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Review of subtribe Singilina Jeannel, 1949, of the Middle East and Central Asia (Coleoptera, Carabidae, Lebiini)

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Abstract

Species of the genus *Singilis* Rambur, 1837 (*Phloeozeteus* Peyron, 1856, **syn. n.**, *Agatus* Motschulsky, 1845, **syn. n.**), occurring in the Middle East and Central Asia are reviewed, with 24 species now recognized in the region, including ten species described as new: *S. makarovi* **sp. n.** (Tajikistan), *S. jedlickai* **sp. n.** (Afghanistan), *S. kolesnichenkoi* **sp. n.** (Iran), *S. kabakovi* **sp. n.** (Afghanistan, Iran), *S. timuri* **sp. n.** (Uzbekistan), *S. klimenkoi* **sp. n.** (Iran), *S. saeedi* **sp. n.** (Iran), *S. felixi* **sp. n.** (UAE), *S. kryzhanovskii* **sp. n.** (Iran, Turkmenistan), and *S. timidus* **sp. n.** (Iran); *S. libani* (Sahlberg, 1913) is recognized as a valid species; and *S. solskyi* **nom. n.** is proposed as a replacement name for *Agatus bicolor* (Solsky, 1874, not Rambur, 1837), now placed in *Singilis* as junior homonym. New synonymies include: *Singilis cingulatus* (Gebler, 1843) = *Singilis jakeschi* Jedlička, 1967, **syn. n.;** *S. mesopotamicus* Pic, 1901 = *Singilis apicalis* Jedlička, 1956, **syn. n.** A key to species is provided. Habitus and aedeagal illustrations are provided for all species. Distributional data include many new country records.

Keywords

Coleoptera, Carabidae, *Singilis*, new species, redescription, country records, review, taxonomy

Introduction

This study aims to clarify the circumscription of the subtribe Singilina Jeannel, 1949, and the status of its member taxa. Until now, most species of this group have been poorly defined, rarely collected, and hard to identify.

The most recent catalogue covering the study area (Lorenz 2005) lists two species of *Singilis* Rambur, 1837, eight species of *Phloeozeteus* Peyron, 1856, and seven species of *Agatus* Motschulsky, 1845. This study leads us to conclude that the fauna of the region includes 24 species, all in the genus *Singilis* Rambur (=*Phloeozeteus* Peyron, *Agatus* Motschulsky).

Material and methods

This study was based on a total of about 270 specimens, including a number of primary types. Measurements: body length, from anterior margin of clypeus to apex of elytra along suture; length of pronotum, along midline; width of pronotum, at widest point; length of elytra, from his base to apex along suture; and width of elytra, at widest point.

The material from the following institutional and private collections has been examined:

AAC	Alexander Anichtchenko private collection (Spain)
APC	Andreas Pütz private collection (Germany)
DUBC	Daugavpils University Beetle Collection (Latvia)
DWWC	Dawid W. Wrase collection (Germany)
IZEC	Institute of Zoology Collection (Armenia)
KOC	K. Orszulik private collection (Czech Republic)
MMBC	Moravske Muzeum, Brno (Czech Republic)
MNHN	National Museum of Natural History in Paris (France)
MPU	Collection of Zoology & Ecology Department, Moscow State Pedagogical University (Russia)
NHMW	Naturhistorisches Museum Wien (Austria)
NMPC	National Museum of Natural History, Prague (Czech Republic)
RFC	Ron Felix private collection (The Netherlands)
RMNH	Natural History Museum 'Naturalis', Leiden (The Netherlands)
SMNS	Staatliches Museum für Naturkunde Stuttgart (Germany)
UAEIC	United Arab Emirates Invertebrate Collection (UAE)
ZIN	Zoological Institute, St. Petersburg (Russia)
ZMM	Zoological Museum of Moscow University (Russia)
ZSM	Zoologische Staatssammlung München (Germany)

High-resolution habitus images of *Singilis* species, including type specimens and additional material, are available at http://www.carabidae.pro.

Subtribe Singilina Jeannel, 1949

Jeannel (1949: 915) proposed the tribe Singilini to include *Singilis* Rambur, 1837; *Phloeozeteus* Peyron, 1856; *Paralebia* Peringuey, 1898; *Somotrichus* Seidlitz, 1887; *Pe-*

phrica Alluaud, 1936; *Paulianites* Jeannel, 1949; and *Velindopsis* Burgeon, 1937; genera whose adults are characterized by small size, and pale, hairy integument. Mateu (1963) excluded from the tribe all the genera but *Singilis*, with *Phloeozeteus* as a subgenus. Ball and Hilchie (1983: 197) treated Singilini as a junior synonym of Dromiina.

The exact composition of this subtribe has not been settled. Debate on the taxonomic status of *Singilis* and *Phloeozeteus* began almost immediately after their description (Reiche 1860; Schaum 1860) and continued until the recent work of Mateu (1963). The taxonomic status of another related genus, *Agatus* Motschulsky, 1845, treated until now in the subtribe Agrina Kirby, 1837 (Kabak 2003; Lorenz 2005), has never been reconsidered since Motschulsky proposed the genus. Motschulsky (1845) considered it to be close to *Calleida* Latreille, 1824, based on similarities in the maxillary palpi and pectinate tarsal claws, although both features are widespread among Lebiini of several subtribes. *Agatus, Phloeozeteus*, and *Singilis* were defined so poorly that Jedlička (1956, 1961a, 1961b, 1963a, 1963b) at various points repeatedly moved species between those 'genera'. *Agatus irakensis* (Jedlička 1963a: 5) was recently synonymized with *Lebia* (*s.str.*) *syriaca* Pic, 1901 (Anichtchenko 2011). Based on our study of more extensive material, we propose the synonymy *Agatus* Motschulsky, 1845 syn. n. = *Phloeozeteus* Peyron, 1856 syn. n. = *Singilis* Rambur, 1837.

The recent catalogues (Kabak 2003; Lorenz 2005) treat the subtribe Singilina as including two genera, *Singilis* and *Phloeozeteus*, with 62 recognized species. The vast majority is found in Africa and the Middle East; a few are known to occur in the south Mediterranean, Central Asia, and India.

Genus *Singilis* Rambur, 1837

http://species-id.net/wiki/Singilis

Singilis Rambur 1837: 25 Type species: *Singilis bicolor* Rambur, 1837 (nec Solsky 1874)
Agatus Motschulsky 1845: 10. Type species *Glycia fasciata* Motschulsky, 1844 (= *Dromius cingulatus* Gebler, 1843: 37) syn. n.
Phloeozeteus Peyron 1856: 715. Type species *Coptodera plagiata* Reiche & Saulcy, 1855 syn. n.
Paralebia Peringuey 1898: 335. Type species *Paralebia vicaria* Peringuey, 1898
Phloezetaeus: Jedlička 1956: 204 [unavailable]
Phloeozetaeus: Jedlička 1961a: 3 [unavailable]
Phloeozetoeus: Jedlička 1961b: 163 [unavailable]
Phloeozetteus: Jedlička 1963a: 6 [unavailable]
Phloeozetus: Kabak 2003: 438 [unavailable]

Remarks. Now we are not in position to give diagnostic features of this genus, for we do not know the other related genera well enough. The limits of these generic groups are not yet defined. Details of relationships among genera and subtribes remain to be

worked out. In lieu of a definitive treatment of classification of *Singilis*, we adopt here the position of Ball and Hilchie (1983). Now a revision of this genus is in progress. In this, the author will try to clarify its position among closely related genera, and will discuss some characters and methods proposed by Basilewsky (1984) and Casale (1998). Inferring phylogenetic relationships within Lebiini from characters of the female reproductive tract will be offered.

The genus *Singilis* as treated here may not be monophyletic; however, the sheer numbers and morphological diversity of its species, both described and undescribed, make a comprehensive revision of the group unfeasible at this time. Still, we believe that describing distinctive species will help faunal studies and contribute to the understanding of higher taxonomy.

***Singilis flavipes* (Solsky, 1874)**
http://species-id.net/wiki/Singilis_flavipes

Glycia flavipes Solsky 1874: 35
Agatus afghanus Jedlička 1961b: 163

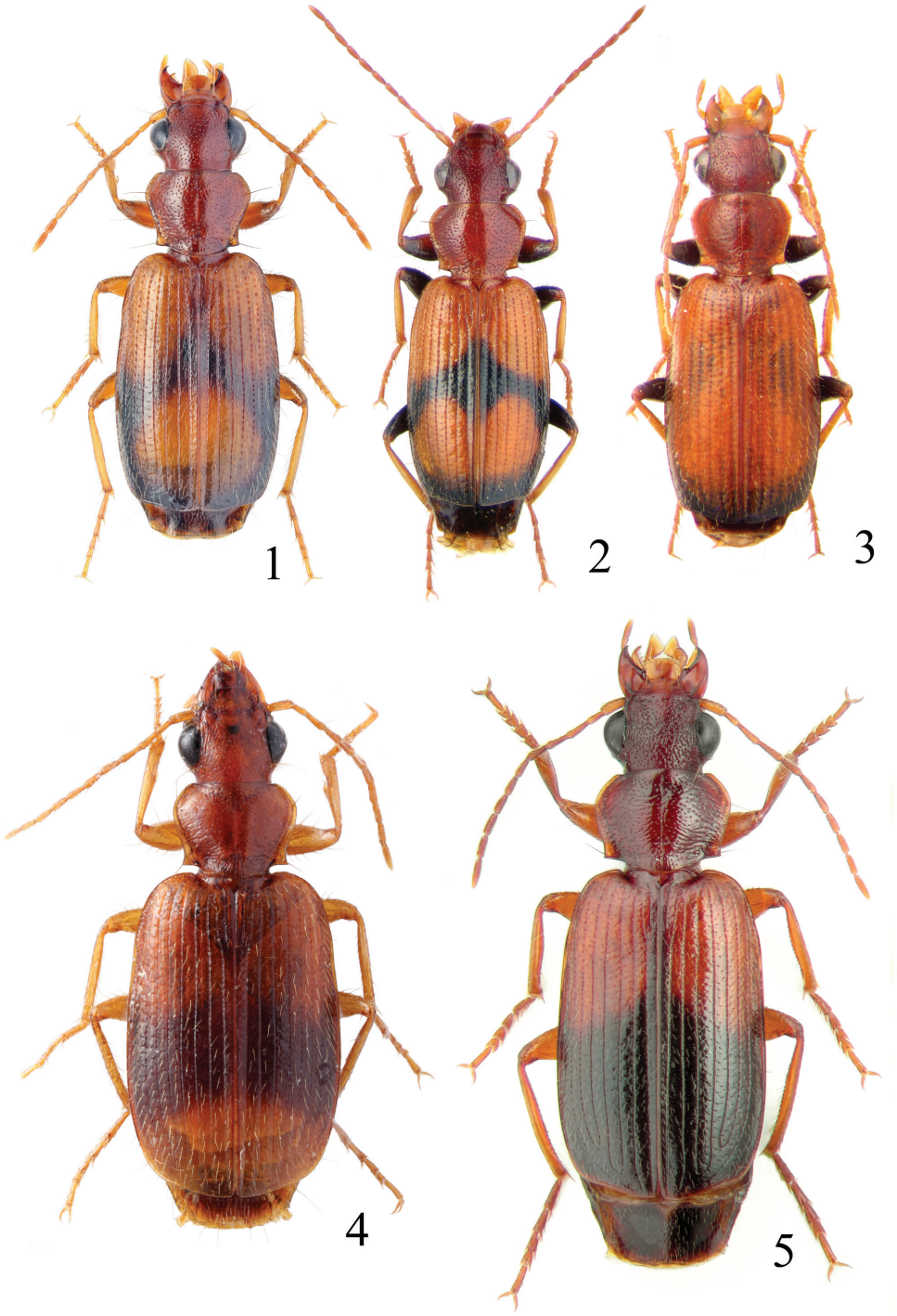
Material examined. AFGHANISTAN: ♂ – TYPE, red label: Agatus afganus sp. n. det. Ing. Jedlička; white label: Afganistan, Bhougavi; Cotype ♂, Afghanistan, Douchi; Cotype ♀, Afghanistan, Dehran (NMPC). KAZAKHSTAN: S Kazakhstan, Karatau Mt. Rng., 40 km N Igilik vill., Kurkal, N43°47'003", E68°03'138", 543m, 8.V.2010, light trap, Ivanov A.V. leg. (5♂♂ 3♀♀, AAC). TURKMENISTAN: Amudar'a riv., Chardzhou, 15.V.1993, Kamarkovskii A. leg. (1♂, AAC); Kaahkinskij raj., 28.IV–25.V.1994, leg. A. Kalninsh (1♂, DUBC).

Diagnosis. This species is most similar to the sympatric *S. cingulatus*. The two species can be diagnosed easily by different color of legs, i.e., *S. cingulatus* has femora and apical part of tibiae piceous to black (Figs 2–3).

Redescription. Length 4.3–5.3 mm. Body elongate; head and pronotum red-brown, elytra black with red-brown basal band and a common preapical round red macula reaching interval 6. Venter light brownish yellow, sterna sometimes darker; legs yellow (Fig. 1).

Head microsculptured, deeply and irregularly punctate, punctures sometimes almost confluent in frontal depressions, on the frons separated by 3–5 their diameters, towards the base of head, by 1–2 diameters. Clypeus with a few punctures at lateral margins. Eyes large and bulging, with numerous strong setae at posterior margin. Second supraocular seta located just anterad the posterior margin of eye. Temples smooth, 2.4 times shorter than length of eye. Scape with a very long seta and a few long thin setae; pedicel with a band of apical setae; antennomere III with scattered setae on apical half. Antennae pubescent from the mid-length of antennomere IV.

Pronotum shinier than head, microsculptured, cordate, 1.08–1.11 times as wide as head, 1.2–1.25 times as wide as long, widest just behind the marginal setae. Anterior margin straight, anterior angles effaced, sides slightly sinuate towards posterior angles,



Figures 1–5. Habitus of *Singilis*: **1** *S. flavipes* (Kazakhstan) **2–3** *S. cingulatus* (Kazakhstan) **4** *S. amoenulus* (SW Turkmenistan, Beki-Bent) **5** *S. solskyi* nom.n. (Kazakhstan).

which are rectangular or slightly acute. Disc sparsely irregularly punctate, somewhat less densely than head; punctures at lateral margins confluent, surface rugose. Disc convex to lateral margins, which are very narrow. Posterior pore right in front of angle. Basal grooves shallow, rugose, confluently punctate. Pronotal base extended in a rounded median lobe. Furrow short and shallow.

Each interval with a row of setiferous pores along the middle from base to apex. Setae as long as the width of interval 2. Microsculpture almost isodiametric. Apices slightly sinuate. Striae deep, punctate. Intervals weakly convex at base, flat at apex.

Legs brownish yellow. Tarsomere V with 4 pairs of ventral setae. Propleuron smooth, even, mes- and metepisterna strongly microsculptured. Claws with 4 teeth, 3 relatively long and one (basal) minute. All abdominal sterna with long pubescence.

Aedeagus – Fig. 28. Internal sac without apparent spicules or microtrichial patches.

Variation. Varies in size, ventral colour, and the extent of dark elytral pattern (may be reduced).

Comments. Types collected in "Samarkand" (now Uzbekistan) and near Shahrud (n. Iran) (Solsky, 1874: 35).

Distribution. Afghanistan, Iran, Kyrgyzstan, Kazakhstan, Tajikistan, Turkmenistan, Uzbekistan.

Singilis cingulatus **(Gebler, 1843)**
http://species-id.net/wiki/Singilis_cingulatus

Dromius cingulatus Gebler 1843: 37.
Agatus cingulatus: Gebler 1859: 319.
Glycia cingulata: Solsky 1874: 34.
Glycia cruciger Heyden 1889: 327.
Glycia fasciata Motschulsky 1844: 42 (Lectotype in ZMM)
Agatus afghanus a. *nigripes* Jedlička 1961b: 163 syn. n.
Singilis jakeschi Jedlička 1967: 102 syn. n.

Material examined. HOLOTYPE, 1 golden foil circle, 1 handwritten label: "cingulatus Gebl. Sibir. Or." (indeed = Ala-kul') (ZIN); AFGHANISTAN: *Singilis jakeschi* HOLOTYPE Jedlička, N Afganistan, prov. Heart prov., coll. O. Jakeš, Bala Murghab, 30.VI–2. VII.1964, 470m, (37) (1♂, MMBC); N Afganistan, prov. Heart prov., Bala Murghab, 4.XI.1964, 470m, coll. O. Jakeš (102) (1 ex., MMBC); same place, 31.X.1964, (97) (3 ex., MMBC); same place, 2.XI.1964, (99) (1 ex, MMBC); same place, 10–13. VII.1964, (100) (1 ex, MMBC); same place, 3.XI.1964, (101) (1 ex, MMBC); N Afganistan, prov. Heart prov., Akaza-i, 3.XI.1964, 450m (100) (1 ex, MMBC); N Afganistan, Prov. Mazar-i-Sharif, Mazar-i-Sharif, 15–30.XI.1964, 365m, coll. O. Jakeš (106) (2 ex, MMBC); *Agatus afghanus a. nigripes* det. Ing. Jedlička HOLOTYPE red label; J.Klapperich, Umgeb. v. Kabul, 1740 m., 20.III.53, O. Afghanistan (1♂, NMPC); COTYPE of *Agatus afghanus a. nigripes* Afganistan, Douchi (1♀, NMPC). KAZAKH-

STAN: S Kazakhstan, Karatau Mt. Rng., 40 km N Igilik vill., Kurkal, N43°47'003" E68°03'138", 543m, 8.V.2010, light trap, Ivanov A.V. leg. (16♂♂ 19♀♀, AAC); Syr Darja, Turkest. (1 ex., NMPC); Turkestan, Auli-Ata, C.Aris (1♂ 1♀, MNHN). TURKMENISTAN: Kaahkinskij raj., 28.IV–25.V.1994, A. Kalninsh leg. (1♂, DUBC); Turcmenia, Leder, Reitter; second label: *Singilis jakeschi* Jedl. det. Ing. Jedlička (1♂, NMPC). UZBEKISTAN: COTYPE of *Agatus afghanus a. nigripes*, Buchara (1♂, NMPC).

Diagnosis. This species is most similar to *S. flavipes*, with diagnostic differences listed under that species.

Redescription. Length 4.5–5.2 mm. Body elongate, head and pronotum red-brown, elytra black with red-brown basal band and two rounded preapical spots, often confluent. Femora and tibial apices piceous to black (Fig. 2–3).

Head microsculptured, deeply irregularly punctate, punctures sometimes almost confluent in frontal depressions, on the frons separated by 3–5 times their diameters, towards the base of head, by 1–2 diameters. Clypeus with a few punctures at lateral margins. Eyes large and bulging, with numerous moderately long setae at posterior margin. Second supraocular seta located just anterad the posterior margin of eye. Temples smooth, 4.2 times shorter than length of eye. Scape with a very long seta and a few long thin setae; pedicel with a band of apical setae; antennomere III with scattered setae on apical half. Antennae pubescent from the mid-length of antennomere IV.

Pronotum shinier than head, microsculptured, cordate, 1.07 times as wide as head, 1.25–1.31 times as wide as long, widest just behind the marginal setae. Anterior margin straight, anterior angles effaced, sides slightly sinuate towards posterior angles, which are rectangular or slightly acute. Disc sparsely irregularly punctate, somewhat less densely than head; punctures at lateral margins confluent, surface rugose. Disc convex to lateral margins, which are very narrowly explanate. Posterior pore right in front of angle. Basal grooves shallow, rugose, confluently punctate. Pronotal base extended in a rounded median lobe. Furrow shallow and short.

Each interval with a row of setiferous pores along the middle from base to apex. Setae as long as the width of interval 2. Microsculpture almost isodiametric. Apices slightly sinuate. Striae deep, punctate. Intervals weakly convex at base, flat at apex.

Femora and apical parts of tibiae piceous to black. Tarsi sparsely pubescent, with long dorsal setae. Tarsomere V with 4 pairs of ventral setae. Propleuron rugose, meso- and metepisterna strongly microreticulate. Claws with 5 teeth. Abdominal sterna black, venter otherwise red-brown. Abdominal sterna with long pubescence.

Aedeagus – Fig. 29. Median lobe apex elongate, slightly downturned at narrowly rounded apex. Internal sac with two groups of large spines.

Variation. Varies in size and colour: venter all-black to all-red, elytral dark pattern sometimes reduced, head and pronotum sometimes blackish. Pronotal sides sometimes sinuate towards base, in which case hind angles acute.

Comments. The study of the holotype of *Singilis jakeschi* Jedlička, 1967, has shown that *S. jakeschi* is synonymous with *Agatus cingulatus* (Gebler, 1843). *S. jakeschi* was originally described based on a single female with reduced dark elytral pattern,

taken from a large series of *A. cingulatus* collected in the same place, and determined by Jedlička as *Singilis afgana* and *A. afghanus* a. *nigripes.*

Distribution. Afghanistan, Iran, Iraq, Israel, Kyrgyzstan, Kazakhstan, s. Russia, Tajikistan, Turkmenistan, Uzbekistan.

***Singilis anthracinus* (Solsky, 1874)**
http://species-id.net/wiki/Singilis_anthracinus

Glycia anthracina Solsky, 1874: 36

Comments. Species described from a single specimen labeled "Sibiria" (from collection of Eversmann) as similar to *Singilis cingulatus*, but differing by uniformly black body color. Body length 5 mm, length of elytra 3.5 mm, width 2.3 mm. Probably this species is just a color variation or melanic form of *Singilis cingulatus*. The type was supposed to be in ZIN but we were unable to locate it. To make a final decision about the taxonomic status of this taxon it is necessary to study the type and additional material.

***Singilis amoenulus* (Semenov, 1889)**
http://species-id.net/wiki/Singilis_amoenulus

Glycia amoenula Semenov 1889: 400

Material examined. Syntypes: Turkestan, W. Balassoglo leg. (1♂ 1♀, ZIN); TURKMENISTAN: SW Turkmenistan, Beki-Bent, 15.V.1952, Romadina leg. (1♂, ZIN); Kara-Bogaz, 40 km N Kizyl-Arvat, 14.IV.1952, Il'ichev leg. (1 ex., ZIN); W Kopet-dag, 15 km S Iskender, 15.V.52, Kir'janova leg. (1♀, ZIN); SW Turkm., vall. of Divan, 15 km W Chat, 4.V.1952 (1♀, ZIN); Turkm., 13 km S Kizil-Arvat, 25.IV.52 (1♂, ZIN); Chardzhou, Amu-Dar'ja riv., 8.VIII.1910, N. Androsov leg. (2♂♂ 2♀♀, ZIN); Kushka, Zakaspiisk reg., 16.VI.1912, leg. V. Kozhanchikov (2♂♂, ZIN); Kushka, 29.VII.1910 (3♂♂ 5♀♀, ZIN); Turkm., Eroilan-Duz, 1.V.1968, G. Medvedev leg. (1♀, ZIN); Tamdytau, Aktau, 4.V.1965, Medvedev leg. (1♂, ZIN); Turkm., Kara-Kala, Sjumy, IX.1931 (1♂, ZIN); Turkmenia (1♀, NMPC). UZBEKISTAN: Termez, Buhara, 3.VII.1912, Kirichenko leg. (1♀, ZIN).

Diagnosis. Instantly recognizable by the combination of cordate pronotum, elongate and flat elytra, intervals with single uninterrupted row of conspicuous setiferous pores bearing long setae. In sympatric *S. solskyi* intervals of elytra with 2–3 irregular and dense rows of big setiferous pores.

Redescription. Length 5.9–6.2 mm. Red-brown, with wide piceous postmedian band on elytra (Fig. 4).

Head smooth, very distinctly microsculptured, finely punctulate, punctures separated by 2–4 diameters. Clypeus with few punctures at base. Eyes normal, with 3–5

setae at posterior margin. Second supraocular seta located just anterad the posterior margin of eye. Temples long, smooth. Scape with a very long subapical seta and several short setae; pedicel and antennomere III each with a single band of apical setae. Antennae pubescent from the mid-length of antennomere IV.

Pronotum cordate, smooth, 1.1 times as wide as head and 1.27 times as wide as long, widest right behind marginal setae. Anterior margin straight, anterior angles effaced, sides strongly sinuate towards base. Posterior angles acute, prominent. Lateral margin narrow. Discal punctation sparse and shallow, somewhat sparser than on head. Posterior pore right in front of angle. Lateral and basal setae long. Basal grooves punctiform. Pronotal base rugosely punctate, extended in a rounded median lobe. Microsculpture as on head.

Each interval of elytra with a single regular row of long sparse setae, interval 8 with two rows of setae. Setae as long as the width of interval 3 at its widest. Pores deep, punctiform, separated by three diameters. Microsculpture of elytra and scutellum irregularly polygonal, shallower than on head and pronotum. Elytral apices weakly obliquely sinuate, rounded at suture. Striae deep and punctate. Intervals almost flat throughout.

Legs pale brownish. Tarsomere V with 4 pairs of ventral setae, two basal pairs very short. Claws with 3 denticles on basal half. Venter entirely brownish yellow. Episterna smooth. All abdominal sterna with long pubescence.

Distribution. Kazakhstan, Turkmenistan, Uzbekistan.

***Singilis solskyi* nom. n.**

Glycia bicolor Solsky 1874: 35 [nec Rambur 1837]
Agatus (Phloeozetoeus) taschkensis Jedlička 1961b: 163

Material examined. Holotype: ♀, red label: *Singilis taschkensis* sp. n., det. Ing. Jedlička, red label: Typus, White label: Tshingan, Taschkent (NMPC); AFGHANISTAN: Farah, W Sindand, 900m, 3.XI.1970, Kabakov leg. (2 ex., ZIN). IRAN: NO Iran, W v. Meshed, 21.VI.1963, Kasy & Vartian (1 ex., NHMW). KAZAKHSTAN: confluence of Arys riv., Syr-Daria, Chimkent, 21.V.1898 (1 ex., ZMM); Syr-Daria reg., pass near Baigakum, Dzhulek, D. Glazunov leg. (5 ex., ZMM); Baigakum (1 ex., ZMM); S Kazakhstan, Karatau Mt. Rng., 40 km N Igilik vill., Kurkal, N43°47'003", E68°03'138", 543m, light trap, 8.V.2010, Ivanov A.V. leg. (3♂♂ 3♀♀, AAC). TAJIKISTAN: Shaartuz env., Chiligor-Chashme, 19.IV.1960, Lopatin leg. (1 ex., ZMM); Aruk-tau Mt. Rng., Gandzhina, 1000–1200m, 24.IV.1962, Kryzhanovskii leg. (1 ex., ZMM). TURKMENISTAN: Kushka, Zakaspiisk reg., 10.VI.1912, Kozhanchikov leg. (2 ex., ZMM); Badhyz, Eroulanduz, 12.IV.80, H. Atamuradov leg. (1 ex., ZMM); SE Turkmenistan, Gaz-Giadyk mt.rng., Akar-Cheshme, 6.IV.1977, Dolin leg. (1 ex., ZMM); Tedzhen' riv., Akar-Cheshme, Zakaspiisk reg., 5.V.1895 (1 ex., ZMM); Imam-Baba (6 ex., ZMM); SE Turkmenistan, Giaz-Gadyk Mt. rng., Akar-Cheshok, 6.IV.1977, Dolin leg. (1♂, ZIN); Turkmenia, Zulphager Mts. Rg., 38 km SE Pulikhetun, 13.IV.93 (1♂, AAC). UZBEKISTAN: Samarkand env., Chahryn, 1.IV.1912 (1 ex., ZMM); Samarkand (2 ex., ZMM); Kugitantau, led mines, 14.IV.1959,

Medvedev leg. (1 ex., ZMM); Buhara, Dzham, 22.V.06, G. Suvorov leg. (1 ex., ZMM); Taschkent (1 ex., ZMM); Guzar-Tengi, Horan, Buhara, 28.IV.1987, Kaznakov leg. (1 ex., ZMM); Zerbant, W Buhara, 27.IV.1912 (1 ex., ZMM); Buhara, Kizil-Al'ma, 17.V.1910, Zarudnyi leg. (1 ex., ZMM); Turcest. Taschkent (1 ex., ZMM); Turcest., Tashkent (2 ex., ZIN). LOCALITY NOT IDENTIFIED: Turkestan, Sahsar, 1892 (1 ex., ZMM).

Diagnosis. This species is most similar to the sympatric *S. makarovi*, new species. This species shares with *S. makarovi* the presence of 2–3 irregular and dense rows of big setiferous pores on all intervals of elytra, bearing long setae. The two species can be diagnosed easily by the propleura, wavy rugate in *S. solskyi*, smooth in *S. makarovi*.

Redescription. Length 6.8–8.0 mm. Head, pronotum, basal third of elytra, thorax, legs, and antennae red-brown; suture, apical 2/3 of elytra, and abdominal sterna black (Fig. 5).

Head microsculptured, deeply irregularly punctate, punctures near eyes sometimes almost confluent, on the frons separated by more than three diameters and on the vertex by 1–2 diameters. Clypeus sparsely punctate. Eyes large and bulging, with numerous strong setae at posterior margin. Second supraocular seta located just anterad the posterior margin of eye. Temples smooth. Scape with a very long seta and a few short thin setae scattered throughout; pedicel with a band of apical setae; antennomere III with numerous setae on apical half. Antennae pubescent from the basal third of antennomere IV.

Pronotum shinier than head and elytra, 1.18 times as wide as head, 1.34 times as wide as long, widest in front of marginal setae. Anterior margin straight, anterior angles effaced, sides very broadly and evenly rounded, slightly sinuate towards posterior angles, which are rectangular. Disc shiny, very sparsely and irregularly punctate, punctures separated by 2–5 diameters, transversely confluent towards lateral margins. Lateral margins narrow, flat towards base. Posterior pore right in front of angle. Basal grooves shallow, rugose, confluently punctate. Pronotal base extended in a rounded median lobe. Furrow fine and reduced. Microreticulation faint.

Elytra pubescent. Each interval with 1–2 irregular rows of setiferous pores from base to apex. Setae as long as mesotarsomere IV. Interval 7 flat, as wide as adjacent intervals. Microsculpture polygonal, deep and irregular, same as on head. Apices slightly sinuate. Striae slightly punctate, shallower on disc and at apices. Intervals slightly convex at base, flat at apex.

Tarsomere V with 5 pairs of ventral setae. Propleura rugose. Mes- and metepisterna smooth. Claws with 5 teeth, basal teeth very small. All abdominal sterna pubescent; pubescence long and dense, as on elytra.

Aedeagus – Fig. 30. Median lobe apex elongate, slightly downturned at narrowly rounded apex. Internal sac with one large and compact spicular field made up of mid size spines.

Distribution. Afghanistan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan.

Comments. This species was described as *Glycia bicolor* (Solsky, 1874) (Types: Samarkand, Karasu, near Katty-Kurgan, 25.IV.1869; and Ulus riv., 1869). Now that *Agatus* has been synonymized with *Singilis*, *Singilis bicolor* (Solsky, 1874) has become a junior homonym of *Singilis bicolor* Rambur, 1837, and should be replaced. We propose the name *solskyi* nom. n. for *Singilis bicolor* (Solsky, 1874), nec Rambur, 1837.

Name derivation. Named after the Russian entomologist Semyon Solsky who first described this species.

***Singilis makarovi* sp. n.**
urn:lsid:zoobank.org:act:CE03FEA8-980B-4D45-9643-334A88A6513C
http://species-id.net/wiki/Singilis_makarovi

Material examined. Holotype: ♂, Tajikistan, Petr 1 mt. rng., western Sangvor, Luli-Harvi, deciduous forest, 23.VIII.1975, leg. V. Yanushev (MPU). Paratype: ♀, same label (MPU).

Diagnosis. This species is most similar to *S. solskyi*, with diagnostic differences listed under that species.

Description. Length 6.0 mm. Head, pronotum, and legs red-brown. Venter red-brown, except black abdominal sterna. Elytra black, with basal third red-brown (Fig. 6).

Head densely punctate, very distinctly microsculptured and pubescent; pubescence as long as on pronotum and elytra, and equal to the width of the sutural elytral interval. Punctures near eyes sometimes almost confluent, on the frons separated by over twice their diameter. Clypeus smooth, very distinctly microsculptured. Eyes large and bulging, with 4–5 long setae at posterior margin. Second supraocular seta located just anterad the posterior margin of eye. Temples very short, smooth. Scape with a very long subapical seta and several more, rather long, setae; pedicel with a band of setae; antennomere III with two bands of apical setae. Antennae pubescent from the basal third of antennomere IV.

Pronotum evenly setose, 1.22 times as wide as head, 1.36 times as wide as long, widest near marginal setae. Anterior margin weakly emarginate, anterior angles effaced, sides broadly evenly rounded, sinuate towards posterior angles, which are acute and protrude as minute denticle. Punctation uniform and deep, somewhat shallower than on the head, especially on the disc of pronotum. Lateral margin moderately explanate in basal half only. Posterior pore right in front of angle. Basal grooves shallow, small, punctiform. Pronotal base extended in a rounded median lobe. Furrow fine, not reaching apical and basal margins. Microsculpture as on head.

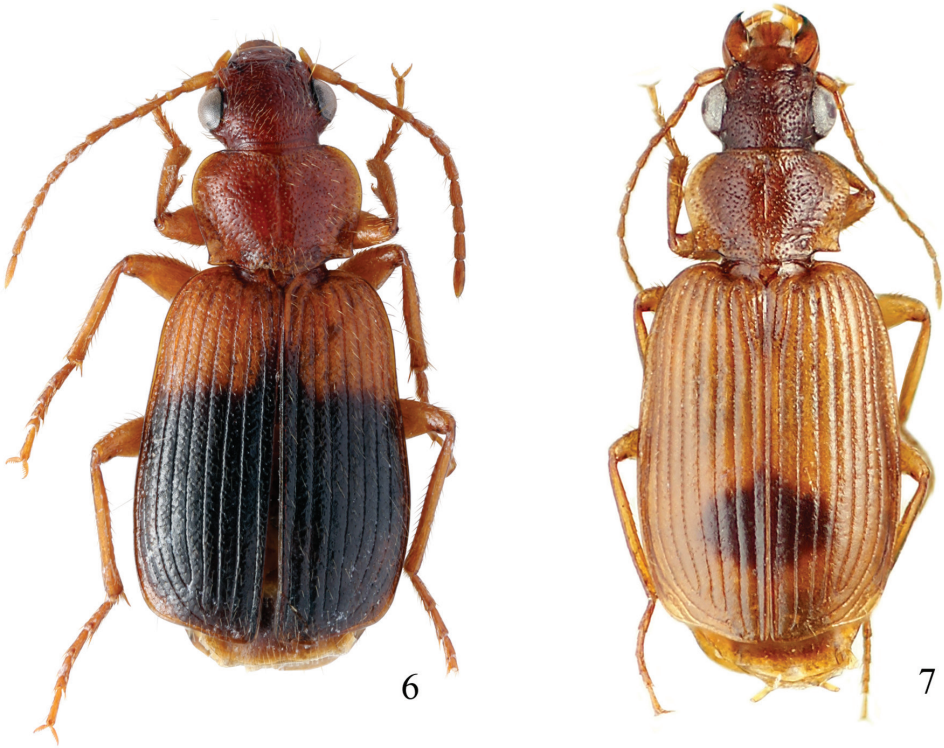
Elytra: All intervals with confused punctation, conspicuous polygonal microsculpture and long, pale pubescence. Apices weakly obliquely sinuate, rounded at suture. Striae deep and crenulate. Intervals almost flat on disc, slightly convex at base and flat towards apex. Scutellum smooth.

Tarsomere V with 4–5 pairs of ventral setae. Claws with 5 teeth, of which apical three very long. Prosternum, propleura and mesepisterna smooth. Abdominal sterna pubescent.

Aedeagus – Fig. 31. Aedeagal median lobe moderately broad, ventral margin straight nearly to apex. Apex broad, slightly downturned and expanded near broadly rounded tip. Internal sac with big size spines.

Name derivation. Named after Dr. Kirill V. Makarov.

Distribution. Tajikistan.



Figures 6–7. Habitus of *Singilis*: **6** *S. makarovi* sp. n., Paratype **7** *S. timidus* sp. n., Paratype (Iran, Lorestan).

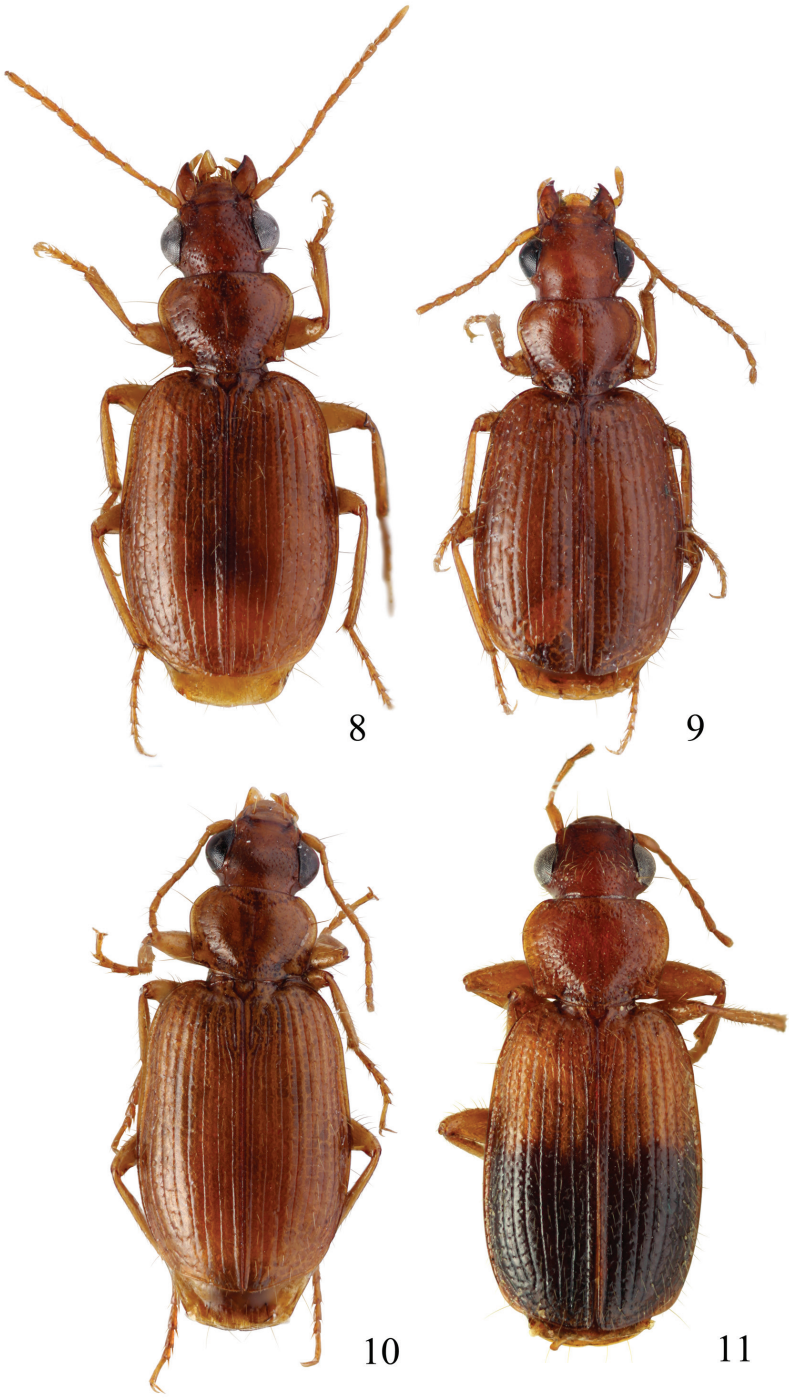
***Singilis kabakovi* sp. n.**
urn:lsid:zoobank.org:act:BA3EF765-DA34-4DEB-B5B7-DF59061031A6
http://species-id.net/wiki/Singilis_kabakovi

Material examined. Holotype: ♂, Afghanistan, Herat, NW Adraskan, 20.XI.1971, leg. Kabakov (ZIN). Paratypes: Afghanistan, Ghazni, W Moqur, 2300 m, 11.IX.1972, leg. Kabakov (1♀, ZIN); Iran, Khorasan, Torbat-e-Heydariyeh, 5 km S Zharf, 14.V.2007, leg. A. Anichtchenko (1♂, AAC); small green rectangle and a white label "Christoph collection" (in Russian) meaning Schahrud, Persia 1870–1873 (1♀, ZIN).

Diagnosis. This plus *S. kolesnichenkoi* sp. n., *S. klimenkoi* sp. n. and *S. timuri* sp. n. constitute a quartet of species consisting of small-bodied beetles, with convex, subovate elytra and long pubescence (Figs 8–11). *S. kabakovi* alone has the elytra with weak, diffuse, grey postmedian band, sometimes reduced to sutural spot and intervals 2, 4 and 6 without setiferous pores.

Description. Length 5.2–5.8 mm. Red-brown, with postmedian sutural infuscation on elytra (Fig. 8).

Head smooth, microsculptured, uniformly punctate, punctures separated by 1–2 their diameters. Clypeus impunctate. Eyes moderately convex, with a few relatively



Figures 8–11. Habitus of *Singilis*: **8** *S. kabakovi* sp. n., Paratype (Iran, Khorasan, E Torbat e Heidarieh, 5 km S Zharf) **9** *S. kolesnichenkoi* sp. n., Holotype **10** *S. klimenkoi* sp. n., Paratype **11** *S. timuri* sp. n., Holotype.

long setae at posterior margin. Second supraocular seta located just anterad the posterior margin of eye. Temples short and smooth. Scape with a very long seta at 2/3 of its length and a few thin setae towards the apex; pedicel with a single, apical band of setae; antennomere III with a few additional setae towards apex. Antennae pubescent from the basal fourth of antennomere IV.

Pronotum smooth, shinier than head, 1.14 times as wide as head, 1.2 times as wide as long, widest at marginal setae. Anterior margin straight, anterior angles slightly prominent, sides very broadly and evenly rounded, conspicuously sinuate towards posterior angles, which are acute. Punctation irregular, sparser and shallower than on the head. Explanate lateral margin rapidly widened from apex, broad and flat to slightly reflexed at base. Lateral and apical setae very long. Posterior pore right in front of angle. Basal grooves punctate. Pronotal base extended in a rounded median lobe. Furrow variable. Microsculpture subtle, slightly transversely polygonal.

Elytra infuscate behind middle, infuscation may reach just one or two innermost intervals, or extend to lateral margins. Intervals 1, 3, 5, 7, 8 pubescent throughout, and interval 6 pubescent in apical half, each with an irregular row of large setiferous pores. Setae as long as the width of interval 4 at its widest. All intervals convex at basal third and slightly convex from there to apex. Interval 7 convex from base to mid-length. Microsculpture deep, irregularly polygonal. Apex slightly sinuate. Striae deep, punctate, shallower at apex.

Legs brownish yellow. Tarsomere V with 3 pairs of ventral setae. Mes- and metepisterna smooth. Claws with 4 moderately long teeth. Venter evenly brownish yellow. All abdominal sterna pubescent, pubescence as long as on elytra.

Aedeagus – Fig. 32.

Name derivation. Named after Oleg Kabakov, a famous Russian coleopterist.

Distribution. Afghanistan, Iran.

***Singilis kolesnichenkoi* sp. n.**
urn:lsid:zoobank.org:act:8E48510D-B30F-4F18-BAAD-8C3EA324DE80
http://species-id.net/wiki/Singilis_kolesnichenkoi

Material examined. Holotype: ♀, Iran, Kerman, Sirjan, 8 km N Balvard, 11–12.V.2007, leg. A. Anichtchenko (ZIN).

Diagnosis. Among the species consisting of small-bodied beetles, with convex, subovate elytra and long pubescence, *S. kolesnichenkoi* is diagnosable by the smooth head, and almost smooth, cordate pronotum; rows of setiferous punctures on intervals 3–5 widely interrupted; setiferous pores on all intervals large; body coloration uniformly red brownish.

Description. Length 4.6 mm. Uniformly red-brown, with venter and legs paler (Fig. 9).

Head smooth, distinctly microsculptured, very sparsely minutely punctulate, punctures sometimes barely visible. Clypeus and labrum distinctly microsculptured. Eyes

moderately large, each with 3 long setae behind. Second supraocular seta located immediately basad the posterior margin of eye. Temples long, smooth. Scape with a very long subapical seta and several small setae; pedicel and antennomere III each with a single band of apical setae. Antennae pubescent from the mid-length of antennomere IV.

Pronotum smooth, cordate, 1.07 times as wide as head, 1.3 times as wide as long, widest just behind marginal setae. Anterior margin straight, anterior angles effaced, sides broadly and regularly rounded, slightly sinuate towards base, posterior angles obtuse. Disc very sparsely punctate. Anterior margin with a few big punctures, basal part with large punctation reaching along lateral margins 1/3 of pronotal length. Lateral margin narrowly explanate from apex, slightly wider at base. Posterior pore right in front of angle. Basal grooves shallow. Pronotal base extended in a rounded median lobe. Furrow long and fine. Microsculpture as on the head.

Elytra suboval, convex, with strong polygonal microsculpture. Each interval with a series of very large setiferous pores in a single row. In the discal part of intervals 2–5 pores may be smaller or rows interrupted. Setae as long as the combined width of intervals 1 and 2. Scutellum smooth and shiny, without microsculpture. Elytral apices truncate, weakly obliquely sinuate, rounded at suture. Striae crenulate at base, finely punctate elsewhere. Intervals slightly convex.

Legs pale brownish yellow. Tarsomere V with 2 pairs of short ventral setae. Claws with 4 minute denticles near base. Abdominal sterna smooth, shiny, with sparse short setae.

Name derivation: Named after my friend, Dr. Kirill Kolesnichenko.

Distribution. Iran.

***Singilis klimenkoi* sp. n.**

urn:lsid:zoobank.org:act:D6BA6713-9986-4CEF-8A12-31A49154979C
http://species-id.net/wiki/Singilis_klimenkoi

Material examined. Holotype: ♂, SE Iran, Sistan, 100 km SE Zahedan, Tamin, 2100m, 3.V.2006, leg. A. Klimenko (ZIN); Paratype: ♂, same label (AAC).

Diagnosis. Among the quartet of species consisting of small-bodied beetles, with subovate elytra and long pubescence (Figs 8–11), easily distinguishable by the single uninterrupted row of widely spaced setiferous pores on all elytral intervals and uniformly yellow brownish coloration.

Description. Length 4.7–5.1 mm. Uniformly yellow-brown, legs paler (Fig. 10).

Head smooth, very distinctly microsculptured, finely punctulate, punctures separated by 2 to 4 diameters. Clypeus impunctate. Eyes large and bulging, with 2–3 short setae at posterior margin. Second supraocular seta located just anterad the posterior margin of eye. Temples short, smooth. Scape with a very long subapical seta and several short setae; pedicel and antennomere III each with a single band of apical setae. Antennae pubescent from mid-length of antennomere IV.

Pronotum smooth, 1.08 times as wide as head, 1.38 times as wide as long, widest right behind marginal setae. Anterior margin straight, anterior angles effaced, sides

almost straight basad the widest point. Posterior angles obtuse. Lateral margin narrow, 2–3 transverse wrinkles at base. Discal punctation sparse and shallow, somewhat sparser than on head. Posterior pore right in front of angle. Lateral and basal setae long. Basal grooves punctiform. Pronotal base extended in a rounded median lobe. Furrow deep and short. Microsculpture as on head.

Elytra shinier than head and pronotum. Each interval with a single irregular row of sparse setae; setae longer than the width of interval 3 at its widest. Setiferous pores large and flat, sparser on intervals 3 and 5 than elsewhere. Microsculpture polygonal, more delicate than on head and pronotum. Apices weakly obliquely sinuate, rounded at suture. Striae very finely punctate. Intervals slightly convex at base and flat at apex. Scutellum microsculpture as on elytra.

Tarsomere V with 4 pairs of ventral setae, two basal pairs very short. Claws with 3 denticles in basal half. Venter brownish yellow throughout. Episterna smooth. Abdominal sterna with long pubescence.

Aedeagus – Fig. 33. Aedeagal median lobe moderately broad, ventral surface straight at midlength, apical fourth of lobe slightly downturned, tip long. Internal sac with compact field of large spines.

Name derivation. Named after Alexei Klimenko who collected the specimens.

Distribution. Iran.

***Singilis timuri* sp. n.**

urn:lsid:zoobank.org:act:323A6D0C-1849-4218-BB17-48ECCE673ADB
http://species-id.net/wiki/Singilis_timuri

Material examined. Holotype: ♂, Aman-Kutan, merid. versus, ab Samarkand, 14.V.65 (ZMM).

Diagnosis. Among the quartet of small-bodied species, with convex, subovate elytra and long pubescence (Figs 8–11), *S. timuri* is diagnosable by the black apical half of elytra.

Description. Length 5.1 mm. Red-brown with apical half of elytra black; anterior margin of the dark area blurry and perpendicular to suture (Fig. 11).

Head sparsely feebly punctate on the frons and between eyes, with punctures separated by 4 to 7 diameters, deeply and densely punctate elsewhere, with punctures separated by their diameter towards head base. Head and clypeus very distinctly microsculptured throughout. Clypeus smooth. Head pubescent, pubescence as long as on pronotum and elytra and as long as width of second interval. Eyes moderately large and bulging, with 4–5 long setae at posterior margin. Second supraocular seta located just anterad the posterior margin of eye. Temples short, smooth. Scape with a very long subapical seta and several more, rather long, setae; pedicel with a band of setae; antennomere III with two apical bands of setae. Antennae pubescent from the basal third of antennomere IV.

Pronotum 1.22 times as wide as head, 1.33 times as wide as long, widest near marginal setae. Anterior margin straight, anterior angles effaced, sides broadly and regularly rounded, sinuate at base, posterior angles rectangular. Punctation confused and coarse, punctures large, shallower and larger towards the furrow and anterior angles. Disc convex, uniformly setose. Lateral margin slightly explanate in basal half only. Posterior pore right in front of angle. Basal grooves flat, densely punctate. Pronotal base extended in a rounded median lobe. Furrow deep, almost reaching anterior margin and ended short of the base by length of antennomere III. Microsculpture as on head.

Elytra subovate, with polygonal microsculpture. Each interval with a series of large setiferous pores in a single irregular row. Scutellum smooth. Elytral apices truncate, weakly obliquely sinuate, rounded at suture. Striae deep and slightly crenulate. Intervals slightly convex.

Legs red-brown. Protarsomere IV small and narrow. Tarsomere V with 4 pairs of ventral setae. Claws with 3 long apical teeth and one tiny denticle. Abdominal sterna black, pubescent throughout. Prosternum, propleura and mesepisterna smooth.

Aedeagus – Fig. 34. Aedeagal median shaft slightly arcuate between basal bulb and elongate, narrow apex with tightly rounded tip. Internal sac with few large spines.

Name derivation. Named after Timur (Tamerlane), the fourteenth-century conqueror of Asia.

Distribution. Uzbekistan.

***Singilis discoidalis* (Mateu, 1986)**
http://species-id.net/wiki/Singilis_discoidalis

Phloeozeteus discoidalis Mateu 1986: 200

Material examined. EGYPT: Aegyptus, Faggala (1♀, NMPC); Le Caire (1♀, MNHN). ISRAEL: Arava-Tal, S Zofar, 18.II.1987, 0 m, leg. Schawaller & Schmalfuss (1♂, SMNS). YEMEN: Lahj, X.2000, malaise trap, leg. A. v. Harten & A. Sallam (1♂ 1♀, SMNS).

Diagnosis. Most similar in overall appearance and small size to *S. turcicus*, but with pronotum strongly transverse and pronotal punctures spaced twice as far apart as those on the head.

Redescription. Length 4.5–4.8 mm. Winged. Ferrugineous or testaceous red with a dark preapical sutural spot reaching interval 4 or 5 (Fig. 16).

Head obtuse, rather wide, slightly convex to flat between the eyes, with numerous large and deep punctures (mixed with wrinkles near eyes) that become sparser towards the neck. Frons without punctures. Eyes large and convex.

Pronotum punctate, slightly wrinkled, transverse, subconvex, considerably broader than head, strongly rounded in front, with anterior angles effaced. Sides rounded, with a long sinuation in front of posterior angles, which are acute. Pronotal margin broadly

explanate, basal impressions fairly deep. Pronotal base projected at the middle, median furrow moderately wide and deep.

Elytra approximately 1/3 longer than broad, sides subparallel, almost obliquely truncate at apex which is weakly sinuate. Striae, including the scutellar stria, fairly deep and finely punctate; intervals weakly convex, with two pores on interval 3.

Microsculpture strong, especially on forebody where the cells are small and rather isodiametric, but cells become more transverse towards the sides of pronotum. Elytra with finer microsculpture of larger, subquadrate cells, and thus appearing shinier than the forebody.

In male, protarsomeres I–III slightly dilated.

Aedeagus – Fig. 35. Aedeagal median lobe elongate, straight, with notch in middle, emphasized by a thickening in the manner of a sagittal crest. Tip of aedeagus slightly curved to right. Internal sac with small spicular field made up of small spines.

Distribution. Egypt (country record), Israel (country record), Saudi Arabia, Yemen.

***Singilis turcicus* (Jedlička, 1963a)**
http://species-id.net/wiki/Singilis_turcicus

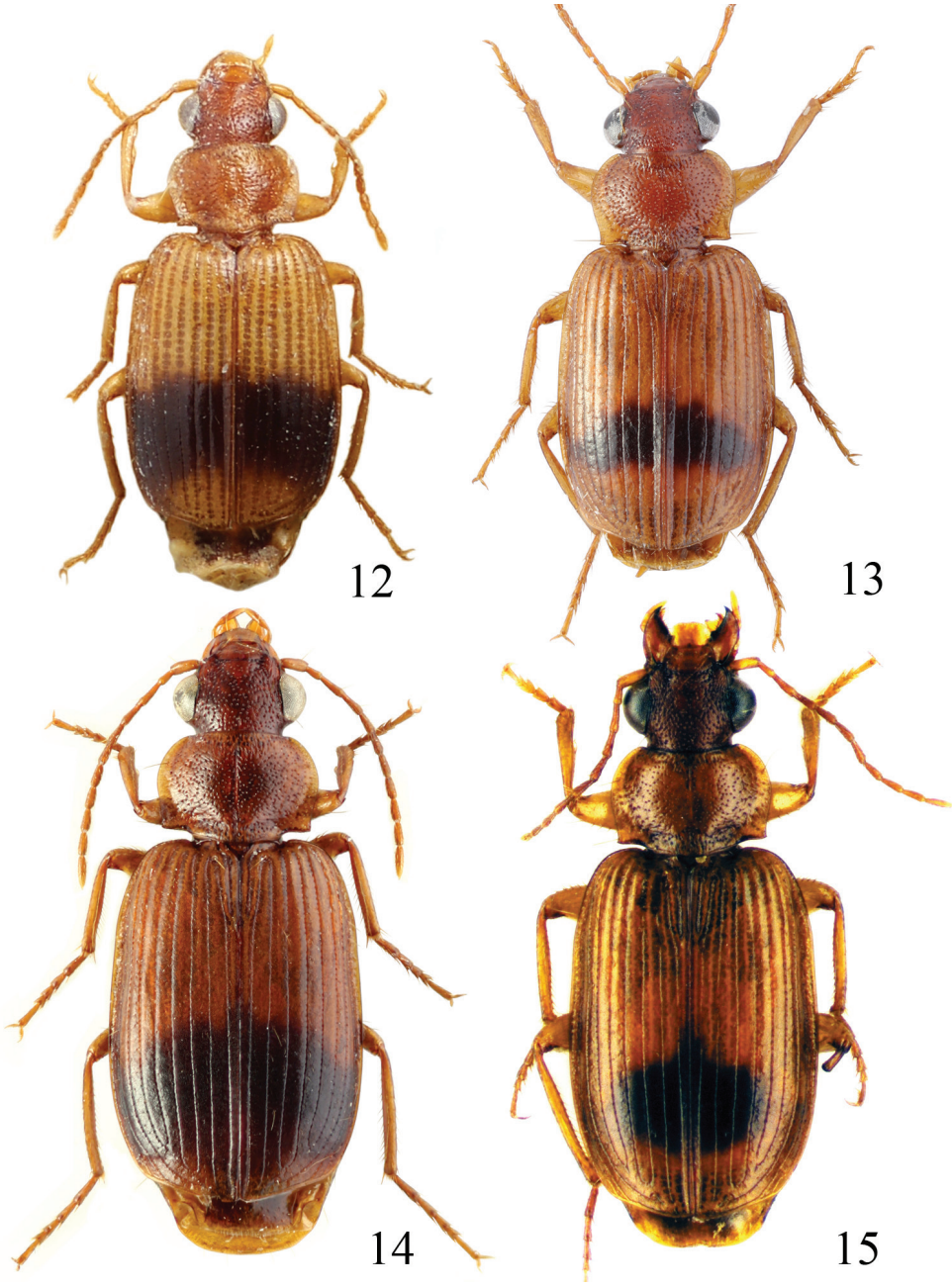
Phloeozetteus turcicus Jedlička 1963a: 6

Material examined. Holotype, ♀, red label: *Phloeozetteus turcicus* sp. n. det. Ing. Jedlička; white label: Türkei, Marasch, 12.V.60, leg. Seidenstücker (ZSM). ARMENIA: Syunik prov., E Meghri, Artsvakar gorge, 650m N38°55', E46°16', light, 8.VI.2007, Kalashian leg. (1♂, IZEC). IRAN: Chaharmahal-va-Bakhuyari prov., 10 km E Chaman Goli, 7–8.VI.2008, 3500m, Anichtchenko A. leg. (1♂, AAC); Fars, near Sarvestan, 8.V.2007, Anichtchenko A. leg. (1♂, AAC); Fars, 10 km SW Kharameh, 31.V.2008, Anichtchenko A. leg. (1♂, AAC); Kerman, Qohrud mts., 10 km E Korin, 3500m, 13.V.2007, Anichtchenko A. leg. (2♂♂, AAC); Kohgiluyeh-va-Boyer Ahmad, 20 km SW Yasuj, 5–6.V.2007, Anichtchenko A. leg. (1♀, AAC); SW Iran, Fars, Sivand NE Shiraz, 1770 m, 3008N 5255E, lux, 15.VII.2004, M. Rejzek leg. (3♂♂ 1♀, DWWC); W Iran, Lorestan, 25 km NWW Dorud, 1874m, 3333N 4853E, lux, 8.VII.2004, M. Rejzek leg. (1♂, DWWC); Kerman env., Deh Bala, 14.V.2003, Orszulik leg.(1♂ 1♀, KOC). ISRAEL: Jerusalem, 11.IX.1904 (1♀, NMPC).

Diagnosis. This species is most similar to *S. discoidalis*, with diagnostic differences listed under that species.

Redescription. Length 4.3–5 mm. Yellowish red-brown, elytra with black pattern behind middle that varies from continuous band reaching lateral margins to small grey sutural spot (Figs 12–13).

Head microsculptured, deeply and uniformly punctate, punctures separated by about their diameter but denser in frontal depressions. Clypeus with few scattered



Figures 12–15. Habitus of *Singilis*: **12** *S. turcicus* (Jedlička, 1963a), Holotype **13** *S. turcicus* (Armenia, Syunik prov., E Meghri, Artsvakar gorge) **14** *S. mesopotamicus* Pic, 1901 (S Iran, 65km N Bandar Abbas) **15** *S. mesopotamicus* (Iran, Kerman, 15 km E Korin).

punctures. Eyes large and bulging, with 4–5 very short setae at posterior margin. Temples short and smooth. Scape with a very long seta at 2/3 of its length and a few short thin setae towards the apex; pedicel with a band of apical setae; antennomere III with two bands of setae (at mid-length and at apex). Antennae pubescent from mid-length of antennomere IV.

Pronotum 1.21–1.27 times as wide as head, 1.42–1.45 times as wide as long, widest just behind the marginal setae. Anterior margin straight, anterior angles effaced, sides very broadly and regularly rounded, slightly sinuate towards posterior angles, which are rectangular or slightly acute, protruded as minute denticle. Discal punctation similar to that of head, but shinier due to more delicate microsculpture. Pronotum at apex and base rugulose and densely punctate. lateral margins narrowly explanate from anterior angle to lateral setae, then widened basally, broad and flat at base. Posterior pore anterad angle. Pronotal base extended in a rounded median lobe. Furrow short and fine.

Elytra in the middle 1.36–1.4 times as long as wide. Intervals 1, 3, 5 and 7 each with minute setae visible only in lateral view at high magnification, and two irregular rows of minute sparse setiferous pores from base to apex. Interval 7 convex in basal half and narrower than interval 6. Microsculpture polygonal. Apices slightly sinuate. Striae slightly punctate, shallower on disc and towards apex. Intervals slightly convex at base, flat at apex.

Legs brownish yellow. Tarsomere V with 5 pairs of ventral setae. Propleuron weakly rugose towards coxae. Mes- and metepisterna smooth. Claws with 4 teeth. Venter brownish yellow. All abdominal sterna with short pubescence, no longer than mesotarsomere IV.

Aedeagus – Fig. 36. Aedeagal median lobe slender, ventral surface straight at midlength. Endophallic spines quite uniform in size, less numerous than in *S. mesopotamicus*.

Variation. Varies in body size and extent of dark elytral pattern (complete band to faint spot).

Distribution. Armenia (country record), Iran (country record), Israel (country record), Turkey.

Singilis mesopotamicus **Pic, 1901**

http://species-id.net/wiki/Singilis_mesopotamicus

Singilis (Phloeozeteus) plagiata var. mesopotamica Pic 1901: 89
Singilis (Phloezetaeus) apicalis Jedlička 1956: 204, **syn. n.** (synonymy presumed; type of *S. mesopotamicus* Pic, 1901, unavailable).
Phloeozetus plagiatius mesopotamicus: Kabak 2003: 438

Material examined. AFGHANISTAN: S Jalalabad, S Agam 2000 m, 23.XII.1970, Kabakov leg. (1♀, ZIN); 20 km NO Kabul, 2000m, 10.IV.1970 Kabakov (1♂ 3♀♀,

ZIN); same locality, 15.IV.1971 (1♂, ZIN); Ghazni W Moqur 2300m, 5.X.1972, Kabakov (1♂ 2♀♀, ZIN); same locality, 11.IX.1972 (1♀, ZIN); Kondahar, Ghbargay 2000 m, 20.III.1973, Kabakov (2♀♀, ZIN); Ghor Saghar 2500 m, 14.VIII.1970 (1♂, ZIN); Heart, NW Adraskan 26.X.1971 (1♂, ZIN); same locality, 20.XI.1071 (1♀, ZIN). IRAN: Chaharmahal-va-Bakhuyari prov., 10 km E Chaman Goli, 7–8. VI.2008, 3500m, Anichtchenko A. leg. (2♂♂, AAC); Kerman, Qohrud mts., 10 km E Korin, 3500m, 13.V.2007, Anichtchenko A. leg. (2♀♀, AAC); S Iran, Kerman prov., Balt area, Korin v., 17–19.V.2008, A. Klimenko leg. (1♂, AAC); Kerman prov., 15 km E Korin, 2800–3300m, Kuh-e-Lalehzar mt., 17–19.V.2008, Anichtchenko A. leg. (1♂, AAC); Kerman, Sargad, 24–26.VI.1898, N. Zarudnyi leg. (1♀, ZIN); same locality, 25–27.VIII.1898 (1♂, ZIN); same locality, 30.IV.1901 (1♀, ZIN); Perse, Bender-Bouchir, Dr. Bussieres, 1905 (1♀, MNHN); S Iran, 65 km nördl. Bandar-Abbas, 30.III.1972, Exped. Mus. Vind. (1 ex, NHMW). IRAQ: Bagdad, coll. Kálalová (6♂♂ 4♀♀, NMPC); Bagdad, Irak, coll. Kálalová (4 ex., NMPC); Bagdad, Ex Musaeo H.W. Bates 1892, Museum Paris, 1952, Coll. R. Oberthür (2♂♂ 2♀♀, MNHN). PAKISTAN: NW Pakistan, prov. Swat, 71°90' L/ 35°70' B, Madyan, 1400 m, am Licht, 19.VI–4.VII.1971, leg. C. Holzschuh (2♂♂, NMPC); Northwest frontier Prov. Barseen, 35°21'42N, 73°12'42E, 900m, at light, No 26, 21.VII.1998, G. Csorba & L. Ronkay (1♂ 1♀, NHMW). TURKEY: Abanc-Sae, Preczmann, Aspock, Radda, 26.V.67 (1♀, NHMW).

Diagnosis. Very similar in both external and aedeagal anatomy to *S. turcicus*. The widespread *S. mesopotamicus* somewhat varies in size, pronotal punctation, and elytral pattern. Endophallic anatomy in each species is rather uniform throughout its range, and the differences are minor and require further study. *S. turcicus* tends to be smaller, with elytra shorter and wider than in *S. mesopotamicus*, while the latter has a more transverse pronotum. In *S. turcicus*, the elytral spot is located immediately behind the middle, often restricted to innermost intervals, and never reaches elytral apices that are widely red-brown; while in *S. mesopotamicus* the spot is a bit farther posteriorly and usually reaches the apices (sometimes narrowly red-brown). Endophallic spine size is clearly different; small spines more numerous than in *S. turcicus*.

Redescription. Length 5.0–6.3 mm. Yellowish brown, elytra behind the middle with piceous spot that may reach apical and lateral margins but sometimes not extended beyond interval 6 and often leaving elytral apices brownish red (Figs 14–15).

Head microsculptured and deeply irregularly punctate, punctures sometimes almost confluent in frontal depressions, on the frons separated by more than 3 diameters. Clypeus with a few punctures near base. Eyes large and bulging, with no setae at posterior margin. Second supraocular seta located just anterad the posterior margin of eye. Temples short and smooth. Scape with a very long seta and a few short thin setae; pedicel with a band of apical setae; antennomere III with two bands of setae (at mid-length and at apex). Antennae pubescent from the basal third of antennomere IV.

Pronotum pale yellow, sometimes shinier than head, 1.16–1.18 times as wide as head, 1.4–1.47 times as wide as long, widest just behind the marginal setae. Anterior margin straight, anterior angles effaced to slightly marked, sides very broadly and even-

ly rounded, slightly sinuate towards posterior angles, which are rectangular (normally) to subacute. Punctation, especially on disc, normally sparser and more delicate than on head; confluent and rugose towards lateral and posterior margins. Lateral explanate margin rapidly widens basad lateral setae, broad and flat at base. Posterior pore right in front of angle. Basal grooves shallow, punctate. Pronotal base extended in a rounded median lobe. Furrow variable. Microsculpture isodiametric.

Elytra 1.45–1.52 times as long as width in the middle. Intervals 1, 3, 5 and 7 each with minute setae and two irregular rows of pores from base to apex, often poorly visible. Even intervals may also bear a few setae in apical areas. Interval 7 convex and narrower than the adjacent intervals. Microsculpture nearly isodiametric. Apices slightly sinuate. Striae narrow and slightly punctate. Intervals slightly convex at base and flat behind the middle.

Legs brownish yellow. Metatarsomere V with 3–4 pairs of ventral setae. Propleura slightly wavy rugose towards sternum and coxae. Claws with 5 teeth. Venter brownish yellow throughout. All abdominal sterna pubescent; pubescence as short as on metatarsomere IV.

Aedeagus – Fig. 37. Aedeagal median lobe slender, ventral surface straight at midlength, apical fifth of lobe slightly downturned, tip long.

Variation. Varies in size, elytral pattern (dark spot may be reduced), shape of posterior pronotal angles (usually acute and prominent but may be rectangular and less prominent). In almost all specimens from Afghanistan the apical spot reaches elytral apices, and the series of punctures in intervals 5 and 7 are shorter. Pakistani specimens have more convex elytral intervals.

Comments. Jedlička (1956: 204) described *S. apicalis* from four syntypes (all NMPC): Afghanistan, Nuristan, Bashgultal (3♀♀); Asmar (1♀). Recent catalogues place this species in *Agatus* (Kabak 2003; Lorenz 2005).

S. plagiatus mesopotamicus Pic, 1901, was described from Baghdad. The original description says that the type is in coll. Pic (MNHN), but my attempts to locate it have been unsuccessful. However, 4 specimens of *S. apicalis* labeled "Bagdad" I've found in MNHN match the original description of *S. p. mesopotamicus*. All other *Singilis* specimens (14 total) from Baghdad area I have examined were *S. apicalis*. Therefore I presume *S. apicalis* to be synonymous with *S. mesopotamicus*.

Distribution. Afghanistan, Iran, Iraq (country record), Pakistan (country record), Turkey (country record), Turkmenistan.

***Singilis fuscoflavus* (Felix & Muilwijk, 2009)**
http://species-id.net/wiki/Singilis_fuscoflavus

Phloeozeteus fuscoflavus Felix and Muilwijk 2009: 125 (in Felix 2009)

Material examined. HOLOTYPE: ♀, 5063 UAE, Hatta, 24°49'N, 56°07'E, 24–30.V.2006, light trap, leg. A. van Harten (UAEIC); Paratypes: 4578, same locality,

8–24.IV.2006 (2♀♀, RFC). OMAN: Oman bor., Prov. Batinah, Al-Jabal al-Ahdar mts., SE Rustaq, W Awabi, 430 m, Wadi Bani Awi, 23°20'0.13''N, 57°29'23.5''E, L. fang + L. fallen, 29–30.XII.2009 leg. Lehmann, Bittner & Stadie (1♂, APC).

Diagnosis. This species can be recognised easily by the wide and small size body (4.8–5.4 mm), strongly transverse, very densely punctate pronotum and uniformly yellow pale body colour.

Redescription. Length 5.1–5.6 mm. Pale brownish yellow, with no dark elytral pattern (Fig. 17).

Head pale yellowish red-brown, slightly darker than pronotum, very distinctly microsculptured and very coarsely and deeply irregularly punctate. Punctures sometimes almost confluent, sometimes separated by over two diameters. Clypeus twice as long as labrum. Eyes very large and bulging, with a few small setae at posterior margin. Second supraocular seta located just anterad the posterior margin of eye. Temples very short, smooth. Scape with a very long subapical seta and several rather long setae; pedicel and antennomere III each with a single band of apical setae. Antennae pubescent from the mid-length of antennomere IV. Antennomeres IV and V each slightly shorter than antennomere III. Antennomere V 2.5 times as long as wide at apex.

Pronotum 1.25 times as wide as head, 1.57 times as wide as long, widest just behind marginal setae. Anterior margin straight, anterior angles effaced, sides broadly and evenly rounded, slightly sinuate towards posterior angles, which are acute and form a minute denticle. Punctation coarse, irregular and deep, somewhat sparser than on head, especially on the disc. Punctures sometimes confluent, especially towards the sides of disc. Lateral explanate margin narrow at apex, rapidly widened basally. Posterior pore right in front of angle. Basal grooves shallow. Pronotal base extended in a rounded median lobe. Furrow very short and fine and does not reach anterior margin (by about the length of antennomere I) or the base. Microsculpture as on head.

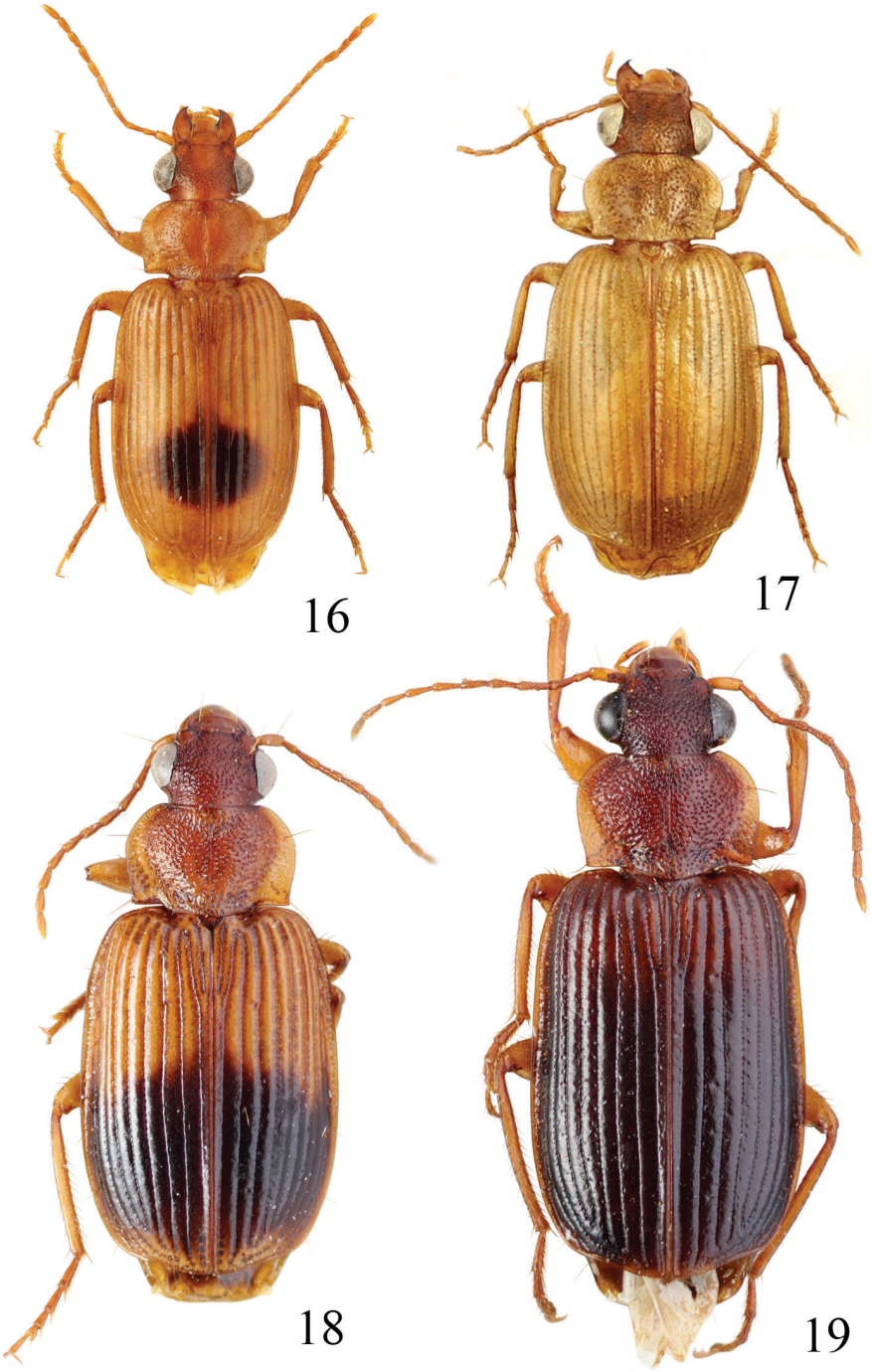
Elytra generally concolorous with pronotum, with the apical third perhaps slightly darker. Intervals 1, 3, 5 and 7 with several minute, barely visible setae. Microsculpture lighter than on head and pronotum, so elytra seem shinier than head and pronotum. Scutellum with similar microsculpture. Elytral apices weakly obliquely sinuate, rounded at suture. Striae shallow, crenulate. Interval 8 convex over most of its length, slightly flattened towards apex; interval 7 convex only at shoulder; other intervals slightly convex near base and flat at apex.

Tarsomere V with 3 pairs of ventral setae. Claws with 4 teeth. Venter testaceous, abdomen slightly infuscated. Metathoracic process margined, with 4 long setae. Abdominal sterna pubescent; the last two also with scattered longer setae.

Variation. In the holotype, last abdominal sternum with 6 setae (3 on each side), irregularly placed. One of the paratypes has 4 setae (two on each side) and one has 5 setae: 3 on one side and 2 on the other.

Aedeagus – Fig. 38. Aedeagal median lobe straight euventrally for much of length between basal bulb and slightly downturned, elongate, narrow apex with tightly rounded tip. Internal sac without apparent spicules.

Distribution. UAE, Oman (country record).



Figures 16–19. Habitus of *Singilis*: **16** *S. discoidalis* (Mateu, 1986) (Israel, Arava-Tal, S Zofar) **17** *S. fuscoflavus* (Felix & Muilwijk, 2009) (Oman bor., Prov. Batinah) **18** *S. plagiatus* (Reiche & Saulcy, 1855) (Libanon, O v. Saida) **19** *S. libani* Sahlberg, 1913 (Israel, Golan Mach).

***Singilis fuscipennis* Schaum, 1857**
http://species-id.net/wiki/Singilis_fuscipennis

Singilis fuscipennis Schaum 1857: 258

Material examined. GREECE: Attica, Dr. Krüper (1♂, NHMW); Graecia, Parnass, Collect. Hauser (2♂♂, NHMW); Dedeagač, Graecia sept. (1♂, NMPC). SYRIA: Al Lathqiyan env., Slenfe env., 1500m, 30–31.V.1998 Josef Mertlik leg. (1♂, DWWC); Syria (1♀, NMPC). TURKEY: Anatolia m., Toros Daglari 900m, 25 km NW Erdemli, 6.VI.1991, S. Kadlec leg. (1♂, NHMW); Bogaz Roy, 12.VII.1989, H. Schmid leg. (1♂, NHMW); Asia Minor, Akschehir (1♂, NHMW); vill. Icel 24–26.V.1995, Erdemli env., 8 km NW of Arslanli, Josef Mertlik leg. . (1♂, DWWC); Asia min., 1.V.1969, Burdur, Antalya, Wewalka leg. (1♂, NMPC); prov. Adana, 20 km NW of Erdemli, 13–15.VI.1992, V. Bíša & Z. Koščál leg. (1♂, DWWC).

Diagnosis. This species is most similar to *S. libani*, sharing a body form and coloration pattern, but is smaller and can be diagnosed easily by pronotum, i.e., *S. libani* has strongly transverse and very densely punctate pronotum. The aedeagal median lobe apex is broader and shorter than in *S. libani*.

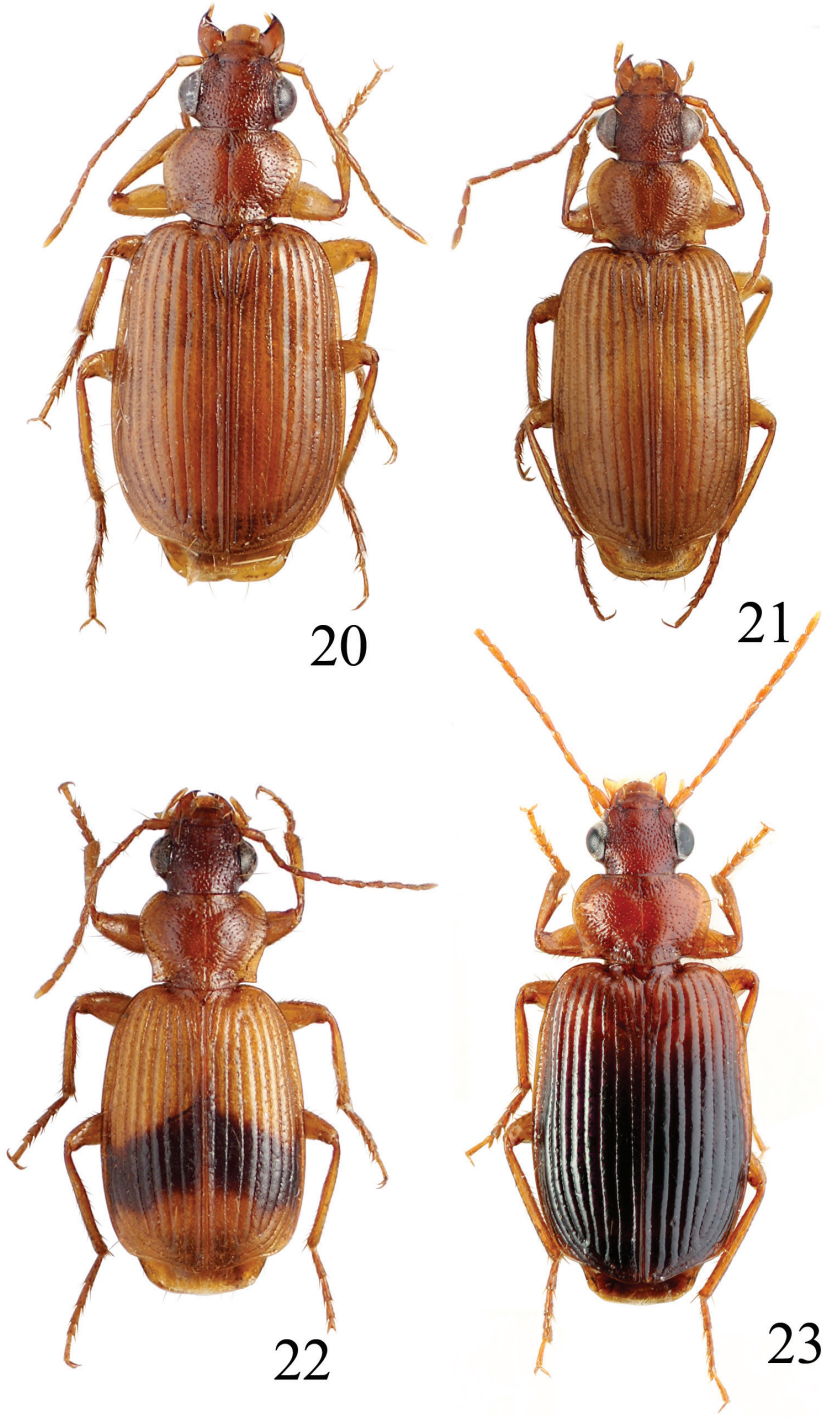
Redescription. Length 5.1–5.9 mm. Head and pronotum brown; elytra piceous to black, with paler lateral margins and a poorly defined triangular area in basal ¼, sometimes extended along suture (Fig. 23).

Head very deeply and densely punctate, strongly microsculptured; punctures sometimes confluent near eyes, separated by a diameter on the vertex. Clypeus impunctate. Eyes large and bulging, with a few very short setae at posterior margin. Second supraocular seta located just anterad the posterior margin of eye. Temples short and smooth. Scape with a very long seta at 2/3 of its length and a few short thin setae; pedicel with a band of apical setae; antennomere III with two bands of setae (at mid-length and at apex). Antennae pubescent from mid-length of antennomere IV.

Pronotum 1.23–1.27 times as wide as head, 1.45–1.5 times as wide as long, widest just behind marginal setae. Anterior margin straight, anterior angles slightly prominent, sides very broadly and evenly rounded, slightly to conspicuously sinuate towards posterior angles, which are acute. Punctation coarse, irregular and deep, somewhat sparser towards furrow, rugose and confluent towards lateral margins. Lateral explanate margin rapidly widened from the apex, broad and flat at base. Posterior pore right in front of angle. Basal grooves shallow, rugose, confluently punctate. Pronotal base extended in a rounded median lobe. Furrow variable. Microsculpture strong, slightly transverse.

Intervals 1, 3, 5 and 7 with subtle, irregular setiferous punctures bearing minute, barely visible setae. Interval 7 narrow and strongly convex. All intervals convex near base and conspicuously convex elsewhere. Striae deep from base to apex, slightly punctate. Microsculpture strong, polygonal. Apices slightly sinuate.

Legs brownish yellow. Tarsomere V with 3 pairs of ventral setae. Mes- and metepisterna slightly punctate. Claws with 5 teeth. Venter brown, abdominal sterna blackish. All abdominal sterna with short pubescence, no longer than metatarsomere IV.



Figures 20–23. Habitus of *Singilis*: **20** *S. kryzhanovskii* sp. n., Holotype **21** *S. saeedi* sp. n., Holotype **22** *S. loeffleri* Jedlička, 1963b, Holotype **23** *S. fuscipennis* Schaum, 1857 (Turkey).

Aedeagus – Fig. 39. Aedeagal median lobe stout, eudorsal surface slightly curved, apex broad, expanded slightly near broadly rounded tip.

Variation. Varies in body size, in the extent of pale area at elytral base (may be reduced), and depth and length of the pronotal furrow.

Comments. Type locality: Athens, Greece (Schaum 1857: 134).

Distribution. Bulgaria, Greece, Turkey, Syria.

***Singilis libani* J.R. Sahlberg, 1913, stat. n.**
http://species-id.net/wiki/Singilis_libani

Singilis fuscipennis var. *libani* J.R Sahlberg 1913: 37.
Phloeozetus fuscipennis libani: Kabak 2003: 438.

Material examined. ISRAEL: Palestina, Gebatha, 2.IX.1927, collectto Paganetti (1 ex. NHMW); Israel, Golan Mach, Pappelrinde 16.7.1985 (1♂, NHMW); Galil, 8.6.1999, Yoqne'am, I. Trojan (1♂, DWWC). SYRIA: Syria occ., distr. Tartus, Safita env., 400 m a.s.l., 30 km SE of Tartus, 1.V.2000, steppe, S. Benedikt leg. (1♂, DWWC).

Diagnosis. This species is most similar to *S. fuscipennis*, with diagnostic differences listed under that species.

Redescription. Length 6.8–7.0 mm. Head, pronotum, and legs brown, elytra piceous to black, sometimes slightly paler around scutellum. Venter brown, with darker abdomen (Fig. 19).

Head deeply microsculptured, very deeply and densely punctate, less or no more than one diameter distance from each other. Clypeus punctate in posterior half. Eyes big and prominent, with no short setae at posterior margin. Second supraocular seta located just anterad the posterior margin of eye. Temples short and smooth. Scape with a very long seta at 2/3 of its length and a few short thin setae towards the apex; pedicel with numerous setae in apical half; antennomere III pubescent towards apex. Antennae pubescent almost from the base of antennomere IV.

Pronotum 1.30–1.37 times as wide as head, 1.57 times as wide as long, widest just behind marginal setae. Anterior margin emarginate, anterior angles slightly prominent, sides very broadly rounded, not sinuate at posterior angles, which are rectangular and protrude as minute denticle. Punctation very coarse, as dense or denser than on head. Lateral explanate margin rapidly widened from the apex, broad and flat at base. Posterior pore right in front of angle. Basal grooves shallow, rugose, confluently punctate. Pronotal base extended in a rounded median lobe. Furrow usually shallow, fine, and incomplete. Microsculpture same as on head.

Elytra piceous to black, sometimes with base narrowly paler. Intervals 1 and 7 with a single row, 3 and 5 with two rows of irregular setiferous pores. Setae minute, barely visible. Interval 7 convex and narrow in basal half. Microsculpture polygonal to almost isodiametric. Apices slightly sinuate. Striae deep, punctate. All intervals convex at base, slightly convex at apex; outer intervals convex throughout.

Legs brownish yellow. Tarsomere V with 4–5 pairs of ventral setae. Claws with 4 long teeth. Epimera slightly rugose. Mes- and metepisterna smooth. Venter brownish yellow, with 3–4 apical sterna darker. Abdomen with short pubescence.

Aedeagus – Fig. 40. Aedeagal median lobe moderately broad, median shaft straight on ventral surface, apical sixth of lobe subangulately downturned, tip slightly pointed.

Comments. Originally described as a subspecies of *S. fuscipennis* Schaum, 1857 (Sahlberg, 1913: 37) based on a single specimen from Jabal al-Baruk in central Lebanon ("Baruk Mt., Libani, IV.1819, Syr.").

Distribution. Israel, Lebanon, Syria.

***Singilis plagiatus* (Reiche & Saulcy, 1855)**
http://species-id.net/wiki/Singilis_plagiatus

Coptodera plagiata Reiche and Saulcy 1855: 578.
Phloeozetus plagiatus plagiatus: Kabak 2003: 438.

Material examined. Type: ♂, Syrie (MNHN). JORDAN: Petra, Taybeh, 21.V.1994, W.G. Ullrich (1♀, DWWC). LEBANON: Appl, Beirut, 1878 (2♂, NHMW); Libanon, O v. Saida, 9–16.V.1963 Kasy & Vartian; "Phloeozetaeus apicalis Jedl. det. Ing. Jedlička" (1♂, NHMW).

Diagnosis. Among the species consisting of beetles with strongly transverse and very densely punctate pronotum, easily diagnosable by bicoloured elytra, with apical half black.

Redescription. Length 5.5–6.2 mm. Head, pronotum and ventral segments ferrugineous, apical half of elytra piceous (Fig. 18).

Head very coarsely and deeply punctate on the sides and towards base, more sparsely on the frons, and very distinctly microsculptured. Punctures near eyes often confluent. Clypeus smooth, with distinctly microsculpture. Eyes large and bulging, with no short setae at the posterior margin. Second supraocular seta located just anterad the posterior margin of eye. Temples very short, smooth. Scape with several setae besides the very long subapical one; pedicel with a band of apical setae; antennomere III in apical half with several setae besides the usual apical ones. Antennae pubescent from the basal fourth of antennomere IV.

Pronotum transverse, 1.17 times as wide as head, 1.4–1.48 times as wide as long, widest just behind marginal setae. Anterior margin straight, anterior angles effaced or faintly marked, sides broadly and evenly rounded, sinuate towards posterior angles, which are acute. Punctation coarse and irregular, punctures (especially on disc) generally smaller and sparser than on head, sometimes confluent (especially on the sides of disc). Lateral explanate margin uniform near apex, rapidly widened, wide and flat towards base. Posterior pore right in front of angle. Basal grooves shallow. Pronotal base extended in a rounded median lobe. Furrow variable. Microsculpture less distinct than on head.

Elytra shinier than head and pronotum. Each interval with 1–2 rows of minute, inconspicuous setae. Microsculpture more delicate than on head and pronotum. Apices weakly obliquely sinuate, rounded at suture. Striae slightly punctate, deep at base and at shoulders, shallower on disc. Interval 7 not much more convex and narrow than interval 6. Intervals slightly convex at base, flat at apex.

Legs brownish yellow. Protarsomere V with 3 pairs of ventral setae, metatarsomere V with 4 pairs. Claws with 4 teeth. All abdominal sterna pubescent, pubescence as long as on tarsi.

Aedeagus – Fig. 41. Aedeagal median lobe slightly arcuate to apex, apex long. Internal sac with microtrichial patches composed of extremely small spicules.

Variation. Varies in body size, density and size of pronotal punctures, and length of furrow.

Comments. Type locality per original description is Beirut (Reiche and Saulcy 1855: 578–579).

Distribution. Jordan, Lebanon. (Iraq, Israel, and Saudi Arabia records need confirmation.)

***Singilis filicornis* Peyerimhoff, 1907**
http://species-id.net/wiki/Singilis_filicornis

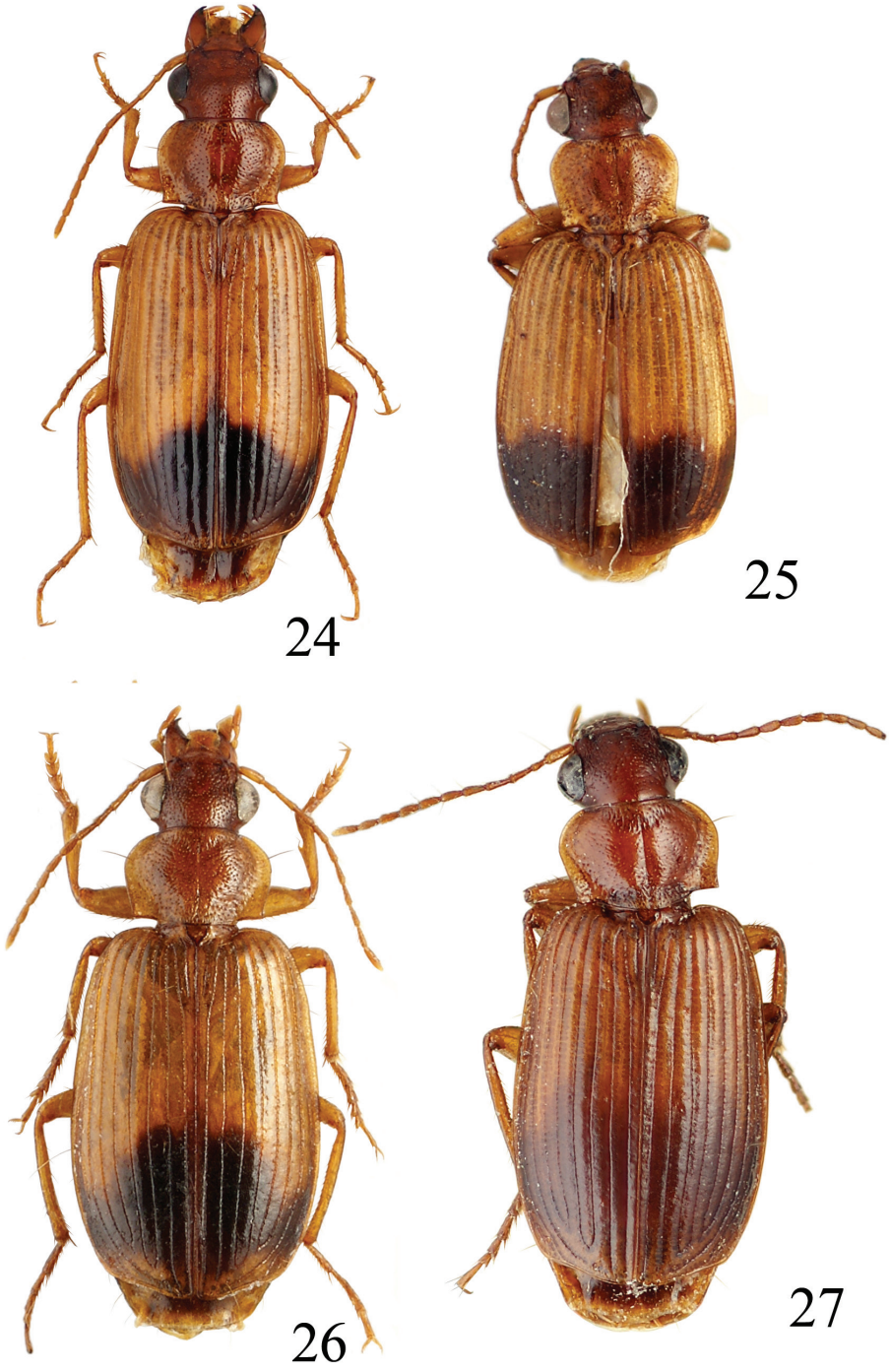
Singilis (Phloeozetaeus) filicornis Peyerimhoff 1907: 8.
Phloeozetus filicicornis: Kabak 2003: 438; Lorenz 2005: 480.

Material examined. Type: ♂, Sinai, ouadi Sa'al, 25.II.1902; Sinai, O. Saal (1♀, MNHN); ISRAEL: Negev 12 km NW Elat, Oberh. En Natafim, 17.II.1987, 600m, Schawaller & Schmalfuss leg. (1♀, SMNS); Negev, Meshar-Ebene, 14.II.1987, 300 m, Schawaller & Schmalfuss leg. (1♀, SMNS); Negev, 12 km NW Elat, Oberh. En Natafim, 17.II.1987, 600m, Schawaller & Schmalfuss leg. (1♀, DWWC).

Diagnosis. This species is most similar to the allopatric *S. jedlickai*, new species. The two species can be diagnosed easily by microsculpture of pronotum, i.e., *S. jedlickai* has conspicuously microreticulate pronotum. The aedeagus also differs dramatically (Figs 42–43).

Redescription. Length 6.8–7.0 mm. Reddish brown, with apical third of elytra black (Fig. 24).

Head shiny, densely minutely punctate, punctures sometimes almost confluent in frontal depressions, separated by 1–2 diameters on the frons. Microsculpture scarcely visible. Clypeus with a few punctures near lateral margins. Eyes large and bulging, with 3–4 setae at posterior margin. Second supraocular seta located just anterad the posterior margin of eye. Temples smooth, 2.6 times as short as length of eye. Scape with a very long seta at 2/3 of its length and a few short thin setae towards the apex; pedicel with a band of apical setae; antennomere III with two bands of setae (at mid-length and at apex). Antennae pubescent from mid-length of antennomere IV.



Figures 24–27. Habitus of *Singilis*: **24** *S. filicornis* Peyerimhoff, 1907 (Israel, Negev) **25** *S. jedlickai* sp. n., Holotype **26** *S. felixi* sp. n., Paratype (Oman bor., Prov. Batinah) **27** *S. persicus* (Jedlička, 1961a), Holotype.

Pronotum shiny, without microsculpture, 1.12–1.14 times as wide as head, 1.33–1.4 times as wide as long, widest just behind the marginal setae. Anterior margin straight, anterior angles effaced, sides evenly rounded, considerably to slightly sinuate towards posterior angles, which are acute and protrude as minute denticle. Punctation, especially on disc, sparse, irregular, somewhat sparser than on head, denser towards lateral margins, where may be confluent and rugose. Lateral explanate margin widened basad lateral setae, broad and flat at base. Posterior pore right in front of angle. Basal grooves small and shallow. Pronotal base extended in a rounded median lobe. Furrow fine.

Intervals 1, 3, 5 and 7 each from base to apex with an irregular row of sparse pores bearing extremely short, barely visible setae. At humerus, interval 7 flat or weakly convex and as wide as the adjacent intervals. Microsculpture delicate, polygonal. Apices slightly sinuate. Striae finely punctate. Intervals slightly convex at base and almost flat at apex.

Legs brownish yellow. Tarsomere V with 4 pairs of ventral setae. Propleuron, mes- and metepisterna smooth, shiny. Claws with 3 short teeth and one minute denticle at base. Venter uniformly testaceous. Abdominal sterna smooth, shiny, with sparse long pubescence.

Aedeagus – Fig. 42. Aedeagal median lobe arcuate, apex long; internal sac with small ventral microtrichial field composed of small spines.

Distribution. Egypt, Israel. Iraq and Saudi Arabia records need confirmation.

***Singilis jedlickai* sp. n.**
urn:lsid:zoobank.org:act:4ED74ABF-B482-45CA-9653-A509EF687534
http://species-id.net/wiki/Singilis_jedlickai

Material examined. Holotype: ♂, Afganistan, Kaboul // *apicalis* det. Ing. Jedlička (NMPC).

Diagnosis. Resembles *S. filicornis* in body shape, elongate elytra, the elytral spot, and the slight pronotal punctation, but can be easily distinguished by presence of well-developed spicular fields, composed of large spines, on the male internal sac (Fig. 43).

Description. Length 6.8 mm. Yellowish red-brown, apical third of elytra pitch-brown (Fig. 25).

Head densely finely punctate, slightly isodiametrically microsculptured; punctures confluent and rugose near eyes, separated by 1 to 3 diameters on the frons. Clypeus smooth. Eyes large and bulging, with 3–4 short setae at the posterior margin. Second supraocular seta located just anterad the posterior margin of eye. Temples smooth, 2.6 times as short as eye length. Scape with a very long seta at 2/3 of its length and a few short thin setae towards the apex; pedicel with the usual band of apical setae; antennomere III with two bands of setae, at the middle and apex. Antennae pubescent from mid-length of antennomere IV.

Pronotum 1.13 times as wide as head, 1.28 times as wide as long, widest just behind the marginal setae. Anterior margin slightly concave, sides behind marginal

setae straight, sinuate towards posterior angles, which are rectangular and protrude as minute denticle. Punctation sparse, irregular, punctures (especially on disc) sparser than on head, transversely rugose and confluent along lateral margins. Lateral explanate margin widened from the marginal setae, broad and flat at base. Posterior pore right in front of angle. Basal grooves small and shallow. Pronotal base extended in a rounded median lobe. Furrow thin. Microsculpture faint, isodiametric.

Elytra elongate, in middle 1.46 times as long as wide. Intervals 1, 3, 5 and 7 with conspicuous pores bearing minute, barely visible setae. Microsculpture polygonal. Apices slightly sinuate, rounded at suture. Striae deep and minutely punctate. Intervals 3–7 convex at humerus, gradually flattened towards apices; other intervals slightly convex at base and almost flat at apex.

Legs pale brownish yellow. Tarsomere V with 4 pairs of ventral setae. Claws with three long and one small basal teeth. Venter entirely brownish yellow. Propleuron faintly rugose, episterna smooth. All abdominal sterna with short pubescence.

Aedeagus – Fig. 43. Aedeagal median lobe broad, ventral surface almost straight to apex, apical fourth of lobe slightly downturned. Apex of median lobe long and expanded slightly near rounded tip. Internal sac with huge fields of numerous long and large spines.

Name derivation. Named after the eminent Czech coleopterist Arnost Jedlička.

Distribution. Known from a single male from Kaboul, Afghanistan.

Singilis felixi sp. n.

urn:lsid:zoobank.org:act:155D08B4-9888-4DCA-8D2A-E7991EA0A2C6
http://species-id.net/wiki/Singilis felixi

Material examined. OMAN: Oman bor., Prov. Batinah, Al-Jabal al-Ahdar mts., SE Rustaq, W Awabi, 430 m, Wadi Bani Awi, 23°20'0.13''N 57°29'23.5''E, L. fang + L. fallen, 29–30.XII.2009 leg. Lehmann, Bittner & Stadie (4♂♂ 1♀, AAC, APC). UAE: HOLOTYPE: ♂, UAE, Bithnah, 25.10N 56.14E, 31.XII.2005–29.I.2006, light trap, A. v. Harten (UAEIC); PARATYPES: UAE, Hatta, 24.49N, 56.07E, 8–24.IV.2006, light trap, A. v. Harten (1♂, RFC); UAE, Wadi Safad, 25.13N 56.19E, 20.XII.2005–2.I.2006, light trap, A. v. Harten (2♂♂, RMNH, RFC); UAE, Wadi Safad, 25.13N, 56.19E, 21.02–4.III.2006, light trap, A. v. Harten (1♀, RFC).

Diagnosis. Extremely similar to *S. persicus*, can be diagnosed based on the length of hairs on abdominal sterna. In *S. felixi* the hairs are long, the same or at least 2/3 of length of the apical setae (shorter in *S. persicus*); odd intervals of elytra in *S. felixi* with easily visible short setae along striae (tiny and difficult to see in *S. persicus*).

Description. Length 7.0–8.6 mm. Pale yellowish red-brown, elytra with large piceous preapical spot (Fig. 26).

Head deeply irregularly punctate, microsculptured, punctures sometimes almost confluent in frontal depressions, separated by over three diameters on the frons. Clypeus with few punctures near lateral margins. Eyes large and bulging, with a few short

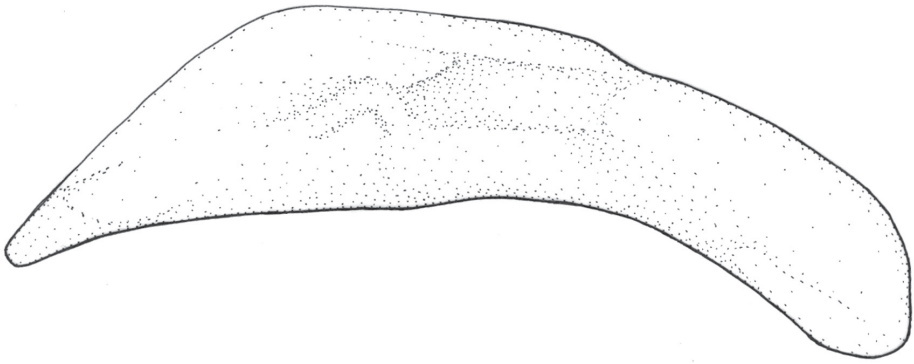


Figure 28. Aedeagus of *S. flavipes* (Solsky, 1874) (Kazakhstan: Karatau mt. rng., 40 km N Igilik vill.).

Figure 29. Aedeagus of *S. cingulatus* (Gebler, 1843) (Kazakhstan: Karatau mt. rng., 40 km N Igilik vill.).

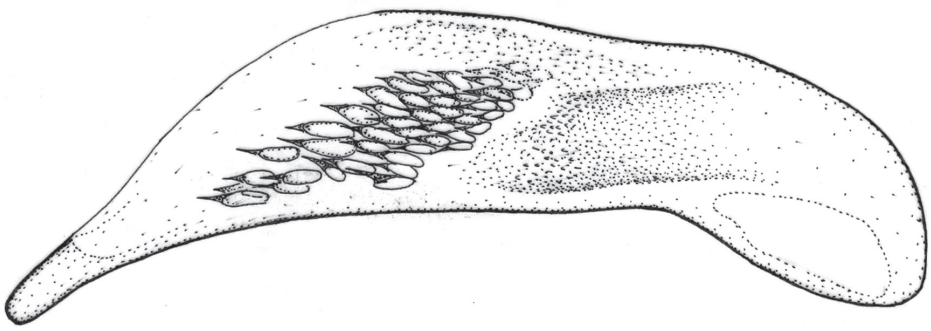


Figure 30. Aedeagus of *S. solskyi* nom. n. (Kazakhstan: Karatau mt. rng., 40 km N Igilik vill.).

setae at posterior margin. Second supraocular seta located just anterad the posterior margin of eye. Temples short and smooth. Scape with a very long seta at 2/3 of its length and a few short thin setae towards apex; pedicel with the usual band of apical

setae; antennomere III with two bands of setae at mid-length and at apex. Antennae pubescent from mid-length of antennomere IV.

Pronotum shinier than head and elytra, 1.16–1.18 times as wide as head, 1.39–1.42 times as wide as long, widest just behind marginal setae. Anterior margin straight, anterior angles effaced, sides very broadly and evenly rounded, slightly sinuate towards posterior angles, which are acute and protrude as minute denticle. Punctation coarse, irregular, deep, somewhat sparser than on head, especially on disc; rugose and confluent at apical and basal margins. Lateral explanate margin rapidly widened from the apex, broad and flat at base. Posterior pore right in front of angle. Basal grooves shallow, rugose, confluently punctate. Pronotal base extended in a rounded median lobe. Furrow deep and complete. Microsculpture faint.

Elytra pale yellowish red-brown, with red brown apices and piceous preapical spot reaching lateral margins (may be reduced to five inner intervals). Intervals 1, 3, 5 and 7 each with minute setae and a row of pores from base to apex. Interval 7 flat, as wide as adjacent intervals. Microsculpture deep, irregular, polygonal, same as on head. Apices slightly sinuate. Striae slightly punctate, shallower on disc and at apex. Intervals slightly convex near base, flat at apex.

Legs brownish yellow. Tarsomere V with 3 pairs of ventral setae. Mes- and metepisterna slightly punctate. Claws with 5 teeth. Venter entirely light brownish yellow. All abdominal sterna with pubescence more than twice as long as protarsomere IV.

Aedeagus (Fig. 44), internal sac without apparent spines.

Variation. Varies in body size; elytral spot sometimes reduced. Pronotal basal angles usually acute and prominent but sometimes rectangular and less prominent.

Name derivation. Named after Ron Felix, my friend and collaborator who discovered this species.

Distribution. Oman (country record), UAE.

***Singilis persicus* (Jedlička, 1961a)**
http://species-id.net/wiki/Singilis_persicus

Phloeozetaeus persicus Jedlička 1961a: 3.
Phloeozetus persicus: Kabak 2003: 438.

Material examined. HOLOTYPE: ♀, S.O. Iran, Djiroft, Anbar-Abad, 1–18.V.1956, W. Richter leg. (SMNS).

Diagnosis. This species is most similar to *S. felixi*, with diagnostic differences listed under that species.

Redescription. Length 7.0 mm. Reddish yellow, with apical third of elytra dark (Fig. 27).

Head microsculptured and rather coarsely punctate. Clypeus punctate in basal half. Eyes with a few small setae at the posterior margin. Second supraocular seta located just anterad the posterior margin of eye. Temples short and smooth. Scape with

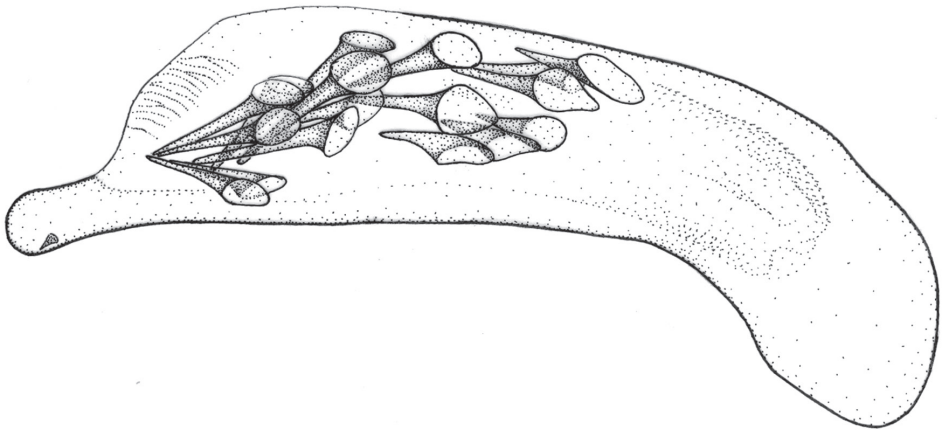


Figure 31. Aedeagus of *S. makarovi* sp. n., Holotype.

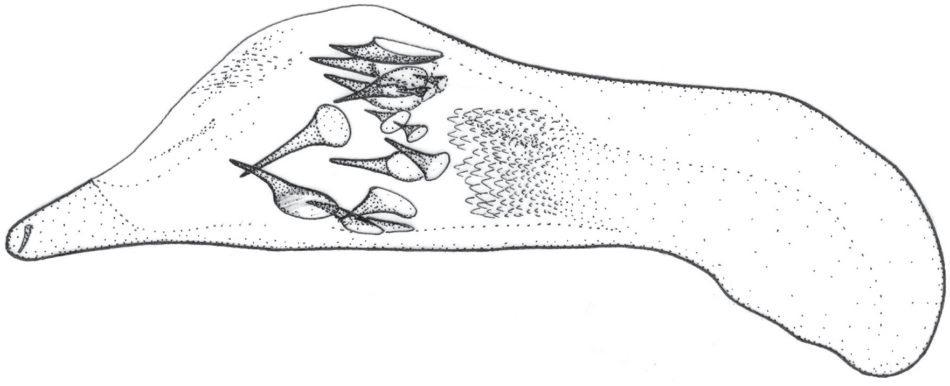


Figure 32. Aedeagus of *S. kabakovi* sp. n., Paratype (Iran: Khorasan, Torbat-e-Heydariyeh, 5 km S Zharf)

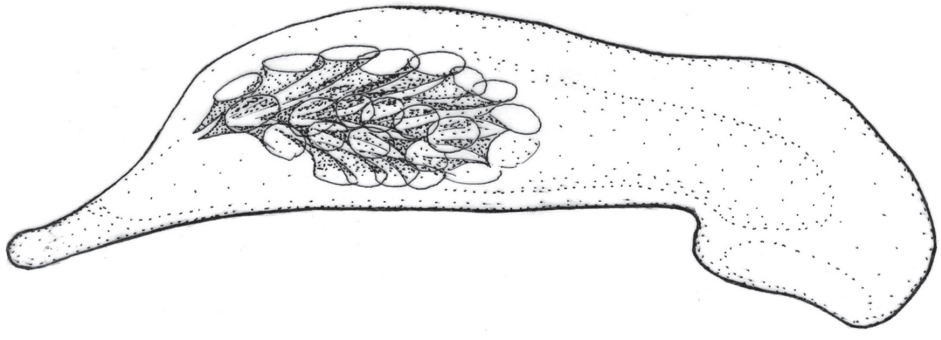


Figure 33. Aedeagus of *S. klimenkoi* sp. n., Holotype.

a very long seta at 2/3 of its length and a few short thin setae towards the apex; pedicel with a band of apical setae; antennomere III with a few setae on apical half. Antennae pubescent from the basal fourth of antennomere IV.

Pronotum brownish yellow, shinier than head and elytra, 1.2 times as wide as head, 1.46 times as wide as long, widest behind the marginal setae. Anterior margin straight, anterior angles effaced, lateral margin very broadly and evenly rounded from anterior angle to marginal setae, almost straight behind that point, slightly sinuate towards posterior angles, which are acute and protrude as minute denticle. Punctation sparse, especially on disc, rugose and confluent at apical and basal margins. Lateral explanate margin widened behind marginal setae, broad and flat at base. Posterior pore right in front of angle. Basal grooves shallow, rugose, confluently punctate. Pronotal base extended in a rounded median lobe. Furrow deep and complete. Microsculpture faint.

Elytra: striae fine, finely punctate. Intervals 1, 3, 5 and 7 with extremely tiny and short setae and row of small pores from base to apex, very difficult to see. Interval 7 at shoulder slightly convex and narrower than the adjacent ones. Microsculpture deep, irregular, polygonal. Intervals slightly convex at base and almost flat at apex.

Legs brownish yellow. Tarsomere V with 3 pairs of ventral setae. Episterna of meso- and metathorax slightly punctate. Claws with 3–4 obtuse teeth. Venter entirely light brownish yellow. All abdominal sterna with pubescence short, no longer than protarsomere IV.

Male unknown.

Distribution. Iran.

***Singilis kryzhanovskii* sp. n.**

urn:lsid:zoobank.org:act:A2F324F9-77EC-4146-8C64-DB9897B38A34

http://species-id.net/wiki/Singilis_kryzhanovskii

Material examined. Holotype: ♂, Iran, Khorasan prov., Gonobad area, 10 km SW Khezri, 1800m, 22.V.2009 Kolesnichenko K. leg.; Paratype: ♂, Kopetdag, 12 km SW Kizyl-Arvat, light trap, 5.VII.1953 Kryzhanovskii leg. (ZIN).

Diagnosis. This new species shares with *S. klimenkoi* and *S. saeedi* the overall appearance and uniformly brownish yellow body coloration. It differs from *S. klimenkoi* by its larger size and by the short and thin setae on elytral intervals. From *S. saeedi* it is differentiated by the presence of weak setiferous pores along only odd elytral intervals, i.e. all elytral intervals of *S. saeedi* with pores along striae. The aedeagus also differs dramatically.

Description. Length 6.3–6.5 mm. Uniformly yellowish red-brown (Fig. 20).

Head very coarsely and deeply irregularly punctate, with distinct isodiametric microsculpture, punctures confluent near eyes, separated by over three diameters on the frons. Clypeus smooth, with a few small punctures near base. Eyes very large and bulging. Second supraocular seta just before the level of the posterior margin of the eye. Temples very short, smooth. Scape smooth, with one very long

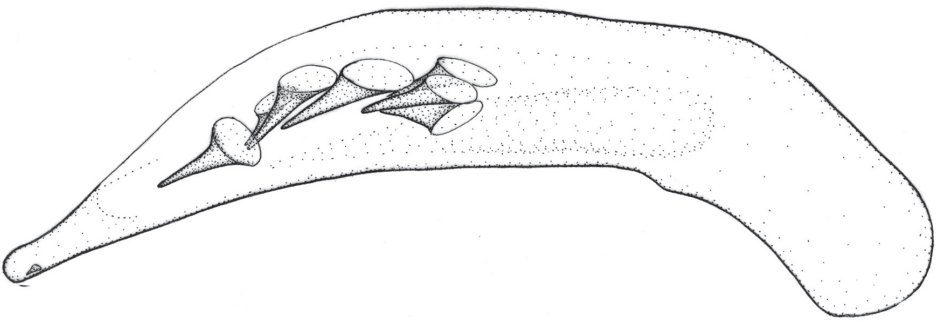


Figure 34. Aedeagus of *S. timuri* sp. n., Holotype.

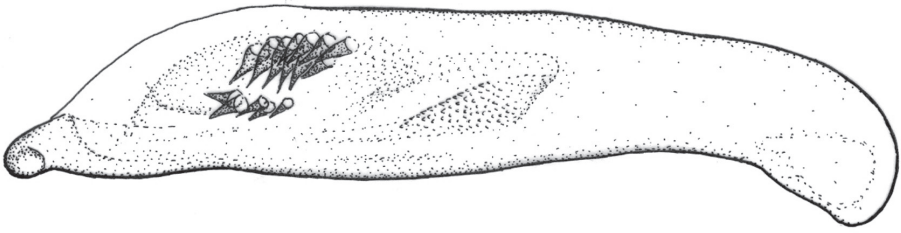


Figure 35. Aedeagus of S. *discoidalis* (Mateu, 1986) (Yemen: Lahj).

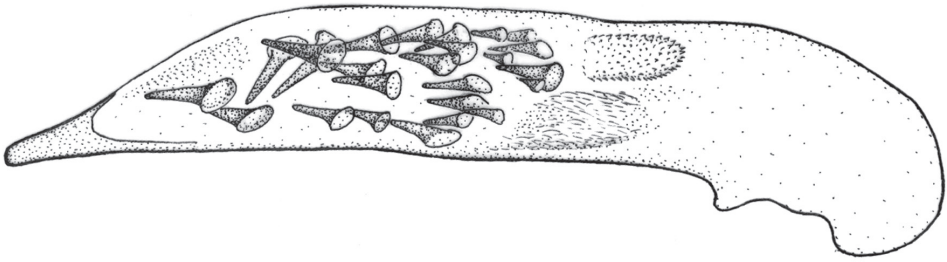


Figure 36. Aedeagus of *S. turcicus* (Jedlička, 1963a) (Armenia: Syunik prov., E Meghri, Artsvakar gorge).

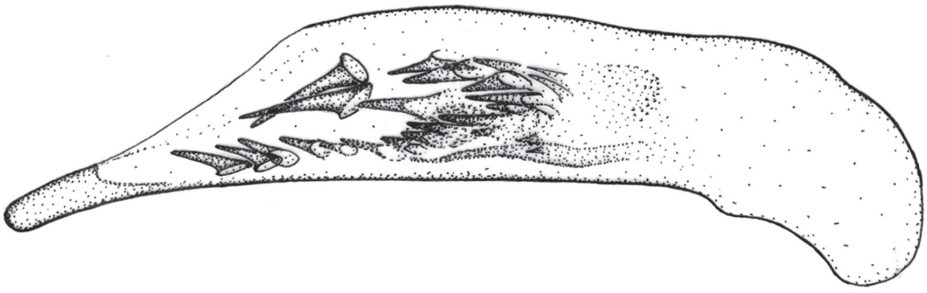


Figure 37. Aedeagus of *S. mesopotamicus* Pic, 1901 (Iran: Kerman, Qohrud mts., 10 km E Korin).

and 3–4 short subapical setae; pedicel with the usual band of apical setae; antennomere III with two bands of apical setae. Antennae pubescent from the basal third of antennomere IV.

Pronotum 1.16 times as wide as head, 1.36–1.42 times as wide as long, widest just behind marginal setae. Anterior margin straight, anterior angles effaced, sides broadly and evenly rounded, slightly sinuate towards posterior angles, which are rectangular and protrude as minute denticle. Punctation irregular, punctures (especially on disc) shallower and sparser than on head, confluent at basal grooves. Lateral explanate margin even from apex to marginal setae, then rapidly widened and flat. Posterior pore right in front of angle. Basal grooves shallow. Pronotal base extended in a rounded median lobe. Furrow deep. Microsculpture as on head.

Elytra subparallel, 1.4 times as long as wide. Intervals 1, 3, 5 and 7 with small pores bearing minute inconspicuous setae. Microsculpture as on pronotum. Apical edge straight, rounded at suture. Striae deep, slightly punctate. Intervals 4–8 convex in basal half, gradually flattened towards apex; other intervals slightly convex at base and flat at apex.

Legs pale brownish yellow. Tarsomere V with 5 pairs of ventral setae. Claws with 5 teeth. Episterna all smooth. Abdominal sterna with long pubescence.

Aedeagus – Fig. 45. Aedeagal median lobe moderately broad, ventral surface straight at midlength, apical fourth of lobe slightly downturned. Apex of median lobe long and expanded slightly near rounded tip. Internal sac with numerous long and large spines.

Variation. In the holotype, elytral intervals are more convex and striae more crenulate than in the paratype, whose striae are almost smooth. However the aedeagal configuration is identical, and so the two specimens are considered conspecific.

Name derivation. Named after the eminent Russian coleopterist Oleg Kryzhanovsky.

Distribution. Iran, Turkmenistan.

***Singilis saeedi* sp. n.**
urn:lsid:zoobank.org:act:E12D7EB6-A5D0-4360-BBB8-CEEE4B3387BF
http://species-id.net/wiki/Singilis_saeedi

Material examined. Holotype: ♂, Iran, Fars, 20 km W Estahban, 2400m, 27–30.V.2008 Anichtchenko A. leg. (ZIN). Paratypes: same locality and date (2♂♂ 4♀♀, ZIN, AAC).

Diagnosis. This new species shares with *S. klimenkoi* and *S. kryzhanovskii* the overall appearance and body coloration, but differs from *S. klimenkoi* by the short and thin setae on elytral intervals. From the other it is differentiated by smaller body size, and presence of weak setiferous pores along all elytral striae, i.e. *S. kryzhanovskii* has only on odd elytral intervals.

Description. Length 5.7–6.7 mm. Uniformly yellowish red-brown (Fig. 21).

Head very coarsely and deeply punctate on sides and towards the base, more sparsely on the frons; punctures near eyes often confluent. Head with very distinct

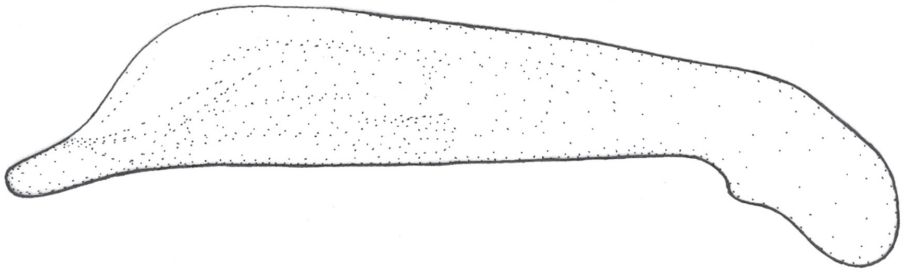


Figure 38. Aedeagus of *S. fuscoflavus* (Felix & Muilwijk, 2009) (Oman).

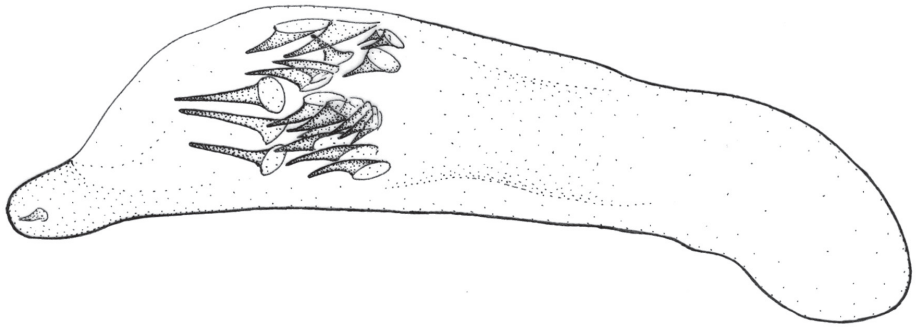


Figure 39. Aedeagus of *S. fuscipennis* Schaum, 1857 (Turkey: Bogaz Roy).

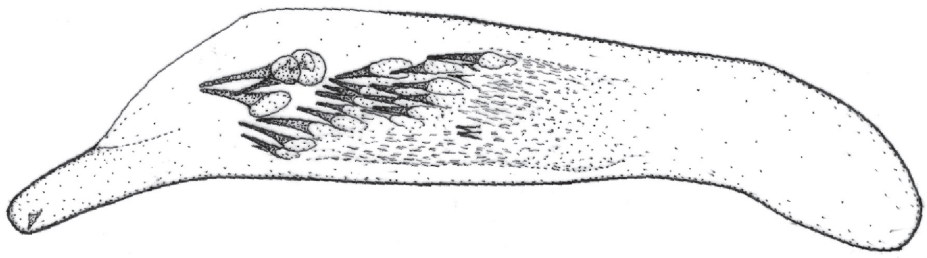


Figure 40. Aedeagus of *S. libani* Sahlberg, 1913 (Israel: Golan Mach).

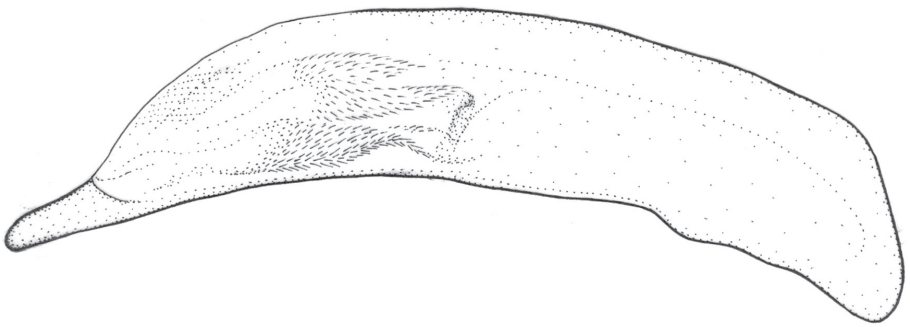


Figure 41. Aedeagus of *S. plagiatus* (Reiche & Saulcy, 1855) (Lebanon: O v. Saida).

microsculpture. Clypeus smooth, with distinct microsculpture. Eyes large and bulging, with no short setae at the posterior margin. Second supraocular seta located just anterad the posterior margin of eye. Temples very short, smooth. Scape with several setae besides the very long subapical one; pedicel with the usual band of apical setae; antennomere III in apical half with several setae besides the usual apical ones. Antennae pubescent from the basal fourth of antennomere IV.

Pronotum 1.17 times as wide as head, 1.4–1.48 times as wide as long, widest just behind marginal setae. Anterior margin straight, anterior angles effaced to faintly marked, sides broadly and evenly rounded, sinuate towards posterior angles, which are acute. Punctation coarse, irregular, punctures (especially on disc) generally smaller and sparser than on head, sometimes confluent (especially on the sides of disc). Lateral explanate margin uniform near apex, rapidly widened, wide and flat towards base. Posterior pore right in front of angle. Basal grooves shallow. Pronotal base extended in a rounded median lobe. Furrow variable. Microsculpture less distinct than on head.

Elytra shinier than head and pronotum. Each interval with 1–2 rows of minute, inconspicuous setae. Microsculpture more delicate than on head and pronotum. Apices weakly obliquely sinuate, rounded at suture. Striae slightly punctate, deep at base and at shoulders, shallower on disc. Interval 7 not much more convex and narrow than interval 6. Intervals slightly convex at base, flat at apex.

Legs brownish yellow. Protarsomere V with 3 pairs of ventral setae, metatarsomere V with 4 pairs. Claws with 4 teeth. Abdominal pubescence as long as tarsal, with no long setae.

Aedeagus – Fig. 46. Aedeagal median lobe stout, eudorsal surface slightly curved, apical third of lobe downturned, apex broad. Internal sac with three long and large spines and one field of small spicules.

Variation. Varies in body size, density and size of pronotal punctures, and length of furrow.

Name derivation. Named after my friend Saeed Mobarra.

Distribution. Iran.

Singilis hirtipennis **Pic, 1901**

http://species-id.net/wiki/Singilis_hirtipennis

Singilis (Phloeozeteus) hirtipennis Pic 1901: 89
Phloeozetus hirtipennis: Kabak 2003: 438.

Type. Syrie, Monts Amanus, Delagrande (in coll. Pic, MNHN). Not examined.

Comments. I failed to locate type specimens in MNHN, including the Pic collection.[1] I have examined one female determined as *P. plagiata* ("ex Musaeo Chaudoir // Museum Paris 1952, coll. R. Oberthür // *plagiata* Reiche, Syrie, Kindermann")

[1] Specimens from the Pic collection are scattered throughout MNHN collection and are difficult to locate.

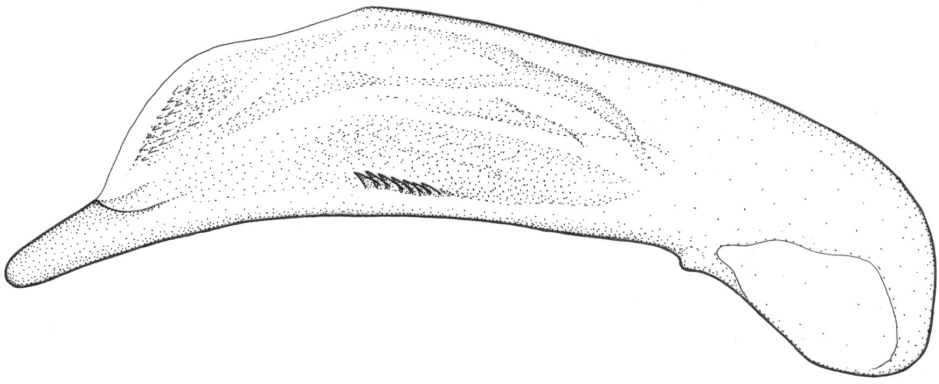


Figure 42. Aedeagus of *S. filicornis* Peyerimhoff, 1907, Holotype.

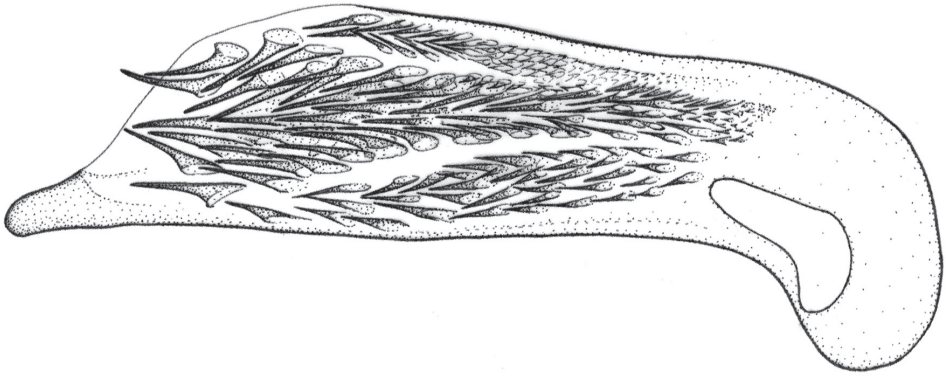


Figure 43. Aedeagus of *S. jedlickai* sp. n., Holotype.

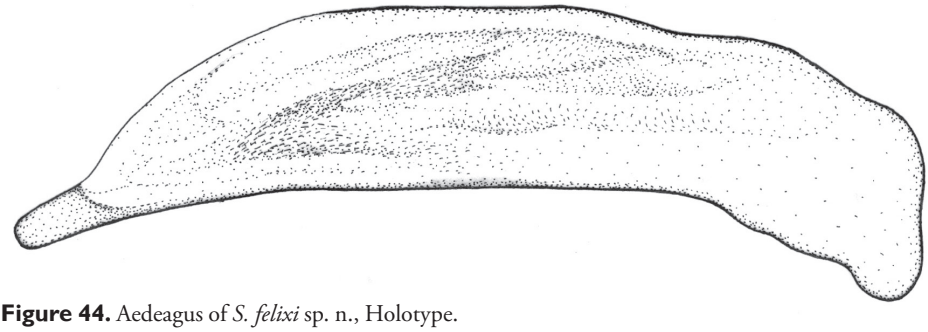


Figure 44. Aedeagus of *S. felixi* sp. n., Holotype.

and reasonably matching the original description of *S. hirtipennis*; I tentatively determined it as *S. loeffleri*; if true, *S. loeffleri* should be considered a junior synonym of *S. hirtipennis*, but resolving this case would require examining the type of the latter.

Singilis loeffleri Jedlička, 1963b

http://species-id.net/wiki/Singilis_loeffleri

Singilis loeffleri Jedlička 1963b: 176

Material examined. Holotype: ♂, Persien, Löffler (=Iran, Kuh-rang) (NMPC); Iran, Kerman, Sirjan, 8 km N Balvard, 11–12.V.2007, Anichtchenko A. leg. (1♂, CAA).

Diagnosis. In *S. loeffleri*, the apex of the aedeagus is short and robust (long and slender in *S. turcicus*, Fig. 36), and the entire propleuron smooth (subrugose near coxae in *S. turcicus*).

Redescription. Length 5.4 mm. red-brown with postmedian black band on elytra (Fig. 22).

Head smooth, microsculptured, deeply irregularly punctate, punctures sometimes almost confluent near eyes, separated by 3 to 6 diameters on the front and by their diameter towards head base. Clypeus impunctate. Eyes large and bulging, with a few short setae at posterior margin. Second supraocular seta located just anterad the posterior margin of eye. Temples short and smooth. Scape with a very long seta at 2/3 of its length and a few thin setae towards the apex; pedicel irregularly setose throughout; antennomere III with numerous setae in apical 2/3. Antennae pubescent from the basal fourth of antennomere IV.

Pronotum red-brown, smooth, shinier than head, 1.21 times as wide as head, 1.34 times as wide as long, widest right behind marginal setae. Anterior margin straight, anterior angles slightly prominent, sides very broadly and regularly rounded, slightly to moderately sinuate towards posterior angles, which are rectangular to acute. Punctation irregular, sparser and shallower than on the head, sparse on the disc and denser towards base. Lateral explanate margin rapidly widened from apex, broad and elevated at base. Posterior pore right in front of angle. Basal grooves punctate. Pronotal base extended in a rounded median lobe. Furrow short and shallow. Microsculpture weak, slightly transversely polygonal.

Elytra red-brown, with piceous to black postmedian band reaching lateral margins. Intervals 1, 3, 5, 7 and 8 setose, with a single irregular row of pores all along. All intervals setose at base, convex on basal third and slightly convex beyond that. Interval 7 convex from base to the middle. Microsculpture deep, irregular, polygonal. Apical margin slightly sinuate. Striae deep, punctate, shallower towards the apices.

Legs brownish yellow. Tarsomere V with 3 pairs of ventral setae. Mes- and metepisterna smooth. Claws with 4 teeth. Venter entirely light brownish yellow. Abdominal sterna pubescent throughout, pubescence as long as protarsomere II.

Aedeagus – Fig. 47. Aedeagal median lobe moderately broad dorsoventrally, ventral margin straight nearly to apex; apex with evenly rounded tip that is not downturned.

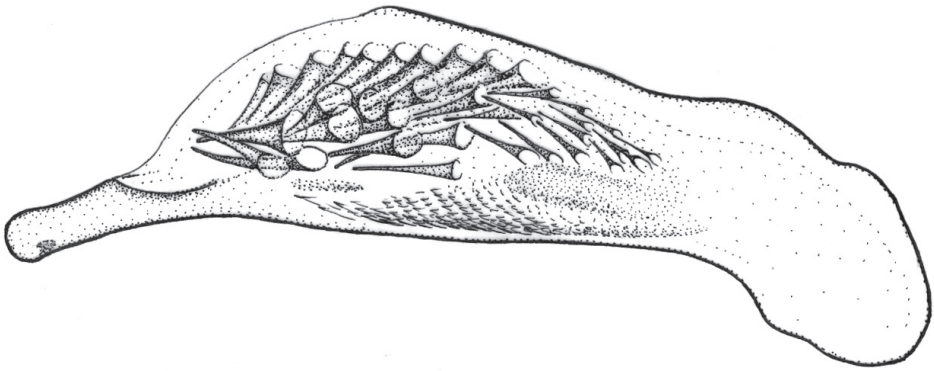


Figure 45. Aedeagus of *S. kryzhanovskii* sp. n., Holotype.

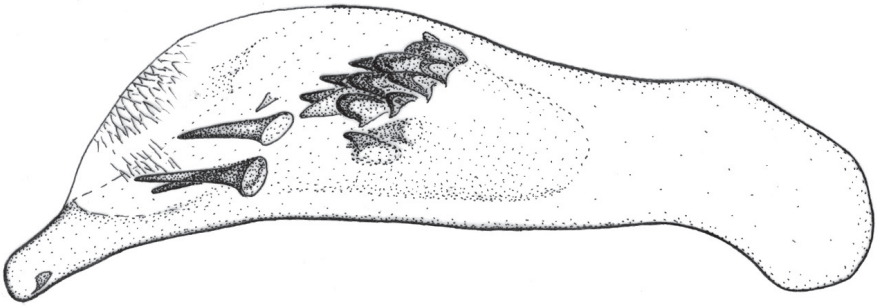


Figure 46. Aedeagus of *S. saeedi* sp. n., Holotype.

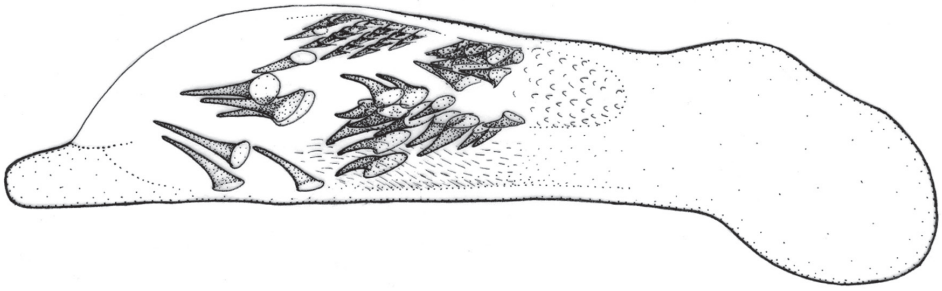


Figure 47. Aedeagus of *S. loeffleri* Jedlička, 1963b, Holotype.

Variation. Elytral band may be reduced to a spot not reaching beyond interval 4. Pronotal and elytral punctures vary in size.

Comments. Jedlička (1963b: 177) erroneously referred to the holotype as female. *Singilis loeffleri* is probably conspecific with *S. hirtipennis*, as discussed above.

Distribution. Iran.

***Singilis timidus* sp. n.**
urn:lsid:zoobank.org:act:5287A9A3-8591-476B-AB4C-1E3F1267A607
http://species-id.net/wiki/Singilis_timidus

Material examined. Holotype: ♂, small green rectangle; white label in Russian: "coll. Khristofa" ['Christoph Collection']; white label in Russian: "na osnovanii tetradi etiketka: Schahrud, Persia 1870–1873" ['Location per log: Schahrud, Persia 1870–1873'] (ZIN); Paratype: ♀, Iran, Lorestan, 1–2.V.2007, 20 km N Pol-e-Dokhtar, Baba Zeyd, near Muruni, Anichtchenko A. leg. (AAC).

Diagnosis. This new species can be confused with specimens of sympatric *S. mesopotamicus* with reduced elytral pattern. The two species can be diagnosed by aedeagal structure.

Description. Length 6.1–6.2 mm. Yellowish red-brown, with legs slightly paler and a dark postmedian elytral spot reaching interval 4 (Fig. 7).

Head coarsely and deeply irregularly punctate, dull, very distinctly microsculptured. Punctures in the frons sometimes separated by over twice the diameter. Clypeus with some small irregular punctures. Eyes very large and bulging, with no small setae at posterior margin. Second supraocular seta located just anterad the posterior margin of eye. Temples short, smooth. Scape with several rather long setae besides the very long subapical one; pedicel with the usual band of apical setae; antennomere III with two bands of apical setae. Antennae pubescent from the basal third of antennomere IV.

Pronotum brownish yellow, 1.24 times as wide as head, 1.4 times as wide as long, widest just behind marginal setae. Anterior margin straight, anterior angles slightly marked, sides broadly and evenly rounded, more or less sinuate towards posterior angles, which are rectangular and protrude as minute denticle. Punctation coarse, irregular and deep, as dense as on head, somewhat sparser on disc and sometimes confluent, especially at the sides of disc. Lateral explanate margin rather wide at apex, rapidly widened basally, broad and flat towards base. Posterior pore right in front of angle. Basal grooves shallow. Pronotal base extended in a rounded median lobe. Furrow variable. Microsculpture less distinct than on head.

Elytra shinier than head and pronotum, 1.4 times as long as wide. Intervals 1, 3, 5 and 7 each with a row of setiferous pores. Pores of intervals 5 and 7 deep, with rather long setae. Intervals 2 and 4 with several minute setae at base. Microsculpture rather isodiametric but irregular, more delicate than on head and pronotum. Apices weakly obliquely sinuate, rounded at suture. Striae deep and crenulate. Interval 7 narrow and convex in basal half, then gradually flattened; other intervals convex at base, almost flat at apex.

Legs pale brownish yellow. Tarsomere V with 4 pairs of ventral setae. Claws with 4 teeth. Venter uniformly testaceous. All abdominal sterna with long pubescence. All episterna smooth.

Aedeagus – Fig. 48. Median lobe apex elongate, slightly downturned at narrowly rounded apex. Internal sac with well-developed spicular fields.

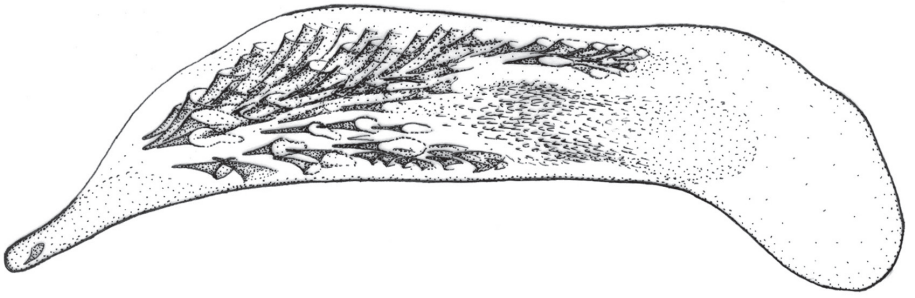


Figure 48. Aedeagus of *S. timidus* sp. n., Paratype (Iran: Lorestan).

Variation. Posterior pronotal angles almost rectangular in the holotype, more prominent and acute in the paratype.

Name derivation. The name (Latin, adjective: timid) refers to the cryptic lifestyle.

Distribution. Iran.

Key to species of *Singilis*

1 Body elongate (Figs 1–3), elytra 1.58–1.63 times as long as wide in the middle. Small size species, 4–5 mm. **2**

– Body wide (Figs 4–27), elytra 1.33–1.47 times as long as combined width in the middle. Size variable **4**

2 Bicolored **3**

– Body completely black. ("Siberia", unspecified) ... ***anthracinus* (Solsky, 1874)**

3 Pronotal sides sinuate in front of base, hind angles acute (Fig. 1). Legs all yellow. Endophallus without sclerotized denticles. (Afghanistan, Iran, Kyrgyzstan, Kazakhstan, Tajikistan, Turkmenistan, Uzbekistan) ..... ***flavipes* (Solsky, 1874)**

– Pronotal sides less sinuate in front of base, hind angles rectangular. Femora and apical part of tibiae piceous to black (Figs 2–3). Endophallus with several sclerotized denticles. (S. Russia, Afghanistan, Iran, Iraq, Israel, Kyrgyzstan, Kazakhstan, Tajikistan, Turkmenistan, Uzbekistan) .... ***cingulatus* (Gebler, 1843)**

4 Pronotum strongly transverse, very densely punctate, distance between punctures less than their diameter (Figs 17–19) **5**

– Pronotum less transverse or subquadrate, distance between punctures more than their diameter **7**

5 Elytra uniformly brownish yellow or piceous **6**

– Elytra bicoloured, with apical half black (Fig. 18). Pronotal punctation strong, crenulate, same as on the head. (Lebanon, Syria) ..... ***plagiatus* Reiche & Saulcy, 1855**

6 Body colour uniformly yellow pale. Intervals of elytra flat. Small size species 4.8–5.4 mm. (fig. 17). (Oman, UAE) ..... ***fuscoflavus* (Felix & Muilwijk, 2009)**

– Body piceous to black, pronotum and sometimes elytral base narrowly paler (Fig. 19). Pronotum dull, deeply and densely punctate, punctures spaced by less than their diameter. (Palestine, Israel, Lebanon) ..... ***libani* (Sahlberg, 1913)**

7 All elytral intervals with conspicuous setiferous pores. Pubescence long **8**

– Setae short and thin, sometimes very short and inconspicuous..... **14**

8 Intervals 1–7 with a single uninterrupted row of setiferous pores, 8th with two rows..... **9**

– All intervals of elytra with 2–3 irregular and dense rows of big setiferous pores..... **12**

9 Elytra elongate, flat, with black postmedian transverse band and red-brown apices. 6.0–6.5 mm. (Fig. 4). (Kazakhstan, Turkmenistan, Uzbekistan) ..... ***amoenulus* (Semenov, 1889)**

– Elytra subovate, convex. Smaller, 4.6–5.1 mm. **10**

10 Uniformly yellow brownish..... **11**

– Elytra with weak, diffuse, grey postmedian band, sometimes reduced to sutural spot, intervals 2, 4 and 6 without setiferous pores (Fig. 8). (Afghanistan, Iran) ..... ***kabakovi* sp. n.**

11 All elytral intervals with a single uninterrupted row of widely spaced setiferous pores. Pronotum transverse. Head and disc of pronotum very sparsely and superficially punctate (Fig. 10). (Iran) ..... ***klimenkoi* sp. n.**

– Rows of setiferous punctures on intervals 3–5 widely interrupted. Setiferous pores on all intervals large. Pronotum cordate. Head smooth, pronotum almost smooth. (Fig. 9). (Iran) ..... ***kolesnichenkoi* sp. n.**

12 Propleura smooth and shiny **13**

– Propleura with wavy rugae. Size bigger, 6.8–8 mm. Elytra longer, basal red spot almost reaching the middle of elytra (Fig. 5). (Afghanistan, Kyrgyzstan, Kazakhstan, Tajikistan, Turkmenistan, Uzbekistan)..... ***solskyi* nom. n.**

13 Propleura smooth and shiny. Body 6 mm. Elytra shorter and wider, basal third red-brown (Fig. 6). Microsculpture of elytra very strong, isodiametric, surface seems crenulate. Setiferous pores on elytra deep and small, very often situated on a par in the same interval. (Tajikistan) ..... ***makarovi* sp. n.**

– Small, 5.1 mm. Basal half of elytra red. Elytra shiny, lightly microsculptured. Setiferous pores on intervals large, almost never situated on a par in the same interval. Head and pronotum sparsely punctate (Fig. 11). (Uzbekistan) ..... ***timuri* sp. n.**

14 Body and elytra uniformly yellow-brown **15**

– Body bicolored **16**

15 All elytral intervals sparsely and irregularly punctate along striae (Fig. 21). Disc of pronotum sparsely punctate. Body and elytra uniformly yellow-brown. (Iran) ..... ***saeedi* sp. n.**

– Only odd elytral intervals with irregular and weak setiferous pores all along striae. Setae very thin and short, barely visible (Fig. 20). (Iran, Turkmenistan)..... ***kryzhanovskii* sp. n.**

16 Head and pronotum red-brown. Elytra red-brown with black band or spot, or with black posterior third of elytra.....**17**

– Head and elytra piceous to black. Pronotum and narrow diffuse band on the base of elytra paler (Fig. 23). Intervals of elytra convex, odd intervals with irregular punctures and tiny setae. (Greece, Turkey) ....***fuscipennis* (Schaum, 1857)**

17 Smaller, up to 5 mm. **18**

– Larger, at least 6–7 mm.....**21**

18 Pronotum strongly transverse. Elytra with black sutural spot extended to interval 4 or 5 (Fig. 16). Pronotal punctures spaced twice as wide as those on the head. (Israel, Yemen)..... ***discoidalis* (Mateu, 1986)**

– Pronotum subquadrate or slightly transverse.....**19**

19 Pronotum subquadrate, sparsely irregularly punctate, punctures 2–6 diameter distance from each other, lateral sides sinuate before acutely prominent posterior angles. Intervals of elytra convex on the base, setiferous pores on odd intervals conspicuous. Transverse band variable (Fig. 22). (Iran) (see also comments in text about *S. hirtipennis* Pic, 1901) ... ***loeffleri* Jedlička, 1963b**

– Pronotum slightly transverse, densely punctate, punctures 1–2 diameters distance from each other, same as in head.....**20**

20 Elytra short. Transverse black band of elytra narrow, often reduced to inner intervals or disappeared (Figs 12–13). Body size 4.3–5 mm (Armenia, Iran, Turkey)..... ***turcicus* (Jedlička, 1963a)**

– Elytra more elongate. Transverse black band of elytra broad, almost reaching apices of elytra. Odd intervals in apical part with 2 rows of setae, even intervals with 1 row of sparse setae (Figs 14–15). Body size bigger, 5.0–6.3 mm (Afghanistan, Iran, Iraq, Pakistan, Turkey)..... ***mesopotamicus* Pic, 1901**

21 Pronotum densely punctate, same as on the head. Black apical spot of elytra not reaching apices.....**22**

– Pronotum sparsely punctate, shiny. Black apical spot of elytra reaching apices.....**23**

22 Black elytral spot narrow, occupying zone from suture to 3 or 4 interval, not reaching apices of elytra (Fig. 7). (Iran).....***timidus* sp. n.**

– Transverse black band of elytra broad, almost reaching apices of elytra (Figs 14–15)..... ***mesopotamicus* Pic, 1901**

23 Pronotum conspicuously microsculptured **24**

– Pronotum shiny, without microsculpture (Fig. 24). Endophallus without spines. (Israel, Egypt).....***filicornis* Peyerimhoff, 1907**

24 Odd intervals of elytra with easily visible short setae along striae.....**25**

– Odd intervals of elytra with extremely tiny and short setae along striae. Hairs on abdominal sterna short, length no more than 1/3 of length of the apical

setae. Pronotum more strongly transverse, sparsely and irregular punctate, less dense than on the head, disc almost without punctures, slightly rugose (Fig. 27). (Iran) ..... ***persicus*** **(Jedlička, 1961a)**

25 Hairs on abdominal sterna long, the same or at least 2/3 of length of the apical setae. Pronotum weakly transverse, regularly punctate. (Fig. 26). Endophallus without spines. (Oman, UAE) ..... ***felixi*** **sp. n.**

– Hairs on abdominal sterna short, length no more than 1/3 of length of the apical setae. Apical third of elytra black (Fig. 25). Endophallus with numerous spines. (Afghanistan) ..... ***jedlickai*** **sp. n.**

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RESEARCH ARTICLE

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Pachybrachis sassii, a new species from the Mediterranean Giglio Island (Italy) (Coleoptera, Chrysomelidae, Cryptocephalinae)

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Abstract

Pachybrachis sassii, new species is described from Giglio Island, of the Tuscan Archipelago (Italy). The new species belongs to the nominotypical subgenus and is closely related to *P. salfii* Burlini, 1957, from which it differs in the shape of the median lobe of the aedeagus and in the pattern of the yellow raised spots on the elytra and pronotum. Ecological observations are made. The neotype of *P. salfii* from Colloreto, Monte Pollino (Italy) is designated.

Keywords

Entomology, taxonomy, Coleoptera, Chrysomelidae, Cryptocephalinae, Pachybrachini, Tuscan Archipelago, neotype

Introduction

The genus *Pachybrachis* Dejean, 1836 belongs to the subfamily Cryptocephalinae (Coleoptera, Chrysomelidae) and according to the color of the prothorax and elytra is subdivided into two subgenera: *Pachybrachis* sensu stricto (hereafter s. str.) and *Chloropachys*

Rey, 1883. Phylogenetic analyses based on mitochondrial (12S rRNA, 16S rRNA) and nuclear markers (18S rRNA and 28S rRNA) (Hsiao 1994, Gomez-Zurita et al. 2007) confirmed the basal position of *Pachybrachis* within the Cryptocephalinae clade.

More than 350 species of *Pachybrachis* s. str. have been described till now, about 200 of which are distributed in the western hemisphere and 150 in the Palaearctic Region (Warchalowski 2008). In the last decades about 45 new species of *Pachybrachis* s. str. have been described from the Palaearctic Region. Nowadays, 51 species are listed in the European fauna, 23 species are present in Italy (Sassi 2004, 2005). Interestingly, in the Mediterranean basin *Pachybrachis* s. str. shows a high level (19.6%) of island endemism. *Pachybrachis* is a polyphagous genus, its species are feeding on plants belonging to different families (Jolivet and Hawkeswood 1995; Bieńkowski 1999).

In the summer of 2010, during study of a Chrysomelidae fauna of the Mediterranean islands, 11 specimens of a previously unknown *Pachybrachis* were collected. The specimens appeared closely related to *P. salfii* Burlini, 1957 from which they differed in the structure of the median lobe of the aedeagus and in the pattern of yellow raised spots of the elytra and pronotum. Genital characters together with a pattern of yellow raised spots are commonly used for discrimination of sibling species within this genus (Burlini 1968, Sassi and Schöller 2003).

Material and methods

All the specimens were collected on the host plants by net sweep. Specimen manipulation, dissection, measure, and photographs were completed with the auxiliary use of the stereo microscope Leica MS5 with an ocular micrometer. SEM micrographs of the aedeagus were made using Jeol JSM-5610LV scanning electron microscope. Spermatheca and kotpresse drawings were made using stereomicroscope Leica MS5 with an ocular grid (size 20 × 20 squares 1 cm^2). Specimens are deposited at the Civic Museum of Natural History, Milan (MSNM), Matteo Montagna private collection, Anzano del Parco, Como, Italy (MMPC), and Davide Sassi private collection, Castelmarte, Como, Italy (DSPC).

Key to *Pachybrachis* s. str. with well defined yellow spots or/and stripes on a black background similar to *P. sassii* sp. n. distributed in Italy

Due to a complexity of the genus (Schöller 2010), the present key is not based on a phylogenetic hypothesis. It includes five species that are most similar to *P. sassii* by the black and yellow pattern of the pronotum and elytra.

1 Mesoepimeron black, sometimes with blurred indistinct yellow shadow **2**
– Mesoepimeron yellow **4**

2 Last abdominal tergite entirely black, without yellow spots. Mid and hind femora fulvous with lighter spot. Length: 3–3.5 mm. Distribution: Central Europe, Spain, France and Italy ..... ***P. picus* Weise, 1882**

– Last abdominal tergite with yellow spots..... **3**

3 Last abdominal sternite black, without spots. Black spot on pronotum with lateral yellowish dots. Length 3.5–4 mm. Distribution: South Central Europe, from Spain to the Caspian Sea .....***P. tesselatus* Olivier, 1791**

– Last abdominal sternite with two yellow spots. Black spot on pronotum without lateral yellowish dots. Length: 3.5–4 mm. Distribution: Spain, France, Italy, Croatia, Serbia and Montenegro..... ***P. exclusus* Rey, 1883**

4 Elytron without convex yellow spots or stripes elevated over the background ... **5**

– Elytron with convex yellow spots or stripes elevated over the background. Mesoepimeron with yellow sometimes indistinct spot. Last abdominal tergite and sternite completely black. Length 2.8–3.4 mm. Distribution: Giglio island (Italy)..... ***P. sassii* sp. n.**

5 Last abdominal sternite without two yellow spots. Length: 3.1–4.2 mm. Distribution: Europe and West Siberia..... *P. hieroglyphicus* Laicharting, 1781

– Last abdominal sternite with two yellow spots. Length: 2.8–3 mm. Distribution: Sicily .....***P. siculus* Weise, 1891**

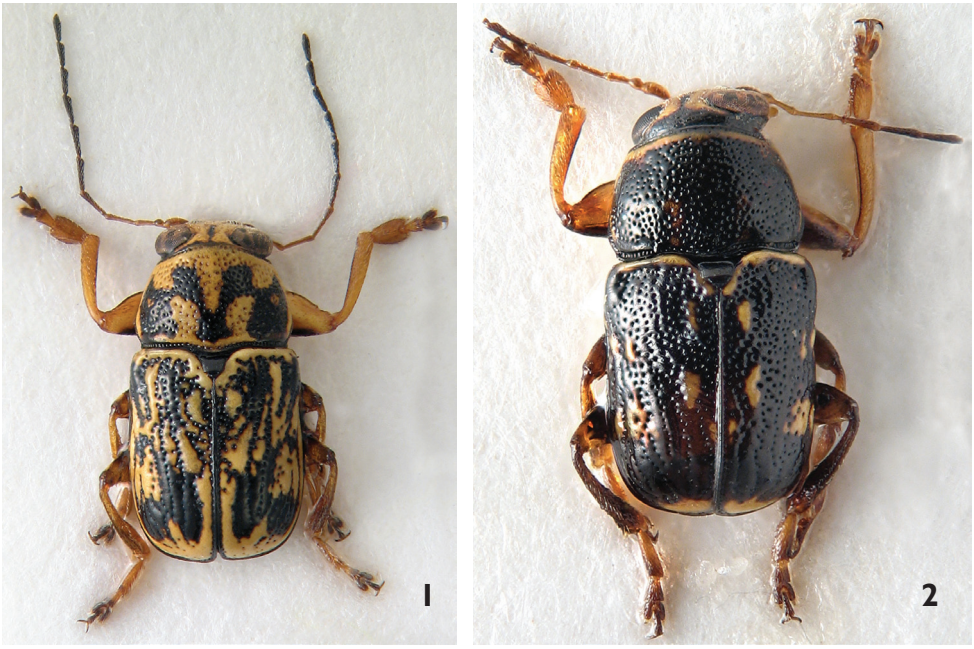
Taxonomy

***Pachybrachis* (*Pachybrachis*) *sassii* Montagna, sp. n.**
urn:lsid:zoobank.org:act:4AD3247F-94F2-43F3-8F89-FFD6D2F3B4FB
http://species-id.net/wiki/Pachybrachis_sassii
Figs 1, 3, 6

Type-locality. Italy, Tuscany: Grosseto, Giglio island, Giglio Campese.

Material examined. Type-specimens: Holotype male, pinned, with genitalia on a separate card board. Original label: "Italy, Grosseto, Isola del Giglio, Giglio Campese, 42°21.90'N, 10°52.59'E, ca. 30 m a.s.l., 14 Jun 2010, M. Montagna & F. Castiglioni leg. [printed label], "HOLOTYPUS / *Pachybrachis sassii* / Montagna M. des. [red handwritten label] (MSNM). Paratypes: 5 females and 5 males pinned. Three females and 3 males, original label: "Italy, Grosseto, Isola del Giglio, Via della Cabulgina, 42°22.97'N, 10°53.89'E, ca. 60 m a.s.l., 13 Jun 2010, M. Montagna & F. Castiglioni leg." [printed label], "PARATYPE / *Pachybrachis sassii* / Montagna M. des. [red handwritten label]; 2 males and 2 females (MMPC), 1 male and 1 female (DSPC). Two males and 2 females, original label: "Italy, Grosseto, Isola del Giglio, Giglio Campese, 42°21.01'N, 10°52.26'E, ca. 30 m a.s.l., 14 Jun 2010, M. Montagna and F. Castiglioni leg. [printed label], "PARATYPE / *Pachybrachis sassii* / Montagna M. des. [red handwritten label] (MMPC).

Diagnosis. The new species belongs to the subgenus *Pachybrachis* s.str. The external morphological characters, general habitus, size, black and yellow pattern of elytra



Figures 1–2. Habitus, dorsal view: **1** *Pachybrachis sassii* sp. n., holotype **2** *Pachybrachis salfii*, neotype.

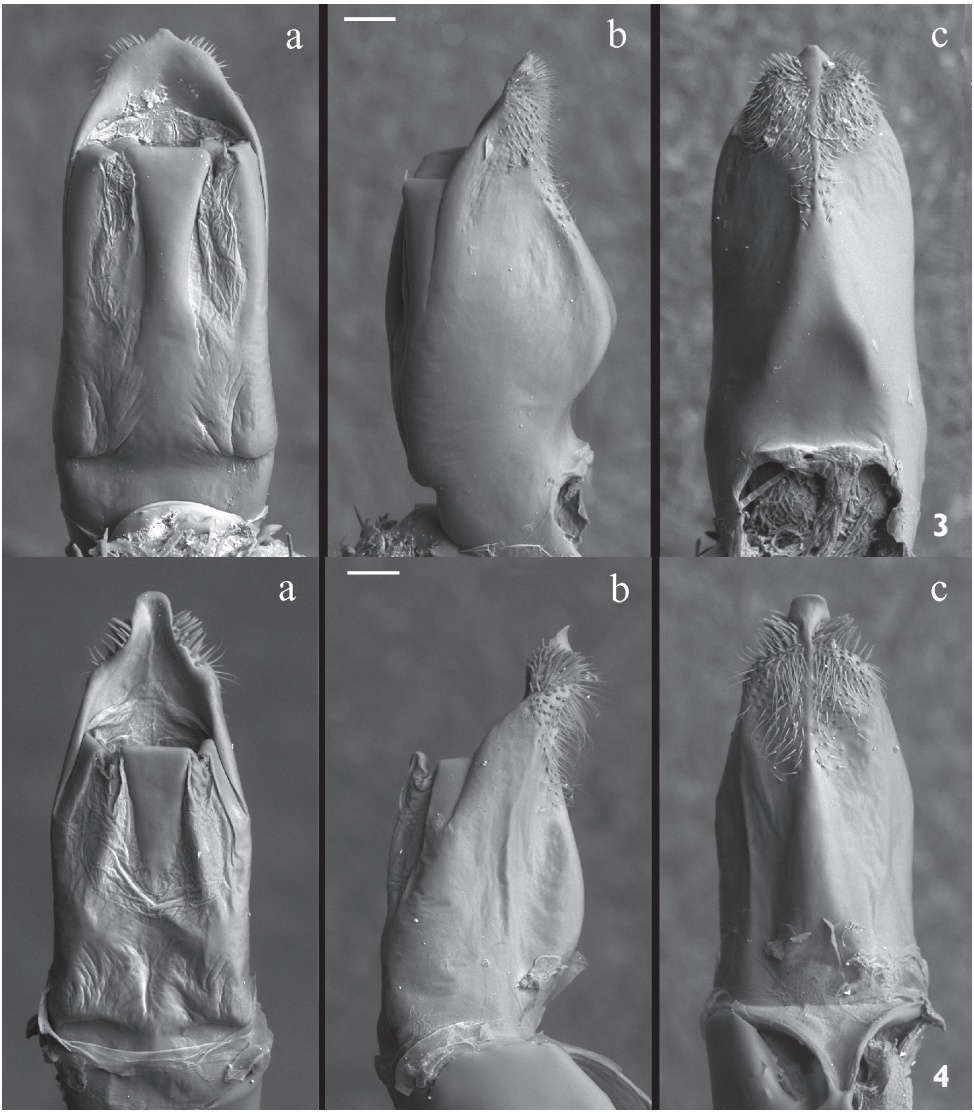
and pronotum prompt the ascription of *P. sassii* sp. n. to the fifth artificial group suggested by Burlini (1968) and adopted in the most recent revision of the subgenus by Warchalowsky (2008). Species belonging to this group are longer than 3 mm, have black elytra with yellow raised spots, mesoepimera completely black or sometimes with an indistinct yellow spot, pronotum with irregular and deep punctation.

Description. Male and female measurements are reported in Table 1.

Body relatively robust, dorsally black with yellow raised spots (Fig. 1), black/yellow ratio variable in male and female (female usually darker than male). Ventral side black, mesoepimera with yellow sometimes evanescent spot. Pygidium black. Vertex,

Table 1. Male and female measurements of *Pachybrachis sassii* sp. n.: mean (with 95% confidence interval) in mm, standard deviation (in parentheses), range of variability (in square brackets) in mm. TotL: total length; ProL: length of pronotum; ElyW: width of elytra (measured at the base); ProW: width of pronotum, Ratio L/W (ratio between total body length and width of elytra).

Specimens	TotL	ProL	ElyW	ProW	Ratio L/W
Male	3.12 ± 0.15	0.98 ± 0.04	1.55 ± 0.06	1.42 ± 0.05	1.94–2.12
	(0.19)	(0.05)	(0.07)	(0.07)	
n = 6	[2.76–3.27]	[0.87–1.02]	[1.42–1.64]	[1.29–1.49]	
Female	3.20 ± 0.10	0.92 ± 0.03	1.63 ± 0.05	1.46 ± 0.03	1.91–1.98
	(0.11)	(0.04)	(0.05)	(0.04)	
n = 5	[3.05–3.38]	[0.87–0.98]	[1.56–1.71]	[1.45–1.53]	[1.45–1.53]



Figures 3–4. Median lobe of aedeagus; magnification 120×, scale bar = 100 μm **3** *Pachybrachis sassii* sp. n. holotype; **a** dorsal **b** lateral and **c** ventral view **4** *Pachybrachis salfii* neotype **a** dorsal **b** lateral and **c** ventral view. Median lobe silhouette is demaged by dehydration, probably due to contact with air for a long time.

frons, clypeus and upper labrum yellow. Antennal insertions, median longitudinal line on frons (in female wider and triangular in shape) and upper internal margin of eyes black. Vertex with black transverse line. First three antennomeres pale with blackish upper part, from IV to XI blackish to completely black. Pronotum with black/yellow pattern and narrow blackish outline, entirely black in some female. Two large lateral and irregular black spots reach pronotal base at corners, sometimes contact with anterior border in female. Lateral and anterior edges yellow, absent in some female.

Evanescent yellow mark present within lateral black spot. Central black "V"-shaped spot connected to lateral spots. Scutellum black, shiny. Elytron with yellow shiny edge extending from humeral callus to suture surrounding scutellum. Humeral callus shiny, proximally yellow, distally black, completely black in some specimens. Suture black. Epipleura yellow with black outline. Apical lunula yellow, covered with evident black punctures in middle, inner and outer yellow branches extending up to half of suture and below humeral calli respectively. Legs brownish, upper part of femora black in male. Mid and hind femora with distinct yellow spots and black knees. Frons flat, interocular furrow fairly impressed and punctured, evanescent in female. Eyes at upper edge with impressed and punctured median line. Head with strong and diffuse punctation, denser in middle and close to internal margins of eyes, evanescent on clypeus. First antennomere swollen, as long as third, second antennomere roundish and shorter than half of third. Eyes prominent, distance between upper lobes smaller than distance between antennal sockets.

Pronotum with maximum width slightly posterior to middle. Longitudinal edge curved in middle, anteriorly not completely visible from above. Posterior edge sinuous in middle, slightly rimmed and bordered by line of punctures. Punctation evanescent on central disc close to median yellow spot, gradually coarser on sides and towards posterior margin, absent on tiny yellow raised ridge surrounding pronotum. Posterior margin of pronotum with single row of punctures. At bottom, two transverse impressions separated from edge by slightly raised area, less evident than in *P. salfii*. Scutellum wide, rectangular, slightly convex, covered with short setae. Elytra slightly wider than pronotum at base, flattened on top. Elytral punctation located mainly on black markings, well impressed and placed in irregular rows anteriorly, starting from median spot becomes almost regular and less impressed. Humeral callus prominent, externally delimited by grooves. Base of elytra, proximally to margin, with evident carina originating at humeral calli and extending along anterior margin up to suture surrounding scutellum. Epipleura narrowly raised. Internal margin of apical lunula evenly cut, puncture clusters separate two inner appendices. Pygidium evenly convex, punctated and pubescent. Urosternite with evident microsculpture and fine whitish pubescence. In male external margin of VII urosternite with row of short and dense setae. Anal sternite with shiny median impression in male, rectangular and not deeply engraved fovea in female. Legs without diagnostic characters, first tarsomere enlarged in male. Median lobe of aedeagus well sclerotized. Phallotreme with sinuous edges, tiny truncated tip surrounded by visible setae, central frenulum with long basal stem expanded anteriorly (Fig. 3a). In lateral view (Fig. 3b) apex sinuous, not curved apically as in *P. salfii* (Figs 4, 5); frenuli narrow with right angle in distal part, not obtuse as in *P. salfii* (Figs 4, 5). Ventral side with evident triangular carina harboring two small cristae at base, apex with robust setae on each side and hairless tip (Fig. 3c). Spermatheca (Fig. 6a) sickle-shaped, wider on curve, slender anteriorly to fine tip, slightly recurved at base; ductus sclerotized and smooth throughout its length, at base robust junction with spermatheca, distal end forming

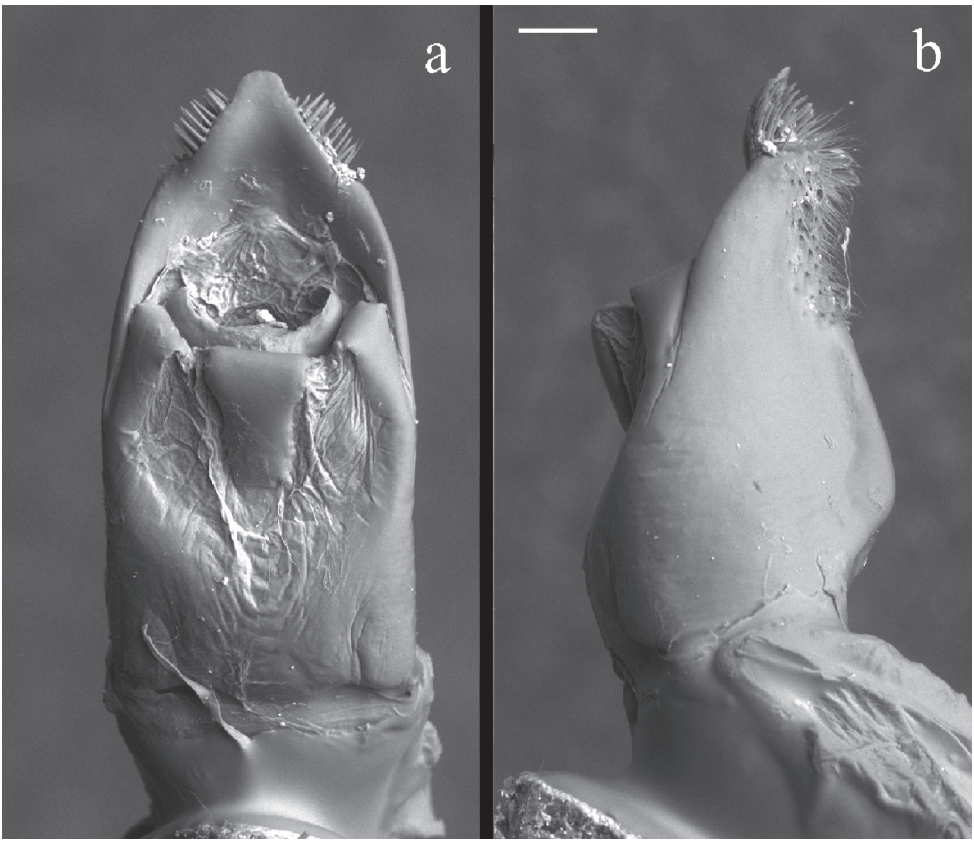


Figure 5. Median lobe of aedeagus: *Pachybrachis salfii* from Monte Pollino freshly extracted **a** dorsal and **b** lateral view. Magnification 120×; scale bar = 100 μm.

a subtriangular pigmented diverticulum; accessory gland joining spermatheca at base in slightly sclerotized junction opposite to ductus. Ventral sclerites of kotpresse (Fig. 6b) triangular, lateral apices with three spicules each, anterior margin with prominent central carina, posterior margin sinuous and convex in middle; dorsal sclerite strongly transverse (Fig. 6c), two narrow lateral wings and two well sclerotized vertical processes.

Etimology. The species is dedicated to Dr. Davide Sassi, a friend and well-known specialist in Chrysomelidae.

Ecology. *Pachybrachis sassii* inhabits plant geoseries of *Cyclamino repandi-Querco ilicis* sigmetum (De Dominicis et al. 2010) that are composed by fragmented bush vegetation close to sea reef. Specimens of *P. sassii* were observed and collected on *Erica arborea* Linné and on *Cistus incanus* Linné. The mating male and female were observed on *C. incanus*. Adults were active in sunny days from mid-morning until mid-afternoon, when the temperature is the highest.

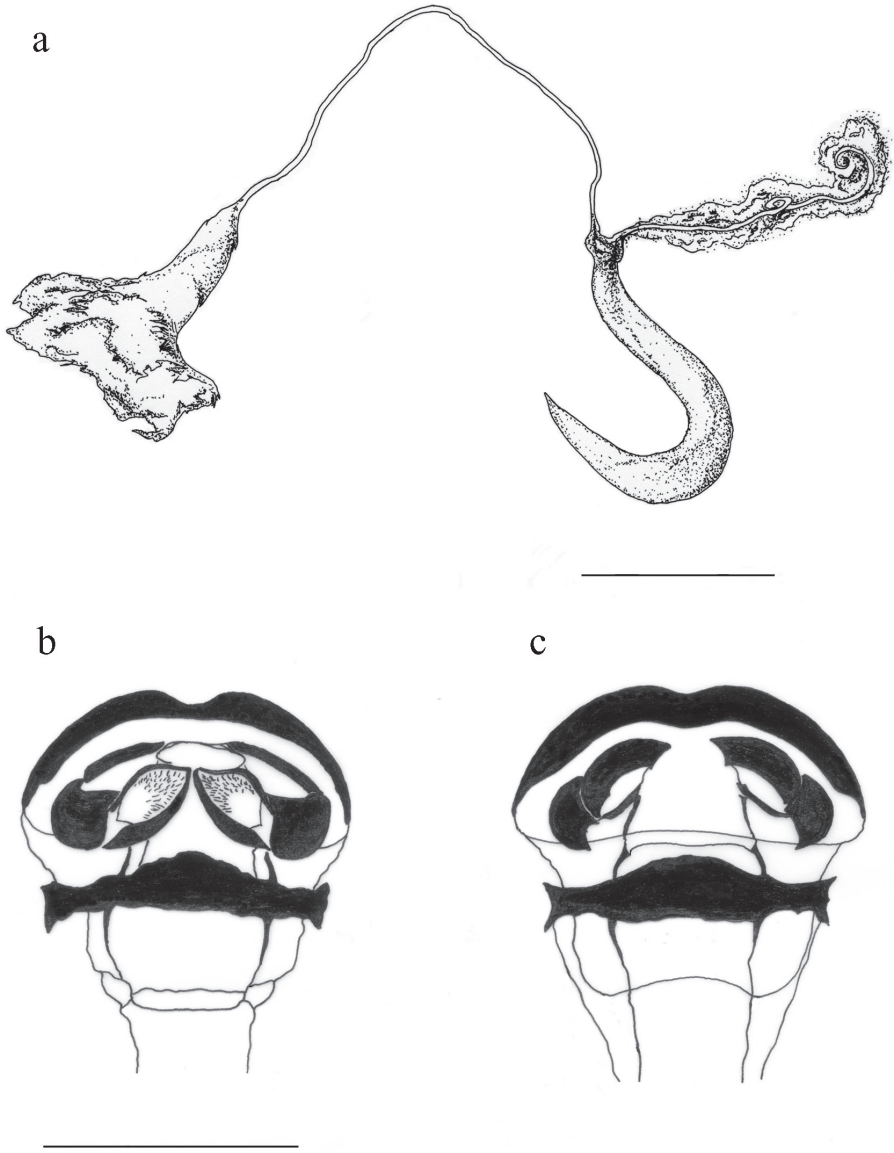


Figure 6. *Pachybrachis sassii* sp. n. **a** spermatheca **b** ventral sclerite of kotpresse **c** dorsal sclerite of kotpresse. Scale bar = 0.3 mm.

Discussion

Morphological characters of the aedeagus highlight the affinity between *P. sassii* and *P. salfii*, as both taxa show the median lobe with a peculiar triangular carina on the ventral side, nevertheless, they differ in the shape of phallotreme, apical tip and lateral apex profile (Figs 3, 4, 5). The tip of the aedeagus in *P. sassii* is sinuous and not curved anteriorly as in *P.*

salfii. These two taxa also significantly differ in the black and yellow pattern on pronotum and elytra (Figs 1, 2). Present data does not allow to test different hypotheses for the origin of the new taxon but the pre-Pleistocene transgression that separated Giglio island from Argentario cape could have been the event that lead to the allopatric speciation.

During the present study, the author discovered that the holotype of *Pachybrachis salfii* Burlini, 1957, deposited in the collection of Museo Zoologico dell'Università Federico II di Napoli, is lost (personal communication of Dr. Nicola Maio, curator, October 2010). According to article 75 of the International Code of Zoological Nomenclature (1999) and in order to clarify the taxonomic status of the nominal taxon, a paratype of *P. salfii* (Burlini, 1957) is designated as neotype. Dr. Carlo Leonardi and Dr. Davide Sassi were previously consulted in order to avoid the proposed designation arousing serious objections. The neotype of *P. salfii* was designated as paratype by Burlini in 1957. The specimens has 4 labels: 1) Colloreto / VI - 951 [printed]; 2) Mass. Pollino / Ruffo l. [printed]; 3) Paratipo [red label, printed]; 4) *Pachybrachys Salfii* m. ♂ [handwritten by M. Burlini]/ det Burlini 1956 [printed]; disegno / dell'olotipo / di Colloreto, / ora in Museo / di Napoli [handwritten by M. Burlini]; 5) *Pachybrachis salfii* /NEOTYPE/ Montagna M. des. [printed]. The neotype of *P. salfii* is preserved in the collections of Civic Museum of Natural History, Verona, Italy. The habitus and aedeagus of the neotype are illustrated (Figs 2, 4).

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The author aknowledges Dr. Michele Zilioli, Dr. Fabrizio Rigato, and Dr. Carlo Leonardi of Natural History Museum of Milan for the image support and the scientific suggestions. A special thanks to Dr. Federica Castiglioni who participated in sample collection and supported my research. I also would like to thank my friend Dr. Davide Sassi for his critical input and scientific support.

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RESEARCH ARTICLE

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New genus and species of flea beetles (Coleoptera, Chrysomelidae, Galerucinae, Alticini) from Puerto Rico, with comments on flea beetle diversity in the West Indies and a key to the West Indian Monoplatini genera

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Abstract

A new genus (*Borinken*) and five new species (*Borinken elyunque, Distigmoptera chamorrae*, *Kiskeya elyunque*, *Ulrica eltoro*, and *U. iviei*) from Puerto Rico are described and illustrated. A key to all West Indian Monoplatini genera is provided, as are keys to all species of *Kiskeya* and to the species of *Ulrica* from Puerto Rico. A list of the flea beetle genera, along with the number of species and some of the faunal features is presented and discussed for the West Indies.

Keywords

Leaf beetles, species diversity, moss, West Indies, Puerto Rico

Introduction

The West Indies Islands are one of the World's biodiversity hotspots (Myers et al. 2000). A great variety of ecosystems exist in the West Indies, ranging from tropical moist broadleaf forests to xeric cactus scrublands. The West Indian flora and fauna are rich and highly endemic. Seventy-two percent of 11,000 plant species of the West Indies are endemic (BirdLife International 2009). Among vertebrates, 99% of amphibians and 93% of reptiles are endemic (Hedges 2001). To date, 351 species of flea beetles in 53 genera are known to occur in the West Indies (Table 1). Compared to other regions of the World, these relatively small land masses are home to considerable species richness. For example, a much larger territory of the European part of the former U.S.S.R. (stretching from the White Sea on the North to the Black Sea on the South, including the Caucasus) has 321 species in 24 genera of flea beetles; none of the genera are endemic, and only 20% of the species are endemic (Konstantinov 1991). In the West Indies, 92% of flea beetle species and 20% of genera (marked bold in the Table 1) are endemic. In addition, only 13% of species occur on more than one island. *Epitrix parvula* Fabricius is the most widespread flea beetle species, being found on most West Indian Islands and in North and Central America. While the number of flea beetle species in the European part of the former U.S.S.R., including the Caucasus, and the West Indies are similar (321 and 351 respectively), the number of genera in the West Indies is more than twice that in the European part of the former U.S.S.R. and the Caucasus, which makes the fauna of the significant part of the Palearctic more of an "island" fauna than the island fauna itself (Konstantinov et al. 2009). As a rule, an island fauna is characterized by a relatively large number of species per higher taxon as a result of a relatively small number of introductions followed by extensive species-level radiation (Magnacca and Danford 2006). The fauna of the European part of the former U.S.S.R. (being part of the Palearctic) was recently dramatically changed by the Tertiary aridization and Quaternary glaciation (Konstantinov et al. 2009), while the West Indian fauna remained relatively intact.

The flea beetles of the West Indies are comparatively well studied. Extensive collecting and publications during the first half of the 20th and early 21st century reported many unusual and endemic flea beetle taxa (Blake 1928, 1931, 1934, 1937, 1938, 1944, 1947, 1960, 1964, Konstantinov 2002, Konstantinov and Chamorro-Lacayo 2006). The three most species rich genera in the West Indies are *Aedmon* Clark with 36 species, *Homoschema* Blake with 26 species, and *Monomacra* Chevrolat with 22 species. Two of these most speciose genera are West Indian endemics. The distribution of species in the endemic genera reveals some aspects of the faunistic relationships between different islands (Table 1). For example, the moss-inhabiting *Kiskeya* Konstantinov and Chamorro-Lacayo has three species in the West Indies, two in the Dominican Republic and one in Puerto Rico. *Kiskeya* is morphologically similar to the Oriental *Clavicornaltica* Scherer, alluding to broader biogeographical patterns of moss and leaf litter inhabiting flea beetles. *Normaltica* Konstantinov has a similar pattern with one species in the Dominican Republic and one in Puerto Rico. The apparent absence of

Table 1. Flea beetle species diversity in the West Indies (we grouped some islands in a few columns because there are just a few species known to occur there. Names in bold indicate that taxon is endemic for West Indies. To make this table current, we include two undescribed species of *Monotalla* from Dominica and St. Lucia, manuscript describing them is in preparation).

Genus Author	Cuba	Hispaniola	Jamaica	Puerto Rico	Grenada	Bahamas	Antigua & Virgin Islands Barbuda St. Lucia Montserrat	Guadeloupe	Dominica	St. Croix St. Thomas	St. Vincent	Total species
Acallepitrix Bechyné								3				3
Acrocyum Jacoby		1										1
Aedmon Clark		21		8				2	6			36
Alagoasa Bechyné	1	4									1	6
Altica Geoffroy	5				1						1	6
Apleuraltica Bechyné								1				1
Apraea Jacoby	8	4	4	3		1						19
Argopistes Motschulsky	1	1		1		1						4
Asphaera Chevrolat	1											1
Blepharida Chevrolat				1								1
Bonfilsus Scherer		1						1				2
Borinken Konstantinov and Konstantinova				1								1
Centralaphthona Bechyné	5	3	1	6	2						2	16
Chaetocnema Stephens	5	5	4	5	2	1		2		1	1	16
Cyrsylus Jacoby	1	1	1	1			1			2		5
Diphaulaca Chevrolat	?	?		?						1		2
Disonycha Chevrolat	7	3	4	4	3							13
Distigmoptera Blake		1		1								2
Epitrix Foudras	3			3	3						1	5
Exoceras Jacoby								1			1	2

Genus Author	Cuba	Hispaniola	Jamaica	Puerto Rico	Grenada	Bahamas	Antigua & Virgin Islands Barbuda St. Lucia Montserrat	Guadeloupe	Dominica	St. Croix St. Thomas	St. Vincent	Total species
Gioia Bechyne	1		3					3	1			8
Glyptina LeConte					1							1
Guadeloupena Bechyné								1				1
Heikertingerella Csiki	2	2	1	1	1			5	2		1	13
Hemilactica Blake	7	1		1								9
Hirtiasphaera Medvedev		1										1
Homoschema Blake	6	5	4	5		2		1	2	1		26
Homotyphus Clark								1				1
Hypolampsis Clark				1	1						1	2
Kiskeya Konstantinov and Chamorro-Lacayo		2		1								3
Kuschelina Bechyné						1						1
Leptophysa Baly	3	4	2	1				1				11
Longitarsus Latreille	7	2	1	6	1	3	2	1			1	21
Lupraea Jacoby		1						1				2
Lysathia Bechyné	1	1	1	2			2		1			2
Macrohaltica Bechyné	1	2	1	1								2
Megasus Jacoby			1									1
Megistops Boheman	4	2	2	3	1	1		1				12
Monomacra Chevrolat	3	1	6	1	2	3		2	3		2	22
Monotalla Bechyné							1	1	1			3
Neothona Bechyné	2		1	2								1
Nesaecrepida Blake	2		2	1								2
Normaltica Konstantinov		1		1								2
Oedionychus Berthold	12	1	2		1						1	17

Genus Author	Cuba	Hispaniola	Jamaica	Puerto Rico	Grenada	Bahamas	Antigua & Virgin Islands Barbuda St. Lucia Montserrat	Guadeloupe	Dominica	St. Croix St. Thomas	St. Vincent	Total species
Omophoita Chevrolat	2	2	1	2	1		1	1		2	1	5
Phyllotreta Chevrolat	1		1	2								3
Physimerus Clark					1						1	1
Platiprosopus Chevrolat	?	?		?				2				2
Pseudodisonycha Blake	2	1		1								4
Strabala Chevrolat	5	1	2	2								7
Syphraea Baly	1	3	4	2	1	1		1			1	14
Systena Chevrolat	3	1	2	2	2						2	7
Ulrica Scherer				2								2
Number of genera/species	30/102	32/79	23/51	33/74	16/24	9/14	5/7	20/32	7/16	5/7	15/18	53/351

Kiskeya and *Normaltica* in Cuba probably reflects more a lack of collecting in that largest West Indian Island than to actual biogeographical patterns. Three currently known species of *Monotalla* Bechyné (two of which are undescribed) occur only in the Lesser Antilles. The only two species of *Bonfilsus* Scherer occur in Hispaniola and Guadeloupe (one species per island).

Recent collecting efforts in Puerto Rico revealed unique flea beetles with several features rarely observed among flea beetle genera.

Materials and methods

Various collecting methods were used in Puerto Rico. Among them, beetles from sifted and unsifted moss samples by Berlese extraction represent most of the new taxa described here. Collecting in moss cushions was one of the most effective methods for uncovering a previously unknown fauna.

Dissecting techniques and terminology for most internal and external structures follow Konstantinov (1998, 2002). Terminology for the thoracic structures follows Konstantinov and Lopatin (1987) and Chamorro-Lacayo and Konstantinov (2004). We follow a format in which we provide a detailed description of a genus with relatively short species descriptions mentioning characters that are useful for species separation. For the new species of *Distigmoptera* Blake, the description is relatively long and contains characters that are helpful in determining generic placement given uncertainty in the generic classification of Monoplatini. The beetles are deposited in the following collections: National Museum of Natural History, Smithsonian Institution, Washington, D.C. (USNM); West Indian Beetle Fauna Project Collection, Montana State University, Bozeman, Montana (WIBF); and Monte L. Bean Life Science Museum, Brigham Young University, Provo, Utah (MLBU).

Borinken Konstantinov & Konstantinova, gen. n.

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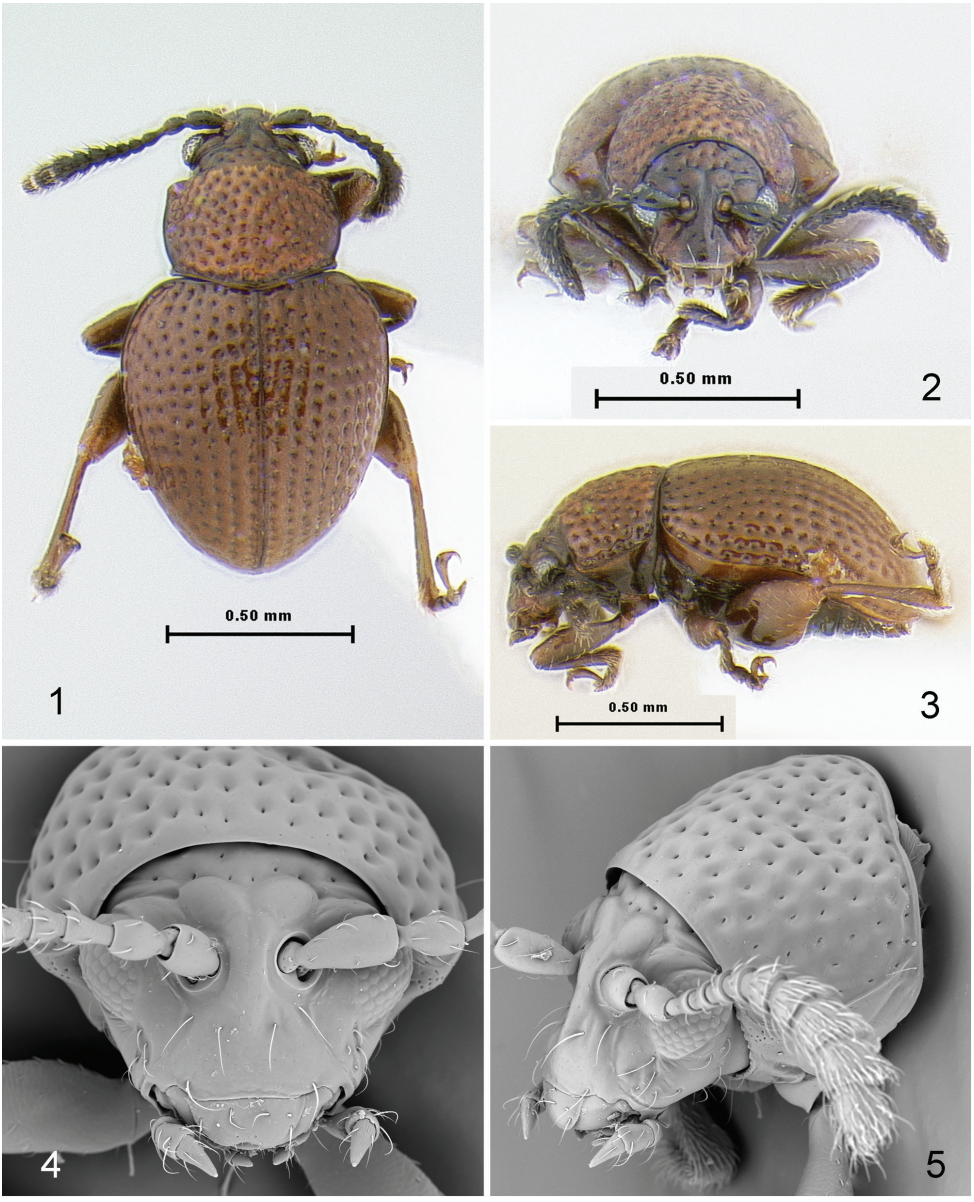
http://species-id.net/wiki/Borinken
Figs 1–14

Description. Body length 1.08–1.18 mm, width 0.70–0.81 mm, elongate, relatively flat in lateral view (2.18 times as long as thick). Color brown without metallic luster, legs slightly lighter and antennae, except last antennomere, darker, almost black.

Head (Figs 4, 5) flat in lateral view. Frons and vertex forming nearly straight line (Fig. 5) in lateral view. Facial part of head elongate. Supraorbital pore situated near outer corner of antennal callus, poorly visible. Antennal calli well developed, slightly longer than wide, oblique, separated from each other by wide midfrontal sulcus. Supracallinal sulcus deep, convex. Suprafrontal and supraantennal sulci well developed, deep. Supraorbital sulcus slightly impressed. Orbit as wide as transverse diameter of eye. In-



Figures 1–5. *Borinken elyunque*: **1** habitus, dorsal view **2** habitus, frontal view **3** habitus, lateral view **4** head and pronotum, frontal view **5** head and pronotum, lateral view.

terantennal space nearly as wide as transverse diameter of eye and as transverse diameter of antennal socket. Frontal ridge narrow, lowering in front of anterofrontal ridge. Anterofrontal ridge not separated from frontal ridge, long and swollen. Two ridges situated laterally of frontal ridge from lower margin of antennal socket to outer corner of mouth. Long seta situated at beginning of each ridge under antennal socket. Another long seta located on both sides of frontal ridge. Eyes small, slightly protruding laterally, 0.72

times as wide as long. Vertex covered with few large and deep punctures. Labrum with six setiferous pores, apically slightly incised. Labium with three palpomeres per palpus, distal palpomere longer than wide (Fig. 6). Maxillary palpus with four palpomeres, distal palpomere conical, slightly longer than preapical, sensilla patch with three setae (Fig. 8). Antenna with 11 antennomeres. First antennomere slightly wider and much longer than second and rest of antennomeres separately. Third and fourth antennomeres much thinner than second. Antennomeres gradually widening distally (Fig. 7).

Pronotum (Fig. 1) 1.34 times wider than long (measured in middle), without impressions, covered with large, deeply impressed punctures. Sides weakly rounded and relatively narrowly explanate, with maximum width in front of middle. Marginal anterolateral callosity situated perpendicularly to midline of body, 3.71 times shorter than lateral margin. Posterolateral callosity protruding laterally. Basal margin evenly convex, slightly extends posteriorly, with distinct border. Procoxal cavity open. Intercoxal prosternal process relatively narrow and parallel-sided in middle, with longitudinal ridge bordered by two deep grooves laterally, abruptly expanding beyond procoxae. Scutellum flat, wider than long, apex sharply triangular, sides straight. Mesocoxae separated by both meso- and metasterna. Mesosternum not covered by metasternum, horizontal (Fig. 9). Metasternum (Fig. 9) protruding anteriorly between mesocoxae, wide, nearly flat at apex.

Elytron (Fig. 1) widest near mid-length. Humeral callus absent. Elytral punctures arranged in nine rows not counting scutellar row. Punctures large, about as large as space between rows. Elytral apex narrowly rounded, surrounded by distinct border. Epipleura broad, slightly oblique, gradually narrowing posteriorly, not attaining sutural margin of elytron. Elytron with sensilla distributed evenly throughout surface, others concentrated in single sensilla patches (Fig. 14). Elytra fused. Elytral lock consists of longitudinal groove along its suture (Fig. 14). Wings absent.

Pro- and mesofemora normally round, only slightly flat dorsoventrally. Metafemur robust, flat dorsoventrally, fairly symmetrical (Fig. 10), 2.15 times as long as wide. Pro- and mesotibiae cylindrical, slightly wider in distal 1/3, without spurs apically. Metatibia (Figs 1, 9) straight in dorsal and lateral views, generally cylindrical, gradually widening distally (in dorsal view), dorsal surface convex nearly to apex. Apical spur long, slightly shorter than tarsal claw. Claw appendiculate near base. Third tarsomere deeply incised (Fig. 11). First metatarsomere as long as two following tarsomeres together.

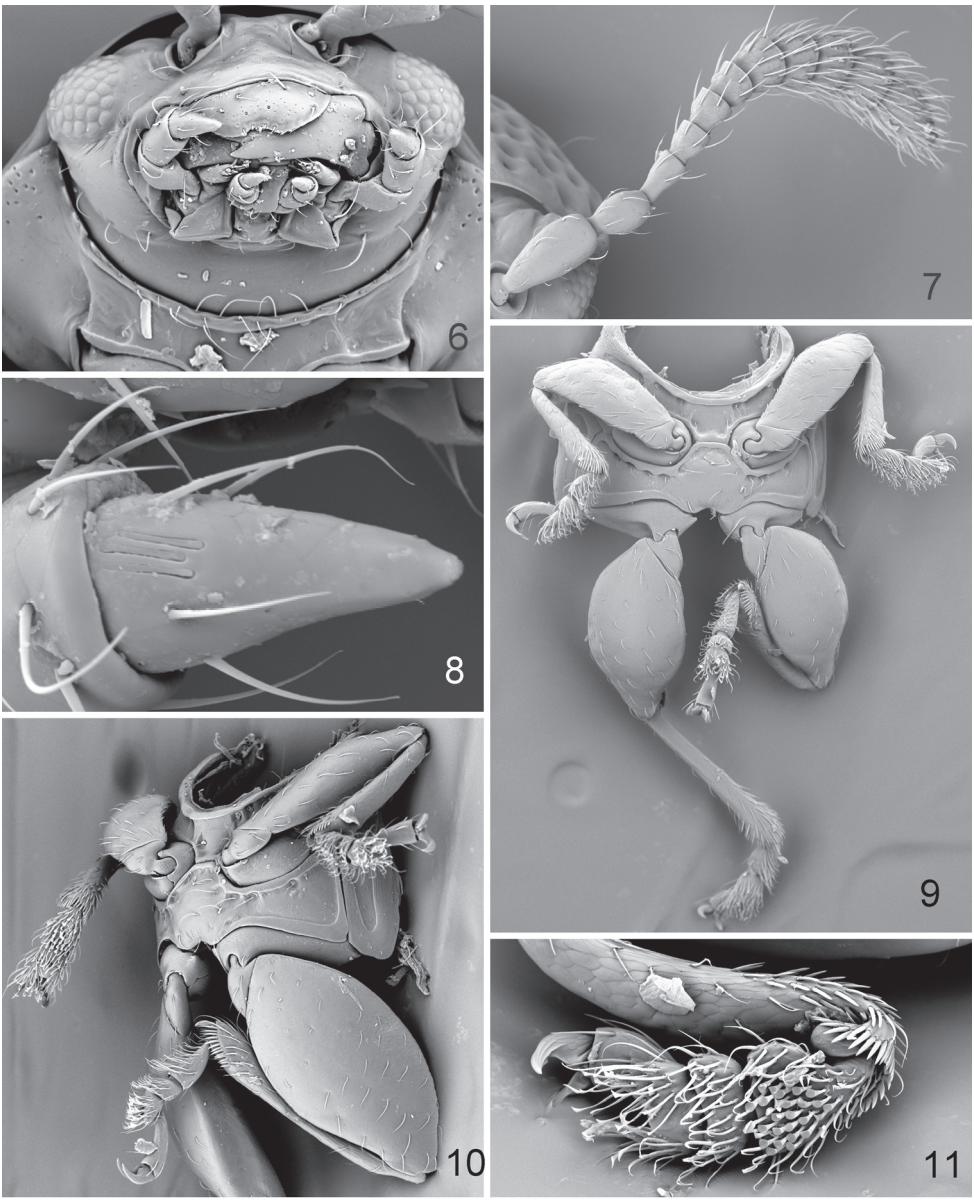
Abdomen with five distinctly visible sternites. Apical sternite shorter than three preceding sternites combined, without appendages basally. Basal sternite longer than four following sternites together.

Median lobe of aedeagus (Fig. 12) simple, robust, slightly and evenly curved in lateral view, without any sculpture ventrally.

Type species. *Borinken elyunque* Konstantinov and Konstantinova, new species.

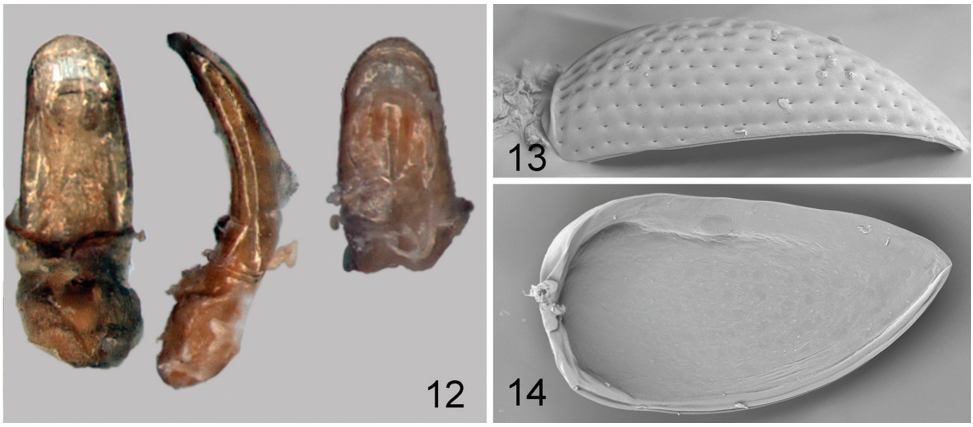
Etymology. This genus is based on the native Taino Indian name for the Island of Puerto Rico, *Borinquen*. The name is masculine.

Diagnosis and comparison. *Borinken* is very different from other flea beetle genera that are known to occur in mosses in the New World (*Kiskeya* in the West Indies, *Nicaltica* Konstantinov, Chamorro-Lacayo and Savini in Nicaragua, and *Ulrica* Scherer



Figures 6–11. *Borinken elyunque*: **6** head, anteroventral view **7** antenna **8** last maxillary palpomere **9** thoracic sternites with mid- and hind legs, ventral view **10** thoracic sternites with mid- and hind legs, lateral view **11** protibia and protarsus.

in the West Indies and Central and South America). Based on the general shape of the body, shape of the base of the pronotum without a lobe extending posteriorly, general shape of the metatibia and tarsal claw, *Borinken* is similar to *Benedictus* Scherer, which inhabits mosses in Asia and does not occur in the New World (Sprecher-Uebersax et al. 2009). It can be easily distinguished from that genus by the unique shape and details



Figures 12–14. *Borinken elyunque*: **12** median lobe of aedeagus, ventral, lateral and dorsal views **13** right elytron, lateral view **14** left elytron, ventral view.

of the head, subquadrate apical antennomeres, and absence of the prebasal impression on the pronotum.

Borinken is also very different from any other West Indian or New World flea beetle genera. Among New World genera it is somewhat similar to *Centralaphthona* Bechyné based on the presence of antennal calli, lack of the prebasal groove on the pronotum, regular elytral striae and open procoxal cavities. *Borinken* can be easily differentiated from *Centralaphthona* by the following features: elongate facial part of head (normally short in *Centralaphthona*); antennal calli longer than wide (usually shorter than wide in *Centralaphthona*); apical antennomeres much wider than basal (about same width in *Centralaphthona*); vertex, pronotum, and elytra strongly punctured (punctation normally small in *Centralaphthona*; overall, this kind of coarse punctation is rare among flea beetles); apex of metatibia convex up to tarsomere (flat in *Centralaphthona*).

***Borinken elyunque* Konstantinov & Konstantinova, sp. n.**
urn:lsid:zoobank.org:act:30A86614-5362-4AE0-9372-80B07A98BBD4
http://species-id.net/wiki/Borinken_elyunque
Figs 1–14

Description. Body length 1.08–1.18 mm, width 0.70–0.81 mm, elongate, relatively flat in lateral view (2.18 times as long as thick). Color brown without metallic luster, legs slightly lighter and antennae, except last antennomere, darker, almost black. Vertex covered with large punctures, shiny, without wrinkles. Oblique fold situated between orbit and antennal callus. Proportions of antennomere lengths in male: 14:9:6:6:6:4:5:5:5:7:10. Antennomeres widened abruptly beginning from antennomere 7 (it is 0.71 times as long as wide). Pronotum evenly covered with large punctures, their diameter much larger than distance between them. Ventral side of body

without many setae. Elytron with nine complete rows of punctures. Additional scutellar row incomplete. Punctures large, about as large as space between rows. Interspaces shiny with wrinkles or punctures. Proportions of tarsomere lengths of male as follows: protarsomeres 5:4:4:11; mesotarsomeres 5:4:4:11; metatarsomeres 9:4:5:11.

Median lobe of aedeagus (Fig. 12) robust in ventral view, with apex evenly convex without apical denticle. Apex slightly swollen in lateral view. Ventral side flat, without membranous window.

Etymology. The specific epithet is a noun in apposition based on the type locality.

Ecology. Unidentified moss samples that contained *B. elyunque* were collected in the forest from a variety of substrates (rocks, tree stumps, trunks and branches) (Figs 59, 60).

Type material. Holotype: ♂, Puerto Rico: El Yunque, El Toro trail, 18°16.850'N, 65°49.753W, 1066m, 14.VI.2008, moss (unsifted) leg. A. Konstantinov (USNM). Paratype ♂, same label as holotype (USNM). Paratypes 2 ♂, same label as holotype except the date, 16.VI.2008 and moss being "unsifted" (USNM).

Distigmoptera **Blake**

http://species-id.net/wiki/Distigmoptera
Figs 15–27

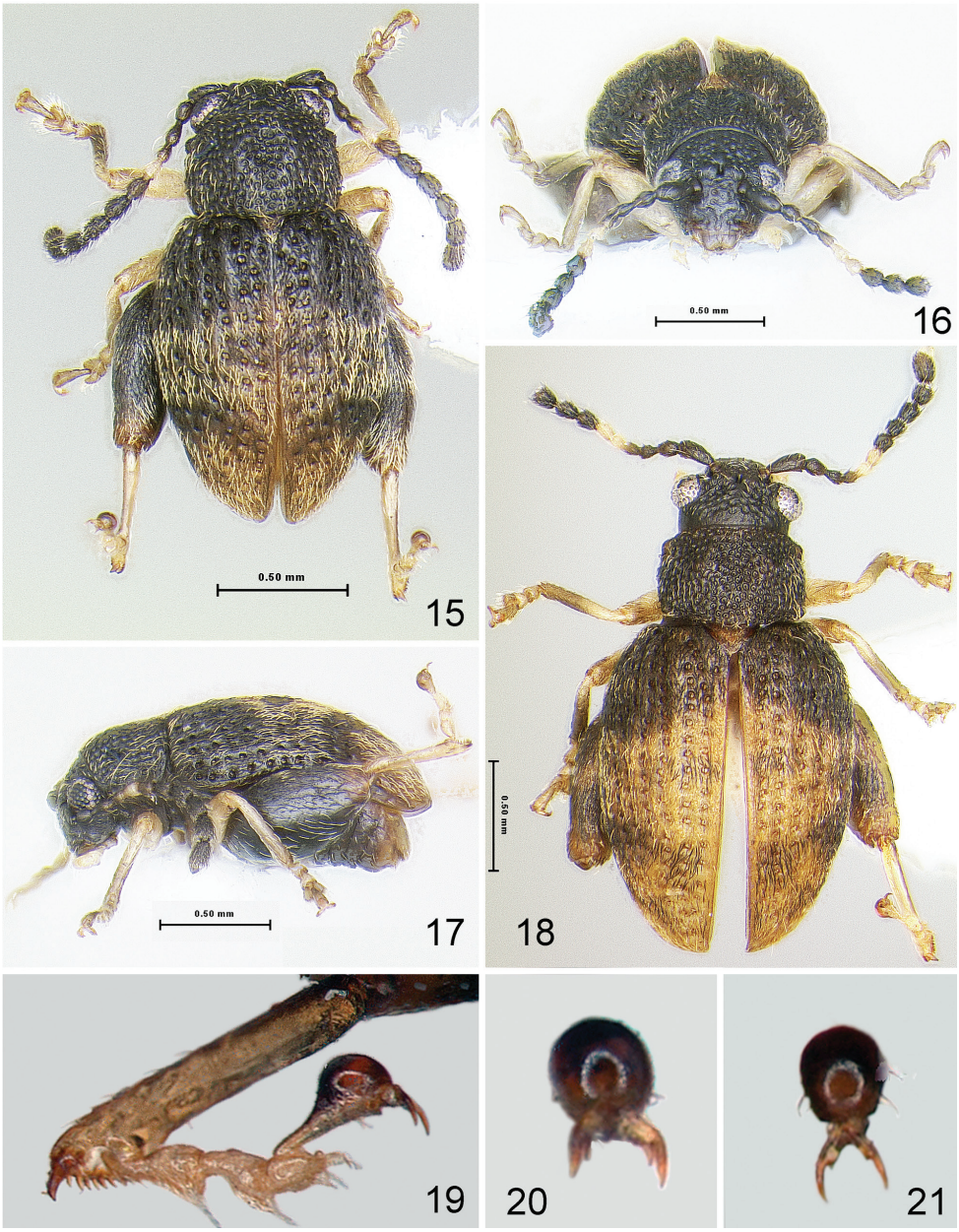
Distigmoptera Blake, 1943: 209 (type species *Distigmoptera apicalis* Blake, 1943, by original designation).

Discussion. *Distigmoptera* was first recorded in the West Indies by Medvedev (2004) who described a new species from the Dominican Republic. Fourteen previously described species of this genus are known to occur in the USA, Canada, Mexico, and Costa Rica. Among the West Indian genera of Monoplatini, *Distigmoptera* is mostly similar to *Apleuraltica* Bechyné. Apart from characters mentioned in the key (see below), *Distigmoptera* can be differentiated from *Apleuraltica* by the antennae that are not clearly clubbed, antennomere six in males is only slightly different from antennomere seven (the antennae are clearly clubbed, antennomere six in males is markedly different from antennomere seven in being much shorter and narrower than seven in *Apleuraltica*) and by the metatibial apex without a sharp denticle (the metatibial apex has a sharp denticle in *Apleuraltica*).

Distigmoptera chamorrae **Konstantinov & Konstantinova, sp. n.**

urn:lsid:zoobank.org:act:3C9F8E9B-A3C3-4264-BC7D-A0CBD4108508
http://species-id.net/wiki/Distigmoptera_chamorrae
Figs 15–27

Description. Body (Figs 15, 18) length 1.72–2.27 mm, width 0.91–1.14 mm, pubescent, oval and moderately flat in lateral view. Head, except mouthparts, antenna, except antennomere five in males and five and six in females, pronotum, base of elytron,



Figures 15–21. *Distigmoptera chamorrae*: **15** habitus, dorsal view, male **16** habitus, frontal view, female **17** habitus, lateral view, male **18** habitus, dorsal view, female **19** metatibia and metatarsus, lateral view **20** claw, male **21** claw, female.

and metafemur dark brown to blackish. Mouthparts, antennomere five in male and five and six in female, front and middle legs and metatibia yellowish to very light brown. Apex of protibia and apical part of elytron (larger in female than in male) slightly darker. Lighter part of elytron with two transverse dark bands, narrower and

better separated in female and wider and poorly visible in male. Lighter parts of elytron covered with setae lighter in color, darker parts covered with setae darker in color.

Head (Figs 16, 17) slightly convex in lateral view, evenly and strongly rugose and pubescent. Frons and vertex forming slightly convex line in lateral view. Supraorbital pore indistinguishable. Antennal callus clearly visible, nearly quadrate, its surface situated above surface of vertex. Midfrontal sulcus wide and deep. Supracallinal and supraorbital sulci poorly visible. Suprafrontal and supraantennal sulci shallow. Orbit relatively narrow, 2.50 times narrower than transverse diameter of eye. Interantennal space as wide as transverse diameter of eye. Antennal socket rounded. Frontal ridge wide, parallel sided. Anterofrontal ridge merged with frontal ridge forming denticle in middle. Eyes small, slightly protruding laterally, inner margin curved. Labrum deeply notched in middle, with six setiferous pores. Apical maxillary palpomere as wide as long, conical, much smaller than preceding palpomere. Labial palpomeres of equal length, apical conical. Antenna with 11 antennomeres, antennomeres widening apically. Antennomere four thinnest (Fig. 18). Proportions of antennomere lengths in male: 12:4:6:5:5:5:7:7:7:6:9; in female: 12:6:5:5:5:6:6:6:6:7:9.

Pronotum (Figs 15, 18) 1.47 times wider than long. Pronotal disc anteriorly raised in two wide ridges separated by shallow and wide impressions. Anterior margin straight, with distinct border. Lateral margins subparallel, very slightly convex, without explanation. Posterior margin nearly straight, without distinct border. Anterolateral callosity globular and evenly rounded, bearing seta and not forming denticle posteriorly. Posterolateral callosity absent. Pronotal surface covered with large closely placed punctures and a few yellow, whitish and black setae. Scutellum triangular, densely covered with yellow setae. Prosternal surface densely covered with irregular punctures. Prosternal intercoxal process extended posteriorly beyond coxa and truncate posteriorly. Posterior end about twice as wide as middle. Procoxal cavities closed posteriorly. Mesosternum shorter than prosternal process, quadrate, rugose and pilose. Metasternum smooth and pilose, convex in lateral view, as long as pro- and mesosterna together. Posterior margin with sharp notch.

Elytral surface punctate (Figs 15, 18), with punctures forming nine striae (not counting marginal and short scutellar striae), densely pilose with black setae near base and yellow setae in posterior half. Interspaces between puncture rows two and three, four and five, six and seven form convex ridges. Humeral callus absent. Base of elytron with callus situated between suture and humeral corner. Epipleura wide, nearly vertical, narrowing abruptly at elytral apex but not reaching it. Elytral apex narrowly truncate.

Pro- and mesofemora slightly dilated and tibiae subcylindrical, somewhat enlarged towards apical edge (Fig. 17); pubescence sparsely distributed. Metafemur greatly enlarged, 1.82 times longer than wide and 1.72 times longer than metatibia. Pro- and mesotibiae without apical spurs. Metatibia straight in lateral view, slightly curved in dorsal view. Outer and inner lateral dorsal ridges more or less straight with apical third with numerous denticles. Metatibial spur well developed. First metatarsomere inserted preapically and about as long as two subsequent tarsomeres together. Claw tarsomere swollen. Claw split in male and appendiculate in female.

Abdomen pubescent, with five visible sternites. Apical sternite shorter than three preceding sternites combined, without appendages basally (Fig. 26). Basal sternite shorter than three following sternites together. Last abdominal tergite of female without groove in middle, evenly covered with long setae.

Median lobe simple, slightly curved in lateral view with more abrupt curvature near middle; in ventral view, with lateral margins almost parallel, apex subtriangular without denticle (Fig. 22). Ventral side apically flatter than basally.

In female genitalia, posterior part of sternite eight sclerotized along its entire margin (Fig. 25). Tignum with rounded anterior margin, evenly sclerotized, bearing many moderately long setae (Fig. 25). Vaginal palpi (Fig. 24) elongate, anteriorly and along middle strongly sclerotized and merged anteriorly for more than half of their length, each with about eight setae at apex, with posterior sclerotization shorter than anterior (Fig. 24). Spermatheca curved (Fig. 23), with receptacle and pump not differentiated from each other (pump about as wide as receptacle). Apex of pump with flattened projection. Spermathecal duct long, forming "S" coils.

Diagnosis and comparison. *Distigmoptera chamorrae* can be easily differentiated from all continental species of *Distigmoptera* by the bicolorous antennae with antennomeres five in the male and five and six in the female being yellowish, much lighter than the rest of the antennae. It can be distinguished from the only other West Indian species (*D. antennata* Medvedev) by the absence of wings (*D. antennata* is winged).

Etymology. The specific epithet is a patronym dedicated to Lourdes Chamorro who collected the only known specimens.

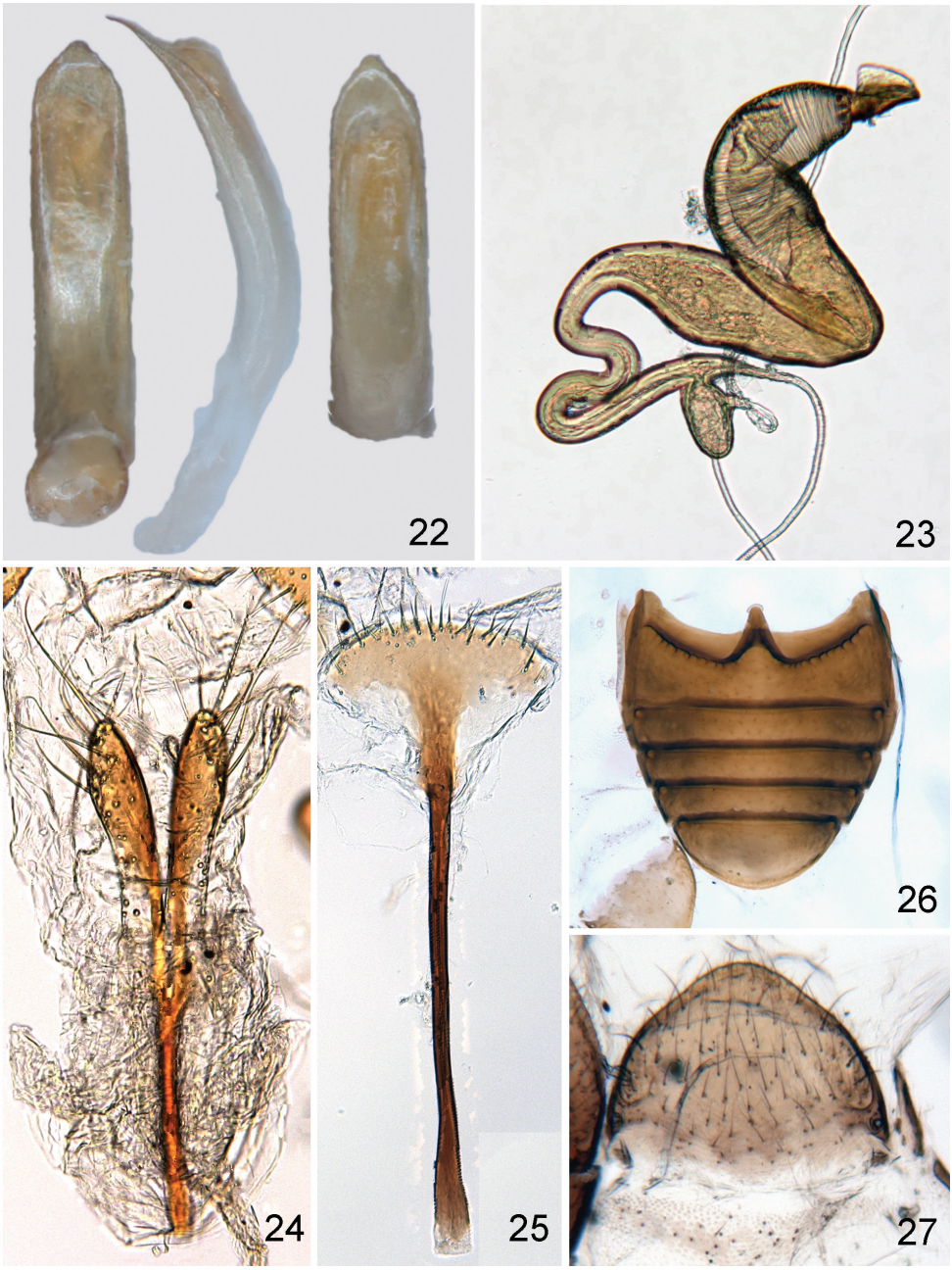
Type material. Holotype: ♂, Puerto Rico: Toro Negro, 18°11.850'N, 66°29.533'W, 904 m, 20.VI.2008, leg. M. L. Chamorro (USNM). Paratype ♀, same label as holotype (USNM).

Kiskeya Konstantinov & Chamorro-Lacayo, 2006

http://species-id.net/wiki/Kiskeya

Kiskeya Konstantinov and Chamorro-Lacayo, 2006: 276 (type species *Kiskeya baorucae* Konstantinov and Chamorro-Lacayo, 2006 by original designation, type depository, USNM).

Discussion. Discovery of about a hundred specimens of a third species of *Kiskeya* in Puerto Rico provided additional material that allowed us to observe structures that were not available for study at the time of the description of the genus (Konstantinov and Chamorro-Lacayo 2006).



Figures 22–27. *Distigmoptera chamorrae*: **22** median lobe of aedeagus, ventral, lateral and dorsal views **23** spermatheca **24** vaginal palpi **25** tignum **26** abdominal sternites, female **27** last abdominal tergite.

Labrum 1.54 times as long as wide and 0.57 times longer than thorma (Fig. 31). Labium as long as wide. Apical labial palpomere conical, longer than wide, slightly longer than palpomeres two and three separately (Fig. 30). Mandible with 4 denticles and well developed prostheca (Fig. 33). Pro- and mesotibia flat, widening apically and abruptly narrowing from apical one-third to apex (Figs 35, 36). Metendosternite typical to one of flightless flea beetles with short stalk and relatively long arms with poorly developed tendons (Fig. 34).

Kiskeya elyunque **Konstantinov & Konstantinova, sp. n.**
urn:lsid:zoobank.org:act:77AC612D-625B-4C57-9798-8144A0751C1E
http://species-id.net/wiki/Kiskeya_elyunque
Figs 28–41

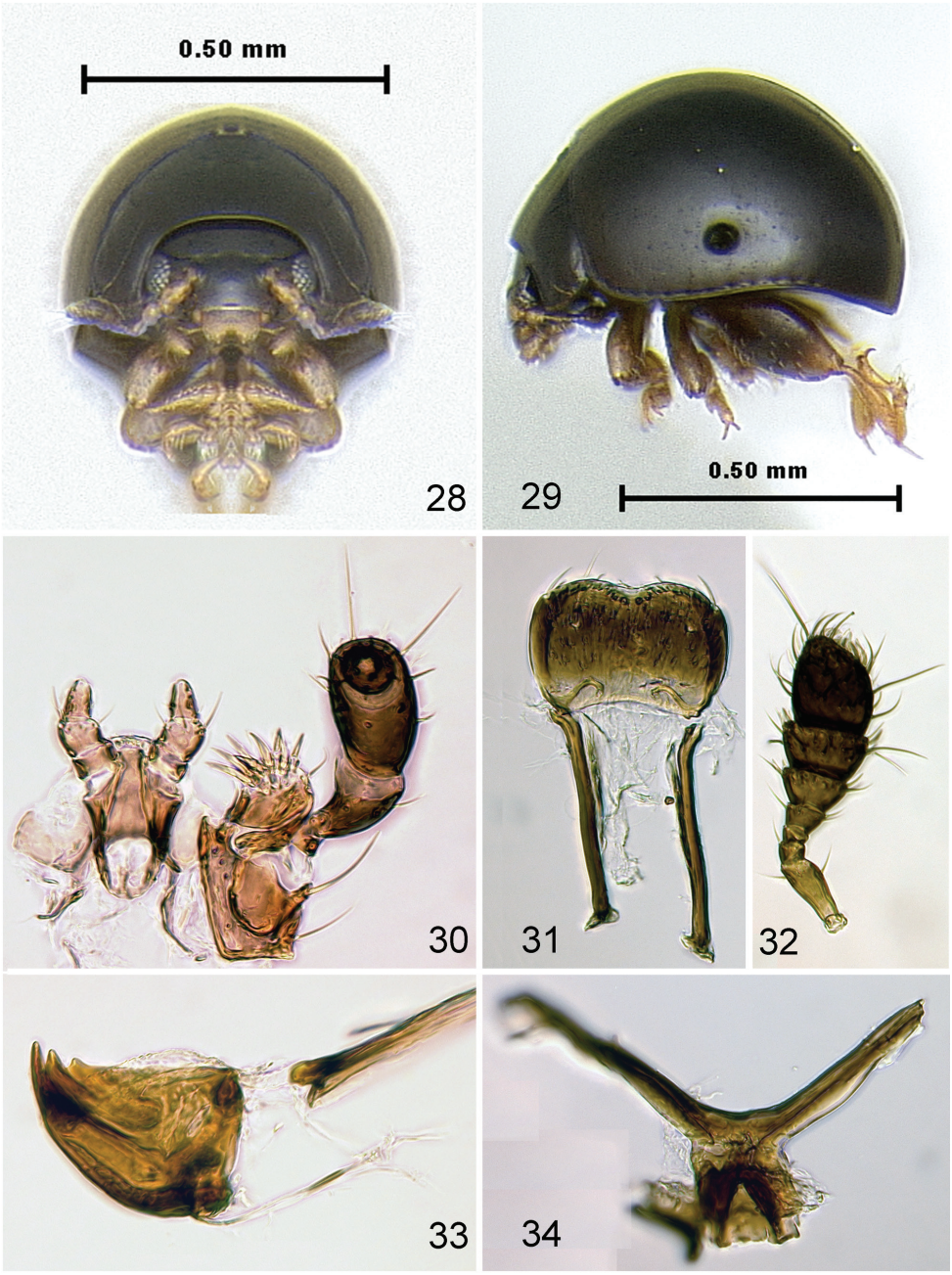
Description. Body length 0.81–0.92 mm, width 0.52–0.65 mm. Color black with light greenish luster. Femur dark brown, rest of legs and antenna dark yellow. Vertex smooth, without punctures or wrinkles. Supraantennal sulcus absent. Pronotum with tiny, sparse, sharp punctures. Antennal club with 3 antennomeres (Fig. 32). Elytron (Fig. 29) convex in lateral view [length (from apex to connection with pronotum) nearly equal to height], with tiny, sparse, barely visible punctures. Proportions of protarsomeres of female (starting with first) 4:2:3:10; mesotarsomeres 4:2:3:10; metatarsomeres 11:2:3:10. In male, proportions as follows: protarsomeres 5:2:3:10; mesotarsomeres 5:2:3:10; metatarsomeres 10:2:2:10. Apex of median lobe of aedeagus without acute denticle in ventral view (Fig. 38). Vaginal palpi with eight long setae posteriorly (Fig. 40), curved towards middle. Anterior sclerotizations widening anteriorly, strongly diverging. Spermatheca (Fig. 39) with receptacle longer and wider than pump. Outer and inner sides of receptacle nearly equally convex. Tignum curved laterally. Posterior sclerotization of tignum wider than middle, arrow shaped (Fig. 41).

Etymology. The specific epithet is a noun in apposition based on the type locality.

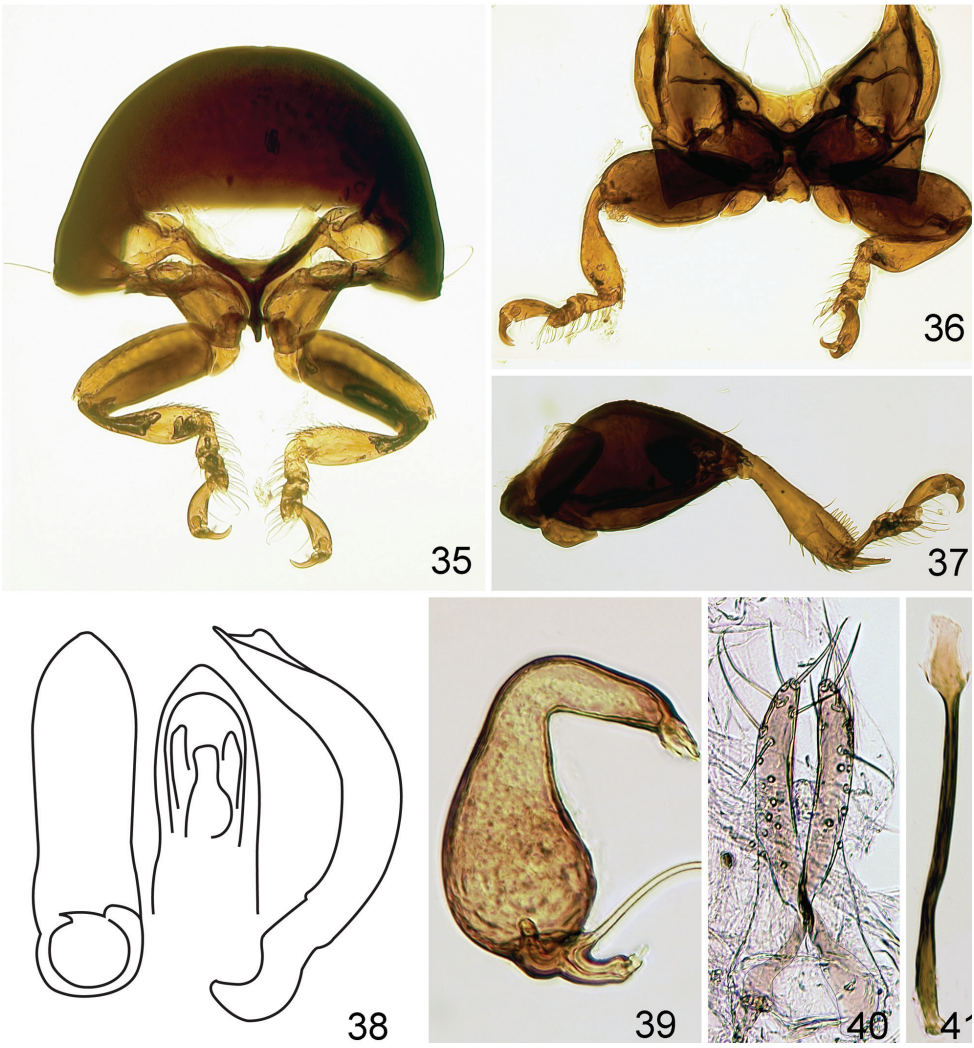
Diagnosis and comparison. *Kiskeya elyunque* is the only species of *Kiskeya* known to occur in Puerto Rico. It can be easily differentiated from the other two known species of the genus based on the key below.

Ecology. Unidentified moss samples which contained *K. elyunque* were collected in the forest from a variety of substrates (rocks, tree stumps, trunks and branches) (Fig. 59, 60).

Type material. Holotype: ♂, Puerto Rico: El Yunque, El Toro trail, 18°11.850'N, 66°29.533'W, 1066m, 14.VI.2008, moss (unsifted) leg. A. Konstantinov (USNM). Paratypes: 45 specimens, same label as holotype (USNM); 37 specimens, same label as holotype except the date, 16.VI.2008 and moss being "unsifted" (USNM).



Figures 28–34. *Kiskeya elyunque*: **28** habitus, frontal view **29** habitus, lateral view **30** labium and maxilla **31** labrum **32** last seven antennomeres **33** mandible **34** metendosternite.



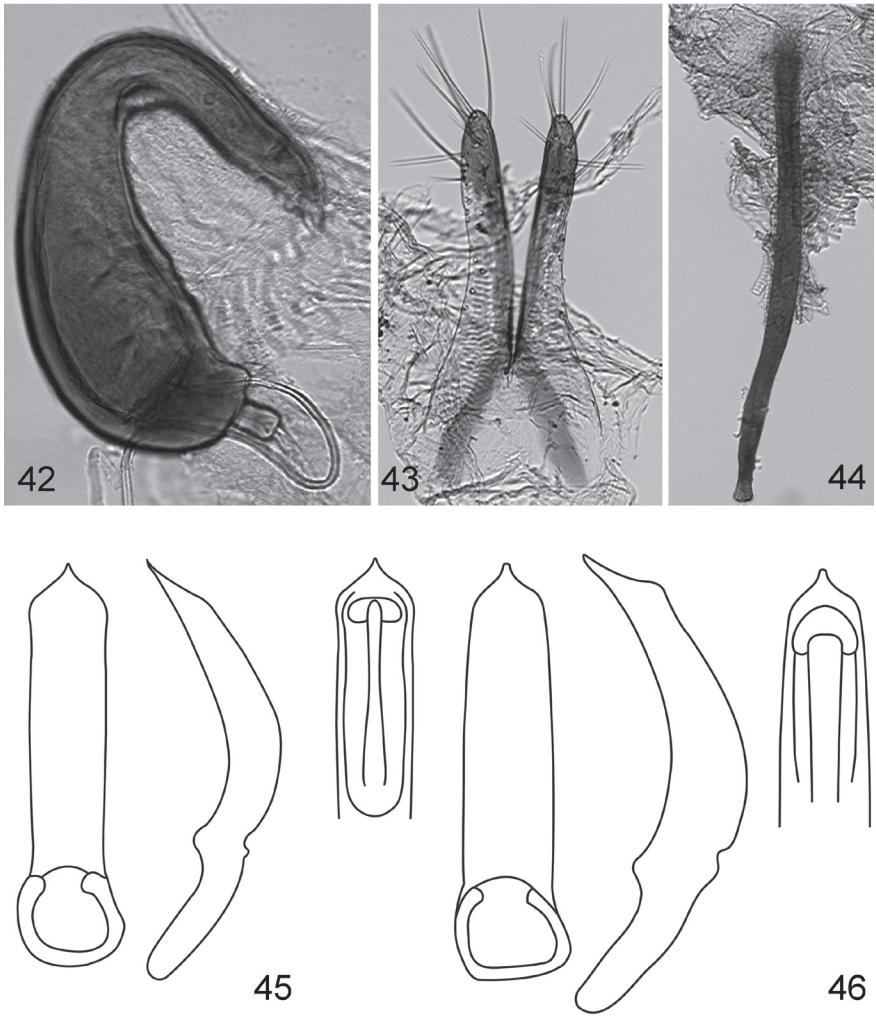
Figures 35–41. *Kiskeya elyunque*: **35** prothorax, frontal view **36** mesosternum, ventral view **37** hind leg **38** median lobe of aedeagus, ventral, dorsal and lateral views **39** spermatheca **40** vaginal palpi **41** tignum.

Key to species of *Kiskeya*

1 Supraantennal sulcus present. Apex of median lobe of aedeagus thick and straight in lateral view with narrowly rounded denticle (Fig. 46)..... ..... ***K. neibae*** **Konstantinov & Chamorro-Lacayo**

– Supraantennal sulcus absent..... **2**

2 (1) Apex of median lobe of aedeagus with acute denticle in ventral view (Fig. 45). Posterior sclerotization of tignum not wider than middle, shapeless (Fig. 44).



Figures 42–46. *Kiskeya* species: *Kiskeya baorucae*: **42** spermatheca **43** vaginal palpi **44** tignum **45** *Kiskeya baorucae* median lobe of aedeagus, ventral, lateral and dorsal views **46** *Kiskeya neibae* median lobe of aedeagus, ventral, lateral and dorsal views.

Internal side of spermathecal receptacle nearly straight (Fig. 42). Posterior ends of vaginal palpi directed laterally (Fig. 43).....
.....***K. baorucae*** **Konstantinov & Chamorro-Lacayo**

– Apex of median lobe of aedeagus without acute denticle in ventral view (Fig. 38). Posterior sclerotization of tignum wider than middle, arrow shaped (Fig. 41). Internal side of spermathecal receptacle convex (Fig. 39). Posterior ends of vaginal palpi directed medially (Fig. 40) .....***K. elyunque*** **sp. n.**

***Ulrica* Scherer, 1962**
http://species-id.net/wiki/Ulrica

Ulrica Scherer 1962: 520 (type species *Sparnus minutus* Jacoby by original designation, BMNH).

Discussion. The only three previously described species of *Ulrica* are known from Venezuela. There are about 20 more species that remain undescribed in various collections, but they were also collected from Venezuela. Among West Indian genera, *Ulrica* can be recognized based on the following key. The five specimens of *Ulrica* that were collected in Puerto Rico come from the same mountain region, El Yunque. Based on the labels, the substrate that they came from differs for two species: it is moss for *U. eltoro* and leaf litter for *U. iviei*. The exact collecting locations for *U. iviei* are unknown.

***Ulrica eltoro* Konstantinov & Konstantinova, sp. n.**
urn:lsid:zoobank.org:act:F5BD9D1D-4F73-4F1B-894B-6640B4C652F1
http://species-id.net/wiki/Ulrica_eltoro
Figs 47–50

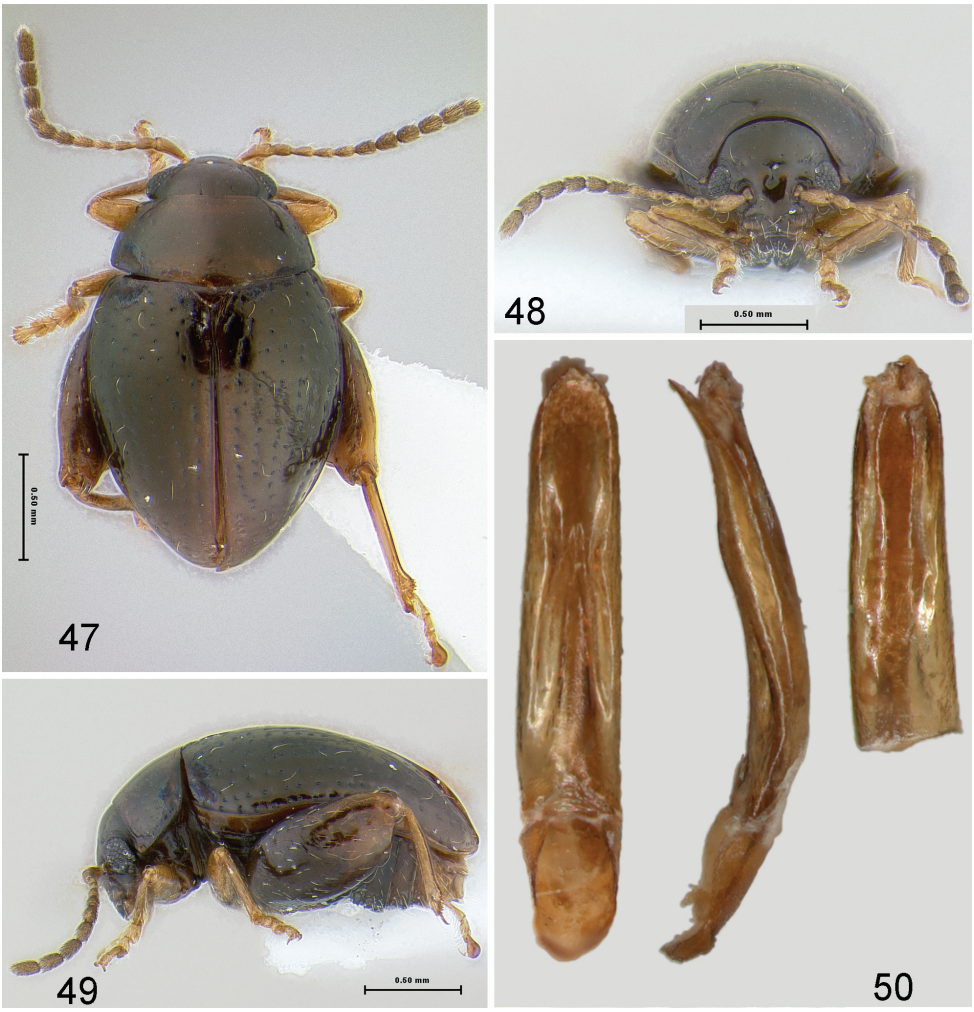
Description. Body length 1.94–2.16 mm, width 1.18–1.29 mm. Color chestnut brown with appendages lighter (Fig. 47). Head surface shiny with few small punctures (Fig. 48), supraorbital pore much larger than a few small punctures on vertex. Supracallinal sulcus clearly separates antennal calli and vertex medially. Frontal ridge wide, longer than antennal calli. Anterofrontal ridge making long denticle about as long as half clypeus length. Pronotum and elytron with fine punctures. Interspaces of elytron flat. Proportions of tarsomeres of male as follows: protarsomeres 7:4:4:9; mesotarsomeres 7:4:4:9; metatarsomeres 10:4:4:9. Median lobe of aedeagus more or less parallel sided in ventral, median lobe view, with ridge in middle being wider at base, narrowing towards middle and widening and disappearing towards apex. In lateral, median lobe view slightly curved with bump on ventral side beyond middle (Fig. 50).

Etymology. The specific epithet is a noun in apposition based on the type locality.

Diagnosis and comparison. *Ulrica eltoro* can be easily differentiated from *U. iviei* based on the key below.

Ecology. Unidentified moss samples that contained *U. eltoro* were collected in the forest from a variety of substrates (rocks, tree stumps, trunks and branches) (Figs 59, 60).

Type material. Holotype: ♂, Puerto Rico: El Yunque, El Toro trail, 18°16.850'N, 65°49.753'W, 1066m, 14.VI.2008, moss (unsifted) leg. A. Konstantinov (USNM). Paratype ♂, same label as holotype (USNM).



Figures 47–50. *Ulrica eltoro*: **47** habitus, dorsal view **48** habitus, frontal view **49** habitus, lateral view **50** median lobe of aedeagus, ventral, lateral and dorsal views.

Ulrica iviei **Konstantinov & Konstantinova, sp. n.**
urn:lsid:zoobank.org:act:1DCF15CA-E09E-4B16-9F13-FBDD84421895
http://species-id.net/wiki/Ulrica_iviei
Figs 51–58

Description. Body length 1.89–2.05 mm, width 1.08–1.29 mm. Color chestnut brown to almost black with appendages lighter (Figs 51, 52). Head surface dorsally shiny, ventrally with some wrinkles (Fig. 53). Vertex with several large punctures, supraorbital pore as large as a few punctures on vertex near it. Supracallinal sulcus not separating antennal calli and vertex medially. Frontal ridge wide, about as long as antennal calli (Fig. 53). Anterofrontal ridge making long denticle about as long as

Figures 51–55. *Ulrica iviei*: **51** habitus, dorsal view **52** habitus, lateral view **53** head, frontal view **54** abdominal sternites, female **55** median lobe of aedeagus, ventral, lateral and dorsal views.

entire clypeus. Pronotum and elytron with coarse punctures. Interspaces of elytron flat on disc, slightly convex apically. Proportions of tarsomeres of male as follows: protarsomeres 5:4:5:9; mesotarsomeres 5:4:5:9; metatarsomeres 10:5:5:9. Median lobe of aedeagus with more or less curved sides in ventral view, with ridge in middle being

Figures 56–58. *Ulrica iviei*: **56** spermatheca **57** vaginal palpi **58** tignum.

wider at base, narrowing towards middle and widening towards apex. In lateral view slightly curved without bump on ventral side beyond middle (Fig. 55). Spermatheca with pump at base wider than receptacle and duct making coils (Fig. 56). Sternite eight nearly fully sclerotized with tignum sharply bent anteriorly (Fig. 58). Vaginal palpi merged at about apical one third (Fig. 57).

Etymology. The specific epithet is a patronym dedicated to Mike Ivie who collected the holotype.

Diagnosis and comparison. *Ulrica iviei* can be easily differentiated from *U. eltoro* based on the key below.

Type material. Holotype: ♂, Puerto Rico: Caribbean Nat. For. Pico El Yunque, El Toro trail, 975 m, 23 Sept. 1987, leg. M. A. Ivie, dwarf forest litter (WIBF). Paratypes ♂ and ♀, Puerto Rico El Yunque, Mt. Britton Tr. VIII.11.1999, C. W. O'Brien, P. Kovarik (MLBU, USNM).

Key to species of *Ulrica* from Puerto Rico

1 Head with supraorbital pore much larger than a few small punctures on vertex. Supracallinal sulcus separating antennal calli and vertex medially. Pronotum and elytron with fine punctures (Fig. 47).....***Ulrica eltoro* sp. n.**

– Head with supraorbital pore as large as a few punctures on vertex near it. Supracallinal sulcus not separating antennal calli and vertex medially. Pronotum and elytron with coarse punctures (Fig. 51) .....***Ulrica iviei* sp. n.**

Figures 59–60. El Yunque, Puerto Rico: **59** moss on tree trunks **60** forest along El Toro trail where moss occurs.

Key to Monoplatini genera of the West Indies

In addition to *Distigmoptera* and *Ulrica*, six other Monoplatini genera are reported in the West Indies: *Aedmon* Clark, *Apleuraltica*, *Bonfilsus* Scherer, *Homotyphus* Clark, *Hypolampsis* Clark, and *Physimerus* Clark (Takizawa 2003). *Aedmon*, *Apleuraltica*, and *Bonfilsus* are West Indian endemics, relatively small (with the exception of *Aedmon*) and relatively well circumscribed. However, *Homotyphus* (with about 20 species mostly from South America and just one in the West Indies), *Hypolampsis* (with about 50 species from North, Central, and South America and just two in the West Indies), and *Physimerus* (with about 60 species from Central and South America and one in the West Indies) are poorly understood; their identity, distinguishing characters and composition need extensive review. Below we provide a key for Monoplatini genera of the West Indies based on the West Indian species.

1 Apical spur of metatibia as long as second metatarsomere. Elytron generally bare, with just a few long setae ..... ***Ulrica***

– Apical spur of metatibia much shorter than second metatarsomere. Elytron, densely covered with numerous short setae **2**

2(1) Supracallinal sulcus absent, antennal calli merged with vertex ..... ***Bonfilsus***

– Supracallinal sulcus present, antennal calli separated from vertex **3**

3(2) Antennal calli much longer than wide. Basal antennomeres about same width as apical. **4**

– Antennal calli about as long as wide. Basal antennomeres much narrower than apical **7**

4(3) Pronotal surface more or less even, without two protuberances separated by relatively deep furrow **5**

– Pronotal surface uneven, with two protuberances separated by relatively deep furrow **6**

5(4) Pronotum about as long as wide ..... ***Physimerus***

– Pronotum significantly wider than long ..... ***Aedmon***

6(4) Pronotal protuberances very well developed, tall. Two denticles before metatibial apex symmetrically developed ..... ***Homotyphus***

– Pronotal protuberances poorly developed, low. Two denticles before metatibial apex asymmetrically developed, one on lateral side much wider than one on medial side ..... ***Hypolampsis***

7(3) Elytron with deep impression posterior to basal callus. Metatibia with transverse ridge above insertion of tarsus. Metatarsal claw in male simple ..... ***Apleuraltica***

– Elytron without deep impression posterior to basal callus. Metatibia without transverse ridge above insertion of tarsus. Metatarsal claw in male split ..... ***Distigmoptera***

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