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Review of the *Amaurina* Kolbe, 1895 of Angola, with description of a new species (Scarabaeidae: Cetoniinae, Leucocelina)

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Abstract
The genus *Amaurina* Kolbe, 1895 has undergone a turbulent taxonomic history and is currently composed of five species, two of which have been recorded from Angola thus far. A new species has recently been discovered in the central and eastern parts of this country and is hereby described as *A. schuelei* **sp. nov.** This new species is most closely related, both biogeographically and morphologically, to the sympatric *A. spoliata* (Harold, 1879), but can superficially be separated from this by its smaller size, the more deplanate body shape lined with a white band across its entire perimeter, the more marked umbonal width and a deeper subhumeral arch. Furthermore, its aedeagal parameres differ markedly from those of *A. spoliata*, and indeed from those of any other species in the genus, by virtue of their extremely reduced external lobes. Only the holotype specimen is currently known physically, but a photographic observation posted on the iNaturalist platform indicates that the species may actually occur across a wide, although poorly accessible, region of Angola and possibly even in neighbouring Zambia.

Key words: Afrotropical Realm, central Africa, new species, regional endemics, biodiversity hotspots.

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Introduction

The status of *Amaurina* Kolbe, 1895 has undergone a history of confused and controversial changes since its inception. It was originally erected as a subgenus of *Leucocelis* Burmeister, 1842 (Kolbe 1895), then elevated to genus level by Schenkling (1921). Ruter (1967) returned its status to subgenus, and also endorsed the initial classification of Kolbe (1895) by splitting it into two groups: 1) *Amaurina* with *Leucocelis spoliata* Harold, 1879 as type species, and 2) *Acheilosis* Ruter, 1967, with *Leucocelis lunata* Reiche, 1847 as type species. Krikken (1984) used the name as genus, but Marais and Holm (1992) and Holm and Marais (1992) in their reductionist approach returned it to subgenus, within a structure for *Leucocelis* that included the nominal as main subgenus and *Amaurina* and *Acheilosis* as secondary subgenera. This model was repeated by Krajcik (1998). Eventually, Antoine (1997) compiled a detailed analysis of key apomorphic characters for the entire group of genera and concluded that *Amaurina* was sufficiently distinct to be regarded as a proper genus. Much of the diagnosis was based on the structure of the external lobes of the parameres, the articulation between the two parameres and the shape of their internal margin. The *Amaurina* type falls in the category "1α, 2α" (*sensu* Antonie 1997), with external lobes homogeneous and presenting only a reduced apical slit, and internal margins connected by a small piece of tissue above the base, initially parallel to each other and then diverging to form the internal cavity with a non-angular transition. This classification is currently still followed by the vast majority of modern authors (e.g. Antoine 2000; Beinhundner 2017; Serrano et al. 2020).

There are at present five recognised species of *Amaurina,* all in the south-western part of central Africa between Angola and Congo-Brazzaville, with Congo-Kinshasa as epicentre of its distribution. Within Angola, two species have been recorded thus far, *A. spoliata* (also occurring in southern Congo-Kinshsa) recorded from the provinces of Huila, Malanje, Benguela, Bié, Cuanza Sul and Huambo, and *A. ruteri* Antoine, 2000 endemic to this country and found in the provinces of Benguela, Cuanza

Sul and Huambo, the western central region of Angola (Beinhundner 2017; Serrano et al. 2020). A third species, recently collected in the area of Caconda, Huila Province, and also posted as photographic observation from the Moxico Province on the citizen science platform iNaturalist, has now been recognised and is herein described.

Materials and Methods

Specimens described in this study were examined directly and dissected when necessary. Types and other specimens used for comparison were provided by the curators or owners of the collections where they are currently reposited (see list below). Original collecting data accompanying each specimen were also obtained from key holders of material of interest. Taxonomic as well as distribution and ecological data were obtained from key literature sources providing quality illustrations and collecting data, including Ruter (1967), Antoine (2000), Serrano et al. (2020) and Beinhundner (2017). The citizen science platform "iNaturalist" (https://www.inaturalist.org) was also used to extract additional information from field observations, after appropriate verification and using only research grade identifications. 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 Cetoniinae morphological terminology followed in this study for the description of specimen characters is derived from Krikken (1984) and Holm & Marais (1992). Photos of specimen dorsal, lateral and ventral habitus were taken with a Canon digital camera EOS 6D fitted with Canon macro photo lens MP-E, 65 mm and pictures were processed using Helicon Focus 7 software. Aedeagal parameres were analysed and photographed under a Leica Z16APO apochromatic zoom system provided with a digital Leica DFC 295 camera and LAS Montage MultiFocus V3.6 software kit version, at the Department of Entomology, Moravian Museum in Brno (Czech Republic). In order to increase the clarity of resolution, the background, pin holes and other disruptive features were removed from each photo using Microsoft Word 2010 (Picture Tools).

In the text, specimens size refers to 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" (when originally indicated); LT, Lectotype; ST(s), Syntype(s); PT(s), Paratype(s).

Institutes and collections are abbreviated as follows:
ASLP – Artur Serrano Private Collection, Lisbon, Portugal;
MHNC – Museu de História Natural e Ciência, Lisbon, Portugal;
MHNL–National Museum of Natural History, Luxenbourg;
MNHN – Muséum national d'Histoire naturelle, Paris, France;
MRAC – Koninklijk Museum voor Midden Afrika, Tervuren, Belgium;
MZMC– Moravské zemské museum, Brno, Czech Republic;
MZUC – Museu de Zoologia da Universidade, Coimbra, Portugal;
NMPC – Národní muzeum, Prague, Czech Republic;
NMNW – National Museum of Namibia, Windhoek, Namibia;
PARF – Ex Collection Philippe Antoine, Roubaix, France;
PMBC – Petr Malec Private Collection, Brno, Czech Republic;
TBCB – Thierry Bouyer Private Collection, Chênée, Belgium;
TGMF – Thierry Garnier Private Collection, Monpellier, France;
ZMHB – Museum für Naturkunde der Humboldt Universität, Berlin, Germany;

Countries within the text are reported with their international ISO Alpha-3 codes (https://www.nationsonline.org/oneworld/country_code_list.htm, accessed on 10 Nov 2023) as follows: AGO, Angola; COD, Congo-Kinshasa; COG, Congo-Brazzaville. The ISO alpha-3 codes for the provinces of Angola are as follows: BGO, Bengo; BGU, Benguela; BIE, Bié; CAB, Cabinda; CCU, Cuando Cubango; CNO, Cuanza Norte; CUS, Cuanza Sul; CNN, Cunene; HUA, Huambo; HUI, Huíla; LUA, Luanda; LNO, Lunda Norte; LSU, Lunda Sul; MAL, Malanje; MOX, Moxico; NAM, Namibe; UIG, Uíge; ZAI, Zaire.

Results and Taxonomy

Amaurina schuelei sp. nov.

(Figs 1, 4)

Diagnosis. *Amaurina schuelei* is most closely related to *A. spoliata* (Harold, 1879), with which it occurs sympatrically at least in parts of Angola (e.g. Huila Province). It differs though remarkably from this and all other related species in its dorsal chromatic ornamentation and particularly in the shape of its aedeagal parameres. In particular, its dorsal habitus exhibits a white cretaceous lining along the entire perimeter of both pronotum and elytra, a brightly green pronotum with two longitudinal lines of well-developed white maculae and a dark green scutellum and elytral sutural area on a testaceous elytral background colour (Fig. 1 A). This pattern appears to be unique within the genus *Amaurina*. On the ventral side, the mesosternal

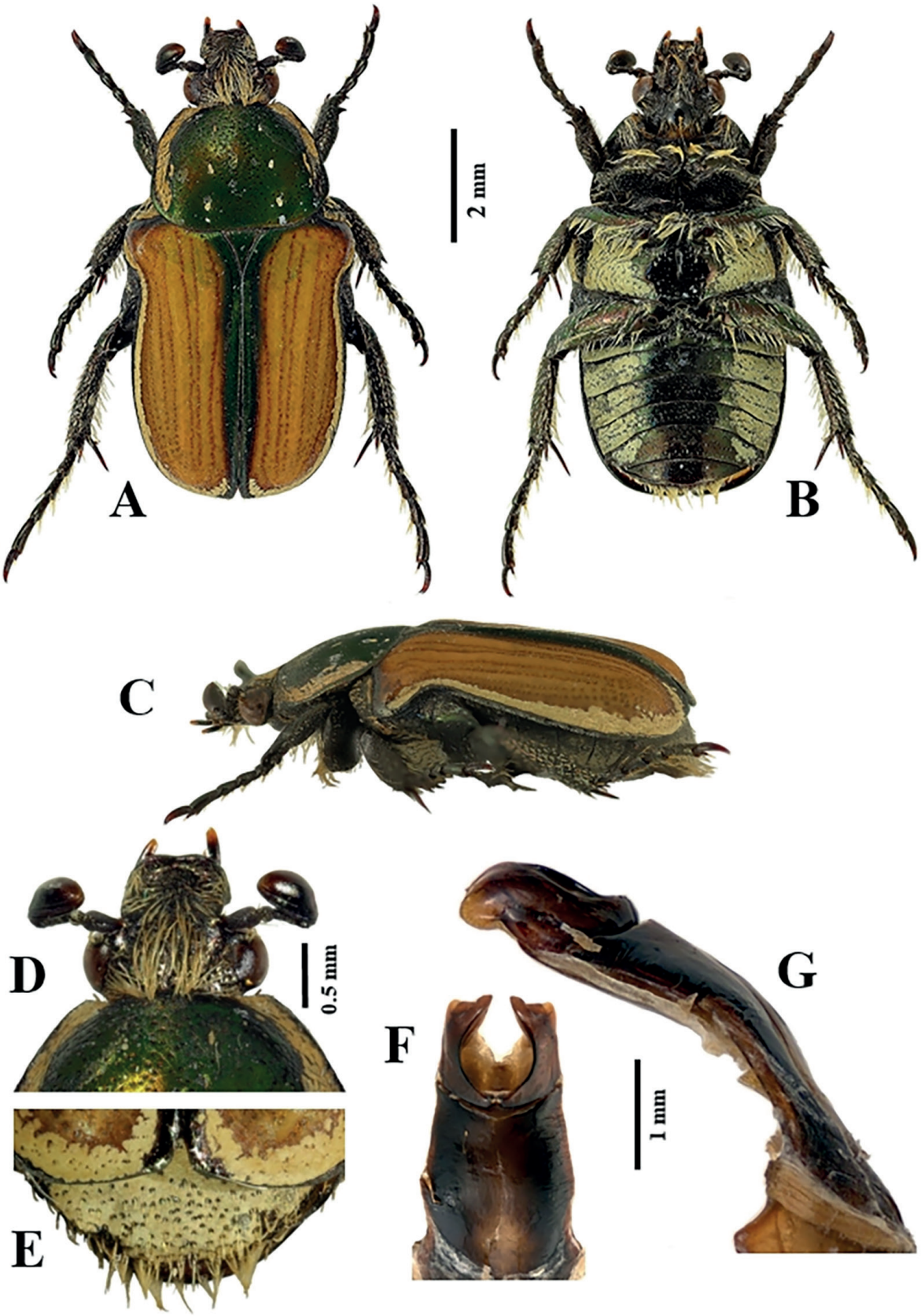

Fig. – 1 *Amaurina schuelei* **sp. nov**.: **A**, HT♂ dorsal habitu; **B**, HT♂ ventral habitus; **C**, HT♂ lateral habitus; **D**, HT♂ clypeus; **E**, HT♂ pygidium; **F**, HT♂ parameres, dorsal view; **G**, HT♂ parameres, lateral view. Photos: Lubos Dembicky.

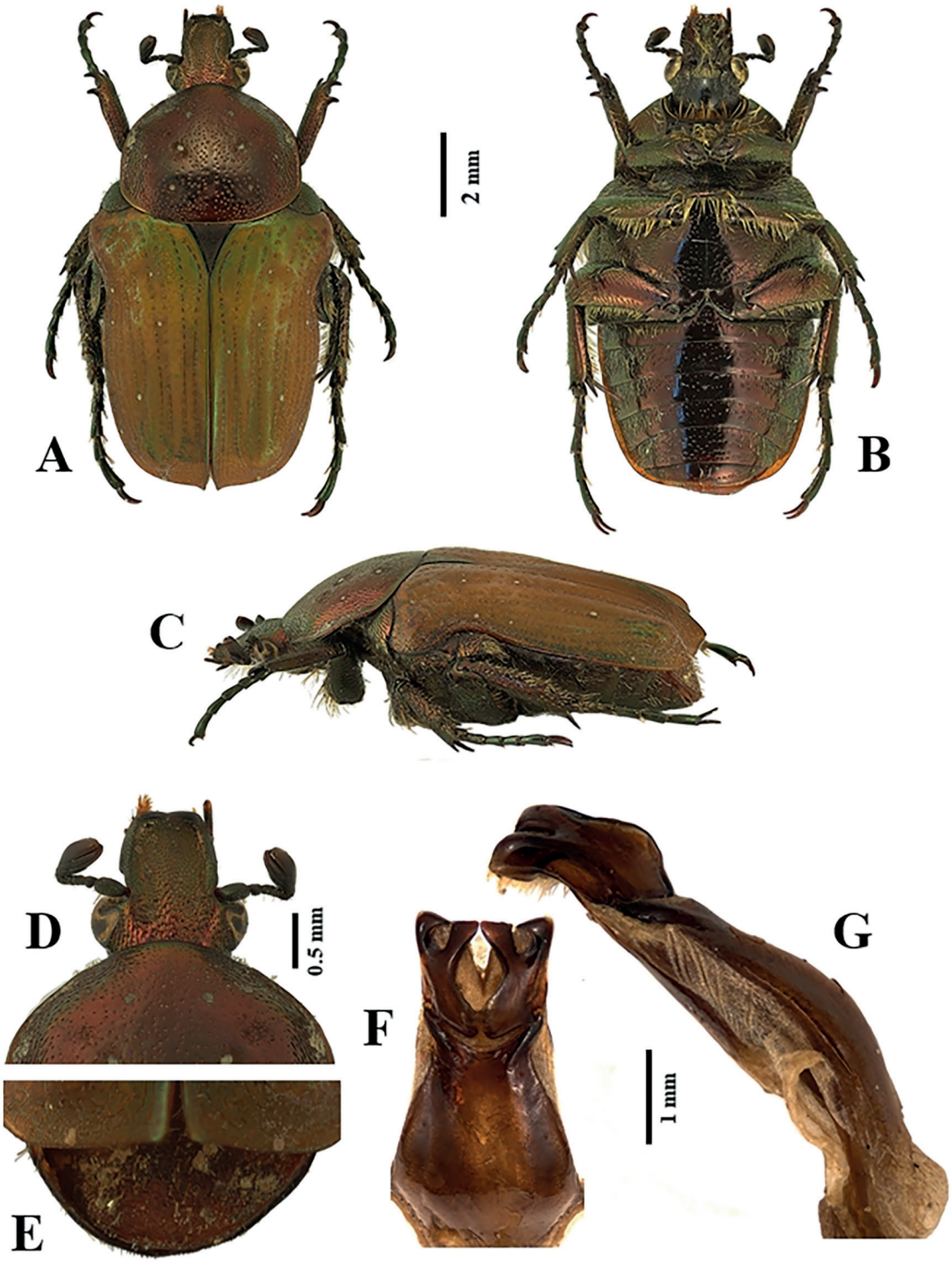

Fig. 2 – *Amaurina spoliata* (Harold, 1879): ♂ **A**, dorsal habitus; **B**, ♂ ventral habitus; **C**, ♂ lateral habitus; **D**, ♂ clypeus; **E**, ♂ pygidium; **F**, parameres, dorsal view; **G**, parameres, lateral view. Photos: Lubos Dembicky.

lobe is poorly produced forward and the apex is straight, rather than sinuate, like in *A. spoliata*, and engulfed with very long tawny setae (Fig. 1 B). Furthermore, the new species differs significantly from *A. spoliata* in its aedeal parameres, which show a similar internal cavity but very reduced external lobes (Fig. 1 F), in comparison to those of the latter species (Fig. 2 F). *Amaurina schuelei* is also smaller in size that *A. spoliata* (i.e. 8 mm vs 10.5-12 mm) and exhibits a shorter clypeus with dense clusters of long to medium tawny setae, while the clypeus of *A. spoliata* is virtually glabrous (Figs 1 A, C, D and 4 A, C).

Description of holotype ♂

Size: TL = 8.0 mm; MW = 4.1 mm

Dorsum. Body shape remarkably deplanate, with widest part at humeral callus followed by deeply concave subhumeral arch; matte and lined with white cretaceous band along entire perimeter, with dark to bright green pronotum and scutellum but testaceous-brownish elytra, also two longitudinal lines of white maculae on pronotum and occasional small to minute maculae on apical half of elytra; with marked sculpture across entire surface, consisting of dense but small round punctures on pronotum and elytral margins becoming deep and geminate along striae; glabrous with scattered short and tawny setae only along margins (Figs. 1 A, C and 4 A).

Head. Black-coppery on clypeus to bright green on frons and vertex; clypeal surface moderately concave with lateral and anterior margins steeply upturned, corners smoothly rounded; lateral margins parallel and anterior margin mildly sinuate; with long tawny setae emerging across entire surface, except on anterior clypeal region; with dense, large round sculpture across entire surface; antennal club as long as flagellum, black with brown tips, but pedicel and flagellum black with few medium-long tawny setae (Fig. 1 A, C, D).

Pronotum. Matte, bright green becoming darker towards margins, with light yellowish cretaceous lining along lateral margins, two sets of four longitudinal maculae each and another two maculae on lateral declivities next to white band; exhibiting feeble longitudinal ridge across middle; with lateral margins widening progressively towards round posterior corners; anterior margin with wide bulge and convexity at centre; posterior margin rather straight, with mild sinuation above scutellum; glabrous, with few short setae only on lateral margins and with moderately dense round punctures across entire surface, becoming smaller and more scattered towards postero-lateral sides (Figs. 1 A and 4A).

Elytra. Matte and testaceous-brownish, with dark green supra-umbonal and sutural region, white cretaceous lining along entire lateral perimeter and few minor white spots on apical half; widest in umbonal region, with deep posthumeral arch posteriad; glabrous, with few short light setae scattered along lateral and posterior margins and declivities; with marked lines of geminate sculpture along each stria and scattered horse-shoe to round punctures in umbonal areas and along declivities (Figs. 1A, C and 4 A).

Scutellum. Approximately equilateral, with very pointed apex and mildly concave lateral margins; dark green, glabrous, with feeble signs of macrosculpture only along basal margin; lateral grooves relatively wide and deep (Figs. 1A, C and 4 A).

Pygidium. Entirely covered in white cretaceous layer, with light tawny setae emerging regularly across surface, becoming longer and denser along apical region; smoothly rounded at apex and elongate at base; with shallow bilateral depressions on basal corners (Fig. 1 E).

Legs. Black-coppery, with brown tarsal claws and tibial spurs; protibia bidentate, widening markedly posteriad of proximal tooth, distal tooth longer than proximal but both teeth equally sharp; both mesotibia and metatibia with slightly bulging external ridge but without outer denticles, with two pairs of short apical teeth and one pair of long and sharp spurs; all tibiae exhibiting dense but coarse sculpture and short but thick tawny setae across entire dorsal surface (Figs. 1 A-C and 4 A).

Venter. Shiny, black-coppery to green metallic, with whitish creataceous areas widespread on sides of abdominal sternites and on metasternum; mesosternal lobe very narrow but transversely elongate, not projecting forward, with apical margin straight and engulfed in a cluster of long tawny setae; metasternal lobe wide and shiny, laterally constricted towards base and then expanded anteriourly, with moderate concavity at centre and median sulcus wide and deep only in anterior half; round punctures small and scattered on central shiny areas, becoming much denser on profemora and larger and horse-shoe shaped on lateral margins of sternites and on meso- and metafemora; short to medium light setae equally scattered across entire surface, becoming denser and much longer on femora, mesosternal process, prosternum and pygidial apex (Fig. 1 B).

Aedeagus. In dorsal view, exhibiting wide central cavity between parameres; internal margins of parameres connected by small junction piece removed from base, remaining parallel beyond junction then becoming concave with non-angular transition (i.e. α-type, *sensu* Antoine 1997); internal lobes regularly developed with apical area angulate, rather than rounded; external lobes reduced in size, smaller than internal lobes and not protruding above apical area of soft light tissue (Fig. 1 F); of typical Leucocelina shape in lateral view, with apical region smoothly rounded and asetose (Fig 1 G).

Derivatio nominis. The species is named after Peter Schüle (Herrenberg, Germany), who collected the holotype specimen in 2017.

Distribution. This new species has so far only been recorded in the Angolan provinces of Huila and Moxico (Fig. 4 D).

Data records. Type series: HT♂, **Angola**: AGO–HUI, 20 Km NW Caconda, 13°39´47.41´´S, 14°59´33.21´´E, 10.XII.2017, P. Schüle leg. (NMPC). Other records: 1 ind., **Angola**: AGO–MOX, Wetlands upstream of the Cuanavale Source Lake, 6 Nov 2022 11:19, Craig Peter (https://www.inaturalist.org/observations/142610715).

Remarks. With a HT total length of only 8.0 mm, *Amaurina schuelei* **sp. nov.** is among the smallest species in the genus along with the Congolese *A. opacipennis* (Arrow, 1909), which exhibits a TL= 7.5-8.5 mm (Beinhundner 2017). There is only minor colour variation in the dorsal habitus of the two specimens recorded so far, and this seems to be restricted to the extent of white maculation on the pronotal and elytral disc areas (Figs 1 A and 4 A). Only the HT male is physically known for this species, but the observation reported on the platform iNaturalist by Graig Peter shows that this may be purely due to undersampling in this largely inaccessible region of Angola.

Although the female is currently unknown, the typical and limited sexual dimorphism of the genus is expected to characterize this species too. Thus, females most likely will differ from their male counterparts by exhibiting shorter protarsi and a lack of central depression on abdominal sternites. Data available thus far seem to indicate that adult activity maybe focused around spring to early summer. Like its congeneric counterparts, *A. schuelei* is likely to be mainly floricolous or stem/leaf feeder at the adult stage. Immature stages remain completely unknown.

***Amaurina spoliata* (Harold, 1879)**
(Figs 2, 4)
Leucocelis spoliata Harold, 1879: 71.
Leucocelis (*Amaurina*) *spoliata* Harold. Ruter 1967: 39; Krajcik 1998: 66.
Leucocelis (*Amaurina*) *cognata* Harold. Holm & Marais 1992: 283 (erratim = *spoliata*).
Amaurina spoliata (Harold). Schenkling 1921: 327; Antoine 2000: 24; Beinhundner 2017: 26.

Data records. Type series: LT, **Angola:** AGO–MAL, Pungo Andongo, A.v. Homeyer, *Leucocelis spoliata* Har. (ZMHB). Other records: 10 inds, AGO, box nº IX-78 (MZUC); 1 ind., AGO–HUI, Sá da Bandeira (= Lubango), 14º55´S, 13º30´E, 1750 m alt.), 25.XI.1957, Nº 2970, *Leucocelis spoliata* Harold, Estudos Apícolas do Ultramar nº 122, Junta de Investigações Coloniais (Entomologia), IICT (MHNC); 1♂ (TL =11 mm), AGO–HUI, 10 Km W Lubango, (14º50´32.5´´S, 13º24´06.2´´E, 2103 m alt.), 1.XII.2017, P. Schüle leg. (PMBC); AGO–HUI, 6 Km NW Lubango, Huila Prov., S14°52.181, E13°27.210, 1-7.XII.2017, P. Schüle leg. (PMBC); 1 ind., AGO–HUA, Chianga, 12º44´S, 15º50´E, 1740 m alt., 26.IX.1964, Nº E.5695, nº 606, E. Fonseca leg., JPCC (MHNC); 1 ind., ibidem, 22.X.1964, Nº E.5729, nº 605, E. Fonseca leg., JPCC MHNC); 1 ind., ibidem, 12-X-64, Helder Cardoso 2597 (MRAC); 1 ind., ibidem, 13-XI-71, Armando 2597 (MRAC); 1 ind., AGO-HUA, (MRAC); 1 ind., ibidem, II-1934, Coll. Burgeon (MRAC); 1 ind., AGO–HUA, Bailundo (MRAC); 1 ind., AGO-BIE, Bihe, Coll. Burgeon (MRAC); 1 ind., AGO, Amaso, 9-IV-65, Eulalia Marçal 2597 (MRAC); 2 inds, AGO, Peilunga, 13-X-71, Auazius 2571 (MRAC); 1 ind., AGO–BGU, Chioa, 22.X.1964, Nº E.5728, nº 607, C. Matos leg., JPCC (MHNC); 1♂, AGO–BIE, Capingana–Satchijamba (13º42´47.18´´S, 17º05´23.81´´E, 1507m alt.), 8.IV.2014, A. Serrano leg. (ASLP); 9♂+5♀, AGO–LSU, Carima (Cacuso–Pungandongo) (09º 35´ 00´´ S, 15º 42´ 01´´ E, 1117 m alt., 130), 17.XI.2017, A. Serrano & R. Capela leg. (ASLP); 16♂+4♀, ibidem, 20.XI.2017, A. Serrano & R. Capela leg. (ASLP); 2♂+1♀, ibidem, 21.XI.2017, A. Serrano & R. Capela leg. (ASLP); 1♂ (TL= 9 mm), AGO–BIE, Cachingues, Kuito Reg., K. Werner Leg. (TGMF); 2 inds, AGO–CUS, Cassoço, 3/13.III.2005, leg. M. Hasson & Th. Bouyer (TBCB); 41 inds, COD, Bas-Congo, Mayidi, 1942, Rev. P. Van Eyen (MRAC); 4 inds, ibidem, 1945, Rev. P. Van Eyen (MRAC); 2 inds, AGO–HUI, Tchivinguire, SE 1513 Ab, 14-17 Nov 1974, H22422 (NMNW); 1♂, ibidem, 3 Dec 1974, H24198 (NMNW); 1 ind. AGO–HUA, Bailundo, "Amaurina spoliata Har." (NMNW).

Distribution. So far known from the Angolan provinces of Benguela, Bié, Cuanza Sul, Huambo, Huila and Malanje and also from the Kongo-Central Province of Congo-Kinshasa (MRAC specimen labels, Serrano et al. 2020, Beinhundner 2017)(Fig. 4 D).

Remarks. As pointed out by Antoine (2000), the species described and illustrated in the book of Holm and Marais (1992) as *Leucocelis* (*A.*) *cognata* (Harold) is actually *A. spoliata* (Harold). Adults of this species appear to be mainly floricolous or stem/leaf feeders, having been observed on a variety of plants including *Pandiaka welwitschii*, *Monotes calomerus* and other unidentified herbs and shrubs (Serrano et al 2020). Available records indicate that the species may be active throughout the wet season, with a distinct peak in late winter and spring, from September to December. The immature stages remain unknown.

***Amaurina ruteri* Antoine, 2000**
(Figs 3, 4)
Amaurina ruteri Antoine, 2000: 24; Beinhundner 2017: 25; Serrano et al. 2020: 43.

Data records. Type series: HT♂, **Angola:** AGO, ex coll. Ruter (MNHN); AT♀, AGO–BGU, Benguella, ex coll.

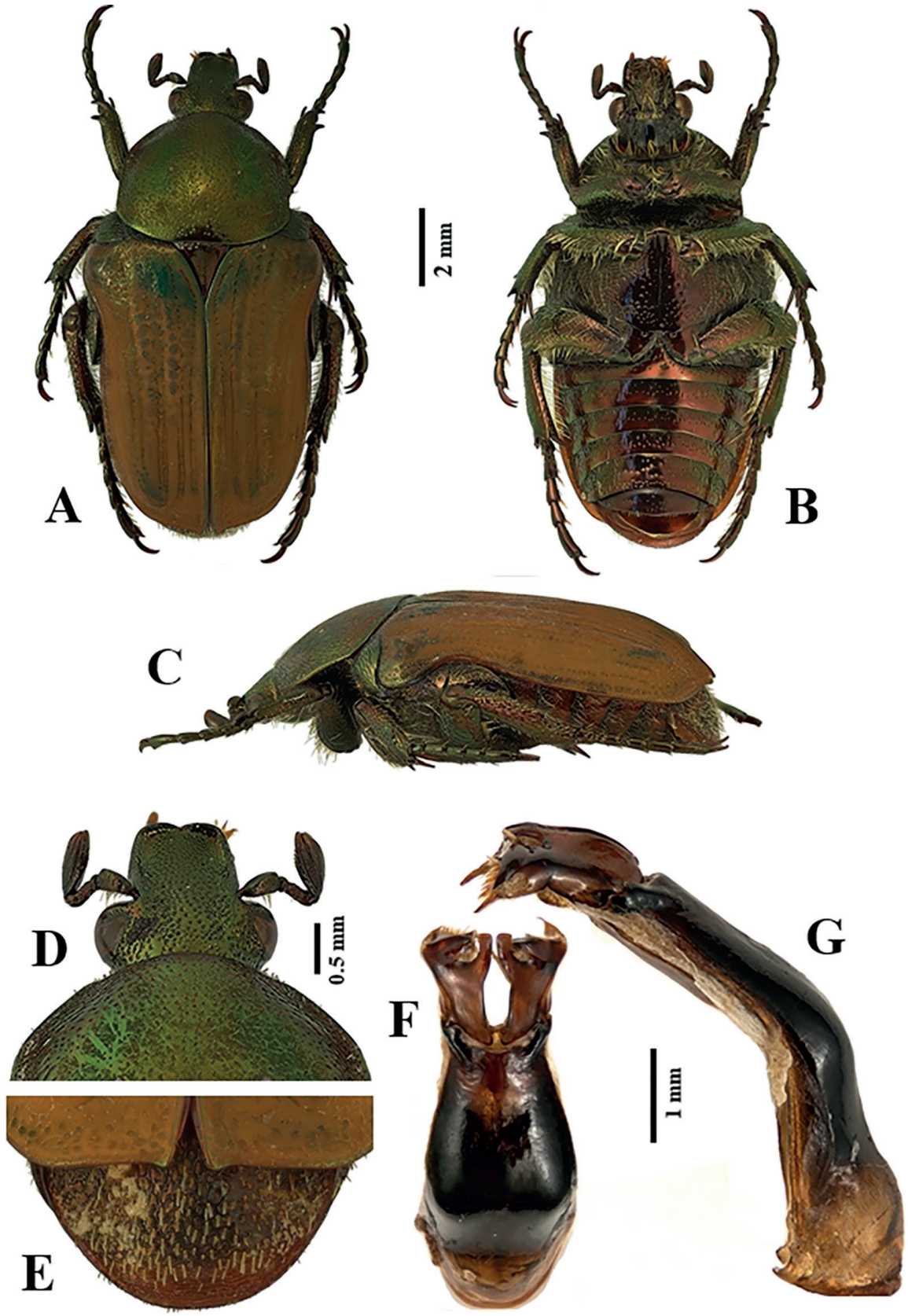

Fig. 3 – *Amaurina ruteri* Antoine, 2000: **A**, ♂ dorsal habitus; **B**, ♂ ventral habitus; **C**, ♂ lateral habitus; **D**, ♂ clypeus; **E**, ♂ pygidium; **F**, parameres, dorsal view; **G**, parameres, lateral view. Photos: Lubos Dembicky.

Ruter, (MNHN); PT♀, AGO–HUA, Serra do Moco, Luimbale, 1.IX.1949, ex coll. Ruter (PARF). Other records: 1♀ (TL =10 mm), AGO–HUI, Tundavala, 15 Km E. Lubango, S. Braine Leg.,"*Amaurina ruteri* / Ph. Antoine det. 2008 / comparated with type"(TGMF); 1♂ (TL =13 mm), AGO–HUI, 6 KM NW Lubango, S14°52.181, E13°27.210, 1-7.XII.2017, P. Schüle leg. (PMBC); 3 inds, AGO–CUS, Cassoço, 3/13.III.2005, leg. M. Hasson & Th. Bouyer (TBCB).

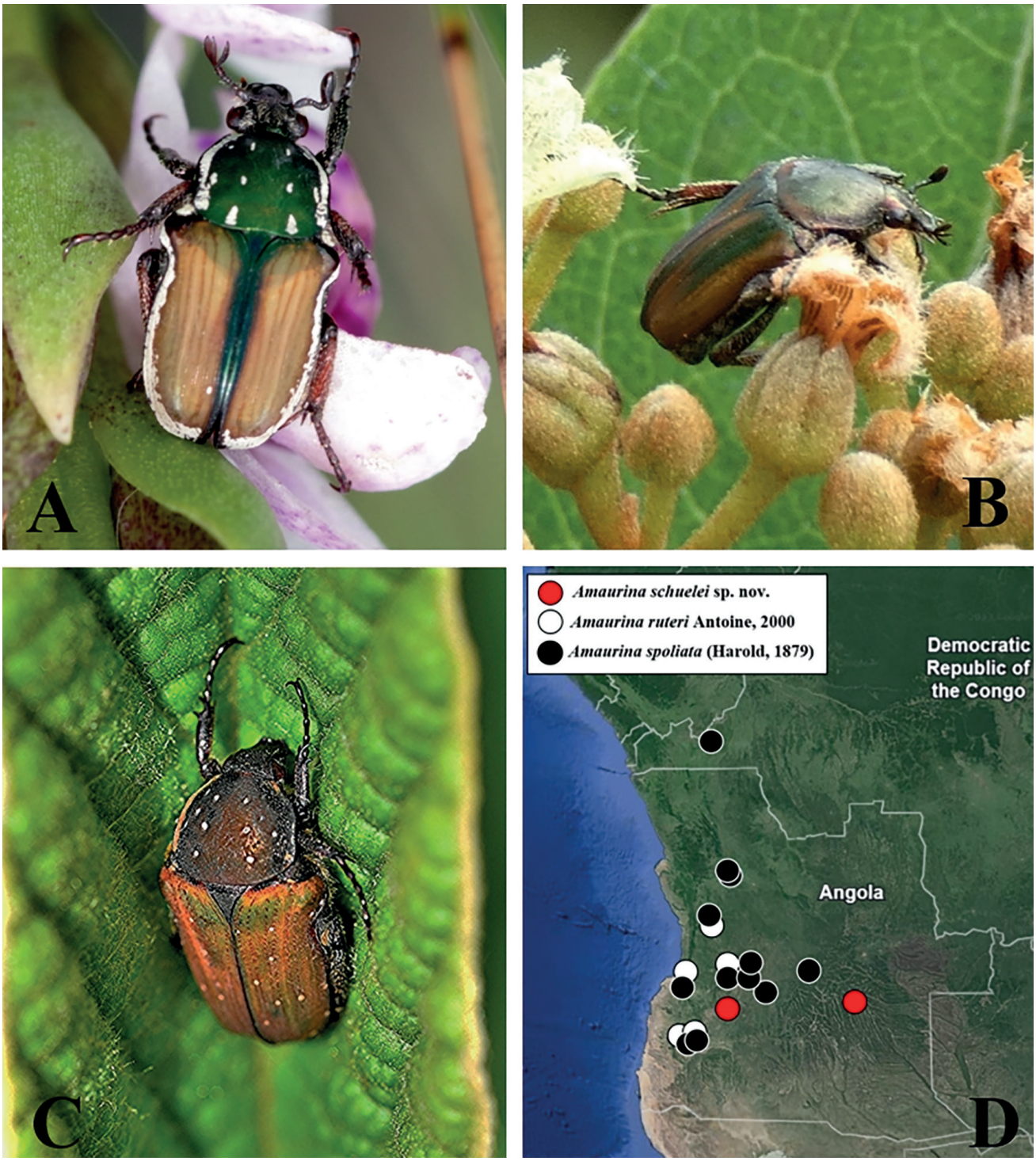

Fig. 4 – *Amaurina* spp. in their natural habitat **(A-C): A,** *Amaurina schuelei* **sp. nov.**, wetlands upstream of the Cuanavale Source Lake, Moxico, Angola, 6 Nov 2022 (Photo: Craig Peter); **B**, *Amaurina vittipennis* Moser, 1909, Lesio-Louna Reserve, Abio II, Republic of the Congo, 8 Oct 2023 (Photo: Tony King); **C**, *Amaurina spoliata* (Harold, 21879), Carima Cacusa-Pungandongo, Malanje, Angola, 20 Nov 2017 (Photo: Artur Serrano). **D**, Distribution of the three species currently known to occur in Angola (Map: Google Earth with data from SIO, NOAA, U.S. Navy, NGA, GEBCOLandsat/Copernicus AfriGIS Pty Ltd IBCAO).

Distribution. So far only known from the provinces of Benguela, Cuanza Sul, Huambo and Huila in Angola (Fig. 4 D).

Remarks. This is the largest species in the genus, attaining a TL = 11.4-13.0 mm (Antoine 2000; Beinhundner 2017). It occurs sympatrically with *A. spoliata* across its entire distribution range, but can easily be separated from the latter by its generally larger size, brownish-green pronotum, presence of fewer and smaller white maculae on the dorsum (Fig. 3 A) and especially by the hypertrophy of the external lobes of its aedeagal parameres (Fig. 3 F, G). Like in the previous species, adults have been collected from September to December, indicating a potential peak in activity during the spring and summer seasons. It is presumably floricolous and stem/leaf feeder like the other species of the genus, but unfortunately there are yet no data or observations available to confirm this. The immature stages are unknown.

Updated dichotomic key for the genus *Amaurina* (partly adapted from Ruter 1967)

1. Elytral surface with no or only residual traces of white maculation, but with dark green longitudinal streaks on disc; lateral pronotal margins diverging markedly towards base; aedeagal parameres small, with internal lobes poorly developed; distribution in COG and north-centre COD.....***A. vittipennis*** Moser, 1909
- Elytral surface with few to numerous small white spots, but no longitudinal green areas on disc; lateral pronotal margins subparallel, not diverging substantially towards base; aedeagal parameres larger, with various degrees of differentiation on both internal and external lobes.....2
2. Pronotal posterior margin markedly sinuate above scutellum; body attaining largest size of approximately 13 mm TL; aedeagal parameres with external lobes disproportionately developed by comparison with internal ones; distribution in western AGO.....
.....***A. ruteri*** Antoine, 2000
- Pronotal posterior margin straight above scutellum; body size < 13 mm TL; aedeagal parameres with external and internal lobes equally developed, or external lobes reduced in size.....3
3. Pronotal disc cupreous metallic with 2 sets of tiny white spots and lateral margins with partial grey tomentose lining; elytra with only minute traces of white markings on disc and in apical area; aedeagal parameres with external lobes exhibiting small pointed protuberance at apex; distribution in south-eastern CO D..... ***A. opacipennis*** (Arrow, 1909)
- Pronotal disc matte, with two longitudinal lines of white spots and cretaceous marginal band; elytra with numerous white spots on disc and apical area, or extensive cretaceous lining on external perimeter; aedeagal parameres with lobes variably developed but without apical protuberances.....4
4. Pronotal disc bichromatic, cupreous to reddish-brown; parameres medially expanded, leading to constricted internal cavity; distribution in central COD.....
.....***A. bourgoini*** (Ruter, 1967)
- Pronotal disc monochromatic, cupreous-brown or green; parameres medially constricted, leading to large internal cavity.....5
5. Pronotal disc cupreous-brown, with narrow white band along lateral margins and two longitudinal lines of small white spots; elytra with numerous small white spots across disc and on margins; body size relatively large (10-12 mm TL); aedeagal parameres with internal and external lobes equally developed; distribution western AGO and southern COD.....
.....***A. spoliata*** (Harold, 1879)
- Pronotal disc bright green, with wider white band along lateral margins and two longitudinal lines of white spots; elytra with tiny residual white spots in apical region and wide white band along external margins; body size small (8 mm TL); aedeagal parameres with external lobes very reduced; distribution in central to eastern AGO.....***A. schuelei* sp. nov**.

Discussion

Despite its turbulent taxonomic history, the genus *Amaurina* Kolbe, 1895 is now recognized as distinct from its closest allies, in particular the *Acheilosis* Ruter, 1967 and *Amauroleucocelis* Bourgoin, 1913 group. In the original description, Kolbe (1895) regarded this as a subgenus of *Leucocelis* Burmeister, 1842 subdivided into two branches: 1) more concolorous species of the "*spoliata*" kind; and 2) more white-maculated species like "*lunata*, *cognata*, *polysticta* and *annulipes*". Although poorly defined, this basic subdivision was later validated and formalized by Ruter (1967), who retained the original name of *Amaurina* for the first group and erected the new name *Acheilosis* for the second group. At that stage, the two were mainly separated on the basis of the degree of thickening (reborded or not) and presence of metallic pigmentation on the margins of their pronotum, as well the level of matteness on their general dorsum. Antoine (1997) provided further support for this subdivision by analysing the structure of their aedeagal parameres, with particular focus on the size and shape of their external lobes, the degree of angulation and concavity of their internal margins and the distance of their joining tissue from the base. The outcome of this analysis was a useful classification table of the different types observed in the *Oxythyrea-Leucocelis* complex, leading to a more rigorous generic and subgeneric subdivision.

While eventually *Amaurina* was recognised as a free-standing, valid genus, *Acheilosis* was never recognised

as such and remained in the literature as a subgenus of *Leucocelis* until Antoine (2002) recognised it as a junior synonym of the monospecific genus *Amauroleucocelis*, and designated the latter also as a subgenus of *Leucocelis*. Thus, the subgenus *Amauroleucocelis* currently numbers 26 species and two subspecies and is distributed across the broader central to southern African region, from Guinea to Angola in the west, to Mozambique and Ethiopia in the east (Beinhundner 2017).

Conversely, with the current addition, the genus *Amaurina* now comprises six species, all restricted to the western part of central Africa, from Congo–Brazzaville in the north which hosts only *A. vittipennis* Moser, 1909, to Angola in the south where the three species investigated in this work are found. Congo-Kinshasa, the current Democratic Republic of Congo, appears to be the epicentre of the genus hosting at least four of the currently known species, namely *A. bourgoini* (Ruter, 1967), *A. opacipennis* (Arrow, 1909), *A. spoliata* (Harold, 1879) and *A. vittipennis* Moser, 1909 (Fig. 4 C). The last species was reported only from Congo-Brazzaville in the latest revision (Beinhundner 2017), but actually the ST reposited in the MHNL originates from Sankuru and the type locality reported by Moser (1909) is "Sankuru, Kassai", in the central region of Congo-Kinshasa (Krajcik 1998; Vitali 2019).

Two of the species, *A. ruteri* and *A. schuelei*, are therefore local endemics to western and central-eastern Angola respectively. This adds to an already remarkable list of Cetoniinae that are endemic to this country, 33 between species and subspecies, representing 15,7% of the total currently known of 179 species and 31 subspecies (Serrano et al. 2020; Bouyer & De Palma 2022). These figures are in line with what is already known for the other major groups of animals and plants that occur in Angola, with for instance 14.8% of the 6850 native species of plants being endemic to the country (Huntley et al. 2019). Indeed, Angola has representatives of four of White's (1971) regional centres of endemism (RCEs), defined as areas having more than 50% of the species confined to them, and a total of more than 1000 endemic species. These are: 1) The Guineo-Congolian RCE (mosaics of forests, thickets

and tall grass savannas); 2) the Zambezian RCE (arid and mesic woodlands, savannas, grasslands and thickets); 3) the Karoo-Namib RCE (desert, shrublands and arid savannas); 4) the Afromontane Archipelago-like RCE (forests, savannas and grasslands) (Huntley 2023).

Although Angola's natural environment has previously been largely ignored, a trilogy on its biodiversity and ecology has been published between 2017 and 2023 under the leadership of renowned conservation biologist Brian Huntley (Huntley 2017, 2024; Huntley et al. 2019). This shows that the country is among the most ecologically diverse in the world, with ecosystems spanning from the tropical rainforests of the Congo Basin in Cabinda (mean annual rainfall > 1600 mm) to the extremely arid Namib Desert (mean annual rainfall < 60 mm) of the south-western Namibe Province. Angola has not only the largest diversity of biomes, with representatives of six out of the seven found in Africa, but also the second largest number of ecoregions found in any African country, with 16 (Huntley 2023). In terms of vegetation types, Barbosa (1970) had described and mapped no less than 32 categories, each in turn with many distinct subtypes.

So far, the biodiversity coverage of the invertebrate fauna has been limited to those groups for which a reasonable amount of information is already available. Regarding insects, these include mainly the Odonata (dragonflies and damselflies), Lepidoptera (butterflies and skippers) and the Coleoptera, with a rather advanced list of the Cetoniinae compiled recently by Serrano et al. (2020). However, these results albeit remarkable are based on a very patchy level of exploration, particularly in the eastern half of the country, where in most likelihood several new taxa yet unknown to science will emerge in the near future.

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