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New species of the *Scarabaeus* subgenus *Scarabaeolus*  
Balthasar, with a review of the subgenus  
(Scarabaeidae: Scarabaeinae: Scarabaeini)

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Zidek and Pokorný

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## New species of the *Scarabaeus* subgenus *Scarabaeolus* Balthasar, with a review of the subgenus (Scarabaeidae: Scarabaeinae: Scarabaeini)

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**Abstract.** The *Scarabaeus* subgenus *Scarabaeolus* Balthasar, 1965 (Scarabaeidae: Scarabaeinae: Scarabaeini) is defined and nine new species are described, six from the Republic of South Africa [*S. (S.) fragilis* sp. n., *S. (S.) kru-geri* sp. n., *S. (S.) lizleri* sp. n., *S. (S.) orientalis* sp. n., *S. (S.) rugosipennis* sp. n., *S. (S.) similis* sp. n.] and one each from Angola [*S. (S.) cunene* sp. n.], Namibia [*S. (S.) namibensis* sp. n.] and Kenya [*S. (S.) weneri* sp. n.], bringing the number of recorded species up to 41. Species accounts listing original descriptions, subsequent accounts, type localities, type repositories, and geographic distributions are provided for all the species. The status of *S. (S.) reichei* Waterhouse, 1890 and of *S. (S.) bohemani* Harold, 1868, both formerly synonymized and reinstated, are discussed. It is concluded that *S. (S.) reichei* is synonymous with *S. (S.) canaliculatus* Fairmaire, 1888, whereas *S. (S.) bohemani* differs from *S. (S.) palemo* Olivier, 1789 in the color of antennal club and shape of paramere tips, and is upheld pending availability of molecular data.

**Key words.** Definition of subgenus, catalogue, Afrotropical region.

### Introduction

Small Afrotropical species of *Scarabaeus* Linnaeus are confined chiefly to the southern part of the continent, but one occurs as far northeast as Somalia (*S. laevifrons* Fairmaire) and another extends northwest into Senegal (*S. palemo* Olivier). Most species are sculptured and hirsute, due to wide separation of lateral carinae have the elytral edge more-or-less rounded in profile, and nearly two-thirds possess a vestigial second mesotibial spur. Based primarily on the latter feature, Balthasar (1965) proposed the subgenus *Scarabaeolus* with *S. laevifrons* Fairmaire as its type species. Zur Strassen (1967: 131) reported only one mesotibial spur in *S. laevifrons* and consequently did not recognize the subgenus, however our re-examination shows this species to have two mesotibial spurs. Mostert and Scholtz (1986: 16) and Davis et al. (2008: 140) recognized *Scarabaeolus* as a likely monophyletic group of subgeneric rank and amended Balthasar's (1965) definition by de-emphasizing the presence of the second mesotibial spur, adding a relatively limited distribution ("... the majority of the species occurring south of 10° S latitude and west of 25° E longitude") and emphasizing the rounded elytral profile and blunt termination of the metatibia with the tarsus inserted very close to the base of the spur and tarsal claws only about as long as the distal tarsal hairs. Most recently, Deschodt et al. (2015) described seven new species, revalidated one species, and proposed two new synonymies. In this paper we add nine new species.

To the above definition we add that, of the 41 species recognized in the Review and Species Accounts sections, 17 have only one mesotibial spur, and that another character which in contrast to the nomenclotypical subgenus appears to hold well throughout the subgenus *Scarabaeolus* is ventral asymmetry of the parameres, as is detailed in the Discussion section.

### Materials and Methods

The following codens of type and other repositories follow Arnett et al. (1993) except for GWPC, MHNM, MNHB and VBPC.

BMNH Natural History Museum, London, UK;

DMSA Durban Museum, RSA;

GWPC G. Werner collection, Peiting, Germany;

ISNB Institut Royal des Sciences Naturelles de Belgique, Brussels, Belgium;

MHNM Museu de História Natural, Maputo, Mozambique;  
 MNHB Museum für Naturkunde Leibniz-Institut, Berlin, Germany;  
 MNHN Muséum National d'Histoire Naturelle, Paris, France;  
 MRAC Musée Royal de l'Afrique Centrale, Tervuren, Belgium;  
 NHMB Naturhistorisches Museum, Basel, Switzerland;  
 NHRS Naturhistoriska Riksmuseet, Stockholm, Sweden;  
 NMPC National Museum (Natural History), Prague, Czech Republic;  
 OXUM Oxford University Museum of Natural History, Oxford, UK;  
 SAMC South African Museum, Cape Town, RSA;  
 SMFD Naturmuseum Senckenberg, Frankfurt a. M., Germany;  
 TMSA Transvaal Museum, Pretoria, RSA;  
 VBPC V. Beneš Collection, Prague, Czech Republic;  
 ZMUC Universitets Zoologisk Museum, Copenhagen, Denmark.

Other abbreviations used throughout the text are:

AT—allotype, HT—holotype, PT—paratype, ST—syntype;

f—female, m—male;

DRC—Democratic Republic of the Congo, RSA—Republic of South Africa.

New taxa bear printed red holotype/allotype and yellow paratype labels.

Cited lengths are measured from the tip of the clypeus to the tip of the elytra.

Sexual dimorphism is slight to altogether absent. In some species, the male can have longer and sinusoidally curved protibiae (as opposed to straight in the female), but in a majority of species even this difference is at best tenuous. Also, posteriorly converging (male) vs. parallel-sided (female) elytral margins or shape of the last ventrite cannot be relied on to determine sex. The lack of reliable external sexual differences thus required examination of the abdominal cavity, first blindly through the pygidium, and, if that failed to produce an aedeagus, then uplifting the elytra, removing the tergites and inspecting the cavity visually. We were able to extract aedeagi from most species, but in a few cases all available specimens proved to be females. The extracted aedeagi were cleaned, glued at tips of paper triangles and pinned underneath specimens.

The seven new species described in Deschodt et al. (2015) (*S. carniphilus* Davis and Deschodt, *S. ermiensae* Deschodt and Davis, *S. megaparvulus* Davis and Deschodt, *S. niemandi* Deschodt and Davis, *S. nitidus* Davis and Deschodt, *S. planipennis* Davis and Deschodt, *S. soutpansbergensis* Deschodt and Davis) have been adequately illustrated and, except *S. megaparvulus* (Fig. 59–62, illustrated for comparison) are not depicted again in this paper. Most of the other species are illustrated and figure numbers are appended in boldface to the list of species at the beginning of the Review section. We were not able to examine *S. andreaei* zur Strassen and *S. inquisitus* Péringuey, and therefore have to refer the reader to the original descriptions and other papers cited in the Review section.

The term “granulorugose” or “granulorugosity” used in some of the descriptions of heads and/or pronota is taken from Edmonds (1994: 4), where it is defined as “... a heterogenous mixture of asperities of various shapes and sizes producing a highly fractured surface ... Thus, granulorugose is an imprecise term describing a roughened texture that is not clearly granulate.”

A remark is in order concerning Ferreira (1953b), cited repeatedly in the Species Accounts section. That paper contains eleven full-page illustrations called “Figures”, each consisting of several to many numbered drawings, in total 212. In some instances, drawings pertaining to the same species are scattered in more than one “Figure”, which makes them hard to find. Therefore, to facilitate reference to Ferreira’s (1953b) illustrations, the full-page “Figures” are here called plates (pl.) and the individual drawings are called figures (fig.).

Of the new species described below, four are based on single specimens, which may be perceived by some workers as an unsound practice. However, the specimens are clearly distinct from all other species and naming them is the only way of avoiding the possibility of their disappearance in unidentified material.

## Descriptions of New Taxa

### *Scarabaeus (Scarabaeolus) krugeri* Zidek and Pokorný, sp. n.

Fig. 1–4

**Type locality.** RSA, Kruger National Park, Punda Milia Sand.

**Type material.** HTm from type locality, 22.38S 31.02E, leg. Endrödi-Younga 3.II.1994.

ATf from RSA, Kruger National Park, Nyandu Sands, 22.41S 31.22E, leg. Endrödi-Younga 9.II.1994.

PT (36): 23 from same locality as AT except 4 leg. Endrödi & Bellamy 18.XI.1994. \\ 1 from same locality as HT, leg. Endrödi-Younga 3.II.1994; \\ 3 from RSA, KwaZulu Natal NE, Jozini, Tembe, Elephant Park env. (west border), leg. M. Snížek 30.XI.2002; \\ 6 from same locality as preceding except leg. M. Snížek 7.XII.2002; \\ 2 from same locality as preceding except leg. V. Kriváň 22.I.2003; \\ 1f from central Botswana, “Brit. Bechuanaland, Ghanzi, leg. J. Maurice 21.XII.1925” [BMNH].

HT+AT+24 PT at TMSA, 5 PT at BMNH, 2 PT at OXUM, 3 PT at NMPC, 2 PT at VBPC.

**Etymology.** The species name refers to collection localities of the type series, most of which are within the limits of the Kruger National Park.

**Description of holotype.** Length 14 mm. Black, head and pronotum glossy, elytra velvety matte with a weak bluish hue.

*Head.* Clypeus without ventral keel, its anterior part longitudinally rugate, middle and posterior parts granulose; teeth weakly upturned, spaces between them U-shaped. Genae separated from clypeus by narrow excisions, their sculpture as that on clypeus. Posterior half of head with a smooth sagittal line. Vertex laterally with large, asperate, setose punctures. Pubescence rusty brown, antennal club light yellowish brown.

*Pronotum.* With a weakly indicated smooth sagittal line and on disc with large, deep, rather sparse setose punctures that laterally become asperate and near margins change to granules. Pubescence rusty brown.

*Scutellum.* Exposed, small, triangular.

*Elytra.* Striate, first interval smooth, posteriorly strongly convex, with sparse small punctures; other intervals weakly convex, with sparse small, setose punctures that do not extend into intervals; fifth interval somewhat more convex. Lateral striae wider than medial, with dense small punctures.

*Pygidium.* Obliquely triangular, bordered all around, finely shagreened, with sparse transverse punctures.

*Venter.* Metasternal process strongly keeled, its sides covered by asperate, setose punctures. Ventral pubescence rusty brown.

*Legs.* Protibia straight, lateral edge coarsely and densely serrate, medial edge with sparse large granules. Mesotibia with two spurs. Lateral margin of metatibia without transverse carinae.

*Aedeagus.* Left paramere with a large ventral tooth, in lateral view parameres taper toward wedge-shaped tips. Length of phallobase does not exceed that of parameres.

**Variability.** Length 11–15 mm, variation other than in size not noticed.

**Comparison.** The new species is close to *S. flavicornis* (Boheman) (Fig. 5–8), from which it differs by smaller size, darker pubescence, more densely punctate pronotum, shagreened elytral sculpture, keeled metasternal process, and aedeagus with relatively shorter phallobase and wedge-shaped (in lateral view) paramere tips.

### *Scarabaeus (Scarabaeolus) lizleri* Zidek and Pokorný, sp. n.

Fig. 9–12

**Type locality.** RSA, Northern Cape Province, 30 km SE of Alexander Bay.

**Type material.** HTm from type locality, leg. R. Lízler 9.X.2000.

PT (179): 172 from type locality, leg. R. Lízler 9.X.2000; \\ 2 from RSA, Richtersveld, Port Nolloth,

leg. Endrödi-Younga 4.X.1976; \ 1 from Richtersveld, Manganese mine, leg. Endrödi-Younga 10.X.1976; \ 2 from S.W. Afr. [Namibia], Namib, Obib dunes, leg. Endrödi-Younga 20.IX.1973; \ 2 from S.W. Afr. [Namibia], S. Namib, Oranjemund, leg. Endrödi-Younga 28.VII.1981.

HT+10 PT at TMSA, 10 PT at BMNH, 10 PT at OXUM, 10 PT at MNHB, 8 PT at NMPC, 131 PT at GWPC.

**Etymology.** Named for Robert Lízler of Hradec Králové, Czech Republic, who collected nearly the entire type series.

**Description of holotype.** Length 15 mm. Black with reddish-orange elytra, glossy.

*Head.* Clypeus without ventral keel, teeth weakly upturned, spaces between them U-shaped, space between medial teeth wider than that between medial and lateral teeth; anterior part with sparse asperate and setose punctures that posteriorly change to setose granules. Genae separated from clypeus by narrow excisions, their sculpture somewhat finer than that of clypeus, front end of each gena sharply pointed. Clypeus/frons boundary with an inconspicuous broad and smooth tubercle. Smooth sagittal line present throughout length, narrow on clypeus, widest on frons and narrowing toward vertex. Pubescence rusty brown, antennal club brownish yellow.

*Pronotum.* Bordered all around, with a distinct smooth sagittal line, disc with sparse deep, setose punctures that become smaller and more closely spaced anteriorly and laterally. Lateral margins evenly rounded, coarsely serrate, with long hairs. Front angles obtuse, pointing outward, hind corners evenly rounded. Basal margin lined by a shallow groove with irregularly spaced setose punctures; medial part of base weakly lobate.

*Scutellum.* Exposed, small, triangular.

*Elytra.* With humeri well developed, indistinctly striate, striae micropunctate. Intervals smooth and glossy, first interval flat on disc, convex and sparsely punctate posterolaterally. Second through fifth intervals nearly impunctate; sixth and seventh intervals weakly arched; suture and first interval black.

*Pygidium.* Obliquely triangular, bordered all around, smooth on disc and punctate near margins.

*Venter.* Metasternum with posterior longitudinal furrow and keeled anterior process. Ventral pubescence dark brown.

*Legs.* Protibia curved inward at level of second tooth, lateral margin densely serrate, medial margin densely granulose. Profemoral anteroventral carina without proximal tooth. Mesotibia with two spurs. Lateral margin of metatibia without transverse carinae. Pubescence dark brown.

*Aedeagus.* Parameres shorter than phallobase, in lateral view dorso-ventrally parallel-sided, without ventral tooth and with truncated tips.

**Variability.** Length 10–15 mm, elytra prevalently bright to dark reddish orange, frequently with scattered small blackish spots, but in some specimens entirely dark brown with reddish hue.

**Comparison.** The dorsal habitus of the new species is indistinguishable from *S. rubripennis* (Boheman) (Fig. 13–16). In ventral view *S. lizleri* sp. n. has a larger and more keeled metasternal process, but this cannot serve as a reliable diagnostic character. However, the two species can be readily separated on the presence of a large, sharp anteroventral tooth at the proximal end of the profemur in *S. rubripennis*, which is absent in the new species. The aedeagi of both species do not have a ventral tooth (merely a minute, barely noticeable tubercle) and differ only in proportions, with the phallobase longer than the parameres in *S. lizleri* and vice versa in *S. rubripennis*. Another species with reddish-brown but much darker elytra is *S. knobeli* Ferreira from southern Angola (HT) and northwestern Namibia (Fig. 21–24), which can be separated from the other two species on having sparsely and shallowly punctate elytral intervals, only one mesotibial spur, and pygidium terminating in a short, outward curved spine.

**Biology.** According to R. Lízler (in litt.) the type locality is about 10 km from the shore, only 10–20 m above the sea level, and has the character of a semidesert with small dunes and interspersed rocky outcrops. Vegetation consists of sparse “tamarysk” brush and succulents, and herbivorous mammals include lagomorphs, small antelope, goat and sheep; large ruminants are absent. At the time of capture of *S. lizleri* the temperature fluctuated between close to freezing at night and 30–35° C at mid-day, and the area experienced strong winds. The beetles were taken at human dung between 8 and 11 a.m. and again in the late afternoon and at dusk. It thus is a diurnal–crepuscular species that avoids daily

thermal maxima more than minima, because in the early morning beetles were observed flying although the temperature was still only about 5° C.

The localities of the type series are in Northern Cape Province close to the southwestern RSA/Namibia border and just across the mouth of the Orange River in southernmost Namibia (Oranjemund, TMSA specimens), whereas localities of *S. rubripennis* are more to the north in the Namib desert—Kuisip (HTm), Namtib dunes (TMSA specimens) and Sessriem (BMNH and OXUM specimens). The two species thus are close neighbors and the question arises whether north of the Orange River they could not be sympatric, separated by diel activity or chemical stimuli. We have found no evidence of hybridization in the morphology of about 200 specimens examined.

***Scarabaeus (Scarabaeolus) namibensis* Zidek and Pokorný, sp. n.**

Fig. 17–20

**Type locality.** S.W. Afr. [Namibia], 60 km NE Gobabeb.

**Type material.** HTm from type locality.

PT (59): 1 from S.W. Afr., Namib, Bloedkoppe, leg. Endrödi-Younga 18.XI.1974; \ \ 1 from same loc. but coll. 7.VII.1978; \ \ 2 from S.W. Afr., Namib, 22 km NE Gobabeb, leg. Endrödi-Younga 28.II.1975; \ \ 1 from S.W. Afr., Namib, 32 km NE Gobabeb, leg. Endrödi-Younga 28.II.1975; \ \ 2 from S.W. Afr., Namib, 42 km NE Gobabeb, leg. Endrödi-Younga 28.VIII.1975; \ \ 2 from S.W. Afr., Namib, 52 km NE Gobabeb, leg. Endrödi-Younga 20.I.1975; \ \ 2 from same loc. but coll. 26.I.1975; \ \ 1 from same loc. but coll. 5.VI.1975; \ \ 2 from S.W. Afr., Namib, 60 km NE Gobabeb, leg. Endrödi-Younga 26.I.1975; \ \ 2 from S.W. Afr., C. Namib, Gobabeb, 12 km NE, leg. Endrödi-Younga 7.VII.1978 [black with more distinctly punctate elytra]; \ \ 43 from S.W. Afr., Kaokoveld, Kunene Riv., 44 km S, leg. Penrith & Müller 7.VII.1984 [two specimens of this series of 45 are *S. knobeli*, one of them shown in Fig. 21–24].

HT and all PT at TMSA.

**Etymology.** Named for the Namib desert biome.

**Description of holotype.** Length 13.5 mm; head, pronotum, venter and legs black, elytra combination of black and reddish brown.

*Head* with a broad glabrous to micropunctate medial area throughout length. Clypeus with teeth upturned, spaces between them U-shaped and wider between medial pair than between medial and lateral teeth; bases of teeth longitudinally granulate, farther posteriorly under each lateral tooth with a diffuse patch of short rusty setae. Genae separated from clypeus by V-shaped fissures, their anterior terminations sharp and weakly curved out, posterior corners rounded toward eyes; surface in front of eyes granulorugose, with a few scattered coarse punctures. Frons with a very weakly indicated and medially interrupted transverse carina. Vertex medially micropunctate, laterally with a few large punctures. Antenna yellowish brown.

*Pronotum.* Bordered all around, lateral margins finely crenulate and setose, base with a small medial lobe; front angles obtuse, hind corners obliquely merging into base. Sagittal line wide, glabrous, present throughout length; remaining surface unevenly coarsely punctate, size of punctures diminishing laterally and anteriorly.

*Scutellum.* Exposed, small, triangular.

*Elytra.* With striae finely and densely punctate, intervals weakly convex (first through fourth, basal third of fifth) to flat (sixth and seventh) and impunctate (first, sixth and seventh) or punctate very sparsely (second through fifth). Humeri small, confined to sixth interval.

*Pygidium.* Semilunar, bordered all around, finely punctate laterally and shagreened medially.

*Venter.* Metasternal process lunate, with a rounded tip; metasternal plate and abdominal ventrites very sparsely micropunctate.

*Legs.* Protibia weakly incurved at level of second tooth, spaces between teeth equal, last tooth rudimental; entire lateral margin finely serrate, setose only in proximal half; medial margin microgranulate, setose only in distal half. Mesotibia with two spurs. Both meso- and metatibia with two transverse carinae. Femoral setation brownish yellow.

*Aedeagus.* With parameres and phallobase of equal length; left paramere in proximal half of length

with a medium-size ventral tooth inclined toward phallobase; tips of parameres in dorsal view inflated, in lateral view produced into short beaks.

**Variability.** Length 8–14 mm, coloration of elytra varies slightly in the extent of black and shades of dark red or brown, some specimens may be entirely black; females have shorter protibiae without distal inward curvature; proximal protibial tooth ranges from rudimental to about one-third the length of preceding tooth.

**Comparison.** This new species is similar to *S. knobeli* Ferreira (Fig. 21–24), with which it is partly sympatric. However, *S. knobeli* has the pygidium terminating in a small, outward curved spine and differs more subtly also in other respects: the protibia lacks any indication of a distal inward curvature, has the medial margin coarsely serrate, and the space between the third and fourth teeth is distinctly smaller than that between preceding teeth; the mesotibia has only one spur; and, in dorsal view, the paramere tips are not inflated.

***Scarabaeus (Scarabaeolus) fragilis* Zidek and Pokorný, sp. n.**

Fig. 25–28

**Type locality.** RSA, Northern Cape Province, Springbok, Lammerhoek.

**Type material.** HTf from type locality, leg. Vári & Goode 5–8.IX.1962. No other specimens.  
HT at TMSA.

**Etymology.** In reference to fragile condition of the unique specimen.

**Description.** Length 12.5 mm. Head black; pronotum black, with lateral margins and front angles dark brown; elytra, entire venter and legs chestnut brown. Metatarsi incomplete.

*Head.* Clypeus with teeth upturned, spaces between medial and lateral teeth U-shaped and equally wide, entire surface finely and densely granulorugose, with short black, forward-recumbent setae and longer black setae on lateral margins. Genae anteriorly pointed, posteriorly rounded toward eyes, space between them and clypeal teeth V-shaped. Frons with a low transverse carina medially extended into a short triangular horn, posterior surface of carina largely glabrous. Vertex medially glabrous, laterally rugose. Antennal club yellowish gray.

*Pronotum.* Bordered all around, lateral margins serrate and setose, front angles sharp and pointing outward, hind corners obliquely merging into base; surface unevenly punctate, more coarsely on disc, spaces between punctures equal to or greater than puncture diameters, center of disc and midlateral areas largely glabrous; sagittal glabrous line narrow, confined to posterior half of length, does not reach medial lobe of base.

*Scutellum.* Exposed, small, triangular.

*Elytra.* With intervals convex but not sharply crested, sparsely punctate, punctures shallow, medium-sized, scattered, spaces between them range from two to ten puncture diameters; striae punctate densely, punctures as large as those on intervals. First interval narrower than others, seventh interval widest and flattest; humeri confined to sixth interval.

*Pygidium.* Semilunar, bordered all around, distinctly but shallowly punctate only in basal half, apical half glabrous.

*Venter.* Anterior process of metasternum lunate, keeled, black and impunctate, lateral of process surface finely granulorugose; hind part of metasternal plate sparsely punctate. Abdominal ventrites I–IV narrower medially than laterally and very sparsely punctate, ventrite V wider medially than laterally and more densely punctate. Entire venter devoid of setae and hairs, all hairs issue from anterior and posterior rows of punctures on legs.

*Legs.* Protibia with last tooth half as long as first tooth, spaces between teeth equal and finely serrate, coarser serration continues to proximal end of tibia; medial margin granulate and hirsute throughout length; both dorsal and ventral surfaces finely punctate, ventral surface more densely; dorsomedial and ventromedial carinae present throughout length, neither of them branches into bases of teeth. Mesotibia with one spur and without transverse carinae, metatibia with two transverse carinae.

**Comparison.** Although the specimen lacks only the distal metatarsomeres, it is a fragile empty shell glued to the pin and due to its uniqueness can be sexed only through the pygidium. Aedeagus was not found, and the shape of the last abdominal ventrite indicates that in all likelihood it is a female. Of the bicolored species, *S. namibensis* sp. n. (Fig. 17–20) is somewhat reminiscent of *S. fragilis* sp. n., though *S. namibensis* has much darker and reddish elytra with more convex intervals, black venter, only a feeble frontal carina, protibia with a very short to rudimental last tooth, and mesotibia with two spurs and transverse carinae. In conclusion, *S. fragilis* sp. n. does not appear to be particularly close to any other *Scarabaeolus* species.

***Scarabaeus (Scarabaeolus) rugosipennis* Zidek and Pokorný, sp. n.**

Fig. 29–32

**Type locality.** RSA, Limpopo Province, Makgaberg [Plateau].

**Type material.** HT from type locality. No other specimens.

HT at TMSA.

**Etymology.** Named for its distinctive, transversely rugate elytra.

**Description.** Length 12.5 mm. Head and pronotum black, glossy, with a weak metallic hue. Elytra, venter and legs brownish black. Abdominal ventrites, pygidium and right legs missing, sex indeterminate.

*Head.* Clypeus without ventral keel, anteriorly longitudinally rugose, posteriorly granulate; teeth strongly upturned, bases of spaces between them weakly angular, shallower between medial/lateral teeth than between medial pair. Genae separated from clypeus by a narrow fissure, sculpture as that on clypeus. Vertex with an indistinct sagittal line and deep setose punctures. Antennal club yellow.

*Pronotum* bordered all around, with a wide but shallow sagittal line throughout length, disc covered by deep setose punctures that become finer and denser laterally and near margins are replaced by granules. Lateral margins evenly rounded, weakly crenulate, with long setae. Front angles inconspicuous, directed outward; hind corners evenly rounded toward eyes.

*Scutellum.* Exposed, small, triangular.

*Elytra.* Bicolored, dominantly brownish black with sides and posterior wedge brownish yellow, but in internal view brownish yellow prevails. Striae medium wide, due to coarse sculpture poorly defined. First interval smooth and glossy, other intervals very coarsely transversely rugate.

*Venter.* Metasternum with anterior process evenly rounded, medially impunctate, laterally with setose asperate punctures.

*Legs.* Protibia curved inward at level of second tooth, last tooth distinctly smaller than preceding; outer edge finely serrate, inner edge sparsely tuberculate. Mesotibia with two spurs and two transverse carinae. Metatibia with two transverse carinae and a dense brush of setae.

**Comparison.** The transversely rugate elytra make this species unique and hard to compare to any other in the subgenus. The head, pronotum, metasternum and protibia show similarities to the preceding *S. fragilis* sp. n., which however has only one mesotibial spur. Moreover, *S. fragilis* is a female whereas *S. rugosipennis* sp. n. most likely is a male (longer, distally incurved protibia), making the assumption of a closer relationship purely conjectural.

***Scarabaeus (Scarabaeolus) cunene* Zidek and Pokorný, sp. n.**

Fig. 33–38

**Type locality.** See label in Fig. 36. There is no “Dones” in any map available to us. Comparing the nearly closed “U” in CUNENE with that in DONES, we read the word as DUNES. The label does not indicate whether the type locality is north of the Cunene River (Angola) or south of the river (Namibia). Angola seems more likely, as in Namibia the usual spelling of the river and northwestern region is Kunene, or the region is called Kaokoveld.

**Type material.** HTm at TMSA, collected on 25.II.83. No other specimens.

**Etymology.** Named for the type locality, noun in apposition.

**Description.** Teneral male 10 mm long, sclerotization of aedeagus incipient. Brown, with head and pronotum darker and semiglossy, elytra lighter brown and glossy, venter brown to brownish black.

*Head.* Clypeus except for teeth sparsely granulose; teeth longitudinally rugate and lighter-colored than rest of head; medial teeth triangular, sharply pointed, strongly upturned, without ventral keel, spaces between them U-shaped; lateral teeth trapezoid, with frontal sides slanted outward, separated from medial teeth by narrowly U-shaped fissures and from genae by slightly wider V-shaped fissures not extending inward as sutures. Genae with front angles pointed, hind corners obtuse, long yellowish hairs extending from lateral margins. Frons and vertex medially elevated, covered by long whitish, forward-recumbent hairs. Antennal club brownish yellow.

*Pronotum.* Bordered all around, with wide but indistinct sagittal line that does not reach front and hind margins; disc covered by shallow punctures and sparse whitish hairs, punctures become laterally smaller and asperate; lateral margins evenly rounded and finely serrate; front margin with a setose medial emargination as wide as distance between outer edges of eyes, setae short, pale yellow; base with a very weak medial lobe; front angles sharp, pointing outward; hind corners oblique, indicated only by serration becoming a smooth, narrow rim of base.

*Scutellum.* Exposed, small, triangular.

*Elytra.* Parallel-sided, with shallow, punctate striae and shagreened, impunctate intervals; first interval posteriorly convex, other intervals flat; posterior margin bears sparse yellowish hairs.

*Pygidium.* Bordered all around, finely shagreened, at base and sides finely punctate.

*Venter.* Metasternum with anterior process keeled, black, tip rounded and delimited by a transverse groove; lateral of process surface brown, finely granulated and with short yellowish hairs; hind part of metasternal plate medially black, laterally darker brown and shagreened. Abdominal ventrites shagreened, with short brownish hairs confined to lateral margins.

*Legs.* Protibia markedly incurved between second and third tooth, spaces between teeth even, finely serrate, serration present also proximal of basal tooth; medial edge microcrenulate, with dense brush of long dark hairs; ventral surface devoid of any sculpture (no carina or striola), dorsal surface with a near-medial striola of fine punctures bearing long dark hairs. Profemur proximally with a long, sharp, anteriorly pointing spine. Mesotibia with two spurs and two transverse carinae. Metatibia with two transverse carinae and dense black hairs through much of length on both lateral and medial sides. Meso- and metafemora with anterior and posterior rows of hair-bearing punctures and markedly inflated distal parts.

*Aedeagus* with parameres and phallobase of equal length; parameres without ventral tooth, their tips inflated (in dorsal view) and with short ventral beaks (in lateral view).

**Comparison.** The shape of the lateral clypeal teeth and their wide separation from the genae distinguish *S. cunene* sp. n. from all other species of the subgenus, but several other features suggest a relationship to *S. rubripennis* (Fig. 13–16) that occurs more to the south in central and southern Namibia. These two species share the presence of profemoral spine and absence of aedeagal ventral tooth, and apart from the unique shape of lateral clypeal teeth differ only in details such as elytral color (although some *S. rubripennis* can have the elytra as brownish as *S. cunene*), shape of the profemoral spine (longer and more slender in *S. cunene*), slightly more proximal position of the protibial inward curvature (in *S. rubripennis* opposite the second tooth), and aedeagal proportions (in *S. rubripennis* parameres longer than phallobase). Other differences may be due to the teneral condition of the *S. cunene* holotype, but the presence of protibial serration and microcrenulation indicates that the lack of protibial dorso- and ventromedial carinae is most likely a real and unique character.

***Scarabaeus (Scarabaeolus) wernerii* Zidek and Pokorný, sp. n.**

Fig. 39–42

**Type locality.** Kenya, North-Eastern Province, Wajir.

**Type material.** HTm and 7 PT (3m, 4f) from type locality, leg. K. Werner and P. Smrž 28.IV–4.V.2001.

HT+1 PT at BMNH, 2 PT at OXUM, 2 PT at TMSA, 2 PT at NMPC.

**Etymology.** Named after the late Karl Werner of Peiting, Germany, the principal collector of all known specimens.

**Description of holotype.** Length 9 mm, black, glossy.

*Head.* Clypeus longitudinally rugate, teeth weakly upturned, without ventral keel, spaces between teeth equal and U-shaped. Frons with a weakly indicated, medially interrupted carina. Vertex with sparse, randomly distributed coarse punctures. Posterior half with a smooth, glossy sagittal line. Pubescence and antennal club yellowish brown.

*Pronotum* bordered all around, strongly arcuate, randomly covered by coarse, setose punctures sparse on disc and more closely spaced laterally. Lateral margins evenly rounded, coarsely crenulate, with long hairs. Front angles pointing outward, hind corners oblique. Base with a minor medial lobe.

*Scutellum.* Exposed, small, triangular.

*Elytra.* With striae finely and densely punctate. First interval convex only posteriorly and nearly impunctate; second through fifth intervals convex throughout length and coarsely punctate, with spaces between punctures 2–5 times puncture diameter; sixth and seventh intervals flat and with only a few fine punctures.

*Pygidium.* Bordered all around, with sparse punctures near lateral margins.

*Venter.* Metasternum with anterior process strongly keeled. Ventral pubescence sparse, yellowish brown.

*Legs.* Protibia weakly curved inward, with lateral margin densely serrate and medial margin with medium-size granules. Profemur pencil-thin, with anteroventral carina smooth. Mesotibia with one spur and two transverse carinae. Metatibia with two transverse carinae.

*Aedeagus.* Phallobase and parameres of equal length, left paramere with a large ventral tooth, paramere tips without ventral beaks.

**Variability.** Length 9–11 mm. Variation other than in size not noticed.

**Comparison.** The new species is close to *S. palemo* Olivier (Fig. 69) and *S. bohemani* Harold (Fig. 43–44), from which it differs in smaller size, sparsely and randomly punctate pronotum, much thinner profemur, and geographic distribution. The aedeagus is similar to that of *S. bohemani* (Fig. 45–46) and differs from that of *S. palemo* (Fig. 88) in lacking ventral curvature (beak) at the tip (insofar as these two species are presently understood—see discussion in the Review section).

**Biology.** According to the late Karl Werner (in litt.) the type locality is in the midst of a low-elevation (200–300 m), sparsely vegetated semidesert area. The specimens of *S. wernerii* were taken on hot days while digging holes in the red sand and depositing small pieces of dung, probably rabbit. Wajir is notable for being the type and only locality of the cicindelid *Lophyra* (*Stenolophyra*) *wajirensis* Miskell and of *Scarabaeus karlwernerii* Nicolas and Moretto, closely related to *Scarabaeus zambesianus* Péringuey.

### ***Scarabaeus (Scarabaeolus) orientalis* Zidek and Pokorný, sp. n.**

Fig. 47–50

**Type locality.** RSA, Transvaal, Fr: Rhenosterpoort.

**Type material.** HTm + 1 PTm, leg. L. Schulze 2.I.1976, meat trap; both types at TMSA.

**Etymology.** Eastern (Latin).

**Description of holotype.** Length 15 mm (both specimens). Black, semiglossy, ventrally with sparse yellowish pubescence.

*Head.* Clypeus finely longitudinally punctate, with teeth upturned, without ventral keel, spaces between them U-shaped, posteriorly with short rust-colored setae concentrated in a pair of ill-defined patches. Genae separated from lateral clypeal teeth by narrow fissures with rounded bases, anterolaterally as punctate as clypeus; their lateral margins straight and sparsely setose, medially with a suture forming a low crest that defines gena/frons boundary but anteriorly ends in front of eye, leaving clypeus/gena boundary incomplete; anterior tips curved out, posterior corners oblique. Frons and vertex largely effaced, only laterally with a few scattered coarse tubercles. Antennal club brownish yellow.

*Pronotum.* Bordered all around, lateral margins evenly rounded and crenulate, base with a weak medial lobe, front angles pointing forward, hind corners gradually merging into base; sagittal line present throughout length, broad, not impressed, defined only by absence of punctures; remainder of surface coarsely punctate, punctures unevenly distributed, spaces between them equal to or greater than puncture diameters, lateral of disc punctures more sparse to absent.

*Scutellum.* Exposed, small, triangular, impunctate.

*Elytra.* With striae deep, finely and densely punctate; intervals convex, punctate as coarsely as pronotum, punctures roughly aligned and not reaching interval margins, first interval only half as wide as following intervals; humeri obsolete, confined to sixth interval.

*Pygidium.* Semilunar, bordered all around, impunctate, shagreened.

*Venter.* Metasternum finely punctate throughout, with tip of anterior process rounded. Abdominal ventrites semiglossy, impunctate, with a few scattered tubercles near midline.

*Legs.* All tibiae and femora sparsely punctate and pubescent. Protibia without distal inward angulation, second tooth longest, fourth tooth shortest; space between first and second teeth equals that between second and third teeth, space between third and fourth teeth slightly shorter; lateral margin serrate between teeth as well as proximal of them, medial margin crenulate throughout length; spur slightly shorter than terminal seta. Meso- and metatibia each with two transverse carinae; mesotibia with one spur. Tarsi slender, with articles not markedly triangularly expanded, basal metatarsomere twice as long as preceding.

*Aedeagus.* With parameres and phallobase of equal lengths, left paramere in lateral view with only a minute ventral tubercle; paramere tips truncate, dorsally rounded and ventrally produced into short beaks.

**Comparison.** In 1993, zur Strassen examined the two specimens described here as a new species and identified them as *S. palemo* Olivier on external morphology alone, without extracting the aedeagus. External differences between *S. palemo* and *S. orientalis* sp. n. are mainly in elytral sculpture, which in some specimens of *S. palemo* is so coarse that punctures span the entire width of intervals, breaking them transversely and giving the elytra rugose appearance. This is merely an intraspecific variation, however, as are relative thickness of the metatibia or the degree of triangular expansion of the basal metatarsomere. The only reliable species-level character appears to be the aedeagus.

***Scarabaeus (Scarabaeolus) similis* Zidek and Pokorný, sp. n.**

Fig. 55–58

**Type locality.** N. Cape Prov., 8.5 km S Pienaarsriver, leg. C. Bellamy 4.VII.1999.

**Type material.** HTm—TMSA. No other specimens.

**Etymology.** Similar, resembling (Lat.).

**Description of holotype.** Length 14 mm; black, glossy.

*Head.* Clypeus with teeth upturned, spaces between them V-shaped with that between medials more open, tips of medials and right lateral broken off. Genae with anterior tips triangular but rounded, posterolateral margins setose, posterior corners obliquely curved toward eyes, posterior margin rimmed by a carina that medially branches to laterally/anterolaterally surround eye. Surface at bases of teeth and entire genae granular, with a narrow glabrous medial strip from bases of teeth through frons and vertex. Antennal peduncle dark brown, club gray.

*Pronotum.* Strongly convex and transverse, bordered all around, with front angles obtuse, lateral margins crenulate and setose, and hind corners obliquely merging into base, which lacks medial lobe. Broad, glabrous sagittal line present from front margin to near base, remainder of surface unevenly coarsely punctate, size of punctures diminishes laterally and anteriorly; punctuation nearly as sparse as in *S. laevifrons* (Fig. 84).

*Scutellum.* Not visible.

*Elytra.* With striae indistinctly, shallowly punctate, interspaces about equal puncture diameters. Second through fourth intervals medium convex and unevenly coarsely punctate, with interspaces

equaling 2 to 5 puncture diameters; first and fifth through seventh intervals flat and mostly impunctate. Humeri barely indicated and confined to sixth interval.

*Pygidium*. Semilunar, bordered all around, finely and shallowly punctate.

*Venter*. Metasternum largely glabrous, finely punctate only lateral of anterior process and with short rusty setae on anterolateral margins; anterior process broadly lunate, with a rounded tip. Abdominal ventrites finely punctate along anterior margins, otherwise glabrous.

*Legs*. Protibia weakly bent inward between second and third teeth, devoid of setae, with lateral margin finely serrate and medial margin finely granulate throughout length; dorsomedial carina branches toward bases of second and third teeth; ventromedial carina simple and continuous throughout length. Profemur robust, proximally thickened by oblique expansion of anterior edge, anteroventral surface glabrous, posteroventral surface coarsely punctate. Mesotibia with one spur. Both meso- and metatibiae with two weak transverse carinae, meso- and metafemora antero- and posteroventrally with rows of setose punctures, setae short and gray.

*Aedeagus*. With paramere tips in dorsal view weakly inflated, in lateral view with a low ventral tooth and tapering into long, ventrally curved beaks.

**Comparison.** The habitus of this new species is reminiscent of *S. megaparvulus* Davis and Deschodt (Fig. 59–60) and *S. funebris* (Boheman) (Fig. 63), of which the latter has not hitherto been included in the subgenus. These two species resemble *S. similis* sp. n. chiefly due to their dorsal sculpture, but at the same time differ in several respects.

*Scarabaeus megaparvulus* has a well-developed transverse frontal carina; a more densely punctate pronotum without sagittal line and with a basal medial lobe; exposed scutellum; a narrow metasternal process whose triangular tip is delimited by a transverse groove; much thinner profemur; mesotibia with two spurs (only one noted in the original description); and paramere tips in lateral view truncate.

*Scarabaeus funebris* has the entire clypeus, genae and frons granulorugose; pronotum densely punctate, a narrow sagittal line reaching basal medial lobe, and a striola of finer setose punctures paralleling the basal margin; exposed scutellum; and elytral intervals much more coarsely punctate. The aedeagus of *S. funebris* (Fig. 102) is indistinguishable from that of *S. similis* sp. n. (Fig. 57–58), but it can hardly be claimed to indicate a close relationship because the same applies to the aedeagus of *S. kochi* Ferreira (Fig. 98), whose habitus (Fig. 79) is quite different.

The combination of a fully concealed scutellum and absence of the pronotal basal medial lobe is unusual. Apart from *S. similis* sp. n., we have found a concealed scutellum only in *S. obsoletopunctatus* Balthasar (Fig. 67), but that species does possess the basal medial lobe.

## Review of the Subgenus *Scarabaeolus*

The list below shows the species deemed by us to belong in the subgenus *Scarabaeolus*, their type repositories, who first included them, and figures at the end of this paper. Bth = Balthasar, DD = Davis and Deschodt/Deschodt and Davis (in Deschodt et al. 2015); [1] and [2] = numbers of mesotibial spurs; \* = on permanent loan to TMSA. Full names of all authors appear in the following Species Accounts.

<i>anderseni</i> Wth.	[2]	BMNH	Deschodt et al. 2015	<b>Fig. 72</b>
<i>andreaei</i> zur Str.	[1]	SAMC	Deschodt et al. 2015	
<i>bohemani</i> Har.	[1]	MNHN	Deschodt et al. 2015	<b>Fig. 43–46</b>
<i>canaliculatus</i> Fm.	[2]	MNHN	Ferreira 1972	<b>Fig. 73, 92–93</b>
<i>carniphilus</i> DD	[2]	TMSA	Deschodt et al. 2015	
<i>clanceyi</i> Fer.	[1]	DMSA	Ferreira 1972	<b>Fig. 65, 103</b>
<i>cunene</i> sp. n.	[2]	TMSA	this paper	<b>Fig. 33–38</b>
<i>damarensis</i> Js.	[2]	MNHN	Ferreira 1972	<b>Fig. 75, 95</b>
<i>ermienae</i> DD	[1]	TMSA	Deschodt et al. 2015	
<i>flavicornis</i> (Boh.)	[2]	NHRS	Ferreira 1972	<b>Fig. 5–8</b>
<i>fragilis</i> sp. n.	[1]	TMSA	this paper	<b>Fig. 25–28</b>
<i>fritschi</i> Har.	[2]	MNHN?	Deschodt et al. 2015	<b>Fig. 74, 87, 94</b>

<i>funebri</i> (Boh.)	[1]	NHRS	this paper	<b>Fig. 63, 102</b>
<i>gilleti</i> Js.	[2]	ISNB	Ferreira 1972	<b>Fig. 76, 96</b>
<i>gracai</i> Fer.	[2]	MHNM*	Ferreira 1972	<b>Fig. 78</b>
<i>inopportunos</i> Fer.	[2]	TMSA	Ferreira 1972	<b>Fig. 82, 104</b>
<i>inquisitus</i> Pér.	[2]	SAMC	Ferreira 1972	
<i>intricatus</i> (Fab.)	[2]	ZMUC	Ferreira 1972	<b>Fig. 81, 100</b>
<i>karrooensis</i> zur Str.	[1]	NHMB	Deschodt et al. 2015	<b>Fig. 66, 90</b>
<i>knobeli</i> Fer.	[1]	TMSA	Ferreira 1972	<b>Fig. 21–24</b>
<i>kochi</i> Fer.	[2]	TMSA	Ferreira 1972	<b>Fig. 79, 98</b>
<i>krugeri</i> <b>sp. n.</b>	[2]	TMSA	this paper	<b>Fig. 1–4</b>
<i>kwiluensis</i> Js.	[2]	MRAC	Barbero et al. 1998	<b>Fig. 77, 97</b>
<i>laevifrons</i> Fm.	[2]	MNHN	Ferreira 1972	<b>Fig. 84, 91</b>
<i>lizleri</i> <b>sp. n.</b>	[2]	TMSA	this paper	<b>Fig. 9–12</b>
<i>lucidulus</i> (Boh.)	[2]	NHRS	Ferreira 1972	<b>Fig. 83, 101</b>
<i>megaparvulus</i> DD	[2]	TMSA	Deschodt et al. 2015	<b>Fig. 59–62</b>
<i>namibensis</i> <b>sp. n.</b>	[2]	TMSA	this paper	<b>Fig. 17–20</b>
<i>niemandi</i> DD	[2]	TMSA	Deschodt et al. 2015	
<i>nitidus</i> DD	[1]	TMSA	Deschodt et al. 2015	
<i>obsoletepunctatus</i> Bth	[1]	NMPC	Deschodt et al. 2015	<b>Fig. 67–68</b>
<i>orientalis</i> <b>sp. n.</b>	[1]	TMSA	this paper	<b>Fig. 47–50</b>
<i>pabulator</i> Pér.	[2]	SAMC	Ferreira 1972	<b>Fig. 80, 99</b>
<i>palemo</i> Oliv.	[1]	MNHN	Barbero et al. 1998	<b>Fig. 69–70, 88</b>
<i>parvulus</i> (Boh.)	[1]	NHRS	Ferreira 1972	<b>Fig. 64, 89</b>
<i>planipennis</i> DD	[1]	TMSA	Deschodt et al. 2015	
<i>rubripennis</i> (Boh.)	[2]	NHRS	Ferreira 1972	<b>Fig. 13–16</b>
<i>rugosipennis</i> <b>sp. n.</b>	[2]	TMSA	this paper	<b>Fig. 29–32</b>
<i>similis</i> <b>sp. n.</b>	[1]	TMSA	this paper	<b>Fig. 55–58</b>
<i>soutpansbergensis</i> DD	[1]	TMSA	Deschodt et al. 2015	
<i>weneri</i> <b>sp. n.</b>	[1]	BMNH	this paper	<b>Fig. 39–42</b>

Other species have been included in *Scarabaeolus* by Ferreira (1968b, 1972) [*S. ebenus* (Klug, 1855), *S. suri* (Hausmann, 1807)], Barbero et al. (1998) [*S. interstitialis* (Boheman, 1857), *S. rugosus* (Hausmann, 1807), *S. rusticus* (Boheman, 1857)] and Mostert and Holm (1982) [*S. scholtzi* Mostert and Holm, 1982, *S. silenus* (Gray, 1832)], however none of them conforms to the subgeneric definition noted in the Introduction. Deschodt et al. (2015) included *S. scholtzi* on the presence of the second mesotibial spur, but noted that according to Forgie et al. (2005) this species consistently falls outside of their “*Scarabaeolus* clades”. *Scarabaeus scholtzi* is a relatively large (about 20 mm) *Pachysoma*-like apterous scarab whose second mesotibial spur is slender and nearly half as long as the principal spur (as in *Sceliages*), quite unlike the minuscule and rather stubby structure in *Scarabaeolus*. Besides that, it is a structure present in other scarabaeine tribes as well (e.g. the *Gymnopleurini*), and thus an adaptation that arose more than once. As such it can be useful for utilitarian sorting of species, but not for determining relationships. We therefore do not include *S. scholtzi* in the subgenus.

The following synonymies have been proposed in the subgenus; their authorships are detailed below in the Species Accounts:

- S. xavieri* Ferreira, 1968 = *S. andreaei* zur Strassen, 1963
- S. cicatricosus* (Boheman, 1857), n. praeocc. = *S. bohemani* Harold, 1868
- S. reichei* Waterhouse, 1890 = *S. canaliculatus* Fairmaire, 1888
- S. azureus* Ferreira, 1952 = *S. damarensis* Janssens, 1940
- S. vansoni* Ferreira, 1958 = *S. lucidulus* (Boheman, 1860)
- S. bohemani* Harold, 1868 = *S. palemo* Olivier, 1789
- S. morbillosus* Fabricius, 1792 = *S. palemo* Olivier, 1789

Deschodt et al. (2015) re-validated *S. reichei*, which is not accepted here because it is based on a photo of a *S. canaliculatus* syntype that either due to encrustation or low resolution shows no detail of elytral sculpture and judged by elevation and evenness of the ribbing could as well be identified as *S. fritschi*. The *S. reichei* holotype (Fig. 85) is an empty shell with a gaping hole in place of the metasternal process, leg joints freely moveable and the left antennal club missing, but otherwise the structure is well preserved. Zur Strassen (1967) examined the types of *S. reichei* and *S. canaliculatus*, followed Gillet (1911) and subsequent authors in synonymizing *S. reichei*, and characterized *S. canaliculatus* as having the elytra striated and intervals elevated but not distinctly ribbed. This (but not the smooth pronotal sagittal line, whose extent and elevation are quite variable) distinguishes *S. canaliculatus* (Fig. 73) from *S. fritschi* (Fig. 74), and in this regard the holotype of *S. reichei* (Fig. 86) matches perfectly all specimens of *S. canaliculatus* that we have seen. In *S. fritschi* (Fig. 87), on the other hand, elevation of intervals does not diminish laterally but remains more-or-less equal, the coarse punctures in their keels bear short yellowish setae, and the sharply demarcated, finely punctate striae are much wider. The parameres of these two species are identical (Fig. 93, 94) and the elytral sculpture differs in degree of development rather than in form, so in terms of population biology it could even be claimed that *S. canaliculatus* is only a variety of *S. fritschi*. However, in absence of a thorough analysis we keep the taxa separate and only point out the close similarity.

The *S. bohemani* = *S. palemo* synonymy was proposed by Janssens (1940), rejected by zur Strassen (1967), and proposed again by Deschodt et al. (2015). We maintain both species as valid the great similarity in habitus notwithstanding, because in our opinion they can usually be separated by their aedeagi (Fig. 45–46 vs. 88 and zur Strassen 1967: fig. 8 vs. 9). An exception is a series of 11 TMSA specimens, seven from Limpopo (Fig. 51–54) and four from Northern Cape provinces, which remind of *S. bohemani* in having grayish antennal clubs (see also Deschodt et al. 2015: fig. 5) but aedeagi more resembling *S. palemo*, with the paramere tips dorsally rounded and ventrally produced into short beaks, as in the typical western *S. palemo* (Fig. 88). We find naming this series premature, call it *S. cf. bohemanipalemo*, and theorize that it could be a transitional population in an area where the two species meet. As pointed out by Deschodt et al. (2015: 524), the question of validity/synonymy of these two taxa would best be resolved by molecular techniques.

The *S. morbillosus* = *S. palemo* synonymy can be accepted only partially and conditionally, for west African specimens that have been dissected. We examined the ZMUC types (5 ST) of *S. morbillosus* (Fig. 70–71) but could not dissect them, and we have no knowledge of the MNHN types of *S. palemo*. In this regard, we had to rely on zur Strassen's (1967) work and his subsequent identifications of *S. palemo*, but they unfortunately did not answer the question of identity of this species because his drawings of *S. palemo* aedeagus (zur Strassen 1967: fig. 8) do not match aedeagi that we extracted from two TMSA specimens identified by him (in 1993) as *S. palemo* and described in this paper as *S. (Scarabaeolus) orientalis* sp. n. (Fig. 47–50). The aedeagus figured by zur Strassen in 1967 came from a Senegal specimen that, although not identified as such in his paper, probably is one of the syntypes (see Olivier 1789: 187–188); it has a paramere with a large, triangular ventral tooth, whereas the aedeagi extracted by us from Transvaal specimens (Frm: Rhenosterpoort, leg. L. Schulze) have only a minute, easily overlooked ventral denticle (Fig. 50). The difference is too great to be considered intraspecific, and since Olivier's (1789) syntypes of *S. palemo* came from two locations as far apart as Senegal and the Cape of Good Hope, we suspect that his type series consists of two species. Fabricius' syntypes of *S. morbillosus* are from "Guinea" (actually Ghana, see Moretto and Génier (2015: 4)), and due to a closer proximity to Senegal thus more likely correspond to the Senegal syntype of *S. palemo*. Conversely, the *S. palemo* syntype(s) from the Cape of Good Hope are more likely to correspond to *S. orientalis* sp. n. from Transvaal, whose aedeagus does not quite match but is very close to *S. cunene* sp. n. (Fig. 37–38) *S. lizleri* sp. n. (Fig. 11–12), *S. rubripennis* (Boheman) (Fig. 15–16) and *S. planipennis* Davis and Deschodt (Deschodt et al. 2015: fig. 6E). Only dissection of the Cape of Good Hope type(s) can show whether our assumption is correct, as external inspection alone is likely to be inconclusive.

One feature of *S. morbillosus* worth mentioning is the presence of orangish pads at the proximal ends of the profemora (Fig. 71). Since they are located on the dorsal side this observation is purely accidental, made possible only by the preparation style of Fabrician specimens (Fig. 70). Whether it does have any

taxonomic significance is unknown to us, as due to a small number of specimens, most of them borrowed, we could not reposition or detach front legs for clear observation of the femora.

In dorsal view, the parameres of *Scarabaeolus* appear symmetrical because the ventral tooth does not extend far enough laterally to show. The asymmetry of the parameres becomes obvious only in ventral view, except for *S. nitidus* where in dorsal view the tip of the right paramere curves inward and overlaps the tip of the left paramere (in *S. bohemani* and *S. palemo* this is apparent only in ventral view). Apart from this exception the dorsal symmetry is consistent throughout the subgenus and accounts for a relatively high degree of similarity, with species-level differences in slenderness/stockiness of the parameres and in their tips, which may be truncate, inflated, bent laterally, dorso-ventrally slanted or ventrally produced into short beaks. Dorsal symmetry is common in the nominotypical subgenus as well, but usually the parameres are symmetrical also in ventral view, which is not the case in *Scarabaeolus*. The ventral asymmetry is thus added to the subgeneric characterization noted in the Introduction.

*Scarabaeus obsoletepunctatus* Balthasar (Fig. 67–68) is based on a somewhat worn and faded female that lacks both antennal clubs, has only one mesotibial spur, and resembles *S. bohemani* (Fig. 43–44). However, our examination shows it to be a valid species, because in contrast to *S. bohemani* it has denticles at bases of three rather than just two proximal protibial teeth, lacks a striola of punctures along the pronotal base, and the medial lobe of the base extends entirely over the scutellum. It bears a typed label “Benguella”, which regardless of whether it means vicinity of the city or the province at large is roughly 300 km north of the Namibia border. We are aware only of the holotype. Deschodt et al. (2015: 521) list also northwestern Namibia in their key, but do not provide concrete records.

We examined 17 specimens (15 GWPC, 1 NMPC, 1 BMNH) from “Namibia, 60/80 km N of Aus, 9–10. XI.2006, Werner & Smrž leg.” that do not differ in any regard from *S. (Scarabaeolus) megaparvulus* Davis and Deschodt, except that contrary to the original description all the specimens have two mesotibial spurs. We therefore list that species as having two spurs and suggest that the type material be re-examined.

A species hitherto not included in the subgenus is *S. funebris* (Boheman), which its describer compared to *S. morbillosus* Fabricius. We find the comparison fitting and see nothing in the distribution and morphology of *S. funebris* (Fig. 63, 102) to prevent its inclusion in *Scarabaeolus*. Its inclusion is supported also by the aedeagus, which, except for being slenderer, closely resembles those of *S. similis* sp. n. (Fig. 57–58) and *S. kochi* Ferreira (Fig. 98).

## Species Accounts

### Genus *Scarabaeus* Linnaeus, 1758

*Scarabaeus* Linnaeus 1758: 345.

Type species: *Scarabaeus sacer* Linnaeus 1758: 347, n. conserv. (Krell et al. 2012).

### Subgenus *Scarabaeolus* Balthasar, 1965

*Scarabaeus (Scarabaeolus)* Balthasar 1965: 14.

Ferreira 1968a: 3; 1968b: 28; 1972: 33, map 7; Mostert and Scholtz 1986: 16; Zidek and Pokorný 2004: 3; Deschodt et al. 2015: 505.

Type species: *Scarabaeus laevifrons* Fairmaire 1884: 121, by original designation.

### *S. (Scarabaeolus) anderseni* Waterhouse, 1890

*Scarabaeus anderseni* Waterhouse 1890: 366.

Péringuey 1901: 35 (syn. of *S. lucidulus*); Janssens 1940: 17, 37 (var. of *S. lucidulus*); Ferreira 1953b: 393 (var. of *S. lucidulus*); zur Strassen 1967: 131, 139; Ferreira 1972: 44; Zidek and Pokorný 2004: 11; Deschodt et al. 2015: 522, 524, fig. 11.

HTf—BMNH, from n. Botswana: Lake Ngami.

n. Botswana, Malawi, Namibia, n. RSA, Zambia.

Length 8–10.5 mm.

***S. (Scarabaeolus) andreaei* zur Strassen, 1963**

*Scarabaeus andreaei* zur Strassen 1963: 107, fig. 1–3.

Zur Strassen 1967: 141, fig. 13a–c; Ferreira 1968b: 35, fig. 6–9; 1972: 44, pl. 17.3; Zidek and Pokorný 2004: 11; Deschodt et al. 2015: 507, 522, fig. 1D.

HTf—SAMC, from Mozambique: Inhambane Province, Inhambane.

s.+c. Mozambique (Inhambane, Gaza, Zambézia provinces).

Length 10–14 mm.

*Scarabaeus (Scarabaeolus) xavieri* Ferreira 1968a: 3, 8, pl. 1; 1968b: 28, 32, fig. 4–5, pl. 7; 1972: 37, 42, pl. 17.2; Zidek and Pokorný 2004: 21; Deschodt et al. 2015: 507, fig. 1C (syn.).

HTm—TMSA, from Mozambique: Inhambane Province, Inharrime.

***S. (Scarabaeolus) bohemani* Harold, 1868b**

*Scarabaeus bohemani* Harold 1868b: 104.

Péringuey 1908: 552 (key); Janssens 1940: 36 (syn. of *S. palemo*); zur Strassen 1961: 240; 1967: 137, fig. 9a–c; Ferreira 1972: 44 (syn.); Zidek and Pokorný 2004: 11; Deschodt et al. 2015: 521, 523, fig. 5A–C, 10. HT—MNHN, from “Caffraria”.

Angola, Botswana, Lesotho, Namibia, c.+n. RSA, Zimbabwe.

Length 9–16 mm.

*Ateuchus cicatricosus* Boheman 1857: 177 (nec Lucas, 1846: 249); Janssens 1940: 36 (syn. of *S. palemo*); Ferreira 1972: 44 (syn. of *S. bohemani*); Zidek and Pokorný 2004: 11, 12.

HT—NHRS, from “Caffraria”.

***S. (Scarabaeolus) canaliculatus* Fairmaire, 1888**

*Scarabaeus canaliculatus* Fairmaire 1888: 177.

Péringuey 1901: 56; Gillet 1911: 308; Janssens 1940: 18, 38; zur Strassen 1967: 143, fig. 16a–b; Ferreira 1953b: 400, pl. 4, fig. 65; 1968a: 8; 1972: 38; Zidek and Pokorný 2004: 12; Deschodt et al. 2015: 507, 522, fig. 2.

HT—MNHN, from Namibia: Namaland.

Namibia, w. RSA.

Length 10–20 mm.

*Scarabaeus reichei* Waterhouse 1890: 365; Péringuey 1901: 57; Gillet 1911: 308 (syn. of *S. canaliculatus*); Janssens 1940: 38 (syn.); zur Strassen 1967: 143 (syn.); Ferreira 1972: 38 (syn.); Zidek and Pokorný 2004: 12, 18 (syn.); Deschodt et al. 2015: 507, 522 (stat. rev.).

HT—BMNH, from RSA: Western Cape Province, Cape of Good Hope.

***S. (Scarabaeolus) carniphilus* Davis and Deschodt, 2015**

*S. (Scarabaeolus) carniphilus* Davis and Deschodt 2015: 510, fig. 3D, 6C, 8 (in Deschodt et al. 2015).

HTm—TMSA, from sw. Botswana.

sw. Botswana, nw. RSA (Northern Cape Province).

Length 14.4 mm (HT).

***S. (Scarabaeolus) clanceyi* Ferreira, 1954**

*Scarabaeus clanceyi* Ferreira 1954: 91, fig. 1–4.

Zur Strassen 1961: 240; 1967: 138, fig. 5; Ferreira 1968a: 7; 1968b: 28, 29, fig. 1–3; 1972: 34, 39, pl. 7; Zidek and Pokorný 2004: 12; Deschodt et al. 2015: 521.

HTm—DMSA, from RSA: KwaZulu Natal, Manguzi River.

s. Mozambique, ne. RSA.

Length 10–12.7 mm.

***S. (Scarabaeolus) cunene* Zidek and Pokorný, sp. n.**

HTm—TMSA, from sw. Angola, “Cunene”.

sw. Angola, nw. Namibia(?).

Length 10 mm (HT).

***S. (Scarabaeolus) damarensis* Janssens, 1940**

*Scarabaeus damarensis* Janssens 1940: 19, 39.

Zur Strassen 1961: 240; 1967: 142, fig. 14; Ferreira 1953b: 428 (not seen); 1968a: 8; 1972: 38, 39, pl. 9.1;

Zidek and Pokorný 2004: 13; Deschodt et al. 2015: 522.

HT—MNHN, from Namibia: Damaraland.

s. Botswana, Namibia, w.–nw. RSA.

Length 11–15 mm.

*Scarabaeus azureus* Ferreira 1952b: 20, 21, pl. 2; 1953b: 396, pl. 11, fig. 209–212; zur Strassen 1967:

142 (syn.); Ferreira 1972: 39; Zidek and Pokorný 2004: 11, 13.

HT—TMSA, from Namibia: Oshikango.

***S. (Scarabaeolus) ermienae* Deschodt and Davis, 2015**

*S. (Scarabaeolus) ermienae* Deschodt and Davis, 2015: fig. 4B, 6D, 8 (*in* Deschodt et al. 2015).

HTm—TMSA, from w. Zambia: Liuwa Plains.

w. Zambia.

Length 15.9 mm (HT).

***S. (Scarabaeolus) flavicornis* (Boheman, 1860)**

*Ateuchus flavicornis* Boheman 1860: 107.

Péringuey 1901: 28, 37, pl. 37.8; Janssens 1940: 18, 38, pl. 3.4; zur Strassen 1967: 141; Ferreira 1953b:

395, pl. 2, fig. 37, 45–48, pl. 10, fig. 169; 1968a: 8; 1972: 38, 40, pl. 9.3; Zidek and Pokorný 2004: 13;

Deschodt et al. 2015: 522, 525, fig. 12.

HT—NHRS, from Namibia: Damaraland, Swakopmund.

s. Angola, Botswana, Namibia, nw.–nc. RSA, Zambia.

Length 11–19 mm.

***S. (Scarabaeolus) fragilis* Zidek and Pokorný, sp. n.**

HTf—TMSA, from RSA: Northern Cape Province, Springbok, Lammerhoek.

Length 12.5 mm (HT).

***S. (Scarabaeolus) fritschi* Harold, 1868a**

*Scarabaeus fritschi* Harold 1868a: 80.

Péringuey 1901: 28, 38, pl. 31.7; zur Strassen 1967: 143; Ferreira 1953b: 397, pl. 4, fig. 64; 1972: 46;

Zidek and Pokorný 2004: 13; Deschodt et al. 2015: 522.

HT—MNHN?, from “Afric. austral. inter.” (Namibia: Damaraland). [Type not located, see Deschodt et al. 2015: 507.]

c.–s. Namibia, w.–e. RSA.

Length 14–18 mm.

***S. (Scarabaeolus) funebris* (Boheman, 1857)**

*Ateuchus funebris* Boheman 1857: 176.

Péringuey 1901: 29, 42, pl. 37.14; Janssens 1940: 20, 40, pl. 1.6; zur Strassen 1967: 149; Ferreira 1953b:

402, pl. 7, fig. 105; 1972: 46; Zidek and Pokorný 2004: 13.

HT—NHRS, from “Caffraria interiore”.

Botswana, n.–ne. RSA, Zimbabwe.

Length 14–18 mm.

*Scarabaeus funebris* var. *pretoriensis* Janssens 1940: 20, 40; zur Strassen 1967: 149 (syn.); Ferreira

1972: 46; Zidek and Pokorný 2004: 13, 18.

HT—ISNB.

***S. (Scarabaeolus) gilleti* Janssens, 1940**

*Scarabaeus gilleti* Janssens 1940: 19, 38.

Zur Strassen 1967: 142, fig. 15; Ferreira 1968a: 8; 1972: 37, 40; Zidek and Pokorný 2004: 14; Deschodt et al. 2015: 522, 525.

HTm—ISNB, from “Bite Angola” (near Luanda, see Deschodt et al., op. cit.).

Angola.

Length 14–18 mm.

***S. (Scarabaeolus) gracai* Ferreira, 1952b**

*Scarabaeus gracai* Ferreira 1952b: 19, 24, pl. 1, fig. 1, 3, 6, 7, 9.

Ferreira 1953b: 387, 430, pl. 11.207–208; zur Strassen 1967: 138; Ferreira 1953b: 387, pl. 11, fig. 207–208; 1968a: 7; 1968b: 28, 32, pl. 6; 1972: 36, 40, pl. 9.2; Zidek and Pokorný 2004: 14; Deschodt et al. 2015: 521, 524.

HT—MHNM (TMSA), from Mozambique: Inhambane Province, Massinga.

The type repository was given by Ferreira (op. cit.) as the MHNM (formerly Museu Dr. Álvaro de Castro) in Maputo, Mozambique, but the type is now on permanent loan to TMSA.

s.–sw. Mozambique (Inhambane and Gaza provinces), ne. RSA (n. Transvaal: Kruger National Park).

Length 8.5–11 mm.

***S. (Scarabaeolus) inoportunus* Ferreira, 1953a**

*Scarabaeus inoportunus* Ferreira 1953a: 23, fig. 1.

Zur Strassen 1967: 141; Ferreira 1953b: 398, pl. 11, fig. 206; 1968a: 7; 1972: 36, 41; Zidek and Pokorný 2004: 15; Deschodt et al. 2015: 522.

HT—TMSA, from RSA: Niekerk’s Hope.

Namibia, nw.–nc. RSA.

Length 12–16 mm.

***S. (Scarabaeolus) inquisitus* Péringuey, 1908**

*Scarabaeus inquisitus* Péringuey 1908: 553 (key).

Janssens 1940: 16, 37; zur Strassen 1967: 138, fig. 11; Ferreira 1952b: pl. 1, fig. 2, 4, 5, 8, 10; 1953b: 386, pl. 1, fig. 1–9, pl. 10, fig. 200–201; 1968a: 7; 1972: 36, 40, pl. 9.4; Zidek and Pokorný 2004: 15; Deschodt et al. 2015: 521.

HT—SAMC, from RSA: North-West Province, Potchefstroom.

nw.–ne. RSA.

Length 9–11 mm.

***S. (Scarabaeolus) intricatus* (Fabricius, 1801)**

*Ateuchus intricatus* Fabricius 1801: 56.

Péringuey 1901: 28, 33, pl. 37.6; 1908: 552 (key); Janssens 1940: 16, 36; zur Strassen 1967: 136; Ferreira 1953b: 382, pl. 3, fig. 49–51, 53, 56–57, pl. 10, fig. 156, 166–167; 1968a: 7; 1972: 36, 41, pl. 10.1; Zidek and Pokorný 2004: 15; Deschodt et al. 2015: 521.

ST(3)—ZMUC, from RSA: Western Cape Province, “Cap. Bon. Spei”.

Namibia, w. RSA.

Length 9–16.5 mm.

According to J. Harrison (TMSA, in litt.), this species appears to be endemic to the west coast. Literary records from Botswana, Zimbabwe and nc.–ne. RSA (Free State, KwaZulu Natal) thus ought to be regarded as doubtful.

***S. (Scarabaeolus) karrooensis* zur Strassen, 1961**

*Scarabaeus karrooensis* zur Strassen 1961: 237, fig. 1–2.

Zur Strassen 1967: 136, fig. 7; Ferreira 1972: 50; Zidek and Pokorný 2004: 16; Deschodt et al. 2015: 521.

HTm + PTf—NHMB, from RSA: Northern Cape Province, Noupoort [= Naawpoort].

s. Namibia, w.+c. RSA.

Length 11–14 mm.

***S. (Scarabaeolus) knobeli* Ferreira, 1958a**

*Scarabaeus knobeli* Ferreira 1958a: 2, fig. 1–8.

Zur Strassen 1967: 143; Ferreira 1968a: 6; 1972: 34, 41, pl. 18.1; Zidek and Pokorný 2004: 16; Deschodt et al. 2015: 522.

HT—TMSA, from Angola: Porto Alexandre.

s. Angola, nw. Namibia.

Length 9–12 mm.

***S. (Scarabaeolus) kochi* Ferreira, 1952a**

*Scarabaeus kochi* Ferreira 1952a: 73, fig. 1–3.

Zur Strassen 1961: 240; 1967: 138, fig. 10; Ferreira 1953b: 388, pl. 1, fig. 10–16, 19, 21–22, pl. 10, fig. 202–203; 1968a: 7; 1972: 36, 41, pl. 10.2; Zidek and Pokorný 2004: 16; Deschodt et al. 2015: 521.

HT—TMSA, from Botswana: Kalahari, Kuke Pan.

s. Botswana, nw. RSA.

Length 10–12.5 mm.

***S. (Scarabaeolus) krugeri* Zidek and Pokorný, sp. n.**

HTm—TMSA, from RSA: Transvaal, Kruger National Park, Punda Milia Sand.

c. Botswana, ne. RSA.

Length 11–15 mm.

***S. (Scarabaeolus) kwiluensis* Janssens, 1940**

*Scarabaeus kwiluensis* Janssens 1940: 19, 39.

Zur Strassen 1967: 142; Ferreira 1972: 50; Zidek and Pokorný 2004: 16; Deschodt et al. 2015: 522.

HTm—MRAC, from DRC: Leopoldville Province, Kwilu River, Leverville.

sw. DRC.

Length 12–15 mm.

***S. (Scarabaeolus) laevifrons* Fairmaire, 1884**

*Scarabaeus laevifrons* Fairmaire 1884: 121.

Janssens 1940: 17, 37; zur Strassen 1967: 140, fig. 12a–c; Ferreira 1968a: 7; 1972: 37, 41, pl. 10.3; Zidek and Pokorný 2004: 16; Deschodt et al. 2015: 522.

HT—MNHN, from Somalia: “Makdishu” [= Mogadishu].

Somalia.

Length 10–14 mm.

ISNB has seven specimens (3m, 4f) identically labeled “Somalia”, six of them identified by Janssens and one (f) by Gillet. The latter one bears the label “SYNTYPE?”, but since the HT is at MNHN it would have to be a PT.

***S. (Scarabaeolus) lizleri* Zidek and Pokorný, sp. n.**

HTm—BMNH, from RSA: Northern Cape Province, 30 km SE of Alexander Bay.

s. Namibia, w. RSA.

Length 10–15 mm.

***S. (Scarabaeolus) lucidulus* (Boheman, 1860)**

*Ateuchus lucidulus* Boheman 1860: 107.

Péringuey 1901: 28, 35; Janssens 1940: 17, 37; zur Strassen 1967: 140; Ferreira 1953b: 393, pl. 6, fig. 104; 1968a: 8; 1972: 37, 42; Zidek and Pokorný 2004: 16; Deschodt et al. 2015: 506, 522, 525, fig. 1B.

HTf—NHRS, from n. Botswana: “N’Gami” [= Lake Ngami].

n. Botswana, n. Namibia (Ovamboland), RSA, Zimbabwe.

Length 8–13.5 mm.

*Scarabaeus vansoni* Ferreira 1958b: 3, fig. 1–3; zur Strassen 1967: 139; Ferreira 1968a: 6 [syn. of *S. suri* (Hausmann)]; 1972: 38, 42; Zidek and Pokorný 2004: 21; Deschodt et al. 2015: 506, fig. 1A (syn.).

HT—TMSA, from Namibia: Mangetti.

***S. (Scarabaeolus) megaparvulus* Davis and Deschodt, 2015**

*S. (Scarabaeolus) megaparvulus* Davis and Deschodt 2015: 508, fig. 3B, 6A, 9 (in Deschodt et al. 2015).  
HTm—TMSA, from RSA: Northern Cape Province.  
wc. Namibia, w. RSA.  
Length 14.5 mm (HT).

***S. (Scarabaeolus) namibensis* Zidek and Pokorný, sp. n.**

HTm—TMSA, from Namibia: 60 km NE Gobabeb.  
w. Namibia.  
Length 8–13 mm.

***S. (Scarabaeolus) niemandi* Deschodt and Davis, 2015**

*S. (Scarabaeolus) niemandi* Deschodt and Davis 2015: 509, fig. 3C, 6B, 8 (in Deschodt et al. 2015).  
HTm—TMSA, from RSA: Limpopo Province, Soutpansberg.  
ne. RSA (Limpopo Province).  
Length 11.7 mm (HT).

***S. (Scarabaeolus) nitidus* Davis and Deschodt, 2015**

*S. (Scarabaeolus) nitidus* Davis and Deschodt 2015: 519, fig. 4C, 6F, 8 (in Deschodt et al. 2015).  
HTm—TMSA, from Botswana: Kutse Game Reserve.  
s. Botswana.  
Length 13.5 mm (HT).

***S. (Scarabaeolus) obsoletepunctatus* Balthasar, 1940**

*Scarabaeus obsoletepunctatus* Balthasar 1940: 68.  
Zur Strassen 1967: 136; Ferreira 1972: 50; Zidek and Pokorný 2004: 17; Deschodt et al. 2015: 521, 524.  
HTf—NMPC, from Angola: Benguela [City?, Province?].  
sw. Angola (Deschodt et al. 2015: 521 list also nw. Namibia).  
Length 14.5 mm (HT).

***S. (Scarabaeolus) orientalis* Zidek and Pokorný, sp. n.**

HTm—TMSA, from RSA: Transvaal, Frm: Rhenosterpoort.  
ne. RSA.  
Length 15–16 mm.

***S. (Scarabaeolus) pabulator* Péringuey, 1908**

*Scarabaeus pabulator* Péringuey 1908: 553.  
Janssens 1940: 75; zur Strassen 1967: 136, fig. 6a–c; Ferreira 1953b: 390, pl. 1, fig. 17–18, 20, 23–30, pl. 10, fig. 170–171; 1968a: 6; 1972: 34, 42, pl. 10.4; Zidek and Pokorný 2004: 17; Deschodt et al. 2015: 521.  
HT—SAMC, from RSA: Northern Cape Province, Calvinia.  
Namibia, sw. RSA.  
Length 12–15 mm.

***S. (Scarabaeolus) palemo* Olivier, 1789**

*Scarabaeus palemo* Olivier 1789: 187, pl. 27.234.  
Olivier 1790: 175; MacLeay 1819: 56; Janssens 1940: 16, 36 pl. 1.4; zur Strassen 1961: 240; 1967: 137, fig. 3, 8a–c; Ferreira 1972: 51, pl. 11.1; Zidek and Pokorný 2004: 17; 2005: 1; Deschodt et al. 2015: 521, 523, fig. 5D, 10.  
ST—MNHN, from Senegal and Cape of Good Hope.  
Angola, Benin, Burkina Faso, DRC, Gambia, Ghana, Guinea, Mali, Namibia, RSA, Senegal, Zimbabwe (some records are probably misidentifications).  
Length 10–16 mm.

*Scarabaeus morbillosus* Fabricius, 1792: 63; 1801: 56 (as *Ateuchus*); MacLeay 1821: 503; Shipp 1895: 221 (as *Parateuchus* gen. n.); Janssens 1940: 36 (syn.); zur Strassen 1967: 137; Ferreira 1972: 51; Zidek and Pokorný 2004: 17; 2005: 1–2, fig. 1.

ST(5)—ZMUC, from “Guinea” (actually from Ghana, see Moretto and Génier 2015: 4).

Zidek and Pokorný (2004, 2005) erred in following Janssens (1940) who stated that Fabricius described the species as *Ateuchus*, when in fact he originally (1792) placed it in *Scarabaeus* and only subsequently (1801) re-assigned it to *Ateuchus* Weber, 1801 (in Fabricius 1801 the *Ateuchus* section starts on p. 54). The name *Ateuchus* was misapplied by Shipp (1895) to five species subsequently assigned by Janssens (1940) to his new genus *Kheper*.

The *S. morbillosus* = *S. palemo* synonymy is conditional on provenience of the syntypes, which makes the distribution of *S. palemo* uncertain—see discussion in the above Review section.

***S. (Scarabaeolus) parvulus* (Boheman, 1860)**

*Ateuchus parvulus* Boheman 1860: 108.

Péringuey 1901: 28, 34; Janssens 1940: 17, 37, pl. 3.6; zur Strassen 1961: 240; 1967: 139; Ferreira 1953b: 394, pl. 2, fig. 31–32, pl. 10, fig. 204–205; 1968a: 7; 1972: 34, 42, pl. 11.2; Zidek and Pokorný 2004: 17; Deschodt et al. 2015: 522.

HT—NHRS, from Namibia: Swakopmund.

s.+c. Namibia, w. RSA.

Length 6–10 mm.

***S. (Scarabaeolus) planipennis* Davis and Deschodt, 2015**

*S. (Scarabaeolus) planipennis* Davis and Deschodt 2015: 516, fig. 4A, 6E, 8 (in Deschodt et al. 2015).

HTm—TMSA, from s. Mozambique.

s. Mozambique, ne. RSA.

Length 12.8 mm (HT).

***S. (Scarabaeolus) rubripennis* (Boheman, 1860)**

*Ateuchus rubripennis* Boheman 1860: 107.

Péringuey 1901: 28, 36, pl. 37.7; Janssens 1940: 17, 37, pl. 3.5; zur Strassen 1967: 143, fig. 17a–d; Ferreira 1953b: 391, pl. 2, fig. 33–36, 38–39, pl. 10, fig. 168; 1968a: 6; 1972: 33, 42, pl. 11.3; Zidek and Pokorný 2004: 18; Deschodt et al. 2015: 522.

HTm—NHRS, from Namibia: Kuisip.

s.+c. Namibia.

Length 13–17 mm.

***S. (Scarabaeolus) rugosipennis* Zidek and Pokorný, sp. n.**

HT—TMSA, from RSA: Limpopo Province, Makgaberger [Plateau].

Length 12.5 mm (HT).

***S. (Scarabaeolus) similis* Zidek and Pokorný, sp. n.**

HTm—TMSA, from RSA: Northern Cape Province, south of Pienaarsriver.

n. RSA.

Length 14 mm (HT).

***S. (Scarabaeolus) soutpansbergensis* Deschodt and Davis, 2015**

*S. (Scarabaeolus) soutpansbergensis* Deschodt and Davis 2015: 507, fig. 3A, 8 (in Deschodt et al. 2015).

HTf—TMSA, from RSA: Limpopo Province, Messina Nat. Res.

ne. RSA (Limpopo Province).

Length 10.1 mm (HT).

***S. (Scarabaeolus) weneri* Zidek and Pokorný, sp. n.**

HTm—BMNH, from Kenya: North-Eastern Province, Wajir.

ne. Kenya.

Length 9–11 mm.

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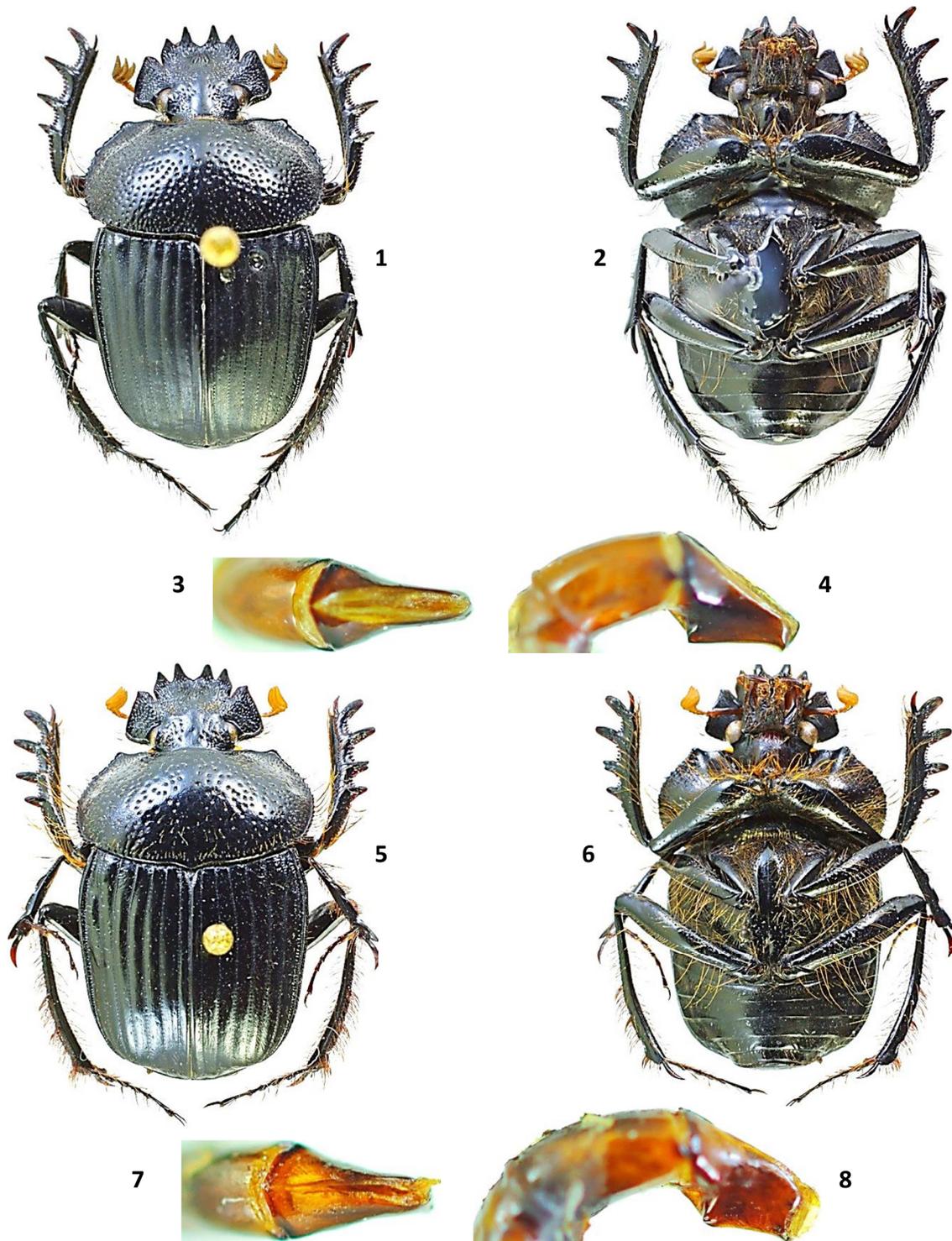
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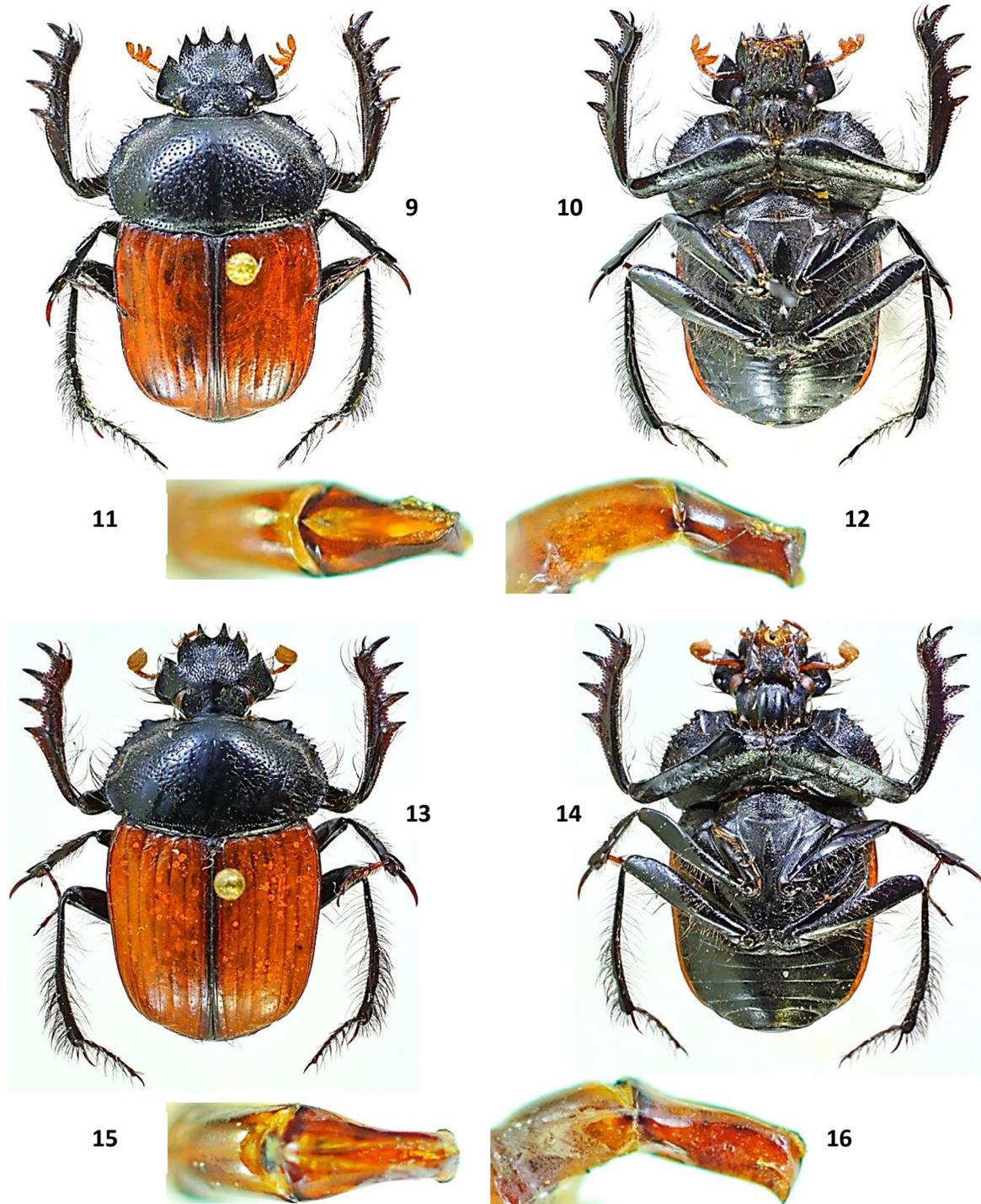
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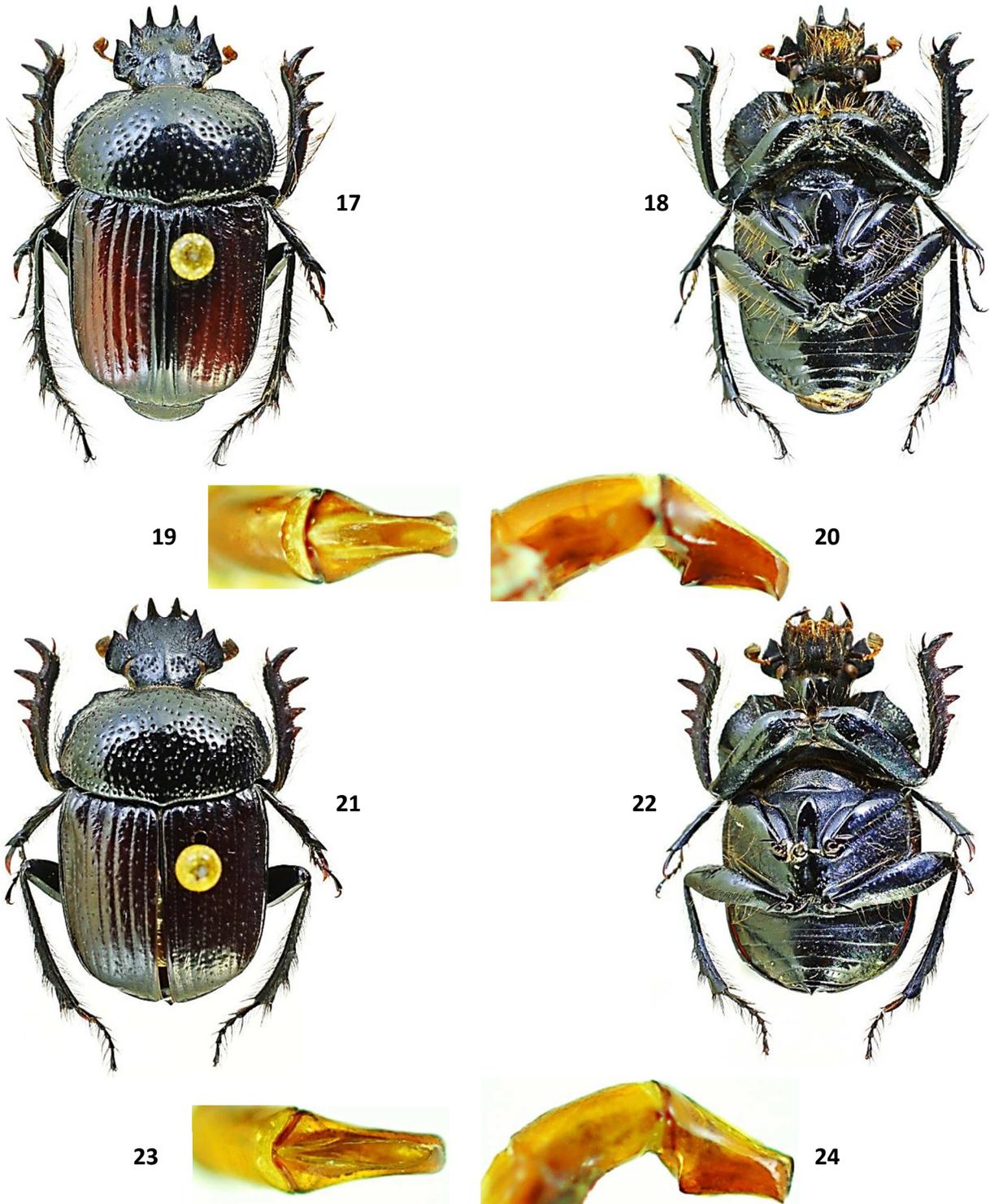
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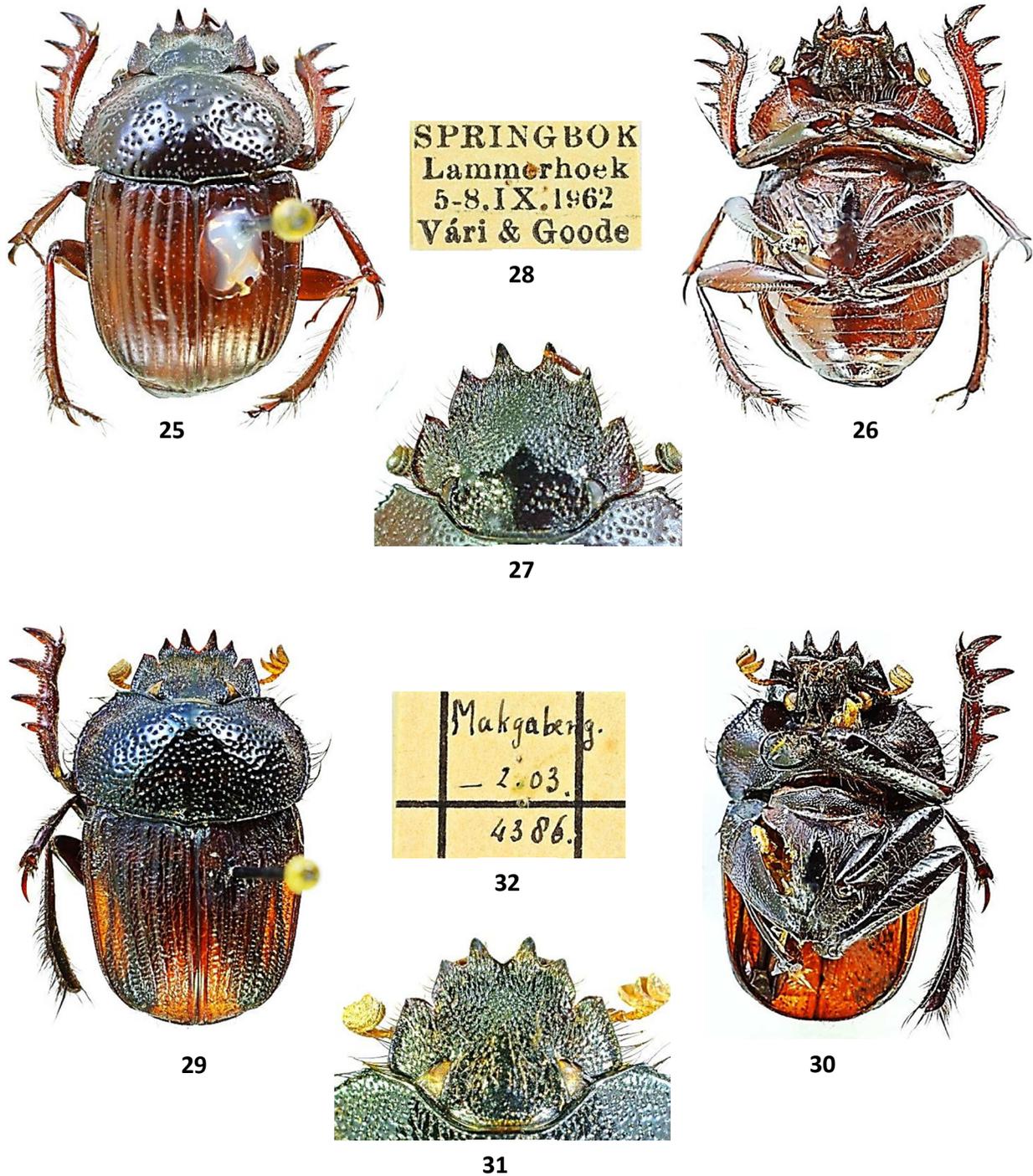
Figures 1–8. *Scarabaeus (Scarabaeolus)* spp. 1–4) *Scarabaeus (Scarabaeolus) krugeri* sp. n., HTm, 14 mm. 1) Dorsal habitus. 2) Ventral habitus. 3) Aedeagus, dorsal. 4) Aedeagus, left lateral. 5–8) *Scarabaeus (Scarabaeolus) flavicornis* (Boheman), 15 mm. 5) Dorsal habitus. 6) Ventral habitus. 7) Aedeagus, dorsal. 8) Aedeagus, left lateral.



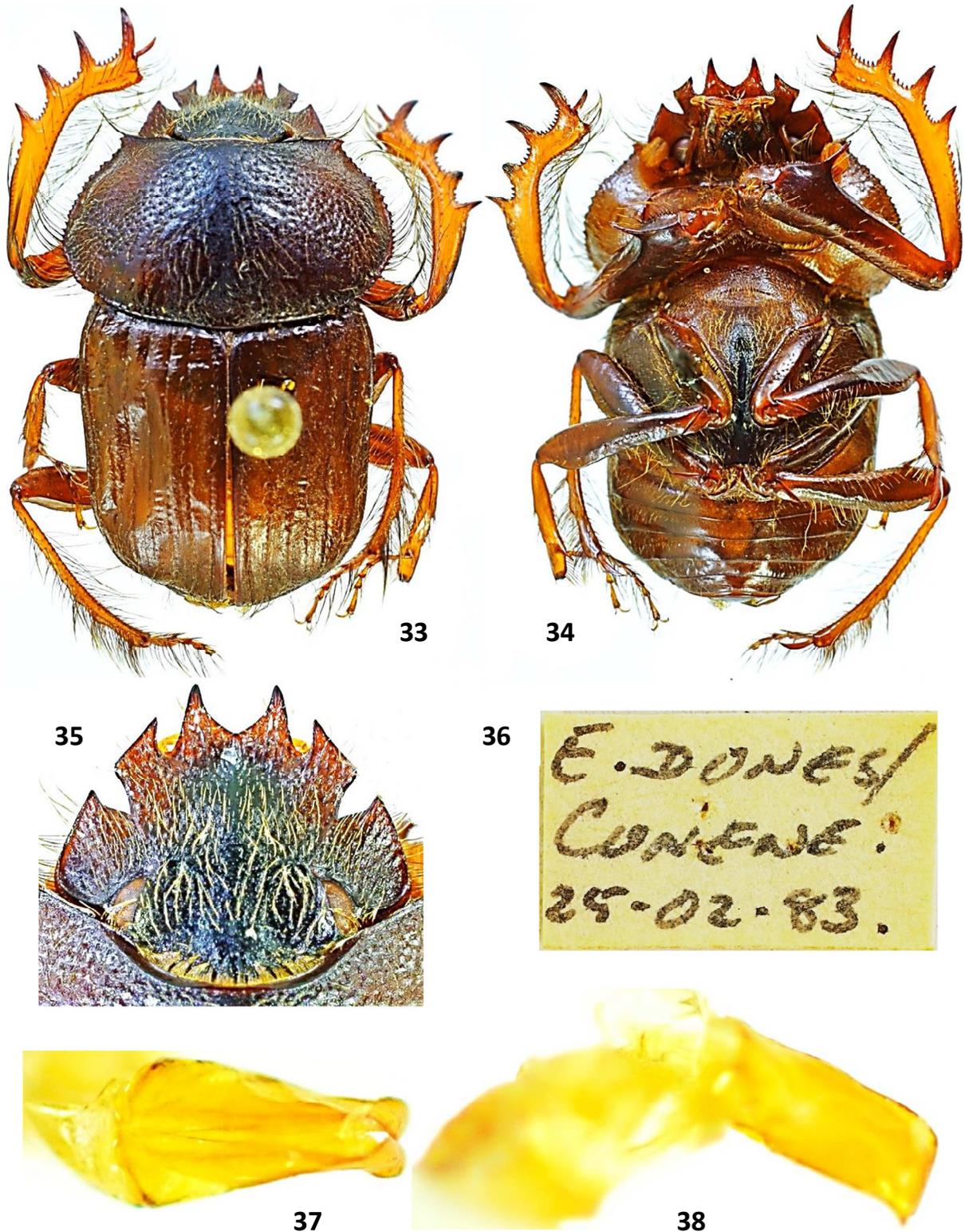
**Figures 9–16.** *Scarabaeus (Scarabaeolus)* spp. **9–12** *Scarabaeus (Scarabaeolus) lizleri* sp. n., HTm, 15 mm. **9**) Dorsal habitus. **10**) Ventral habitus. **11**) Aedeagus, dorsal. **12**) Aedeagus, left lateral. **13–16** *Scarabaeus (Scarabaeolus) rubripennis* (Boheman), 14 mm. **13**) Dorsal habitus. **14**) Ventral habitus. **15**) Aedeagus, dorsal. **16**) Aedeagus, left lateral.



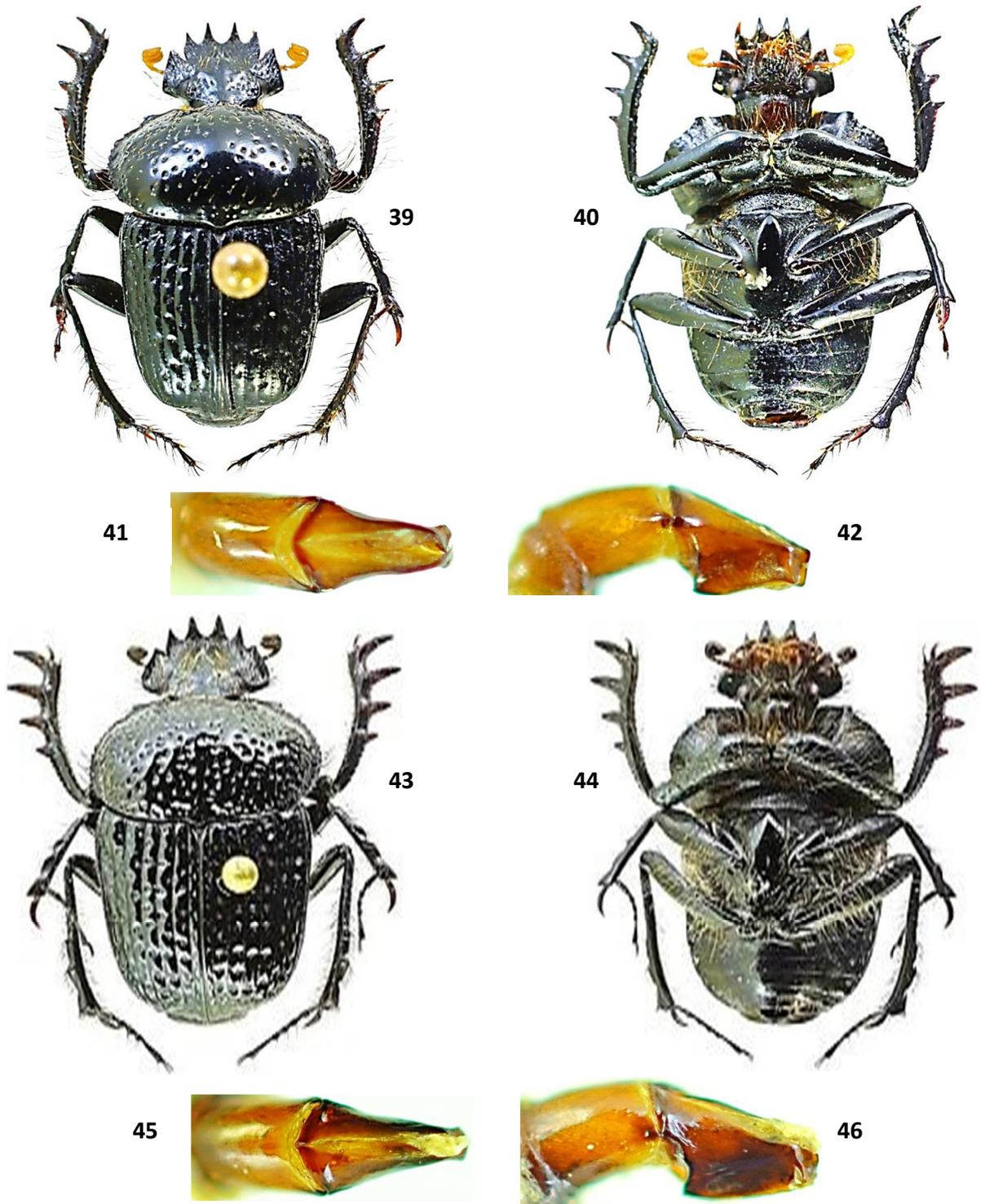
Figures 17–24. *Scarabaeus (Scarabaeolus)* spp. 17–20) *Scarabaeus (Scarabaeolus) namibensis* sp. n., HTm, 13.5 mm. 17) Dorsal habitus. 18) Ventral habitus. 19) Aedeagus, dorsal. 20) Aedeagus, left lateral. 21–24) *Scarabaeus (Scarabaeolus) knobeli* Ferreira, 12 mm. 21) Dorsal habitus. 22) Ventral habitus. 23) Aedeagus, dorsal. 24) Aedeagus, left lateral.



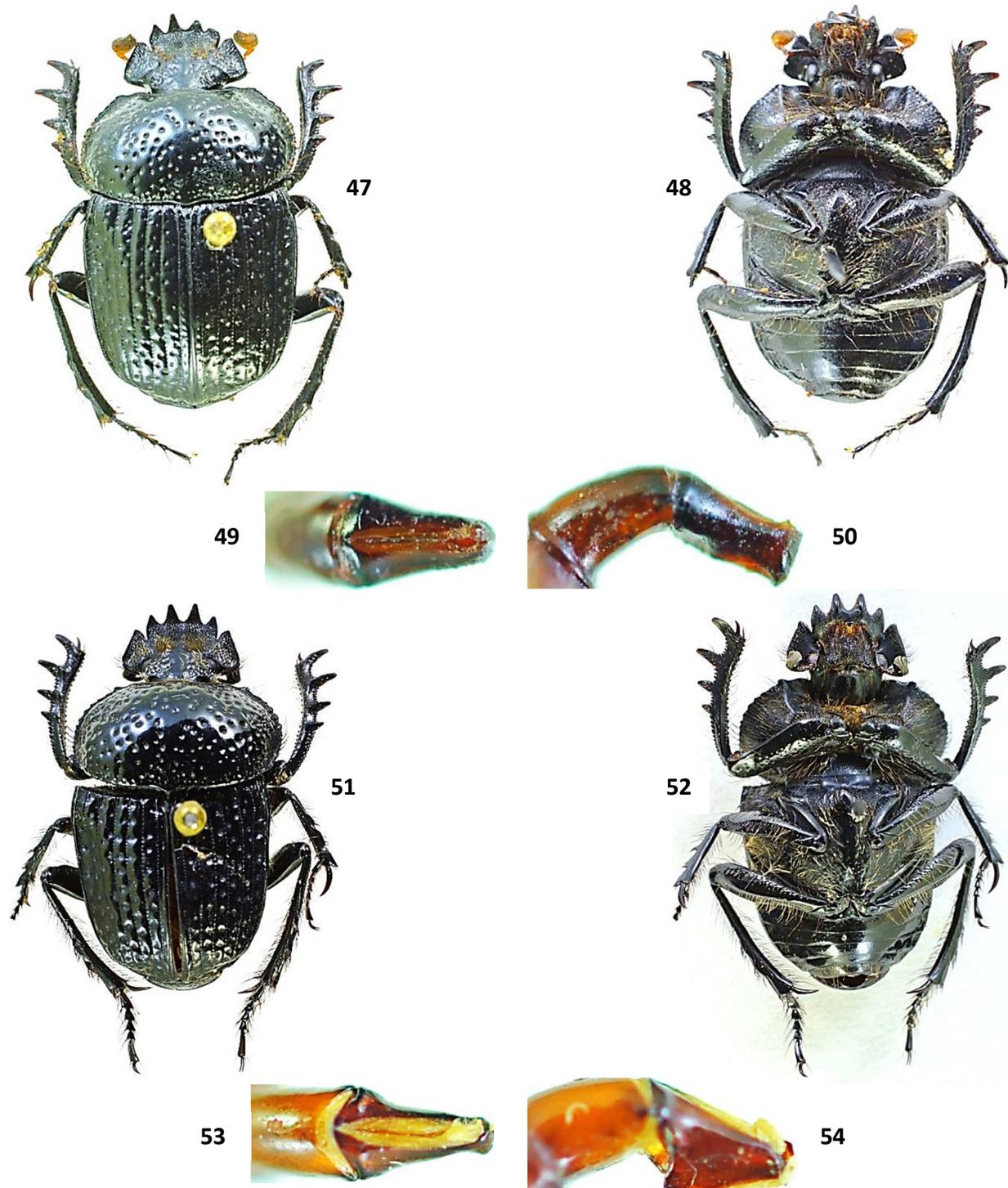
Figures 25–32. *Scarabaeus (Scarabaeolus)* spp. 25–28) *Scarabaeus (Scarabaeolus) fragilis* sp. n., HTf, 12.5 mm. 25) Dorsal habitus. 26) Ventral habitus. 27) Head leveled horizontal. 28) Locality label. 29–32) *Scarabaeus (Scarabaeolus) rugosipennis* sp. n., HT, 12.5 mm. 29) Dorsal habitus. 30) Ventral habitus. 31) Head leveled horizontal. 32) Locality label.



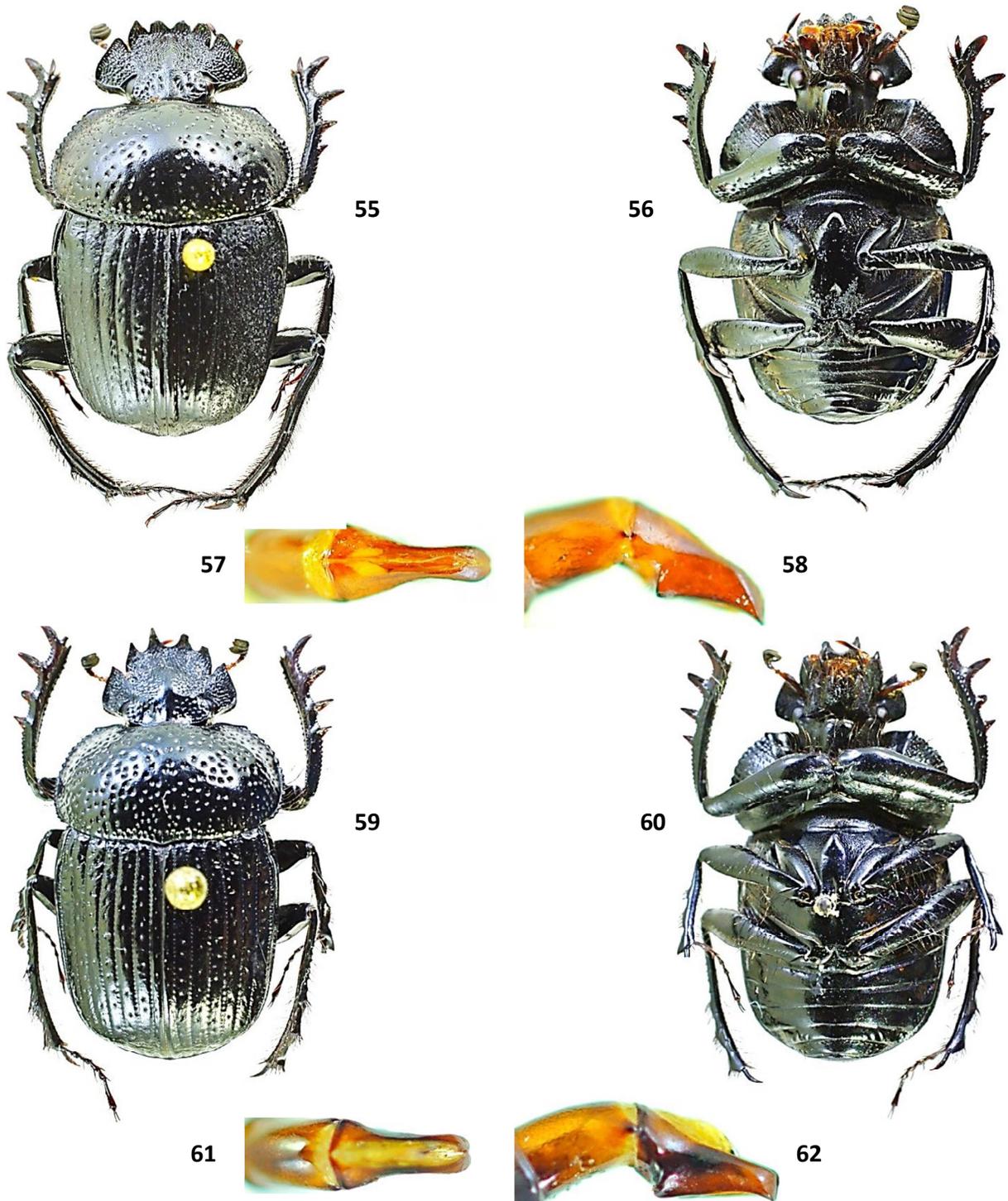
Figures 33–38. *Scarabaeus (Scarabaeolus) cunene* sp. n., HTm, 10 mm. 33) Dorsal habitus. 34) Ventral habitus. 35) Head leveled horizontal. 36) Locality label. 37) Aedeagus, dorsal. 38) Aedeagus, left lateral.



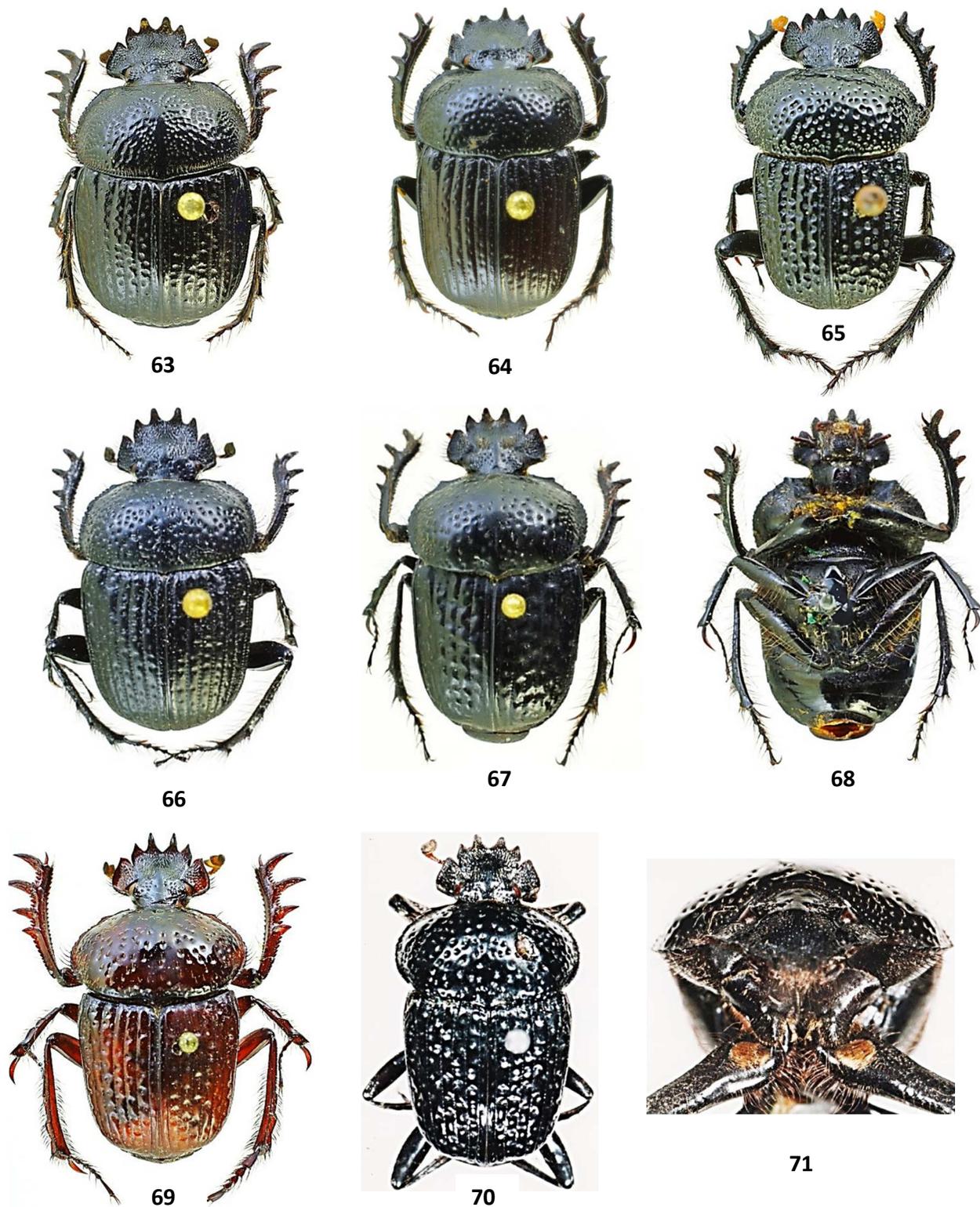
Figures 39–46. *Scarabaeus* (*Scarabaeolus*) spp. 39–42) *Scarabaeus* (*Scarabaeolus*) *weneri* sp. n., HTm, 9 mm. 39) Dorsal habitus. 40) Ventral habitus. 41) Aedeagus, dorsal. 42) Aedeagus, left lateral. 43–46) *Scarabaeus* (*Scarabaeolus*) *bohemani* Harold, 16 mm. 43) Dorsal habitus. 44) Ventral habitus. 45) Aedeagus, dorsal. 46) Aedeagus, left lateral.



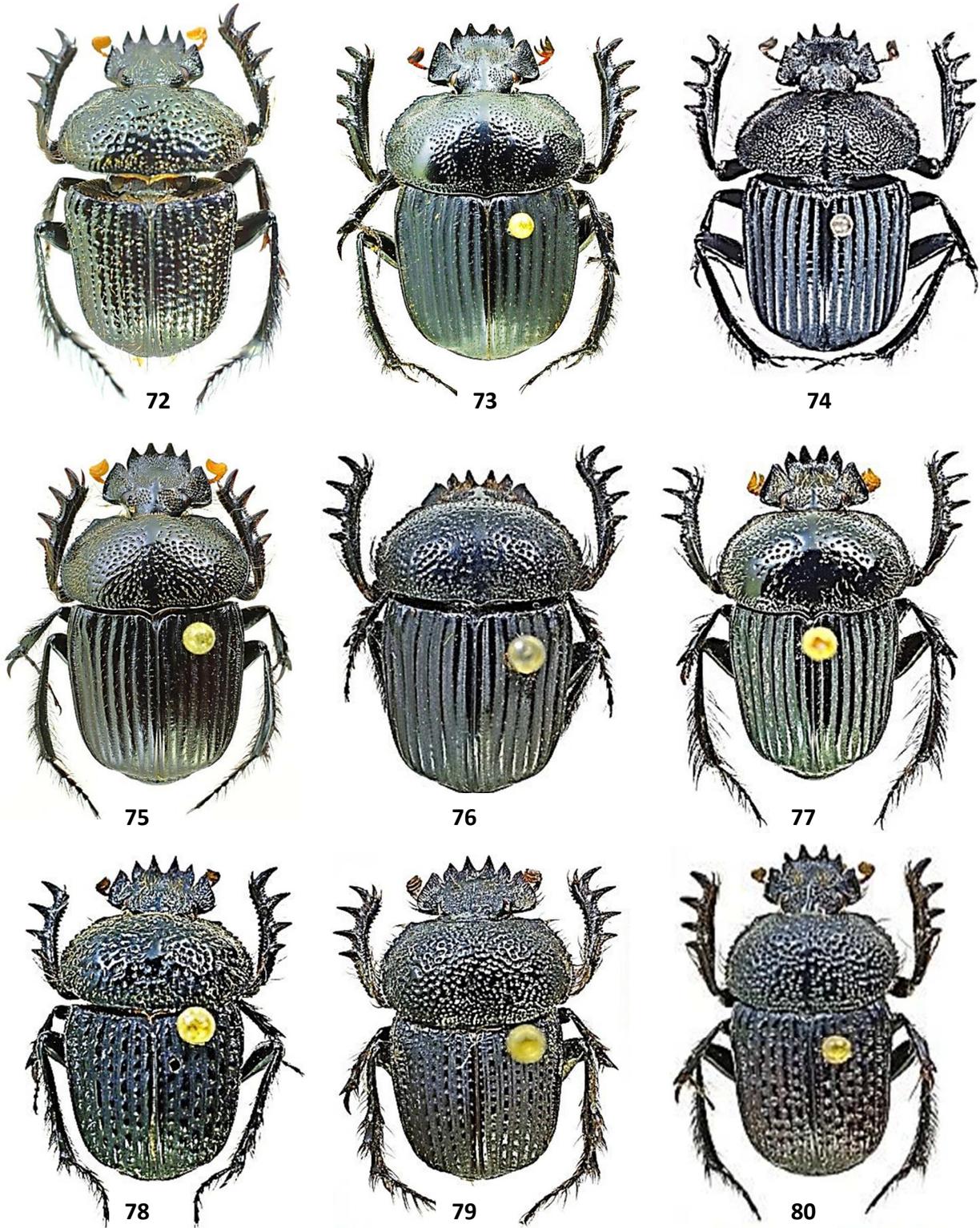
Figures 47–54. *Scarabaeus (Scarabaeolus)* spp. 47–50) *Scarabaeus (Scarabaeolus) orientalis* sp. n., HTm, 15 mm. 47) Dorsal habitus. 48) Ventral habitus. 49) Aedeagus, dorsal. 50) Aedeagus, left lateral. 51–54) *Scarabaeus (Scarabaeolus)* cf. *bohemani / palemo*, RSA, Limpopo Province, 14 mm. 51) Dorsal habitus. 52) Ventral habitus. 53) Aedeagus, dorsal. 54) Aedeagus, left lateral.



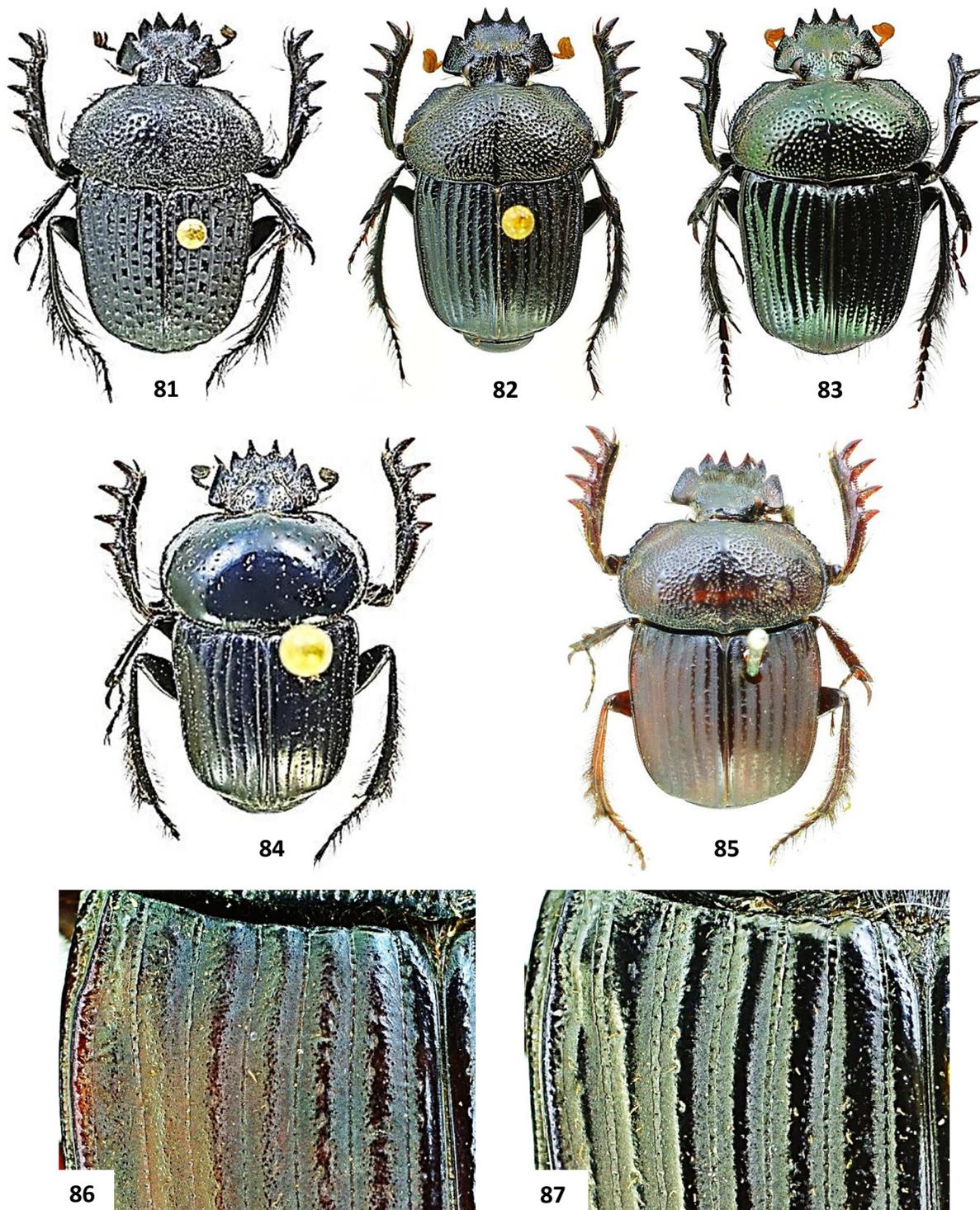
Figures 55–62. *Scarabaeus* (*Scarabaeolus*) spp. 55–58) *Scarabaeus* (*Scarabaeolus*) *similis* sp. n., HTm, 14 mm. 55) Dorsal habitus. 56) Ventral habitus. 57) Aedeagus, dorsal. 58) Aedeagus, left lateral. 59–62) *Scarabaeus* (*Scarabaeolus*) *megaparvulus* Davis and Deschodt, 12 mm. 59) Dorsal habitus. 60) Ventral habitus. 61) Aedeagus, dorsal. 62) Aedeagus, left lateral.



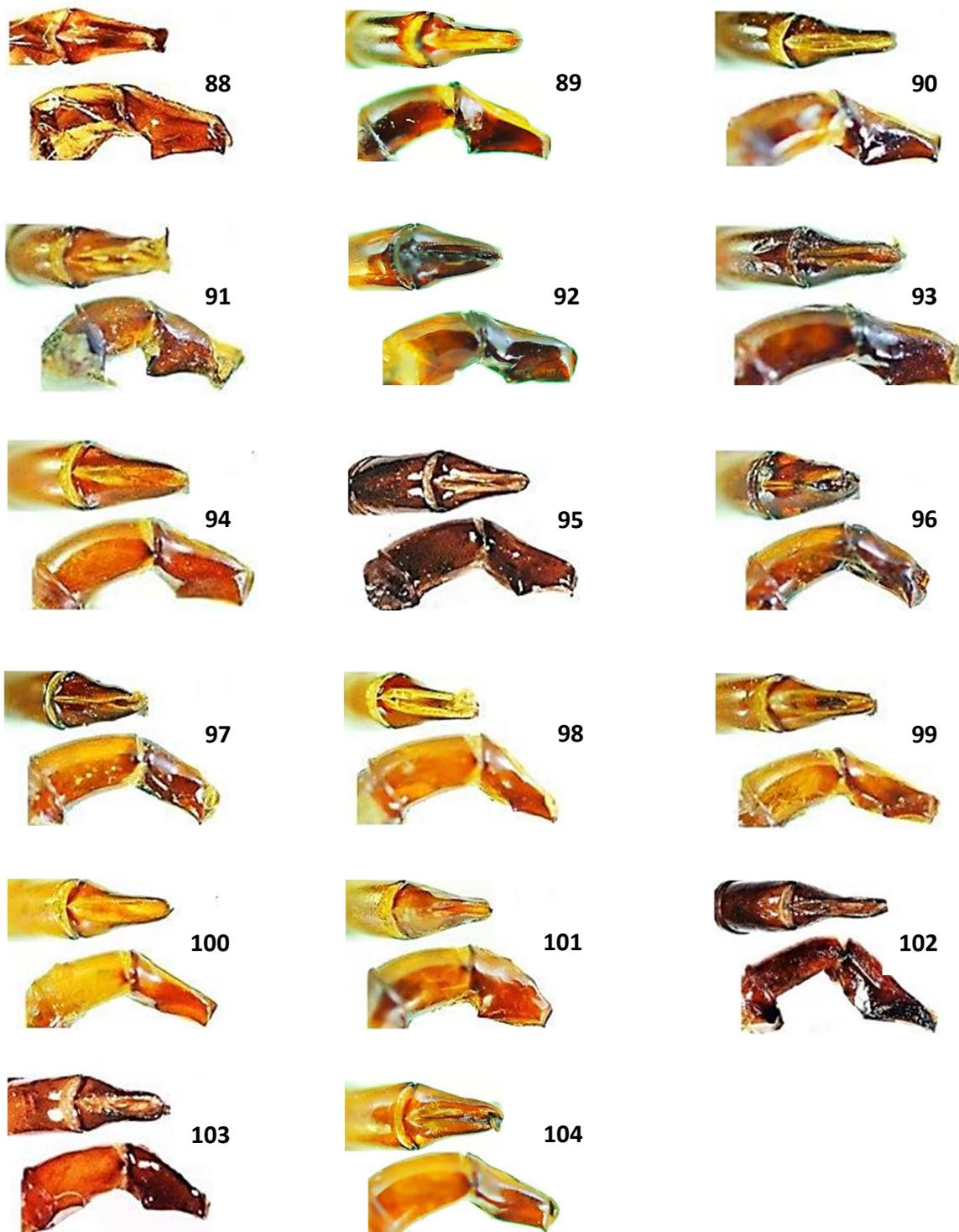
**Figures 63–71.** *Scarabaeus* (*Scarabaeolus*) species with one mesotibial spur. **63)** *S. funebris* (Boheman), m, 17.5 mm. **64)** *S. parvulus* (Boheman), m, 14 mm. **65)** *S. clanceyi* Ferreira, m, 12.7 mm. **66)** *S. karrooensis* zur Strassen, m, 13 mm. **67)** *S. obsoletepunctatus* Balthasar, HTf, 14.5 mm. **68)** Same, ventral view. **69)** *S. palemo* Olivier, m, 14.5 mm (Benin, brownish because teneral). **70)** *S. morbillosus* Fabricius, ST, 13.7 mm (= *S. palemo* Olivier). **71)** Same, frontal view showing orangish profemoral pads.



Figures 72–80. *Scarabaeus* (*Scarabaeolus*) species with two mesotibial spurs. 72) *S. anderseni* Waterhouse, HTf, length 10.5 mm. 73) *S. canaliculatus* Fairmaire, m, 18 mm. 74) *S. fritschi* Harold, m, 19 mm. 75) *S. damarensis* Janssens, m, 13 mm. 76) *S. gilleti* Janssens, HTm, 14.5 mm. 77) *S. kwiluensis* Janssens, m, 15 mm. 78) *S. gracai* Ferreira, f, 11 mm. 79) *S. kochi* Ferreira, PTm, 12.5 mm. 80) *S. pabulator* Péringuey, m, 12 mm.



Figures 81–87. *Scarabaeus* (*Scarabaeolus*) species with two mesotibial spurs. 81) *S. intricatus* (Fabricius), m, 16.5 mm. 82) *S. inoportunus* Ferreira, m, 13.5 mm. 83) *S. lucidulus* (Boheman), m, 13.5 mm. 84) *S. laevifrons* Fairmaire, m, 11.5 mm. 85) *S. reichei* Waterhouse, HT, 18.5 mm. 86) *S. reichei* HT, detail of left elytron. 87) *S. fritschi* Harold, detail of left elytron (from specimen in Fig. 74).



**Figures 88–104.** *Scarabaeus* (*Scarabaeolus*) aedeagi in dorsal and left lateral views. **88)** *S. palemio* Olivier (Benin, from specimen in Fig. 69). **89)** *S. parvulus* (Boheman). **90)** *S. karrooensis* zur Strassen. **91)** *S. laevifrons* Fairmaire. **92)** *S. reichei* = *S. canaliculatus* (det. Ferreira). **93)** *S. canaliculatus* Fairmaire. **94)** *S. fritschi* Harold. **95)** *S. damarensis* Janssens. **96)** *S. gilleti* Janssens. **97)** *S. kwiluensis* Janssens. **98)** *S. kochi* Ferreira. **99)** *S. pabulator* Péringuey. **100)** *S. intricatus* (Fabricius). **101)** *S. lucidulus* (Boheman). **102)** *S. funebris* (Boheman). **103)** *S. clanceyi* Ferreira. **104)** *S. inoportunus* Ferreira.

