.1967, I. K. Lopatin (USNM). Paratypes 18 specimens with same label as holotype (16 USNM, 2 ZMAS).

***Longitarsus nadiae* sp. nov.**

(Figs. 1, 2, 9, 39–43)

Description. Length 1.31–2.23 mm, width 0.69–1.04 mm. Dorsum black with greenish metallic tint, pronotum concolorous with elytra. Legs dark brown, pro- and mesotibia nearly as dark as pro- and mesofemora, particularly in middle, metafemur slightly darker than pro- and mesofemora. Antennae entirely dark brown.

Vertex strongly shagreened. Antennal callus as dark, but slightly higher than vertex, not delineated from vertex by supracallinal sulcus. Surface of antennal calli shiny, lacking sculpture. Frontal ridge moderately wide and flat in lateral view, parallel sided, not narrowing from middle to anterofrontal ridge. Anterofrontal ridge in middle thicker than frontal ridge. Second antennomere longer than third, as long as fourth.

Pronotum width/length ratio 1.28, basally wider than apically. Slightly convex laterally, without denticle, maximum width near base. Anterolateral callosity low, with obtuse denticle, much lower anteriorly than posteriorly. Posterolateral callosity low, wide. Punctures small, shallow, poorly defined. Interspaces uneven, with some irregularly shaped, shallow wrinkles.

Scutellum rounded on top. Elytron without humeral callus; maximum width in males nearly in middle, in females near posterior margin. Apex greatly concave, more so in females than in males. Punctures larger than those on pronotum, their diameter slightly less than or about equal to interpunctal distance. Interspaces shiny, with some wrinkles and punctures.

Male first protarsomere 1.46 times longer than wide, wide in middle, 1.29 times longer than second, 1.57 times longer than third and 0.78 times longer than fourth (visible) protarsomere. Male metatibia 4.50 times as long as wide, curved in dorsal view, with denticles directed posteriorly. First metatarsomere of male 2.16 times shorter than metatibia. Tarsal claw thin, lacking denticle. Metatibial spur as long as third metatarsomere.

Median lobe of aedeagus slightly narrowing in middle, with deep groove ventrally. Ventral groove of the median lobe narrowing abruptly to slightly anterior to middle of median lobe. Apex without denticle-like structure. In lateral view, apex slightly sinuous, without impression at apical 0.25, tip curved dorsally. In lateral view, median lobe straight near base, angulate posteriorly.

Spermatheca with receptacle nearly cylindrical, posteriorly nearly as wide as anteriorly, separated from pump by distinct border. Internal side of receptacle slightly convex, external straight. Pump with vertical and horizontal parts well separated, vertical shorter than horizontal. Internal side of horizontal part evenly convex. Spermathecal duct basally projecting in direction of receptacle, forming a few coils distally. Anterior apex of tignum abruptly expanded, much wider than posterior apex. Tignum not well sclerotized posteriorly, from anterior widening nearly parallel sided, widening slightly just before entering sternite 8. Abdominal sternite 8 in female membranous apically and laterally. Vaginal palpus medially curved posteriorly and anteriorly, not widening anteriorly, laterally straight in middle curving posteriorly and (to lesser degree) anteriorly. Abdominal tergites 1 to 3 completely sclerotized. Tergite 1 with clusters of deep pores laterally.

Comments. *Longitarsus nadiae* can be separated from all known *Testergus* by the unique anterior apex of the tignum being abruptly expanded. It is most similar to *L. tmetopterus* and, in addition to the unique apex of the tignum, can be distinguished from *L. tmetopterus* by the greenish tint in the color of elytra; and the more slender median lobe of the aedeagus with a flat apex being much less curved in lateral view than that of *L. tmetopterus*. (Fig. 14).

Etymology. This species is named after my daughter, Nadia.

Type material. Holotype ♂: Kirgizstan, Kirgizsky mountains, Tswou Aryk 23.VI.2002. leg. Snizek (DCAG). Paratypes 8 specimens with same label as holotype (2 DCAG, 4 USNM, 2 ZMAS).

***Longitarsus fuscoaeneus* Redtenbacher**

(Figs. 6, 26–30)

Longitarsus fuscoaeneus Redtenbacher, 1849:535 (Type locality: Austria. Lectotype, ♀NHMW, designated here).

Comments. As currently recognized, *Longitarsus fuscoaeneus* is one of the species of *Testergus* with the largest geographic range, spanning from Central Europe, Eastern Mediterranean, and Caucasus (including Armenia) to Middle Asia. A number of forms occurring across this range have various degrees of wing reduction but share a similarly shaped median lobe. Some of them were described as subspecies (Warchalowski 1967). During a visit to the Natural History Museum in Vienna, a female of *L. fuscoaeneus* was found in the Redtenbacher collection. The genitalia of this specimens are illustrated and

this specimen is designated here as a lectotype in order to have a unique bearer of this name and the standard for its application. The specimen is accompanied by a larger label pinned to the bottom of the drawer “Fusco-aeneus Redt.,” labeled with a sign “♀”, and the following lectotype label: Lectotype *Longitarsus fuscoaeneus* Redtenbacher, des. A. Konstantinov 2005.

***Longitarsus tmetopterus* Jacobson**

(Figs. 14, 54–66)

Longitarsus tmetopterus Jacobson, 1893: 246 (Type locality: Kazakhstan, Jany-Kurgan: Fluss Sansar. Lectotype ♀ ZMAS, designated here).

L. zeravshanicus Palij, 1970:13 (Type locality: Tadzhikistan, Leninabad (1.IV.1955, ♂). Type material lost). Lopatin, 1977: 220 (synonymy).

L. nurataicus Palij, 1970:13 (Type locality: Kzakhstan, Nuratau. Lectotype ♂ USNM, designated here). Lopatin, 1977: 220 (synonymy).

Comments: *Longitarsus tmetopterus* was described from male and female collected near the town of Janykurgan, west of Karatau mountain ridge on 29.III.1892 by D. Glasunov. A single female with the following labels was found in the collection of Zoological Institute (ZMAS): 1) Turkestan, Sansar, Glasunov, 1892; 2) *L. tmetopterus* typ. Jac. G. Jacobson det.; 3) k. G. Jacobsona. This specimen is designated here as a lectotype in order to have a unique bearer of this name and the standard for its application. A lectotype label is added: Lectotype *Longitarsus tmetopterus* Jacobson, des. A. Konstantinov 2005. The second specimen mentioned in the original description was not found. In addition, 5 females collected by K. Anger, on 21.III.1900 at Kalanmor, Zakaspiiskoi oblasti, and identified as *L. tmetopterus* by G. Jacobson are present in Lopatin collection and ZMAS.

Proposing *L. nurataicus*, Palij (1970) did not designate the holotype and depository of his collection is unknown. It is highly possible that it was lost. For *L. zeravshanicus*, the holotype was indicated. In addition to the locality of the holotype, Palij (1970) sites the following locations: 1) env. of Samarkand (Bulungur), 31.I.1963 (♀ ♂), 6.III.1963 (2 ♀), 27.III. 1963 (♀ ♂); 2) env. of Nura-Tau, Karakum, 11.V.1945 (3 ♂). Palij (1970) indicated the following locations for *L. nurataicus*: river valleys of Chu, Syr-Dar’ya, and Zeravshan, piedmont of Turkestanskii, Zeravshanskii, Kirgizskii, Nuratau mountain ridges. He noted that *L. nurataicus* was collected in hundreds at the last location in April and May of 1965 and 1966. The specimens collected by Palij in 1965 and 1966 near Nuratau, obviously known to him at the time when he described the species, are available in the USNM collection. A male with the following label is designated as the lectotype: khr. Nuratau, 45 km NW. Dzhizaka, 8.IV.1966 (USNM). Five specimens with the same labels are designated as paralectotypes (3 USNM, 2 ZMAS). Four more specimens with the same labels except for 7.IV.1966 are also designated as paralectotypes (3 USNM, 1 ZMAS). Lectotype designation is done in order to have a unique bearer of this name and the standard for its application.

Lopatin (1977) synonymized both *L. nurataicus* and *L. zeravshanicus* with *L. tmetopterus*. The female genitalia of the lectotypes of *L. tmetopterus* (Figs. 64–66) and *L. nurataicus* (Figs. 60–63) are nearly identical which leaves no doubt in their synonymy. Also type localities of both species are part of the vast territory of Karakum - Kyzylkum deserts. As for *L. zeravshanicus*, there are no specimens that can be unambiguously attributed to this name. Specimens identified as topotypes of *L. zeravshanicus* in the Lopatin collection originate from Nuratau, and most likely are *L. nurataicus* (sensu Palij). The holotype of *L. zeravshanicus* was collected near Leninabad (northern Tadjikistan) along the valley of Syr-Dar'ya river, not isolated from the main range of *L. tmetopterus*.

The female genitalia of the lectotype of *L. tmetopterus* and specimens determined by Jacobson as *L. tmetopterus* (Anger collecting) (Figs. 54–59) exhibit some relatively minor differences in the shape of the vaginal palpi and spermathecal pump, but they are not significant enough to warrant recognition of separate species.

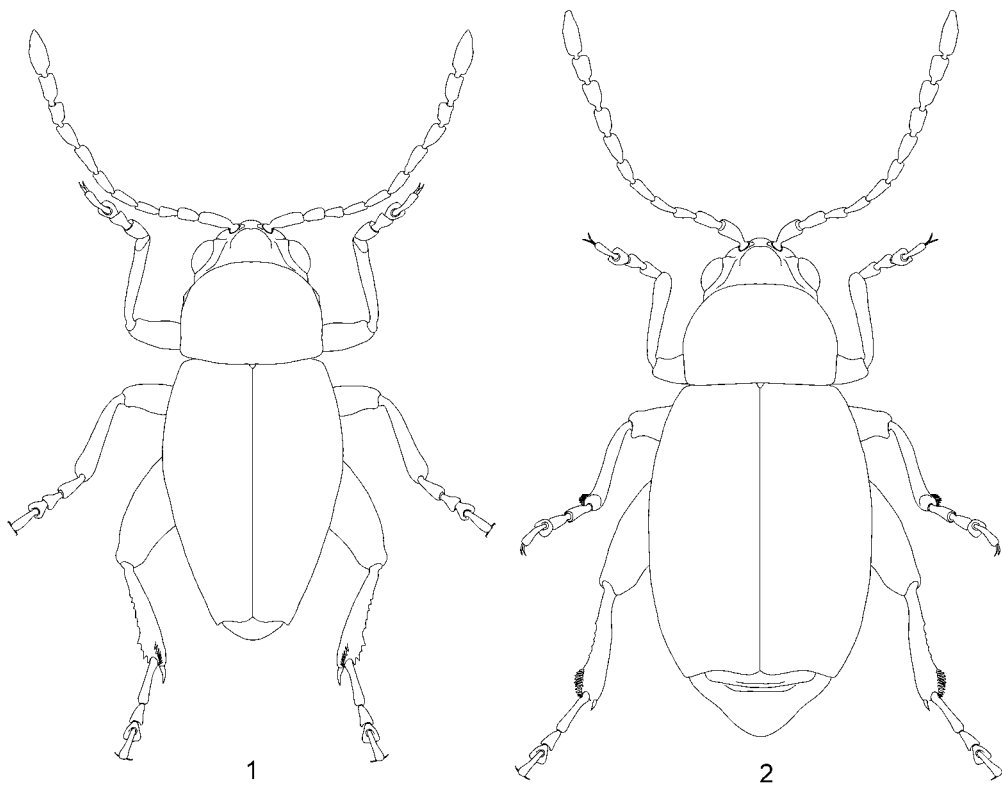
Acknowledgments

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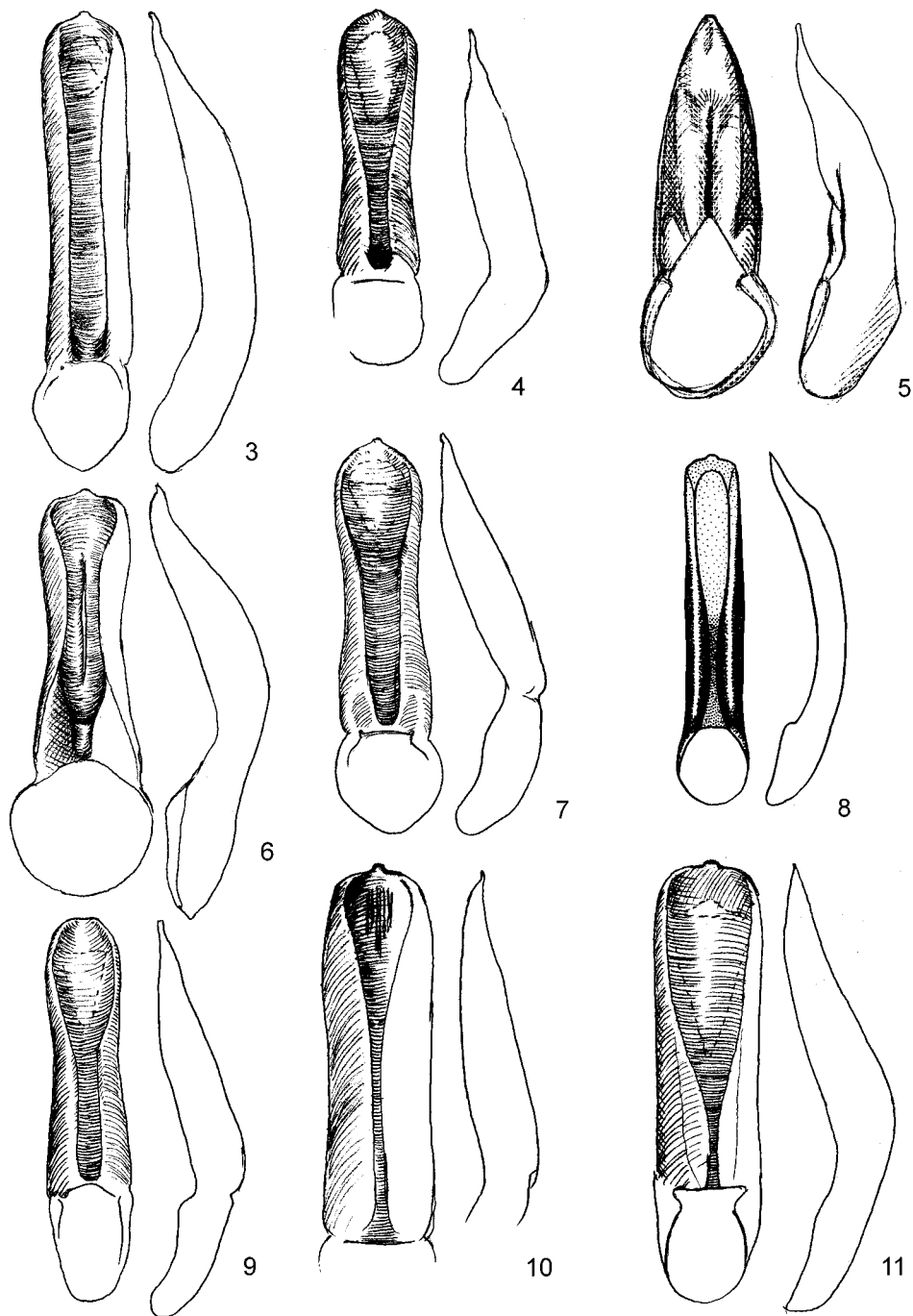
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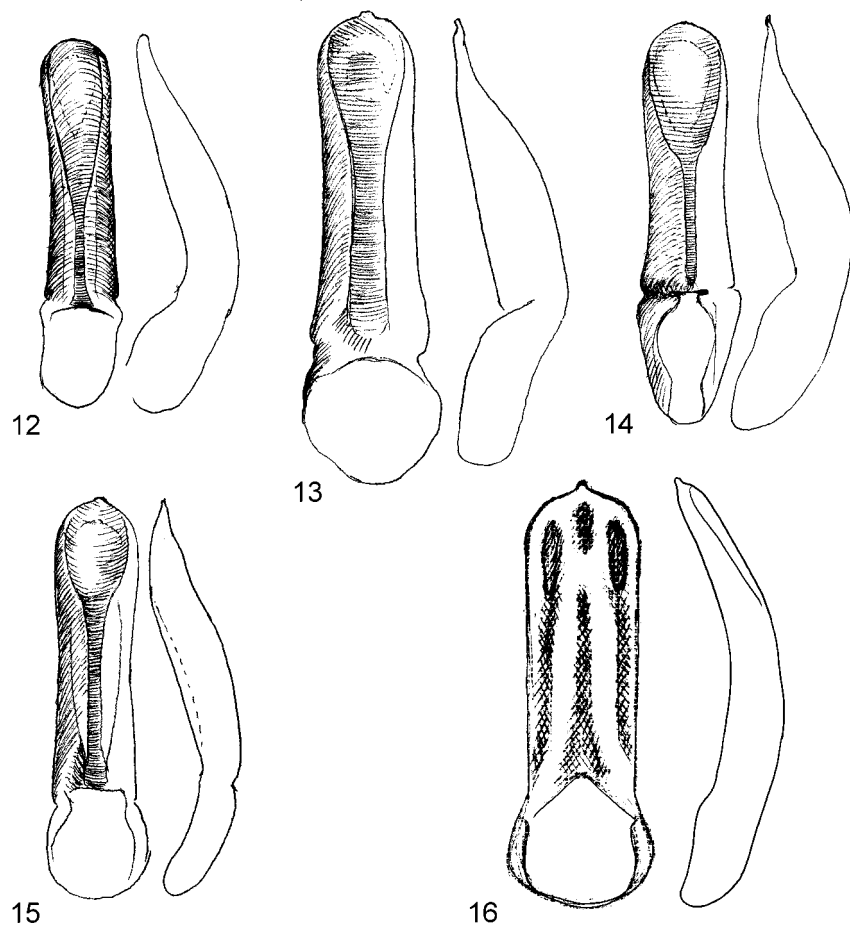
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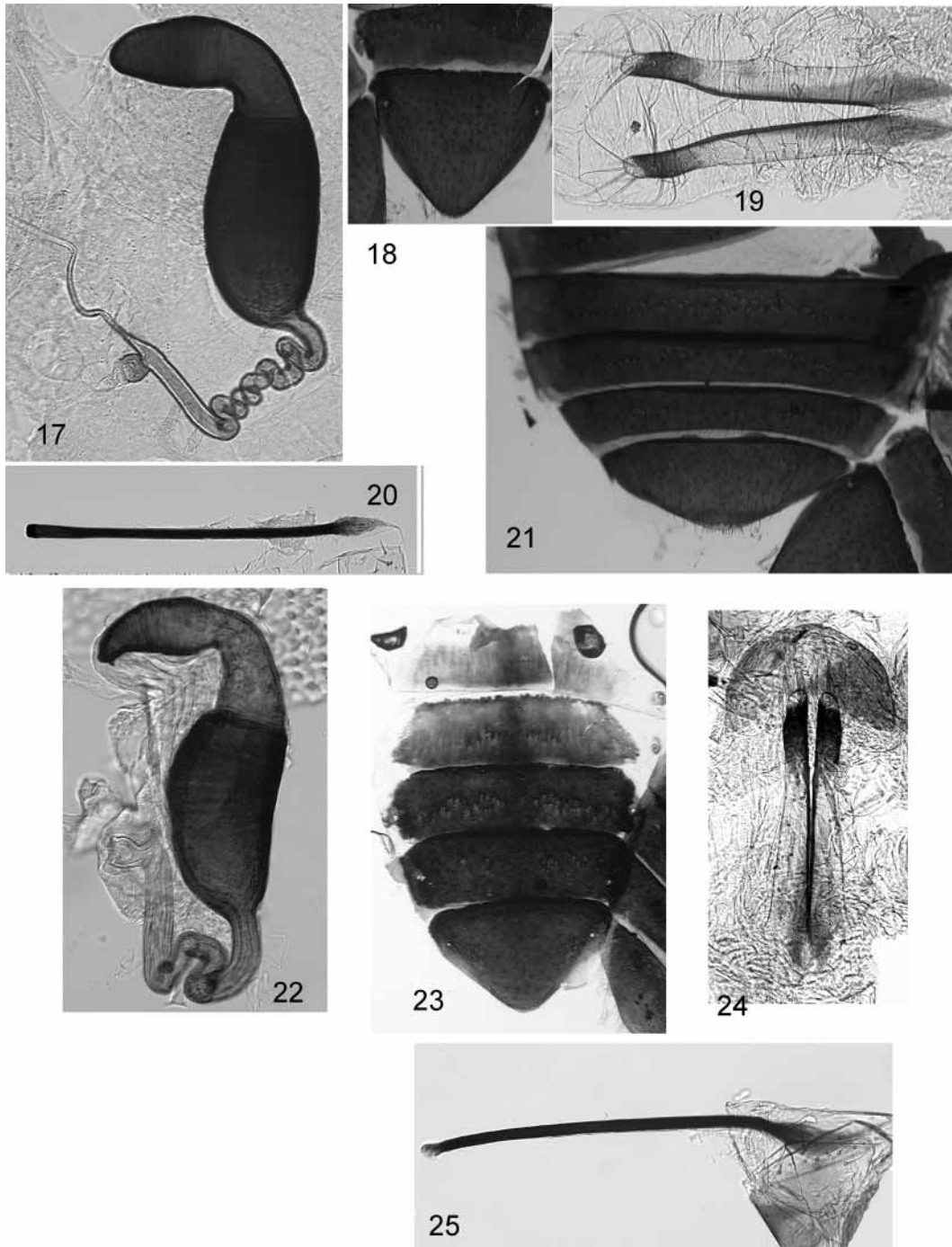
FIGURES 1–2. *Longitarsus nadiae*, habitus. 1 - male, 2 - female.



FIGURES 3–11. Median lobe of aedeagus (ventral and lateral views). 3 - *L. borisi*, 4 - *L. danilevskyi*, 5 - *L. excipennis*, 6 - *L. fuscoaeneus* (Armenia). 7 - *L. igori*. 8 - *L. josiphi*. 9 - *L. nadiae*. 10 - *L. pubescens*. 11 - *L. lederi*.

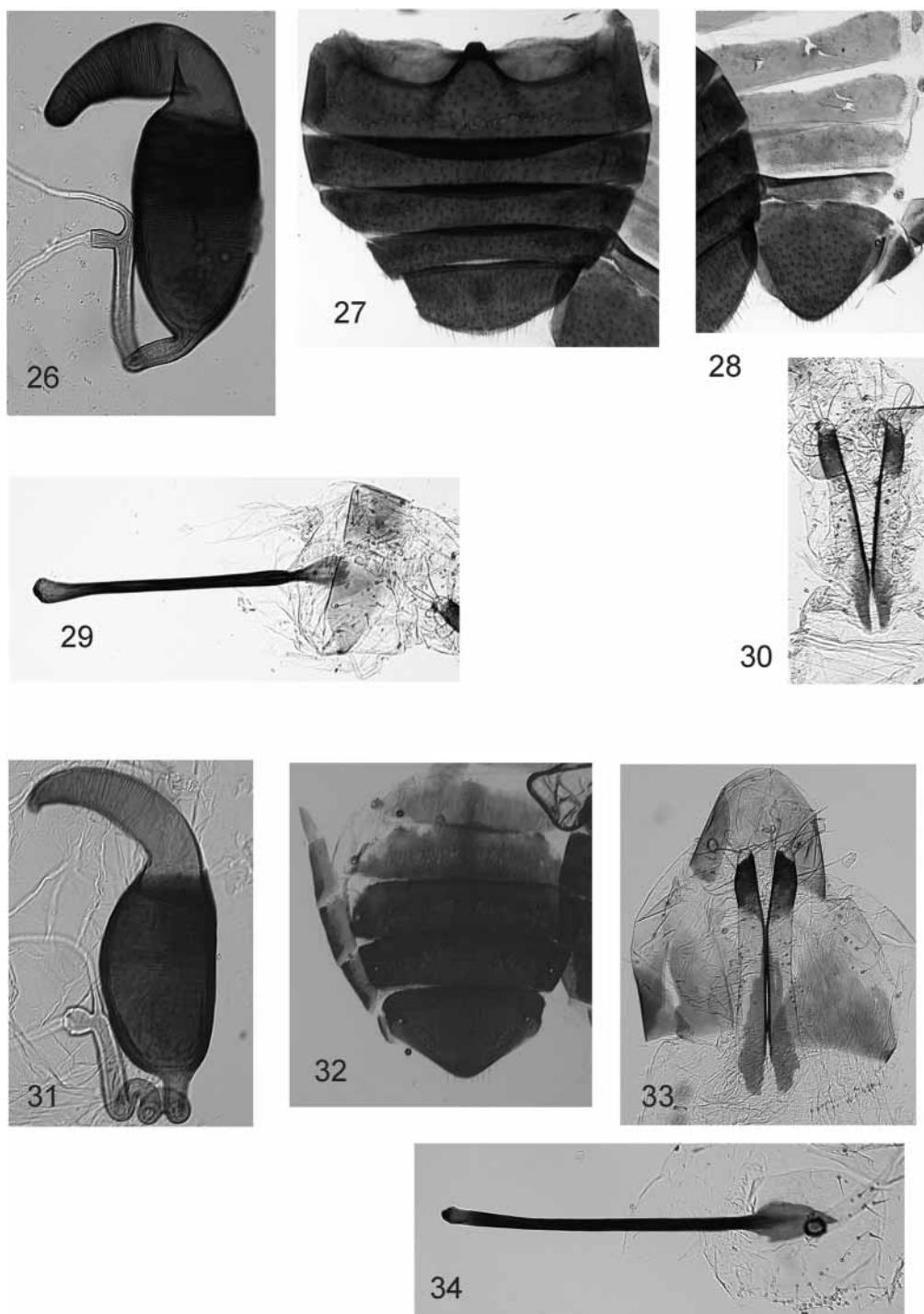


FIGURES 12–16. Median lobe of aedeagus (ventral and lateral views). 12 - *L. sengloki*. 13 - *L. sogdianus*. 14 - *L. tmetopterus*. 15 - *L. truncatellus*. 16 - *L. turkomanorum*.



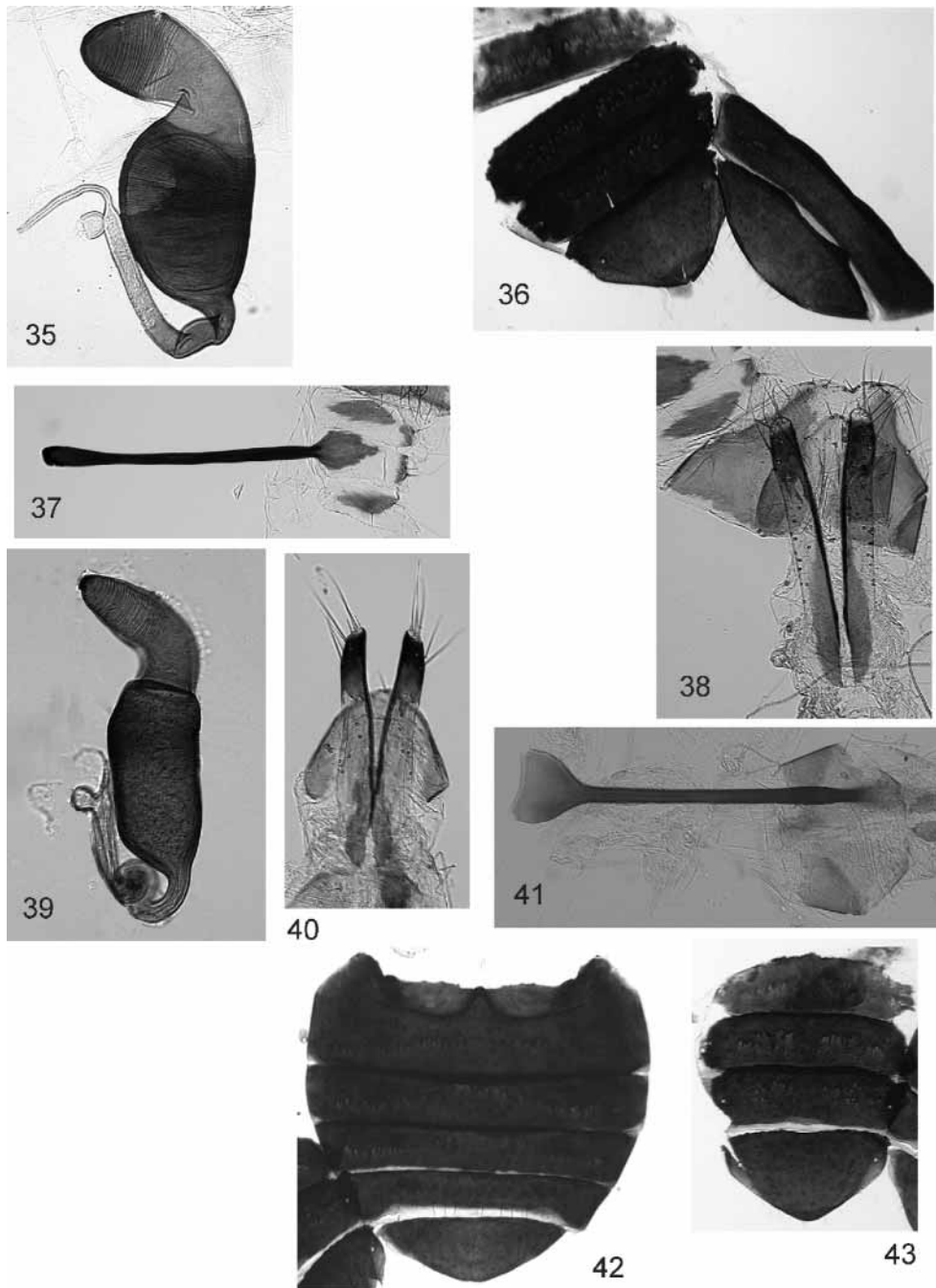
FIGURES 17–21. Female abdomen and genitalia of *L. borisi*. 17 - spermatheca. 18 - abdominal tergites. 19 - vaginal palpi. 20 - tignum. 21- abdominal sternites.

FIGURES 22–25. Female abdomen and genitalia of *L. danilevskyi*. 22 - spermatheca. 23 - abdominal tergites. 24 - vaginal palpi. 25 - tignum and internal abdominal sclerites.



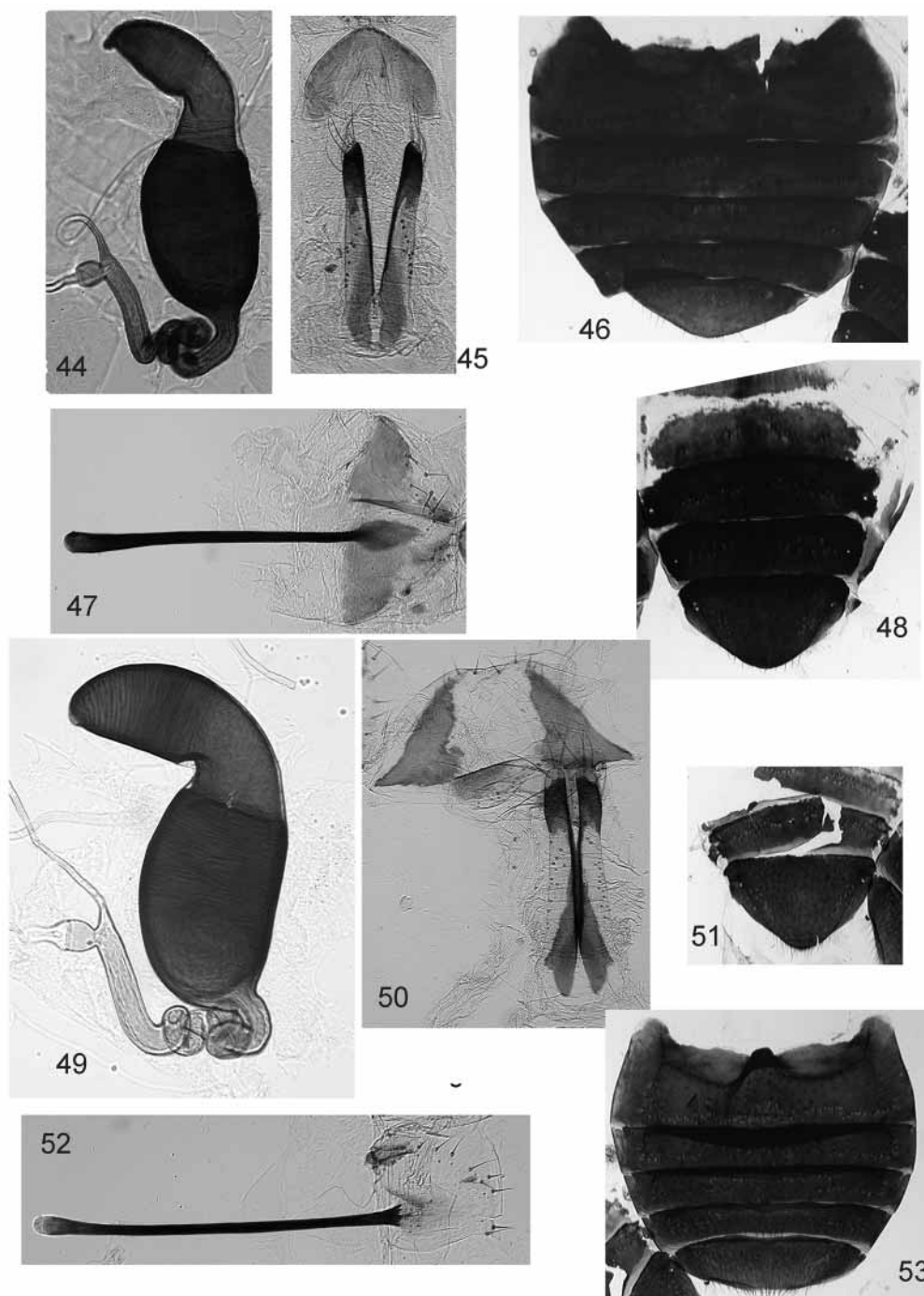
FIGURES 26–30. Female abdomen and genitalia of *L. fuscoaeneus* (lectotype). 26 - spermatheca. 27 - abdominal sternites. 28 - abdominal tergites. 29 - tignum and internal abdominal sclerites. 30 - vaginal palpi.

FIGURES 31–34. Female abdomen and genitalia of *L. igori*. 31 - spermatheca. 32 - abdominal tergites. 33 - vaginal palpi. 34 - tignum and internal abdominal sclerites.



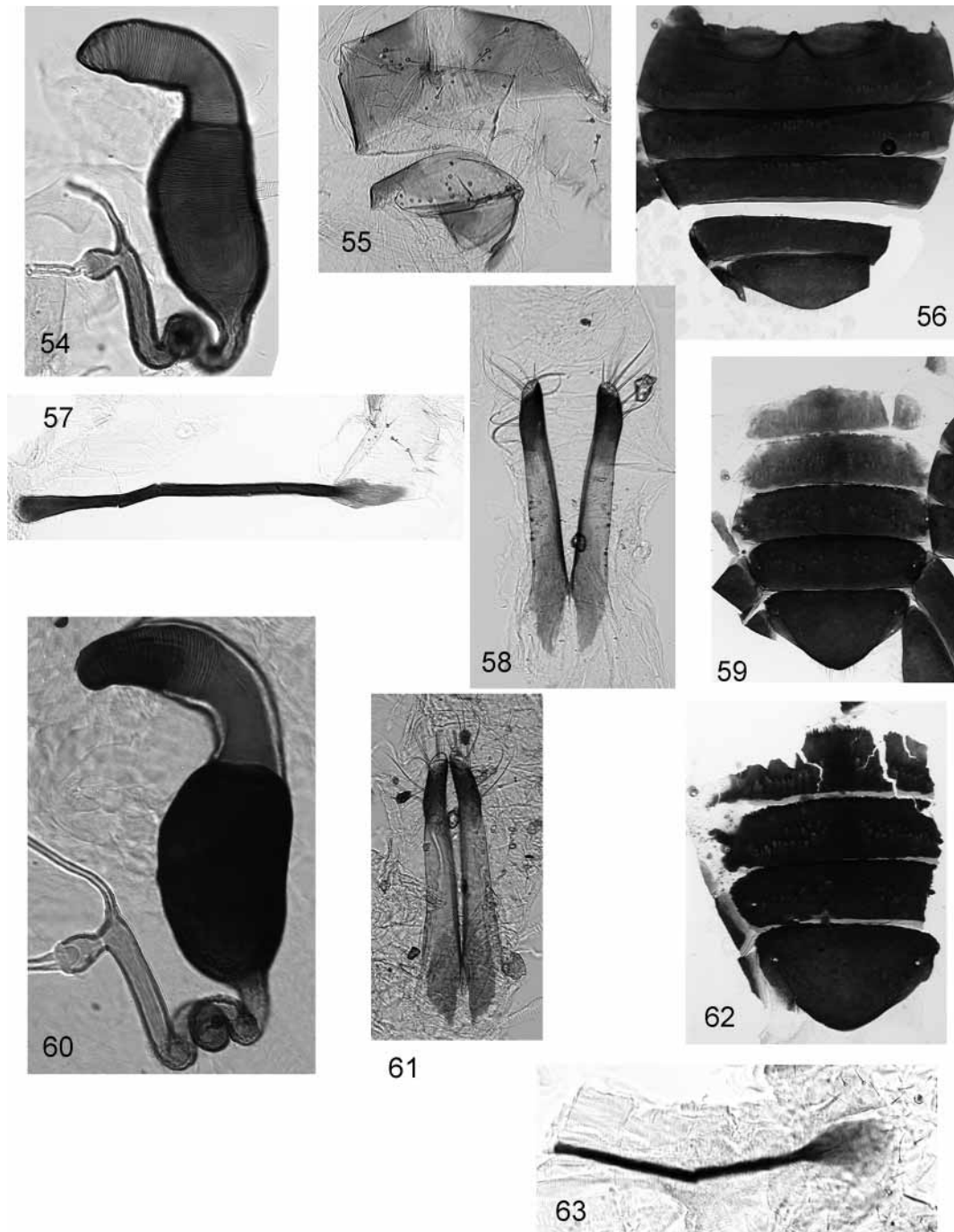
FIGURES 35–38. Female abdomen and genitalia of *L. josiphi*. 35 - spermatheca. 36 - four abdominal tergites and two sternites. 37 - tignum and internal abdominal sclerites. 38 - vaginal palpi.

FIGURES 39–43. Female abdomen and genitalia of *L. nadiae*. 39 - spermatheca. 40 - vaginal palpi. 41 - tignum and internal abdominal sclerites. 42 - abdominal sternites. 43 - abdominal tergites.



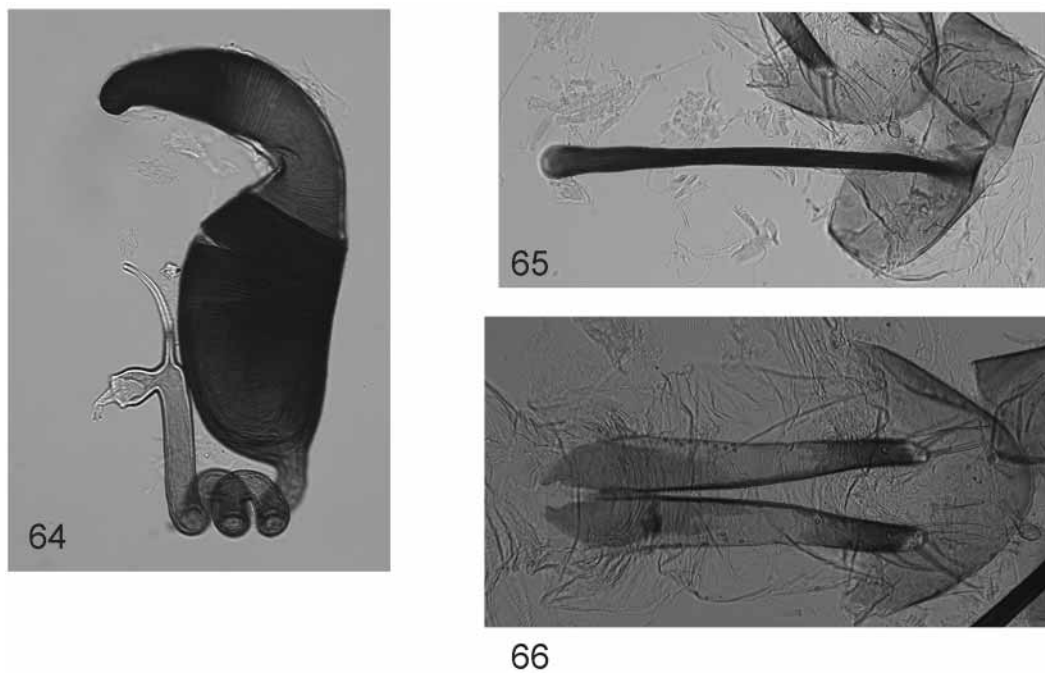
FIGURES 44–48. Female abdomen and genitalia of *L. sengloki*. 44 - spermatheca. 45 - vaginal palpi. 46 - abdominal sternites. 47 - tignum and internal abdominal sclerites. 48 - abdominal tergites.

FIGURES 49–53. Female abdomen and genitalia of *L. sogdianus*. 49 - spermatheca. 50 - vaginal palpi. 51 - abdominal tergites. 52 - tignum and internal abdominal sclerites. 53 - abdominal sternites.

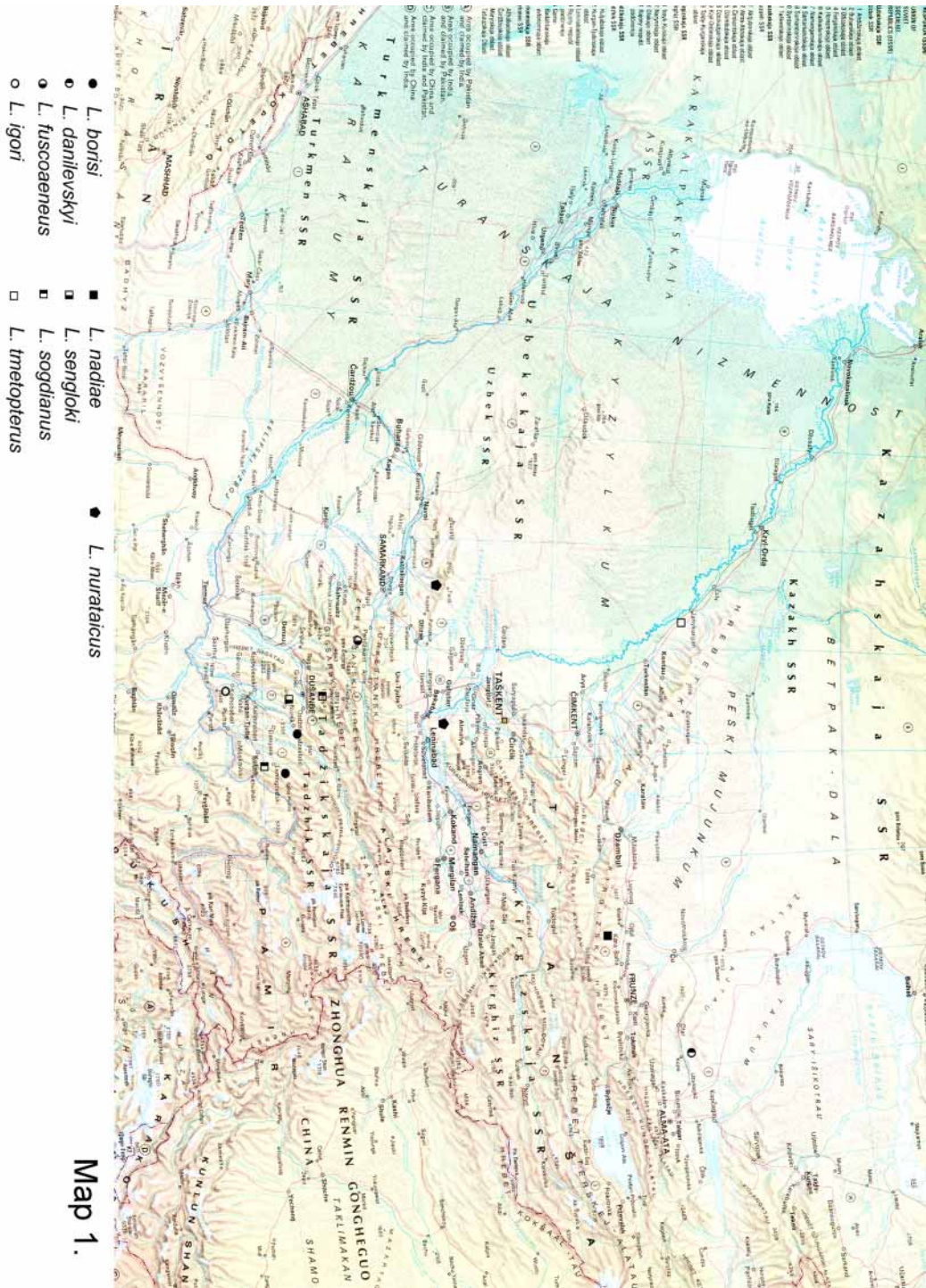


FIGURES 54–59. Female abdomen and genitalia of *L. tmetopterus* (Anger collecting). 54 - spermatheca. 55 - internal abdominal sclerites. 56 - abdominal sternites. 57 - tignum and internal abdominal sclerites. 58 - vaginal palpi. 59 - abdominal tergites.

FIGURES 60–63. Female abdomen and genitalia of *L. tmetopterus* (*L. nurataicus* sensu Palij). 60 - spermatheca. 61 - vaginal palpi. 62 - abdominal tergites. 63 - tignum and internal abdominal sclerites.



FIGURES 64–66. Female abdomen and genitalia of *L. tmetopterus* (Lectotype). 64 - spermatheca. 65 - tignum and internal abdominal sclerites. 66 - vaginal palpi.



MAP 1. Distribution of *Testergus* species in Middle Asia.