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Description of new species of *Spilophorus* (*Prospilophorus*) Holm & Perissinotto, 2010 with revision of the subgenus (Coleoptera: Scarabaeidae, Cetoniinae, Cremastocheilini)

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Abstract
Despite two revisions of the genus *Spilophorus* Westwood, 1848 having been published fairly recently, new findings and closer analyses have revealed the existence of more species than previously reported. A new species of the endemic African subgenus *Prosphilophorus* Holm & Perissinotto, 2010 has been discovered in Cameroon and is hereby described as *S.* (*P.*) *superbus* **sp. nov.** A series of new specimens of *S.* (*P.*) *grandis* Schein, 1949 has also been found in KwaZulu-Natal (KZN, South Africa), making it possible to confirm the type locality for this species in South Africa and necessitating the erection of a new species, *S.* (*P.*) *holmi* **sp. nov.** for the specimens from Tanzania, previously grouped under the former taxon. Finally, two female specimens housed in the Museum of Central Africa (MRAC, Tervuren, Belgium) and other specimens reposited in private collections and previously regarded as belonging to *S.* (*P.*) *aurifer* Westwood, 1874 are here recognized as a separate species and described as *S.* (*P.*) *congoensis* **sp. nov.** , on the basis of their comparative differences in dorsal ornamentation, sculpture and shape of the mentum. The genus appears to be of special significance for the biodiversity of the continent, due to its rather unique ecological characteristics of association with bird and ant aerial nests. The suggestion that species may represent highly specialized and isolated relicts, as highlighted in Holm & Perissinotto (2010), seems to be validated and strengthened by these findings.

Key words: Afrotropical Realm, bird and ant aerial nests, *Crematogaster* ants, dietary habits, isolated relicts.

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Introduction

The genus *Spilophorus* s.l. Westwood in Schaum, 1848 is remarkable among the Cremastocheilini, because some of its characteristics are closer to those exhibited by Cetoniini than to those of its own tribe (Péringuey 1907). These include a body habitus with a length/width ratio of typical Cetoniini proportions, abdominal ventrites not protruding beyond the elytral surface, presence of dorsal and ventral clay-like layers or tomentose spots, and a lack of basal depressions on the pronotum (Holm & Perissinotto 2010). For these, among other reasons, in the modern literature the genus has been consistently placed within a special subtribe of its own, the Spilophorina (e.g. Krikken 1984; Bouchard et al. 2011; Krajčík 2024).

The genus has extant representatives on the Indian subcontinent and in sub-Saharan Africa, thus representing a true Gondwanaland relict. Kraatz (1899) had earlier proposed to reserve the original genus name for the two Indian species, while erecting the new genus *Pseudospilophorus* Kraatz, 1899 for the African species, on the basis of differences in the shape of the pronotum between the two groups. Péringuey (1907), however, regarded the difference between a sub-hexagonal and a transverse pronotum insufficient to justify the new genus. Holm & Perissinotto (2010), on the other hand, have recently recognized substantial differences among the African component, with one group represented by smaller but more widespread species spanning the whole continent and a second composed of a few larger but more localized relict species. The two groups are now regarded as separate although closely related clades, and constitute the nominal *S.* (*Spilophorus*) and the *S.* (*Prospilophorus*) Holm & Perissinotto, 2010 subgenera, respectively.

In this updated classification scheme, the African species of the nominal subgenus are actually more closely associated with the two Indian species, namely *S.* (*S.*) *maculatus* (Gory & Percheron, 1833) and *S.* (*S.*) *cretosus* (Hope, 1833), than to the African species of *S.* (*Prospilophorus*). Inter-continental differences are minimal and only at diagnostic level of species, restricted to pronotal sides being slightly more angular and the clypeal carina less developed in the Indian species than in their African counterparts. The general body habitus, particularly the dorsal ornamentation, of the two Indian species matches remarkably well that of S. (*S.*) *plagosus* Westwood in Schaum, 1848 [vs *S.* (*S.*) *maculatus*] and of *S.* (*S.*) *pringlei* Holm & Perissinotto, 2010 [vs *S.* (*S.*) *cretosus*] from southern Africa. In the Afrotropical Realm, currently the nominal subgenus includes five species and two subspecies (Antoine 2006; Holm & Perissinotto 2010).

The key diagnostic characters exhibited by the two subgenera have been highlighted in detail by Holm & Perissinotto (2010) and can be summarized in *S.* (*Prospilophorus*) exhibiting larger species (TL > 13 mm), with clypeus convexly rounded and without ridge, with the inner dorsal mid-metatibial spine obsolete and a variable colour pattern that ranges from completely ornamented to nigrito forms in the same population. The relictual distribution of species and the occurrence of plesiomorphic characters, such as the tridentate protibial in the female of *S.* (*P.*) *cervinus* Bourgoin, 1921, suggests an old phylogenetic lineage ancestral to the nominal subgenus.

Spilophorus (*P.*) currently comprises three Afrotropical species, namely *S.* (*P.*) *grandis* Schein, 1949, *S.* (*P.*) *aurifer* Westwood, 1874 and *S.* (*P.*) *cervinus*. The subgenus is extremely conservative in all its key morphological characters and diagnostic differences have been difficult to detect, leading to the clustering of specimens belonging to different taxa into the same species until very recently. New findings in South Africa, and further analyses conducted on historical specimens housed in museum and private collections, have revealed the existence of three additional species that are herein described along with a revision of the biogeography and ecology of the subgenus. Holm & Perissinotto (2010) suggested that "it is more than likely that further localized relicts may exist". The new species described here fully confirm that hypothesis and indicate that species within the subgenus are rather restricted in their distribution range, being regional to local endemics.

Materials and Methods

Fresh material of *Spilophorus* (*Prospilophorus*) *grandis* Schein, 1949 was collected between 2010 and 2016, either drowned on the shores of Lake St Lucia (KZN, South Africa) or inside aerial nests of *Crematogaster peringueyi* (Emery, 1895) within the sand forest adjacent to the lake. In the first instance, specimens were identified using direct inspection of the ground, while in the second case a small number of ant nests were split open with a garden pick axe and the internal surfaces carefully scrutinized for beetle presence. The type pair of *S.* (*P.*) *superbus* sp. nov. was obtained by TG from Cameroonian local collectors, who had used their indigenous knowledge to search for these beetles inside "Fourmiliere" or ant hills.

Given that there has been some confusion and mixing up of specimens in previous descriptions (e.g., Holm & Perissinotto 2010), it is necessary here to provide an unequivocal redescription for virtually all the species of the subgenus *S.* (*Prospilophorus*), with the exception of *S.* (*P.*) *cervinus* Bourgoin, 1921 for which no mixture of specimens has been detected yet. In the systematic section below, species are presented in alphabetic order.

Historical type specimens were either taken out on loan from museum collections and studied directly, or analyzed through high resolution images kindly provided by the relevant curators (see also Acknowledgements section). Taxonomic, distribution and ecological data for each species were obtained mainly from the recent reviews of Antoine (2006) and Holm & Perissinotto (2010), as well as from additional collecting details reported on the labels accompanying each specimen reposited in key museums and private collections. The data of historical type specimens are reported in their original integrity. For each taxon, data records are reported with the number of individuals and their respective sex, if verified. Otherwise, such details are omitted and only a generalized reference to an unspecified number (n) of individuals (inds) is given.

The terminology used for the Cetoniinae external morphology is mainly derived from Krikken (1984), Holm & Marais (1992) and Sakai & Nagai (1998). Photos of specimen dorsal, lateral and ventral habitus as well as pygidial and clypeal surfaces were taken with a variety of cameras, mainly Nikon CoolPix S9700 digital camera with macro setting or a Canon EOS 5D camera fitted with a 100 mm macro lens. Photos of male aedeagal parameres and female mentum were generally obtained using an OptikamB9 Digital Camera attached to a Kyowa SDZ-PL dissecting microscope, or alternatively with a Zeiss Axio Zoom V16 microscope fitted with a digital camera (at x16 magnification). Stacking was done using either the Helicon Focus 8 software or the Combine ZP Image Stacking package of Alan Hadley (alan@micropics.org.uk). In order to increase the clarity of resolution, the background, pin holes and other physical damages or disruptive features were removed from each photo using Microsoft Word 2010 (Picture Tools).

Specimen size includes measurements of total body length (TL), taken from the tip of the clypeus to the tip of the pygidium, and maximum body width (MW), taken at the widest point of the elytra. All measurements are expressed in millimetres and were taken with a Vernier

calliper. Abbreviations of types are as follows: HT, Holotype; AT, Allotype; LT, Lectotype; PL(s), Paralectotype(s); PT(s), Paratype(s).
Museums, institutes and private collections are abbreviated as follows:
BMCS – Jonathan Ball & Andre Marais Private Collection, Cape Town, South Africa;
BLLF – Bruno Le Rü Private Collection, Les Matelles, France;
GBEG – Gerhard Beinhundner Private Collection, Euerbach, Germany;
MNHN – Muséum national d'Histoire naturelle, Paris, France;
PLPF – Philippe Le Gall Private Collection, Prunay-le-Temple, France;
MRAC – Musée Royal de l'Afrique Centrale, Tervuren, Belgium;
RPGS – Renzo Perissinotto Research Material, Gqeberha, South Africa;
SRSF – Sébastien Rojkoff Private Collection, Sourcieux-les-Mines, France;
TGMF – Thierry Garnier Private Collection, Montpellier, France;
TMSA – Ditsong National Museum of Natural History, Pretoria, South Africa;
ZMUC – Universitetets Zoologiske Museum, København, Denmark;
ZSMC – Zoologische Staatssammlung, München, Germany.

Results and Taxonomy

Subgenus *Spilophorus* (*Prospilophorus*) Holm & Perissinotto, 2010

Spilophorus (*Prospilophorus*) Holm & Perissinotto, 2010: 49; Kajčík 2024: 226.
Type species: *Spilophorus grandis* Schein, 1949.

Spilophorus (*Prospilophorus*) *aurifer* Westwood, 1874

(Figs 1, 15)

Spilophorus aurifer Westwood, 1874: 30; Marais & Holm 1992: 73; Krajčík 1999: 30.

Hoplostomus aurifer (Westwood). Schaum 1848: 62 (catalogue).

Pseudospilophorus aurifer (Westwood). Schenkling1921: 362.

Spilophorus (*Prospilophorus*) *aurifer* Westwood. Holm & Perissinotto 2010: 51; Krajčík 2024: 226.

Diagnosis. The species is obviously most closely related to *S.* (*P.*) *congoensis* sp. nov., described here in the following section. Unfortunately, only the original HT female specimen is currently known for *S.* (*P.*) *aurifer*, and consequently its diagnostic characters are somehow limited. The two species can be separated on the basis of the more extensive and darker dorsal tomentose cover observed in *S.* (*P.*) *aurifer*, by comparison with *S.* (*P.*) *congoensis*. Also, the dorsal sculpture is generally coarser and more scattered in the former than in the latter species. The anterior margin of the mentum of *S.* (*P.*) *aurifer* is very regularly rounded, while in *S.* (*P.*) *congoensis* this is mildly sinuate. Finally, the ventral tooth on the protarsi of the former species is poorly developed and virtually obsolete, while in the latter species this is moderately long and rather sharp.

Data records. Type series: HT♀, **[Republic of Guinea?]:** "Guinea, Aurifer Westw., Mus. Westerm. Zoological Museum DK– Copenhagen" (ZMUC).

Redescription

Size. TL = 14.8 mm; MW = 8.3 mm (n =1)
Head. Glabrous, black with coarse round sculpture except on apical half of clypeus; anterior clypeal margin roundly bilobate with lateral corners smoothly rounded; middle of clypeus roundly elevated, without ridges; vertex with sharp median ridge and longitudinal carina, with symmetric depressions on each side covered in ochreous-yellow tomentum; antennae missing on both sides, but right pedicel present, dark brown with medium sized brown setae on apex (Fig. 1 A, C, D).

Pronotum. Black, shiny and generally glabrous, with exception of few brown setae along lateral margins; with fine sparse punctures on disk becoming denser and larger towards sides; lateral margins exhibiting irregular ochreous spots, roundly angled at middle, widest just anteriad of base with posterior corners rather sharply angled; posterior margin roundly emarginate above scutellum (Fig. 1 A, C).

Scutellum. Equilateral triangular; shiny black and glabrous, with only a few round punctures near apex and interior corners, becoming elongate to crescent in shape on basal margin; lateral grooves deep and arcuate (Fig. 1 A).

Elytra. Shiny black and generally glabrous, but exhibiting short and scattered tawny setae emerging at centre of punctures along margins; depressed around suture in basal half, with further depressions mediad of humeral calli; with large sparse umbilicate to horse-shoe punctures on disk but absent on irregular first costa, becoming more densely spaced, horseshoe-shaped and smaller on margins and declivities; ochreous-yellow tomentose band present from below humeri to apical declivity, interrupted by punctures and occasionally spreading towards disc as small ochreous spots below scutellar apex and near middle of elytral length; sutural apices smoothly rounded and without projections (Fig. 1 A, C).

Legs. Black with short tawny to brown setae, becoming longer on ventral sides; densely sculptured with punctures of variable shape, often elongate; tarsal segments typically short, protibial ventral tooth sharp but extremely short; meso and metatibia each with one median outer denticle (Fig. 1 A-C).

Fig. 1 – *Spilophorus* **(***Prospilophorus***)** *aurifer* Westwood, 1874, HT♀ ("Guinea"): dorsal habitus **(A)**; ventral habitus **(B)**; lateral habitus **(C)**; clypeus **(D)**; pygidium **(E)**; mentum **(F)**; labels **(G)**. Photos: Anna Reinhold Larsen.

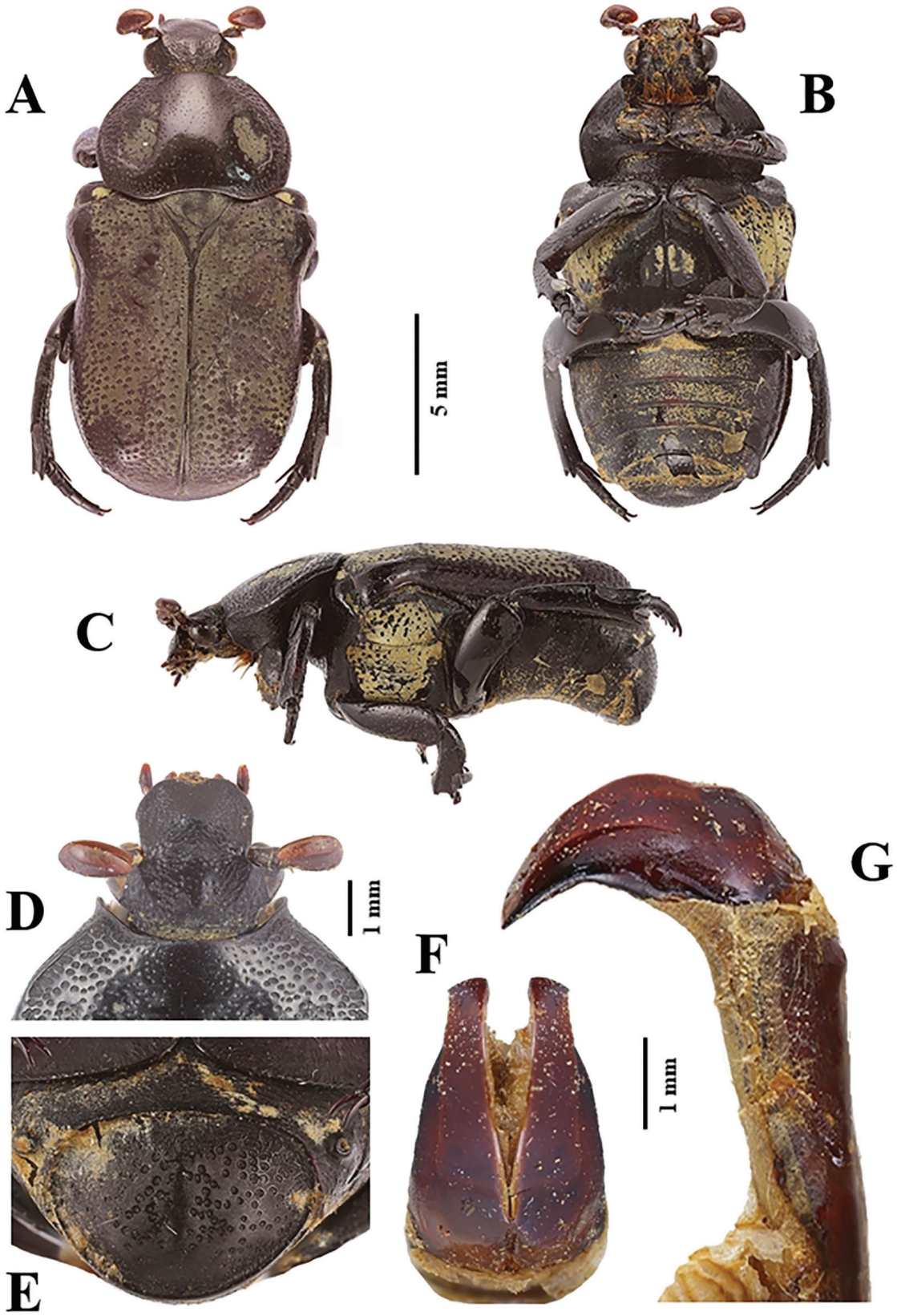

Fig. 2 – *Spilophorus* (*Prospilophorus*) *cervinus* Bourgoin, 1921, ♂ (Congo-Kinshasa, Wenga Ifomi): dorsal habitus **(A)**; ventral habitus **(B)**; lateral habitus **(C)**; clypeus **(D)**; pygidium **(E)**; aedeagal parameres, dorsal view **(F)**; aedeagal parameres, lateral view **(G)**. Aedeagus damaged, partially reconstructed with MS-Paint software. Photos: Olivier Montreuil.

Pygidium. Sharply upturned along margins and with median longitudinal carina; black, matte and glabrous, with semi-contiguous round punctures and irregular bilateral ochreous spots (Fig. 1 E).

Venter. Black and shiny, medially with very fine punctures becoming larger and more densely spaced towards sides; very short reddish-brown setae discernible along middle and extreme sides of abdominal ventrites and mesepisternum; ochreous spots interrupted by punctures on sides of metasternum, abdominal ventrites 2-5, metepisternum and postero-distal corners of abdominal ventrites 1-4; mesosternal lobe small, rounded and not protruding (Fig. 1 B); mentum with apical margin and apico-lateral corners smoothly rounded (Fig. 1 F).

Distribution. Currently known only from an unspecified locality in "Guinea", which probably refers to the modern Republic of Guinea (formerly French Guinea) (Fig. 15), but could also mean the broader Guinea region.

Remarks. The two female specimens from the DRC, reported as *S.* (*P.*) *aurifer* in Holm & Perissinotto (2010), have been analysed more closely and it is evident that they actually represent a different, new species described here below as *S.* (*P.*) *congoensis* sp. nov. Not only they exhibit reduced tomentose areas, with one actually being completely black, but their dorsal sculpture is more dense and finer than in the *S.* (*P.*) *aurifer* HT. Biogeographically, they are disjunct by a distance of approximately 5000 Km, with another species of the same subgenus "sandwiched" in between, namely *S.* (*P.*) *superbus* sp. nov. in Cameroon and southern Congo-Brazzaville.

***Spilophorus* (*Prospilophorus*) *cervinus* Bourgoin, 1921**
(Figs 2, 3, 15)
Spilophorus cervinus Bourgoin, 1921: 84; Marais & Holm 1992: 73; Kajčík 1999: 30.

Spilophorus (*Prospilophorus*) *cervinus* Bourgoin. Holm & Perissinotto 2010: 50; Krajčík 2024: 226.

Data records. Types: HT♀, **[Congo-Kinshasa]**: Maniéma, Kindu [S02° 55' E25°52'], 1917, L. Burgeon (MNHN). Other records. **Cameroon**: 1♀, South, Obout, 04-1997, inside ants nest (TGMF); **Congo-Kinshasa**: 1♀, Uele, Dingila [N03°44' E26°06'], 31/VII/1933, J.V. le Roy (MRAC); 1♀, Equateur, Bonula Sabouga [N01°05' E19°58'], VII/1926, R.P. Hulstaert (MRAC); 1♂, Wenga Ifomi, E. Quineaux (MNHN); 1♀ (14.5 mm), ibidem, E. Quineaux, R. Mus. Hist. Nat. Belg. I.G. 10.565, G. Ruter det. 1962, *Spilophorus* (*Pseudospilophorus*) *cervinus* Bourgoin, Ex Collection Dr Vincent Allard, received from Christophe Allard 21.II.2015 (GBEG); **Congo-Brazzaville**: 1♀, Kola, Kouilou, X.2000, Bruno Le Rü (BLLF); 1♀, Kinanga, Kouilou, I.2025, local collector leg. (BLLF).

Distribution. This species occurs mainly in the northern regions of Congo-Kinshasa (DRC), reaching also the central part of Cameroon and southern Congo-Brazzaville to the west (Fig. 15).

Remarks. Bourgoin (1921) reported in its original description that the HT was "Un mâle". However, a dissection of this specimen, currently reposited in the MNHN, has revealed that it is actually a female (O. Montreuil pers. comm.). With the exception of the single male, rather old and worn, illustrated in Fig. 2, all the other specimens traced thus far are also females and characterized by an externally tridentate protibia, with the proximal tooth usually much reduced in size by comparison with the other two. Only fully ornamented specimens are currently known for this species, with yellow-ochraceous to brownish-grey tomentum covering most of elytra and scutellar surfaces as well part of pronotum. In the latter, most often there are two symmetric elongate spots close to the lateral margins, but at least in one Cameroonian female these can be more extensive, converging towards the centre and merging to form an almost continuous discal band. The size of this species ranges from 13.4-15.0 mm in TL to 5.8-7.6 mm in MW (Bourgoin 1921; Holm & Perissinotto 2010). Adults appear to be active pretty much throughout the year and a female was found on one occasion inside an "ants nest" (TG data records) and another "resting on leaves" in dense rainforest (B. Le Rü pers. comm.). The larva and other immature stages remain completely unknown.

***Spilophorus (Prospilophorus) congoensis* sp. nov.**
(Figs 4, 5, 15)

Diagnosis. The two female specimens housed in the MRAC were previously confused with *S.* (*P.*) *aurifer*, by virtue of their superficial similarity with the HT female of that species. Several new specimens have recently been discovered in private collections and these include also a few males, thereby allowing a more detailed and comprehensive analysis of their diagnostic characters. The new species is also very close to *S.* (*P.*) *holmi* sp. nov. in size, distribution of tomentum and shape of clypeus. It differs, however, from that species in the arrangement of its tomentose spots (ornamented forms), by exhibiting an extremely narrow longitudinal carina on the pygidium, a longer and sharper protibial ventral tooth and a less straight mentum apical margin. The aedeagal parameres of the two species are also rather distinctive (Figs 4 and 12).

Type series. HT♂: Congo RPC **[Congo-Brazzaville]**: Kinkengue, Bouenza Reg., 05-1993. (TGMF). PTs, **Cameroon**: 1♀, Ebogo, 10.2010 (PLPF); **Congo-Brazzaville**: 2♂, Malele, Kouilou, 08-1999 (TGMF); 1♂+1♀, idem (PLPF); 5♂+1♀, idem (BLLF); 1♀, ibidem, 11-1999, B. Le Ru leg. (TGMF); 2♂, Mengo, Kouilou,

08-1999 (BLLF); 1♀, Matakall, Pool, 02-1992 (BLLF); 2♂+1♀, Voka, Pool, 10-1993 (PLPF); 1♀, ibidem, 11-1993 (PLPF); 1♀, ibidem, 11-1977, Rec. G. Onoré (RMCA-ENT-000049356);

Congo-Kinshasa: 1♀, Musée du Congo, Galli-Koku [Galikoko], Kasai, R. Carlier, Spilophoerus aurifer Westw., det. E. Holm 07 (RMCA-ENT-000049358); 1♀, Coll. Mus. Congo, Mayidi, -1942; Rév. P. Van Eyen, R. Dét C

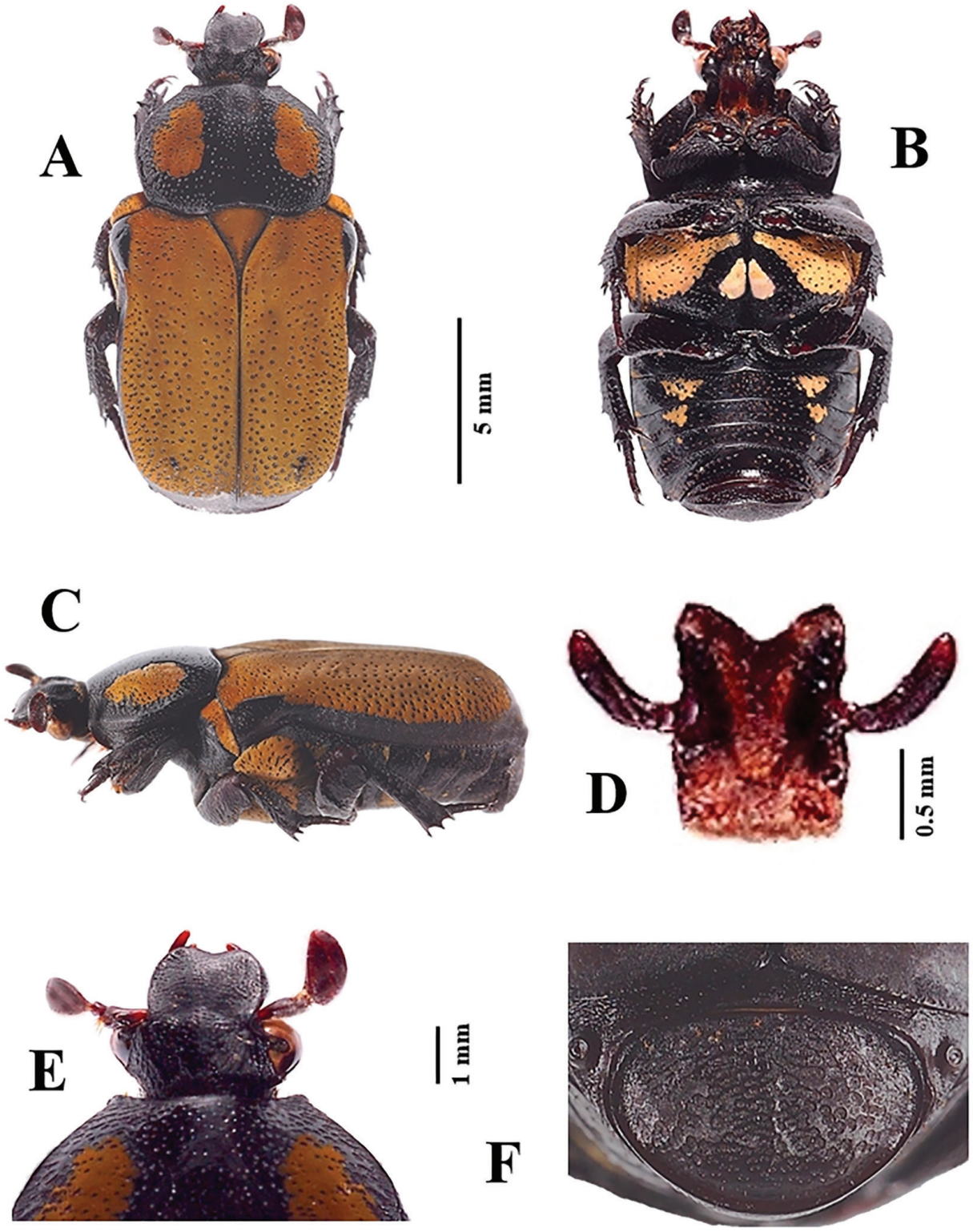

Fig. 3 – *Spilophorus* **(***Prospilophorus***)** *cervinus* Bourgoin, 1921, ♀ (Congo-Brazzaville, Kola): dorsal habitus **(A)**; ventral habitus **(B)**; lateral habitus **(C)**; mentum **(D)**; clypeus **(E)**; pygidium **(F)**. Photos: Bruno Le Rü.

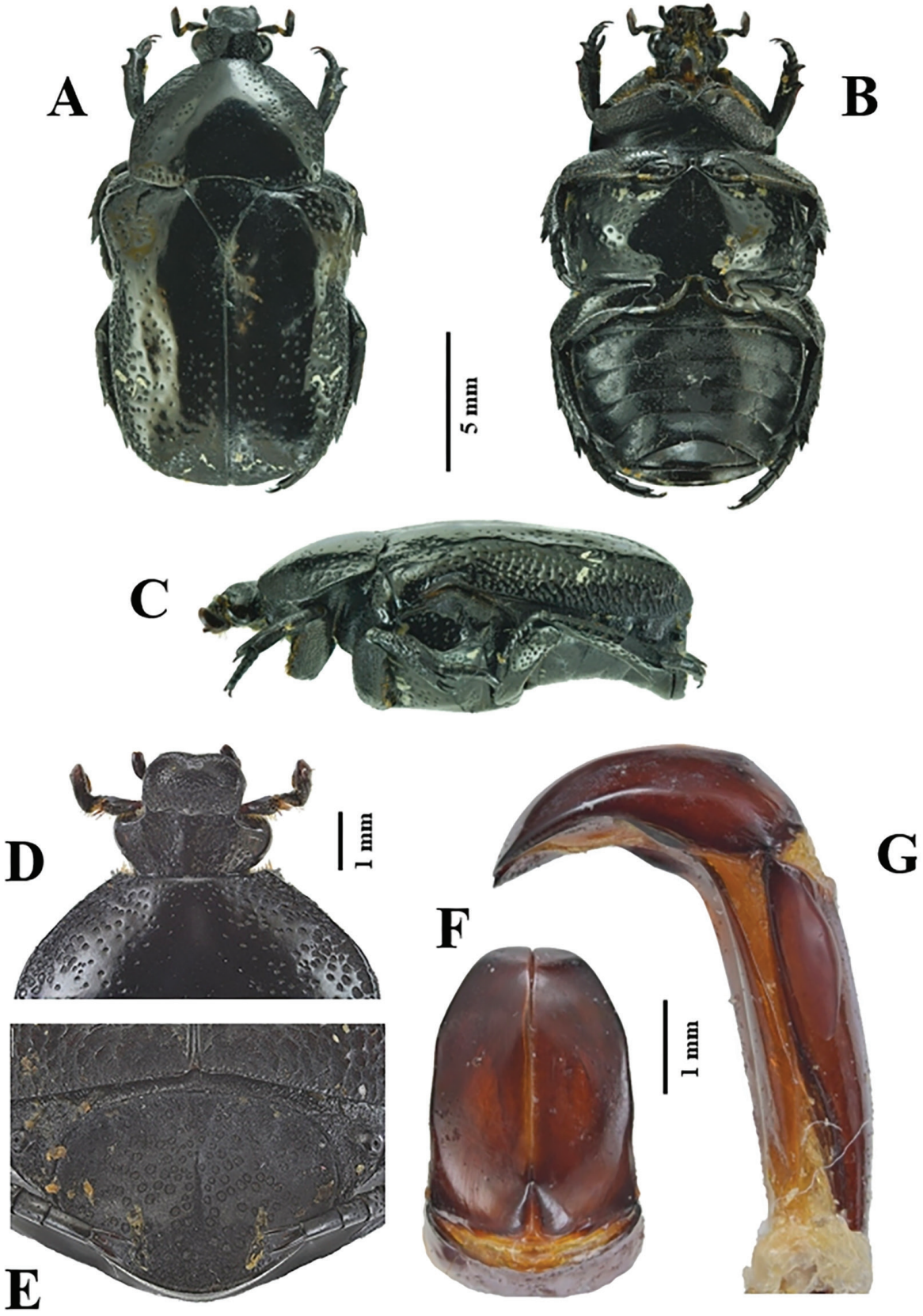

Fig. 4 – *Spilophorus* **(***Prospilophorus***)** *congoensis* **sp. nov**., HT♂ (Congo-Brazzaville, Kinkengue): dorsal habitus (**A**); ventral habitus (**B**); lateral habitus (**C**); clypeus (**D**); pygidium (**E**); aedeagal parameres, dorsal view (**F**); aedeagal parameres, lateral view (**G**). Photos: Gilles Flutsch.

92, Spilophorus aurifer Westw., det. E. Holm 07 (RMCA-ENT-000049359); 1♀ (19.5 mm), Zaire, Katanga, Zilo, 3-1991, Ex Collection Dr Vincent Allard, received from Christophe Allard 21.II.2015 (GBEG).

Description of holotype ♂

Size: 17.2 (TL) mm; 10.4 mm (MW).

Head. Entirely black, shiny and glabrous, covered in dense and rather deep round to elongate punctures, becoming wider

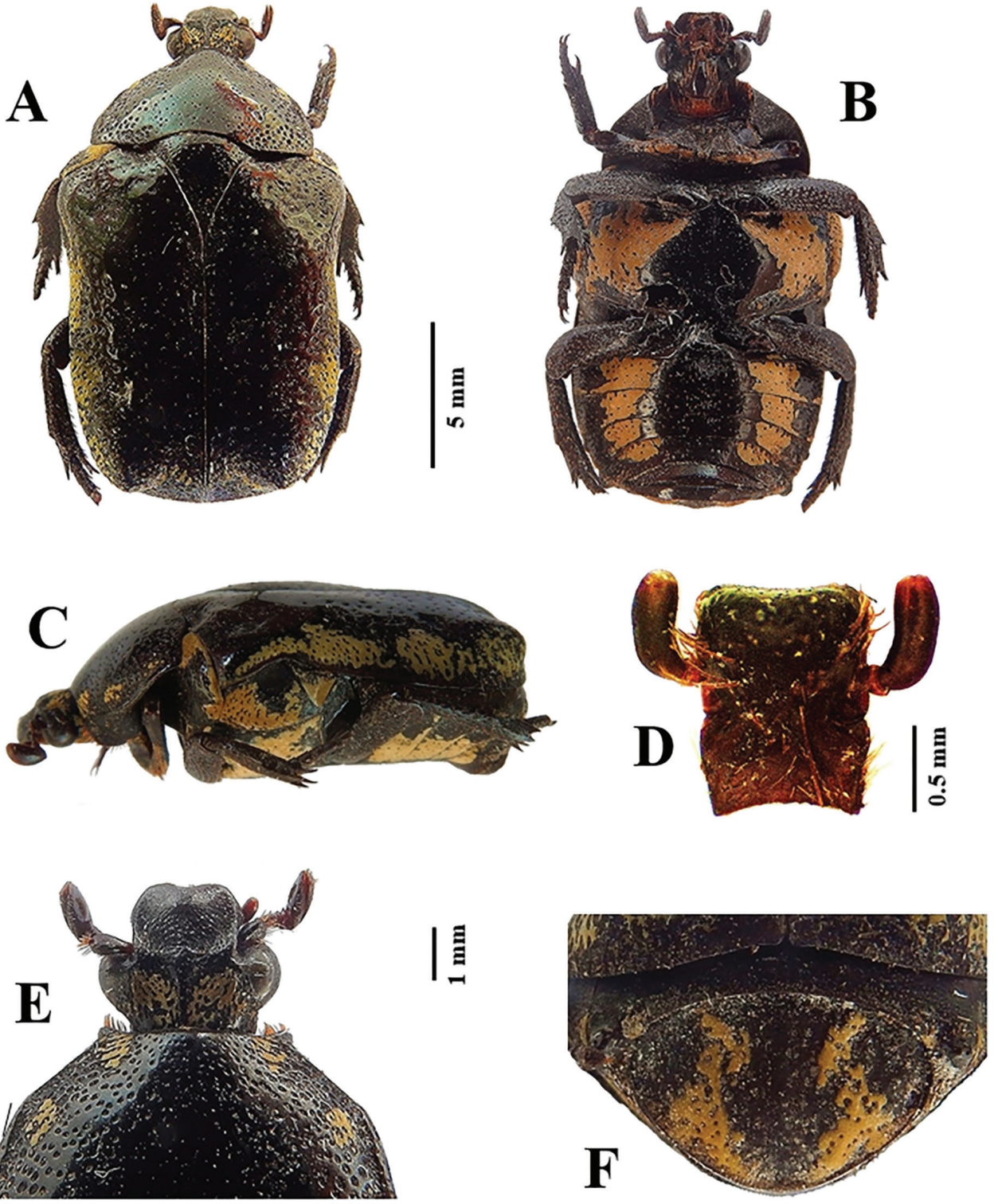

Fig. 5 – *Spilophorus* **(***Prospilophorus***)** *congoensis* **sp. nov**., PT♀ (Congo-Kinshasa, Galikoko): dorsal habitus (**A**); ventral habitus (**B**); lateral habitus (**C**); mentum (**D**); clypeus (**E**); pygidium (**F**). Photos: Lynette Clennell.

Fig. 6 – *Spilophorus* **(***Prospilophorus***)** *grandis* Schein, 1949 (South Africa, KZN, False Bay 16 Nov 2016): Aerial nest of *Crematogaster peringueyi* (Emery, 1895) **(A)**; male specimen found inside it **(B)**. Photos: Lynette Clennell.

and horse-shoe in shape on frons and vertex; clypeus with anterior depression and elevated margins, frontal margin bilobate and lateral margins outwardly expanded at middle; frons with elevated protuberance, continuing towards vertex as narrow ridge separating symmetric depressions (Fig. 4 A, D); antennal clubs black to dark brown, approximately as long as flagellum, with short tawny to dark setae present across entire antennal surface, becoming denser and longer on pedicel.

Pronotum. Trapezoidal, widest at base and exhibiting marked antescutellar arch, with sharp anterior corners but posterior ones mildly rounded; completely black, shiny and glabrous; disc barely sculptured with tiny, scattered round punctures and exhibiting triangular flattish to slightly depressed area at basal centre; regularly-spaced round punctures of medium size distributed across rest of surface, becoming larger and denser towards lateral and posterior margins (Fig. 4 A, D).

Scutellum. Triangular isoscelic, with declivous baso-lateral corners and apex; entirely black, shiny and glabrous, with scattered round punctures along perimeter area, but fading on disc and absent in central part (Fig. 4 A); lateral grooves deep but narrow, as is typical in all members of this subgenus.

Elytra. Black, shiny and glabrous, with marked depression on each side of scutellar base and along basal and median parts of suture; secondary depressions present also within the umbone and anteriad of apical callus; traces of creamy-yellowish tomentum present on apical and postero-lateral declivities, as v-shaped lines irregularly interrupted to form elongate maculae (Fig. 4 A, C); completely covered in small to medium round or horse-shoe punctures, becoming larger and more numerous along margins and declivities but very sparse on disc and calluses; scattered, tiny tawny setae visible only on apical and lower lateral declivities; sutural apices smoothly rounded and without projections.

Legs. Tarsi short and compact, tapering towards apex, with basal segments shortest and widest, except metatarsi where second last segment is wider than last; protibia bidentate on outer margin, with short but sharp inner tooth and long, arcuate spur; meso- and metatibia each with one external denticle in apical third (Fig. 4 A-C); all tibial surfaces densely sculptured with round to elongate or even reticulated punctures; setation generally short and scattered but present across all tibial and tarsal surfaces, becoming longer and denser on ventral ridges.

Pygidium. Black, glabrous and matte, with regularly-spaced, large but shallow punctures; broadly oval to hemicircular in shape, with all margins very smoothly rounded, with shallow bilateral baso-lateral depressions and very narrow median longitudinal ridge at centre; with traces of golden-cream tomentum in near-apical and lateral margins, in shape of elongate to irregular maculae (Fig. 4 E).

Venter. Black and shiny, with short tawny setae scattered across the whole surface except mesometasternal

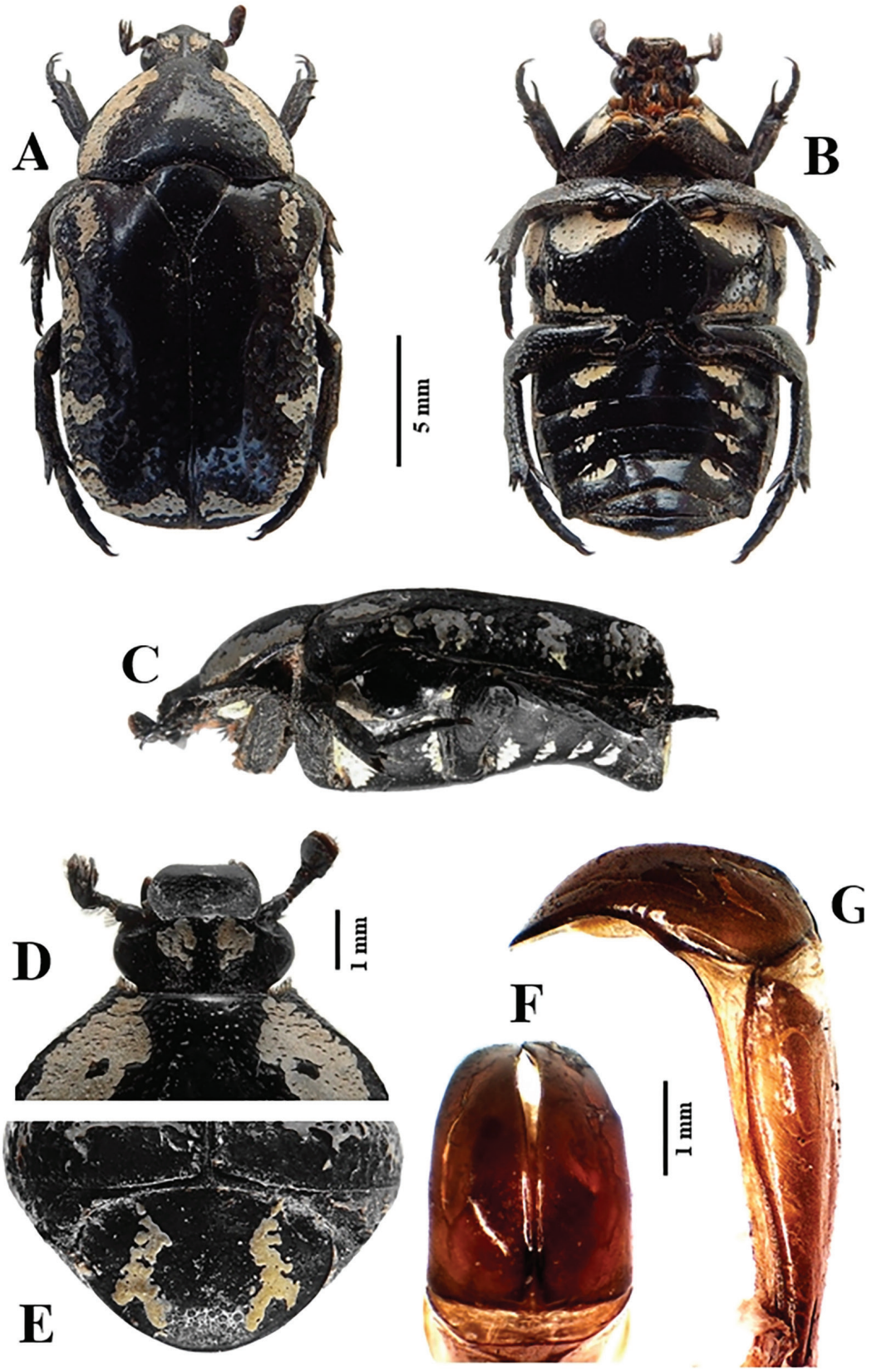

Fig. 7 – *Spilophorus* **(***Prospilophorus***)** *grandis* Schein, 1949, ♂ (South Africa, False Bay KZN): dorsal habitus **(A)**; ventral habitus **(B)**; lateral habitus **(C)**; clypeus **(D)**; pygidium **(E)**; aedeagal parameres, dorsal view **(F)**; aedeagal parameres, lateral view **(G)**. Photos: Lynette Clennell.

area and abdominal ventrites, becoming denser, darker and longer along prosternal spine, posterior femoral margins, mouth parts and head joint; small, round punctures across entire surface, becoming larger but more scattered on mesometasternal area and abdominal ventrites; small creamy-yellow tomentose areas visible only on metasternum and metepisternum; abdominal ventrites 1-6 medially flat to slightly depressed; mesometasternal process wide and triangular, but laterally constrained towards base, mesosternal lobe tiny, rounded and not protruding (Fig. 4 B); mentum with apical margin slightly sinuate at centre, with lateral margins subparallel but slightly indented below palp attachment and with long tawny setae in peripalpal region (Fig. 5 D),

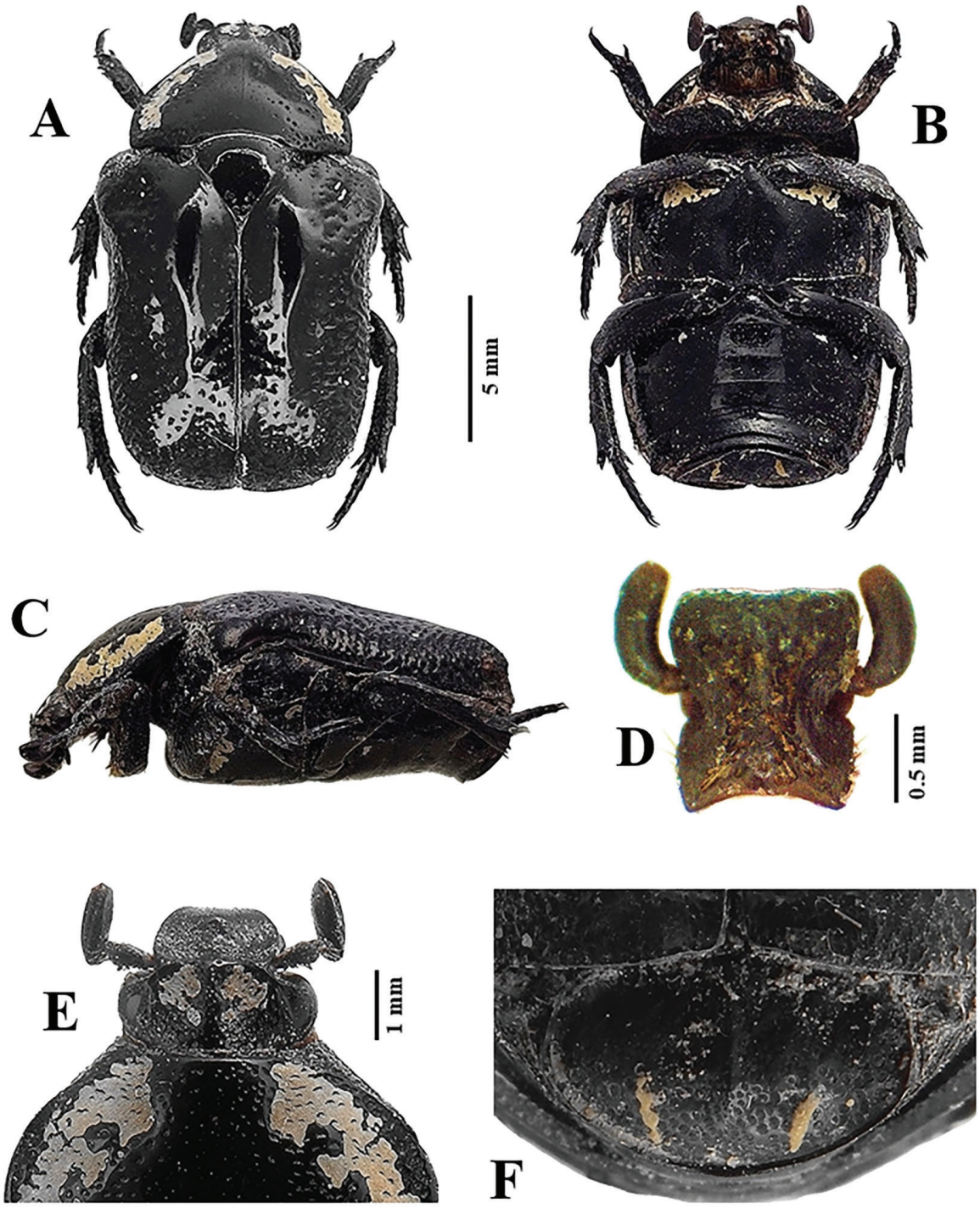

Fig. 8 – *Spilophorus* **(***Prospilophorus***)** *grandis* Schein, 1949, ♀ (South Africa, False Bay KZN): dorsal habitus **(A)**; ventral habitus **(B)**; lateral habitus **(C)**; mentum **(D)**; clypeus **(E)**; pygidium **(F)**. Photos: Lynette Clennell.

Aedeagus. Parameres subparallel in dorsal view, tapering smoothly in apical third; two sides perfectly matching at centre without gap (Fig. 4 F); smoothly rounded dorsally and sharply pointed at apex in lateral view, with ventral lobes markedly expanding in basal half (Fig. 4 G).

Derivatio nominis. The species is named after the broad region of the Congo Basin, where the vast majority of the specimens currently known originates from.

Distribution. Of the eight specimens currently known, three originate from the southern provinces of Congo-Kinshasa (DRC), while all the others are from Congo-Brazzaville and one even from southern Cameroon (Fig. 15).

Remarks. The size of specimens range from 14.7-18.2 mm (TL) to 8.8-10.4 mm (MW). Most specimens known for this species are almost completely black like the HT, but exhibit residual amounts of tomentum or clay-like layers on the postero-lateral and apical declivities of their elytra, as well as on metasternum, metepisternum and some marginal portions of abdominal ventrites 1-6. At least two small oblique tomentose spots can also be seen regularly on the apical region of their pygidium. Only the female represented in Fig. 5 has a more expanded cover of tomentum on its dorsal, ventral and pygidial surfaces. There is also some variation in dorsal sculpture among specimens, particularly in the area of the humeral callus and elytral disc, but this does not appear to represent a form of sexual dimorphism, as it is equally noticeable in both males and females.

Most of the specimens originating from Congo-Brazzaville were collected at dusk with light traps (B. Le Rü pers. comm.). Here, the species appears to be partially sympatric with both *S.* (*P.*) *superbus* sp. nov. and *S.* (*P.*) *cervinus*, but there is habitat segregation between the three of them, with S. (*P.*) *congoensis* inhabiting areas with mosaic of forests and savannah, usually at altitudes below 200 m, and the other two occurring in dense rainforest areas at mid-altitudes of ± 500 m (B. Le Rü pers. comm.).

Spilophorus (*Prospilophorus*) *grandis* Schein, 1949

(Figs 6-10, 15)

Spilophorus (*Pseudospilophorus*) *grandis* Schein, 1949: 306–8.

Spilophorus grandis. Marais & Holm 1992: 73; Krajčík 1999: 30.

Spilophorus (*Prospilophorus*) *grandis*. Holm & Perissinotto 2010: 52; Krajčík 2024: 226.

Diagnosis. Its close resemblance with *S.* (*P.*) *holmi* sp. nov., described further down, has led to the past confusion and mixing up of characters between the two species. As explained in greater detail under the description of the latter species, the two can be separated mainly on the basis of the colour of their tomentum (white-cream in *S.* (*P.*) *grandis* rather than golden-cream like in *S.* (*P.*) *holmi*), and the size of the protibial ventral tooth, which is rather well- developed in *S.* (*P.*) *grandis* but atrophic in *S.* (*P.*) *holmi*. Also, the central gap between right and left lobes of the aedeagal parameres is virtually obsolete in the latter species, while it is rather wide in the former, as a result of the markedly arcuate inner margins of its lobes.

Data Records. Type series. HT♀, **[South Africa]**: Barberton [S25°47' E31°03'], 2.1906, Miss de Beer, Typus *Spilophorus grandis* m. det. Schein, München (TMSA).
Other records. **South Africa**: 1♀, KZN, False Bay [S 27°58', E 32°23'], 27 Mar 2010, Drowned on lake shores, R Perissinotto & L Clennell (RPGS); 1♀, idem, 2 Apr 2010 (BMCS); 2♂, idem, 2 May 2010 (BMCS); 1♂, idem, 16 May 2010 (RPGS); 1♀, idem, Nov 2015 (TGMF); 2♂+1♀, ibidem, 11 Nov 2016, Inside aerial nests of *Crematogaster peringueyi*, R Perissinotto & L Clennell (RPGS) (Fig. 6).

Redescription

Size. 16.2-20.4 mm (TL); 8.7-11.6 mm (MW) (n = 9).
Head. Anterior clypeal margin bilobate but without transverse ridge; middle of clypeus bulbous; vertex with rounded median ridge, separating two symmetric tomentose depressions on each side, and distal bilateral oblique ridge extending to base of ocular canthus; antennal clubs short, approximately as long as flagellum, short to medium dark setae present across entire antennal surface, becoming denser and longer on pedicel (Figs 7-10).

Pronotum. Trapezoidal, widest at base, with irregular white-cream tomentose lining along sides, forming an eye-shape on anterior third in several cases (Figs 7-10); asetose but with numerous punctures, fine and scattered on disk becoming large and umbilicate towards sides and semi-confluent in mid marginal area.

Scutellum. Triangular, asetose and without tomentum; with smooth disc and fine sparse punctures along base, becoming dense and coarse at apex (Figs 7-10).

Elytra. Depressed at sides of scutellar base, from scutellar apex along suture, inside humeral callus and anteriad of apical callus; with minuscule white-cream tomentum spots within humeral callus and mid lateral declivity in partly-ornamented specimens (Figs 8 and 9), but large and distributed in irregular spots along lateral and apical declivities in fully-ornamented specimens (Figs 7 and 10); sculpture horseshoe to umbilical, absent on baso-sutural elevations, becoming contiguous and forming dense network of ridges on lateral and apical declivities.

Legs. Tarsi short and robust, tapering gradually towards apex, with basal segments shortest and widest; meso- and metatibia with one median external denticle; protibia with two denticles on outer dorsal side, apical longer and pre-apical shorter (Figs 7-10); setation limited to ventral ridges, with setae generally numerous but short,

Fig. 9 – *Spilophorus* **(***Prospilophorus***)** *grandis* Schein, 1949, HT♀ (South Africa, Barberton): dorsal habitus **(A)**; ventral habitus **(B)**; lateral habitus **(C)**; clypeus **(D)**; pygidium **(E)**; labels **(F)**. Photos: Werner Strümpher.

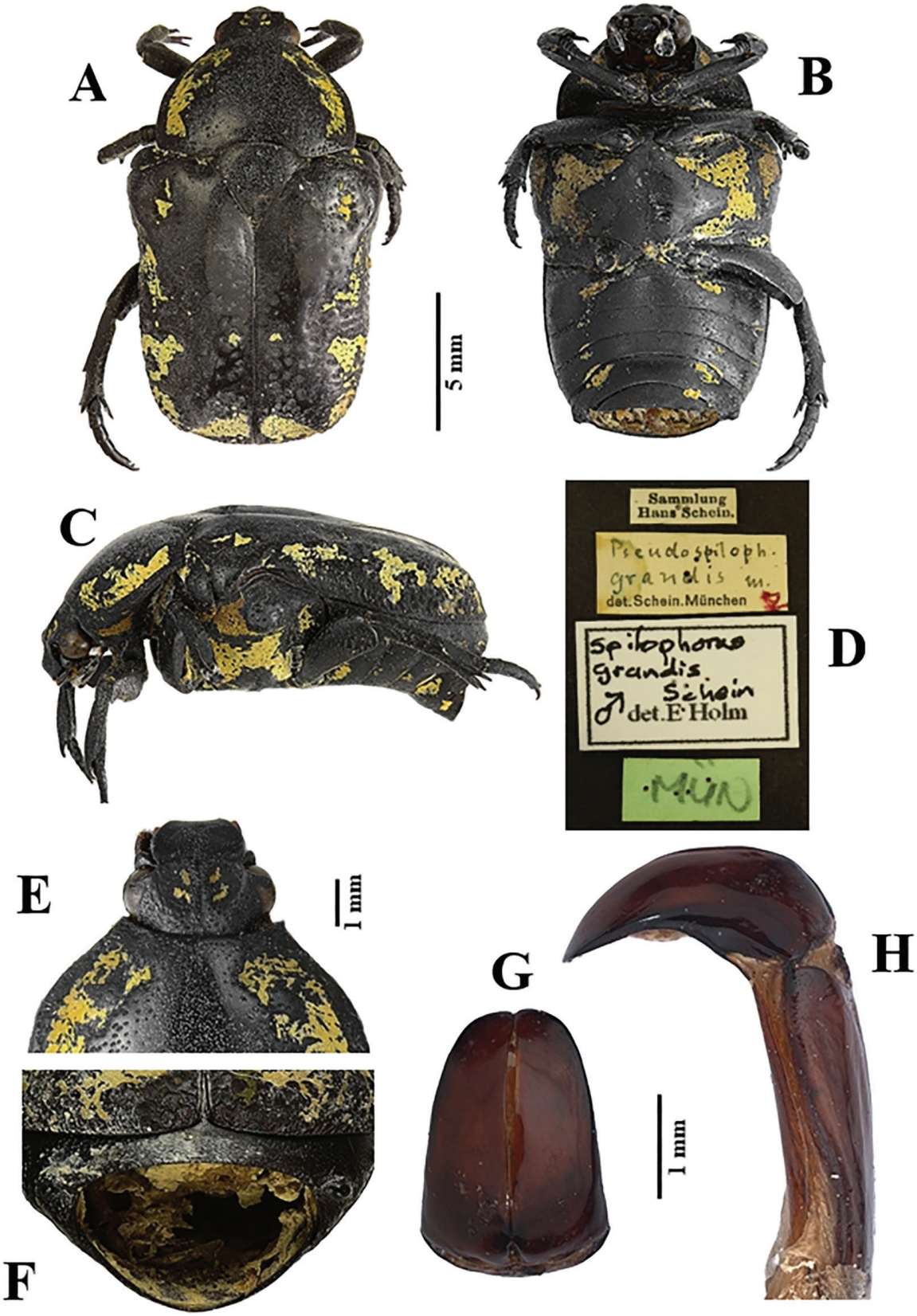

Fig. 10 – *Spilophorus* **(***Prospilophorus***)** *grandis* Schein, 1949, Schein's ♂ (No locality): dorsal habitus **(A)**; ventral habitus **(B)**; lateral habitus **(C)**; labels (**D**); clypeus (**E**); pygidium (plate missing) **(F)**; aedeagal parameres, dorsal view **(G)**; aedeagal parameres, lateral view **(H)**. Photos: Werner Strümpher.

except at tibial-femoral joint where clusters of longer setae are present; tibial joints with white-cream tomentose spots in the most ornamented specimens.

Pygidium. With symmetrical white-cream to ochraceous tomentose marks, in the shape of discontinuous sigmoid fading in the basal region, halfway between median protuberance and lateral basal depressions; with round umbilicate sculpture spread throughout (Figs 7-10).

Venter. Black, asetose except on prosternum, where long light-brown setae line both spine and margins; with few short setae also on margins of abdominal ventrites 5 and 6; with white-cream tomentose spots always on mesepimeron, metasternum, metepisternum and also on proepisternum, metacoxa and abdominal ventrites 1-6 in fully-ornamented specimens (Figs 7 and 10); all abdominal ventrites except anal plate deeply, roundly depressed medially in male (Figs 8 and 11), but substantially less so in female (Figs 8 and 9).

Aedeagus. Parameres asetose, broad, simple and sub-contiguous with dorsal lobes partly separated along midline; with thin black lining on edges (Figs 7 and 10).

Distribution. With the exception of the HT female, which originates from Barberton (Mpumalanga Province) (Fig. 9), all specimens recorded thus far were collected within an area of a few km^2 along the lake shores of False Bay, in north-eastern KwaZulu-Natal (Fig. 15).

Remarks. The male specimen without collecting data (carrying only Schein's identification label as "Pseudospilophorus grandis m. det. Schein, München") and belonging to the ZSMC, has now been traced in the TMSA (Fig. 10). An analysis of its key characters has shown that it belongs to *S.* (*P.*) *grandis*. It was probably part of the material that Schein had received during the "Swedish Expedition to Southern Africa (1950-1951)", as responsible for the compilation of the Cetoniinae chapter of the South African Animal Life book series (Schein 1960).

Spilophorus (*P.*) *grandis* is the largest species in the genus, attaining a total body length in excess of 2 cm. A white-cream band on the lateral sides of pronotum, interrupted in the apical region (Figs 7-10) appears to be a consistent feature of the specimens so far known, while no completely black forms have been found yet. Most specimens were found dead, probably drowned during the previous weeks/months, but in good conditions, between the end of March and the middle of May 2010. Their preservation had most probably been secured by the persistence of hypersaline conditions (salinity in the range of 95-220 psu) in lake waters during that year. Thus, this species appears to be mainly linked to the sand forest vegetation that is typically found in areas of the False Bay Reserve and its record in the north-eastern Drakensberg region at Barberton may be related to dispersal movements along the connecting Lebomboberge corridor (cf. Holm & Stobbia 1995).

With the limited sample size currently available, it appears that sexual differences may be limited to the more deeply depressed abdominal ventrites of the male by comparison with those of the female, as is the case with most other species of the genus. The degree of ornamentation is approximately the same in seven out of the nine specimens known so far (Figs 7-10), and there appears to be no complete nigrito form, unlike in *S.* (*P.*) *holmi.* However, Schein's specimen and another male exhibit a more extensive ornamentation, with tomentum on the dorsal side for instance distributed not only on the sides of the pronotum, but also in irregular spots along the elytral lateral half and apical declivity (Figs 7 and 10).

In 2016, three specimens were found inside aerial nests of *Crematogaster peringueyi* (Emery, 1895), thereby confirming the association of this species with ants, in a similar fashion to that reported for *S.* (*P.*) *holmi* described here below. Their frequency of occurrence inside these nests does not appear to be high though, as out of a total of eight nests investigated on the occasion only two had adult beetles inside. None of them was found to contain larvae or other immature stages. Thus, the medium of larval development and indeed the morphology and habits of all the immature stages remain completely unknown.

***Spilophorus* (*Prospilophorus*) *holmi* sp. nov.**
(Figs 11, 12, 15)

Diagnosis. A revised in-depth analysis has revealed that the Tanzanian specimens are substantially different to those of the series retrieved from the False Bay region of KZN, and from the HT female from Barberton originally used in the description of *S. grandis* by Schein (1949). Superficially, this new species differs from *S.* (*P.*) *grandis* by exhibiting: 1) golden-cream, rather than white-cream, tomentum across the body (Figs 12 and 13); 2) an atrophic tooth and relatively scattered setation on the ventral side of the protibia (Fig. 12 B), while these are substantially more developed in *S.* (*P.*) *grandis*. The central longitudinal ridge on the frons of *holmi* is also smoother and less elevated than in *grandis,* and the basal attachment of the labium is narrower and more laterally constrained in the former than the latter species. Its aedeagal parameres are gradually tapering in the apical half, rather than abruptly as in *S.* (*P.*) *grandis*, and the central gap between right and left lobes is virtually obsolete, while it is rather wide in the latter species as a result of the markedly arcuate inner margins of its lobes (Fig. 11 F, G). The two species also live in drastically different habitats, with *S.* (*P.*) *grandis* mainly restricted to the coastal sand forests of KwaZulu-Natal and *S.* (*P.*) *holmi,* on the other hand, occurring in tropical rainforests on the lower slopes of the Uluguru Mountains.

Type series. HT♂: **[Tanzania]**: Tanzanie, Mts Uluguru, Kiroka, for. héliophile, nids Crematogaster, alt. 725 m, 27-

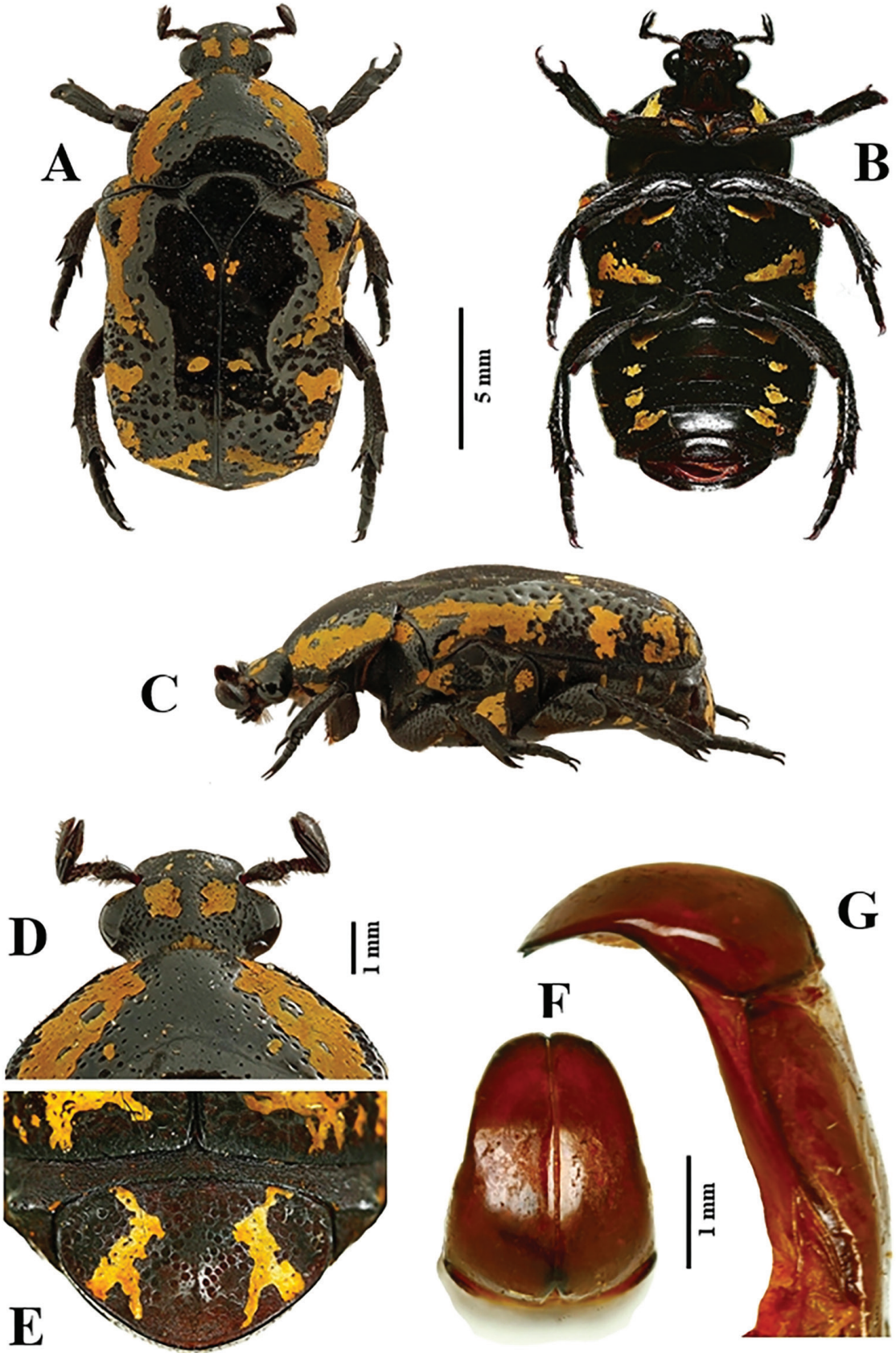

Fig. 11 – *Spilophorus* **(***Prospilophorus***)** *holmi* **sp. nov**., HT ♂ (Tanzania, Morogoro): dorsal habitus (**A**); ventral habitus (**B**); lateral habitus (**C**); clypeus (**D**); pygidium (**E**); aedeagal parameres, dorsal view (**F**); aedeagal parameres, lateral view (**G**). Photos: Stéphane Hanot.

31/V/71, Coll. Mus. Tervuren, Mission Mts Uluguru, L. Berger, N. Leleup, J Debecker V/VIII/71, R. Det. 7937 B. (RMCA-ENT-000049326). PTs, **Tanzania**: 1♀, idem (RMCA-ENT-000049343); 1♀, idem (RMCA ENT 000049349 → RPGS); 1♂, idem (RMCA-ENT-000047933);
1 ind., idem (RMCA-ENT-000049304); 1 ind., idem (RMCA-ENT-000049305); 1 ind., idem (RMCA-ENT-000049306); 1 ind., idem (RMCA-ENT-000049307); 1 ind., idem (RMCA-ENT-000049308); 1 ind., idem (RMCA-ENT-000049309); 1 ind., idem (RMCA-ENT-000049313); 1 ind., idem (RMCA-ENT-000049314); 1 ind., idem (RMCA-ENT-000049315); 1 ind., idem (RMCA-ENT-000049316); 1 ind., idem (RMCA-ENT-000049317); 1 ind., idem (RMCA-ENT-000049318); 1 ind., idem (RMCA-ENT-000049319); 1 ind., idem (RMCA-ENT-000049323); 1 ind., idem (RMCA-ENT-000049324); 1 ind., idem (RMCA-ENT-000049325); 1 ind., idem (RMCA-ENT-000049326); 1 ind., idem (RMCA-ENT-000049327); 1 ind., idem (RMCA-ENT-000049328); 1 ind., idem (RMCA-ENT-000049329); 1 ind., idem (RMCA-ENT-000049333); 1 ind., idem (RMCA-ENT-000049334); 1 ind., idem (RMCA-ENT-000049335); 1 ind., idem (RMCA-ENT-000049336); 1 ind., idem (RMCA-ENT-000049338); 1 ind., idem (RMCA-ENT-000049339); 1 ind., idem (RMCA-ENT-000049344); 1 ind., idem (RMCA-ENT-000049345); 1 ind., idem (RMCA-ENT-000049346); 1 ind., idem (RMCA-ENT-000049347); 1 ind., idem (RMCA-ENT-000049348); 1 ind., idem (RMCA-ENT-000049353); 1 ind., idem (RMCA-ENT-000049354); 1 ind., idem (RMCA-ENT-000049355); 1♂, idem (RMCA-ENT-000047933); 1 ind., idem (RMCA-ENT-000047934); 1 ind., idem (RMCA-ENT-000047935); 1 ind., idem (RMCA-ENT-000047936); 1 ind., idem (RMCA-ENT-000047937); 1 ind., idem (RMCA-ENT-000047938); 1 ind., idem (RMCA-ENT-000047939); 1 ind., idem (SRSF); 1♂ (19 mm), ibidem, Ex Collection Dr Vincent Allard, received from Christophe Allard 21.II.2015 (GBEG); 1♀ (19.5 mm), idem (GBEG); 1♂ (20 mm), idem, R. Det. 7937 B. (GBEG); 1♂, ibidem, Spilophorus grandis Schein, G. Ruter det. 1975 (RMCA-ENT-000049303 → RPGS).

Description of holotype ♂

Size: 19.5 (TL) mm; 12.2 mm (MW)

Head. Surface black, shiny and glabrous, with small tomentose areas on vertex, completely covered in large but shallow round punctures; clypeus with deep anterior depression and sharply elevated margins, frontal margin bilobate; clypeal frons bulbous, but without sharp ridge; vertex with rounded median ridge, separating small golden-cream tomentose depression on each side, delimited by bilateral oblique ridges at base of ocular canthus (Fig 11 A, C, D); antennal clubs relatively short, approximately as long as flagellum, short tawny setae present across entire antennal surface, becoming denser on pedicel.

Pronotum. Trapezoidal, widest at base and exhibing marked antescutellar arch, with posterior corners smoothly rounded, but anterior corners rather sharp; with continuous lateral bands of golden-cream tomentum, irregularly defined towards disc; disc black, shiny and glabrous with small and scattered round punctures, becoming larger and denser towards lateral and posterior margins; lateral margins exhibiting occasional short tawny setae (Fig. 11 A, C).

Scutellum. Triangular isoscelic, with declivous baso-lateral corners and apex; entirely black, shiny and glabrous, with smooth depression on disc and few round punctures in periapical and latero-basal regions (Fig. 11 A).

Elytra. Black, shiny and glabrous, with marked depression on each side of scutellar base, along the basal and median parts of suture, within humeral callus and anteriad of apical callus; with large patches of golden-cream tomentum on lateral and apical declivities as well as on humeral callus, also small spots on sides of suture and at margins of disc in central region; (Fig. 11 A, C); small and scattered round to horseshoe punctures across disc, becoming larger and more numerous along margins and declivities, often with umbilical shape; sutural apices smoothly rounded and without projections.

Legs. Tarsi typically short and compact, tapering towards apex with basal segments shortest and widest, except metatarsi where second last segment is wider than last; protibia bidentate on outer margin, with small and rounded inner tooth but rather thick and long spur; meso-and metatibia (Fig. 11 A, B) each with one external denticle in apical third; all tibial surfaces densely sculptured with round to elongate or even reticulated punctures, setation extremely short and scattered, limited to ventral ridges.

Pygidium. Black and glabrous, but matte; hemicircular in shape, with all margins very smoothly rounded, with bilateral baso-lateral depressions and weak median protuberance at centre; with longitudinal bilateral golden-cream tomentose bands of irregular shape; (Fig. 11 E); regular round to umbilicate sculpture present across entire surface.

Venter. Black, shiny and generally glabrous except along prosternal spine, posterior femoral margins, mouth parts and head joint, where tawny to brown setae can become numerous and even long, particularly on head surface; with golden-cream tomentose areas on proepisternum, mesepimeron, metasternum, metacoxa and lateral parts of all abdominal ventrites, except last; abdominal ventrites 1-6 deeply, roundly depressed medially; mesometasternal process wide and roughly bottle-shaped, mesosternal lobe tiny, squarely rounded and not protruding; mentum with apical margin straight, with lateral margins tapering gently towards base and indented around palp attachment, with few thick tawny setae above palp attachment (Fig. 11 B).

Aedeagus. Parameres short and wide, with typical conservative *Prospilophorus* shape; broad, simple and sub-contiguous with dorsal lobes not exhibiting any separation along midline, but only small sutural depression on each side; with thin dark lining on edges (Fig. 11 F, G).

Derivatio nominis. The species is named after the renowned South African entomologist Erik Holm (ex University of Pretoria, South Africa), in recognition of his fundamental contribution to the knowledge of this Cetoniinae genus and for pioneering the analysis of the long series belonging to this species housed at MRAC.

Distribution. All records available so far are from the lower slopes (725 m) of the Uluguru Mountains in eastern Tanzania (Fig. 15).

Remarks. The series from the Uluguru Mountains housed in the MRAC, and reported in Holm & Perissinotto (2010)

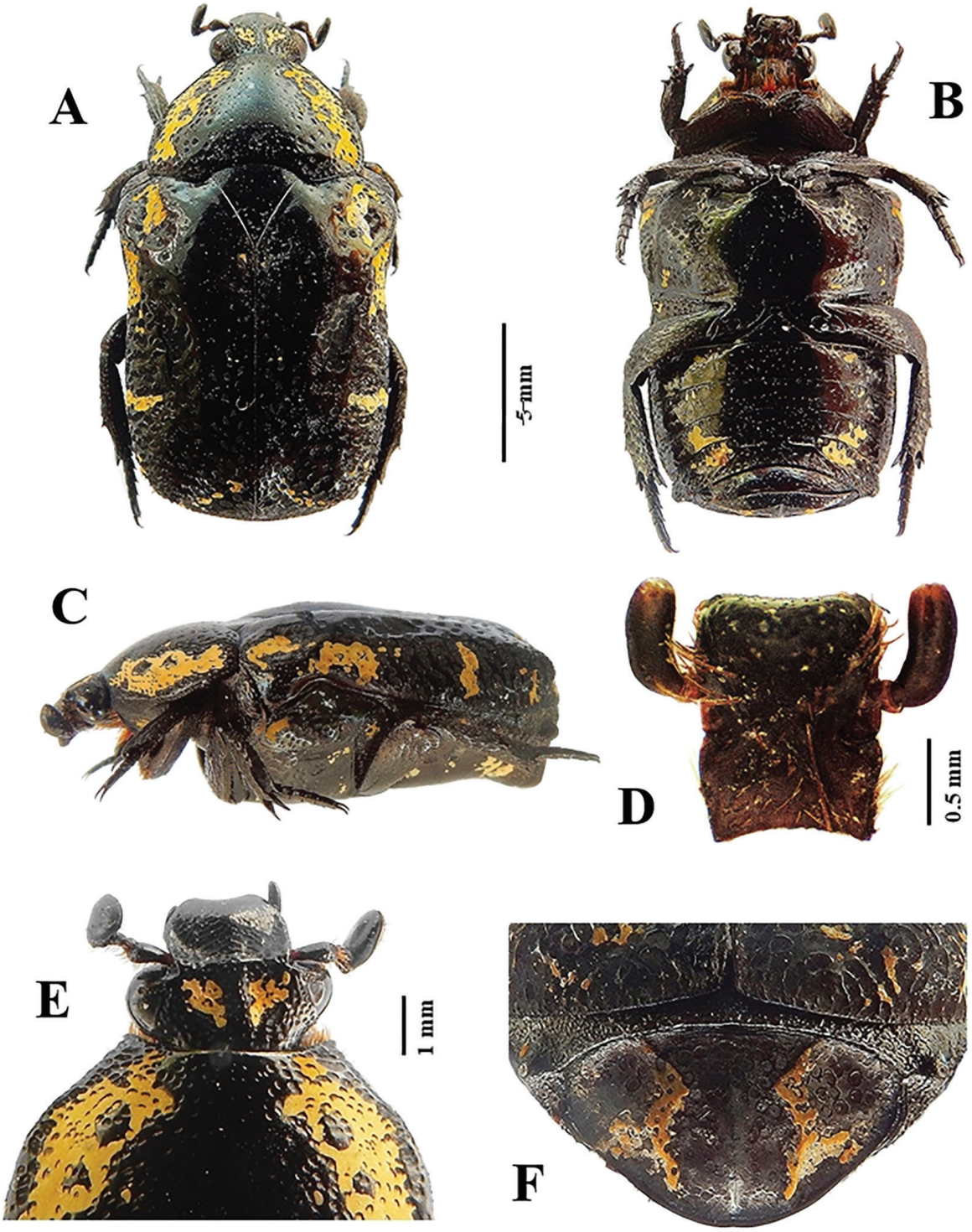

Fig. 12 – *Spilophorus* **(***Prospilophorus***)** *holmi* **sp. nov**., PT♀ (Tanzania, Morogoro): dorsal habitus (**A**); ventral habitus (**B**); lateral habitus (**C**); mentum (**D**); clypeus (**E**); pygidium (**F**). Photos: Lynette Clennell.

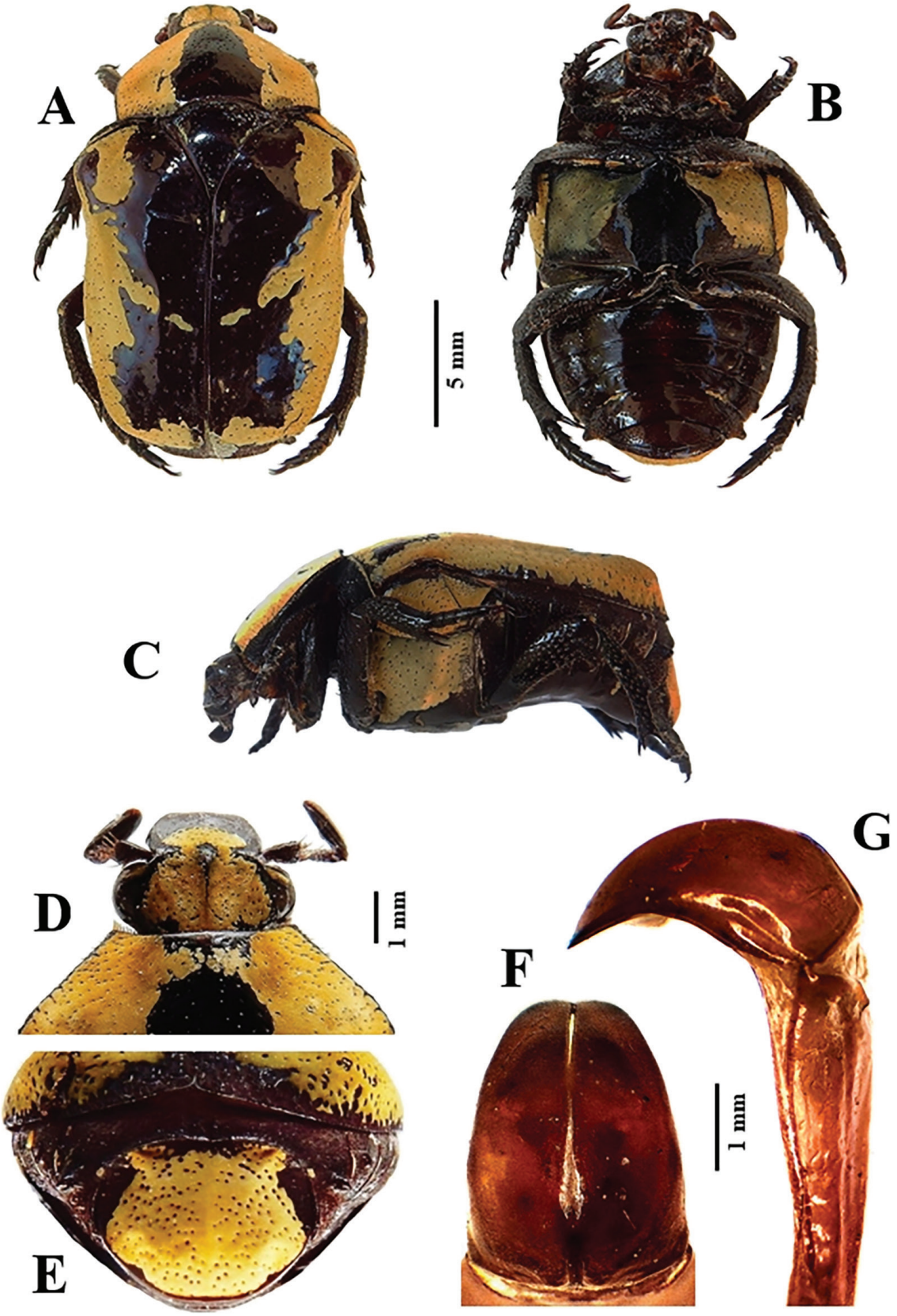

Fig. 13 – *Spilophorus* **(***Prospilophorus***)** *superbus* **sp. nov**., HT♂ (Cameroon, Meniam): dorsal habitus (**A**); ventral habitus (**B**); lateral habitus (**C**); clypeus (**D**); pygidium (**E**); aedeagal parameres, dorsal view (**F**); aedeagal parameres, lateral view (**G**). Photos: Lynette Clennell.

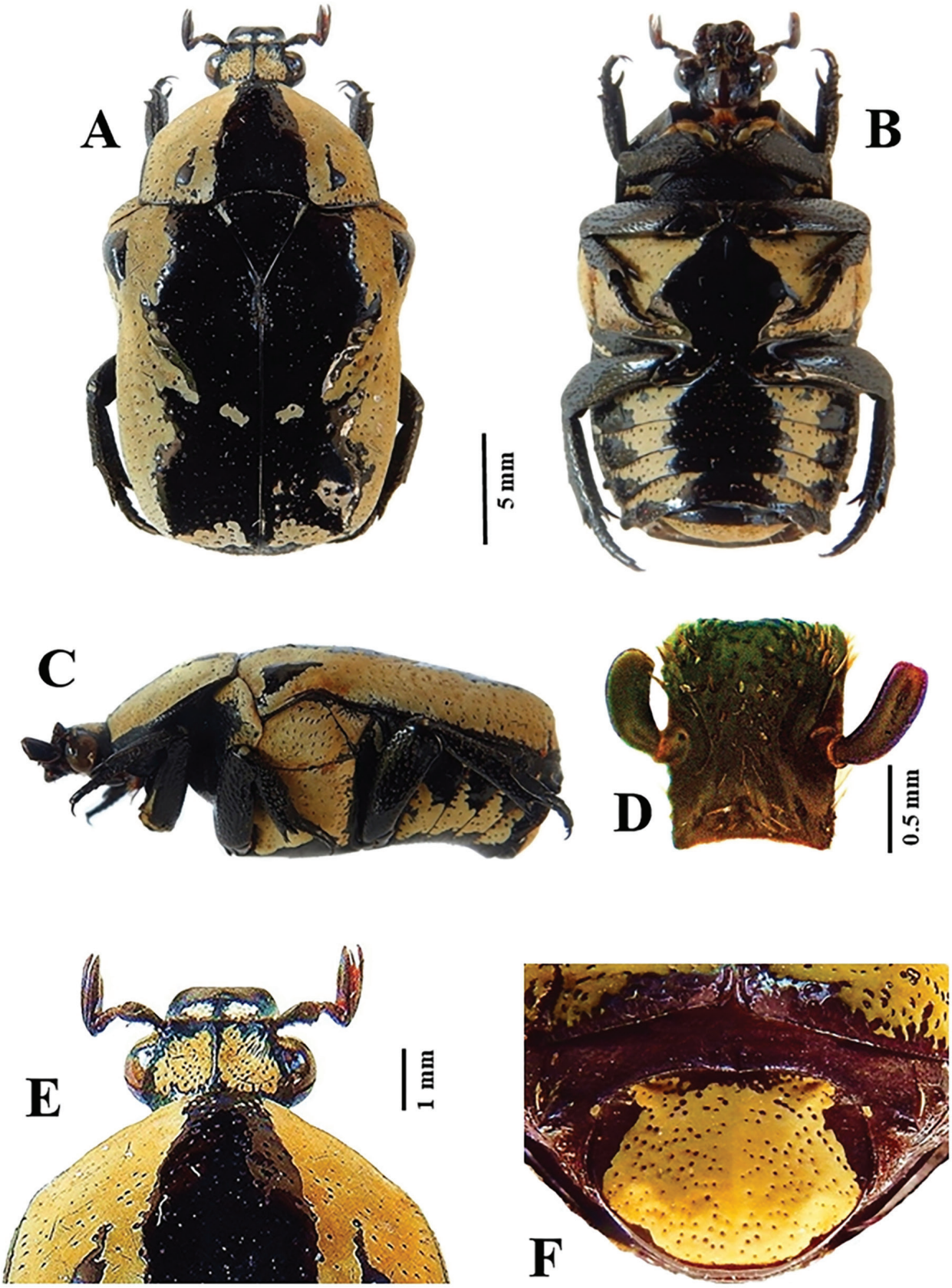

Fig. 14 – *Spilophorus* **(***Prospilophorus***)** *superbus* **sp. nov**., PT♀ (Cameroon, Ebogo): dorsal habitus (**A**); ventral habitus (**B**); lateral habitus (**C**); mentum (**D**); clypeus (**E**); pygidium (**F**). Photos: Lynette Clennell.

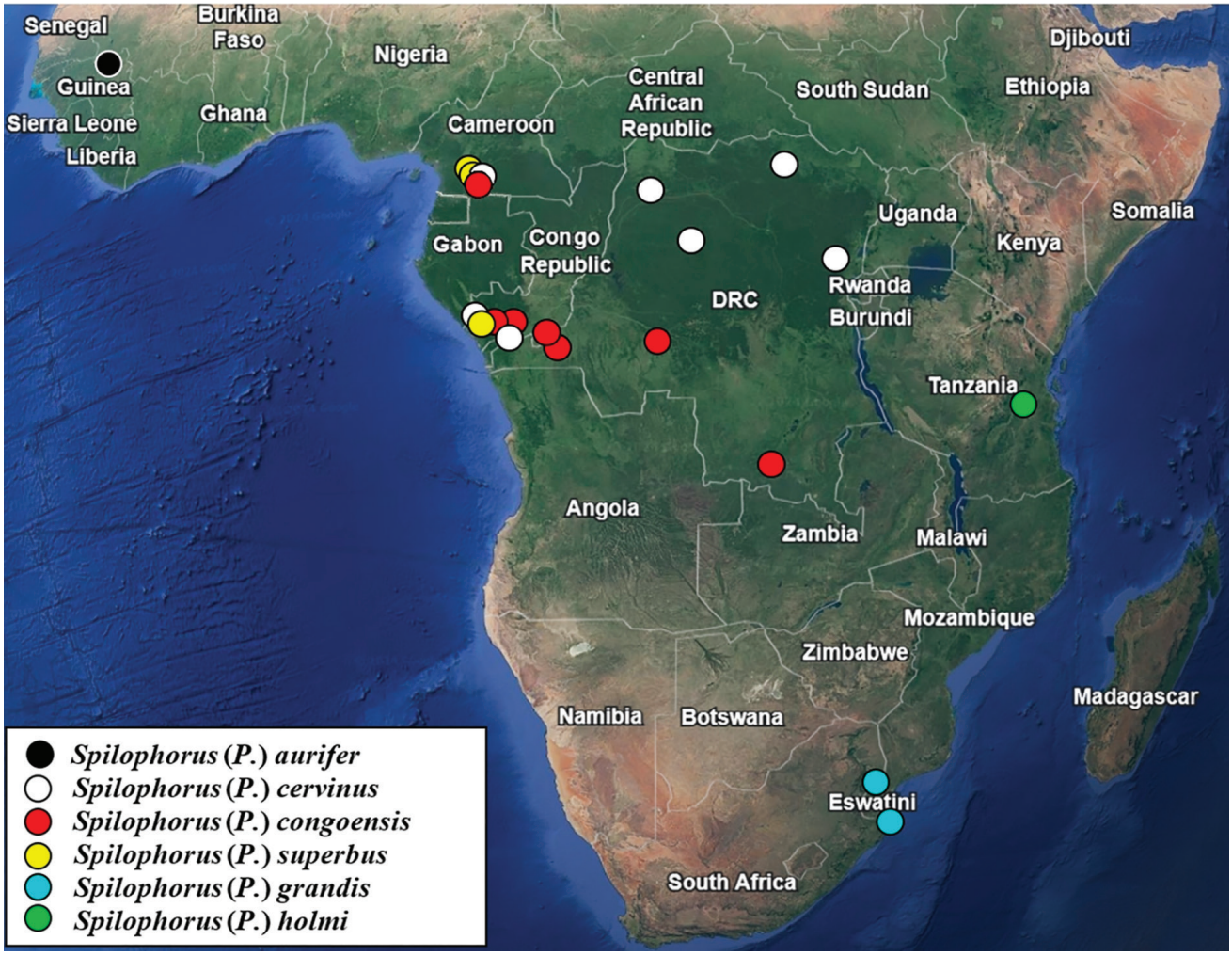

Fig. 15 – *Spilophorus* **(***Prospilophorus***)** subgenus: Known distribution range of the species within the Afrotropical Realm (Map: Google Earth Pro with image from Landsat/Copernicus 12/14/2015).

as comprising two males and five females, is actually much larger and consists of 44 specimens in total. Of these, 34 (77.3%) are fully ornamented with ochreous-yellow bands and spots, 4 (9.1%) are only partly ornamented exhibiting an entire band on pronotum but only small/residual spots on the elytra, and 6 (13.6%) are completely black. Variations in degree of ornamentation are not sex-linked, as totally black and well-ornamented specimens occur in both sexes. The sexual differences are limited to the more depressed abdominal ventrites in the male by comparison with those rather flattish of the female (Fig. 12). Specimen size ranges between 16.2-19.5 (TL) mm and 9.4-12.2 mm (MW). The entire Tanzanian series was found in late May inside arboreal nests of *Crematogaster* Lund, 1831 ants.

***Spilophorus* (*Prospilophorus*) *superbus* sp. nov.**
(Figs 13-15)

Diagnosis. This rather striking species is similar to *S.* (*P.*) *aurifer*, but significantly larger in size and lacking median carina on the pygidium. Its tomentose ochreous-yellow ornamentation is also drastically more extensive than in *S.* (*P.*) *aurifer*, covering most of head, pronotum, pygidium and approximately half of the elytral surface. Unfortunately, comparisons of aedeagal parameres cannot be undertaken at this stage, as the male of *S.* (*P.*) *aurifer* is yet unknown (Holm & Perissinotto 2010).

Type series. HT♂: **[Cameroon]**: S. Cameroun, Memiam, Reg. Mbalmayo, 8/10/1983, "S. grandis ornamented form ou s. sp. nov.", 18.5 mm (TGMF). PTs, **Cameroon**: 1♀, Ebogo, Reg. Yaounde, Dec 2002, Fourmiliere, "S. aurifer ornamented", 18 mm (TGMF); 1♀, "Cameroun", R.P. Carret (MNHN); **Congo-Brazzaville**: Dimonika, Mayombe, X/2008, Bruno Le Rü (BLLF).

Description of holotype ♂
Size. 18.3 mm (TL); 10.9 mm (MW).
Head. Black and shiny at margins, with wide yellow-ochreous tomentose area from vertex to frons (Fig. 13 A, D); glabrous,

with scattered punctate sculpture across entire surface; clypeus deeply concave with anterior margin roundly bilobate, lateral margins steeply upturned and protruding outwards at centre; clypeal base roundly elevated towards frons; vertex with black median longitudinal ridge, bilaterally depressed with ochreous tomentum on entire surface; antennal clubs black, approximately as long as pedicel and flagellum combined; pedicel black, but flagellum brown, each carrying tufts of medium-length light-brown setae.

Pronotum. Largely covered in yellow-ochreous tomentum, except on central disc area which is black and shiny (Fig. 13 A, D); lateral margins roundly angled at centre, widest just anteriad of base; roundly emarginate above scutellum; generally glabrous, with few short brownish setae along lateral margins; large but sparse round punctures on disk, becoming smaller and more scattered towards margins.

Scutellum. Shiny black, with only residual patch of yellow tomentum on basal part of lateral margins; with round punctures along all margins, but virtually absent on central disc; lateral margins compressed at centre and apex very pointed (Fig. 13 A).

Elytra. Shiny black, covered in dense yellow-ochreous tomentum on lateral and apical margins and declivities, as well as around humeral callus and on apical half of disc, as intruding flame-shaped tongues; with marked perisutural depression in basal half, smaller depressions also mediad of humeral calli; glabrous, with only tiny light setae noticeable along lateral and apical margins; very sparse round to umbilicate punctures on disc becoming smaller to absent on declivities and margins (Fig. 13 A, C).

Legs. Black, short and robust, with short brown setae; densely sculptured with round to elongate irregular punctures; protarsi particularly short, protibiae externally bidentate and with very short internal tooth; mesotibia with sharp median outer denticle and short but pointed spurs; metatibia with poorly-developed median outer denticle, but long and sharp spurs (Fig. 13 A-C).

Pygidium. Entirely covered in yellow-ochreous tomentum, except on baso-lateral corners and central part of basal margin; surrounded by a sharp basal ridge, with deep concavity along entire basal margin; glabrous with few short setae only along apical margin; large round punctures in basal and baso-lateral area, becoming smaller and sparser on disc and towards apical margin (Fig. 13 E).

Venter. Shiny, black but dark brown on abdominal ventrites, with extensive cover of yellow-ochreous tomentum on metasternum, metepisternum and metepimeron; smaller spots and patches of tomentum also on 7th abdominal sternite, femoral and coxal bases; mesosternal lobe minute and rounded, not protruding; metasternal lobe concave and bell-shaped, with median sulcus narrow and shallow; very fine round punctures scattered across entire surface, becoming larger and more densely spaced towards margins; very short brownish setae along margins of metasternum and abdominal ventrites (Fig. 13 B).

Aedeagus. Dorsal lobes wide and compact, tapering very gradually towards apex; slightly diverging at centre and converging but not overlapping at apex (Fig. 13 F); perfectly rounded dorsally and sharply pointed at apex in lateral view (Fig. 13 G).

Derivatio nominis. This species is named after the striking tomentose ornamentation of its general body surface.

Distribution. The species is currently known from the Centre Region of Cameroon and from the southern part of Congo-Brazzaville (Fig. 15).

Remarks. Specimen size ranges from 18.3-19.1 mm (TL) to 10.6-10.9 mm (MW). The four type specimens currently known are virtually identical in general habitus. The female is slightly smaller in size than the male and exhibits wider tomentose areas on the sides of each abdominal ventrites (Fig. 14). Data accompanying one of the female specimens indicate that it was found in an anthill ("Fourmiliere").

Updated key to the species of the subgenus *Spilophorus* (*Prospilophorus*) (adapted from Holm & Perissinotto 2010)

1. Median mesotibial spine bifurcate; protibia (female) tridentate; elytral disk covered in greyish-yellow tomentum; pronotum with bilateral, large yellow tomentose spots; size ≤ 15 mm; distribution in Congos and Cameroon ..... ***S.* (*P.*) *cervinus*** Bourgoin, 1921
- Median mesotibial spine with only outer denticle developed; protibia bidentate 2
2. Tomentose markings ochreous-yellow and greatly developed across entire dorsal surface 3
- Tomentose markings (when present) ocheous-yellow to golden cream, less developed and interrupted in places; nigrito forms known 4
- Tomentose markings white-cream and developed to various degrees, nigrito forms unknown 5
3. Ocheous-yellow band on elytral side sub-continuous both on elytra and pronotum; apical and latero-apical margins of mentum smoothly rounded; size <15 mm; distribution in "Guinea"..... .....***S.* (*P.*) *aurifer*** Westwood, 1874
- Ochreous-yellow band fully developed and continuous both on elytra and pronotum; both lateral and apical margins of mentum straight; size > 18 mm; distribution in Cameroon and southern Congo-Brazzaville .... **(*P.*) *superbus*** sp. nov.
4. Tomentose band weakly developed and interrupted both on pronotal and elyral sides; apical margin of mentum slightly sinuate and latero-apical margins with round corner; size < 18 mm; distribution in south-western

Congos and southern Cameroon .... ***S.* (*P.*) *congoensis*** sp. nov.

- Tomentose band variously developed, but more regularly interrupted on elytral than pronotal side; apical margin of mentum straight, lateral margins rounded and tapering towards base; size > 16 mm; distribution in eastern Tanzania ..... ***S.* (*P.*) *holmi*** sp. nov.

5. Tomentose band always present on pronotal sides, occasionally and interrupted on elytron; apical margin of mentum straight, but lateral margins rounded with deep sinuation at middle; size > 16 mm; distribution in eastern South Africa .... ***S.* (*P.*) *grandis*** Schein, 1949

Discussion

Prior to this study, only three species were recognised within the subgenus *Spilophorus* (*Prospilophorus*) Holm & Perissinotto, 2010. This work has now confirmed that its diversity is at least twice as high, and that most likely other undescribed species will be revealed with more exploration and field work. The fact that there is as yet no record of specimens having been caught in flight, may be an indication that species do not undertake frequent or long flights, but are rather sedentary, with limited dispersal ability.

Adults of both *Spilophorus* (*P.*) *grandis* Schein, 1949 and *S.* (*P.*) *holmi* sp. nov. have been found in nests of *Crematogaster* Lund, 1831 ant species (pers. obs., L. Berger & N. Leleup, specimen data labels). The South African specimens were found inside aerial nests of the black cocktail ant, *Crematogaster peringueyi* (Emery, 1895), at False Bay (KwaZulu-Natal). Another newly described species, *S.* (*P.*) *superbus* sp. nov., carries on the labels of one of the female type specimen a reference to "Fourmiliere", which obviously implies that it was found in an ant hill/nest. A related Indian species belonging to the nominal subgenus, *S.* (*S.*) *cretosus* Hope, 1833, was also found in the nest of a black ant (*Crematogaster* sp.) at Malegaon in Maharashtra by H. Maxwell-Lefroy (Ghorpade 1975). There is thus consistent evidence accumulating to show that adults of several species of the genus *Spilophorus,* and particularly within the subgenus *S.* (*Prospilophorus*), are targeting ant nests, presumably with the purpose of feeding on the ants' brood (Holm & Perissinotto 2010). This, combined with reports of *S.* (*S.*) *plagosus* s.s. Westwood in Schaum, 1848 feeding on social spider nests (Holm & Perissinotto 2010), leads to the hypothesis that the whole genus may actually be characterized by adult predatory behaviour, with a possible protein/lipid diet.

Recently, however, observations have shown that adult members of the nominal subgenus feed also on flowers and sap flows. In southern KwaZulu-Natal adult *S.* (*S.*) *plagosus* s.s. have been collected while feeding inside flowers of at least two *Protea* species, *P. caffra* and *P. cynaroides* (R.P. pers. obs.), while in the Soutpansberg (Limpopo Province), the same species has been collected on sap flows of *Combretum* sp. (A.P. Marais pers. comm.). This clearly shows that species of the nominal subgenus are also relying on carbohydrate and alcohol diets, which are typical for most members of the Cetoniinae. Evidence is therefore accumulating, showing a remarkable ability of the subgenus *Spilophorus* s.s. to utilize a variety of food sources, ranging from bird droppings and nests at the larval stage, to flower nectar, sap flows and ants as well as spider brood during adulthood. This, however, cannot be extended to the subgenus *S.* (*Prospilophorus*), which appears to be more conservative in its dietary approach.

Remarkably, no immature stages of any of the *S.* (*Prospilophorus*) species have yet been recorded, either in ant or bird nests. On the other hand, it is well established that the larval biology of most species of the nominal subgenus is linked to bird nests. Péringuey (1907: 505) reported that the "*South African species breeds in the nests of small birds like finches, robins, & c*". An even more detailed elaboration was submitted by Antoine (2006: 191): "*En ethiopie*, *S. kolbei digennaroi vivait dans l'herbe pourissante amassée par certains oiseaux pour faire leur nid, une indication allant dans le même sens que l'étiquetage «dans nids de Tisserins» des 11 spécimens de transition provenant de Kajiado mentionnés ci-dessus, et «N. d'oiseau» du spécimen de S. kolbei digennaroi provenant de Mahadday Weyne dans la collection C. Joly".* Thus, there are numerous records of larvae and cocoons of *S* (*S.*)*. plagosus* s.l., *S.* (*S.*) *lugubris* (Fabricius, 1775) and *S.* (*S.*) *kolbei digennaroi* Antoine, 2006 found in various bird nests, where the larvae presumably feed on bird droppings and refuse, and possibly also on the plant detritus accumulated therein (Péringuey 1907; Antoine 2006; Holm and Perissinotto 2010; R.P. pers. obs.).

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