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Two new species of *Bradybaenus* DEJEAN, 1829 from Africa (Coleoptera: Carabidae: Harpalinae)

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Abstract

Two new species of *Bradybaenus* DEJEAN, 1829 (Coleoptera: Carabidae) are here described. *Bradybaenus czeppeli* sp.n. from Namibia and Botswana and *B. robustus* sp.n. from Chad are the fourteenth and the fifteenth species of this genus known so far. Habitus and male genitalia of the new taxa and related species are illustrated, and a map with the distribution and systematic notes on other species of the genus are provided.

Key words: Coleoptera, Carabidae, Harpalinae, *Bradybaenus*, taxonomy, new species, Africa.

Introduction

The genus *Bradybaenus* DEJEAN, 1829 belongs to the tribe Harpalini (subtribe Bradybaenina according to BASILEWSKY (1951), Bradybaeni group according to NOONAN (1976)), and includes 12 known species from continental Africa and Madagascar and one species (*B. festivus* DEJEAN, 1829) from India and Sri Lanka. JEANNEL (1946) treated *Ooidius* CHAUDOIR, 1847 as congeneric with *Bradybaenus*, but BASILEWSKY (1951) considered *Ooidius* as a valid genus, distinguished from *Bradybaenus* by several characters, in particular the toothed mentum and the mesotarsomeres of the male distinctly dilated and with two rows of scale-like bristles ventrally. Moreover, BASILEWSKY (1951, 1984) provided a key to the African species and described *B. obscurus* from Tanzania.

The genus *Bradybaenus* is characterized by: head with frontal furrows represented by a small pit (without clypeo-ocular grooves), mentum without median tooth, paraglossae pubescent, penultimate articles of labial palpi each with three or more setae on anterior margin, mesotarsomeres of male not dilated, without rows of scale-like bristles ventrally, metatarsomere 1 longer than 2 but markedly shorter than 2 and 3 together, anterior angles of pronotum without setae, elytra with scutellar stria on interval 2, abdomen with penultimate and two preceding sterna with a row of long setae near hind margin, median lobe of aedeagus with ostium not deflected to left.

Study of abundant material collected in Chad, Namibia and Botswana has led to the discovery of two new species of this genus, and their description is the main purpose of this work. Moreover, the examination of type specimens of some other taxa has allowed us to provide some further systematic notes.

Acknowledgements

We wish to thank our colleague Dr. Robert Davidson (Carnegie Museum of Natural History, Pittsburgh) for his critical review of the English text. We express here our warmest thanks to Dr. M. De Meyer (Musée Royal de l'Afrique Centrale, Tervuren) and Dr. T. Deuve (Muséum National d'Histoire Naturelle, Paris) for allowing us to examine typical material preserved in

their respective institutions. We also would like to thank Roberto Czeppel (Milan) for allowing us to study the species discovered by him and for the beautiful drawing illustrating it.

Material and methods

This work is based upon specimens of *Bradybaenus* from continental Africa, Madagascar and India. Examined material is preserved in the following institutions or private collections, each of which is coded by an acronym used in this publication.

MRAC	Musée Royal de l'Afrique Centrale, Tervuren (Belgium)
MSNM	Museo Civico di Storia Naturale, Milan (Italy)
CF	Coll. Facchini, Piacenza (Italy)
CK	Coll. Kmeco, Litovel (Czech Republic)
CS	Coll. Sciaky, Milan (Italy)

Measurements were made with an ocular micrometer in a Leica MZ 12.5 stereoscopic microscope. The total length was measured from the apex of the mandibles (closed) to the apex of the elytra. Measurements of body parts and abbreviations used for them in the text are:

El	length of elytra from base of scutellum to apex
Ew	maximum width of elytra
Pl	length of pronotum along median line
Pw	maximum width of pronotum

Indices used in this publication are Pw/Pl and El/Ew.

Photographs were made with a Minolta camera attached to a Leica MZ 12.5 stereoscopic microscope.

Bradybaenus czeppeli sp.n.

DIAGNOSIS: Total length 9.0 - 10.6 mm; body yellowish with posterior part of head, two longitudinal bands on pronotum and intervals 2-6 of elytra (in part) brown with green hue; legs, palpi and antennae yellowish, mandibles yellowish with dark brown apex. It can be distinguished from the other *Bradybaenus* with similar colour pattern (*B. scalaris* (OLIVIER, 1808), *B. scalaris somalicus* ALLUAUD, 1922, *B. opulentus* BOHEMAN, 1848, *B. opulentus insularis* JEANNEL, 1948, *B. robustus* sp.n. and *B. festivus* DEJEAN, 1829) by its bands and spots brown with green hue instead of metallic green (with rare exceptions), slender body, with head comparatively larger, sides of pronotum more markedly sinuate and constricted toward base. Moreover, from *B. opulentus opulentus* and *B. opulentus insularis* it is distinguished by its pronotal bands being longitudinal instead of transverse, and from *B. festivus* it is distinguished by the intervals 8-9 of elytra being yellowish instead of green.

TYPE LOCALITY: Namibia, Etosha National Park, Okaukuejo.

TYPE MATERIAL: Holotype: ♂ "Namibia, Etosha Nat. Park, Okaukuejo, I/II - 98, leg. Czeppel, Forti, Giannatelli" (CS). Paratypes: same data as holotype, 1 ♀ (CF); Namibia, Outjo, I/II - 98, leg. Czeppel, Forti, Giannatelli, 1 ♂ (MSNM); Namibia, Tsumeb, 11. 98, leg. Czeppel, 1 ♂, 1 ♀ (MSNM, CF); Namibia, Kavango, Rundu, Okavango riv., 30.1-3.2.1999, 1050 m, leg. Rudolf Kmeco, 1 ♂, 1 ♀ (CK, CF); Botswana, nr. Kasane, 6.1.1994, leg. Bednařík, 1 ♂ (CF); Botswana, nr. Kasane, 1.1.1994, leg. Moravec, 1 ♀ (CS).

DERIVATIO NOMINIS: We are pleased to dedicate this species to our dear friend Roberto Czeppel from Milan, one of the collectors of the new species.

DESCRIPTION: Total length 9.0 - 10.6 mm (9.7 mm in holotype). Habitus as in Figs. 1, 9. Body yellowish with posterior part of head, two longitudinal bands on pronotum and intervals 2-6 of

elytra (in part) brown with green hue; legs, palpi and antennae yellowish, mandibles yellowish with dark brown apex; body ventrally yellowish with abdomen, pro-, mes- and metepisterna partially brown. Body rather convex; wings fully developed. Isodiametric microsculpture present on head, pronotum and elytra.

Head very large, only slightly narrower (with eyes) than base of pronotum, smooth (with only micropunctures); frontal furrow represented by a small pit. Labrum not concave at middle; clypeus with one seta on each side; mentum without tooth; ligula slightly expanded at apex, as long as paraglossae; apical labial palpomere slender, constricted toward apex. Eyes moderately convex, tempora short. Antennae short, with antennomere 2 and 5-10 particularly short; antennomeres 1-2 glabrous, 3-11 densely pubescent, except the base of 3.

Pronotum wide, markedly transverse (index Pw/Pl = 1.89 in holotype), with lateral gutter narrow; sides markedly sinuate before hind angles, markedly constricted toward base, maximum width anterior to middle; basal angles slightly obtuse, almost right, sharp at the extreme apex; lateral seta anterior to middle; anterior angles not protruding, rounded; median longitudinal impression moderately deep; basal impressions wide, poorly delimited, punctate, one on each side of pronotum; base completely bordered; dorsal surface smooth, punctate in basal impressions. Pro-, meso- and metasternum with only very few punctures, pro- and metepisterna smooth, mesepisterna sparsely punctate; metepisterna markedly longer than wide, constricted; prosternal process unbordered, with some long setae at apex.

Elytra wide (index El/Ew = 1.52 in holotype), rather convex, glabrous, maximum width almost at middle; basal border entire, shoulders distinct, basal and lateral margin forming an obtuse angle (with a small tooth). Striae quite deep, complete, finely (often indistinctly) punctate. Intervals nearly flat, smooth. Scutellar stria long, scutellar setigerous puncture present at base of scutellar stria, without a discal setigerous puncture on interval 3 (only one paratype with a discal setigerous puncture on interval 3 on left elytron). Umbilicate series composed of 20-23 setigerous punctures, without a gap between humeral and apical series. Abdomen punctate and pubescent, penultimate and two preceding sterna with a row of long setae near the posterior border, last visible sternum with two setae on each side in both sexes.

Legs short; metatarsomere 1 longer than 2 but markedly shorter than 2 and 3 together; onychium with three pairs of thin setae ventrally; protarsomeres 1-4 of male slightly dilated, ventrally with two rows of scale-like bristles; mesotarsomeres not dilated, ventrally without rows of scale-like bristles.

Median lobe of aedeagus (Fig. 10) medium sized (1.93 mm), median lobe with dorsal ostium; apex in lateral view slender, in dorsal view straight; internal sac with a big tooth and two groups of microscopic spines.

DISTRIBUTION: Known from Namibia (Etosha National Park, Okaukuejo; Outjo; Tsumeb; Kavango, Rundu, Okavango River) and Botswana (nr. Kasane). The distributions of *Bradybaenus czeppeli* sp.n., *B. robustus* sp.n., *B. scalaris*, *B. scalaris somalicus*, *B. opulentus*, and *B. opulentus insularis* are given in Fig. 17.

AFFINITIES: *Bradybaenus czeppeli* sp.n. (Figs. 1, 9) is easily distinguished from the other *Bradybaenus* with similar colour pattern by its bands and spots brown with green hue instead of metallic green (with rare exceptions), slenderer body, with head comparatively larger, sides of the pronotum more markedly sinuate and constricted toward base, and the different shape of the aedeagus and sclerites in the internal sac (Fig. 10). Moreover, from *B. opulentus opulentus* (Fig. 5) and *B. opulentus insularis* (Fig. 6) it is distinguished by its pronotal bands being longitudinal instead of transverse, and from *B. festivus* (Fig. 7) it is distinguished by the elytral intervals 8-9 being yellowish instead of green.

Bradybaenus robustus sp.n.

DIAGNOSIS: Total length 10.5 - 11.1 mm, body yellowish with posterior part of head, two longitudinal bands on pronotum and intervals 2-5 of elytra (in part) green; legs, palpi and antennae yellowish, mandibles yellowish with dark brown apex. It can be distinguished from the other *Bradybaenus* with similar colour pattern by the stouter body, the wider base of the pronotum, almost as wide as the base of the elytra, sides of the pronotum not sinuate (sinuate in the other species, only *B. scalaris somalicus* with sides of the pronotum feebly sinuate or in some specimens not sinuate), basal angles of pronotum rounded at the extreme apex (extreme apex sharp in the other species, only *B. scalaris somalicus* with extreme apex rounded). Moreover, from *B. opulentus opulentus* and *B. opulentus insularis* it is distinguished by the pronotal bands being longitudinal instead of transverse, and from *B. festivus* it is distinguished by elytral intervals 8-9 being yellowish instead of green.

TYPE LOCALITY: Chad, Moundou, Bébédjia.

TYPE MATERIAL: **Holotype**: ♂ "Tchad, Mondou, Bebedjia, 21.I.1978, G. Ruella" (MRAC). **Paratypes**: same data as holotype, 2 ♀♀ (MRAC, CF).

DERIVATIO NOMINIS: The name of this species alludes to the robust body shape.

DESCRIPTION: Total length 10.5 - 11.1 mm (10.5 mm in holotype). Habitus as in Fig. 2. Body yellowish with posterior part of head, two longitudinal bands on pronotum and intervals 2-5 of elytra (in part) green; legs, palpi and antennae yellowish, mandibles yellowish with dark brown apex; body ventrally yellowish with abdomen, pro-, mes- and metepisterna partially brown. Body stout, rather convex; wings fully developed. Isodiametric microsculpture present on head, pronotum and elytra.

Head large, markedly narrower (with eyes) than base of pronotum, smooth (with only micropunctures); frontal furrow represented by a small pit. Labrum not concave at middle; clypeus with 1 seta on each side; mentum without tooth; ligula expanded at apex, slightly shorter than paraglossae; apical labial palpomere slender, constricted toward apex. Eyes moderately convex, tempora short. Antennae short, with antennomere 2 and 5-10 especially short; antennomeres 1-2 glabrous, 3-11 densely pubescent, except the base of 3.

Pronotum wide, markedly transverse (index Pw/Pl = 1.91 in holotype), with narrow but distinct lateral gutter; sides not sinuate before hind angles, very slightly constricted toward base, maximum width almost at middle; basal angles right, rounded at the extreme apex; lateral seta anterior to middle; anterior angles protruding, rounded; median longitudinal impression moderately deep; basal impressions wide, indistinctly delimited, punctate, one on each side of pronotum; base almost as wide as base of elytra, bordered completely; dorsal surface smooth, punctate in basal impressions and with only a few punctures at sides and in middle at base. Pro-, meso- and metasternum with only very few punctures, proepisterna smooth, mes- and metepisterna sparsely punctate; metepisterna markedly longer than wide, constricted; prosternal process unbordered, with some long setae at apex.

Elytra wide (index El/Ew = 1.38 in holotype), rather convex, glabrous, with maximum width at basal third; basal border entire, shoulders distinct, basal and lateral margin forming an angle (with an evident tooth). Striae quite deep, complete, finely (often indistinctly) punctate. Intervals nearly flat, smooth. Scutellar stria long, scutellar setigerous puncture present at base of scutellar stria, without a discal setigerous puncture on interval 3. Umbilicate series composed of 20-25 setigerous punctures, without a gap between humeral and apical series. Abdomen punctate and pubescent, penultimate and two preceding sterna with a row of long setae near posterior border, last visible sternum with two setae on each side in both sexes.

Legs short; metatarsomere 1 longer than 2 but markedly shorter than 2 and 3 together; onychium with three pairs of thin setae ventrally; protarsomeres 1-4 of male slightly dilated, ventrally with two rows of scale-like bristles; mesotarsomeres not dilated, ventrally without rows of scale-like bristles.

Median lobe of aedeagus (Fig. 11) medium sized (2.3 mm), median lobe with dorsal ostium; apex in lateral view slender, in dorsal view straight; internal sac with a big tooth and two groups of microscopic spines.

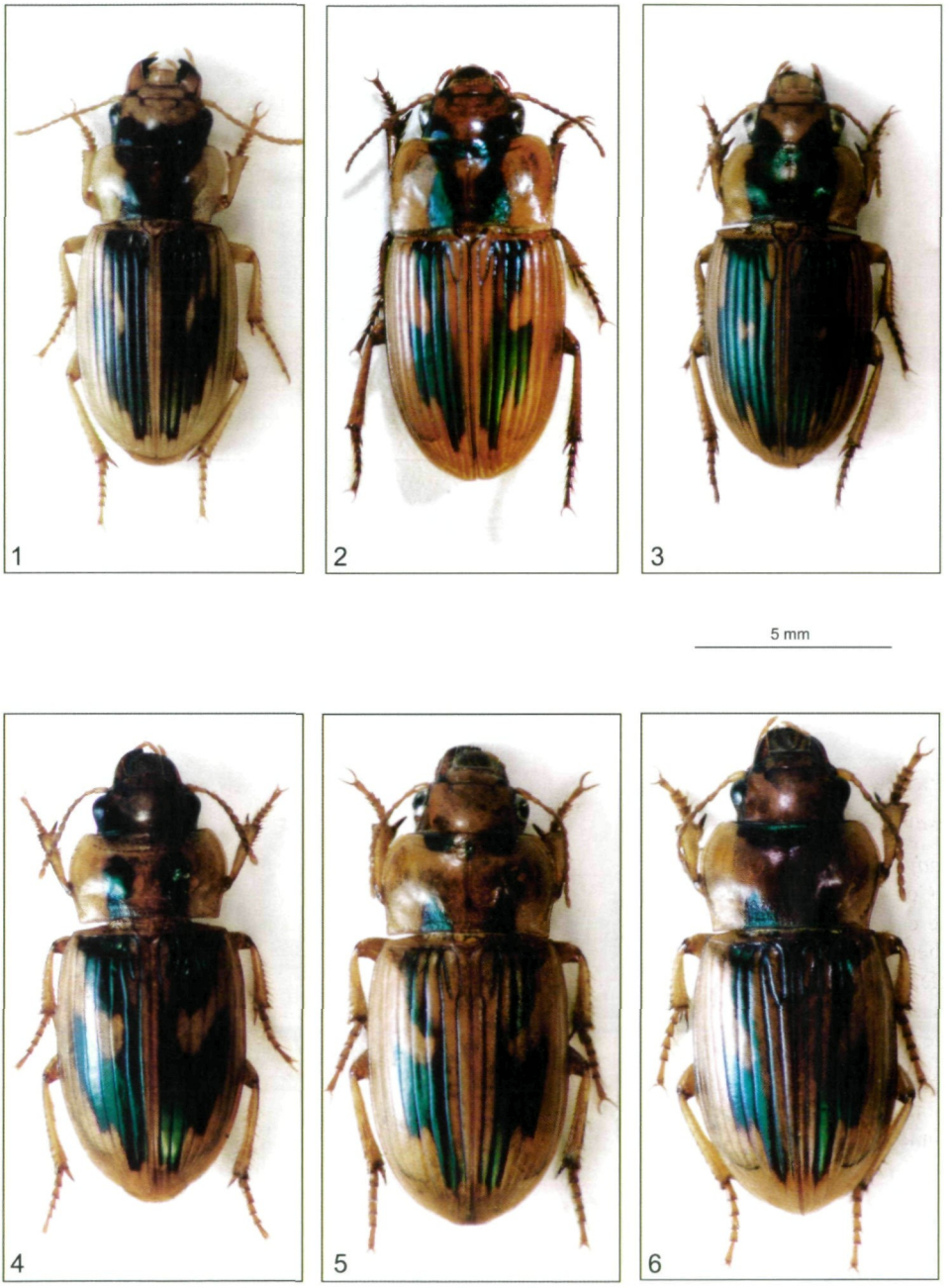
DISTRIBUTION: Known only from Chad: Moundou (Bébédjia). It is important to emphasize that *B. robustus* sp.n. and B. *scalaris* are here sympatric and probably syntopic (we have seen a series of *B. scalaris* with labels with the same data as holotype and paratypes of *B. robustus* sp.n.). The distributions of *Bradybaenus robustus* sp.n., *B. czeppeli* sp.n., *B. scalaris scalaris*, *B. scalaris somalicus*, *B. opulentus opulentus*, and *B. opulentus insularis* are given in Fig. 17.

AFFINITIES: *Bradybaenus robustus* sp.n. (Fig. 2) is easily distinguished from the other *Bradybaenus* with similar colour pattern by the stouter body, with the base of the pronotum wider, almost as wide as the base of the elytra, sides of the pronotum not sinuate (sinuate in the other species, only *B. scalaris somalicus* with sides of the pronotum feebly sinuate or in some individuals not sinuate), basal angles of the pronotum rounded at the extreme apex (extreme apex sharp in the other species, only *B. scalaris somalicus* with extreme apex rounded) and the different shape of the aedeagus and sclerites in the internal sac (Fig. 11). Moreover, from *B. czeppeli* sp.n. (Fig. 1) it is distinguished by the head markedly narrower (with the eyes) than the base of the pronotum (instead of only slightly narrower, with the eyes, than the base of the pronotum in *B. czeppeli* sp.n.) and by the bands and spots being green instead of brown with green hue. From *B. opulentus opulentus* (Fig. 5) and *B. opulentus insularis* (Fig. 6) it is distinguished by its pronotal bands being longitudinal instead of transverse, and from *B. festivus* (Fig. 7) it is distinguished by the elytral intervals 8-9 being yellowish instead of green.

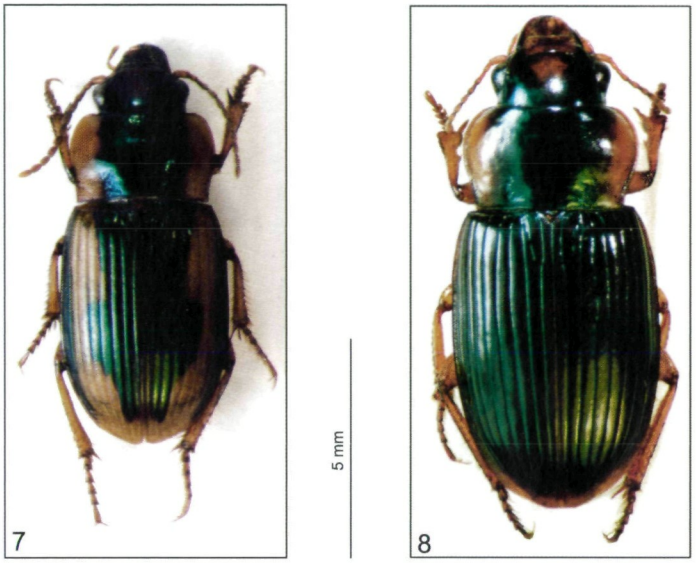
Systematic notes on other species of *Bradybaenus*

Bradybaenus scalaris (OLIVIER, 1808)

Bradybaenus scalaris scalaris (Fig. 3) occurs in Cape Verde Islands and West and Central Africa, from Senegal to Eritrea (we have examined specimens from Senegal, Eritrea and several other African countries). BASILEWSKY (1951) cited *B. scalaris scalaris* also from "Abyssinie" (today Ethiopia), riv. Boule-Boulo, but it does not seem to correspond to any locality reported in many recent or old atlases. In Somalia and Kenya there is a well-characterized subspecies, *B. scalaris somalicus* (Fig. 4), easily distinguishable from the nominotypical form. The main differences are in the sides of the pronotum slightly or not sinuate before hind angles (instead of sinuate), the basal angles of the pronotum at the extreme apex rounded (instead of sharp), and the shoulders with a small tooth (with a big tooth in *B. scalaris scalaris*). On the other hand, the aedeagus is almost identical (Figs. 12, 13). At present, the distributions of these two subspecies seem to be well separated and, since the morphological characters mentioned above are very constant, we can confirm the status of valid and well-characterized subspecies, representing an interesting example of isolated peripheral endemism. It is interesting to note that *B. scalaris somalicus* is sympatric and probably syntopic in two localities in Kenya with *B. opulentus*, the only other African widespread species with a similar colour pattern. They are immediately separated from one another (Figs. 4, 5) by the bands of the pronotum longitudinal in *B. scalaris somalicus*, transverse in *B. opulentus*, the basal angles of the pronotum rounded at the extreme apex in *B. scalaris somalicus* while the extreme apex is sharp in *B. opulentus*, and by the differently shaped aedeagus and sclerites of the internal sac (Figs. 13, 14).



Figs. 1 - 6: Habitus of 1) *Bradybaenus czeppeli* sp.n., holotype; 2) *B. robustus* sp.n., holotype; 3) *B. scalaris*, from Sassandra, Ivory Coast; 4) *B. scalaris somalicus* from Voi, Kenya; 5) *B. opulentus opulentus* from Ruaha N.P., Tanzania; 6) *B. opulentus insularis* from Andranofasika, Madagascar.



Figs. 7 - 8: Habitus of 7) *Bradybaenus festivus* from Pudukkottai, India, and 8) *B. obscurus*, paratype from Barbati-Basotu, Tanzania.

We examined a paratype of *B. scalaris somalicus* ALLUAUD, 1922 preserved in MRAC and found it corresponded completely to the abundant material examined by us from Kenya (Tsavo N.P., Sagala, Voi env.; Mwingi, Nguni env.; Garissa env.), and Somalia (Afgoi).

***Bradybaenus opulentus* BOHEMAN, 1848**

Bradybaenus opulentus opulentus (Fig. 5) occurs in eastern and southern Africa and eastern D. R. Congo, whereas *B. opulentus insularis* JEANNEL, 1948 (Fig. 6), occurs only in Madagascar. The differences between these two forms (the shape of the pronotum and the aedeagus) seem rather weak, in particular comparing the specimens from Madagascar with material from different localities from continental Africa. To this it can be added that, while JEANNEL (1948) has correctly mentioned the characters distinguishing the two forms, BASILEWSKY (1951) has inverted them.

We have examined the type specimen of *B. opulentus insularis* JEANNEL, 1948, preserved in coll. Jeannel (Muséum National d'Histoire Naturelle, Paris), observing the subtle characters noted by Jeannel that seem to us to be weak and rather variable. For the moment we still accept *B. insularis* as an insular subspecies of *B. opulentus*, although with very subtle and weak characters.

***Bradybaenus sellatus* DEJEAN, 1831**

BASILEWSKY (1946) described the species *Bradybaenus mauritanicus* from Mauritania, Senegal and Dahomey [today Benin]. Later, the same author (BASILEWSKY, 1951) considered the species *Bradybaenus sellatus* DEJEAN, 1831 as belonging to the genus *Ooidius* CHAUDOIR, 1847 (LORENZ 1998 followed this arrangement) and recorded it from French Sudan [Mali], Dahomey [Benin], Chad and Haut Volta [today Burkina Faso]. BASILEWSKY (1951) also extended the knowledge of the distribution of *B. mauritanicus* to Sudan, Niger and French Sudan [Mali].

BRUNEAU DE MIRÉ (1976) was the first who could examine the Oberthür collection (containing the types of Dejean) and observed that *B. mauritanicus* BASILEWSKY, 1946 is a synonym of *B. sellatus* DEJEAN, 1831, while *Ooidius nigerensis* VUILLET, 1911 is a synonym of *B. sellatus* and not of *B. oxyomus* CHAUDOIR, 1843 as had been proposed by BASILEWSKY (1951). We perfectly agree with the opinion of BRUNEAU DE MIRÉ (1976), observing that the characters of *B. sellatus* are unequivocally those typical of *Bradybaenus*, in particular the mesotarsomeres of male not dilated, without rows of scale-like bristles ventrally, the mentum without tooth and the paraglossae pubescent. We therefore propose to consider *sellatus* DEJEAN, 1831 as belonging to the genus *Bradybaenus*, where it had been included in the original description. This species seems diffused in a wide area extending across Africa along the Sahel Zone from Senegal to Sudan, although it is quite rare and very seldom observed in collections, so that its precise distribution is difficult to ascertain.

The correct synonymies are therefore:

Bradybaenus sellatus DEJEAN, 1831 = *Bradybaenus mauritanicus* BASILEWSKY, 1946

Bradybaenus sellatus DEJEAN, 1831 = *Ooidius nigerensis* VUILLET, 1911

Key to the *Bradybaenus* species with greenish elytral bands or spots

The following key includes the species of the genus *Bradybaenus* with greenish bands or spots, that is with a similar colour pattern to *B. robustus* sp.n. and *B. czeppeli* sp.n. We included also *B. obscurus*, with elytra almost completely greenish brown but head and pronotum with a colour similar to the other species in the key.

1 Head greenish brown, yellowish only at middle, on clypeus and buccal pieces; pronotum greenish brown with yellowish lateral parts; elytra brown with greenish hue, with interval 1 and apex pale brown (Fig. 8). Tanzania ..... *B. obscurus* BASILEWSKY, 1984

\- Head yellowish with base greenish brown or completely yellowish; pronotum yellowish with two bands green or greenish brown; elytra yellowish with greenish brown bands, distinctly bicoloured 2

2 Elytra with intervals 8-9 green (Figs. 7, 16). India, Sri Lanka..... *B. festivus* DEJEAN, 1829

\- Elytra with intervals 8-9 yellowish. Continental Africa and Madagascar 3

3 Pronotum with two green or greenish brown transverse bands; head yellowish 4

\- Pronotum with two green or greenish brown longitudinal bands; head yellowish with posterior part green or greenish brown (near the eyes) 5

4 Eastern and southern Africa, Eastern D. R. Congo (Figs. 5, 14) ..... *B. opulentus opulentus* BOHEMAN, 1848

\- Madagascar (Figs. 6, 15)..... *B. opulentus insularis* JEANNEL, 1948

5 Body stouter; base of pronotum wider, almost as wide as base of elytra, sides of pronotum not sinuate (Figs. 2, 11). Chad ..... *B. robustus* sp.n.

\- Body slenderer; base of pronotum narrower, sides of pronotum sinuate (only *B. scalaris somalicus* with sides of pronotum feebly sinuate or in some specimens not sinuate) 6

6 Body slenderer; head larger compared with pronotum; posterior part of head, bands on pronotum and intervals 2-6 of elytra (in part) brown with green hue; sides of pronotum more markedly sinuate; eyes less convex (Figs. 1, 9, 10). Namibia, Botswana..... *B. czeppeli* sp.n.

\- Body stouter; head smaller compared with pronotum; posterior part of head, bands on pronotum and intervals 2-6 of elytra (in part) green; sides of pronotum less markedly sinuate or in some specimens not sinuate; eyes more convex 7

7 Sides of pronotum sinuate, basal angles of pronotum acute or right, sharp at extreme apex; shoulders with an evident tooth (Figs. 3, 12). Cape Verde, West and Central Africa, Eritrea. ..... *B. scalaris scalaris* (OLIVIER, 1808)

- Sides of pronotum slightly sinuate or in some specimens not sinuate, basal angles of pronotum obtuse or right, rounded at extreme apex; shoulders with a small tooth (Figs. 4, 13). Eastern Africa ..... *B. scalaris somalicus* ALLUAUD, 1922

Geographical observations

The present-day diffusion of the genus *Bradybaenus* shows a Gondwana distribution, with 14 species from continental Africa and Madagascar (including the species here described) and one species (*B. festivus*) from India and Sri Lanka. The distributions of *B. scalaris* and *B. opulentus*, the African species with the same colour pattern as *B. czeppeli* sp.n. and *B. robustus* sp.n., have been reported in BASILEWSKY (1951, 1953, 1955, 1956, 1967, 1968), JEANNEL (1948) and LECORDIER (1977). In addition, we have seen abundant material from several other African localities and the results are shown in Fig. 17.

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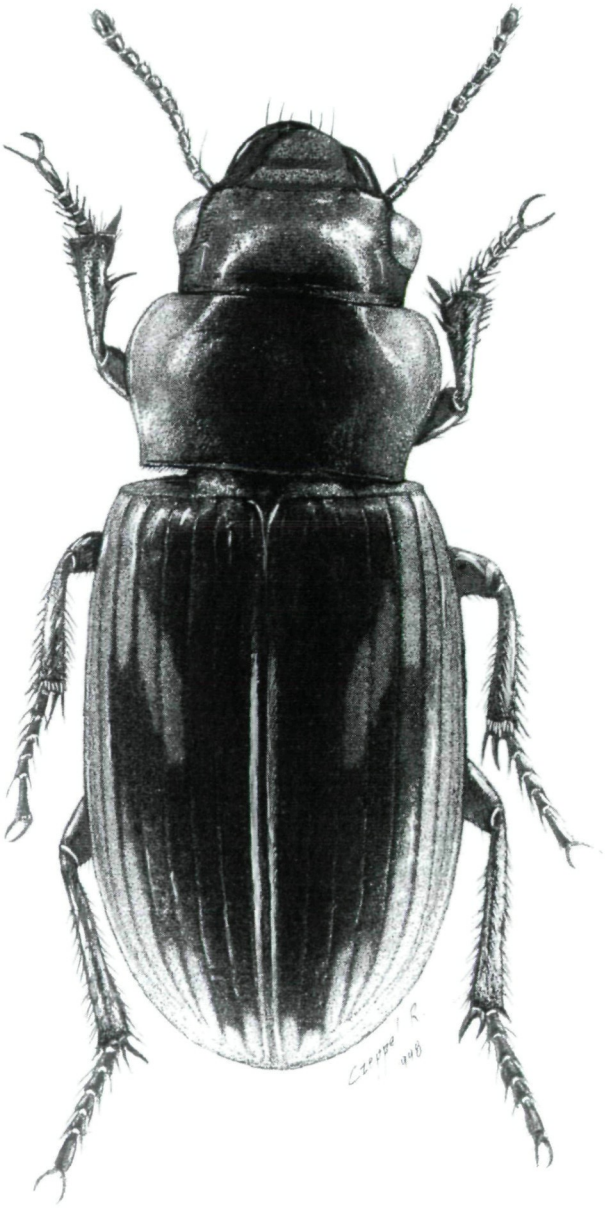
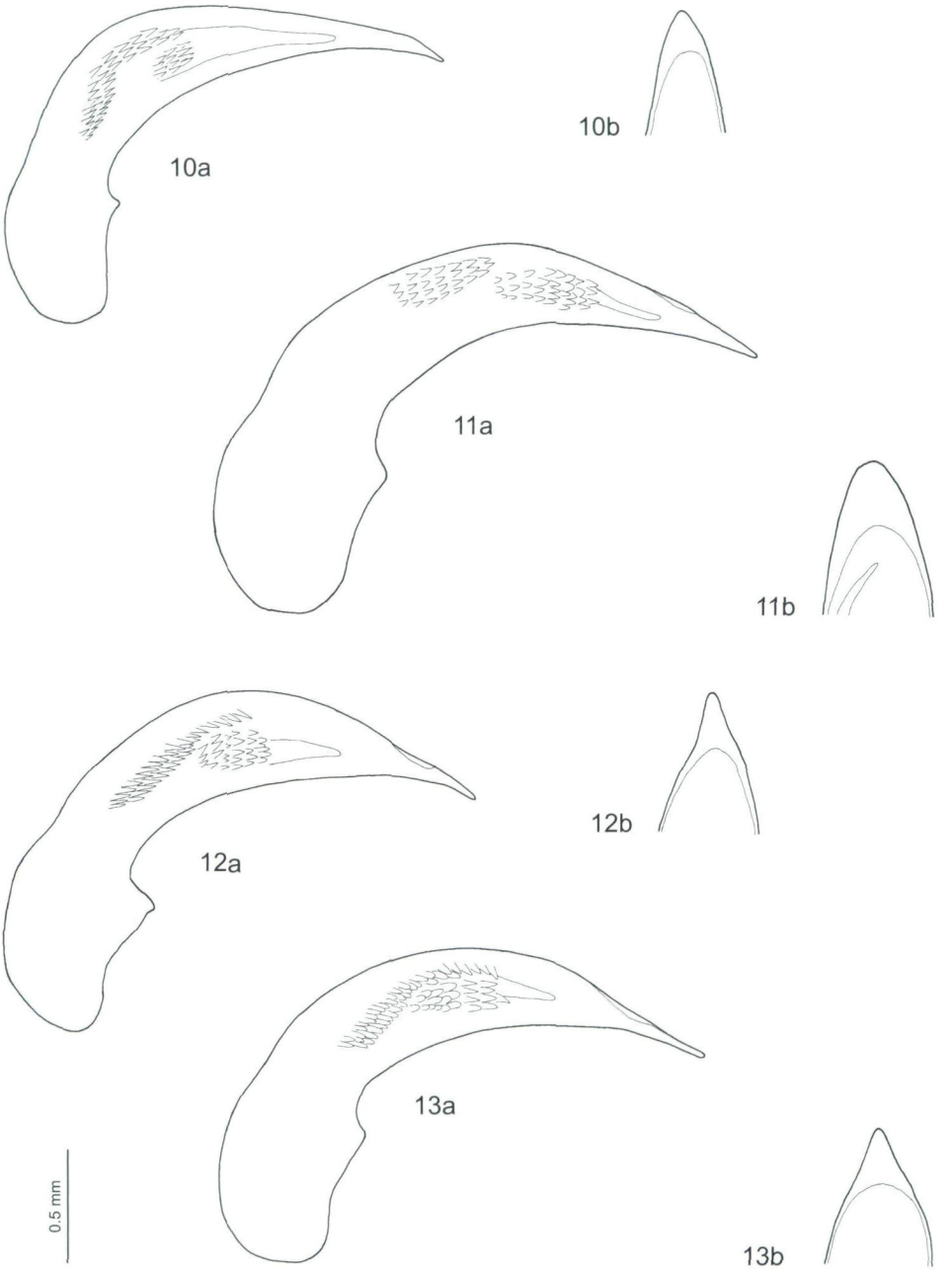
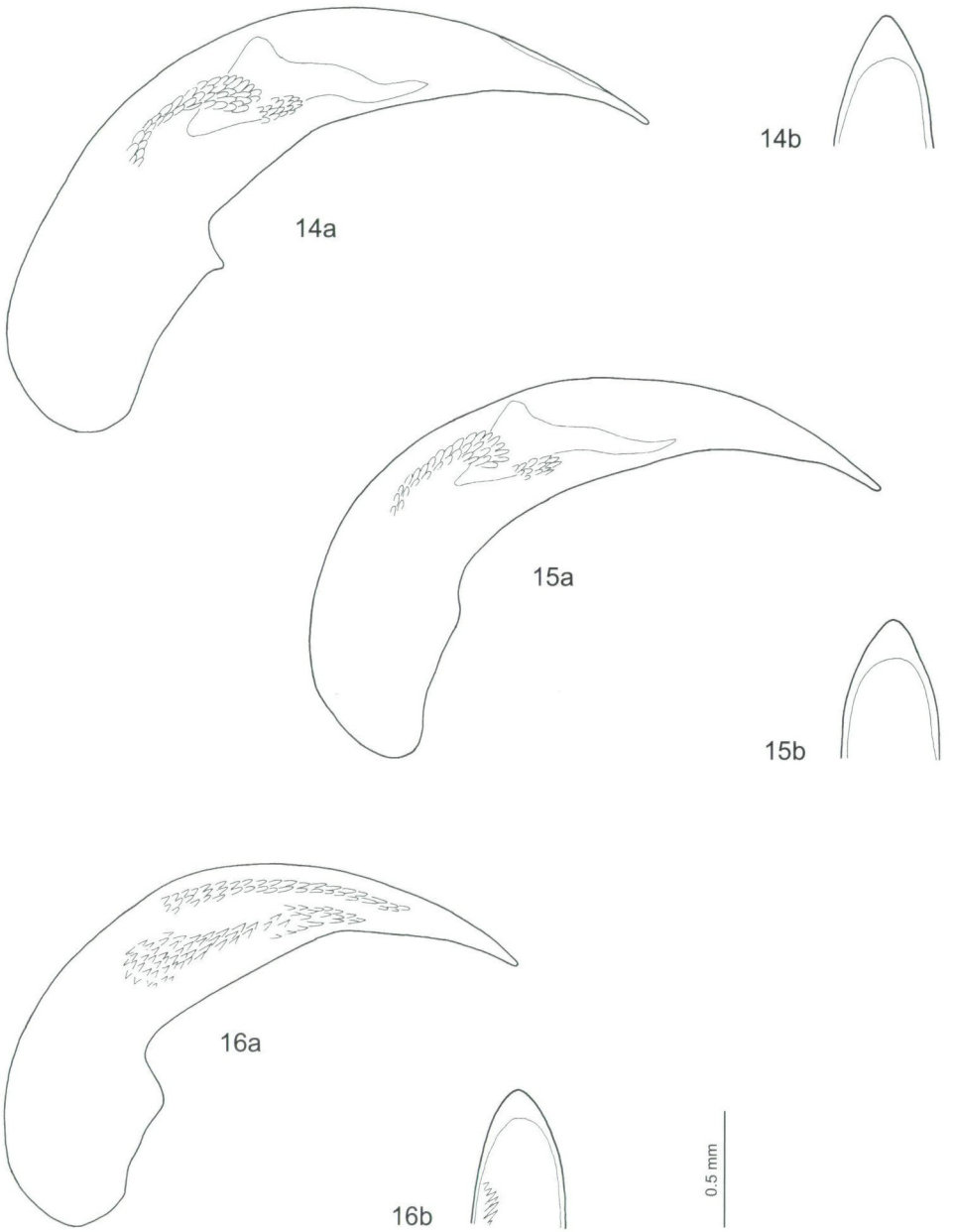


Fig. 9: Habitus of *Bradybaenus czeppeli* sp.n., paratype from Etosha N.P., Namibia (drawing made by R. Czeppel).



Figs. 10 - 13: Median lobe of the aedeagus in left view (a) and dorsal view, apical part (b) of: 10) *Bradybaenus czeppeli* sp.n., holotype; 11) *B. robustus* sp.n., holotype; 12) *B. scalaris* from Mbour, Senegal; 13) *B. scalaris somalicus* from Nguni, Kenya.



Figs. 14 - 16: Median lobe of the aedeagus in left view (a) and dorsal view, apical part (b) of: 14) *B. opulentus* from Lake Langano, Ethiopia; 15) *B. opulentus insularis* from Andranofasika, Madagascar; 16) *B. festivus* from Haridwar, India.

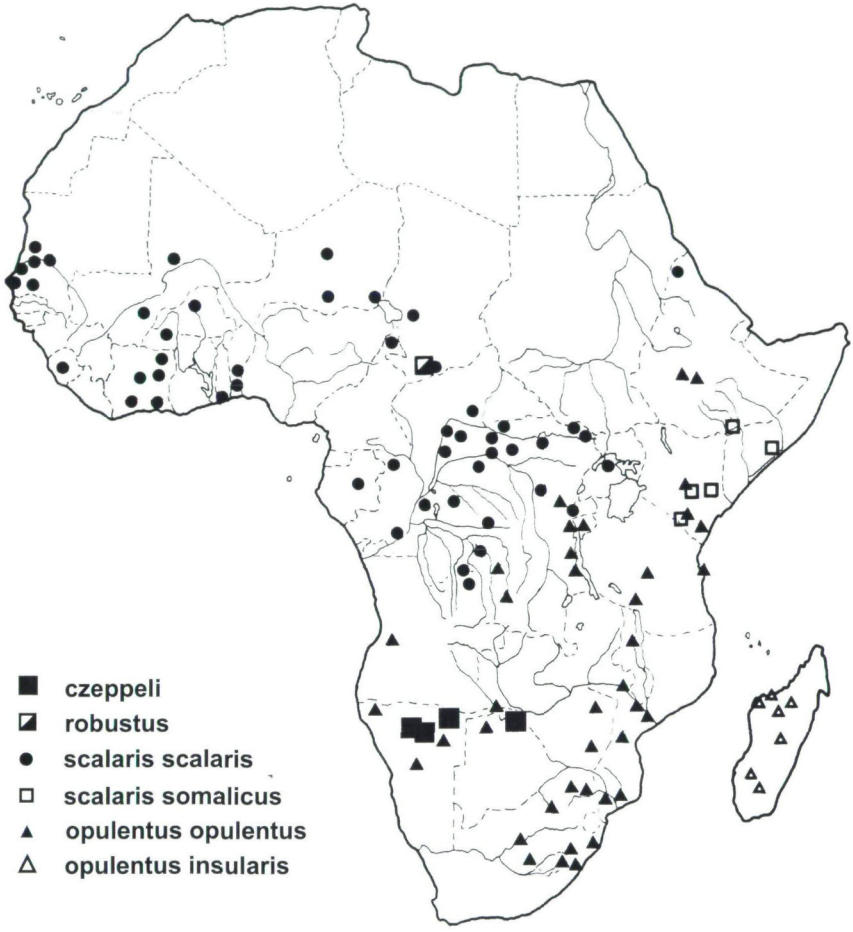


Fig. 17: Distribution of *Bradybaenus czeppeli* sp.n., *B. robustus* sp.n., *B. scalaris scalaris*, *B. scalaris somalicus*, *B. opulentus opulentus*, and *B. opulentus insularis*.

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