

Uncovering diversity of carrion beetles (Coleoptera: Staphylinidae: Silphinae) across the Eastern Afromontane biodiversity hotspot

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Abstract

The Eastern Afromontane region of Africa is characterized by striking levels of endemism and species richness accompanied by significant conservation threat, a pattern typical across biodiversity hotspots composed of highly fragmented forested highlands (sky islands). Based on the extensive study material of representatives of the subgenus *Silpha* Linnaeus, 1758, we recognized that hidden diversity this group occurs in the Eastern Afromontane biodiversity hotspot (EABH). Despite the unavailability of molecular data, we tried to reconstruct the phylogeny of Afrotropical *Silpha* species using cladistic analysis based on morphological data. The four Afrotropical species of *Silpha* form a clade. Taxonomic revision of the subgenus *Silpha* in the Afrotropical Region is provided. *Silpha chelinda* Sommer, Růžička & Barclay, **sp. nov.** from northern Malawi is described and illustrated. *Silpha lata* Portevin, 1920 is assigned into the Afrotropical fauna, the stated type locality of Nias Island, Malaysia is probably based on wrong labelling. *Silpha francoisi* Dierkens, 2020 from Tanzania is redescribed and an additional material is listed. Finally, *S. capicola* Péringuey, 1888, with two junior subjective synonyms, *S. punctulata* Olivier, 1790 and *S. peringueyi* Portevin, 1922, is redescribed and illustrated. *Silpha punctulata* Olivier, 1790 is considered as junior primary homonym of *S. punctulata* Gmelin, 1790. A key to the Afrotropical species of the genus *Silpha* is provided. Distribution of all four taxa is summarized and mapped.

Key words: Afrotropical Region, montane speciation, Silphidae, *Silpha*, phylogeny, taxonomy, morphology, new species, distribution

1. Introduction

1.1. Montane archipelagos as biodiversity hotspots

Fragmented landscapes such as archipelagos are excellent natural laboratories to assess the influence of geography on genetic and phenotypic divergence (e.g., Roy 1997; Knowles 2000; McCormack *et al.* 2008; Price 2008; Shepard & Burbrink 2009; Clegg & Phillimore 2010; Lawson 2013). In particular, tropical montane archipelagos harbour some of the highest biological diversity on the planet, making them important regions of interest for understanding the patterns and processes leading to the accumulation of diversity. The hyperdiverse Eastern Afromontane biodiversity hotspot (EABH) (Myers *et al.* 2000) has received considerable attention from evolutionary biologists investigating how this highly heterogeneous landscape has influenced population differentiation and speciation both temporally and spatially. This region is currently experiencing severe habitat loss (Myers *et al.* 2000) and has alarming rates of forecasted urban growth (Seto *et al.* 2012), which places a premium on quantifying the diversity that this key hotspot harbours, as well as understanding the evolutionary processes responsible for adaptive radiation. Evolutionary insights will furthermore allow a better understanding of organisms' responses to on-going and future habitat fragmentation.

Unlike the continuous mountain ranges of the Himalayas or Andes, the EABH is composed of a chain of ancient isolated massifs (Griffiths 1993) and young volcanoes (<5 Ma; e.g., Baker *et al.* 1971) forming sky islands. Montane forests typically occur above 800 m on these isolated peaks, so that the climatic conditions and ecosystem are highly differentiated from the surrounding low altitude savannah habitats and thus form ‘ecological islands’. Previously, the montane forests formed a pan-African forest that fragmented in the Early Oligocene due to the onset of aridification (Lovett 1993; Sepulchre *et al.* 2006) and have therefore had a long period of isolation. The isolation of these habitats potentially allows in situ speciation events to be differentiated from colonization events, which would otherwise be much harder to identify in montane systems exhibiting higher degrees of connectivity (Voelker *et al.* 2010). It has been assumed for other groups of beetles, for example in the families Curculionidae, Hybosoridae or Scarabaeidae (e.g., Grebennikov 2017, 2021b, Montanaro *et al.* 2024), that the stability of this ecosystem and its isolation has resulted in the occurrence of endemic species or entire phylogenetic lines. Afrotropical representatives of the genus *Silpha* Linnaeus, 1758 could be another example of such a group.

1.2. The genus *Silpha* in the Afrotropical Region

The genus *Silpha* Linnaeus, 1758 (*sensu lato*) is classified as a member of the terminal clade of the tribe Silphini within the subfamily Silphinae (Dobler & Müller 2000; Ikeda *et al.* 2008, 2012; Růžička *et al.* 2023; Mahlerová *et al.* 2025). Representatives of the genus *Silpha* (*sensu stricto*) are found mainly in the Palaearctic Region, with 20 extant taxa (Růžička 2015; Newton 2025). The centre of diversity is located in the eastern part of the Palaearctic Region, especially in Nepal and China (Růžička 2015).

Until recently, only two species of the genus *Silpha* were known from the Afrotropical Region (Schawaller 1987; Thayer & Newton 2005; Newton 2025), of which *S. francoisi* was only described in 2020 (Dierkens 2020). The species diversity of carrion beetles in this region is very low. Apart from *S. capicola* and *S. francoisi*, only three other Silphinae, all in the genus *Thanatophilus* Leach, 1815, were known from Sub-Saharan Africa, including Madagascar (Schawaller 1987; Thayer & Newton 2005; Newton 2025). The precise distribution of *Silpha* in Southern Africa was studied by Schawaller (1987). Concerning biology and immature stages, only Prins (1984) described the larva and adult of *S. capicola*. Midgley (2007) mentioned notes on the biology of this species, its use in forensic entomology and predicted its distribution based on three potential ecological models. Finally, Daniel *et al.* (2017) presented a key to larvae of Afrotropical Silphidae, in which *S. capicola* was also included based on data from Prins (1984).

The present study focusses on a taxonomic revision of the genus *Silpha* in the Afrotropical Region, with the description of one new species from Eastern Africa. With the correction of a misattributed type locality for *Silpha lata* Portevin, 1920, which is now included in the Afrotropical fauna, it raises the number of known *Silpha* species in this region to four. We precisely map the distribution of all the species, which seems to be vicariants.

2. Material and methods

2.1. Abbreviations and labelling

The following abbreviations are used for collections. Part of the acronyms follow Arnett *et al.* (1993). Specimens examined in this study are deposited in the following museums (curators names are given in parentheses) and private collections:

BMNH—Natural History Museum, London (formerly British Museum, Natural History), United Kingdom (M.V.L. Barclay);

CMNC—Canadian Museum of Nature, Ottawa, Canada (F. Genier);

HNHM—Magyar Természettudományi Múzeum, Budapest, Hungary (Gy. Makranczy);

ISAM—Iziko South African Museum, Cape Town, South Africa (A. Mayekiso);

JRUC—collection of Jan Růžička, Praha, Czechia;

JSCC—collection of Jan Schneider, Praha, Czechia;

MHNG—Muséum d’histoire naturelle, Genève, Switzerland (G. Cuccodoro)

MNHN—Museum National d’Histoire Naturelle, Paris, France (A. Mantilleri);
 MRAC—Musée Royal de l’Afrique central, Tervuren, Belgium (M. de Meyer, S. Hanot);
 MZLU—Entomological Museum of Lund University, Lund, Sweden (C. Fägerström);
 NHMD—Natural History Museum Denmark at the University of Copenhagen, Copenhagen, Denmark (A.Y. Solodovnikov);
 NHMW—Naturhistorisches Museum, Wien (H. Schillhammer);
 OUMNH—Oxford University Museum of Natural History, Oxford, United Kingdom (J. Hogan, D.J. Mann);
 RSEC—collection of Rostislav Sehnal, Unhošť, Czechia;
 SANC—South African National Collection of Insects, Pretoria, South Africa (R. Stals);
 SMNS—Staatliches Museum für Naturkunde, Stuttgart, Germany (W. Schawaller, A. Faille);
 TAU—The Steinhardt Museum of Natural History and National Research Center, Tel Aviv University, Tel Aviv, Israel (A.L.L. Friedman);
 TMSA—Ditsong Museum (formerly Transvaal Museum), Pretoria, South Africa (R. Müller);
 ZFMK—Zoologisches Forschungsinstitut und Museum “Alexander Koenig”, Bonn, Germany (D. Ahrens);
 ZMHB—Museum für Naturkunde, Berlin, Germany (J. Frisch, B. Jäger).

Specimens of the newly described species are provided with one red printed label “**HOLOTYPE** [or] **PARATYPE** | **chelinda** sp. nov. | D. Sommer, J. Růžicka & | M.V.L. Barclay des. 2025“. Verbatim label data are cited for the type material, individual lines of every label are separated by a vertical bar (“|”), individual labels by a double vertical bar (“||”). Information in quotation marks (“ ”) indicates the original spelling. Our remarks and additional comments are found in brackets (“[]”), [p]—preceding data within quotation marks are printed, [hw]—the same but handwritten.

2.2. Material for photography

The following additional and type material of selected taxa of the genus *Silpha* for photography, and for morphology-based phylogenetic analysis of the Afrotropical species were used:

Silpha businskyorum Háva, Schneider & Růžicka, 1999

(Figs. 7B, 9A, 12A, 14A, 16A, 17A, 19A, 20A, 21A)

Type material examined (2 specimens). **China, Shaanxi Province: Paratypes**, 1 ♂ 1 ♀ (JRUC) (Figs. 7B, 9A, 12A, 14A, 16A, 17A, 19A, 21A), “CHINA (Shaanxi) | Qin Ling Shan 110.04E | 34.30 N Hua Shan | 100 km E Xian | 1500 m 7-14.VII.1996 | Kleinfeld & Schütze || Spec. No. H2 || PARATYPUS | *Silpha* ♂ | *businskyorum* sp. n. | Jiří Háva, Jan Schneider & | Jan Růžicka det. 1998 [p]” and “CHINA, Shaanxi prov. | Zhouzhi Co., Houzhenzi env. | 1200 m, 18-25.vii.1998, V. Beneš leg. || spec. no. 3 || PARATYPUS | *Silpha* ♀ | *businskyorum* sp. n. | Jiří Háva, Jan Schneider & | Jan Růžicka det. 1998 [p]”.

Additional material (1 specimen). **China, Henan Province**, 1 ♂ (JRUC) (Fig. 20A), Funiu Shan, Baotianman, 33.5N 111.9E, 15.v.–2.vi.2005, J. Turna lgt., pitfall trap.

Silpha carinata Herbst, 1783

(Figs. 7D–F, 9B, 12B, 14B, 16B, 17B, 19B, 20B)

Additional material (5 specimens). **Bulgaria**, 1 ♀ (JRUC) (Fig. 7E), Batovo, 8.vii.1987, O. Hovorka lgt. **Czechia**, 1 ♀ (JRUC) (Figs. 17B, 19B), Bohemia bor., České středohoří Mts., Bořeň hill, [without date], 360–380 m a.s.l., J. Růžicka & P. Moravec lgt., baited pitfall trap no. 50 (fish meat, ripen cheese); 1 ♂ (JRUC) (Figs. 12B, 14B, 16B), Bohemia centr., Milovice env., Mladá military training area, 19.v.–27.x.1993, J. Růžicka lgt., baited pitfall trap no. 6 (fish meat), open biotope, remnants of bunkers on the firing line; 1 ♂ (JRUC) (Fig. 20B), Bohemia bor., České středohoří Mts., Boreč hill, 22.iv.–28.v.1994, J. Růžicka lgt., baited pitfall trap no. 6 (fish meat, ripen cheese) on NE slope, rock debris; 1 ♂ (JRUC) (Figs. 7D, F, 9B), Bohemia bor., České středohoří Mts., Libochovany env., Církvice, 1.vii.–19.ix.2004, M. Žemlička lgt., unbaited pitfall traps.

***Silpha longicornis* Portevin, 1926**

(Figs. 8A–C, 9C, 12C, 14C, 16C, 17C, 19C, 20C, 21B)

Additional material (3 specimens). **Japan**, 1 ♀ (JRUC) (Fig. 8B), Saitama Pref., Chichibu Co., Ontaki vill., Tonbaku-zawa vall., Chichibu Exp. Forest of Tokyo Univ., 1150 m a.s.l., 30.–31.vii.1986, K. Nemoto lgt.; 1 ♂ 1 ♀ (JRUC) (Figs. 8A, C, 9C, 12C, 14C, 16C, 17C, 19C, 20C, 21B), Honshu, Tochigi Pref., Shizu Rindoh Nikko N. P., 17–21.vii.1995, S. Nomura lgt.

***Silpha perforata* Gebler, 1832**

(Figs. 8D–F, 9D, 12D, 14D, 16D, 17D, 19D, 20D, 21C)

Additional material (4 specimens). **China, Liaoning Province**, 1 ♂ (JRUC) (Figs. 8D, F), Fengcheng City, Mt. Laobeishan, 10.vi.1999, ex coll. Franz Malsbender. **Russia**, 1 ♂ 1 ♀ (JRUC) (Figs. 12D, 14D, 16D, 17D, 19D, 20D, 21C), Primor reg., Jasnoe, vii.1989, R. Dunda lgt.; 1 ♀ (JRUC) (Fig. 8E), Ussurijsk, Kajmanovka, 2.–9.viii.1992, Snížek lgt.

2.3. Morphological analyses

Material was examined with an Olympus SZX10 stereomicroscope and a Keyence VHX6000 digital microscope. Male genitalia and female abdominal segments were cleaned in a 10% KOH solution for several hours at room temperature. Subsequently, they were inserted in glycerol for several days and then transferred to 96% alcohol. The photographs were taken on genitalia mounted temporarily in Kaiser's glycerol gelatine (phenol-free) (Merck, Germany). After taking the photographs, they were stored in glycerol in glass micro vials with silicone stoppers (BioQuip Products, Inc., California, USA) attached to the same pin as the corresponding dry mounted specimens. Alternatively, external details of morphology were taken from dry, cleaned specimens. Habitus photographs were taken using a Canon macro photo lens MP-E 65mm on a Canon 550D. Multiple layers of focus were combined using Zerene Stacker 1.04 (<http://www.zerenesystems.com/cms/stacker>). Photographs of genitalia and other details of external morphology were taken using a Keyence VHX6000 microscope with a VH-Z20T lens. All pictures were digitally enhanced using Adobe Photoshop CC. Plates were arranged in CorelDRAW 2018.

2.4. Measurements

External morphological characters were measured using the ocular grid on the Olympus SZ61 stereomicroscope. Length of pronotum was measured along the median line (as posterior angles are slightly prolonged in some species); width of pronotum was measured at its widest point perpendicular to the median line; length of elytra was measured from the posterior margin of the scutellum to the tip of the elytra in dorsal view. Total body length (TBL) was measured as the combined length of pronotum and elytra. Maximum body width (MBW) was measured in at its widest point perpendicular to the median line. The ratios of the length and width of the pronotum (RLWP) and the ratios of the length and width of elytra (RLWE) were also calculated. All measurements are given for males and females separately.

2.5. Distribution maps

The distribution maps (Figs. 22–23) were produced and edited in ESRI ArcMap 10.8.1 of ArcGIS Desktop 10.8.1 suite. For map layers, free levels 0–1 data from Global Administrative Areas (<http://www.gadm.org>, ver. 2.8), Natural Earth (<http://naturalearthdata.com>, Natural Earth I with Shaded Relief, Water, and Drainages), combined with World Shaded Relief (<https://www.arcgis.com/home/item.html?id=9c5370d0b54f4de1b48a3792d7377ff2>) (with 45% transparency) were used. For distribution maps, we used literature and present data (see Table 2).

2.6. Phylogenetic analysis

Phylogenetic analyses were performed using a matrix (Table 1) comprising ten terminal taxa of the ingroup with one additional taxon for the outgroup, and 22 characters based on external adult morphology. The matrix was compiled in WinClada version 1.00.08 (Nixon 2002), and analysed by exhaustive search (“implicit enumeration” option) of maximum parsimony approach using TNT ver. 1.6 (Goloboff & Morales 2023). Standard bootstrap analysis (with 1000 replicates) was executed in TNT; tree visualization and character mapping were done in WinClada. All characters were equally weighted and all multi-state characters were treated as unordered.

3. Phylogeny

3.1. Characters

Twenty-two characters are used for the eight taxa of the genus *Silpha*. The list of characters is given below, illustrated in Figs. 2–21. The resulting matrix of characters is given in Table 1 and also available as supplementary file 1.

1. Head in dorsal view, elongation: (0) unmodified (Figs. 2A, D, 3A, D, 4A, D–E, 5A, D, 6A–B, E, 7A–B, D–E, 8A–B, D–E); (1) elongate.
2. Pronotum, shape in dorsal view: (0) trapezoidal (Figs. 2A, D, 3A, D, 4A, D–E, 5A, D, 6A–B, E); (1) oval; (2) bell-shaped.
3. Pronotum, anterior margin in dorsal view: (0) regularly rounded; (1) truncate (Figs. 2A, D, 3A, D, 4A, D–E, 5A, D, 6A–B, E); (2) notched medially (Figs. 7A–B, D–E, 8A–B, D–E).
4. Elytra, colour: (0) dark brown to black (Figs. 2A, D, 3A, D, 4A, D–E, 6A–B, 7A–B, D–E, 8A–B, D–E); (1) pale brown (Figs. 5A, D).
5. Elytra, shape of punctures: (0) simple; (1) with small elevate grain on anterior margin (Figs. 2A, D, 3A, D, 4A, D–E, 5A, D, 7A–B, D–E, 8A–B, D–E, 9A–G); (2) large, elevated grain (Figs. 6A–B, E, 9H).
6. Elytra, external costa: (0) fully developed, long (Figs. 2A, D, 3A, D, 4A, D–E, 5A, D, 6A–B, E); (1) apically shortened (Figs. 7A–B, D–E, 8A–B, D–E).
7. Metathoracic wings: (0) macropterous; (1) brachypterous; (2) apterous.
8. Apex of antenna, antennomeres proportions: (0) antennomeres 9–10 two times as large as antennomere 8; (1) antennomeres 8–10 similar in size (Figs. 20A–D); (2) antennomeres 9–10 distinctly shorter than antennomere 8 (Figs. 20E–H).
9. Antennomere 8, shape: (0) rounded or triangular, as wide as long (Figs. 20A–C, H); (1) transverse, 0.6–0.8 as long as wide (Figs. 20D–G).
10. Male protarsus in dorsal view, dilatation: (0) expanded (Figs. 5A, 7A, D, 8A, D); (1) narrower, only slightly expanded (Figs. 4A–D); (2) unexpanded, similar to female (Figs. 2A, 6A).
11. Male protarsus in ventral view, setation: (0) long, yellowish adhesive setae (Figs. 5B, 7B, E, 8B, E, 21A–D); (1) reduced setation, without long adhesive setae (Figs. 2B, 4B, 6D, 21E–G).

Male terminalia

12. Aedeagus, proportion of median lobe: (0) very long, 4.1 times as long as wide (Schawaller 1980: 5, fig. 2); (1) moderately elongate, 3.4–3.5 times as long as wide (Figs. 12A–D); (2) shortened, 2.4–2.9 times as long as wide (Figs. 10A–B, 11A–B).
13. Aedeagus, median lobe, shape of apex: (0) simply narrowing into blunt, sclerotized tip (Schawaller 1979: 7, fig. 5); (1) widely rounded, sclerotized (Schawaller 1980: 7, fig. 2; Šustek 1983: 27, fig. 55); (2) elongate into sharp, sclerotized tip (Figs. 12A–D); (3) short, triangular tip, apically desclerotized (Fig. 10A); (4) extremely shortened, transverse, with widely desclerotized tip (Figs. 10B, 11A–B).
14. Parameres, thickness in dorsal view: (0) slender (Figs. 10B, 11B); (1) robust (Figs. 10A, 11A, 12A–D); (2) extremely robust (Schawaller 1980: 5, fig. 2).

15. Parameres, shape in lateral view: (0) straight, almost parallel with median lobe (Figs. 11A–B, 12A–D); (1) distinctly bent in ventral direction (Figs. 10A–B).
16. Basal portion of aedeagus, thickness of sclerotized ring: (0) fully developed, thick (Figs. 10A, 11B, 12A–D), (1) narrow, slender (Figs. 10B, 11A).
17. Male genital segment, general shape in dorsal view: (0) rectangular (Figs. 13A, 14A–D); (1) widely rounded (Figs. 13B–D).
18. Male genital segment, anterior margin of tergum 10 in dorsal view: (0) narrow, v-shaped (Figs. 13A, D, 14A–D); (1) broadly rounded (Figs. 13B–C).
19. Male genital segment, spiculum gastrale in ventral view: (0) elongate (Figs. 13B, D, 14A–D); (1) short, slender (Figs. 13A, C); (2) short, robust.
20. Male abdominal tergum 8, posterior margin in dorsal view: (0) truncate or medially broadly emarginate (Figs. 15A, C, 16A–D); (1) regularly rounded (Fig. 15B).

Female terminalia

21. Size of gonostylus: (0) unmodified (Figs. 17A–D, 19A–D); (1) elongate (Figs. 17G–H, 18C–D); (2) miniaturized (Figs. 17E–F, 18A–B).
22. Shape of gonocoxite in ventral view: (0) unmodified (Figs. 17A–E, H, 18A, D, 19A–D); (1) with elongate inner apical part (Figs. 17F–G, 18B–C).

TABLE 1. Morphological data matrix for the phylogenetic analysis of the Afrotropical species of *Silpha* with other selected taxa from this genus.

species/char	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
<i>S. (Phosphuga)</i>																						
<i>atrata</i> (outgroup)	1	2	0	-	0	1	1	0	0	1	0	2	0	0	0	0	0	0	2	1	0	0
<i>S. obscura</i>	0	1	0	0	0	0	1	1	1	0	0	0	1	2	0	0	0	0	0	0	1	1
<i>S. tristis</i>	0	1	0	0	1	0	0	1	1	0	0	2	2	1	0	0	0	1	0	0	1	1
<i>S. businskyorum</i>	0	0	2	0	1	1	2	2	0	0	0	1	2	1	0	0	0	0	0	0	0	0
<i>S. capicola</i>	0	0	1	0	1	0	1	1	1	2	1	2	3	1	1	1	0	0	1	0	2	0
<i>S. carinata</i>	0	0	2	0	1	1	1	2	0	0	0	1	2	1	0	0	0	0	0	0	0	0
<i>S. chelinda</i> sp. nov.	0	0	1	1	1	0	2	1	1	0	0	2	4	1	0	0	1	1	0	0	1	1
<i>S. francoisi</i>	0	0	1	0	2	0	2	1	0	2	1	2	4	0	0	1	1	0	1	1	1	0
<i>S. lata</i>	0	0	1	0	1	0	2	1	1	1	1	2	4	0	1	0	1	1	0	1	2	1
<i>S. longicornis</i>	0	0	2	0	1	1	2	2	0	0	0	1	2	1	0	0	0	0	0	0	0	0
<i>S. perforata</i>	0	0	2	0	1	1	2	2	1	0	0	1	2	1	0	0	0	0	0	0	0	0

3.2. Result of analysis

Analysis resulted in a single most parsimonious tree with a length of 55 steps (consistency index = 63, retention index = 65) (Fig. 1). The four Afrotropical species form a clade nested within the grade formed by the Palearctic species *S. tristis* and *S. obscura*. *Silpha capicola* and *S. francoisi* are sister species, being sister to *S. lata*. A clade formed by these three species is sister to *S. chelinda* Sommer, Růžicka & Barclay, **sp. nov.** (Fig. 1). The Palearctic species *S. carinata* and additional closely related species (*S. businskyorum*, *S. longicornis*, and *S. perforata*) form a separate clade (Fig. 1).

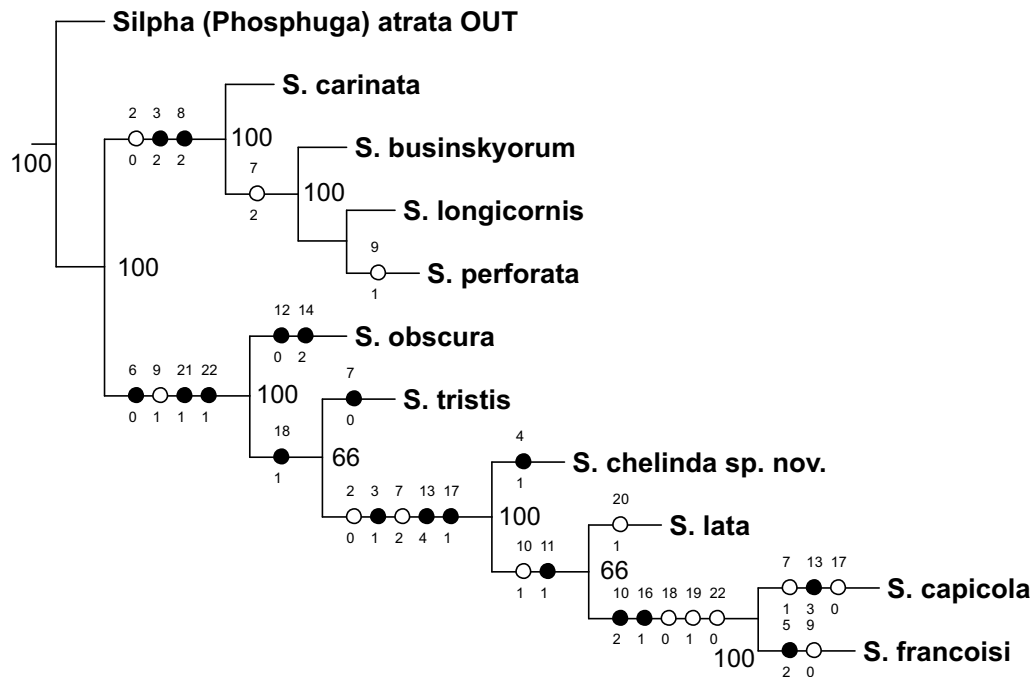


FIGURE 1. Most parsimonious topology from phylogenetic analysis of *Silpha*, based on morphological characters, obtained from implicit enumeration analyses. Ambiguous characters are optimized with ACCTRAN (accelerated optimization in WinClada). Character numbers are given above, character states below. Solid circle indicates uncontroverted synapomorphy; empty circle indicates homoplasy or reversal apomorphy. Numbers at nodes indicate bootstrap values (with 1000 replicates).

4. Taxonomy

4.1. Diagnosis of the Afrotropical clade of species of *Silpha*

The Afrotropical clade of *Silpha* can be characterized by combination of the following four synapomorphies: (1) pronotum with anterior margin truncate in dorsal view (Figs. 2A, D, 3A, D, 4A, D–E, 5A, D, 6A–B, E); (2) male protarsi not expanded, without long adhesive setae (Figs. 21E–H), distinctly expanded and with long yellow adhesive setae only in *S. chelinda* Sommer, Růžicka & Barclay, **sp. nov.** (Fig. 21D); (3) metathoracic wings reduced (in *S. capicola*) or absent; (4) median lobe of aedeagus distinctly shortened, transverse, apically desclerotized (Figs. 10–11).

4.2. Diagnosis and (re-)description of species

Silpha capicola Péringuey, 1888

(Figs. 2A–F, 3A–F, 9E, 10A, 13A, 15A, 17E, 18A, 20E, 21E, 22–23)

Silpha capicola Péringuey, 1888: 86 (type locality: Cape Colony, Seymour [ca. 32°33'12"S 26°46'42"E, 800 m a.s.l.]; as synonym of *S. punctulata* Olivier, 1790 by Schawaller 1987: 281).

Silpha punctulata Olivier, 1790 (No. 11): 13 (type locality "Cap de Bonne-Espérance" [Cape of Good Hope, ca. 34°21'03"S 18°29'04"E, 130 m a.s.l., or Cape Province]; preoccupied, junior primary homonym of *Silpha punctulata* Gmelin [in Linnaeus], 1790: 1617; used as valid by Schawaller 1987: 281).

Silpha Péringueyi Portevin, 1922: 506 (type locality: "Cafrerie" [= Kaffraria, now Eastern Cape Province, South Africa] and "Le Cap" [= Cape Town, ca. 33°57'00"S 18°31'00"E, 10 m a.s.l.]). (as synonym of *S. punctulata* Olivier, 1790 by Schawaller 1987: 281).

Silpha capricola [sic] Péring.: Hatch 1928: 104 (partim; lapsus calami).

Published records (shown in the maps in Figs. 22–23).

Schawaller (1987): “**South Africa: Eastern Cape Province:** Port Elizabeth; Willowmore. **Western Cape Province:** 6 km S–Botriver; Caledon area; 63 km N of Cape Town; 12 km E of Pearly Beach; 5 km S of Stanford; Tygerberg hills near Cape Town; Van Schoor’s drift near Philadelphia; Verlorelei Farm”.

Type locality. South Africa, Eastern Cape Province, Cape Colony, Seymour [ca. 32°33’12”S 26°46’42”E, 800 m a.s.l.].

Type material (3 specimens). **South Africa, Western Cape Province: Syntypes**, 1 ♂ (MNHN) (Figs. 3A–B), “Cafrerie | (Coll. Chevrolat) [hw, modern label added by curator] || TYPE [p, red label] || Muséum Paris [p] | Portevin [hw] | Coll. M. Pic [p, modern label added by curator] || Silpha | Peringueyi | m. [hw, Portevin’s manuscript] || **SYNTYPE No. 1 | Silpha Peringueyi** | Portevin, 1922 | D. Sommer & | J. Růžička des. 2023 [p, red label] || Silpha capicola | Péringuey, 1888 | D. Sommer & | J. Růžička det. 2023 [p]”; 1 ♂ (MNHN), “MUSEUM PARIS | LE CAP | REYNAUD 1829 [p, light green label with thin black frame] || TYPE [p, red characters] || Silpha | punctulata | OLIVIER 1790 [hw] | det. Schawaller [p] || **SYNTYPE No. 2 | Silpha Peringueyi** | Portevin, 1922 | D. Sommer & | J. Růžička des. 2023 [p, red label] || Silpha capicola | Péringuey, 1888 | D. Sommer & | J. Růžička det. 2023”; 1 ♂ (MNHN), “MUSEUM PARIS | LE CAP | REYNAUD 1829 [p, light green label with thin black frame] || Reynaud | 1829 | Cap [hw, round label] || TYPE [p, red characters] || **SYNTYPE No. 3 | Silpha Peringueyi** | Portevin, 1922 | D. Sommer & | J. Růžička des. 2023 [p, red label] || Silpha capicola | Péringuey, 1888 | D. Sommer & | J. Růžička det. 2023”.

Additional material (175 specimens). **South Africa, Eastern Cape Province**, 2 spec. (TMSA), Willowmore, viii.1927, Dr. Brauns lgt.; 2 ♀♀ (SANC) (Figs. 3D–F), Katberg, 24.i.1928, J. Hewitt [lgt.], ex coll. AMGS, No. 5577; 1 spec. (SANC), Knysna Dist[ri]ct., Grootrivier, i.1955, Martin lgt. **Western Cape Province**, 1 spec. (TMSA); Cape, [without date and collector’s name]; 4 spec. (BMNH), same locality, [without date and collector’s name], ex coll. G. Lewis 1915–38.; 1 spec. (JSCC), same locality, 1952, [without collector’s name]; 2 spec. (ISAM), Cape C., Rondebosch, [without date and collector’s name], SAM-COL-A021996; 1 spec. (ISAM), Cape, Cape Town, Rondebosch, ix.1882, J. Desozir lgt., SAM-COL-A021997; 1 spec. (SANC), 1 spec. (TMSA), Cape Town, [without date and collector’s name]; 1 spec. (SANC), same locality, [without date], Purcell lgt.; 2 spec. (ISAM), same locality, vi.1882, Pres. L. Péringuey lgt., in cop.[ula], SAM-COL-A021995; 1 spec. (SMNS), 1 ♀ (TMSA) (Figs. 2D–F), same locality, 63 km N, 33.24S 18.16E, 30.viii.1983, Endrödy & Penrith lgt., E–Y: 2001, groundtraps, 63 days, groundtrap with faeces bait; 1 spec. (BMNH), Hoets Bay, [without date and collector’s name], 90–49.; 1 spec. (SANC), Stellenbosch, [unreadable date], W.J. Carsrans lgt.; 1 spec. (SANC), same locality, 1888, L. P. [=Louis Péringuey lgt.]; 3 spec. (TMSA), same locality, 1.x.1927, Dr. Brauns lgt.; 1 spec. (SANC), same locality, 8.x.1935 [or 1985, unreadable], Ac. US.; 1 spec. (SANC), same locality, 11.ix.1941, Ac. US.; 1 spec. (SANC), same locality, 15.iii.1946, W.I. Carsrans lgt.; 1 spec. (SANC), same locality, 4.x.[19]46, W.S. Smik lgt.; 1 spec. (SANC), same locality, 17.iv.1947, E.C. Anderssen lgt.; 1 spec. (SANC), same locality, 25.vii.1947, [unreadable collector’s name]; 1 spec. (SANC), same locality, 2.ix.1947, Allderman lgt.; 1 spec. (SANC); same locality, 3.ix.1947, B. Tard lgt. [? unreadable]; 1 spec. (SANC), same locality, 3.ix.1947, C. Armstrong lgt.; 1 spec. (SANC), same locality, x.1960, Entomologist Ac. Ca., P.C. Smith lgt.; 1 spec. (MNHN), De Tafle Berg, v.1821, Mus. Paris, ex Chevrolat, Coll. E. Fleautiaux, C. B. Esp.; 1 spec. (ISAM), Knysna, 1896, Purcell lgt., SAM-COL-A21999; 1 spec. (ISAM), same locality, 1912, L. P. [=Louis Péringuey] lgt., SAM-COL-A022004; 1 spec. (BMNH), George, 27.vi.–1.vii.1920, R.E. Turner lgt., 1920–318.; 6 spec. (ISAM), C.P. [= Cape Province], Somerset West, Nov.–Feb.1927 [= xi.1926–ii.1927], A.J. Hasse lgt., SAM-COL-A021993; 1 spec. (larvae) (SANC), same locality, Lourens River, 34°05’S 18°51’E, 100m a.s.l., 14.x.2007, coll. P.E. Reavell, alluvial flood plain old river bed winter pools; 6 spec. (1 spec. larvae) (SANC), same locality, Vegelogen Est., 34°05’S 18°56’E, vi.–vii.2008, M.J.T. Weaver, this specimen ex undergraduate student collection, treat label data with caution; 1 spec. (TMSA), V. Rynsdorp, vii.1927, Dr. Brauns [lgt.]; 1 spec. (TMSA); same data, viii.1927; 1 spec. (ISAM), Oudebosch, R. Zonder End Mts. [= Riviersonderend Mountain], 1500 ft. [ca. 457 m], xi.–xii.1928, K.H. Barnard lgt., SAM-COL-A022003; 2 spec. (ISAM), same locality, i.1933, H.G. Wood lgt., SAM-COL-A022000, ..02; 1 spec. (ISAM), C.P. [= Cape Province], Keurbooms River Knyasna, i.1931, K.H. Barnard lgt., SAM-COL-A022005; 1 spec. (SANC), C.P. [= Cape Province], Faure, 28.ix.1947, [without collector’s name]; 1 spec. (ISAM), same locality, 21.x.1956, A.J. Hasse lgt., SAM-COL-A021994; 1 spec. (SANC), same locality, 34°05’S 18°51’E, 100m, 6.xii.[20]04, [without collector’s name]; 1 spec. (SANC), Kaapse, Vlakte [?], xii.1947, J.G. Theron lgt.; 1 spec. (TMSA), C.T. [= Cape Town], Cape Flats, 30.x.1949, Andrae & Koch lgt.; 1 spec. (SANC), Kaapstad, 1960, deKlerk lgt.; 1 spec. (TMSA), Strand, viii.[19]65, Dickson

lgt.; 1 spec. (CMNC), Cape Prov., Van Schoer's drift nr. Philadelphia, 17.viii.1969, [without collector's name]; 2 spec. (SANC), KP. [= Cape Province], Agulhas, 16.i.[19]71, M.W. Strydom lgt.; 1 spec. (TMSA), Caledon area, 20.x.[19]71, Bornemissza & Kirk lgt.; 1 spec. (ISAM), Kleinmond, x.1981, A.J. Prins lgt., SAM COL-62, SAM-COL-A022007; 1 spec. (SANC), Swellendam, 2.ii.1978, J.H. Coetzee lgt.; 1 spec. (ISAM), Piquetberg, 31.x.[19]81, T.D. Butler lgt., SAM-COL-A021998; 1 ♂ (CMNC), Knysna, Buffelsnek, 33.9124214S, 23.1570450E, 800 m, 16.–19.xii.1981, S. & J. Peck lgt., carrion trap, fynbos; 1 spec. (SANC), Malmesbury, viii.1983, W. Schreuder lgt.; 1 spec. (TMSA), Botriver, 6 km S, 34.15S 19.13E, 27.viii.1983, [S.] Endrödy & Penrith lgt., E–Y: 1980, groundtraps, 66 days, groundtrap with banana bait; 1 spec. (TMSA), Pearly Beach, 12 km E, 34.36S 19.36E, 27.viii.1983, [S.] Endrödy & Penrith lgt., E–Y: 1985, groundtraps, 63 days, groundtrap with banana bait; 2 spec. (TMSA), Stanford, 5 km S, 34.29S 19.26E, 27.viii.1983, [S.] Endrödy & Penrith lgt., E–Y: 1981, groundtraps, 66 days, groundtrap with banana bait; 1 spec. (JRUC), same locality, 8 km NEE (stream), 34°25.0'S 19°32.38'E, 35 m, 4.–5.xii.2015, [Emmanuel Varela] Arriaga, [Martin] Fikáček, [Matthias] Seidel & [Dominik] Vondráček lgt., RSA49, UV light collecting at the sandy stream with sparse *Phragmites* patches; 5 spec. (TMSA) (Figs. 2A–C), Verlorevlei farm, 34.19S 18.22E, 28.viii.1983, [S.] Endrödy & Penrith lgt., E–Y: 1990, groundtraps, 60 days, groundtrap with banana bait; 4 spec. (TMSA), same data, groundtrap with meat bait; 1 spec. (SMNS), same data, groundtrap with banana bait; 2 spec. (SMNS), same data, groundtrap with meat bait; 1 spec. (ISAM), Cynbos site, Suc. Cio., 19.iii.[19]84, A.V. Milewski lgt., SAM-COL-A062671; 1 spec. (ISAM), C.P. [= Cape Province], Springfield, Bredasdorp, 10.x.1984, A.V. Milewski lgt., C10, caught [in] rodent box trap, SAM-COL-A062670; 1 spec. (ISAM), same locality, 18.x.1984, A.V. Milewski lgt., C10, caught [in] rodent box trap, Protea compacta scrub, SAM-COL-A062673; 1 spec. (ISAM), same locality, 21.x.1984, A.V. Milewski lgt., C10, eating bait in rodent trap, Protea compacta site, SAM-COL-A062674; 2 spec. (ISAM), same locality, 5.xi.1984, A.V. Milewski lgt., C10, caught [in] rodent box trap., Protea compacta scrub, SAM-COL-A062672, ..75; 1 spec. (ISAM), Springfield, xi.[19]84, C10, (caught [in] rodent box trap.), A.V. Milewski lgt., SAM-COL. A062669; 1 spec. (SANC), Kuilsrivier, 25.vi.1986, J. Liebenberg lgt.; 1 spec. (MRAC), Muizenberg, v.1989, R. Legg lgt.; 2 spec. (MRAC), same locality, vi.1989, R. Legg lgt.; 6 spec. (MRAC), same locality, 2.vi.–16.vi.1989, R. Legg lgt.; 1 spec. (MRAC), same locality, 14.vi.–28.vii.1989, R. Legg lgt.; 4 spec. (MRAC), same locality, 16.vi.–30.vi.1989, R. Legg lgt.; 15 spec. (MRAC, JRUC), same locality, 30.vi.–14.vii.1989, R. Legg lgt.; 31 spec. (BMNH, MRAC, JRUC) (Figs. 9E, 10A, 13A, 15A, 17E, 18A, 20E, 21E), same locality, 28.vii.–11.viii.1989, R. Legg lgt.; 3 spec. (MRAC), same locality, 29.ix.–13.x.1989, R. Legg lgt.; 5 spec. (MRAC), same locality, 10.x.–25.x.1989, R. Legg lgt.; 2 spec. (MRAC), same locality, 15.xi.–1.xii.1989, R. Legg lgt.; 2 spec. (MRAC), same locality, xii.1989, R. Legg lgt., 15. miss.; 1 spec. (ZMHB), Cape of Good Hope Nat. Res. [= National Reserve], 6.–7.i.1993, F. Koch lgt.; 3 spec. (ISAM), same locality, Olifantsbos, nr. Skaife Centre, ca. 34°16'S 18°23'E, 18.–19.ix.1993, S. van Noort lgt., strandveld on coast at sea level, pifall trap, SAM-COL-A022006; 1 spec. (JRUC), Table Mts. NP, Olifantsbos, river banks, ca. 34°15.3'S 18°23.0'E, 5.xi.2019, P. Bulirsch lgt.

Ambiguous or poorly georeferenced material (17 specimens). **South Africa**, 1 spec. (ZMUC), Africa austral., [without date], Mus. Drens.; 1 spec. (MHNG), Cap B E [Cap de Bonne-Espérance or Cape of Good Hope = West Cape Province] [without date and collector's name]; 2 spec. (ZFMK), Cap. b. Sp. [Cap Bonae Spei or Cape of Good Hope = West Cape Province], [without date and collector's name], ex coll. R. Oberthür; 2 spec. (ZMUC), Cap. bon. sp., [without date and collector's name], ex coll. Westermann; 1 spec. (ZMUC), Cap. bon. sp., [without date and collector's name], Mus. Drens.; 2 spec. (ZMUC), Cape Good Hope [= West Cape Province], vi.1817, [without collector's name], Mus. Westerm.; 1 spec. (OUMNH), Captn. Boys, [without date and collector's name]; 1 spec. (BMNH), Cape, [without date and collector's name], determined from description G. J. A[rrrow]., *Silpha punctulata* Oliv., Ent. Club. 44-12., *Silpha capensis* Dej; 1 spec. (SMNS), Indes Int., Cap. Boys, [without date and collector's name], schlanke Form wie Typus von *peringueyi* Port. [slender form as the type of p.], det. Schawaller; 1 spec. (OUMNH), [without locality, date and collector's name], *punctulata*, Mus. Norvic [?, illegible], Kirby; 1 spec. (OUMNH), [without locality, date and collector's name], *punctulata*, Oliv. PBS; 1 spec. (BMNH), S. Afr. [= South Africa], vi.[19]44, Dr. Smith lgt.; 1 spec. (TMSA), [without locality, date and collector's name], ex coll. Pretoria University (UPSA 2002); 1 spec. (ISAM), "South Africa" [without date and collector's name], SAM-COL-A022001.

Redescription. Male (♂) [based on specimen from Verlorevlei farm, Western Cape Province (coll. TMSA)]. *Body* (Figs. 2A–C) oval, dorso-ventrally flattened. Elytra arched. Whole body surface and appendages black, or rarely dark brown (probably in subternal specimens).

Head (Figs. 2A–C). Black, lustrous, surface with dense, small, distinct, regular punctation. Covered with short, recumbent orange setation. Lateral area posterior to clypeal suture with long, erect orange setation. Clypeus anteriorly widely notched. Anterior margin of clypeus with slightly irregular row of dense, long, orange setation. Eye kidney-shaped in lateral view. Frons with marked dorsal tentorial pits and a transverse, elevated crest posteriorly.

Antennae (Figs. 2A–C, 20E). Medium-sized, with last four antennomeres forming a distinct club.

Pronotum (Figs. 2A, C) moderately transverse, widest posteriorly. Margins rimmed anteriorly and laterally; anterior margin slightly sinuous, with wide, shallow medial emargination; anterior angles weakly elevated. Posterior margin weakly sinuous laterally. Surface dull, with dense punctation, punctures small, clearly separated, from disc to margin larger and more deeply impressed. Punctures bearing extremely short, orange setae.

Scutellum (Fig. 2A). Irregularly triangular, widely vaulted medially. Surface with coarse, distinct, dense, homogenous punctation, from disc to margin smaller and slightly impressed; covered with short, recumbent, black setation. Posterior margin rounded.

Elytra (Figs. 2A–C, 9E) subparallel, at the widest point (along 2/3 of its length) wider than pronotum. Elytron with three distinctly elevated, rounded ridges; ridges nearly reaching apex of elytron; second ridge shortened anteriorly; external ridge shortened posteriorly. Elytral epipleura strongly elevated dorsally along almost the entire length, flattened at elytral apex. Apex of elytron imperceptible elongate. Surface dull, without setation, with isodiametric microsculpture; covered with dense, distinct, regular punctation; punctures clearly separated by 1.0–1.5 of their diameter. Punctures posteriorly with small tubercle. Each tubercle bearing a small, short, black seta. Elytra with coarse, subrectangular punctures covering most of the surface in dorsal view. Elytral epipleura irregularly, coarsely punctated in ventral view.

Metathoracic wings. Brachypterous.

Ventrum (Fig. 2B). Thorax finely to roughly punctate, covered mostly with short to medium-sized, recumbent, orange to black setae. Proventrite with dense punctation laterally; metaventrite densely, roughly punctate, with dense, medium-sized setation. Mesocoxae closely separated. Abdominal ventrites with distinct impressions laterally in ventral view. Abdominal ventrites punctate, covered with short, orange to black setation, with expanded brick-wall pattern on intersegmental membranes.

Legs (Figs. 2A–C, 21E). Protarsus slightly expanded. Pro-, meso- and metatibia each with two apical spurs of different length. Metatibia almost straight, only very slightly curved in ventral view. Trochanters with bunch of medium-sized, orange setae.

Abdominal segments (Figs. 2B, 13A, 15A). Tergite VIII subquadrate, apically almost straight, rounded posteriorly. Ventrite VIII widely rounded posteriorly. Ventrite IX oval, elongate and deeply medially desclerotized in ventral view. Spiculum gastrale robust, elongate in ventral view; continuously narrowing towards the apex.

Aedeagus (Fig. 10A). Median lobe stout, robust, gradually tapered to widely rounded, triangular apex. Internal sac sclerotized. Parameres robust, slightly curved downwards, as long as median lobe, apex widely rounded. Basal portion oval, robust, not exceeding the width of median lobe.

Sexual dimorphism. Female (♀) (Figs. 2D–F, 3D–F, 17E, 18A). Similar to male, except for the following structures. Tergite VIII subquadrate, apically almost straight, rounded posteriorly. Ventrite VIII widely rounded. Tergite IX elongate, rounded; tergite X widely rounded, almost pentagonal, apex with dense setation. Coxite robust, subquadrate, apex only slightly indicated, rounded; stylus extremely short, subquadrate, inserted lateroapically, shorter than apex of coxite.

Variability. Individuals vary in size and shape (see next paragraph). Elytra dark brown (probably in subteneral or historical specimens) to black. Pronotal punctures with short setation; setae are reduced to absent in some specimens, especially on disc.

Two female specimens (Figs. 3D–F) from Katberg, Eastern Cape Province (coll. SANC) are distinctly larger and wider, their elytral epipleura are distinctly flattened, costae are only weakly raised and elytra are broadly oval (TBL 18.3 mm, MBW 12.9 mm, RLWP 0.57 and RLWE 0.96; these measurements were not included in summary in the next paragraph). Elytra are with much finer and denser punctation (Fig. 3D). A similar looking specimen from Port Elizabeth, Eastern Cape Province (coll. SANC) was already mentioned and documented by Schawaller (1987: 282–283, fig. 5), who considered it conspecific with *S. punctulata* (= *S. capicola*). Unfortunately, this specimen was not available to re-examine. More material (incl. male specimens) is highly desirable to understand the variation of *S. capicola*. Similar variability is known in *S. carinata*, where lowland populations (sometimes treated as a separate subspecies, *S. carinata italica* Küster, 1851) from temperate regions are also larger and more broadly oval, which is linked with the intraspecific variation and the ecological plasticity of this species (Šustek 1983).

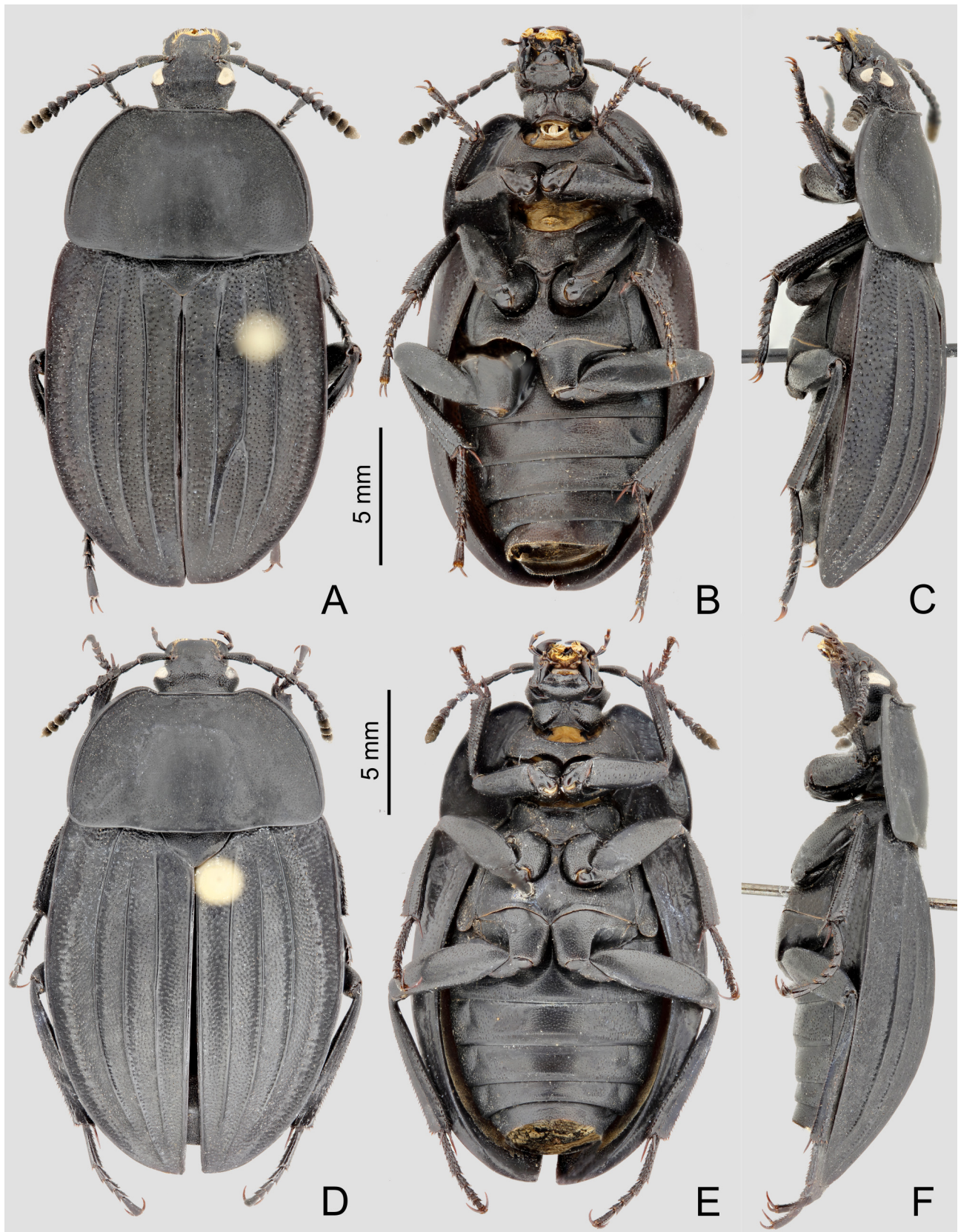


FIGURE 2. Habitus of *Silpha capicola* Péringuey, 1888. A–C: male in dorsal, ventral and lateral views, Verlorelevlei farm (TMSA). D–F: female in dorsal, ventral and lateral views, 63km N of Cape Town (TMSA).

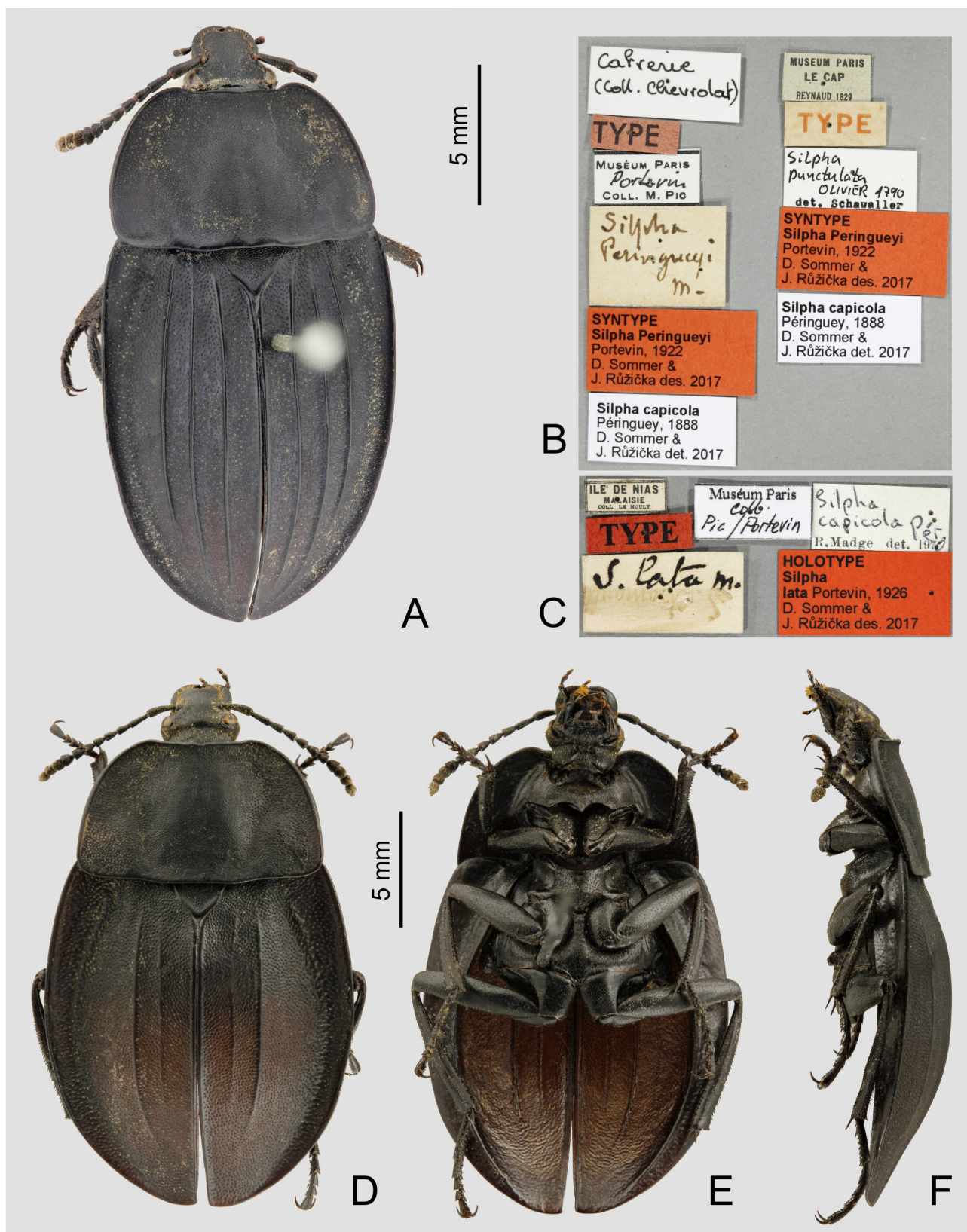


FIGURE 3. Habitus of *Silpha capicola* Péringuey, 1888. A: syntype of *Silpha Peringueyi* Portevin, 1922, dorsal view (MNHN). B–C: labels of the two syntypes of *S. Peringueyi* Portevin, 1922, from MNHN. D–F: female in dorsal, ventral and lateral views, Katberg (SANC).

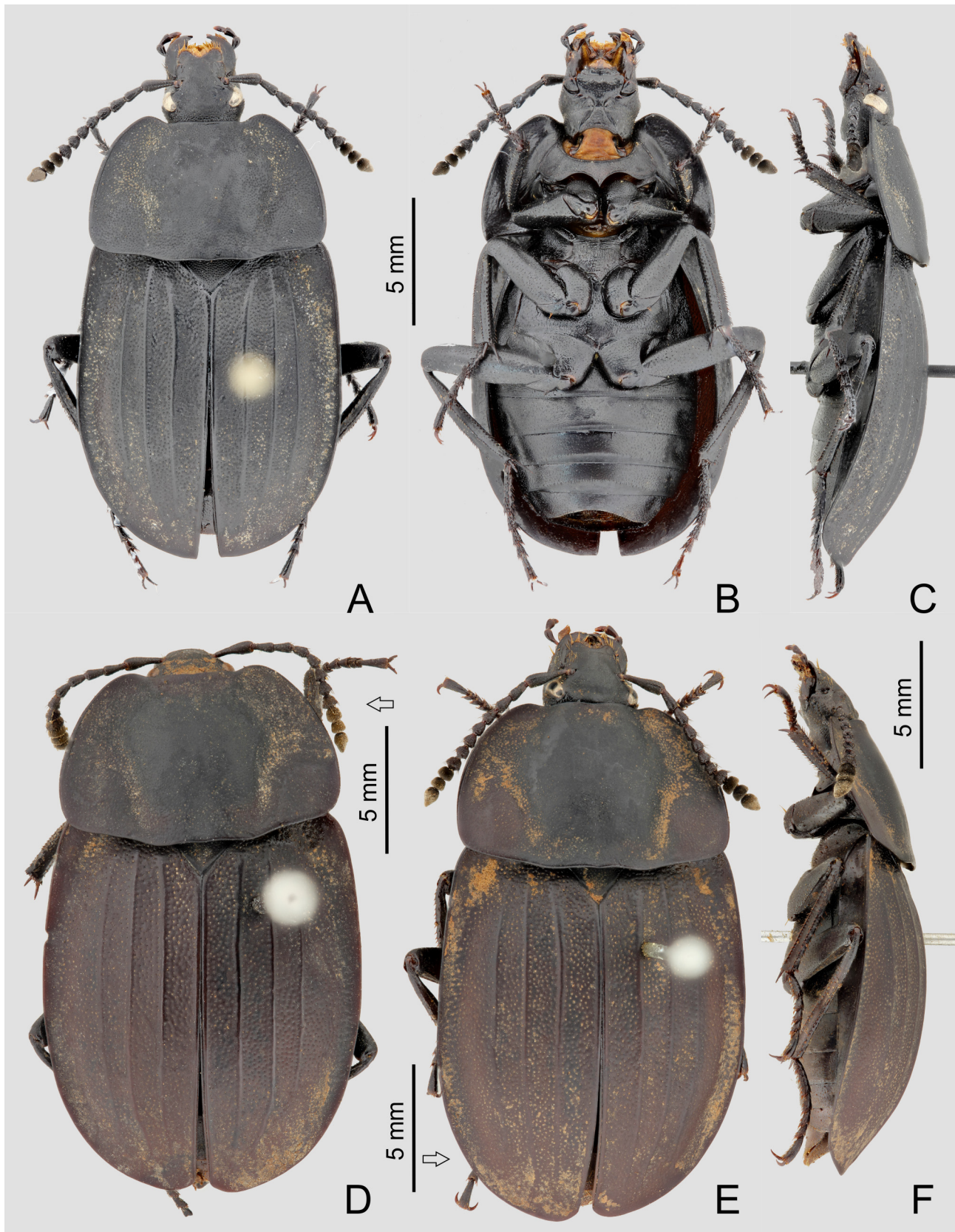


FIGURE 4. Habitus of *Silpha lata* Portevin, 1920. A–C: male in dorsal, ventral and lateral views, Changalawe—Mafinga (NHMW). D: holotype of *S. lata* Portevin, 1920, male (MNHN). E–F: female in dorsal and lateral views, Upangwa (HNHM).

Measurements. TBL 16.5–17.5 mm in ♂ (syntypes No. 1 to No. 3 of *S. peringueyi*: 17.0, 16.2 and 16.2 mm) and 14.5–18.5 mm in ♀; MBW 10.0–11.0 mm in ♂ (syntypes No. 1 to No. 3: 10.4, 10.0 and 10.1 mm) and 10.0–12.0 mm in ♀; RLWP 0.58 to 0.61 in ♂ (syntypes No. 1 to No. 3: 0.59, 0.60 and 0.63), 0.52 to 0.56 in ♀; RLWE 1.05 to 1.2 in ♂ (syntypes No. 1 to No. 3: 1.11, 1.09 and 1.06), 1.00 to 1.14 in ♀.

Differential diagnosis. Refer to species key and Table 3 below.

Distribution. Endemic species of South Africa, widespread in southern part of West Cape Province, and also known from three locations in East Cape Province (see map, Figs. 22–23 and Table 2).

Note. Nothing is known about the life history of this species. Larvae were observed wandering on ground covered with fynbos (Prins 1984).

Taxonomical remarks. Historically, there are three names available for this species.

(1) *Silpha punctulata* Olivier, 1790, described from “Cap de Bonne-Espérance [= West Cape Province around Cape of Good Hope, Republic of South Africa]” (Olivier 1790). This name is a subjective homonym of *Silpha punctulata* Gmelin, 1790, described from “Hallae Saxonum [= Halle, Germany]”. The second volume of Olivier (1790) has the year of publication “1790” on its title page, livraison 4 (*Dermestes* to *Anthobium*, also containing *Silpha*) was published in December 1790 (Bousquet 2016: 394). Gmelin (1790) is considered to have been published before 21 May 1790 (Bousquet 2016). Consequently, *S. punctulata* Olivier is considered preoccupied and needs to be treated as a junior primary homonym of *S. punctulata* Gmelin.

The current identity of *S. punctulata* Gmelin is not completely clear: in the original description, Gmelin (1790) refer to Fabricius (1787, page 46, species No. 9), which is *Ips atomaria*—now *Mycetophagus atomarius* (Fabricius, 1787) (Coleoptera: Mycetophagidae). However, this synonymy is not listed in Nikitsky (2008), and AnimalBase Project Group (2021) under *speciestaxon?id=34654* only provides “current allocation not known”. A.F. Newton (e-mail of 21 March 2017) noted “Gmelin’s name seems to have been forgotten; technically it is a synonym of *atomarius*, but is not in the Pal. Cat.”. A solution to this issue is not provided here.

Silpha punctulata Olivier was treated as valid until fairly recently, the fact that it is preoccupied and needs to be replaced by another available name (see below) was only discovered by Thayer & Newton (2005). Many type specimens of beetles described by G.A. Olivier are deposited in MNHN (Bousquet 2016), but no type(s) of *S. punctulata* were located during repeated visits in 2002–2008 (J. Růžicka, pers. comm.).

Portevin (1926) reported this species also from “Afrique orientale, de l’Abyssinie au Cap” [= Eastern Africa, Abyssinia and Cape]. It is clear that he did not pay much attention to the precise distribution of the species. We have not seen any material of *Silpha* from Abyssinia (nowadays the territory of Ethiopia and Eritrea).

(2) *Silpha capicola* Péringuey, 1888 was described from “Cape Colony, Seymour” (Péringuey 1888). It was treated as junior synonym of *S. punctulata* Olivier, 1790 by Schawaller (1987), who also briefly discussed and documented its morphological variability. Thayer & Newton (2005) listed *S. capicola* as the valid name of the South African *Silpha*, as *S. punctulata* Olivier is preoccupied (see above). We were not able to locate the type(s)—they were not located in ISAM (Robertson 2008) nor in SANC (Elizabeth Grobbelaar, e-mail of 20 April 2017; Riaan Stals, e-mail of 14 December 2017).

This species was misinterpreted by Portevin (1926), his description fits the material from Tanzania, but distribution is provided as from both “Cap de Bonne Espérance [= Cape of Good Hope]” and “Lac Nyassa [= Lake Nyassa, now Lake Malawi]”. For correct interpretation of the latter, see below.

(3) *Silpha peringueyi* Portevin, 1922 was described, based on a series of specimens from “Cafrerie” and “Le Cap” (Portevin 1922). It was treated as junior synonym of *S. punctulata* Olivier, 1790 by Schawaller (1987), who consider it only as a slenderer form of *S. punctulata*. We have located three syntypes in MHNH.

***Silpha chelinda* Sommer, Růžicka & Barclay, sp. nov.**

(Figs. 5A–F, 9G, 11A, 13C, 15C, 17G, 18C, 20G, 21D, 22–23)

Type locality. Malawi: Northern Region, Nyika Plateau, Chelinda [ca. 10°34′51″S 33°48′15″E], 2300 m.

Type material (17 specimens). **Malawi, Northern Region: Holotype**, ♂ (MRAC) (Figs. 5A–C, F), “Chelinda | 2300m | 1/21. XII. 1981 [p] || Coll. Mus. Tervuren | Malawi North. Reg. | Nyika Plateau | XII. 1981 – R. Jocqué [lgt.] [p] || *Silpha* | *capicola* Pér. [hw] | J. Decelle det. 19 [p] 89 [hw]”. **Paratype**, 3 ♂♂ 9 ♀♀ (MRAC, BMNH, JRUC) (Figs. 5D–E, 9G, 11A, 13C, 15C, 17G, 18C, 20G, 21D), same data as holotype; 2 ♂♂ 1 ♀ (TAU, JRUC),

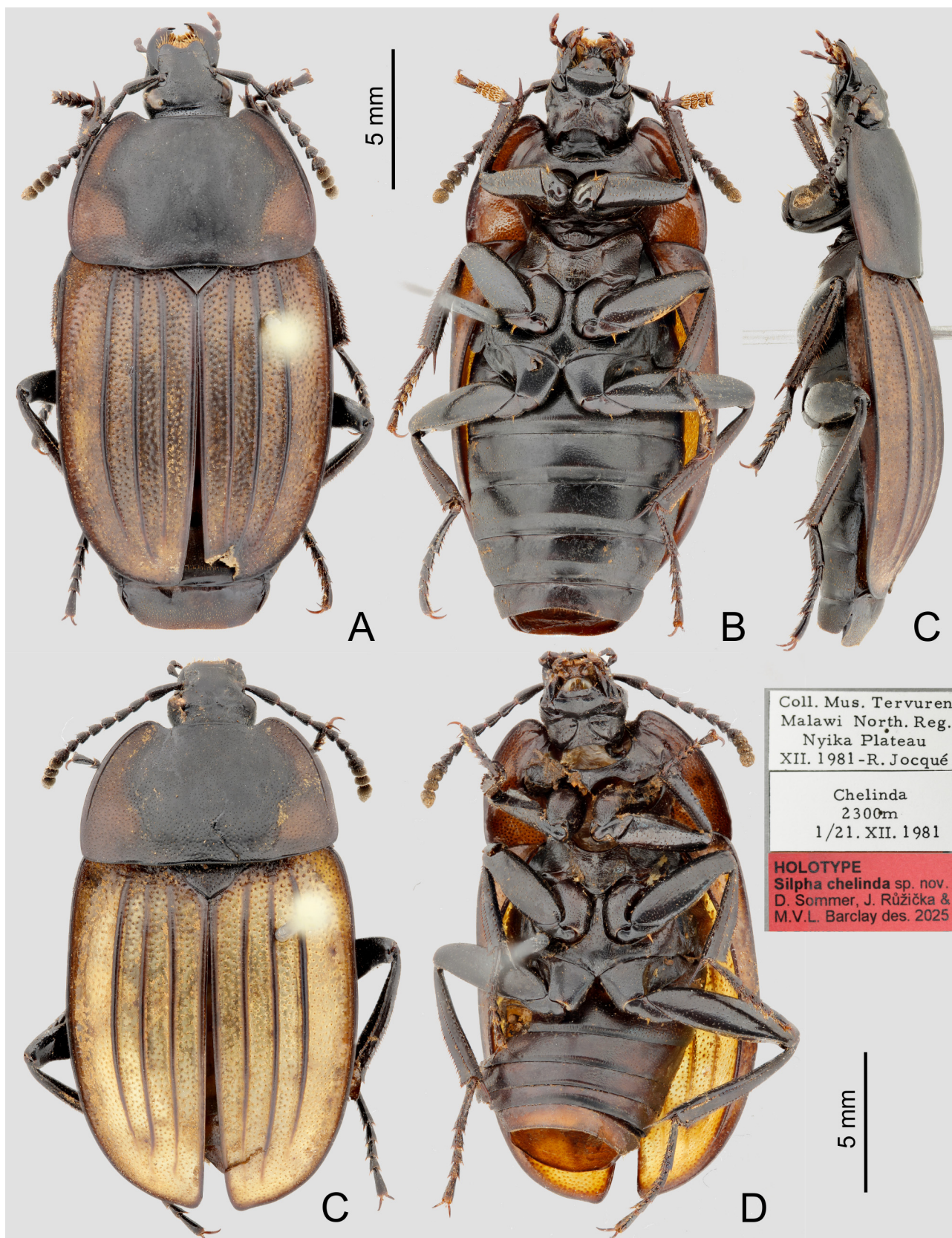


FIGURE 5. Habitus of *Silpha chelinda* Sommer, Růžicka & Barclay, *sp. nov.* A–C: paratype, male, in dorsal, ventral and lateral views, Chelinda (MRAC). D–E: paratype, female, in dorsal and ventral views, Chelinda (MRAC). F: labels of the holotype of *S. chelinda* Sommer, Růžicka & Barclay, *sp. nov.* (MRAC).

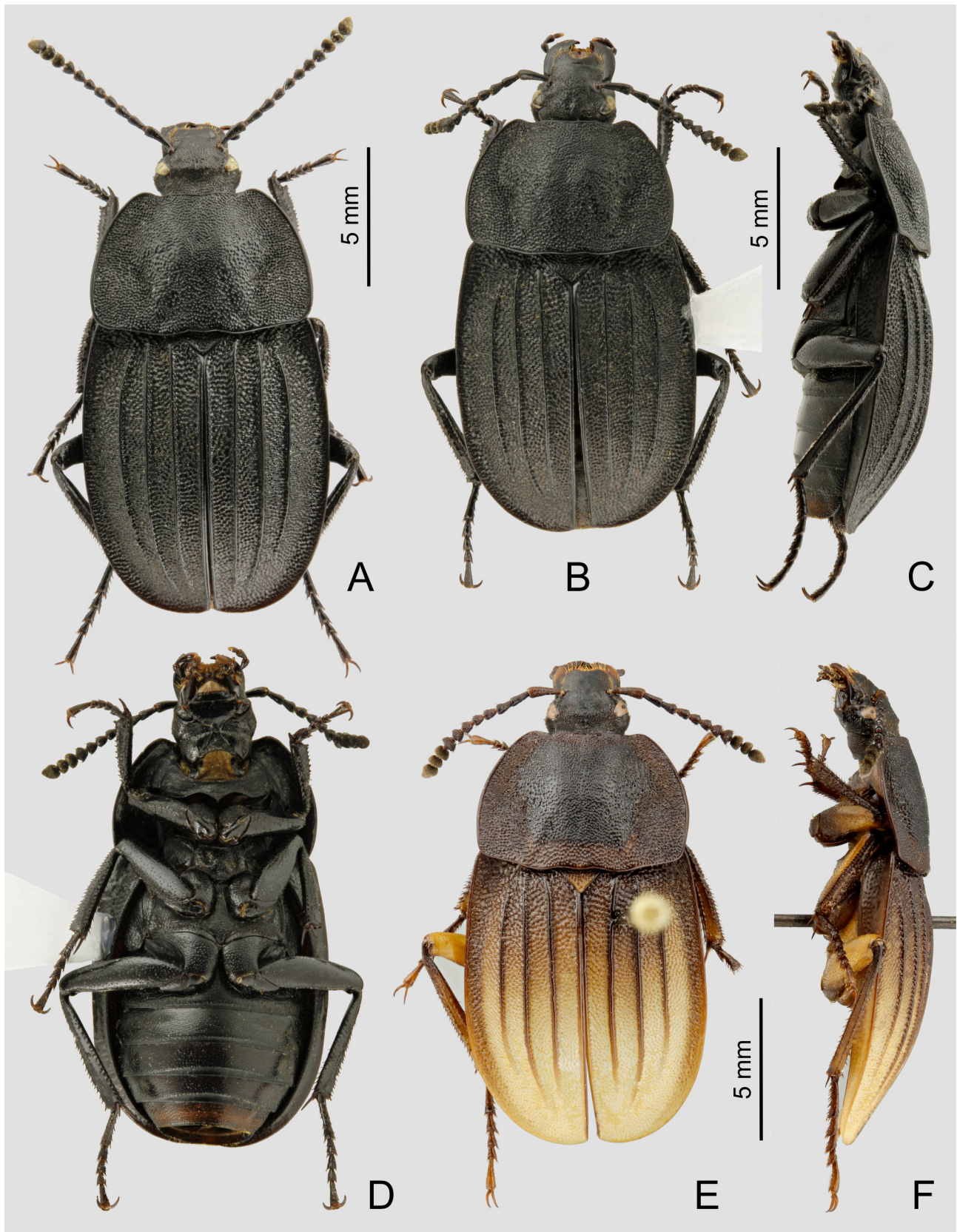


FIGURE 6. Habitus of *Silpha francoisi* Dierkens, 2020. A: male, in dorsal view, Rungwe Mt. (JSCC). B–D: female, in dorsal, lateral and ventral views, Rungwe Mt. (JSCC). E–F: female, teneral specimen, in dorsal and lateral views, Southern Highlands (MZLU).

“70842. [or 70843., or 70845.] MALAWI: | NyikaNationalPark | Nganda-Chelinda | dirt road, 2349m | 29. xii. 2009 | L. FRIEDMAN [lgt.] [p]”; 1 ♀ (SANC), “MALAWI SE1033DB | Nyika National Park | 2. iii. 1987 2607m | J & A Londt Nganda | summit – grassveld [p] || NATIONAL COLL. | OF INSECTS | Pretoria. S. Afr [p] | ex NMSA [hw] || Silpha | sp. [hw] | A.F.Newton det.2004 [p]”.

Description. Male (♂). *Body* (Figs. 5A–C) oval, dorso-ventrally flattened. Elytra arched, surface yellow to brown. Pronotum black, lateral area brown; appendages black.

Head (Figs. 5A–C)). Black, lustrous, surface with fine, very small, distinct, regular punctation. Covered with recumbent orange setation; dorsal surface without setation; lateral area posterior to clypeal suture covered with long, erect orange setation. Clypeus anteriorly widely notched. Anterior margin of clypeus with slightly irregular row of dense, long, orange setation. Eye kidney-shaped in lateral view. Frons with marked dorsal tentorial pits and a transverse, elevated crest posteriorly.

Antennae (Figs. 5A–C, 20G). Medium-sized, with last four antennomeres forming a distinct club.

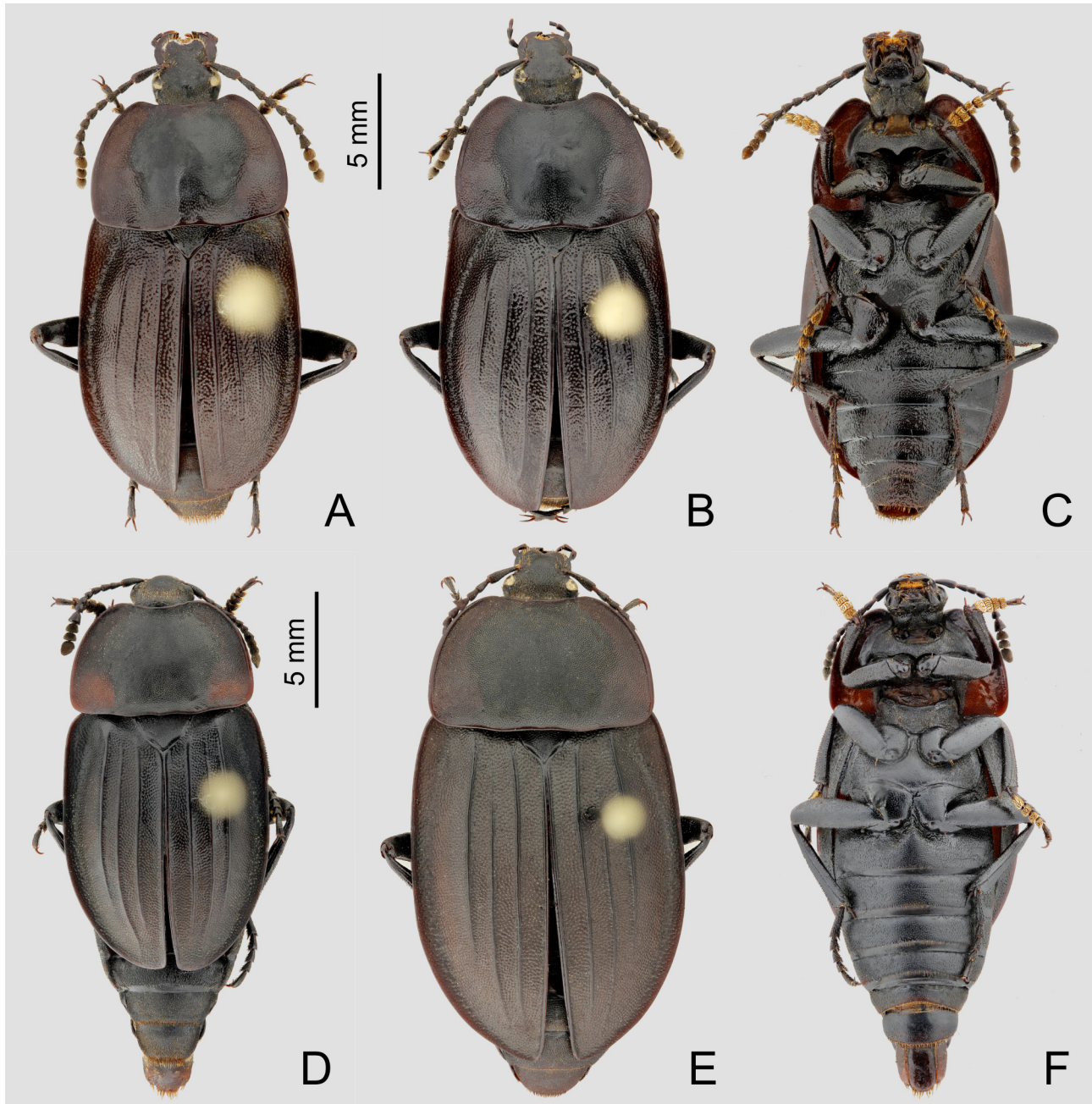


FIGURE 7. Habitus of *Silpha*. A, C: male of *S. businskyorum*, in dorsal and ventral views, Houzhenzi env. (JRUC). B: female of *S. businskyorum*, in dorsal view, Houzhenzi env. (JRUC). D, F: male of *S. carinata*, in dorsal and ventral views, Církvice (JRUC). E: female of *S. carinata*, in dorsal view, Batovo (JRUC).

Pronotum (Figs. 5A, C) moderately transverse, widest posteriorly. Margins rimmed anteriorly and laterally; anterior margin only slightly elevated; anterior margin almost straight, without medial emargination; anterior angles weakly elevated. Posterior margin weakly sinuous laterally. Surface dull, with fine punctation, punctures small, clearly separated, from disc to margin larger and more deeply impressed. Punctures without setae.

Scutellum (Fig. 5A). Irregularly triangular, widely vaulted medially. Surface with fine, distinct, sparse, homogenous punctation, from disc to margin smaller and slightly impressed; without setation. Posterior margin strongly acute.

Elytra (Figs. 5A–C, 9G) subparallel, at the widest point (along 2/3 of its length) slightly wider than pronotum. Elytron with three distinctly elevated, rounded ridges; ridges nearly reaching apex of elytron; external ridge shortened posteriorly. Elytral epipleura strongly elevated dorsally along almost the entire length, flattened at elytral apex. Apex of elytron rounded. Surface dull, without setation, with isodiametric microsculpture; covered with

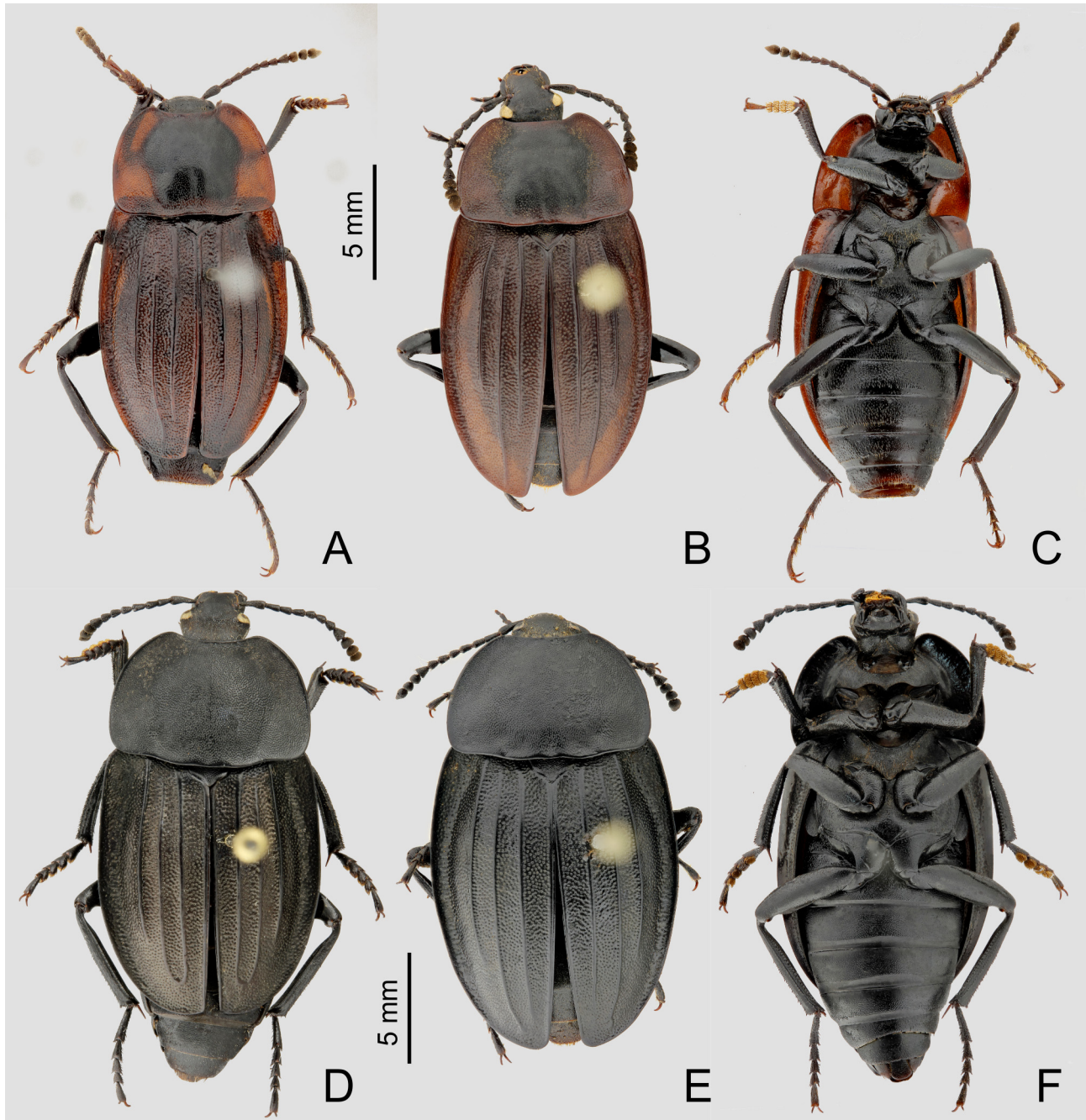


FIGURE 8. Habitus of *Silpha*. A, C: male of *S. longicornis*, in dorsal and ventral views, Shizu Rindoh Nikko N. P. (JRUC). B: female of *S. longicornis*, in dorsal view, Chichibu Exp. Forest of Tokyo Univ. (JRUC). D, F: male of *S. perforata*, in dorsal and ventral views, Mt. Laobeishan (JRUC). E: female of *S. perforata*, in dorsal view, Kajmanovka (JRUC).

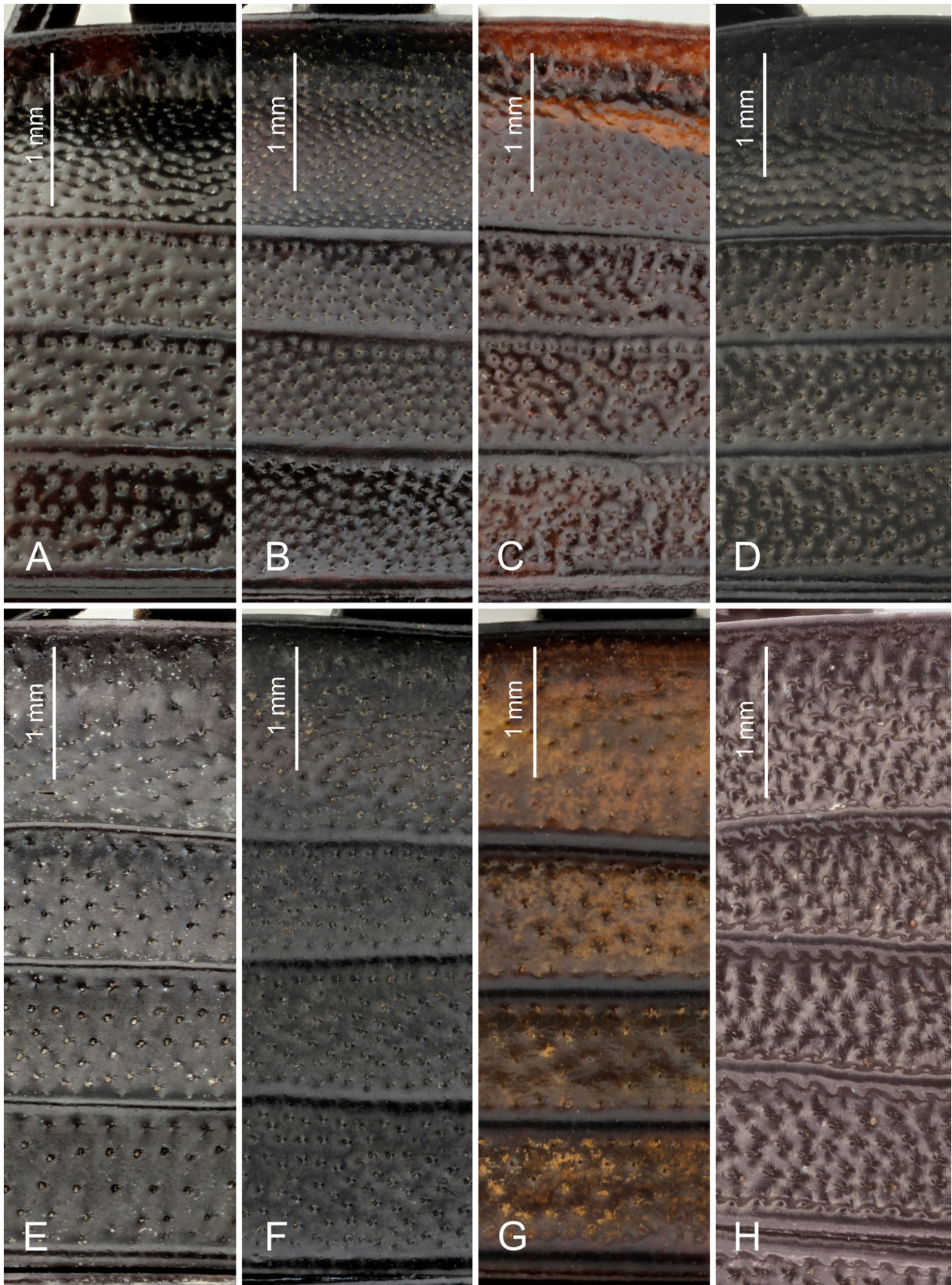


FIGURE 9. Details of elytral surface in *Silpha*, dorsal view. A: *S. businskyorum*, Houzhenzi env. (JRUC). B: *S. carinata*, Církvice (JRUC). C: *S. longicornis*, Shizu Rindoh Nikko N. P. (JRUC). D: *S. perforata*, Mt. Laobeishan (JRUC). E: *S. capicola* Péringuey, 1888, Muizenberg (MRAC). F: *S. lata* Portevin, 1920, Chungalawe—Mafinga (NHMW). G: *S. chelinda*, paratype, Chelinda (MRAC). H: *S. francoisi* Dierkens, 2020, Rungwe Mt. (JSCC).

dense, distinct, regular punctation; punctures clearly separated by 1.5–2.0 of their diameter. Punctures posteriorly with small tubercle. Each tubercle bearing a small, short, black seta. Elytra with coarse, subrectangular punctures covering most of the surface in dorsal view. Elytral epipleura irregularly, finely punctated in ventral view.

Metathoracic wings. Apterous.

Ventrum (Fig. 5B). Thorax finely punctate, covered mostly with short to medium-sized, recumbent, orange setae. Proventrite without punctation laterally; metaventrite finely, roughly punctate, with dense, medium-sized setation. Mesocoxae closely separated. Abdominal ventrites with distinct impressions laterally in ventral view. Abdominal ventrites slightly punctate, covered with short, orange setation, with expanded brick-wall pattern on intersegmental membranes.

Legs (Figs. 5A–C, 21D). Protarsus widely expanded. Pro-, meso- and metatibia each with two apical spurs of different length. Metatibia straight in ventral view. Trochanters with bunch of medium-sized, orange setae.

Abdominal segments (Figs. 13C, 15C). Tergite VIII subquadrate, apically strongly sinuous, widely rounded posteriorly. Ventrite VIII apically weakly sinuous, rounded posteriorly. Ventrite IX rectangular, apically rounded, elongate and deeply medially desclerotized in ventral view. Spiculum gastrale robust, elongate in ventral view; near the apex expanded.

Aedeagus (Fig. 11A). Median lobe stout, robust, tapered to widely rounded, triangular apex. Internal sac sclerotized. Parameres robust, slightly curved downwards, longer than median lobe, apex rounded; in the 2/3 of the length noticeably narrowed. Basal portion oval, weak, slightly exceeding the width of median lobe.

Sexual dimorphism. Female (♀) (Figs. 5D–E, 17G, 18C). Similar to male, except for the following structures. Protarsus not expanded. Tergite VIII subquadrate, apically sinuous, widely rounded posteriorly. Ventrite VIII apically weakly sinuous, rounded posteriorly. Tergite IX elongate, rounded, in first half almost straight; tergite X widely rounded, almost pentagonal, apex with dense setation. Coxite robust, apex extremely elongated, rounded; stylus robust, subquadrate, inserted lateroapically, shorter than apex of coxite.



FIGURE 10. Aedeagus of *Silpha*, dorsal, ventral, dorsolateral and lateral views. A: *S. capicola* Péringuey, 1888, Muizenberg (MRAC). B: *S. lata* Portevin, 1920, Upangwa (MNHN).

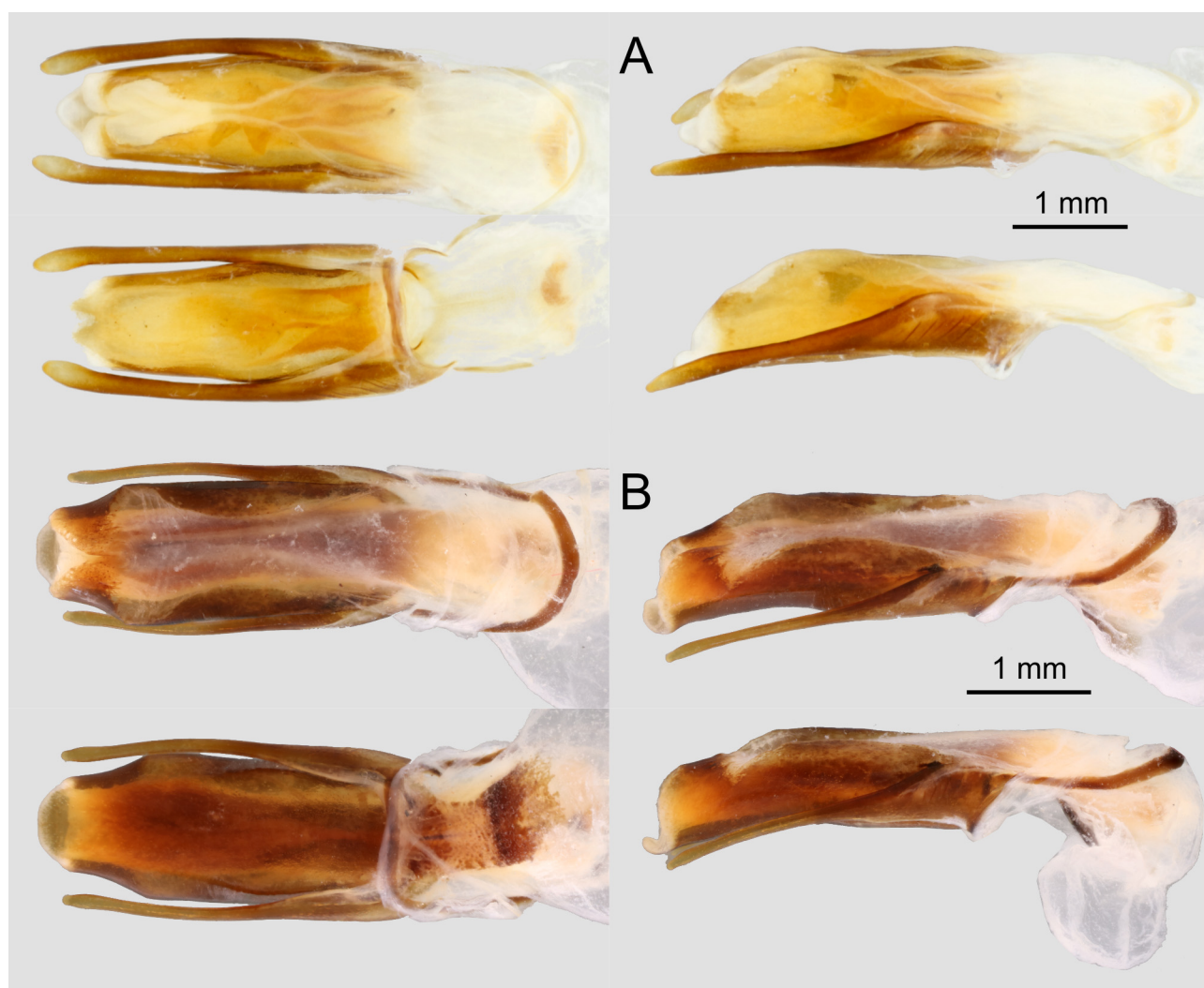


FIGURE 11. Aedeagus of *Silpha*, dorsal, ventral, dorsolateral and lateral views. A: *S. chelinda* Sommer, Růžička & Barclay, **sp. nov.**, Chelinda (MRAC). B: *S. francoisi* Dierkens, 2020, Rungwe Mt. (JSCC).

Variability. Individuals vary in size and shape (see next paragraph). Elytra light yellow to dark brown.

Measurements. TBL 15.0–17.5 mm in ♂ (holotypus 15.0 mm) and 15.0–17.0 mm in ♀; MBW 9.3–10.0 mm in ♂ (holotypus 9.3 mm) and 10.0–10.5 mm in ♀; RLWP 0.55 to 0.61 in ♂ (holotypus 0.56), 0.56 to 0.59 in ♀; RLWE 1.07 to 1.21 in ♂ (holotypus 1.07), 1.00 to 1.14 in ♀.

Differential diagnosis. Refer to species key and Table 3 below.

Etymology. Named for Chelinda, the type locality of this species, noun in apposition.

Distribution. An endemic species, known only from two closely located sites in the north of Malawi (see map, Figs. 22–23 and Table 2).

Silpha francoisi Dierkens, 2020

(Figs. 6A–F, 9H, 11B, 13D, 17H, 18D, 20H, 21G, 22–23)

Published records (shown in the maps in Figs. 22–23).

Dierkens (2020): “Tanzanie, Mbeya, Mbogo Mts, Umalila forest”.

Type locality. Tanzanie, Mbeya, Mbogo Mts, Umalila forest [ca. 9°10'40"S 33°16'29"E, 2385 m a.s.l.].

Type material. Not examined.

Additional material (7 specimens). **Tanzania, Mbeya Region:** 1 ♀ (MZLU) (Figs. 6E–F), Southern Highlands, iii.–iv.1985, Börje Pettersson lgt.; 1 ♂ 1 ♀ (JSCC) (Figs. 6A–D, 9H, 11B, 13D, 17H, 18D, 20H, 21G–H), 2 ♀♀ (JRUC), 2 ♀♀ (RSEC), Rungwe Mt., 2400 m, i.2017, local collector lgt.

Redescription. Male (♂). *Body* (Fig. 6A) oval, dorso-ventrally flattened. Elytra arched. Whole body surface and appendages black.

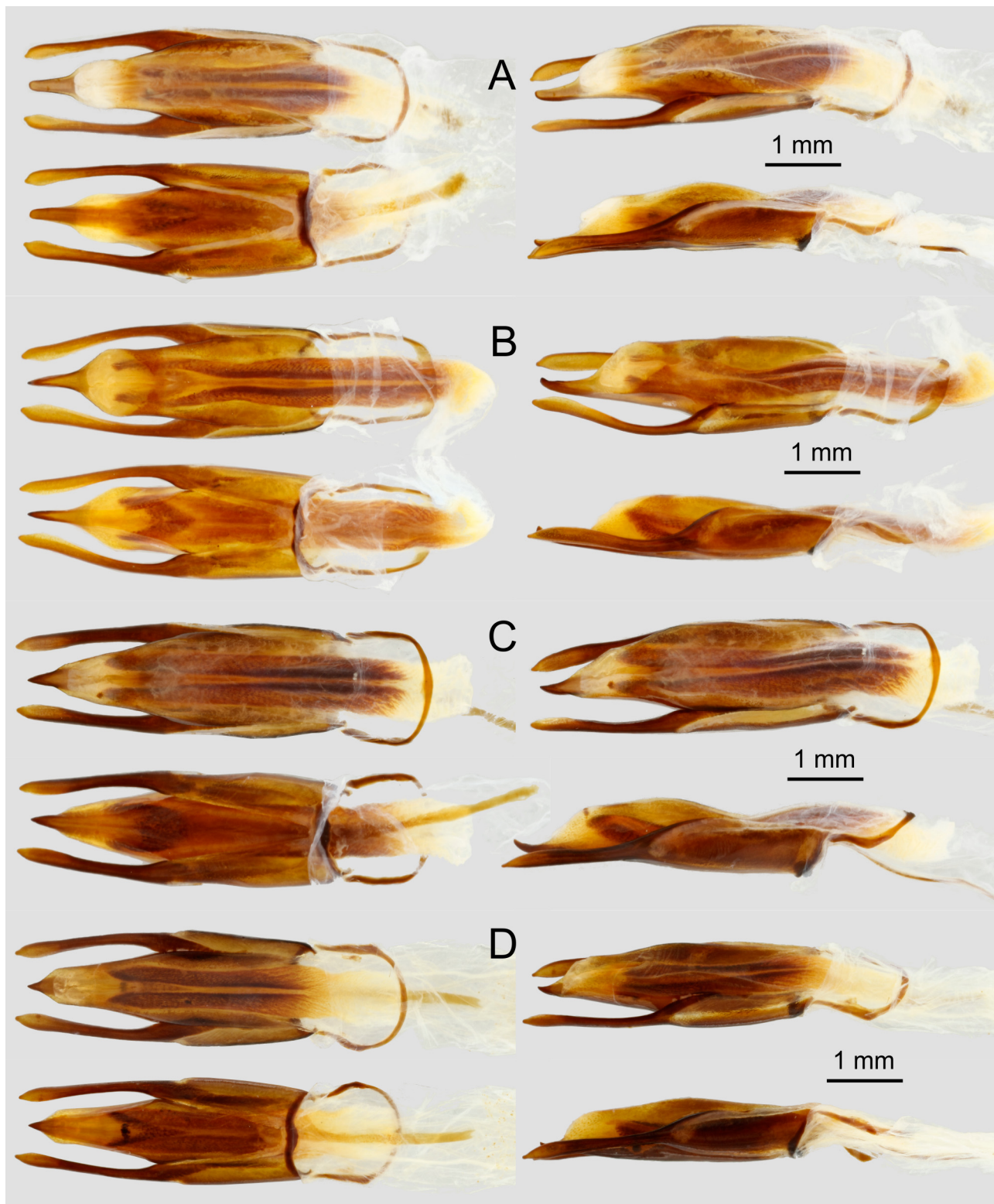


FIGURE 12. Aedeagus of *Silpha*, dorsal, ventral, dorsolateral and lateral views. A: *S. businskyorum*, Houzhenzi env. (JRUC). B: *S. carinata*, Mladá military training area (JRUC). C: *S. longicornis*, Shizu Rindoh Nikko N. P. (JRUC). D: *S. perforata*, Jasnoe (JRUC).

Head (Fig. 6A). Black, lustrous, surface with dense, coarse, distinct, regular punctation. Covered with short, recumbent orange setation. Lateral area posterior to clypeal suture with long, erect orange setation. Clypeus anteriorly widely notched. Anterior margin of clypeus with slightly irregular row of dense, long, orange setation. Eye kidney-shaped in lateral view. Frons with marked dorsal tentorial pits and a transverse, elevated crest posteriorly.

Antennae (Figs. 6A, 20H). Medium-sized, with last four antennomeres forming a distinct club.

Pronotum (Fig. 6A) moderately transverse, widest posteriorly. Margins rimmed anteriorly and laterally; anterior margin only slightly elevated, concave, without medial emargination; anterior angles weakly elevated. Posterior margin strongly sinuous laterally. Surface shiny, with dense, coarse punctation, punctures medium sized, not separated, from disc to margin larger and more deeply impressed. Punctures bearing extremely short, orange setae.

Scutellum (Fig. 6A). Irregularly triangular, widely vaulted medially. Surface with coarse, distinct, dense, homogenous punctation, from disc to margin only slightly smaller and slightly impressed; covered with extremely short, recumbent, black setation. Posterior margin rounded.

Elytra (Figs. 6A, 9H) subparallel, at the widest point (along 2/3 of its length) wider than pronotum. Elytron with three distinctly elevated, rounded ridges; ridges nearly reaching apex of elytron; external ridge shortened anteriorly and posteriorly. Elytral epipleura strongly elevated dorsally along almost the entire length, flattened at elytral apex. Apex of elytron rounded. Surface shiny, without setation, with isodiametric microsculpture; covered with dense, coarse, distinct, regular punctation; punctures separated by 1.0 of their diameter or less. Punctures posteriorly with big tubercle. Each tubercle bearing a small, short, black seta. Elytra with coarse, subrectangular punctures covering most of the surface in dorsal view. Elytral epipleura irregularly, coarsely punctated in ventral view.

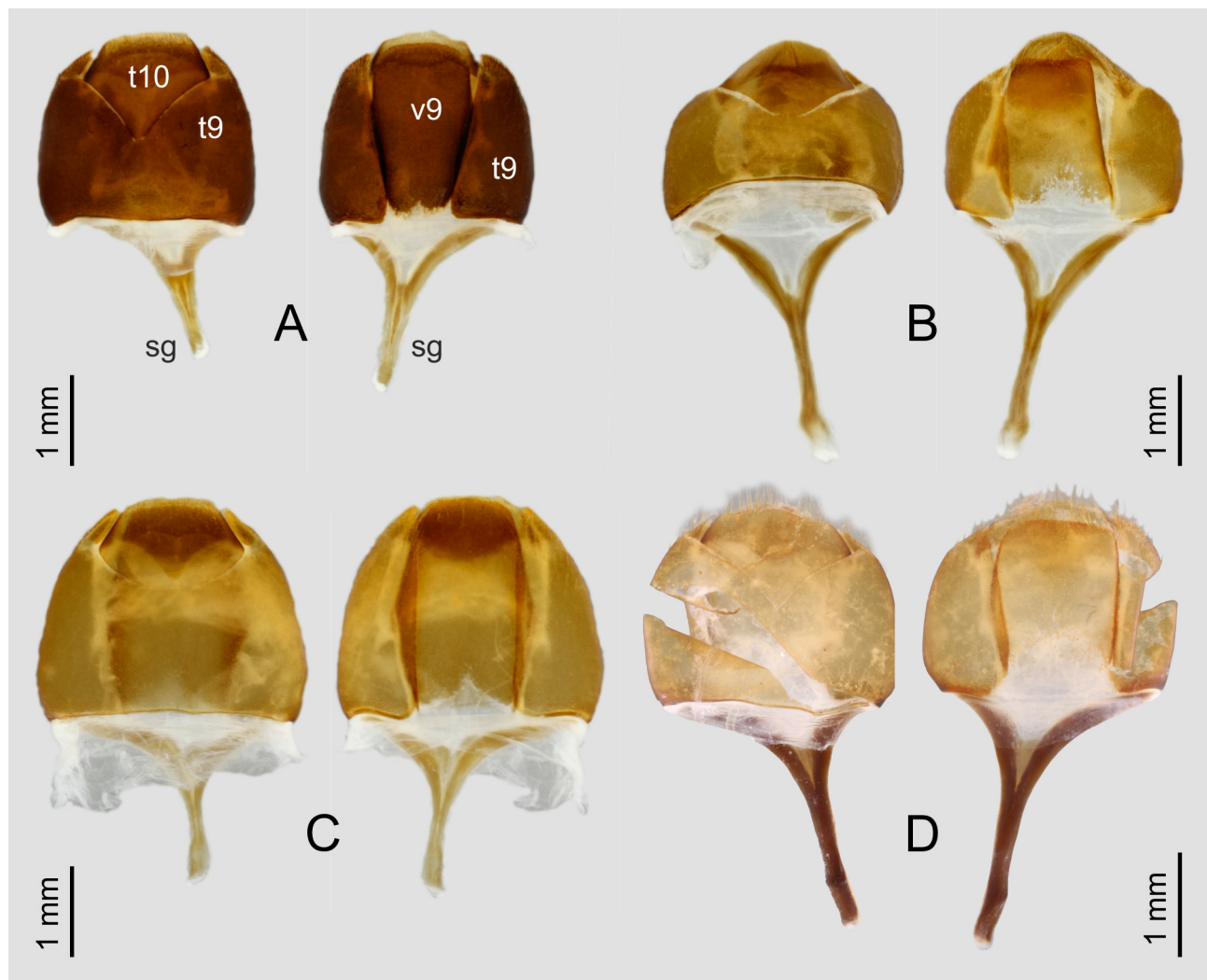


FIGURE 13. Male genital segment of *Silpha*, dorsal and ventral views. A: *S. capicola* Péringuey, 1888, Muizenberg (MRAC). B: *S. lata* Portevin, 1920, Upangwa (MNHN). C: *S. chelinda* Sommer, Růžicka & Barclay, **sp. nov.**, Chelinda (MRAC). D: *S. francoisi* Dierkens, 2020, Rungwe Mt. (JSCC). Abbreviations: sg—spiculum gastrale, t9—tergite IX, t10—tergite X, v9—ventrite IX.

Metathoracic wings. Apterous.

Ventrum. Thorax finely to roughly punctate, covered mostly with short to medium-sized, recumbent, orange setae. Proventrite without punctation laterally; metaventrite sparsely, roughly punctate, with dense, medium-sized setation. Mesocoxae closely separated. Abdominal ventrites with distinct impressions laterally in ventral view. Abdominal ventrites punctate, covered with short, orange setation, with expanded brick-wall pattern on intersegmental membranes.

Legs (Figs. 6A, 21G–H). Protarsus not expanded. Pro-, meso- and metatibia each with two apical spurs of different length. Metatibia almost straight in ventral view. Trochanters with bunch of medium-sized, orange setae.

Abdominal segments (Fig. 13D). Tergite VIII subquadrate, apically regularly rounded. Ventrite VIII apically and posteriorly truncate. Ventrite IX rectangular, apically almost straight, subquadrate and deeply medially desclerotized in ventral view. Spiculum gastrale robust, strongly elongate in ventral view; near the apex only slightly expanded.

Aedeagus (Fig. 11B). Median lobe stout, robust, tapered to widely rounded apex. Internal sac sclerotized. Parameres slender, straight, shorter than median lobe, apex rounded. Basal portion oval, robust, slightly exceeding the width of median lobe.

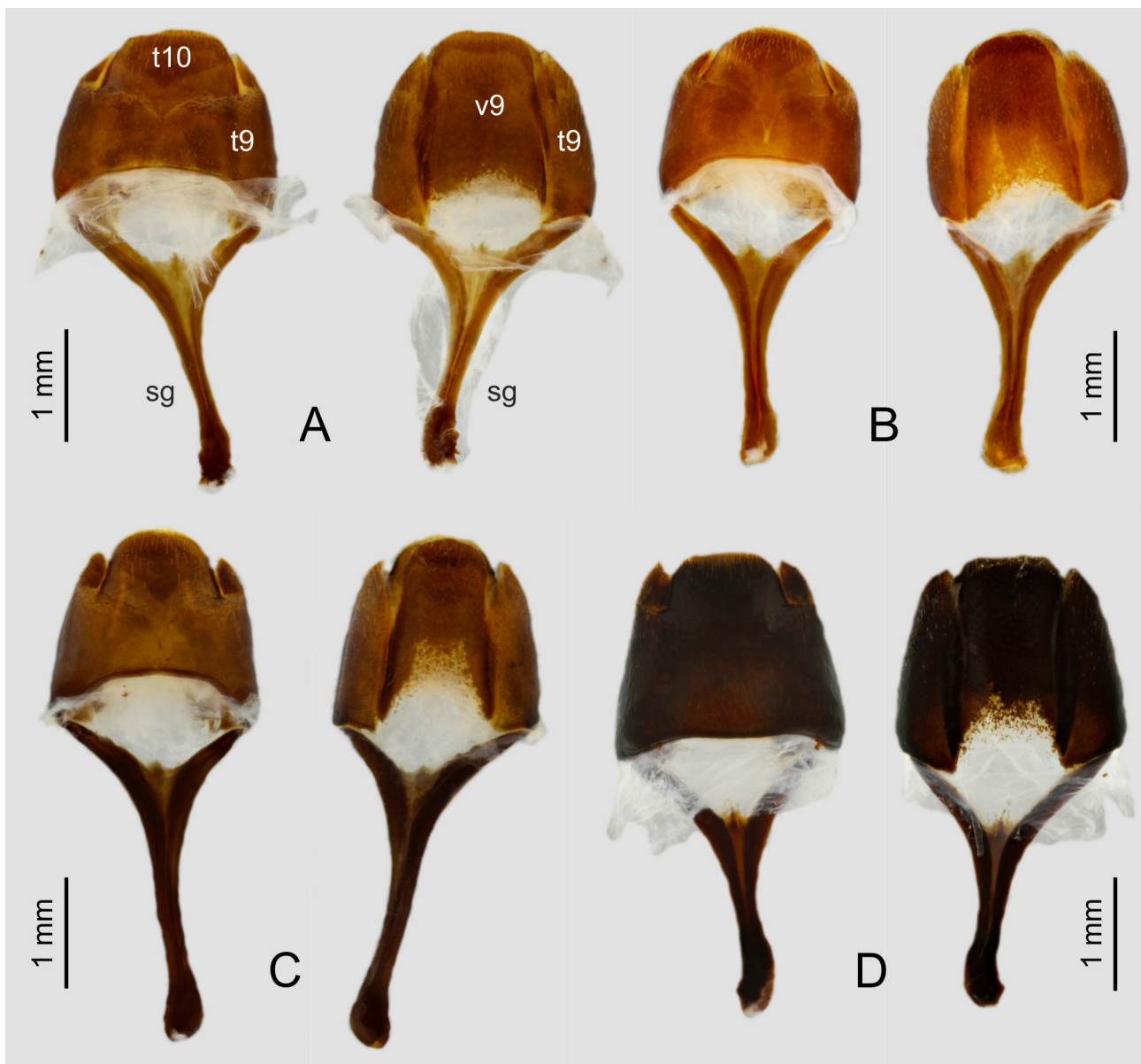


FIGURE 14. Male genital segment of *Silpha*, dorsal and ventral views. A: *S. businskyorum*, Houzhenzi env. (JRUC). B: *S. carinata*, Mladá military training area (JRUC). C: *S. longicornis*, Shizu Rindoh Nikko N. P. (JRUC). D: *S. perforata*, Jasnoe (JRUC). Abbreviations: sg—spiculum gastrale, t9—tergite IX, t10—tergite X, v9—ventrite IX.

Sexual dimorphism. Female (♀) (Figs. 5B–F, 17H, 18D). Similar to male, except for the following structures. Tergite VIII widely rounded. Ventricle VIII weakly rounded. Tergite IX elongate, rounded, in first half almost straight; tergite X widely rounded, almost pentagonal, apex with dense setation. Coxite robust, subquadrate, apex almost straight; stylus extremely elongated, triangular, inserted apically.

Variability. Individuals vary in size and shape (see next paragraph).

Measurements. TBL 13.6 mm in ♂ and 13.2–14.1 mm in ♀; MBW 8.5 mm in ♂ and 8.0–8.5 mm in ♀; RLWP 0.63 in ♂, 0.62–0.65 in ♀; RLWE 1.04 in ♂, 1.00–1.13 in ♀.

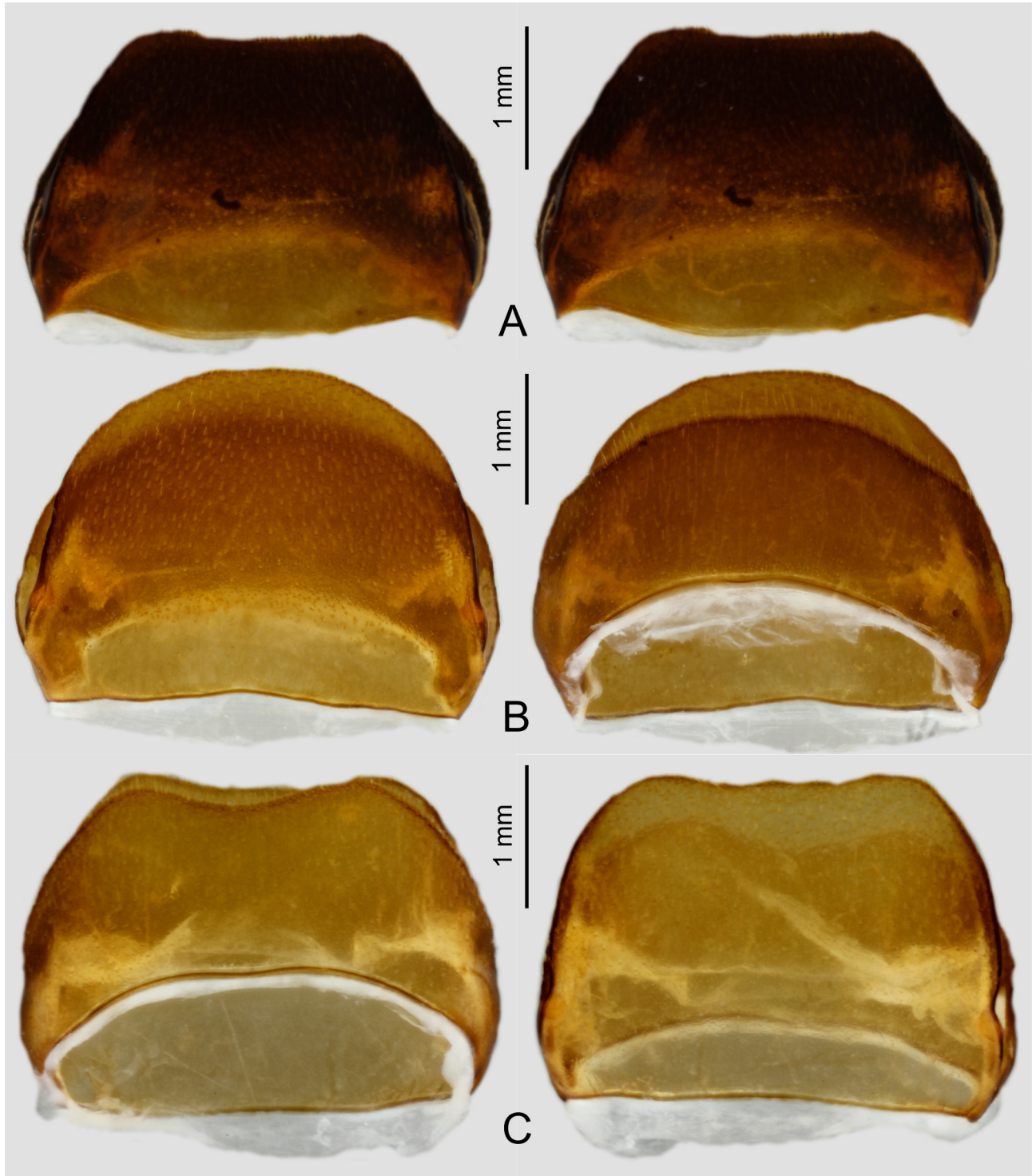


FIGURE 15. Male abdominal segment VIII of *Silpha*, dorsal and ventral views. A: *S. capicola* Péringuey, 1888, Muizenberg (MRAC). B: *S. lata* Portevin, 1920, Upangwa (MNHN). C: *S. chelinda* Sommer, Růžicka & Barclay, **sp. nov.**, Chelinda (MRAC).

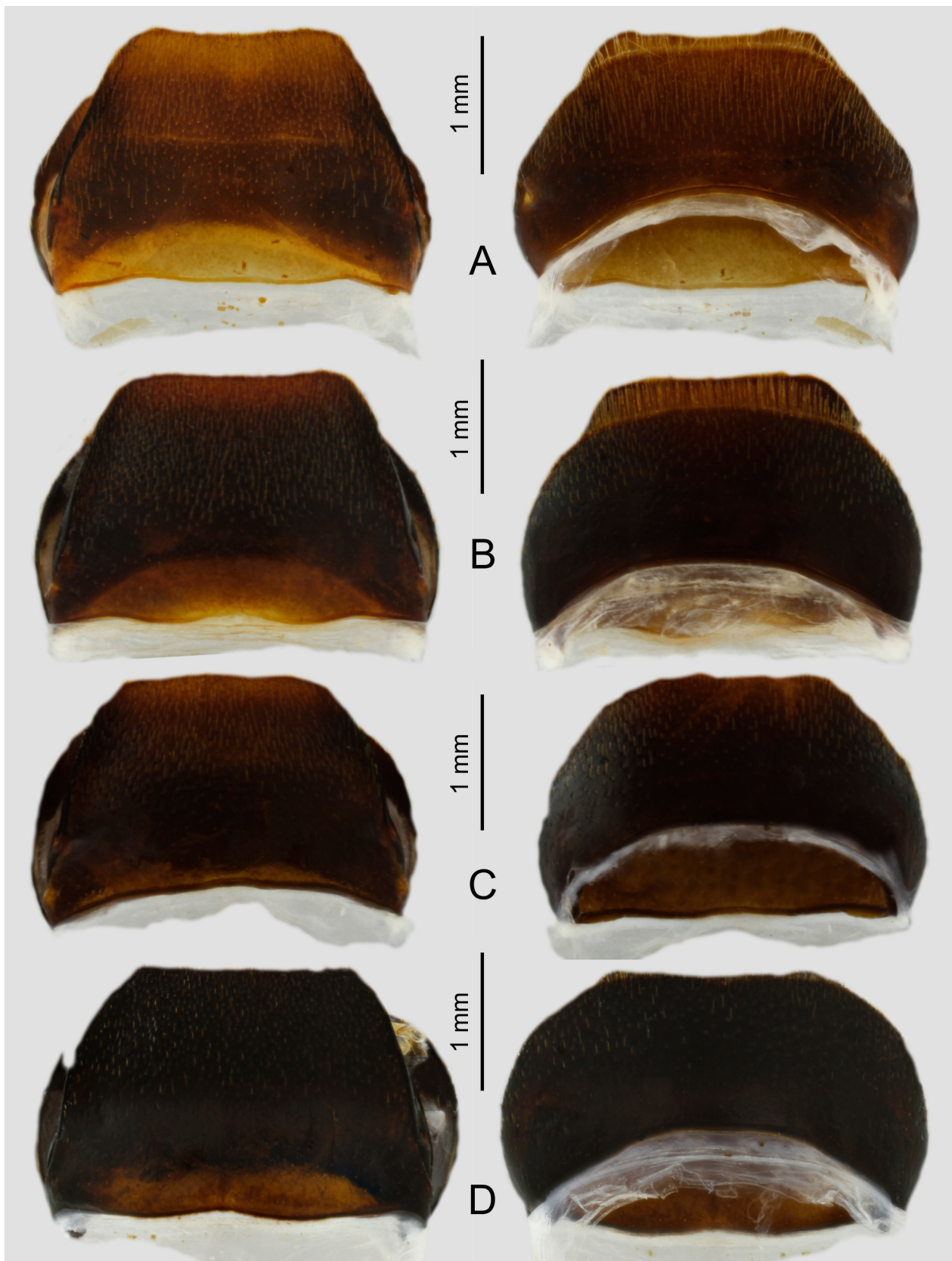


FIGURE 16. Male abdominal segment VIII of *Silpha*, dorsal and ventral views. A: *S. businskyorum*, Houzhenzi env. (JRUC). B: *S. carinata*, Mladá military training area (JRUC). C: *S. longicornis*, Shizu Rindoh Nikko N. P. (JRUC). D: *S. perforata*, Jasnoe (JRUC).

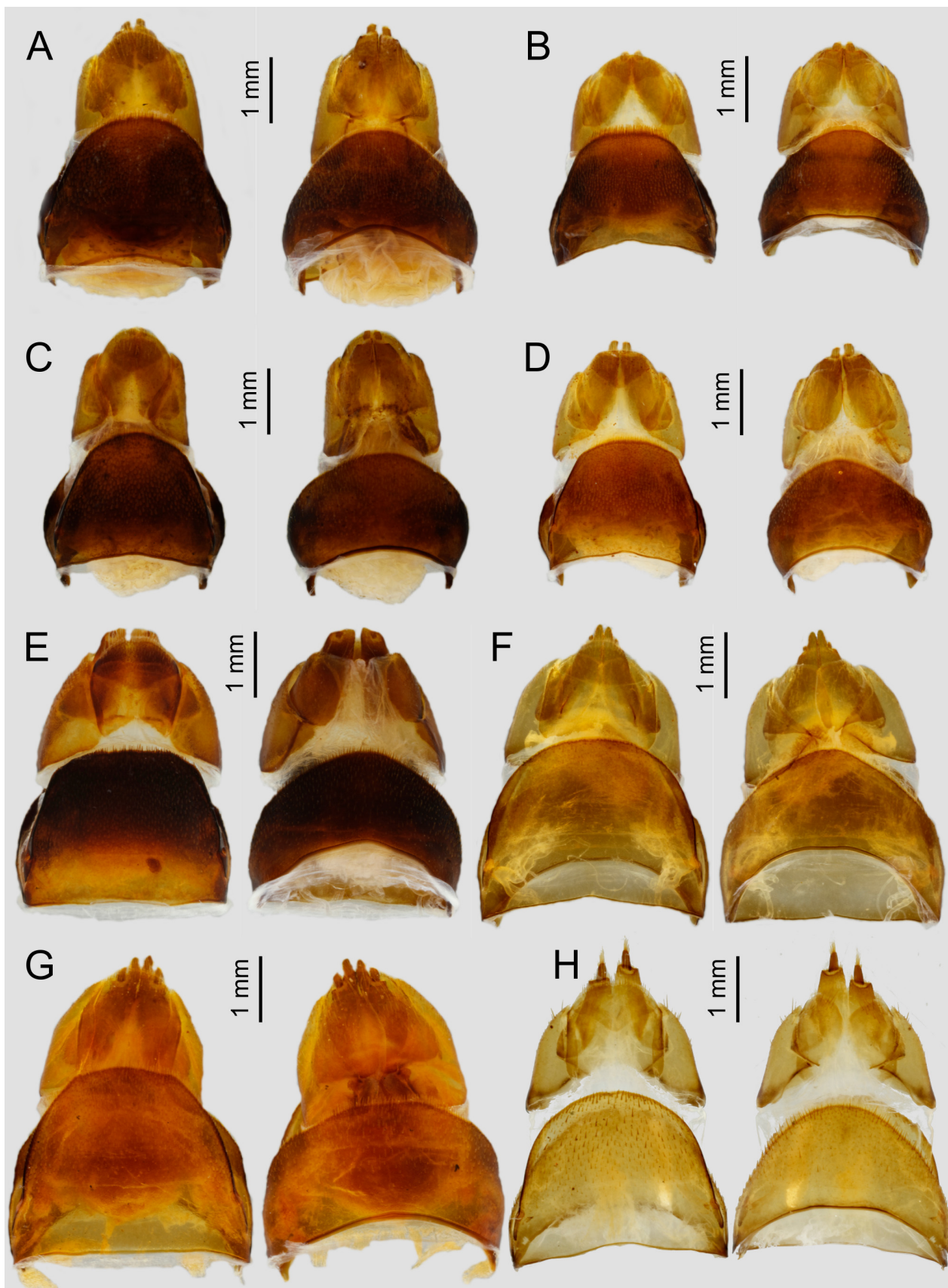


FIGURE 17. Female genital segment and abdominal segment VIII of *Silpha*, dorsal and ventral views. A: *S. businskyorum*, Houzhenzi env. (JRUC). B: *S. carinata*, Bořeň hill (JRUC). C: *S. longicornis*, Shizu Rindoh Nikko N. P. (JRUC). D: *S. perforata*, Jasnoe (JRUC). E: *S. capicola* Péringuey, 1888, Muizenberg (MRAC). F: *S. lata* Portevin, 1920, Upangwa (HNHM). G: *S. chelinda* Sommer, Růžička & Barclay, **sp. nov.**, Chelinda (MRAC). H: *S. francoisi* Dierkens, 2020, Rungwe Mt. (JSCC).

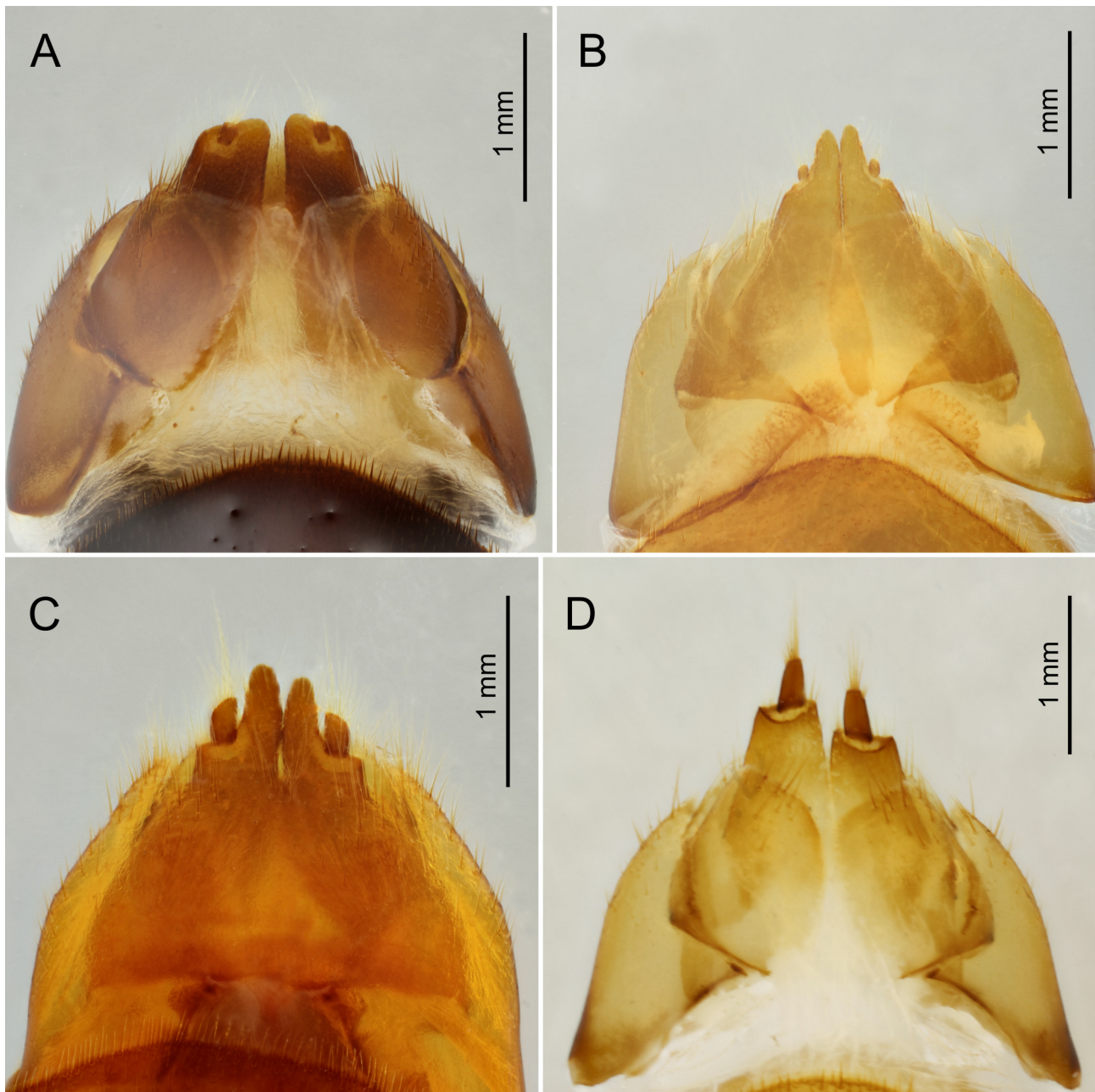


FIGURE 18. Female genital segment of *Silpha*, ventral view, detail. A: *S. capicola* Péringuey, 1888, Muizenberg (MRAC). B: *S. lata* Portevin, 1920, Upangwa (HNHM). C: *S. chelinda* Sommer, Růžicka & Barclay, **sp. nov.**, Chelinda (MRAC). D: *S. francoisi* Dierkens, 2020, Rungwe Mt. (JSCC).

Differential diagnosis. Refer to species key and Table 3 below.

Distribution. An endemic species, known only from several localities in southern Tanzania (see map, Figs. 22–23 and Table 2).

***Silpha lata* Portevin, 1920**

(Figs. 4A–F, 9F, 10B, 13B, 15B, 17F, 18B, 20F, 21F, 22–23)

Silpha lata Portevin, 1920: 396 (type locality: Ile de Nias (Malaisie) [probable misinterpretation of “Njasasee” or “Lake Nyasa”, recently Lake Malawi]).

Silpha capicola Pér.: Portevin 1926: 72, 145 (misinterpretation of *Silpha capicola* Péringuey, 1888).

Silpha capricola [sic] Péring.: Hatch 1928: 104 (partim, lapsus calami).

Type locality. Malaisie, Ile de Nias (probable misinterpretation of “Njasasee” or “Lake Nyasa”, recently Malawi, Lake Malawi).

Type material (1 specimen). **Tanzania: Holotype**, ♂ (MNHN) (Fig. 4D), “ILE DE NIAS | MALAISIE | COLL. LE MOULT [p] || TYPE [p, red label] || *S. lata* m. [hw, Portevin’s manuscript] || Muséum Paris [p] | coll. | Pic | Portevin [hw] [recent label added by curators] || *Silpha* | *capicola* | Pér. [hw] | R. Madge det. 197[p]0 [hw] || **HOLOTYPE** | *Silpha lata* Portevin, 1920 | D. Sommer & | J. Růžicka des. 2023 [p, red label]”.

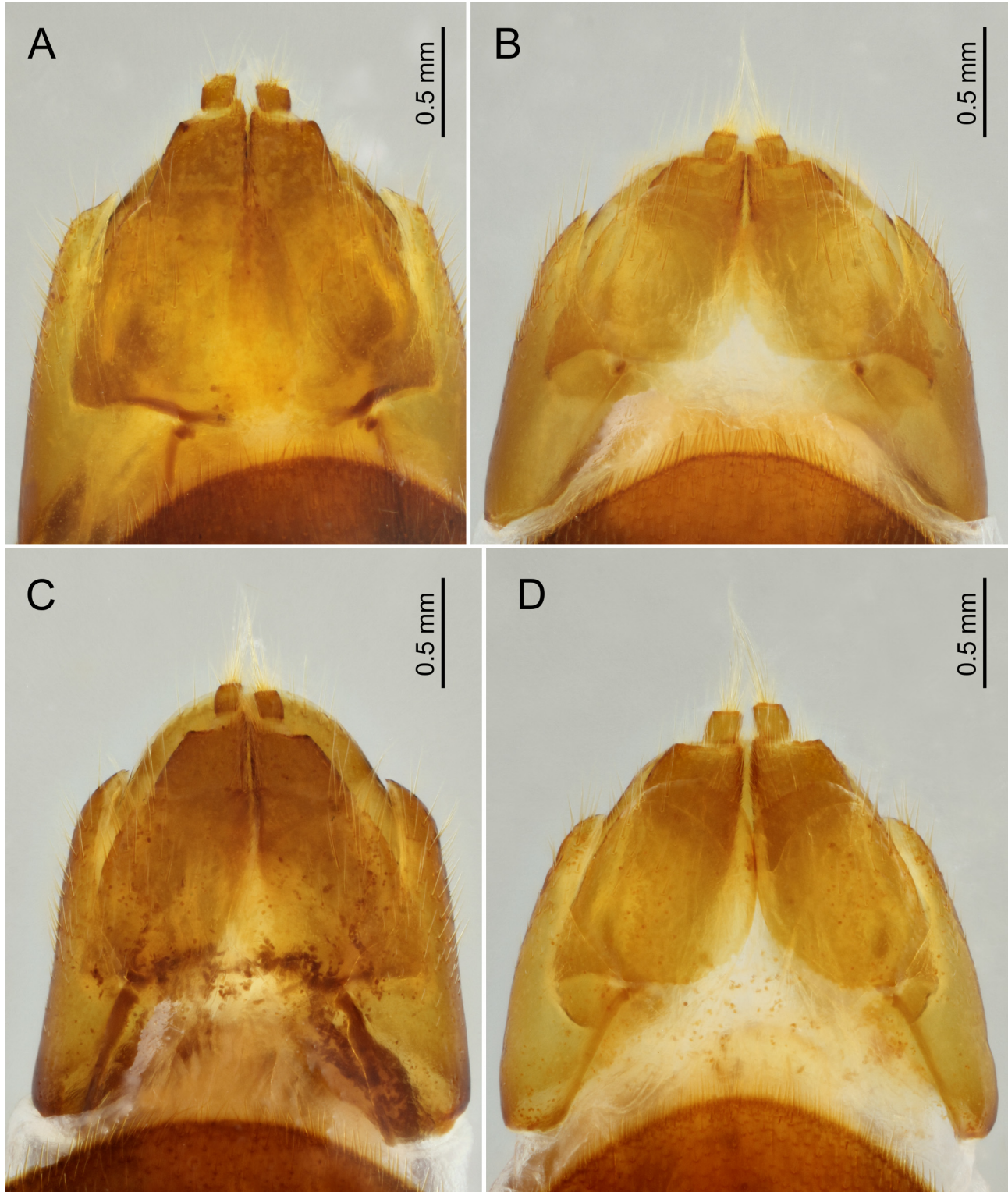


FIGURE 19. Female genital segment of *Silpha*, ventral view, detail. A: *S. businskyorum*, Houzhenzi env. (JRUC). B: *S. carinata*, Bořeň hill (JRUC). C: *S. longicornis*, Shizu Rindoh Nikko N. P. (JRUC). D: *S. perforata*, Jasnoe (JRUC).

Additional material (8 specimens). **Tanzania, Iringa Region**, 1 ♂ (NHMW) (Figs. 4A–C, 9F, 20F, 21F), Str. zw. Iringa u. Makumbaku [road between Iringa and Makambako], 1800 m, Chungalawe—Mafinga, 29.xi.2009, A. Puchner lgt., ex coll. Barries. **Njombe Region**, 2 spec. (HNHM) (Figs. 4E–F, 17F, 18B), Dtsch. O. Af. [= German East Africa, SW Tanzania], Upangwa, [without date and collector's name]; 1 ♂ (MNHN) (Figs. 10B, 13B, 15B), same data, ex. coll. A. Grouvelle 1915; 1 ♂ 1 ♀ (JSCC), Iringa—Njombe, 8.xii.1997, Werner & Lizler lgt.; 1 ♂ (JSCC), near Njombe, 14.xii.1997, Werner & Lizler lgt. **Revuma Region**, 1 ♀ (JSCC), Tanganyika-Terr., Matengo-Hochland, wsw. v. Songea, Litembo, 15[00]–1700 m, 11.–28.ii.[19]36, Zerny lgt.

Ambiguous or poorly georeferenced material (9 specimens). **Tanzania**, 3 spec. (MNHN), Afr. or., Njassasee [= Malawi lake, without more details, but probably SW Tanzania], [without date and collector's name], ex coll. A. Grouvelle 1915; 3 spec. (HNHM), D. Ost-Africa [= German East Africa, without more details, but probably SW Tanzania], [without date and collector's name]; 3 spec. (MNHN), same data, [coll.] Portevin, ex coll. M. Pic.

Redescription. Male (♂). *Body* (Figs. 4A–D) oval, dorso-ventrally flattened. Elytra arched. Whole body surface and appendages dark brown to black.

Head (Figs. 4A–D). Black, lustrous, surface with fine, very small, distinct, regular punctation. Covered with recumbent orange setation; dorsal surface without setation; lateral area posterior to clypeal suture covered with long, erect orange setation. Clypeus anteriorly widely notched. Anterior margin of clypeus with slightly irregular row of dense, long, orange setation. Eye kidney-shaped in lateral view. Frons with marked dorsal tentorial pits and a transverse, elevated crest posteriorly.

Antennae (Figs. 4A–D). Medium-sized, with last four antennomeres forming a distinct club.

Pronotum (Figs. 4A, C–D) moderately transverse, widest posteriorly. Margins rimmed anteriorly and laterally; anterior margin only slightly elevated and slightly sinuous; anterior margin slightly sinuous, without medial emargination; anterior angles weakly elevated. Posterior margin sinuous laterally. Surface dull, with fine punctation, punctures small, clearly separated, from disc to margin larger and more deeply impressed. Punctures without setae.

Scutellum (Figs. 4A, D). Irregularly triangular, widely vaulted medially. Surface with fine, distinct, dense, homogenous punctation, from disc to margin smaller and slightly impressed; without setation. Posterior margin acute.

Elytra (Figs. 4A, C–D, 9F) subparallel, at the widest point (along 2/3 of its length) slightly wider than pronotum. Elytron with three elevated, rounded ridges; ridges nearly reaching apex of elytron; all ridges almost the same length. Elytral epipleura faintly elevated dorsally along almost the entire length, flattened at elytral apex. Apex of elytron widely rounded. Surface dull, without setation, with isodiametric microsculpture; covered with dense, distinct, regular punctation; punctures clearly separated by 2.0 or more of their diameter. Punctures posteriorly with small tubercle. Each tubercle bearing a small, short, black seta. Elytra with coarse, subrectangular punctures covering most of the surface in dorsal view. Elytral epipleura regularly, finely punctated to without punctation in ventral view.

Metathoracic wings. Apterous.

Ventrum (Fig. 4B). Thorax finely punctate, covered rarely with short to medium-sized, recumbent, orange setae. Proventrite without punctation laterally; metaventrite rarely, roughly punctate, with dense, medium-sized setation. Mesocoxae closely separated. Abdominal ventrites with distinct impressions laterally in ventral view. Abdominal ventrites without punctation, covered with short, black setation, with expanded brick-wall pattern on intersegmental membranes.

Legs (Figs. 4A–D, 21F). Protarsus not expanded. Pro-, meso- and metatibia each with two apical spurs of different length. Metatibia almost straight, only very slightly curved in ventral view. Trochanters with bunch of medium-sized, orange setae.

Abdominal segments (Figs. 13B, 15B). Tergite VIII subquadrate, apically widely rounded, posteriorly rounded. Ventrite VIII apically and posteriorly widely rounded. Ventrite IX rectangular, apically almost straight, elongate and deeply medially desclerotized in ventral view. Spiculum gastrale robust, strongly elongate in ventral view; near the apex expanded.

Aedeagus (Fig. 10B). Median lobe stout, robust, widely sinuous apex. Internal sac sclerotized. Parameres robust, curved downwards, shorter than median lobe, apex rounded. Basal portion oval, robust, as wide as median lobe.

Sexual dimorphism. Female (♀) (Figs. 4E–F, 17F, 18B). Similar to male, except for the following structures. Protarsus not expanded. Apex of elytron rectangular (but rounded in the other species). Tergite VIII widely rounded.

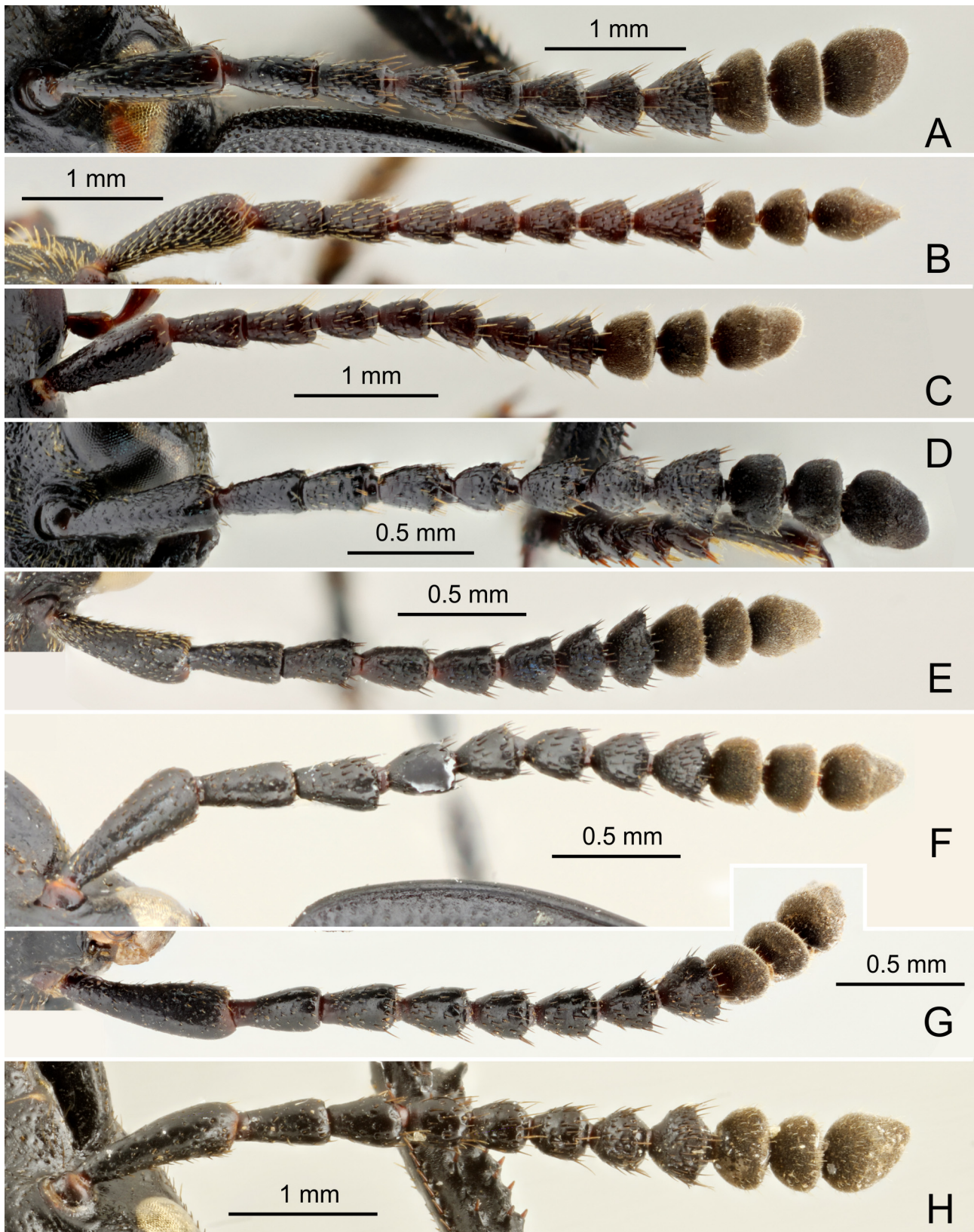


FIGURE 20. Antenna of *Silpha*, dorsal view. A: *S. businskyorum*, Baotianman (JRUC). B: *S. carinata*, Boreč hill (JRUC). C: *S. longicornis*, Shizu Rindoh Nikko N. P. (JRUC). D: *S. perforata*, Jasnoe (JRUC). E: *S. capicola*, Muizenberg (MRAC). F: *S. lata* Portevin, 1920, Changalawe—Mafinga (NHMW). G: *S. chelinda* Sommer, Růžická & Barclay, **sp. nov.**, Chelinda (MRAC). H: *S. francoisi* Dierkens, 2020, Rungwe Mt. (JSCC).

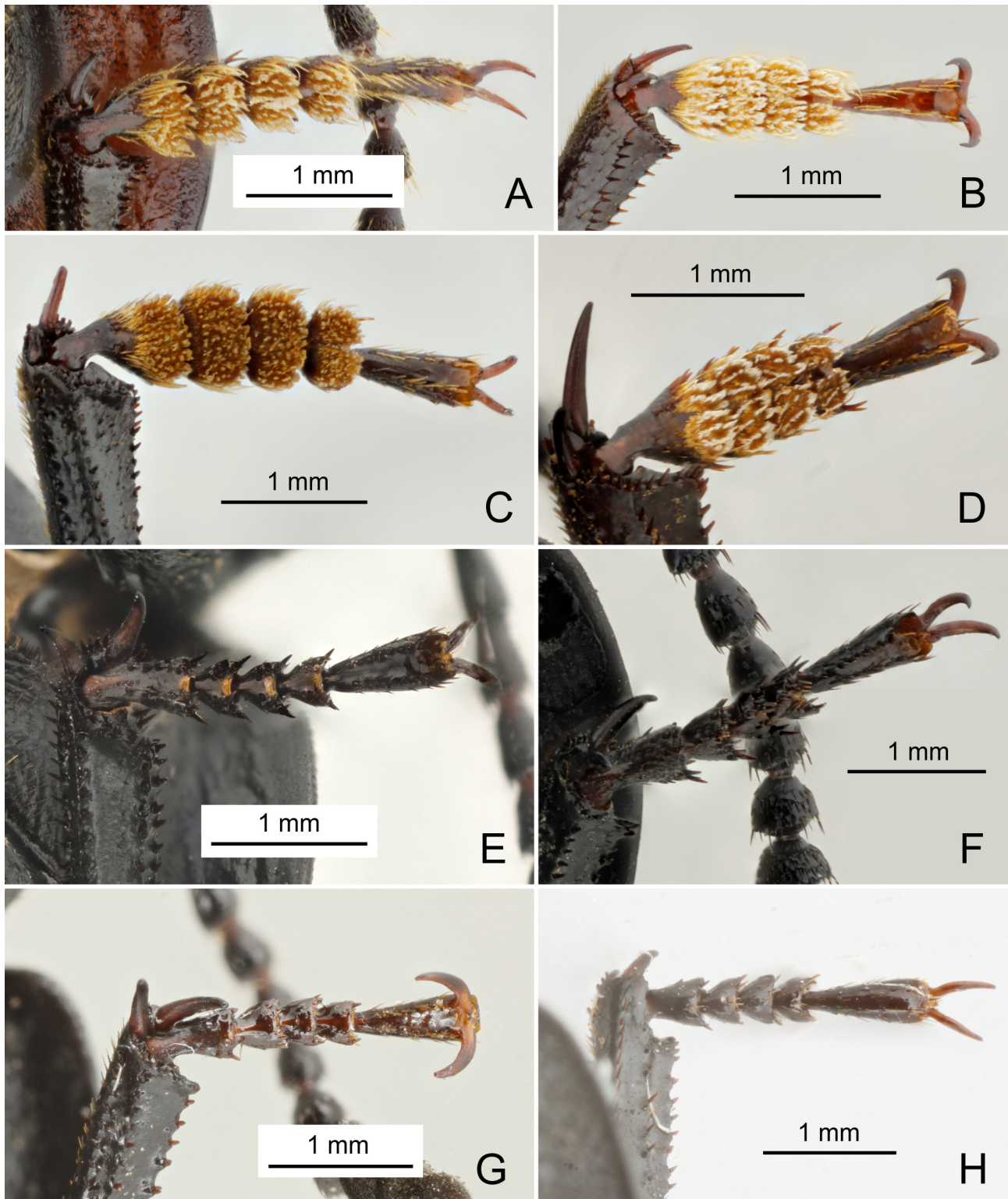


FIGURE 21. Protarsus of *Silpha*, ventral view. A: *S. businskyorum*, Houzhenzi env. (JRUC). B: *S. longicornis*, Shizu Rindoh Nikko N. P. (JRUC). C: *S. perforata*, Jasnoe (JRUC). D: *S. chelinda* Sommer, Růžička & Barclay, **sp. nov.**, Chelinda (MRAC). E: *S. capicola* Péringuey, 1888, Muizenberg (MRAC). F: *S. lata* Portevin, 1920, Changelawe—Mafinga (NHMW). G: *S. francoisi* Dierkens, 2020, Rungwe Mt. (JSCC). H: *S. francoisi* Dierkens, 2020, dorsal view, Rungwe Mt. (JSCC).

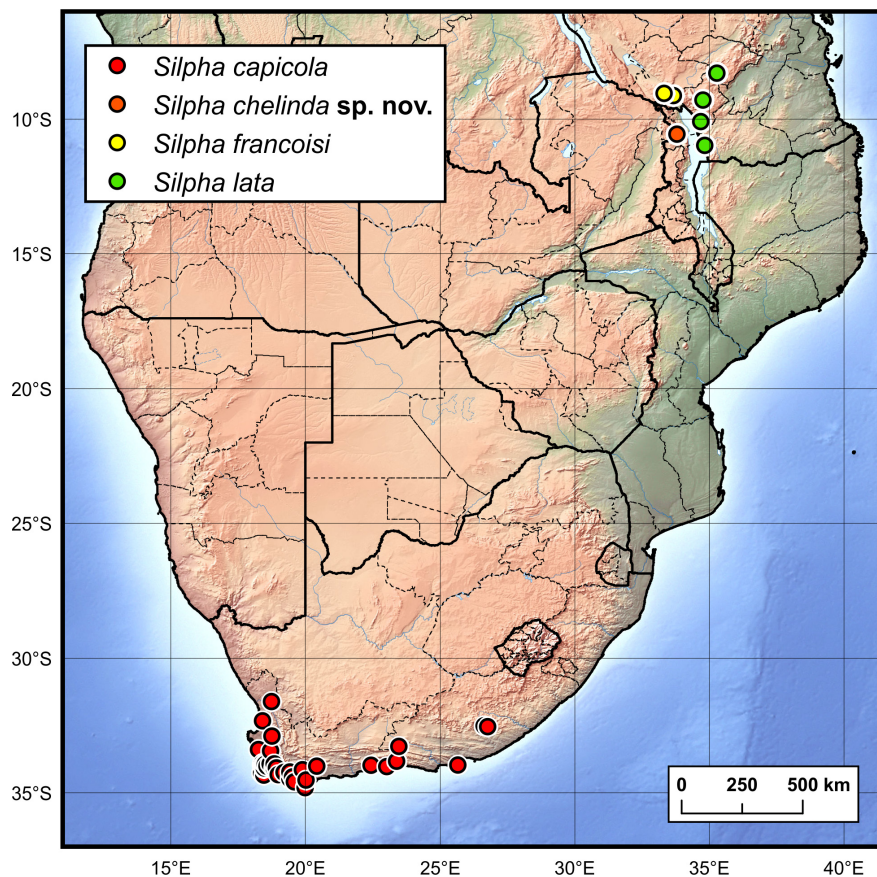


FIGURE 22. General distribution of *Silpha* in Afrotropical Region.

Ventrite VIII weakly rounded. Tergite IX elongate, rounded, in first half almost straight; tergite X widely rounded, almost pentagonal, apex with dense setation. Coxite robust, apex extremely elongated, acute; stylus extremely small, subquadrate, inserted laterally, shorter than apex of coxite.

Variability. Individuals vary in size and shape (see next paragraph). Elytra dark brown to black.

Measurements. TBL 15.6–17.5 mm in ♂ (holotypus 15.6 mm) and 15.5–18.0 mm in ♀; MBW 10.0–11.0 mm in ♂ (holotypus 10.5 mm) and 9.5–10.5 mm in ♀; RLWP 0.55–0.61 in ♂ (holotypus 0.60), 0.55–0.63 in ♀; RLWE 0.96–1.10 in ♂ (holotypus 0.96), 1.10–1.19 in ♀.

Differential diagnosis. Refer to species key and Table 3 below.

Distribution. An endemic species, known only from several localities in southern Tanzania (see map, Figs. 22–23 and Table 2).

Taxonomical remarks. *Silpha lata* Portevin, 1920 was described from “Ile de Nias [= Nias Island, Malaysia]”, based on a single male specimen (Fig. 4D), erroneously listed as a female (Portevin, 1920). It was compared with *S. olivieri* Bedel, 1887, distributed in the Mediterranean subregion; also, a more comprehensive key to *Silpha* (Portevin 1926) treated these two species as very similar, and placed them in a different part of the key from the Afrotropical species listed above. We have located the holotype in MHNH, and to our surprise, it is identical with the specimens from Tanzania identified as *C. capicola* by G. Portevin and also deposited in MHNH. The holotype was probably obtained from Eugène Henri Le Moult (1882–1965), a Paris insect trader (Bousquet 2012: 733). Very probably, the German translation (“Njassasee”) of the Lake Nyassa (now Lake Malawi) was mistaken for Nias Island (“Ile de Nias” is clearly printed on the locality label). Consequently, the populations from Tanzania should be assigned to *S. lata*, and its distribution should be corrected to the Afrotropical Region.

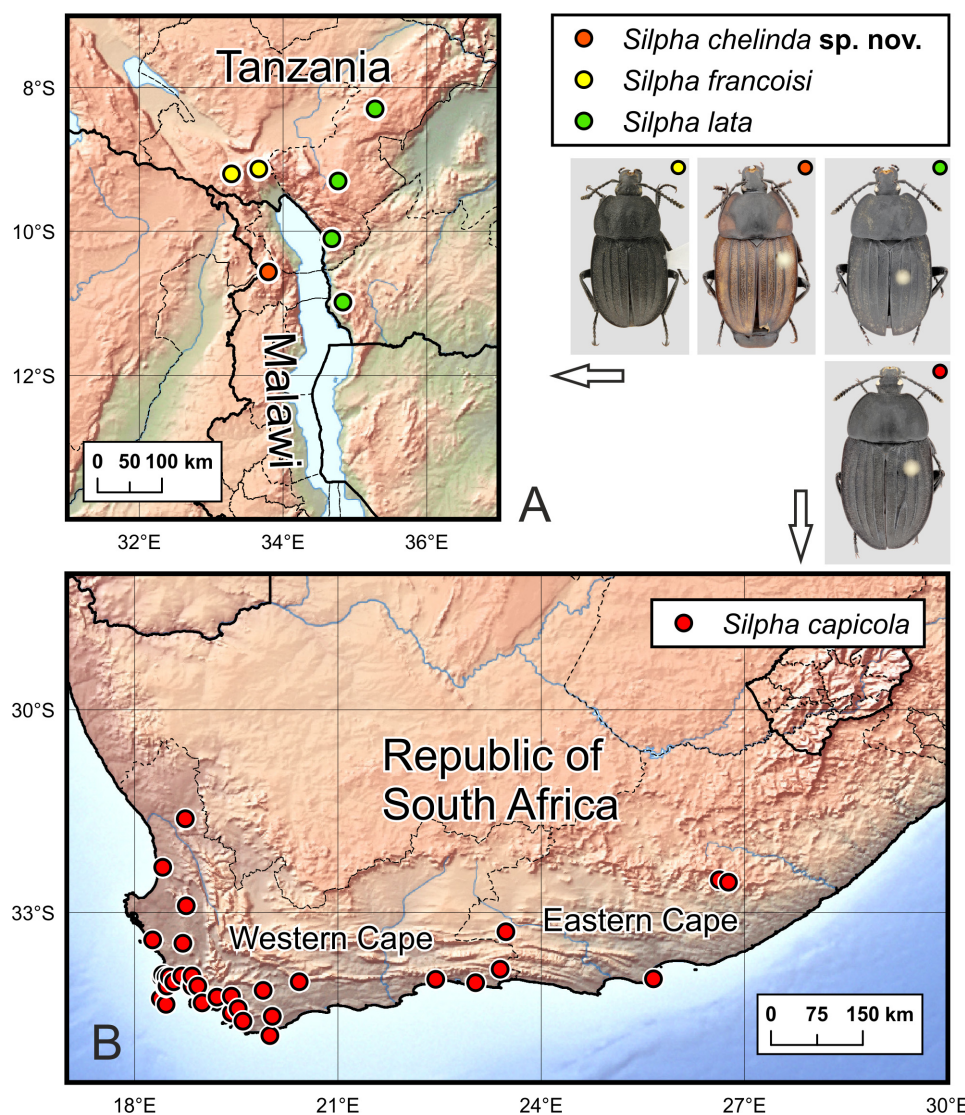


FIGURE 23. Detailed known distribution of *Silpha* in Afrotropical Region. A: Eastern Africa. B: Southern Africa.

TABLE 2. Gazetteer of the known collecting localities of *Silpha capicola* Péringuey, 1888, *S. chelinda* Sommer, Růžicka & Barclay, **sp. nov.**, *S. francoisi* Dierkens, 2020, and *S. lata* Portevin, 1920 with their geographic coordinates and altitude data; * type localities.

species	country	locality	S	E	~ altitude m a.s.l.
<i>S. capicola</i>	RSA, Eastern Cape	Katberg	32°31'28"S	26°38'47"E	955
<i>S. capicola</i>	RSA, Eastern Cape	Port Elizabeth	33°57'43"S	25°37'07"E	60
* <i>S. capicola</i>	RSA, Eastern Cape	Seymour	32°33'12"S	26°46'42"E	800
<i>S. capicola</i>	RSA, Eastern Cape	Willowmore	33°17'24"S	23°29'31"E	830
<i>S. capicola</i>	RSA, Western Cape	Agulhas	34°49'05"S	20°00'34"E	120
<i>S. capicola</i>	RSA, Western Cape	Botriver, 6 km S	34°17'02"S	19°11'11"E	15
<i>S. capicola</i>	RSA, Western Cape	Bredasdorp	34°32'00"S	20°02'39"E	65
<i>S. capicola</i>	RSA, Western Cape	Caledon area	34°14'01"S	19°26'01"E	235
<i>S. capicola</i>	RSA, Western Cape	Buffelsnek	33°54'45"S	23°09'25"E	800
<i>S. capicola</i>	RSA, Western Cape	Cape Flats	34°01'00"S	18°35'00"E	35

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TABLE 2. (Continued)

species	country	locality	S	E	~ altitude m a.s.l.
<i>S. capicola</i>	RSA, Western Cape	Cape of Good Hope National Reserve	34°21'03"S	18°29'04"E	130
<i>S. capicola</i>	RSA, Western Cape	Cape Town	33°57'00"S	18°31'00"E	10
<i>S. capicola</i>	RSA, Western Cape	Cape Town, 63 km N	33°24'00"S	18°16'00"E	60
<i>S. capicola</i>	RSA, Western Cape	Cape, see Cape Town			
<i>S. capicola</i>	RSA, Western Cape	De Tafle Berg, see Tafelberg			
<i>S. capicola</i>	RSA, Western Cape	Faure	34°01'55"S	18°45'11"E	15
<i>S. capicola</i>	RSA, Western Cape	George	33°59'18"S	22°27'02"E	205
<i>S. capicola</i>	RSA, Western Cape	Hoets Bay	34°06'00"S	18°28'00"E	40
<i>S. capicola</i>	RSA, Western Cape	Keurbooms River Knyasna, see Knysna, Keurboomsrivier			
<i>S. capicola</i>	RSA, Western Cape	Kleinmond	34°20'22"S	19°00'55"E	40
<i>S. capicola</i>	RSA, Western Cape	Knysna	34°02'00"S	23°02'00"E	70
<i>S. capicola</i>	RSA, Western Cape	Knysna, Keurboomsrivier	33°59'00"S	23°24'00"E	80
<i>S. capicola</i>	RSA, Western Cape	Kuilsrivier	33°56'00"S	18°42'00"E	80
<i>S. capicola</i>	RSA, Western Cape	Lourens River	34°06'20"S	18°49'44"E	10
<i>S. capicola</i>	RSA, Western Cape	Malmesbury	33°27'46"S	18°43'33"E	135
<i>S. capicola</i>	RSA, Western Cape	Muizenberg	34°06'08"S	18°28'28"E	5
<i>S. capicola</i>	RSA, Western Cape	Olifantsbos	34°15'26"S	18°22'59"E	5
<i>S. capicola</i>	RSA, Western Cape	Oudebosch, R. Zonder End Mts., see Riviersonderend Mountain			
<i>S. capicola</i>	RSA, Western Cape	Pearly Beach, 12 km E	34°39'42"S	19°37'37"E	220
<i>S. capicola</i>	RSA, Western Cape	Philadelphia			
<i>S. capicola</i>	RSA, Western Cape	Piketberg	32°54'10"S	18°45'54"E	160
<i>S. capicola</i>	RSA, Western Cape	Piquetberg, see Piketberg			
<i>S. capicola</i>	RSA, Western Cape	Riviersonderend Mountain	34°08'35"S	19°55'09"E	150
<i>S. capicola</i>	RSA, Western Cape	Rondebosch	33°57'54"S	18°28'34"E	25
<i>S. capicola</i>	RSA, Western Cape	Somerset West	34°04'00"S	18°50'00"E	110
<i>S. capicola</i>	RSA, Western Cape	Stanford, 5 km S	34°29'02"S	19°26'00"E	105
<i>S. capicola</i>	RSA, Western Cape	Stanford, 8 km NEE	34°25'08"S	19°32'19"E	35
<i>S. capicola</i>	RSA, Western Cape	Stellenbosch	33°56'05"S	18°51'35"E	110
<i>S. capicola</i>	RSA, Western Cape	Strand	34°06'55"S	18°50'47"E	15
<i>S. capicola</i>	RSA, Western Cape	Swellendam	34°01'27"S	20°26'31"E	120
<i>S. capicola</i>	RSA, Western Cape	Tafelberg	33°57'46"S	18°24'36"E	1070
<i>S. capicola</i>	RSA, Western Cape	Tygerberg hills	33°50'51"S	18°38'28"E	215
<i>S. capicola</i>	RSA, Western Cape	V. Rynsdorp, see Vanrynsdorp			
<i>S. capicola</i>	RSA, Western Cape	Vanrynsdorp	31°36'24"S	18°44'39"E	120

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TABLE 2. (Continued)

species	country	locality	S	E	~ altitude m a.s.l.
<i>S. capicola</i>	RSA, Western Cape	Van Schoor's drift	33°40'00"S	18°34'54"E	80
<i>S. capicola</i>	RSA, Western Cape	Vegelogen Est.	34°05'00"S	18°56'00"E	265
<i>S. capicola</i>	RSA, Western Cape	Verlorevlei farm	32°18'53"S	18°23'45"E	10
<i>*S. chelinda</i> sp. nov.	Malawi, Northern Region	Chelinda	10°34'51"S	33°48'15"E	2330
<i>S. chelinda</i> sp. nov.	Malawi, Northern Region	Nganda-Chelinda	10°34'51"S	33°48'15"E	2330
<i>S. chelinda</i> sp. nov.	Malawi, Northern Region	Nyika National Park	10°34'51"S	33°48'15"E	2330
<i>S. francoisi</i>	Tanzania, Mbeya Region	Rungwe Mt.	09°08'00"S	33°40'00"E	2820
<i>S. francoisi</i>	Tanzania, Mbeya Region	Southern Highlands	09°10'00"S	34°31'00"E	1800
<i>*S. francoisi</i>	Tanzania, Mbeya Region	Umalila forest	09°10'40"S	33°16'29"E	2385
<i>S. lata</i>	Tanzania, Iringa Region	Changalawe—Mafinga	08°17'43"S	35°17'57"E	1830
<i>S. lata</i>	Tanzania, Revuma Region	Litebo	10°59'01"S	34°50'38"E	1645
<i>S. lata</i>	Tanzania, Njombe Region	Ludewa district	09°59'22"S	34°47'45"E	1380
<i>S. lata</i>	Tanzania, Njombe Region	Njombe	09°20'59"S	34°46'46"E	1925
<i>S. lata</i>	Tanzania, Njombe Region	Upangwa, see Ludewa district			

4.3. Key to species of *Silpha* from the Afrotropical Region

1. Surface of elytra yellow to brown; pronotum black, lateral area brown (Figs. 5A, D) *S. chelinda* Sommer, Růžička & Barclay, sp. nov.
- Surface of elytra and pronotum black or dark brown (Figs. 2A, D, 3A, D, 4A, D–E, 6A–B) 2
2. Surface of pronotum shiny, with dense, coarse punctation; punctures medium sized, not separated (Figs. 6A–B, E) *S. francoisi* Dierkens, 2020
- Surface of pronotum dull, punctures small, clearly separated (Figs. 2A, D, 3A, D, 4A, D–E) 3
3. Surface of pronotum with dense punctation; punctures bearing extremely short, orange setae (Figs. 2A, D, 3A, D) *S. capicola* Péringuey, 1888
- Surface of pronotum with fine punctation; punctures without setae (Figs. 4A, D–E) *S. lata* Portevin, 1920

TABLE 3. Matrix of male and female characters and character states separating the *Silpha* species from the Afrotropical region. (*—only male, **—only female).

character	<i>S. capicola</i> Péringuey, 1888	<i>S. chelinda</i> Sommer, Růžička & Barclay, sp. nov.	<i>S. francoisi</i> Dierkens, 2020	<i>S. lata</i> Portevin, 1920
head	dense, small (Figs. 2A, D, 3A, D)	fine, very small (Figs. 5A, D)	dense, coarse (Figs. 6A–B, E)	fine, very small (Figs. 4A, D–E)
punctuation				
dorsal head	present (Figs. 2A, D, 3A, D)	absent (Figs. 5A, D)	present (Figs. 6A–B, E)	absent (Figs. 4A, D–E)
setation				
pronotal	sinuous, with	straight, no emargination	concave, no	slightly sinuous, no
anterior	emargination (Figs. 2A, D, 3A, D)	(Figs. 5A, D)	emargination (Figs. 6A–B, E)	emargination (Figs. 4A, D–E)
margin				
pronotal	small, distinct, with	small, fine, no setae (Figs. 5A, D)	coarse, confluent, with	fine, distinct, no setae
punctuation	setae (Figs. 2A, D, 3A, D)		setae (Figs. 6A–B, E)	(Figs. 4A, D–E)
scutellum	short black setae (Figs. 2A, D, 3A, D)	none (Figs. 5A, D)	short black setae (Figs. 6A–B, E)	none (Figs. 4A, D–E)
setation				

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TABLE 3. (Continued)

character	<i>S. capicola</i> Péringuey, 1888	<i>S. chelinda</i> Sommer, Růžička & Barclay, sp. nov.	<i>S. francoisi</i> Dierkens, 2020	<i>S. lata</i> Portevin, 1920
scutellum	rounded (Figs. 2A, D, 3A, D)	strongly acute (Figs. 5A, D)	rounded (Figs. 6A–B, E)	acute (Figs. 4A, D–E)
posterior margin				
elytral apex	imperceptibly elongate (Figs. 2A, D, 3A, D)	rounded (Figs. 5A, D)	rounded (Figs. 6A–B, E)	widely rounded (Figs. 4A, D–E)
elytral puncture spacing	1.0–1.5× (Figs. 2A, D, 3A, D, 9E)	1.5–2.0× (Figs. 5A, D, 9G)	≤1.0× (Figs. 6A–B, E, 9H)	≥2.0× (Figs. 4A, D–E, 9F)
Elytral tubercles	small (Figs. 2A, D, 3A, D, 9E)	small (Figs. 5A, D, 9G)	large (Figs. 6A–B, E, 9H)	small (Figs. 4A, D–E, 9F)
epipleura elevation	strong (Figs. 2B–C, E–F, 3E–F)	strong (Figs. 5B–C, E)	strong (Figs. 6C–D, F)	faint (Figs. 4B–C, F)
metathoracic wings	brachypterous	apterous	apterous	apterous
*protarsus	slightly expanded (Figs. 2A–B, 21E)	widely expanded (Figs. 5A–B, 21D)	not expanded (Figs. 6A, 21G–H)	not expanded (Figs. 4A–B, D, 21F)
metatibia shape	slightly curved (Figs. 2B–C, E–F, 3E–F)	straight (Figs. 5B–C, E)	almost straight (Figs. 6C–D, F)	slightly curved (Figs. 4B–C, F)
proventrite lateral punctation	dense (Figs. 2B, E, 3E)	absent (Figs. 5B, E)	absent (Fig. 6D)	absent (Fig. 4B)
abdominal ventrite punctation	present (Figs. 2B–C, E–F, 3E–F)	slight (Figs. 5B–C, E)	present (Fig. 6C–D, F)	absent (Fig. 4B–C, F)
abdominal ventrite setation	orange to black (Figs. 2B–C, E–F, 3E–F)	orange (Figs. 5B–C, E)	orange (Fig. 6C–D, F)	black (Fig. 4B–C, F)
*tergite VIII apex	straight or rounded (Fig. 15A)	strongly sinuous (Fig. 15C)	regularly rounded (similar to Fig. 15B)	regularly rounded (Fig. 15B)
*ventrite IX shape	oval (Fig. 13A)	rectangular (Fig. 13C)	subquadrate (Fig. 13D)	rectangular (Fig. 13B)
*spiculum gastrale	narrows apically (Fig. 13A)	expanded apically (Fig. 13C)	slightly expanded (Fig. 13D)	expanded apically (Fig. 13B)
*aedeagus—median lobe	gradually tapered to widely rounded, triangular apex (Fig. 10A)	tapered to widely rounded, triangular apex (Fig. 11A)	tapered to widely rounded apex (Fig. 11B)	widely sinuous apex (Fig. 10B)
*aedeagus—parameres	robust, as long as median lobe (Fig. 10A)	longer than lobe, narrowed (Fig. 11A)	shorter than lobe, slender (Fig. 11B)	shorter than lobe, robust (Fig. 10B)
*aedeagus—basal portion	oval, robust, not wider (Fig. 10A)	weak, slightly wider (Fig. 11A)	robust, slightly wider (Fig. 11B)	robust, equal width (Fig. 10B)
**protarsus	expanded (Figs. 2D–E, 3D–E)	not expanded (Figs. 5D–E)	expanded (Figs. 6B, D–E)	not expanded

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TABLE 3. (Continued)

character	<i>S. capicola</i> Péringuey, 1888	<i>S. chelinda</i> Sommer, Růžička & Barclay, sp. nov.	<i>S. francoisi</i> Dierkens, 2020	<i>S. lata</i> Portevin, 1920
**elytral apex	rounded (Figs. 2D–E, 3D–E)	rounded (Figs. 5D–E)	rounded (Figs. 6B, D–E)	rectangular (Fig. 4E)
**tergite VIII	subquadrate, apically almost straight, rounded posteriorly (Fig. 17E)	subquadrate, apically sinuous, widely rounded posteriorly (Fig. 17G)	widely rounded (Fig. 17H)	widely rounded (Fig. 17F)
**ventrite VIII	widely rounded (Fig. 17E)	apically weakly sinuous, rounded posteriorly (Fig. 17G)	weakly rounded (Fig. 17H)	weakly rounded (Fig. 17F)
**tergite IX	elongate, rounded (Figs. 17E, 18A)	elongate, rounded, in first half almost straight (Figs. 17G, 18C)	elongate, rounded, in first half almost straight (Figs. 17H, 18D)	elongate, rounded, in first half almost straight (Figs. 17F, 18B)
**tergite X	widely rounded, almost pentagonal, dense setation at apex (Figs. 17E, 18A)	widely rounded, almost pentagonal, dense setation at apex (Figs. 17G, 18C)	widely rounded, almost pentagonal, dense setation at apex (Figs. 17H, 18D)	widely rounded, almost pentagonal, dense setation at apex (Figs. 17F, 18B)
**coxite	robust, subquadrate, apex slightly indicated, rounded (Figs. 17E, 18A)	robust, apex extremely elongated, rounded (Figs. 17G, 18C)	robust, subquadrate, apex almost straight (Figs. 17H, 18D)	robust, apex extremely elongated, acute (Figs. 17F, 18B)
**stylus	extremely short, subquadrate, inserted lateroapically, shorter than apex of coxite (Figs. 17E, 18A)	robust, subquadrate, inserted lateroapically, shorter than apex of coxite (Figs. 17G, 18C)	extremely elongated, triangular, inserted apically (Figs. 17H, 18D)	extremely small, subquadrate, inserted laterally, shorter than apex of coxite (Figs. 17F, 18B)

5. Discussion

5.1. Evolution and history of the subgenus *Silpha*

In total, the subgenus *Silpha* is represented by 20 species through the Palaearctic Region (Růžička 2015; Newton 2025; Mahlerová *et al.* 2025). The centre of diversity of *Silpha* is located in the eastern part of the Palaearctic Region, especially in Nepal and China (Růžička 2015). Four endemic species form a separate lineage in Nepal (Schawaller 1982; Růžička 2021), two other endemic species form another lineage in mid-west China (Schawaller 1996, Háva *et al.* 1999), and three species are from the Canary Islands. These three Canary Islands species were until recently treated as a separate genus *Heterotemna* Wollaston, 1864, before being transferred to *Silpha* sensu stricto (Mahlerová *et al.* 2025). Other regions are poor in species. The Nearctic Region has only two species, *S. tristis* Illiger, 1798 and *S. puncticollis* Lucas, 1846, both only recently introduced (Laplante 1997; Ferreira 2017). *Silpha obscura obscura* Linnaeus, 1758 is the only species which extends into the Oriental Region, but only into its north-westernmost mainland part (Růžička & Schneider 2002; Růžička 2015).

The last zoogeographical area in which we find representatives of the subgenus *Silpha* is the Afrotropical Region. Until now, only two species of the (sub)genus *Silpha* were reported: *S. punctulata* (according to this paper, *S. capicola* [see above]) and *S. francoisi* (Schawaller 1987; Thayer & Newton 2005; Dierkens 2020). The species *S. lata* Portevin, 1926, described from the Island of Nias (Portevin 1926), has in fact its type locality misinterpreted, and it is also Afrotropical in distribution (see above). An additional new species, *S. chelinda* Sommer, Růžička & Barclay, **sp. nov.** is described here from isolated mountains in northern Malawi (see above). The species diversity of carrion beetles in this region is very low, compared with the Palaearctic Region.

A preliminary phylogenetic study of the subgenus *Silpha*, based on molecular data of nine Palaearctic species, confirmed its monophyly (Mahlerová *et al.* 2025). However, two independent endemic lineages within *Silpha* that originated in the high mountains of Asia, were absent from this analysis, because of lack of available DNA-grade samples (J. Růžicka, unpublished). These lineages are not yet formally delimited, but they differ distinctly from the other members of *Silpha* both in terms of adult morphology and specific distribution. It is noteworthy that within this subgenus, in which some species are relatively widespread, three endemic lineages have originated in high mountain complexes, which are often considered hotspots of biodiversity (Myers *et al.* 2000). Moreover, these events certainly originated independently.

A similar pattern is known in several Eastern Palaearctic beetle groups, e.g., *Enoplotrupes* Lucas, 1869 and *Odontotrupes* Fairmaire, 1887 (Coleoptera: Geotrupidae) (Král *et al.* 2001, 2015a, 2015b), *Anemadus* Reitter, 1884 (Coleoptera: Leiodidae) (Růžicka & Perreau 2017) and *Micropeplus* Latreille, 1809 (Coleoptera: Staphylinidae) (Grebennikov & Smetana 2015).

The third similar endemic lineage within the subgenus *Silpha* are the three Afrotropical species from the EABH. Similar parallel evolution of local endemics in EABH occur in many groups, e.g., in *Chappuisiotes* Jeannel, 1957 and *Oritocatops* Jeannel, 1921 (Coleoptera: Leiodidae) (Jeannel 1964), *Rioneta* Johnson, 1975 (Coleoptera: Ptiliidae) (Grebennikov 2008), *Lupangus* Grebennikov, 2023, *Prothrombosternus* Voss, 1960, *Tazarcus* Grebennikov, 2020, and *Typoderus* Marshall, 1953 (Curculionidae: Molytinae) (Grebennikov 2016, 2017, 2020, 2021a), in *Balleriodes* Grebennikov, 2021 and *Philharmostes* Kolbe, 1895 (Coleoptera: Hybosoridae: Ceratocanthinae) (Grebennikov 2019, 2021b), and in *Grebennikovius* Mlambo, Scholtz & Deschodt, 2019 (Coleoptera: Scarabaeidae) (Montanaro *et al.* 2024).

For the three EABH species of *Silpha*, they appear to be difficult to collect and are correspondingly rare in museum collections. The whole known material of all three species combined totals fewer than 50 specimens, and the number of collecting events is even lower, even though the area where they occur, around Lake Malawi, has received considerable attention from entomologists over many decades. Recent trips by the African Natural History Research Trust and BMNH to Tanzania and Malawi have not revealed any additional specimens of this genus, despite using dung-baited and unbaited pitfall traps, which are successful in capturing adults of *Silpha* spp. in other regions. Knowledge of the bionomy of these beetles might enable the collecting of more material, possibly even more species, and increase our understanding of their distribution.

5.2. Afrotropical *Silpha* species—geographically isolated group of the Eastern Afrotropical biodiversity hotspot

Relationships between Afrotropical species and other representatives of the subgenus *Silpha* are weakly resolved, because a detailed molecular phylogenetic analysis of all lineages is absent. In this study, we tried to reconstruct these relationships at least on the basis of morphological data. Regardless of what exactly constitutes sister “group” of the Afrotropical lineage, it seems plausible to assume that it is a speciose and widely distributed clade, and also a member of the subgenus *Silpha*. Three Afrotropical species (excluding *S. capicola*) are currently known from a few localities in EABH. This is a species-poor lineage geographically restricted to exceptionally stable habitat, and sister of a species-rich and widely distributed Palaearctic clade. Similar conclusions were made about two other beetle groups, the weevil beetles genus *Lupangus* (Curculionidae: Molytinae) and pill scarab beetles genera *Balleriodes* and *Philharmostes* (Hybosoridae: Ceratocanthinae) (Grebennikov 2017, 2019, 2021b). Each of these clades likely defines an old (pre-Miocene) dichotomy and is each sister to a much larger and widely distributed clade. Other less numerous and endemic examples for EABH are partridges from the genus *Xenoperdix* Dinesen, Lehmsberg, Svendsen, Hansen & Fjeldså, 1994, a clade probably divergent from its Asian sister group in the early Oligocene (Wang *et al.* 2017), the amphibian genus *Boulengerula* Tornier, 1896, probably divergent from its African sister group in the late Cretaceous (Roelants *et al.* 2007) or Kupeaceae monocots probably divergent from their pantropical sister group in the late Cretaceous (Mennes *et al.* 2013).

These observations are consistent with the exceptionally stable biological past of the wet forests in EABH, which are under the direct influence of the moisture from the Indian Ocean and, therefore, are thought to have persisted uninterruptedly since the Oligocene (Lovett & Wasser 1993). Most importantly, these presently widely isolated and relatively small forests have likely survived as wet refugia supporting the existence of the forest-

dependent biota during Miocene uplift of the East African plateau resulting in gradual fragmentation of the forest cover (Bobe 2006), and also during dramatic and repeated subsequent forest expansion/shrinkage cycles. The latter coincided with the Pleistocene glacial cycles (Plana 2014) when the Afrotropical rainforest repeatedly shrank to about 10% of its present size (Hamilton & Taylor 1991).

The discontinuous occurrence of this originally Palaearctic lineage in the Afrotropical Region strikingly follows the two largest biodiversity hotspots in Africa, (1) the area of East African Rift Lakes, respectively EABH, and the Eastern and Western Cape Region, known mainly for its high endemism (Forest *et al.* 2007; Schnitzler *et al.* 2011). Other groups of taxa, especially plants and birds, have a similar pattern of distribution (Mairal *et al.* 2017).

The dated molecular phylogeny of Afrotropical *Silpha* species is necessary to shed light on the evolution and history of this lineage, here we only present data on preliminary classification and recent distribution of the species.

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