

# Revision of the obligate mushroom-feeding African “dung beetle” genus *Coptorhina* Hope (Coleoptera: Scarabaeidae: Scarabaeinae)

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## Abstract

The African genus *Coptorhina* Hope is revised. Nine new synonymies are established which reduces the number of valid names from 15 to six. One new species is also described. The name changes are the following: *C. subaenea* Janssens, *C. bicolor* Ancey, *C. pygmaea* Balthasar and *C. saganicola* Müller are considered junior synonyms of *C. nitidipennis* Boheman; *C. africana* Hope, *C. vicina* Péringuey, *C. obtusicornis* Boheman, *C. punctata* Ferreira and *C. optata* Péringuey are considered junior synonyms of *C. klugii* Hope. The new species, *C. excavata* sp. n., is described from southern Africa. A key to the species and notes on biology are given.

## Introduction

The genus *Coptorhina* comprises medium-sized, dark brown to black, strongly convex “dung beetles” which are widely distributed in Africa, south of the Sahara. The members of the taxon are morphologically distinguished by two characters, a bidentate clypeus and deeply emarginate lateral sides of the elytra. However, possibly the most interesting feature of the genus is the fact that all species are obligate feeders of basidiomycete fungi. The genus is currently placed in one of the tribes of so-called “tunneling” dung beetles, the Dichotomiini, although this placement is contentious (see Montreuil 1998) and is presently under review (Frolov and Scholtz, unpublished). Members of the genus harvest pieces of fungus on which adults and larvae feed. The latter develop in a ball of fungus fragments encased in a clay shell. Because suitable fungal food is widely dispersed and highly ephemeral, large amounts of food are probably seldom available. This apparently leads to variable amounts of larval food which, in turn, leads to very high variability in individual adult sizes, with up to 100% size variability common in most species. Large size, and often, structural, variability is a well-established phenomenon amongst dung beetles in general, and may be the major contributor to the presence of so-called major and minor males. The very high variability found in *Coptorhina* species has probably contributed to the large numbers of synonyms encountered during this study.

The genus was established by Hope (1835) for two species, *C. klugii* Hope and *C. africana* Hope, described in the same paper from the Cape of Good Hope and Sierra Leone, respectively. Castelnau (1840) and Lacordaire (1856) gave short diagnoses to the genus and mentioned Hope's two species but provided no original information. Boheman (1857) provided diagnoses of three species known to him: *C. klugii*, *C. nitidipennis* Boheman and *C. obtusicornis* Boheman. The two latter species were described by him as new from basins of the Orange and Limpopo Rivers, respectively. Harold (1872) transferred *Epirinus armatus* Boheman to *Coptorhina*. Ancey (1882) described a new species, *C. bicolor* Ancey, from Tanzania. Fairmaire (1893) described a new species, *C. seminitida*, from "Abessinien". Péringuey (1901) provided descriptions and a key to 10 *Coptorhina* known from South Africa and described four new species. He also used the spelling "klugi" for the Hope's species *C. klugii*, which was subsequently used by all authors. Gillet and d'Orbigny (1908) synonymized *C. seminitida* with *C. nitidipennis*. In the Junk Coleopterorum Catalogus, Gillet (1911) gave a list of all 15 *Coptorhina* species then known, including *C. parva* Sharp which was later transferred by Arrow (1931) to the genus *Delopleurus* Erichson. Gillet (1932) described a new species, *C. nitefacta* Gillet, from Kenya. Janssens (1939) designated *C. africana* the type species of the genus, described two new species from Belgian Congo and provided a key to 17 species of *Coptorhina*. Müller (1947) described a new species, *C. saganicola* Müller, from Somali. Ferreira (1954) reviewed the species of *Coptorhina* and placed six species (including a new one) in a separate, new genus *Pseudocoptorhina* (type species *C. armata* (Boheman)). However, in a later publication, Ferreira (1972) synonymized *Pseudocoptorhina* with *Frankenbergerius* since she recognized that both genera had the same type species. Ferreira's works were, however, ignored and *Frankenbergerius* has long been considered a synonym of *Coptorhina*. It was restored and revised recently (Frolov and Scholtz 2005). Bacchus (1978) designated a lectotype of *C. angolensis*. Before the present contribution the genus comprised 15 nominal species. Some of them were only known from the original descriptions and their validity was not supported by subsequent findings. The species of the genus have largely been ignored in ecological and biogeographical studies, probably due to the lack of taxonomic treatment and inability to reliably identify species using available literature. Having examined large series of *C. klugii*, *C. nitidipennis* and *C. auspicata* for this study, we found that their interspecific variability has been greatly underestimated. This necessitated examination of the type specimens of all nominal species and revision of the genus.

## Material and methods

Large numbers of *Coptorhina* specimens collected over the past few decades are available in the Transvaal Museum and RSA National Collection of Insects (both in Pretoria), but they largely originate from South Africa. Other material was borrowed widely from foreign collections. The material used for this study is housed in the following institutions: AMGS: Albany Museum, Grahamstown; BMNH: The Natural History Museum, London; BMSA: National Museum, Bloemfontein; DMSA: Durban Museum, Durban; JJCM: Jean-François Josso private collection, Muzillac; IRSNB: Institut Royal des Sciences Naturelles de Belgique, Brussels; KWCP: Karl Werner

personal collection, Peiting; MHNG: Muséum d'Histoire Naturelle, Geneva; MNHN: Muséum National d'Histoire Naturelle, Paris; MRAC: Musée Royal de l'Afrique Centrale, Tervuren; NHRS: Naturhistoriska Riksmuseet, Stockholm; NMPC: National Museum (Natural History), Prague; SAMC: South African Museum, Cape Town; SANC: National Collection of Insects, Plant Protection Research Institute, Pretoria; TMSA: Transvaal Museum, Pretoria; UMO: University Museum, Oxford; UPSA: University of Pretoria Insect Collection, Pretoria; ZIN: Zoological Institute of Russian Academy of Sciences, Sankt-Petersburg; ZMHB: Museum für Naturkunde der Humboldt-Universität, Berlin.

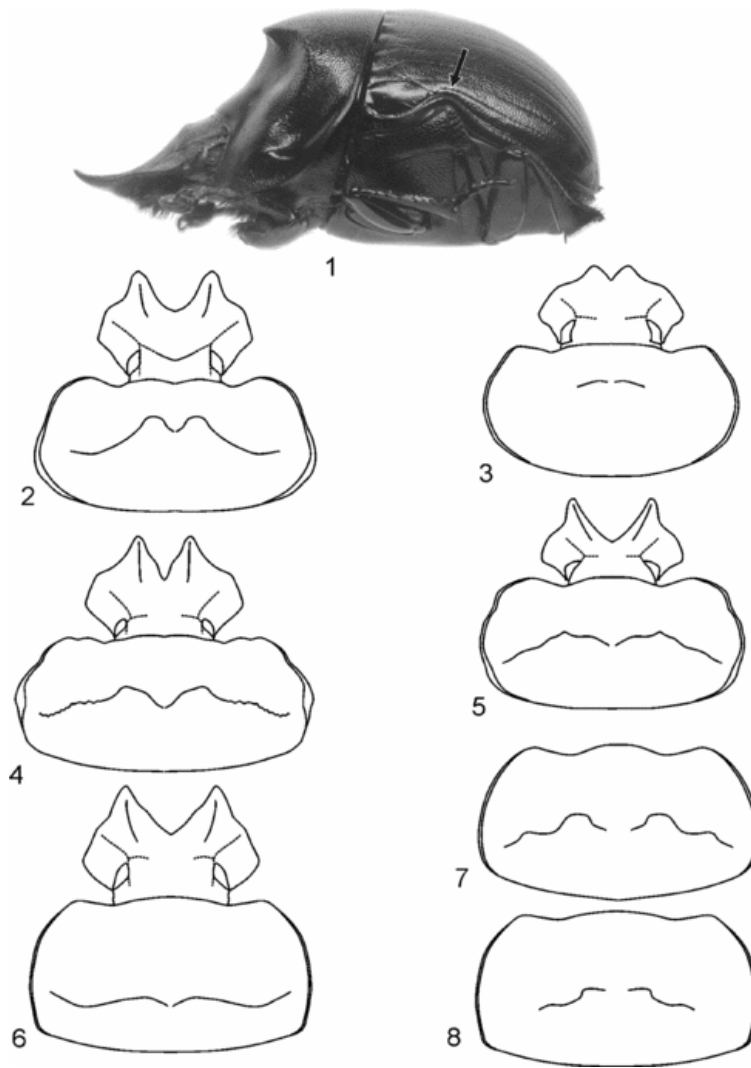
The distribution maps were generated with ArcView GIS 3.2 software (ESRI, Inc.). Coordinates were taken from the specimens' labels, if available, otherwise from the NGA GEOnet Names Server (GNS, <http://earth-info.nga.mil/gns/html/index.html>). In the lists of examined material, the localities are arranged according to countries and the countries are listed from north to south and from west to east. The distribution maps are based on the collection material and not on the literature data since the latter are often unreliable. Preparation of genitalia follows the common technique used in entomological research. Genus *Coptorhina* Hope, 1835

#### **Type species**

*Coptorhina africana* Hope, 1835 (considered here a junior synonym of *C. klugii* Hope).

#### **Diagnosis**

Among Scarabaeinae taxa, species of *Coptorhina* are readily recognized by a combination of two characters: (1) metepisternon somewhat rectangular, widest in its hind part, with secondary suture and very convex epipleural margin (Figure 1); (2) bidentate clypeus (Figures 2-6). *Coptorhina* shares the first character with the genus *Delopleurus* Erichson and it is probably a synapomorphy of the two genera. *Delopleurus*, however, can be easily separated by having a quadridentate clypeus. Males with weakly developed clypeal processes and females of some larger species of *Frankenbergerius* Balthasar are similar to species of *Coptorhina*. They can, however, be easily separated from *Coptorhina* by having a triangular metepisternon which is widest in its anterior part, with slightly convex epipleural margin, and, especially in larger males, by curious clypeal processes (Frolov and Scholtz 2005).



**Figures 1-8.** *Coptorhina* spp. 1, lateral view of body; 2-6, head and pronotum in dorsal view; 7-8, pronotum in dorsal view. 1-2, *C. auspicata*; 3, *C. nitidipennis*; 4, *C. excavata* sp. n.; 5, *C. nitefacta*; 6, *C. klugii*; 7, *C. angolensis*; 8, *C. davidi*. Figures are not to scale.

### Description

Beetles are medium-sized (8-20 mm), strongly convex, black or dark brown, glabrous. Clypeus deeply sinuate in the middle, angulate to dentate at sides of the situation. In most species anterior angles of clypeus with short carina directed proximally. Genae rectangular to rounded. Frontoclypeal suture interrupted in the middle, genal suturae distinct. Eyes small, the dorsal part slit-shaped, ventral part sub-rectangular. Distance between eye and gula approximately two times the width of eye in ventral view. Gula with longitudinal groove. Dorsal surface of clypeus rugose in most specimens, frons densely punctate to rugose.

Pronotum more or less trapezoidal, about two times wider than long. Anterior margin and base with feebly distinct, fine border. Lateral margins bordered, width of border varies

and is species-specific. Pronotum is excavated in larger specimens of all species except for *C. nitidipennis*.

Elytra trapezoidal, as wide as long, shiny to opaque, with deep sinuation on lateral margins (Figure 1). Stria fine but distinct, punctate; striae 1-7 reach base of elytron, stria 8 reaches the sinuation but not the base; striae 9-10 are very close to epipleura and mostly inseparable from each other except apically. Elytral intervals flat to feebly convex, sparsely to densely punctate. Elytra fused along sutura. During flight they are closed and slightly elevated. Scutellum not visible from above.

Wings are well developed and feature a number of, probably synapomorphic (Frolov and Scholtz, unpublished), characters that are unique to the genera *Coptorhina*, *Delopleurus*, *Frankenbergerius* and *Sarophorus*. These are: (1) brown colour of the wing except for very basal part which is almost transparent; (2) reduced anal area (veins J and AP<sub>3+4</sub> are absent); (3) CuA widened apically along the wing margin; (4) RA<sub>4</sub> does not reach the wing margin and becomes wide and indistinct apically (Figure 9) (vein nomenclature follows Kukalova-Peck and Lawrence 1993).

Anterior tibiae have three outer teeth. Margin basad of third tooth more or less serrate. Spur of anterior tibia long, apically acute and curved inwards. Outer margins of middle and posterior tibiae without transverse carinae, serrate. Tarsi of all legs well developed, shorter than tibiae. Claws about half the length of fifth tarsal segment.

Pygidium 2 times wider than long, punctate, bordered, without carinae.

Aedeagus of typical scarabaeinae shape (Figures 10-11). Basal sclerite with two symmetrical tubercles. Parameres symmetrical, without setae, similar in all species. Internal sac with armature; one sclerite (arrowed in Figure 12) has a peculiar shape and can be easily homologized among species (Figures 13A-J).

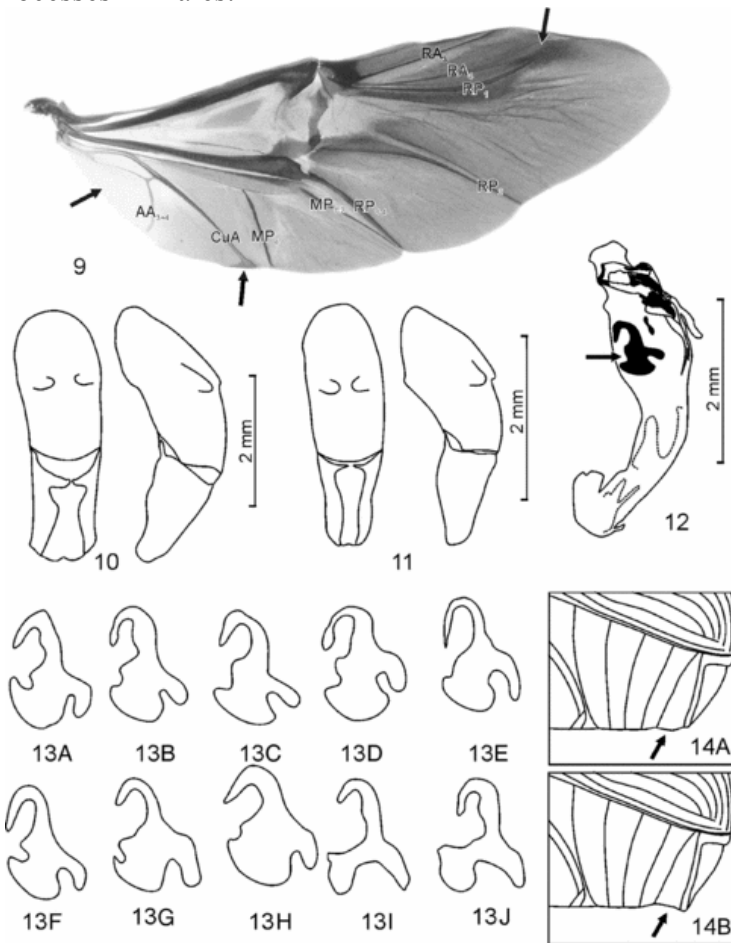
Sexual dimorphism is very weak in *Coptorhina*. Sexes do not differ in the shape of fore tibial spur or clypeal processes, i.e. in characters that can readily separate sexes in genera *Delopleurus* and *Frankenbergerius*. It is possible that minor yet statistically significant differences can be found after appropriate morphometric analysis which is beyond the scope of the present revision. The only, albeit ambiguous, character that can separate sexes is a somewhat convex sixth abdominal sternite in males which is more or less flat in females (Figure 14).

### **Diagnostic characters**

In the putatively related genera *Sarophorus* and *Frankenbergerius*, which were revised recently (Frolov and Scholtz 2003, 2005), shape of the parameres and some sclerites of the internal sac of the aedeagus provide a number of diagnostically important characters. Male and female genitalia were studied in a large number of *Coptorhina* specimens, but, despite some variation (i.e. in internal sac sclerites, Figure 13) no reliable diagnostic characters were found in these structures. The only exception is *C. nitidipennis* which has a somewhat distinctive shape of the internal sac sclerite (Figures 13I-J) and parameres

(Figure 11). This species can, however, be readily distinguished from other *Coptorhina* species by the shape of the clypeus which makes dissection unnecessary.

We found that the most reliable characters that can separate *Coptorhina* species are sculpture of pronotum and elytra and shape of the lateral border of pronotum. It can be noted that differences among the species of *Coptorhina* are considerably less distinct than among the species of two other related genera, *Sarophorus* and *Frankenbergerius*. In *Sarophorus*, species differ in a number of structures: male genitalia, body sculpture, appendages. Both paramere shape and internal sac armature are species-specific. In *Frankenbergerius*, the shape of the parameres is species-specific but in some individuals the character may be ambiguous; armature of internal sac of aedeagus is similar in most species. The species of *Frankenbergerius*, however, are readily distinguished by the sculpture of upper side of body and by the shape of the clypeal processes in males.



**Figures 9-14.** *Coptorhina* spp. 9, wing; 10-11, aedeagus in dorsal and lateral view; 12, internal sac of aedeagus; 13, internal sac sclerite arrowed in Figure 12; 14, abdomen in lateral view (14A, female, 14B, male). 9, 10, 12, 13C-E, 14, *C. auspicata* (13C, lectotype, Enkeldoorn, Zimbabwe, 13D, Cinergy Game farm, RSA, 13E, Shesheke, Zambia); 11, 13I-J, *C. nitidipennis* (13I, Cinergy Game farm, RSA, 13J, paratype, “Caffraria”); 13A-B, *C. excavata* sp. n. (13A, holotype, 13B, paratype, Mamathes, Lesotho); 13F, *C. klugii*,

Blouberg, RSA; 13G, *C. davidi*, paratype, Mpika, Congo; 13H, *C. nitefacta*, holotype, Bura, Kenya. 9, 13 and 14 are not to scale.

### **Variability**

Specimens of *Coptorhina* vary considerably in size and in shape of the pronotum. For example, in a large series of *C. auspicata* from Limpopo Province (South Africa) beetle sizes range from 8.5 mm to 19.5 mm. Specimens also show considerable variation in shape of the pronotum which is strongly excavated anterolaterally in larger specimens and less so in smaller specimens (Figure 15). Small specimens may have the pronotum only slightly excavated with a pair of small tubercles medially.

### **Biology**

The highly unusual (for a dung beetle) trophic association between members of the genus and mushrooms was first recorded during the nineteenth century. *Coptorhina* specimens have been observed feeding on mushrooms with two types of fruit-body. In the case of “puff-ball” mushrooms the adults burrow into the fruit-body, detach pieces and drag them into their burrows. In “parasol” mushrooms, the beetles climb the stalk and detach pieces of the gills, which they then drag into their burrows (Tribe 1976).

The authors' observations are limited to South Africa where the beetles occur in highland grassland, savanna and shrubland, in summer rainfall areas. Beetle activity is correlated with the availability of the fruit bodies of mushrooms and is mostly limited to periods after rain. During this study two species (*C. auspicata* and *C. nitidipennis*) were observed on Cinergy Game Farm (Limpopo Province, South Africa, 24°39'S 28°45'E) starting from the beginning of the rainfall season (mid-October). For a month, they were common in the area and most of the mushrooms examined were damaged by the beetles. At this time they actively fed and built brood balls for larvae.

Specimens of *C. auspicata* were collected and bred in the laboratory at the University of Pretoria. The beetles were kept in containers with sandy soil collected in their habitat and were fed on commercial mushrooms (*Agaricus ?bisporus*) from a grocery store. The beetles made brood balls about 2 cm in diameter. Typical coprine-like 3<sup>rd</sup>-instar larvae were found in the brood balls after three weeks. The larvae were observed to eat the macerated mushroom substance along with sand particles. The smaller size of brood balls (compared to those of dung feeders like *Copris* or *Catharsius* with similar sized larvae) is probably due to the higher nutritive value of mushrooms compared to dung. As the larvae progressively consume the brood ball contents and repeatedly re-ingest their own faeces it is likely that bacteria and fungi inhabiting the brood ball substance become the main nutritional component of the larval food.

An apparently unrecorded phenomenon was observed in *C. auspicata* specimens in which disturbed beetles excreted a whitish substance with strong, unpleasant odour that probably serves to repel predators. The substance is probably a product of the metabolism of the mushroom tissue eaten by the beetles. It is unknown if it is unique to *C. auspicata* or characteristic for a few species.

Beetles were only observed flying in day time, about half a metre above the ground. None was ever collected at light.

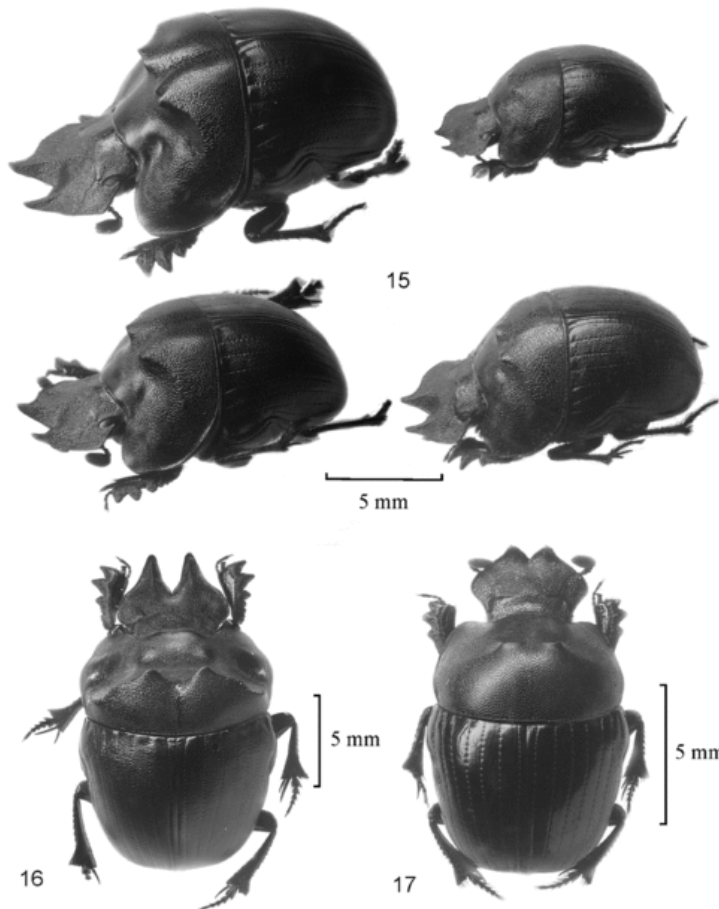
### Key to *Coptorhina* species

1. Clypeal situation acute-angled. Clypeal processes without carinae on the upper sides (Figure 3). Antennal club reddish to dark brown. Elytra sparsely punctate (punctures separated by 5-6 times their diameters)...*C. nitidipennis* Clypeal situation right-angled to rounded. Clypeal processes with more or less distinct carinae (Figures 2, 4-6). Antennal club dark brown to black. Elytra relatively densely punctate (punctures separated by 1-3 times their diameters)...2
2. Lateral border of pronotum narrow (Figures 6-8)...3 Lateral border of pronotum wide (Figures 2, 4, 5)...5
3. Disc of pronotum basad of transverse carina with punctures separated by 2-2.5 times their diameters...4 Disc of pronotum basad of transverse carina with larger punctures; sculpture is sometimes rugose....*C. davidi*
4. Carina on pronotum more or less smooth, without tubercles (Figure 6)...*C. klugii* Carina on pronotum with four tubercles...*C. angolensis*
5. Lateral border of pronotum about 2 times wider basally than apically. Disc of pronotum more sparsely punctate (punctures separated by 2-4 times their diameters basad of pronotal carina)...6 Lateral border of pronotum very wide medially becoming very faint, almost indistinct apically and basally (Figure 4). Disc of pronotum more densely punctate (punctures separated by 1 times their diameter basad of pronotal carina)...*C. excavata* sp. n.
6. Head with short but distinct fronto-clypeal tubercle (Figure 2). Pronotum densely punctate (punctures separated by 2-2.5 times their diameters). Elytral intervals coarsely punctate, punctures sometimes fused....*C. auspicata* Head without fronto-clypeal tubercle. Elytral intervals and disc of pronotum smooth, with small sparse punctures separated by 3-4 times their diameters)...*C. nitefacta*



## *Coptorhina nitidipennis* Boheman

(Figures 3, 11, 13I-J, 17, 18)



**Figures 15-17.** *Coptorhina* spp., general view. 15, *C. auspicata*, Cinergy Game farm, RSA; 16, *C. excavata* sp. n., holotype; 17, *C. nitidipennis*, Cinergy Game farm, RSA. *Coptorhina nitidipennis* Boheman 1857:207, 208; Páringuey 1901:291, 292; Ferreira 1954:3; Ferreira 1967:312, 313; Ferreira 1972:358; Gillet 1911:48; Janssens 1939:37. *Coptorhina seminitida* Fairmaire 1893:14; Ferreira 1954:3; synonymy by Gillet 1911:48. *Coptorhina subaenea* Janssens 1934:37; Ferreira 1972:359; syn. n. *Coptorhina bicolor* Ancey 1882:71; Janssens 1939:36; Gillet 1911:48; syn. n. *Coptorhina pygmaea* Balthasar 1963:95; Ferreira 1972:359; syn. n. *Coptorhina saganicola* Müller 1947:92; Ferreira 1972:359; syn. n.

### Diagnosis

This species can easily be separated from all other *Coptorhina* species by having the following characters: clypeus with acute-angled sinuation in the middle, anterior clypeal processes without longitudinal carinae on the upper side, antennal clubs reddish-orange to brown, disc of pronotum without long transversal carina even in larger specimens, only with two small carina-shaped tubercles in the middle.

## **Description**

Strongly convex, black to dark-brown, sometimes with greenish or bronze tint, shiny beetle (Figure 17). Body length 8.5-15.5 mm, width 5.5-10.0 mm. Dorsal surface without visible setae.

## **Head**

Clypeus with protruding anterior angles separated by an acute-angled situation (Figure 3). Protruding angles rounded apically, without longitudinal carinae on the upper side. Genae obtusely rounded. Genal sutures feebly distinct. Lateral margins of clypeus not sinuate near genal sutures. Frontal suture feebly visible, broadly interrupted in the middle. Dorsal surface of head with rugose sculpture. Antennal clubs reddish-orange to brown.

## **Pronotum**

Widely rounded basally, two times wider than long. Anterior margin and base finely bordered. Sides rounded, with lateral border relatively narrow, tapering basally and apically. Pronotum with two short transversal carina-shaped tubercles in the middle. Anterior part of pronotum rugose to granulate, not excavated laterally. Posterior part rugose to very densely punctate.

## **Elytra**

Striae distinct, punctate (punctures separated by 3-4 puncture diameter). Intervals feebly convex, with minute punctures, strongly shiny.

## **Underside**

Pygidium bordered, its disc densely punctate. Abdominal and thoracic sternites coarsely punctate except for disc of metasternum which is very sparsely to almost indistinctly punctate.

## **Aedeagus**

Parameres with somewhat obtuse apices in lateral view (Figure 11). Internal sac sclerite is somewhat distinctive (Figures 13I-J).

## **Variability**

Except for the body size variability the beetles differ slightly in the colour of antennal clubs which vary from reddish-orange to brown. Some species have elytral intervals almost flat.

## **Type material examined**

### ***Coptorhina nitidipennis***

Holotype with labels "Caffraria.", "J. Wahlb", "Type", "3646 E92", "Typus", "nitidipennis Boh."; paratype with labels "Caffraria", "J. Wahlb", "3645 E92" and paratype ♂ with labels "Caffraria", "J. Wahlb", "158 54", "3644 E92+", "Allotypus" (NHRS).

### **Coptorhina subaenea**

Holotype ♂ with labels “Musée du Congo Elisabethville XI-1911 Miss. Agric.”, “A Janssens det., 1939: Coptorhina subaenea type n. sp.”, “166”, “R. DÉT. L 432”, “TYPE”, “TYPE C. subaenea”, “HOLOTYPUS”, “R. DÉT. F 3943” (MRAC); paratype with labels “Paratypus”, “Paratype C. subaenea”, “Musée du Congo Elisabethville: Lubumbashi - XII - 1925 Dr Van Saceghem”, “Paratype”, “R. DÉT. 1770 J”, “A Janssens det., 1939”, “Coptorhina subaenea n.sp.”, “R. DÉT. G 3943”, “Boucomont det. 1929 Coptorhina nitidipennis Boh.” (MRAC).

It is possible that the labels of the two above specimens were confused by Janssens or after him since in the original description only Lubumbashi is mentioned as the type locality. There is however no doubt that these specimens are conspecific.

### **Coptorhina bicolor**

“Coll. R.I.Sc.N.B. Tanganyika. UZAGARA”, “Ancey det 1882 Coptorhina bicolor n. sp.”, “Syntype”, “cf. Il Natural. Siciliano II. 1882-83 p. 71”, “J.J. Gillet., vend.: Coptorhina bicolor Ancey R.M.H.N. Belg. 10.640” (IRSNB).

### **Coptorhina pygmaea**

Holotype ♂ with labels “Joko, Kamerun” and “Coptorhina pygmaea n. sp. Balth. Holotypus” (NMPC).

## **Additional material examined**

**Soudan:** Sikasso [11°19' N 05°40' W], Dr Balthasar leg. 2 spm. (NMPC).

**Nigeria:** 10km E Kontagora [10°24' N 05°28' E], 19 December 1974, G.F. Bornemissza leg. 4 spm. (SANC).

**Cameroon:** The Sangha Carnot [03°30' S 16°05' E], 2 spm. (IRSNB); Jami [not traced] L. Kolin leg. 1 spm. (ZMHB).

**Central African Republic:** Haut Chari, Fort Sibut [05°44' N 19°05' E], 1912, G. Favarel leg. 2 spm. (IRSNB); UAMG Sebiet, Bosum [06°19' N 16°23' E], 1-20 June 1914, S. Tessmann leg. 15 spm. (ZMHB); 1 spm. (IRSNB); 1919, 1 spm. (IRSNB).

**Ethiopia:** Shinile [09°41' N 41°51' E], May 1996, R. Lizler leg. 1 spm. (KWCP); Agere Maryam to Shakisso [05°38' N 38°14' E], 13 May 2002, Werner and Sudre leg. 3 spm (KWCP); Negele B. to Kebri Mengist [05°20' N 39°36' E], 13-16 May 2002, Werner and Sudre leg. 3 spm. (KWCP).

**Democratic Republic of Congo:** Katanga, Jadotville [10°59' S 26°44' E], December 1952, Van Mol leg. 2 spm. (MRAC); 18m SW of Lubumbashi [11°40' S 27°28' E], 1928, Dr H.S. Evans leg. 1 spm. (SANC), October 1971-April 1972, W. Beun (don A. Allaer) leg. 1 spm. (MRAC); Moto, Haut Uele [02°46' N 27°37' E], 1920, L. Burgeon leg. 1 spm. (MRAC); Jadotville [10°58' S 26°44' E], December 1952, J.J. Van Mol leg. 10 spm. (MRAC); Mura [11°02' S 26°42' E], November 1952, December 1949, Van Mol leg. 3 ♀ and 2 ♂ (MRAC); Kisantu [05°07' S 15°05' E], P. Goossens leg. 1 spm. (MRAC); Bambesa [03°28' N 25°43' E], April 1939, J. Vrydagh leg. 1 spm. (MRAC); Kafakumba [09°41' S 23°44' E], December 1931, G.F. Overlaet leg. 1 spm. (MRAC); Region de

Sassa [not traced], 1895-1896, Colmant leg. 2 spm. (MRAC), 1 spm. (IRSNB); Lualaba, Kalwerzi [not traced], October 1955, Dr V. Allard leg. 1 spm. (NMPC).

**Uganda:** Mt-Labwor [02°45' N 33°40' E], April 1950, van Someren leg. 8 spm. (BMNH); Busoga [00°45' N 33°30' E], April-May 1909, D. re E Bayon leg. 2 spm. (BMSA);

Karamoja, Moroto [02°45' N 34°15' E], 15 May 1971, R. Madge leg. 2 spm. (BMNH).

**Kenya:** Near Voi [03°23' S 38°34' E], 28-30 November 1997, Werner and Lizler leg. 3 spm. (KWCP); Rabai [03°55' S 39°33' E], June 1928, Dr van Someren leg. 1 ♂ (BMNH); Watamu [03°21' S 40°01' E], 29 April 1944, G.W. Jeffery leg. 1 spm. (BMNH); 25 km N of Kilifi [03°38' S 39°51' E], Arabuko-Sokoke forest, 11 June 1981, M. Ritchie leg. 1 spm. (BMNH); Makueni, Ukamba [01°48' S 37°37' E], November 1947, van Someren leg. 1 spm. (BMNH).

**Tanzania:** Near Mitundu [05°25' S 33°02' E], 10-16 December 1999, Werner and Lizler leg. 3 spm. (KWCP); to Kondoa [04°13' S 35°45' E], 9 April 2005, Werner and SMRZ leg. 5 spm. (KWCP); near Babati [04°13' S 35°45' E], 3-6 December 1997, Werner and Lizler leg. 5 spm. (KWCP); Kigonsera Nyassa-See [10°48' S 35°03' E], 1 spm. (IRSNB), 1 spm. (BMSA), 3 spm. (NMPC); Dar es Salaam [06°48' N 39°17' E], 1 spm. (IRSNB); Gelglet Estate, Ngomeni [05°09' S 38°54' E], 26-28 April 1950, R.C.M. Sweeney leg. 1 spm. (BMNH); Ndala Mission 04°45' S 33°15' E, December 1916-January 1917, Dr D.G.H. Carpenter leg. 4 spm. (BMNH); Panganisteppe, Membo Masinde [03°39' S 37°26' E], January 1906, Dr O. Schroder leg. 1 spm. (ZMHB); Kondoa to Dodoma [04°04' S 35°14' E], 10 April 2005, Werner and SMRZ leg. 6 spm. (KWCP).

**Malawi:** Nyasaland [16°02' S 35°30' E], 8 February 1913, 27 January 1923 S.A. Neave leg. 2 spm. (BMNH), 27 January 1914, S.A. Neave leg. 1 spm. (SANC); Chikala, Boma, Nyasaland [15°07' S 35°25' E], 20-25 March 1910, 4000 ft, S.A. Neave leg. 3 spm. (BMNH); Nyassa [12°00' S 34°30' E], 1944-1950, 1 spm. (BMNH), 1 spm. (ZMHB); NW Paje [15°20' S 35°38' E], 9 January 1914, S.A. Neave leg. 1 spm. (BMNH).

**Angola:** Tangambica [12°11' S 15°58' E], 1 spm. (IRSNB).

**Zambia:** N of Broken Hill, Kashitu [14°26' S 28°27' E], December 1914, H.C. Dollman leg. 2 spm. (SANC), 4 spm. (BMNH); Kabompo [13°36' S 24°12' E], 4-7 December 2001 Werner and Lizler leg., 1 ♂. (KWCP); Abercorn [08°50' S 31°23' E], 1942, H.J. Bredo leg. 1 spm. (IRSNB); Nakonde [09°20' S 32°46' E], 5 December 2004, Werner and SMRZ leg. 4 spm. (KWCP); near Kasempa [13°27' S 25°50' E], 23 November 2003, Werner and SMRZ leg. 1 spm. (KWCP), 8-9 December 2001, Werner and Lizler leg. 2 spm. (KWCP); Mwendwa 13°00' S 27°40' E, February 1914, H.C. Dollman leg. 14 spm. (BMNH), 1 spm. (SANC); Kashitu [13°42' S 28°40' E], February 1915, H.C. Dollman leg. 1 spm. (BMNH); Zambesi River, Livingstone [17°45' S 25°46' E], 26 February 1913, H.C. Dollman leg. 1 spm. (BMNH); Monze [16°19' S 27°11' E], January-March 1929, Lidio Cipriani leg. 1 spm. (NMPC); East Longwa Distr., January 1905, S.A. Neave leg. 18 spm. (UMO).

**Mozambique:** Lourenco-Marques [26°00' S 32°34' E], Dr G. Audeoud Makulane leg. 5 spm. (MHNG); Sofala, Gorongosa, Parque Nacional [18°41' S 34°18' E], 17-18 December 2003, Werner and Lizler leg. 2 spm. (KWCP); Sofala, 20/50 km N Chimoio, Manica [20°03' S 34°43' E], 17 December 2003, Werner and Lizler leg. 2 spm. (KWCP).

**Zimbabwe:** Salisbury [17°49' S 31°02' E], 1894, Marshall leg. 1 spm. (SANC), 4 spm. (SAMC), 1 spm. (TMSA), 2 spm. (IRSNB); Hillside [17°50' S 31°04' E], 5 February 1923, Swinburne and Stevenson leg. 1 spm. (TMSA); Bulawayo [20°09' S 28°35' E],

January 1923, R. Stevenson leg. 1 spm. (TMSA), 1 spm (IRSNB); Umtali, [18°58' S 32°40' E], December 1901, G.A.K. Marshall leg. 1 spm. (BMNH), 1903, A. Bodong leg. 1 spm. (SAMC); Mashonaland [17°30' S 32°00' E], 2 spm. (DMSA); Hartley [18°08' S 30°09' E], December 1895, 2 spm. (BMNH); Christmas pass, Manica [18°55' S 32°38' E], 1892, F.S. Selous leg. 1 spm. (SAMC); Umtali [18°58' S 32°40' E], January 1932, P.A. Sheppard leg. 7 spm. (TMSA); Umtali [18°58' S 32°40' E], 1 spm (SANC); Near Dorowa [19°04' S 31°45' E], 16-17 December 2004, Werner and SMRZ leg. 1 spm. (KWCP).

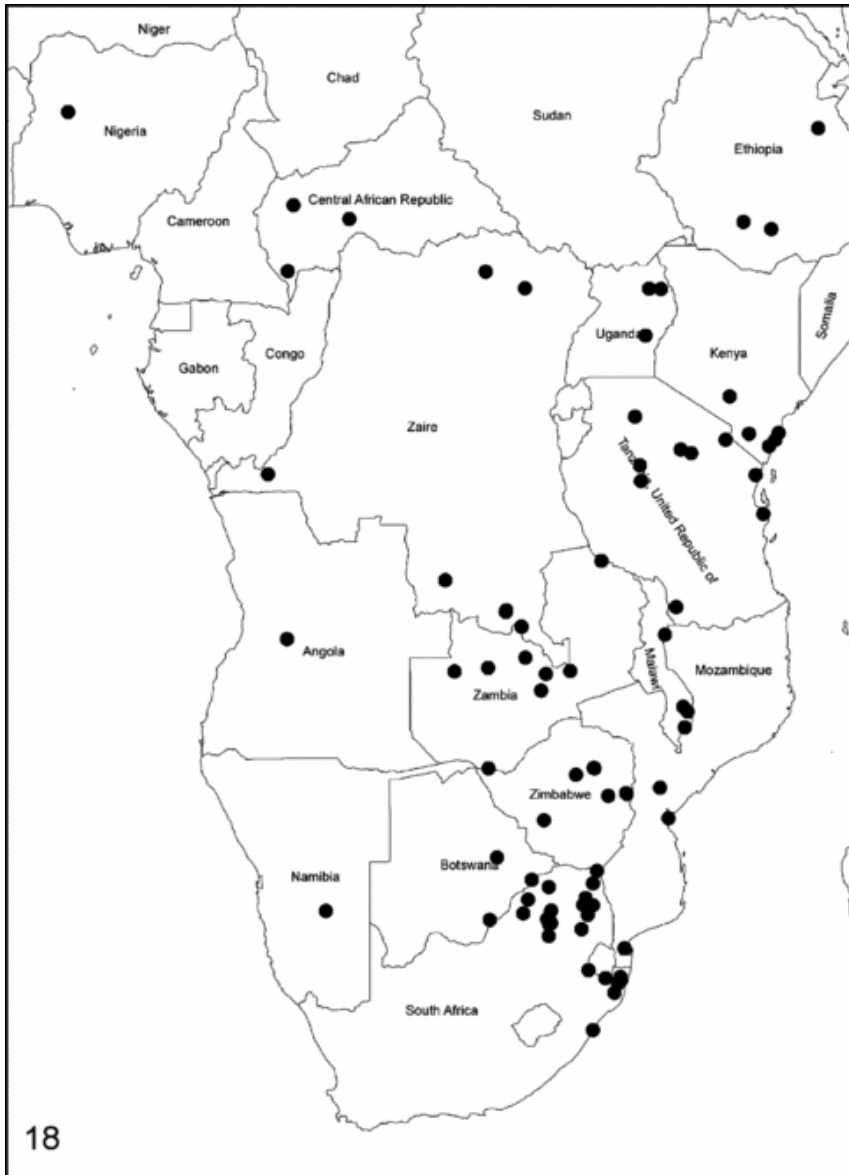
**Botswana:** Gaborones, Bechuanaland [24°40' S 25°55' E], 1915, 1 spm. (IRSNB); Tuli Saf. Lodge [22°50' S 28°00' E], 17 December 2001, 2 spm. (UPSA, ZIN); NW Paje 21°50' S 26°17' E, 30 March 1997, W.D. Haacke leg. 2 spm. (TMSA).

**Namibia:** Argentine [24°16' S 17°51' E], January 1995, Tueuman leg. 1 spm. (TMSA).

**South Africa:** KwaZulu-Natal: Ndumu [26°87' S 32°25' E], December 1960, van Son leg. 7 spm. (TMSA), 1 spm. (ZMHB); Durban, Port Natal [29°51' S 31°01' E], 3 spm. (BMNH); Pongola [27°23' S 31°38' E], 22 January 1978, G.L. Prinsloo leg. 2 spm. (SANC); Hluhluwe Game Reserve 28°05' S 32°04' E, 19 November 1992, Endrödy-Younga leg. 6 spm. (TMSA); Nsumu Pan, Mkuzi Game Reserve [27°38' S 32°15' E], 4 December 1975, G. Tribe leg. 1 spm. (SANC); Mabibi 27°20' S 32°23' E, 5 April 1995, L. Niemand leg. 1 spm. (UPSA). Limpopo: Hans Merensky Nature Reserve [23°40' S 30°39' E], 27-30 November 1981, Light trap, R.G. Oberprieler leg. 1 spm. (SANC); D'Nyala Nature Reserve, Ellisras District 23°45' S 27°49' E, 18 - 20 December 1987, B. Grobbelaar leg. 7 spm. (SANC); Moorddrift [24°15' S 28°57' E], December 1914, C.J. Swierstra leg. 10 spm. (TMSA); Letaba [23°00' S 31°00' E], December 1977, C.H. Scholtz leg. 1 spm. (SANC); near Lodge Station, 11 km E of Tuinplaas [24°53' S 28°51' E], 14 November-20 December 2002, 1000m, 1 spm. (SANC); Blouberg [23°10' S 28°50' E], 20 December 2003, A. Frolov and C. Deschodt leg. 7 spm. (UPSA, ZIN); Geelhoutbosch farm 24°22' S 27°34' E, 13 January 1999, C.L. Bellamy leg. 1 spm. (TMSA); Leydsdorp, Sidula [23°59' S 30°32' E], 1 March 1928, J. van Son leg. 1 spm. (IRSNB), 2 spm (TMSA); Pafuri, Kruger National Park [22°26' S 31°12' E], 20-24. January 1985, 264m, G.L. Prinsloo leg. 1 spm. (SANC); Cinergy Game Farm, Naboomspruit District 24°38' S 28°45' E, 16 November 2001, A. Frolov and C. Deschodt leg. 3 ♀. (UPSA, ZIN); Farm Dunstable [24°27' S 30°45' E], January 1990, V.M. Uys leg. 1 spm. (SANC); Klaserie 24°00' S 31°00' E, March 1981, H. Terblanche leg. 1 spm. (UPSA); Farm Twee Kansen 624, 20km NE of Tuinplaas [24°49' S 28°57' E], 09 January-6 February 2002, 1000m, 1 spm. (SANC). Mpumalanga: Pongola River, 36 km S Piet Retief [27°00' S 30°48' E], 19 January 2000, Werner and Lizler leg. 1 spm. (KWCP); Lydenburg District [25°06' S 30°27' E], 1896, P.A. Krantz leg. 1 spm. (TMSA); Stoffberg, Rosenkraal [25°25' S 28°50' E], 22 November 2001, Werner and Lizler leg. 4 spm. (KWCP); Cape of Good Hope, de Bonneuil leg. 1 spm. (IRSNB); Natal, M.C. Ferreira leg. 1 spm. (TMSA).

## Distribution

The species is distributed in most of the countries south of the Sahara, from Nigeria and Ethiopia in the north to South Africa in the south (Figure 18).



**Figure 18.** *Coptorhina nitidipennis*, distribution map.

## Remarks

This is the most widespread species of *Coptorhina* and it shows considerable variation in size and, to some degree, in coloration. This, along with very limited comparative material available to the past researchers, resulted in a few apparently aberrant forms from different parts of the range of *C. nitidipennis* being described as separate species. Examination of the type specimens of these species suggests that they are all conspecific with *C. nitidipennis*. They are discussed in more detail below.

In his key to the *Coptorhina* species, Janssens (1939:33, 34) mentioned the following characters to separate *C. subaenea* from *C. nitidipennis*: disc of pronotum not or feebly rugose in the former species and more or less tuberculate in the latter, carinae on the centre of the pronotum oblique in the former and straight and transverse in the latter, clypeal teeth more curved in the former and less so in the latter, body with greenish tint in the former and bronze tint in the latter. Examination of a large series of *C. nitidipennis* shows that these characters vary considerably. Additionally, comparison of the types of the two species shows no essential difference among them.

The following two species are known from single type specimens so far. *Coptorhina bicolor* was described from Tanzania. The distinctiveness of this species, according to the original description, is largely the testaceous colour of its elytra. Examination of the type specimen shows that, except for the colour, it is very similar to the *C. nitidipennis*. We believe this is a teneral specimen of the latter species and therefore we established a new synonymy here.

Balthasar described *C. pygmaea* from a specimen from Cameron and compared it with *C. bicolor*. He wrote that the new species differs from the latter in having black colour of the body (as opposed to testaceous in *C. bicolor*), incompletely granulate pronotum, coarser elytral striae and more convex elytral intervals. He did not, however, compare it with *C. nitidipennis* or any other species, and apparently had no specimens for comparison. We could not find any sound difference when compared to the type of *C. nitidipennis*.

### ***Coptorhina saganicola***

Despite reasonable effort and help from Italian colleagues we were unable to trace the type of this species. In the brief original diagnosis, however, a distinctive character of *C. nitidipennis* - red antennal clubs - is mentioned. Other characters also agree with those of the latter species. As there were no records of *C. saganicola* after it was described and there are no characters to separate it from *C. nitidipennis* we consider this name a junior synonym of *C. nitidipennis*.

## ***Coptorhina klugii* Hope**

(Figures 6, 13F, 19)

*Coptorhina klugii* Hope 1835:97; Boheman 1857:208, 209.

*Coptorhina klugi* Hope: Péringuey 1901:288, 289; Janssens 1939:35, 39; Ferreira 1972:357; Gillet 1911:48; Ferreira 1954:5, 6; unjustified emendation.

*Coptorhina africana* Hope 1835:96; Ferreira 1967:308; Janssens 1939:31, 35, 39; Ferreira 1972:354-356; Gillet 1911:47; Ferreira 1954:2; syn. n.

*Coptorhina vicina* Péringuey 1901:287, 289; Janssens 1939:35, 39; Ferreira 1972:359; Gillet 1911:48; Ferreira 1967:309, 314; Ferreira 1954:4; syn. n.

*Coptorhina obtusicornis* Boheman 1857:209; Péringuey 1901:288, 292; Janssens 1939:33, 37; Ferreira 1972:358; Gillet 1911:48; Ferreira 1967:309, 310, 313; Ferreira 1954:2; syn. n.

*Coptorhina punctata* Ferreira 1954:5; Ferreira 1972:358; syn. n.

*Coptorhina optata* Péringuey 1901:288, 290; Ferreira 1972:358; Gillet 1911:48; Ferreira 1967:309, 310, 313; Ferreira 1954:6, 7; syn. n.

## **Type material examined**

### ***Coptorhina klugii***

Holotype ♀ with labels “21”, “Type Col: 451 *Coptorhina Klugi* Hope HOPE DEPT. OXFORD”, “TYPE HOPE Trans. Zool. Soc. 1. P. 96. Coll. Hope Oxon.”, “Klugii Hope Z.J?” (UMO).

### ***Coptorhina africana***

Holotype ♂ with labels “TYPE HOPE Trans. Zool. Soc. 1. P. 96. T. I+8. 2 Coll. Hope Oxon.”, “*Coptorhina africana* Hope Z.J.”, “Type Col: 450 *Coptorhina africana* Hope HOPE DEPT. OXFORD” (UMO).

### ***Coptorhina vicina***

Syntype ♂ with labels “Type SAMC”, “Ent 2767”, “Ricatla Delagoa”, “*Coptorhina vicina* Péring. Type” (SANC).

### ***Coptorhina obtusicornis***

Holotype with labels “Caffraria.”, “J. Wahlb”, “Type”, “*obtusicornis*. Bhn.”, “*obtusicornis* Boh”, “3647 E92+”, “159 54” (NHRS).

### ***Coptorhina punctata***

Holotype with labels “Pretoria 28.XI.1921 A. Roberts”, “HOLOTIPO *Coptorhina punctata* M.C. Ferreira, 1954”. Paratype with labels “Uitzicht Zautpansberg distr. Nov, 24 (Hezke)”, “*Coptorhina nitidipennis* Boh. J.J.E. Gillet det.”, “PARATIPO *Coptorhina punctata* M. C. Ferreira, 1954”, “Paratypus *Coptorhina punctata* sp.n. M.C. Ferreira 1954” (TMSA).

### ***Coptorhina optata***

Syntype ♂ with labels “*Coptorhina optata* Typ.”, “S.E. Trop. Afr. Manica, Christmass Pass. F.C. Selous. 1892.”, “Type SAMC/Ent 2769” (SAMC).

## **Additional material examined**

**Mozambique:** Movo [12°55' S 40°00' E], 24 May 1936, 1 spm. (TMSA); Inharrime [24°28' S 35°01' E], 1983, P.P. de Moor leg. 1 spm. (TMSA); 50/100km N Massinga [23°05' S 35°20' E], 13 December 2003, Werner and Lizler leg. 1 spm. (KWCP); Ricatla, Delagoa [25°46' S 32°37' E], 1 spm. (SANC), H.A. Junod leg. 1 spm. (BMSA); Delagoa Bay [25°59' S 32°42' E], Monten? leg. 1 spm. (SAMC), 1918, 2 spm. (BMNH); Lourenco-Marques [25°58' S 32°34' E], Dr G. Audeoud Makulane (T.d.) leg. 5 spm. (MSNG); Delagoa [23°58' S 28°45' E], H. Junod leg. 6 spm. (IRSNB); Valley of Kola R. [16°28' S 35°12' E], 2 April 1913, 1500-2000 ft, S. A. Neave leg. 3 spm. (BMNH); Ponta do Ouro [26°51' S 32°54' E], 25-27 February 1968, 4 spm. (BMSA); Manhoca [26°49' S



32°35' E], 23 October 1965, G. Veiga Ferreira leg. 1 spm. (BMSA); Maputo [25°48' S 32°51' E], 1 spm. (IRSNB); 1905, 1 spm. (BMNH); 1 spm. (IRSNB); Coll. P.de Moffarts, 2 spm. (IRSNB); 1 spm. (IRSNB).

**Zimbabwe:** Mashonaland, Salisbury [17°49' S 31°02' E], G.A.K. Marshall leg. 1 spm. (TMSA); Christmas pass [18°55' S 32°38' E], 1♂ (SANC).

**South Africa:** Natal, 2 spm. (BMNH), 4 spm. (IRSNB), 1 spm. (SAMC), 1 spm. (ZMHB), 1 spm. (ZMHB); Natal, E. Candeze leg. 3 spm. (IRSNB); Natal, J. Thomson leg. 1 spm. (IRSNB); Natal, De Bonneuil, 2 spm. (IRSNB); Natal, 1913, H. Swale leg. 1 spm. (BMNH); Cape of Good Hope, J. Thomson leg. 1 spm. (IRSNB); South Africa, coll. P. de Moffarts 1 spm. (IRSNB); Transvaal, Cutter leg. 1 spm. (IRSNB); Transvaal, 10.VIII.97; 1 spm. (ZMHB); Eastern Cape: Grahams Town [33°18' S 26°32' E], 26 January 1917, P. Holl leg. 1 spm. (AMGS); Pretoria [30°47' S 28°35' E], January 1941, K. Wooldridge leg. 1 spm. (AMGS), L. Van leg. 1 spm. (TMSA); Komga [32°35' S 27°54' E], 24 January 1972, J.H. Brill leg. 1 spm. (TMSA); Port Natal [Durban], Hopp leg., 1 spm. (ZMHB). E. London [33°02' S 27°55' E], 1915, Lightfoot leg. 1 spm. (SAMC). Free State: Tigerkloof [27°51' S 28°18' E], February 1901, H.B. Marley leg. 5 spm. (BMNH); Bethlehem district 28°15' S 28°20' E, 15 January 1996, M.M. v.d.Merwe leg. 1 ♀. (UPSA); Florida district [29°56' S 26°09' E], February 1967, D.K. Green leg. 1 spm. (TMSA); Vrede 27°00' S 28°00' E, 9-15 February 1979, A. Strydom leg. 1 spm. (BMSA). Gauteng: Verwoerdburg 25°49' S 28°13' E, 1 April 1995, J. Weiermans leg. 1 spm. (UPSA); Premier Game Farm, Cullinan 25°40' S 28°29' E, 22 November 2001, 1309m, 4 spm. (TMSA); Alberton [26°14' S 28°08' E], 24 December 1973, G. Tribe leg. 4 spm. (SANC), 14 April 1974, G. Tribe leg. 1 spm. (SANC); Johannesburg [26°12' S 28°05' E], March 1929, G. Kobrow leg. 1 spm. (TMSA). KwaZulu-Natal: Durban [29°51' S 31°01' E], 3 spm. (BMNH), 1 spm. (NMPC); Mkuzi Game Reserve [27°38' S 32°15' E], 24 December 1972, A.L.V. Davis leg. 1 spm. (SANC); Charter's Greek [28°12' S 32°26' E], 26 February 1971, H.D. Brown leg. 1 spm. (SANC); Ndumu Game Reserve 26°87' S 32°25' E, 20-22 November 2002, A. Frolov leg. 6 spm. (UPSA, ZIN), 8-11 November 1971, A. Strydom leg. 1 spm. (TMSA); Ndumu Game Reserve [26°54' S 32°19' E], 22 January 1990, S. van. Noort leg. 1 spm. (SAMC); Frere [28°53' S 29°46' E], 1892, A. Marshall leg. 2 spm. (IRSNB); Krantzklouf [28°51' S 30°43' E], 1911, 1 spm. (BMNH); Sodwana 27°32' S 32°40' E, 24 March 1995, L. Niemand leg. 1 spm. (UPSA); Mabibi 27°20' S 32°23' E, 8 April 1995, L. Niemand leg. 1 spm. (UPSA); Mkuzi Game Reserve [27°38' S 32°15' E], 3-4 December 1973, K.M. Paschalidis leg. 2 spm. (SANC), 22 December 1973, A.V.L. Davis leg. 2 spm. (SANC), 1-3 April 1984, A.J. Weaving leg. 3 spm. (AMGS), 31 March 1984, A.J. Weaving leg. 1 spm. (AMGS); Lower Tugela [river] [29°14' S 31°30' E], October 1902, E.D. Reynolds leg. 1 spm. (BMNH); 56km NW of Melmoth [28°20' S 31°10' E], 31 October-1 November 2001, A.L.V. Davis leg. 1 spm. (UPSA); Newcastle [27°45' S 29°56' E], 1894, A. E. Hunt leg. 1 spm. (SAMC); Estcourt [29°00' S 29°53' E], 1 spm. (SAMC); Hluhluwe Game Reserve 28°05' S 32°04' E, 19 November 1992, Endrödy-Younga leg. 6 spm. (TMSA); Roodedraai farm [28°53' S 29°58' E], 5 April 1997, L. Erasmus leg. 1 spm. (SANC); Malvern [29°53' S 30°55' E], 4 spm. (DMSA); Durban [29°51' S 31°01' E], 26 December 1905, 1 spm. (TMSA), 1911, 1 spm. (BMNH), 25 February 1905, 1 spm. (DMSA); False bay [27°55' S 32°22' E], 23 November 2000, P. Schule leg. 11 spm. (TMSA); Scottburgh [30°17' S 30°45' E], December 1941, S. Cooper leg. 1 spm. (AMGS); New Hanover [29°21' S

30°32' E], January 1955, N.B. Baver leg. 1 spm. (TMSA); Ladysmith [28°33' S 29°47' E], 1922, Andrew Bequest leg. 2 spm. (BMNH); Sodwana Bay National Park 27°32' S 32°41' E, 9-13 November 1986, Evans, d'Hotman, Nel leg. 1 spm. (UPSA); Umvoti [29°09' S 30°45' E], H. Fry leg. 1 spm. (SANC), 1 spm. (SAMC), 1 spm. (IRSNB); Dukuduku 28°22' S 32°50' E, January 1978, G.L. Prinsloo leg. 1 spm. (SANC); Ladysmith [28°29' S 29°45' E], 1 spm. (BMNH); False Bay [27°55' S 32°22' E], 22-23 September 2000, K. Werner leg. 8 spm. (KWCP); Estcourt [29°00' S 29°53' E], 1922, Andrew Bequest leg. 1 spm. (BMNH); Isipingo [29°59' S 30°56' E], February 1896, 1 spm. (BMNH); Hluhluwe, Falaza Game Reserve [28°02' S 32°17' E], 10-15 November 2001, A. Ballerio leg. 2 spm. (ZIN); Ndumu [26°87' S 32°25' E], December 1960, van Son leg. 2 spm. (TMSA), 1 spm. (ZMHB); Tembe Elephant Park 26°51' S 32°24' E, 28 November 1998, Pieter le Roux leg. 1 spm. (SANC); Umziki Pan Reserve, near Hluhluwe 32°22' S 28°00' E, 4 April 1994, P.E. Reavell leg. 1 spm. (SANC); Malvern [29°53' S 30°55' E], P. de Moffarts leg. 2 spm. (IRSNB); Farm Kuleni, Hluhluwe District 27°54' S 32°22' E, 12-14 February 1990, B. Grobbelaar leg. 1 spm. (SANC); 5 km S of Hluhluwe [28°02' S 32°17' E], 5-10 February 1981, Bush, C. Fox leg. 2 spm. (SANC); Mnyalsa [not traced], 1 November 1979, C.R. Owen leg. 1 spm. (TMSA); Parry leg. 2 spm. (IRSNB); Zululand, 2 spm. (BMNH); 8 spm. (BMNH). Limpopo: Soutpansberg [22°58' S 29°45' E], 3 spm. (ZMHB); Moorddrift [24°15' S 28°57' E], December 1914, C.J. Swierstra leg. 1 spm. (TMSA); Cap [23°58' S 28°45' E], 1 spm. (IRSNB), 1 spm. (NMPC); Pumbe sands, Kruger National Park 24°13' S 31°56' E, 22 November 1994, ground trap, meat bait, Endrödy-Younga leg. 8 spm. (TMSA); Pumbe sands, Kruger National Park [24°12' S 31°55' E], 22 November 1994, Endrödy, Bellamy leg. 4 spm. (TMSA); Blouberg 23°10' S 28°50' E, 20 December 2003, ground trap, meat bait, A. Frolov leg. 5 spm. (UPSA, ZIN); Klaserie [24°05' S 31°15' E], 5 November 1971, T. Bouwer leg. 1 spm. (SANC); Rustenburg [24°56' S 27°09' E], December 1909, M.C. Ferreira leg. 1 spm. (TMSA); Delagoa [23°58' S 28°45' E], November 1913, Julliard leg. 3 spm. (MSNG); 6 km W of Klaserie [24°05' S 31°15' E], 5 November 1971, H.D. Brown, D. Wessels, A.S. Prinsloo leg. 1 spm. (SANC); 75km W of Messina [22°21' S 30°03' E], 24 November 1974, A.L.V. Davis leg. 1 spm. (SANC). Mpumalanga: Maboki, Lydenburg [25°06' S 30°27' E], 1917, F.J. Kroeger leg. 2 spm. (SAMC); Barberton [25°47' S 31°03' E], 1911, P. Rendall leg. 1 spm. (BMNH), December 1940, W.G. Kobrow leg. 2 spm. (TMSA), 14 January 1909, G.M. Jeffery leg. 1 spm. (TMSA); Stoffberg - Rosenkaal [25°25' S 28°50' E], 22 November 2001, Werner and Lizler leg. 4 spm. (KWCP); Lydenburg District [25°06' S 30°27' E], 1981, A.L.V. Davis leg. 1 spm. (SANC), 1896, P.A. Krantz leg. 1 spm. (TMSA), 1883, Dunn? leg. 1 spm. (SAMC), 1879, T. Ayres leg. 2 spm. (SAMC); Ermelo [26°32' S 29°59' E], 1934, G. Kobrow leg. 1 spm. (TMSA); Piet Retief District [27°00' S 30°48' E], 1903, R. Crawshay leg. 1 spm. (BMNH). North-west: Vryburg [26°57' S 24°44' E], 1 spm. (SAMC); Potchefstroom District [26°43' S 27°06' E], 1879, T. Ayres leg. 4 spm. (SAMC), 1 spm. (IRSNB); Magaliesberg [25°50' S 27°30' E], V. de Poll leg. 2 spm. (IRSNB). Western Cape: Gamkaberg, Little Karoo 33°44' S 21°57' E, 21 December 1993, ground trap, banana bait, Endrödy-Younga leg. 1 spm. (TMSA); Keurbooms River [34°01' S 23°25' E], April 1947, W.E. Callett leg. 1 spm. (TMSA).

**Lesotho:** Basoutoland, 1925, R. Ellenberg leg. 3 spm. (IRSNB).

### **Diagnosis**

This species is most similar to *C. davidi* and *C. angolensis* but differs from them in the shape of the transverse pronotal carina which is lacking tubercles in larger specimens (Figure 6). From other species it differs in having narrow lateral borders of the pronotum and evenly rounded lateral sides of the pronotum. From *C. nitefacta* it also differs in having densely punctured upper side of body.

### **Description**

Strongly convex, black to dark-brown, subopaque beetle. Body length 10.5-20.5 mm, width 7.5-14.0 mm. Dorsal surface without visible setae.

### **Head**

Clypeus with protruding anterior angles separated by deep sinuation (Figure 6). Sinuation right-angled to broadly rounded. Protruding angles acute to narrowly rounded apically, with short longitudinal carinae on the upper side. Genae obtusely rounded. Genal sutures feebly distinct. Lateral margins of clypeus sinuate near genal sutures in some individuals. Frontal suture feebly visible, broadly interrupted in the middle. Head very densely and evenly punctate, punctures sometimes adjacent and sculpture appears rugose. Antennal club dark-brown.

### **Pronotum**

Trapezoidal, two times wider than long. Anterior margin and base not bordered. Sides more or less evenly rounded. Lateral border relatively narrow, evenly tapering basally and apically. Pronotum divided into larger anterior part and smaller posterior part by a transverse carina (Figure 6). The carina is more developed in larger specimens. Anterior part of pronotum rugose to granulate, excavated laterally in larger specimens. Posterior part in specimens with well developed carina densely punctate.

### **Elytra**

Striae fine but distinct, punctate (punctures separated by 3-4 puncture diameter). Intervals flat, very densely punctate, punctures separated by about 1 puncture diameter, sometimes almost adjacent; their margins sometimes indistinct especially in apical part.

### **Underside**

Pygidium with fine border, its disc densely punctate. Abdominal and thoracic sternites coarsely punctate except for disc of metasternum which is very sparsely to almost indistinctly punctate.

### **Aedeagus**

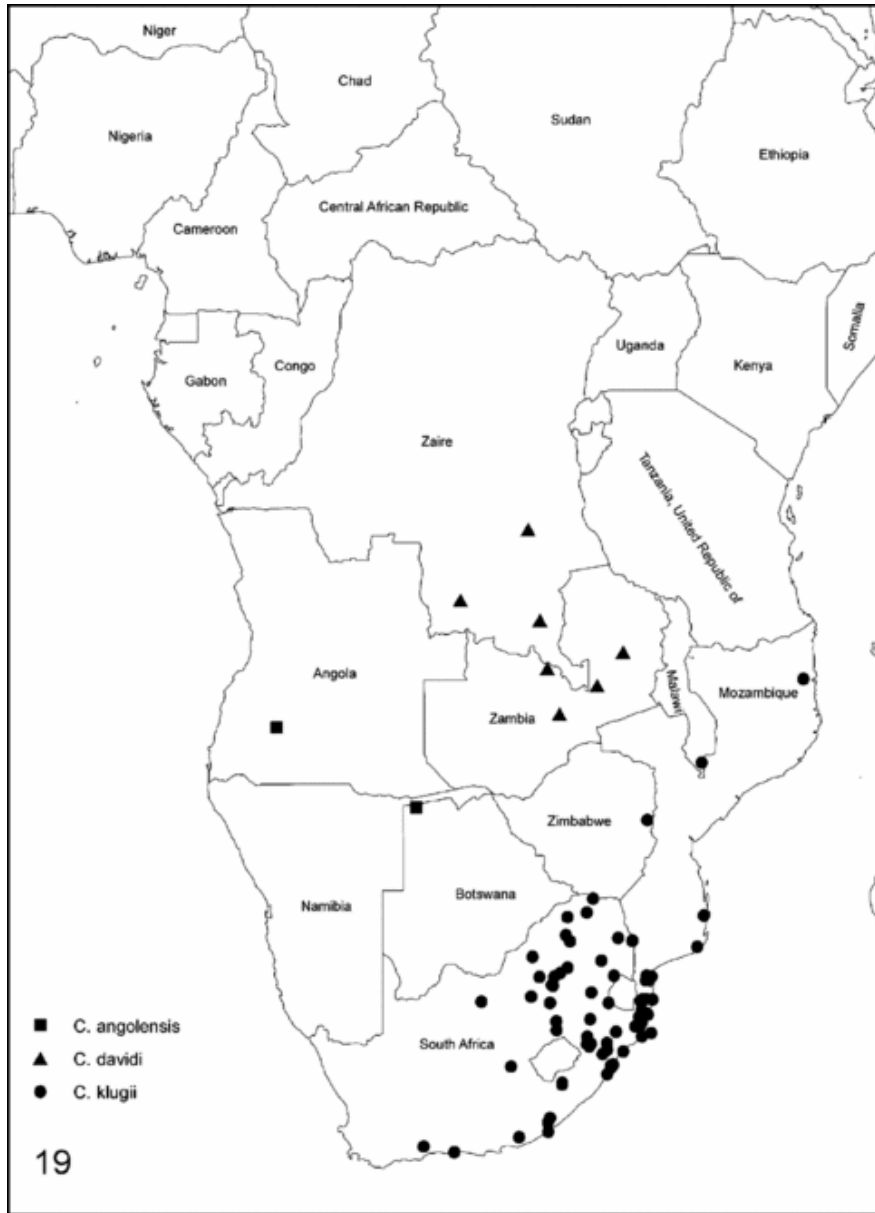
Parameres with widely rounded apices in lateral view.

### **Variability**

Except for the body size variability the beetles differ in shape and sculpture of pronotum. Smaller specimens have less developed transverse pronotal carina and slightly or almost not excavated anterolateral sides of pronotum.

## Distribution

The species is distributed mostly in South Africa and southern Mozambique. The two northernmost isolated localities are in northern Mozambique: Movo and valley of the Kola River (Figure 19).



**Figure 19.** *Coptorhina* spp., distribution map.

## Remarks

Hope (1835) described two species, *C. klugii* Hope and *C. africana* Hope from the Cape of Good Hope and Sierra Leone, respectively. The latter species was listed then in all

catalogues and reviews and was designated the type species of the genus by Janssens (1939). There are, however, no other findings of this species recorded nor are any *Coptorhina* species (except for *C. nitidipennis*) known from West Africa. Examination of the types of *C. africana* and *C. klugii* showed that they belong to the same species and the differences between them are within the limits of interspecific variability of the species commonly known as *C. klugii*. As the description of *C. africana* is based on apparently mislabelled specimen, we consider it a junior synonym of *C. klugii*.

*Coptorhina obtusicornis* Boheman was described from a specimen from the basin of the Limpopo River. Its main diagnostic character is the short, obtuse anterior clypeal processes which are normally long and acute in other *Coptorhina* species. We found, however, a few such specimens among the series of *C. klugii*. The particular form of clypeus could be a result of malformation or, less probably, abrasion. Except for the clypeus, the holotype of *C. obtusicornis* is very similar to *C. klugii*. The type locality also agrees with the known range of the latter. We believe the description of *C. obtusicornis* is based on an aberrant specimen of *C. klugii*, therefore we propose the new synonymy here.

Pêringuey (1901) described two new species, *C. optata* and *C. vicina*, from single specimens from Zimbabwe and Mozambique respectively. He wrote that both species are similar to *C. klugii* and can be separated from it by the shape of pronotum. Examination of the type of *C. vicina* showed that it cannot be distinguished from the smaller specimens of *C. klugii* which have feebly developed transverse pronotal carina. We found no differences in the shape of the pronotum between the type of *C. optata* and typical specimens of *C. klugii* with well developed carina, contrary to the characters given in the original description. Therefore we consider the two specific names synonyms of *C. klugii*.

*Coptorhina punctata* Ferreira was described from a few specimens from South Africa. We examined the holotype and the paratype of this species and found no characters to separate it from specimens of *C. klugii* with feebly developed transversal pronotal carina. Consequently, it too, is considered a synonym.

## ***Coptorhina angolensis* Arrow**

(Figures 7, 8, 19)

*Coptorhina angolensis* Arrow 1906:129; Janssens 1939:35, 38; Gillet 1911:47; Ferreira 1972:356.

### **Type material examined**

#### ***Coptorhina angolensis***

Lectotype with labels “Angola. 76.28”, “*Coptorhina angolensis* Arrow. Type ♂ a. m. 1906”, “*Coptorhina* ♂ *angolensis* Arr. M.E. Bacchus det 1975. Lectotype”, “Lectotype” (BNMH). Paralectotype with labels “Angola. 76.28”, “Paralectotype”, “*Coptorhina* ♂ *angolensis* Arr. M.E. Bacchus det 1975. Paralectotype” and with labels “Angola. 76.28”,

“Coptorhina ♂ angolensis Arr. M.E. Bacchus det 1975. Paralectotype”, “Paralectotype” (BNMH).

### **Additional material examined**

**Angola:** Bailundo [not traced], 1♂ (BMSA); Angola, August 1954, Chassot leg. 1♂ (MHNG); 1♂ (BMSA); Huila 15°00' S 15°00' E, 2 spm. (SAMC).

**Namibia:** Caprivi Park Nova, 5 km N of Okavango River [18°10 S 21°44' E], 19 December 1999, Mann, Marais, and Newman leg., 9 spm. (UMO).

### **Diagnosis**

This species is most similar to *C. klugii* but can be separated from it by the shape of the transverse carina of the pronotum which has four distinct tubercles in larger specimens (Figure 7). From other species it differs in having narrow lateral borders of the pronotum and evenly rounded lateral sides of the pronotum. From *C. nitefacta* it also differs in having densely punctured upper side of body.

### **Description**

Strongly convex, black to dark brown, subopaque beetle. Body length 11.6-18.5 mm, width 7.5-12.0 mm. Dorsal surface without visible setae.

### **Head**

Clypeus with protruding anterior angles separated by deep sinuation (Figure 6). Sinuation right-angled to broadly rounded. Protruding angles acute to narrowly rounded apically, with short longitudinal carinae on the upper side. Genae obtusely rounded. Genal sutures feebly distinct. Lateral margins of clypeus sinuate near genal sutures in some individuals. Frontal suture feebly visible, broadly interrupted in the middle. Head very densely and evenly punctuate, punctures sometimes adjacent and sculpture appears rugose. Antennal club dark-brown.

### **Pronotum**

Trapezoidal, two times wider than long. Anterior margin and base not bordered. Sides more or less evenly rounded. Lateral border relatively narrow, evenly tapering basally and apically. Pronotum divided into larger anterior part and smaller posterior part by a transverse carina (Figure 7). The carina is more developed and has four tubercles in larger specimens. Anterior part of pronotum rugose to granulate, excavated laterally in larger specimens. Posterior part in specimens with well developed carina densely punctuate.

### **Elytra**

Striae fine but distinct, punctate (punctures separated by 3-4 puncture diameter). Intervals flat, very densely punctate, punctures separated by about 1 puncture diameter, sometimes almost adjacent; their margins sometimes indistinct especially in apical part.

### **Underside**

Pygidium with fine border, its disc densely punctate. Abdominal and thoracic sternites coarsely punctate except for disc of metasternum which is very sparsely to almost indistinctly punctate.

### **Aedeagus**

Parameres with widely rounded apices in lateral view.

### **Variability**

Except for the body size variability the beetles differ in shape and sculpture of pronotum. Smaller specimens have less developed transverse pronotal carina and little excavated anterolateral sides of pronotum.

### **Distribution**

The range of this species is not quite clear because of limited material available. It is known from a few localities in Angola and was recently collected in north-eastern Namibia (Caprivi) (Figure 19).

### ***Coptorhina davidi* Janssens**

(Figures 13G, 19)

*Coptorhina davidi* Janssens, 1939:35, 38; Ferreira, 1972:357.

### **Type material examined**

Holotype with labels "Coll. R.I.Sc.N.B. Congo Belge Katanga Ankoro 7.I-1939 Dr David", "A Janssens det., 1939: *Coptorhina Davidi* nsp. Type", "Type" (IRSNB). 11 paratypes: 1 spm. with labels "Paratypus", "Paratype C. Davidi", "Musee du Congo belge Kundelungu 9-22. XII.1910", "R. DÉT. 432", "Paratype", "438", "optata Pér.", "A. Janssens det., 1939: *Coptorhina Davidi* n. sp.", "R. DÉT. L 3943" (MRAC). 1 spm. with labels "Paratypus", "Paratype C. Davidi", "Musee du Congo Dr Sheffield Neave MADONA-BANG-WEOLO XII.07", "R. DÉT. 264", "Paratype", "A. Janssens det., 1939: *Coptorhina Davidi* n. sp.", "R. DÉT. M 3943" (MRAC). 5 spm. with labels "Coll. R.I.Sc.N.B. Zambia Dr Sheffield Neave MPIKA XII. 07", "A. Janssens det., 1939: *Coptorhina Davidi* n. sp.", "Paratype" (IRSNB); 3 of them with additional labels "R. DÉT. 264", "A. Janssens det., 1939: *Coptorhina Davidi* n. sp.", "R. DÉT. M 3943"; 1 spm. with additional label "*Coptorhina auspicata* Per. Det. J.J.E. Gillet". 4 spm. with labels "Coll. R.I.Sc.N.B. Zambia Dr Sheffield Neave MPIKA I.08", "C. J. Arrow det. *Coptorhina auspicata* Pér.", "A. Janssens det., 1939: *Coptorhina Davidi* n. sp.", "Paratype" (IRSNB); three of them with additional label "J.J. Gillet det., vend.: *Coptorhina auspicata* Pering R.M.H.N. Belg. 10.640".

## Additional material examined

**Tanzania:** 1 spm. (NMPC).

**Democratic Republic of Congo:** Katanga [09°41' S 23°44' E], November 1937, F.G. Overlaet leg. 1 spm. (IRSNB).

**Zambia:** N'Changa [12°31' S 27°52' E], December 1930, C.T. Macnamara leg. 1♂ (TMSA); Serenje District [13°14' S 30°14' E], 19-22 December 1907, 4500 ft, Neave leg. 1♂ (BMNH); 23-26 December 1907, 4500 ft, 1 spm. (BMNH); N of Broken Hill, Kashitu [14°26' S 28°27' E], December 1914, H.C. Dollman leg. 1 spm. (SANC), 1 spm. (BMNH).

## Diagnosis

This species is most similar to *C. klugii* and *C. angolensis* but differs from them in the sculpture of the pronotum: disc basad of transverse carina densely punctate, sometimes rugose, even in larger specimens; transverse carina with two distinct medial tubercles and two indistinct or absent lateral ones (Figure 8). From other species it differs in having narrow lateral borders of the pronotum and evenly rounded lateral sides of the pronotum.

## Description

Strongly convex, black to dark-brown, subopaque beetle. Body length 10.2-17.0 mm, width 7.0-11.0 mm. Dorsal surface without visible setae.

## Head

Clypeus with protruding anterior angles separated by deep sinuation (Figure 8). Sinuation right-angled to broadly rounded. Protruding angles acute to narrowly rounded apically, with short longitudinal carinae on the upper side. Genae obtusely rounded. Genal sutures feebly distinct. Lateral margins of clypeus sinuate near genal sutures in some individuals. Frontal suture feebly visible, broadly interrupted in the middle. Head very densely and evenly punctate, punctures sometimes adjacent and sculpture appears rugose. Antennal club dark-brown.

## Pronotum

Trapezoidal, two times wider than long. Anterior margin and base not bordered. Sides more or less evenly rounded. Lateral border relatively narrow, evenly tapering basally and apically. Pronotum divided into larger anterior part and smaller posterior part by a transverse carina (Figure 8). The carina is more developed in larger specimens where it has two distinct medial tubercles and two indistinct or absent lateral ones (Figure 8). Anterior part of pronotum rugose to granulate, excavated laterally in larger specimens. Posterior part in specimens with well developed carina densely punctate to rugose.

## Elytra

Striae fine but distinct, punctate (punctures separated by 3-4 puncture diameter). Intervals flat, very densely punctate, punctures separated by about 1 puncture diameter, sometimes almost adjacent; their margins sometimes indistinct especially in apical part.



### **Underside**

Pygidium with fine border, its disc densely punctate. Abdominal and thoracic sternites coarsely punctate except for disc of metasternum which is very sparsely to almost indistinctly punctate.

### **Aedeagus**

Parameres with widely rounded apices in lateral view.

### **Variability**

Except for the body size variability the beetles differ in shape and sculpture of pronotum. Smaller specimens have less developed transverse pronotal carina and little excavated anterolateral sides of pronotum.

### **Distribution**

The species is distributed west and north of Tanganyika Lake (Figure 19). It is known from a few localities in Zambia and Democratic Republic of Congo and from an unknown locality in Tanzania.

## ***Coptorhina excavata* sp. n.**

(Figures 4, 13A-B, 16, 21)

### **Type material examined**

Holotype ♂ with label “Mamathes Basutoland 4 - 14-XII-1954 C. Jacot Guillarmod” (AMGS). Paratypes. 7 spm. with same label as the holotype (AMGS, ZIN). 1 ♂ with label “Basutoland Masite, 31.I.1930. J. Hewitt” (AMGS). 1 ♂ with label “Mamathes 5-I-1930 C. Jaco, Dept. of Entomology University of Pretoria” (UPSA). 1 spm. with labels “Basutoland Mamathes 2-XII-1933 C. Jacot Guillarmod” (UPSA). 1 ♂ and 1 ♀ with labels “S. Africa, O.F.S. Kromrant 123 BOSHOFF SE2825 Ca”, “BMSA 14055” and “November 1983-January 1984. Pres. traps.” (BMSA). 1 spm. with labels “S. Africa O.F.S. Schoongezicht 56. Bloemfontein 29°14' S 26°09' E”, “19.X.1983 Van Rensburg, Earlé” (BMSA). 1 ♂ with labels “S. Africa, O.F.S. Driekloof 2836 Bloemfontein 29°12' S 25°54' E”, “National Museum Bloemfontein Dept. Entomology”, “Dec. 1983 Van Rensburg, Earlé”, “BMSA 14943” (BMSA). spm. with label “Lichtenburg Dr. Brauns” (TMSA). 1 spm. with label “Museum Paris Basoutolanad Lessouto Vallee du Ht Orange 1500 m (legit R.Ellenberger) E.Haug 1906” (MNHN). 1 spm. with label “Museum Paris Afrique du Sud Pays des Bassoutos V. Ellenberger 1928” (MNHN). 1 spm. with label “Moletsane 19-XII-1930 C. Jacot Guillarmod” (TMSA). 1 ♂ with labels “BETW. LIMPOPO & ZAMBEZI RS.”, “C. optata”, “SAMC-COL. AO32416” (SAMC).

### **Diagnosis**

This species differs from other *Coptorhina* species by the shape of the pronotum and its lateral border (Figures 4, 16), somewhat serrate transverse pronotal carina and mostly brown coloration of elytra. From *C. nitefacta* it also differs in having densely punctured upper side of body.

## **Description**

Holotype ♂. Strongly convex, dark-brown with slightly lighter elytra, opaque beetle (Figure 16). Body length 20.5 mm, width 14.0 mm. Dorsal surface without visible setae.

## **Head**

Clypeus with protruding anterior angles separated by deep sinuation (Figure 4). Sinuation right-angled to broadly rounded. Protruding angles acute to narrowly rounded apically, with short longitudinal carinae on the upper side. Genae obtusely rounded. Genal sutures feebly distinct. Frontal suture feebly visible, broadly interrupted in the middle. Head very densely and evenly punctate, some punctures adjacent and sculpture appears rugose. Antennal clubs dark-brown.

## **Pronotum**

Trapezoidal, two times wider than long. Anterior margin and base finely bordered. Sides somewhat undulate. Lateral border very wide near the middle and tapering basally and apically. Pronotum divided into larger anterior part and smaller posterior part by a transversal carina. The carina is almost as wide as pronotum, very narrowly interrupted in the middle, serrate laterally. Anterior part of pronotum rugose to granulate, very deeply excavated laterally.

## **Elytra**

Colour brown, somewhat paler than in pronotum and head. Striae fine but distinct, punctate (punctures separated by 3-4 puncture diameter). Intervals flat, very densely punctate, punctures separated by about 1 puncture diameter, sometimes almost adjacent; their margins sometimes indistinct especially in apical part.

## **Underside**

Pygidium with fine border, its disc densely punctate. Abdominal and thoracic sternites coarsely punctate except for disc of metasternum which is very sparsely to almost indistinctly punctate.

## **Aedeagus**

Parameres with widely rounded apices in lateral view.

## **Variability**

Body size of paratypes: length 10.5-20.5 mm, width 7.5-14.0 mm. Except for the body size variability the beetles differ in shape and sculpture of pronotum. Smaller specimens have less developed transversal pronotal carina and lesser excavated anterolateral sides of pronotum.

## **Distribution**

The species is known from a few localities in South Africa (mostly in the Free State Province) and Western Lesotho (Figure 20).

## *Coptorhina auspicata* Péringuey

(Figures 1, 2, 9, 10, 12, 13C-E, 14, 15, 20)

*Coptorhina auspicata* Péringuey 1901:289, 290; Ferreira 1954:3-4, 1967:311-312, 1972:356-357; Janssens 1939:38; Gillet 1911:47.

### Type material examined

*Coptorhina auspicata*: lectotype (here designated): “Rhodesia. Enkeldorn. Darling.”, “*Coptorhina auspicata* typ.”, “Type SAMC/Ent 2768” (SAMC).

### Remark

In the original description, the number of the type specimens was not mentioned but the localities provided (“Transvaal (Rustenburg), Southern Rhodesia (Salisbury, Enkeldoorn), Ovampoland (Humbe)”) suggest that at least three specimens were studied. We could trace only the above mentioned specimen and we designate it the lectotype to ensure the stability of the nomenclature.

### Additional material examined

**Zambia:** 50 km NW Shesheke [17°28' S 24°18' E], 2 December 2001, Werner and Lizler leg. 1 spm. (KWCP); Livingstone [17°45' S 25°46' E], 25 February 1913, H.C. Dollmann leg. 3 spm. (BMNH).

**Zimbabwe:** Gazaland, Mpudzi River [9°24' S 32°30' E], November 1901, G.A.K. Marshall leg. 1 spm. (BMNH); Salisbury [17°49' S 31°02' E], November 1898, G.A.K. Marshall leg. 1 spm. (DMSA) 5 spm. (BMNH) 2 spm. (TMSA) 2 spm. (IRSNB), 1913, J. O'Neil leg. 2 spm. (SAMC), 10 December 1914, R. Lowe Thompson leg. 1 spm. (BMNH), 6 spm. (DMSA), F.L. Snow leg. 1 spm. (SAMC), D. Dodds leg. 1 spm. (SAMC), G.A.K. Marshall leg. 1 spm. (BMNH), 2 spm. (SAMC); Matopos [20°05' S 30°57' E], January 1904, G.A.K. Marshall leg. 3 spm. (BMNH); Bulawayo [20°09' S 28°35' E], 1909, P. de Moffarts leg. 1 spm. (IRSNB), 19 December 1924, R.H.R. Stevenson leg. 1 spm. (TMSA), January 1923, R. Stevenson leg. 2 spm. (TMSA); Galloway Estate [18°04' S 32°07' E], 1 January 1985, A.J. Weaving leg. 1 spm. (AMGS); Sawmills [19°35' S 28°02' E], 31 December 1921, 1 spm. (SAMC); Selukwe [19°40' S 30°00' E], 1915, A. Ellenberger leg. 3 spm. (IRSNB); Wedza [8°37' S 31°34' E], 17 December 1973, R.A. Erasmus leg. 1 spm. (TMSA); Hartley [18°08' S 30°09' E], December 1895, 2 spm. (BMNH); Kvinke? [not traced], December 1841, 1 spm. (DMSA).

**Botswana:** [20°30' S 22°30' E], November 1930-January 1931, G.D. Hale Carpenter leg. 2 spm. (BMNH); Okavango, Thamalakane river [20°08' S 23°23' E], December 1973, P. Reavel leg. 3 spm. (TMSA); Sitatunga, Crocodil Fm., 10km S of Maun 20°02' S 23°22' E, 10-12 January 1986, Holm, Marais, Nel, Saieva leg. 1 spm. (UPSA); 35km SE of Kang [23°45' S 22°50' E], 24 January 1978, C. Scholtz leg. 1 spm. (SANC); Bechuanaland [22°00' S 24°00' E], J.J. Gillet leg. 1 spm. (IRSNB); 42 mls. W of Kalkfontein [22°07' S 20°54' E], 11-12 April 1972, 1 spm. (BMNH); 16km N of Maun

[19°59' S 23°25' E], 17-18 January 1978, A.L.V. Davis leg. 1 spm. (SANC); Mogobane [not traced], 10 February 1970, N.S. Irving leg. 1 spm. (BMNH).

**Namibia:** Damaraland, Abachaus [21°00' S 17°30' E], December 1951, G. Hobohm leg. 1 spm. (TMSA); Otjiwarongo district, Abachaus [23°49' S 19°34' E], February 1953, G. Hobohm leg. 1 spm. (TMSA), 20 February 1956, G. Hobohm leg. 1 spm. (NMPC); Otjozondjupa, Okahandja [21°59' S 16°55' E], January 1934, 1320m, K. Jordan leg. 2 spm. (BMNH).

**South Africa:** Gauteng: Pretoria [30°47' S 28°35' E], 1 spm. (SANC); Moloto [5°27' S 28°37' E], 7 December 2000, Werner and Lizler leg. 5 spm. (KWCP); Tswaing Soutpan, 25°24' S 28°06' E, 16 December 1999, K. Nonaka leg. 4 spm. (TMSA). KwaZulu-Natal: Malvern [29°53' S 30°55' E] J.J. Gillet leg. 1 spm. (IRSNB). Limpopo: Farm Ruimte 617, 10 km N of Tuinplaas [24°49' S 28°46' E], 17 October-14 November 2002, 1050 m, 3 spm. (SANC), 19 December 2002-29 January 2003, 2 spm. (SANC); Lekkerus 24°27' S 28°33' E, 6 February 1980, W.A. Harrop leg. 1 spm. (SANC); Geelhoutbosch farm 24°22' S 27°34' E, 13-16 January 1998, Bellamy and Gussmann leg. 9 spm. (TMSA); Moorddrift [24°15' S 28°57' E], December 1914, C.J. Swierstra leg. 4 spm. (TMSA); Waterberg District [24°24' S 27°59' E], 1898-1899, V. Jutrzencka leg. 1 spm. (SAMC), 2 spm. (TMSA); Farm Twee Kansen 624, 20 km NE of Tuinplaas [24°49' S 28°57' E], 6 November-6 December 2001, 1000 m, 1 spm. (SANC), 29 January-26 February 2003, 1 spm. (SANC); Farm Ruimte 617, 10 km N of Tuinplaas [24°49' S 28°46' E], 6 December 2001-9 January 2002, 1050 m, 1 spm. (SANC), 7 November-6 December 2001, 1 spm. (SANC); Pietersburg [23°54' S 29°27' E], 1 spm. (SAMC); near Lodge Station, 11km E of Tuinplaas [24°53' S 28°51' E], 6 February-13 March 2002, 1000 m, 1 spm. (SANC), 30 January-6 March 2001, 1 spm. (SANC), 20 December 2002-29 January 2003, 3 spm. (SANC); Cinery Game farm 24°39' S 28°45' E, 18 December 2002, h = 1108 m, A. Frolov and C. Deschodt leg. 25 spm. (UPSA, ZIN); D'Nyala Nature Reserve, Ellisras District 23°45' S 27°49' E, 18-20 December 1987, B. Grobbelaar leg. 2 spm. (SANC); Potgietersrus - Thabazinabi [24°11' S 29°01' E], 25 November 2001, Werner and Lizler leg. 1 spm. (KWCP); Warmbaths [24°53' S 28°17' E], 9 November 2000, Werner and Lizler leg. 4 spm. (KWCP); Pietersburg [23°54' S 28°87' E], 1 spm. (SANC); Nylsvley, Naboomspruit 24°00' S 28°00' E, 1100 m, 1 spm. (TMSA); Cinery Game Farm, Naboomspruit District 24°38' S 28°45' E, 16 November 2001, A. Frolov C. Deschodt leg. 20 spm. (UPSA, ZIN); 35km E of Thabazimbi, Groenfontein 24°34' S 27°45' E, 27 November 1980, S.J. van Tonder leg. 4 spm. (SANC); Moorddrift [24°15' S 28°57' E], December 1914, C.J. Swierstra leg. 3 spm. (IRSNB), 1925, G.V. Dam leg. 1 spm. (TMSA); Koedoesrivier [23°27' S 30°15' E], December 1902, Breyer leg. 1 spm. (TMSA); D'Njana Game Reserve 23°40' S 27°44' E, 18 November 1988 D. Lelagadec leg. 3 spm. (UPSA); Nylsvley Nature Reserve 24°39' S 28°42' E, November 1978, light trap, 1095 m, C.D. Eardley leg. 1 spm. (SANC); Tswaing [24°29' S 29°41' E], 22 January 2000, R. Toms leg. 1 spm. (TMSA); Hill base, Nylsvley 24°40' S 28°42' E, 1 spm. (TMSA); Nylsvley Nature Reserve 24°39' S 28°42' E, March 1978, 1095 m, G. Ferreira leg. 1 spm. (SANC); Blouberg 23°10' S 28°50' E, 20 September 2003, A. Frolov leg. 2 spm. (UPSA, ZIN); Grootpan 24°01' S 27°06' E, 16 February 1990, D.J. Kotze leg. 1 ♂. (SANC); Doorndraai Dam Nature Reserve 24°18' S 28°44' E, 4-7 February 1980, Moolmen leg. 2 spm. (SANC). Mpumalanga: Leslie Fall [26°22' S 28°55' E], February 1962, 1 spm. (TMSA). N. Cape: Smythe Farm, near Olifantshoek 27°53' S 22°55' E,

February 1992, 1200 m, H.E. Steenkamp leg. 1 spm. (SANC). North-west: Vryburg [26°57' S 24°44' E], 1 April 1919, J.B. Pole-Evans leg. 2 spm. (SANC); de Wildt [25°37' S 27°57' E], 3 January 1974, G. Tribe leg. 1 spm. (SANC), 4 April 1974, A.L.V. Davis leg. 3 spm. (SANC), 6 November 1975, G. Tribe leg. 1 spm. (SANC); Castle Gorge, Magaliesberg 25°38' S 27°34' E, 2 January 1970, G.F. Bornemissza leg. 1 spm. (SANC), 27 February 1972, Bornemissza & Insley leg. 1 spm. (SANC); Ubundu Lodge Radium 25°44' S 28°13' E, 11 February 1998, J.D.M. Engels leg. 1 spm. (SANC). Rustenburg [24°56' S 27°09' E], December 1984, 3 spm. (SANC). Waterberg, 22 November 1972, E. Holm leg. 1 spm. (SANC). Between Limpopo and Zambezi Rivers, J.J. Gillet leg. 1 spm. (IRSNB).

### **Diagnosis**

This species can easily be separated from other *Coptorhina* species by having the head with carina-shaped tubercle in the middle (Figure 2). From *C. nitifacta* it also differs in having densely punctured upper side of body.

### **Description**

Black, strongly convex, dark-brown with slightly lighter elytra, opaque beetle. Body length 9.0-19.5 mm, width 6.0-12.3 mm. Dorsal surface without visible setae.

### **Head**

Clypeus with protruding anterior angles separated by deep sinuation (Figure 2). Sinuation right-angled to broadly rounded. Protruding angles acute to narrowly rounded apically, with short longitudinal carinae on the upper side. Genae obtusely rounded. Genal sutures feebly distinct. Lateral margins of clypeus sinuate near genal sutures in some individuals. Frontal suture almost invisible. Frons with short, carina-shaped tubercle in the middle. Head very densely and evenly punctate, punctures sometimes adjacent and sculpture appears rugose. Antennal clubs dark-brown.

### **Pronotum**

Trapezoidal, two times wider than long. Anterior margin and base finely bordered. Sides widely rounded. Lateral border somewhat flattened, wider in basal part and tapering apically. Pronotum with short, bituberculate transversal carina. The carina is more developed in larger specimens. Anterior part of pronotum rugose to granulate, excavated laterally in larger specimens.

### **Elytra**

Striae fine but distinct, punctate (punctures separated by 3-4 puncture diameter). Intervals flat, very densely punctate, punctures separated by about 1 puncture diameter, sometimes almost adjacent; their margins sometime indistinct especially in apical part.

### **Underside**

Pygidium with fine border, its disc densely punctate. Abdominal and thoracic sternites coarsely punctate except for disc of metasternum which is very sparsely to almost indistinctly punctate.

### **Aedeagus**

Parameres with widely rounded apices in lateral view.

### **Variability**

Except for the body size variability the beetles differ in shape and sculpture of pronotum. Smaller specimens have less developed transversal pronotal carina and lesser excavated anterolateral sides of pronotum.

### **Distribution**

This species is distributed in southern Africa from Zambia in the north to KwaZulu-Natal Province of South Africa in the south (Figure 21).

## ***Coptorhina nitifacta* Gillet**

(Figures 5, 13H, 22)

*Coptorhina nitifacta* Gillet 1932:327; Ferreira 1972:357; 1939:34, 38.

### **Type material examined**

#### ***Coptorhina nitifacta***

Holotype ♂ with labels “AFR. OR. ANGL. (WA-TaiTA) BURA Alluaud and Jeannel Mars 1912 - 1050 m - St. 61”, “*Coptorhina nitifacta* Gillet type.”, “Holotype” (MNHN).

### **Additional material examined**

**Kenya:** Garissa env. [00°27' S 39°39' E], 30 November 1999, M. Snižek leg. 1 spm. (JJCM).

### **Diagnosis**

This species differs from other similar *Coptorhina* species in having shiny, very sparsely punctate upper side of body.

### **Description**

Strongly convex, black, shiny beetle. Body length 9.5-13.5 mm, width 6.5-9.5 mm. Dorsal surface without visible setae.

### **Head**

Clypeus with protruding anterior angles separated by deep, right-angled sinuation (Figure 5). Protruding angles acute to narrowly rounded apically, with longitudinal carinae on the upper side. Genae obtusely rounded. Genal sutures feebly distinct. Lateral margins of clypeus sinuate near genal sutures in some individuals. Frontal suture feebly visible, broadly interrupted in the middle. Head very densely and evenly punctate, punctures sometimes adjacent and sculpture appears rugose. Antennal clubs dark-brown.

**Pronotum**

Trapezoidal, two times wider than long. Anterior margin and base finely bordered. Sides more or less evenly rounded. Lateral border relatively narrow, evenly tapering basally and apically. Pronotum divided into larger anterior part and smaller posterior part by a transversal carina. The carina is almost as wide as pronotum, narrowly interrupted medially, not serrate. Anterior part of pronotum punctate, excavated laterally in larger specimens. Posterior part sparsely punctate with minute punctures.

**Elytra**

Striae fine but distinct, punctate (punctures separated by 3-4 puncture diameters). Intervals flat, very sparsely punctate with minute punctures.

**Underside**

Pygidium with fine border, its disc densely punctate. Abdominal and thoracic sternites coarsely punctate except for disc of metasternum which is very sparsely to almost indistinctly punctate.

**Aedeagus**

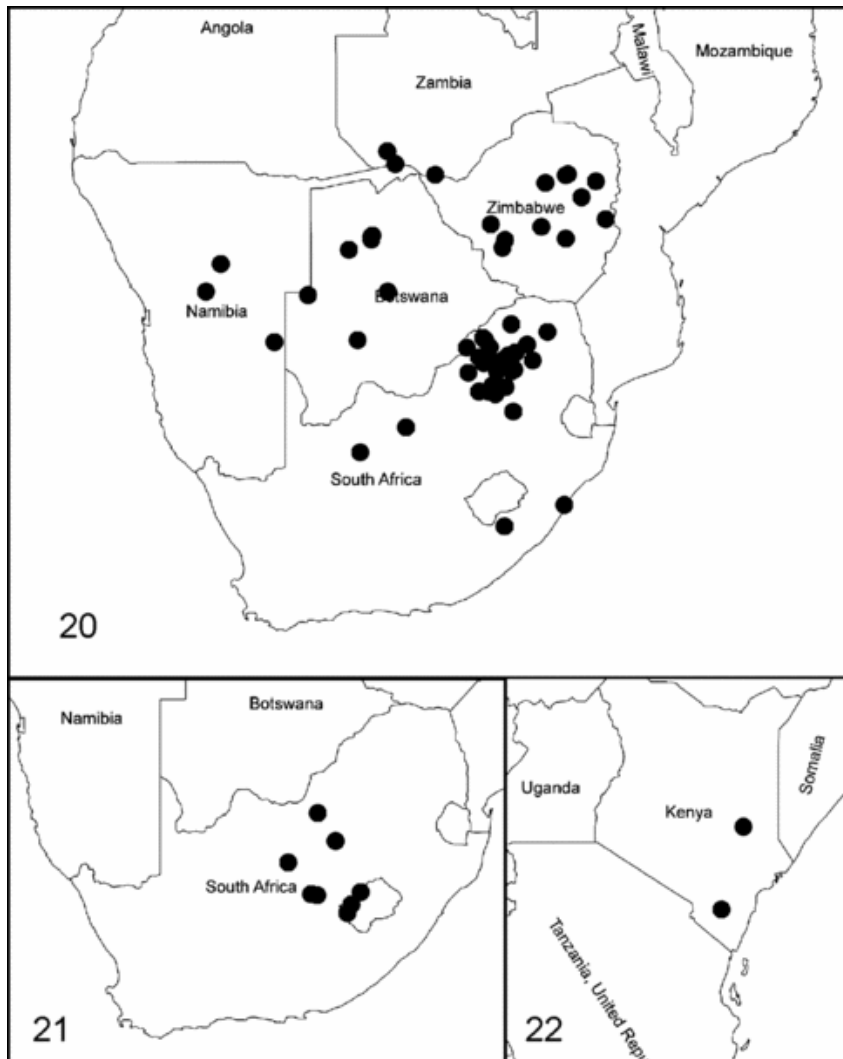
Parameres with widely rounded apices in lateral view.

**Variability**

The description above is based mostly on the holotype. The other specimen known to us is smaller and has less developed transversal pronotal carina and slightly or not excavated anterolateral sides of pronotum. It is however impossible to appreciate the interspecific variability from the material available.

**Distribution**

This species is known from two localities in Kenya (Figure 22).



**Figures 20-22.** *Coptorhina* spp., distribution map. 20, *C. auspicata*; 21, *C. excavata* sp. n.; 22, *C. nitifacta*.

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