

# Studies in Afrotropical Cleomenini (Coleoptera, Cerambycidae, Cerambycinae) VI. Review of the genus *Hexarrhopala* Gahan, 1890 with a discussion on generic limits vs. the genus *Apiogaster* Perroud, 1855

ANDERS BJØRNSTAD

Bjørnstad, A. 2014. Studies in Afrotropical Cleomenini (Coleoptera, Cerambycidae, Cerambycinae). VI. Review of the genus *Hexarrhopala* Gahan, 1890 with a discussion on generic limits vs. the genus *Apiogaster* Perroud, 1855. *Norwegian Journal of Entomology* 61, 135–142.

A review of the genus *Hexarrhopala* Gahan, 1890 with its three known species *H. apicalis* Gahan, 1890, *H. gahani* Aurivillius, 1913 and *H. rufipennis* Aurivillius, 1916 is given. Colour images of the species are published for the first time. The relationship between *Hexarrhopala* and its generic relative, *Apiogaster* Perroud, 1855, is discussed.

Key words: Coleoptera, Cerambycidae, Sestyrini, *Hexarrhopala*, *Apiogaster*, Africa.

Anders Bjørnstad, Høyåsstien 12, NO-3727 Skien, Norway. E-mail: andbjo4@online.no

## Introduction

Gahan described the genus *Hexarrhopala* with *H. apicalis* Gahan, 1890 from Nyassa as the type species. He related this new genus to *Apiogaster* Perroud, 1855, differing i.a. by the carinate prothorax (Gahan 1890 p. 309). Any reference to the shape of the scutellum – a key character distinguishing *Apiogaster* from other genera (cf. Adlbauer 2003) – were, however, not made.

Two more species of this genus were subsequently described: *H. gahani* Aurivillius, 1913 from southeastern coastal Tanzania and *H. rufipennis* Aurivillius, 1916 from the Southern Highlands in south-central Tanzania. Apart from a brief reference on *H. apicalis* by Kolbe (1897), and in the Aurivillius' Catalogue (1912), none of the species has ever been mentioned in later publications. Moreover, apart from line drawings of *H. apicalis* and *H. rufipennis* accompanying their original descriptions no pictures have been published. Enquiries to the most relevant

museums hosting Afrotropical Cerambycidae show that material of this genus and these species other than types are virtually non-existent.

The present paper aims to put some more light on these elusive species: updated information on distribution and a key to the species are given below.

Further, during this study it has become evident that the borderline between the two related genera *Hexarrhopala* Gahan, 1890 and *Apiogaster* Perroud, 1855 is not always easy to draw. A discussion on intergrading characters will be given below.

Collections acronyms. ABS = Coll. Anders Bjørnstad, Skien, Norway; NHM = Natural History Museum, London, U.K.; TMSA = Ditsong: National Museum of Natural History (ex. Transvaal Museum), Pretoria, Republic of South Africa; USNM = Smithsonian Institution, Washington DC, USA; ZSM = Zoologische Staatssammlung, München, Germany

### The genus *Hexarrhopala* Gahan, 1890

Type species: *Hexarrhopala apicalis* Gahan, 1890

The original generic description according to Gahan (1890 pp. 308–309) is as follows: “*Head deeply enough concave between the antennal tubercles. Front declivous. Muzzle short. Eyes finely faceted, emarginate, lower lobes somewhat rounded, upper lobes small, narrow. Antennæ (♀?) attaining the middle of the elytra; scape short, little thickened, joint 3 equal to 4 and 5 united, the rest gradually decreasing in length, joints 5–11 slightly dilated, 6<sup>th</sup> and 7<sup>th</sup> broadest. Prothorax cylindrical, longer than broad, with the sides nearly parallel, unarmed, very slightly constricted at the base; with a carina, strongly raised posteriorly, along the middle of the disk. Elytra with the sides nearly parallel; strongly punctured; apices broadly conjointly rounded. Femora pedunculate at the base, abruptly swollen into a short thick club at the apex. Abdomen with the first segment as long as the three following united. Sternal processes simple. Anterior cotyloid cavities closed in behind; the intermediate shut off from the mesothoracic epimera by the production forward of the antero-lateral lobes of the metasternum. The body, legs, and basal joints of the antennæ provided with long scattered hairs.*”

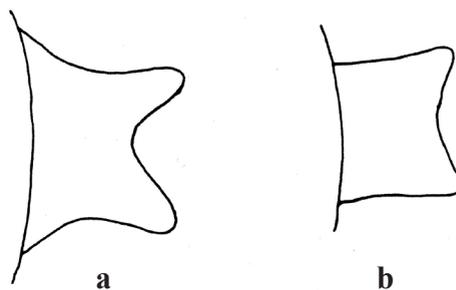
Further, Gahan (l.c.) added: “*There can be no doubt that the place of this genus is in the group Cleomeninæ, from the other genera of which, it is, however, sufficiently distinct. It comes nearest, perhaps, to Apiogaster.*”

**Sexual dimorphism.** Neither Gahan nor Aurivillius mention anything about differences in external characters between the sexes of the species of *Hexarrhopala*. However, it seems sexual dimorphism is weakly developed. The males are slightly smaller, slightly narrower, and have slightly longer antennae. Although material is scant, it appears that the ultimate antennal joint in males is more slender and with a more acute apex than in females.

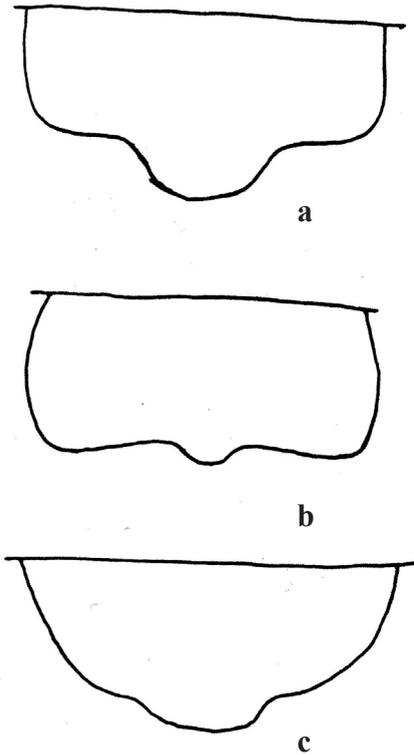
### Delimitation towards the genus *Apiogaster* Perroud, 1855: discussion and analysis of relevant characters.

**Scutellum.** As can be seen from Gahan’s generic description of *Hexarrhopala* there is no reference to the structure of the scutellum. Neither is this to be found in the description of the type species, *H. apicalis* Gahan, 1890.

Adlbauer (2003) revised the genus *Apiogaster*. There he states *Dere* White, 1855 and *Zoocosmius* Fåhraeus, 1872 (= *Dere*, cf. Bjørnstad 2013) as the nearest relatives. However, there is no mention in this article of *Hexarrhopala*. The author points out, however (l.c. p. 4) that the key character for the genus *Apiogaster* is “*das kleine, steil aufragende und zweispitzige Scutellum*”. The shape of this bifid scutellum varies a bit through the genus as can be seen from Figure 1. The typical shape is that found in the type species of *Apiogaster*, *A. rufiventris* Perroud, 1855 (Figure 1a): a rather broad base, then slightly narrowed in the middle before bifurcating into two more or less blunt apical lobes. The majority of the species of *Apiogaster* have a scutellum with a shape like this, but in some species the sides of the scutellum are more or less parallel, and the apical excavation much more shallow (Figure 1b). This type is found in e.g. *A. femoralis* Hintz, 1919, *A. zimbabweensis* Adlbauer, 2003, *A. centralis* Adlbauer 2007, *A. conradti* Aurivillius, 1907, *A. sanguinicollis* Hintz, 1919 and *A. collare* Jordan 1903.



**FIGURE 1.** Outline of various shapes of the scutellum in *Apiogaster*. **1a.** *A. rufiventris* Perroud, 1855. **1b.** *A. femoralis* Hintz, 1919.

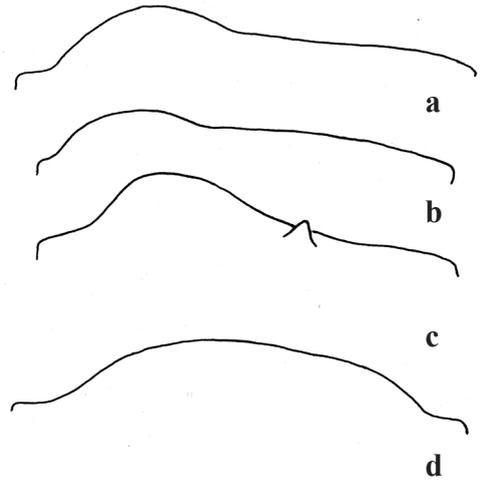


**FIGURE 2.** Outline of various shapes of the scutellum in *Hexarrhopala*. **2a.** *H. apicalis* Gahan, 1890. **2b.** *H. gahani* Aurivillius, 1913. **2c.** *H. rufipennis* Aurivillius, 1916.

The present author has examined the scutella of the three species of *Hexarrhopala*. As can be seen from Figure 2 their shape varies, but all three are essentially transversal in shape: broad and short and with a short protruding rounded apical lobe.

The scutella of *Apiogaster* are always glabrous, while those of *Hexarrhopala* hairy or glabrous: densely ciliate in *H. apicalis* and *H. gahani*, but practically glabrous in *H. rufipennis*.

**Carination of pronotum.** In *Apiogaster* the pronotum is normally acarinate. However, in 1903 Jordan described the taxon *collare*, which he attributed to *Apiogaster* in spite of it having a strong medial pronotal carina (Figure 8). All three *Hexarrhopala* spp. have carinate pronota. The carina itself, however, is essentially different in *A. collare* and *Hexarrhopala*. In *A. collare* the



**FIGURE 3.** Lateral view of the pronotum (anterior part to the right). **3a.** *H. apicalis* Gahan, 1890. **3b.** *H. gahani* Aurivillius, 1913. **3c.** *H. rufipennis* Aurivillius, 1916 (note tubercle). **3d.** *Apiogaster collare* Jordan, 1903.

pronotum has “a mesial carina from near apical edge to basal constriction” (Jordan 1903 p. 140). In other words, the keel is running for almost the entire length of the pronotum (Figure 3d). In *Hexarrhopala* the carinate part is restricted to the posterior half of the pronotum where there is a sharp ridge with a profile like the hump of a camel’s back (Figures 3a–c).

**Carination of tibiae.** In Gahan’s original description of *Hexarrhopala* (1890) he says “The tibiae carinate, with the intervals between the carinae punctured.” Actually, the tibiae are 3–5-carinate with the dorsoanterior (front) carina the strongest. Although this is consistent in all three species of *Hexarrhopala*, it is a character also found in *Apiogaster*. This multicarinate condition is strongly present in e.g. *A. rufiventris* Perroud, 1855, *A. mahota* Distant, 1898, *A. kaszabi* Fuchs, 1974, *A. frischi* Adlbauer, 2003, *A. conradti* Aurivillius, 1907 and *A. collare* Jordan, 1903, but only weakly so in *A. xanthomelas* Jordan, 1904, *A. zimbabweensis* Adlbauer, 2003 and *A. sanguinicollis* Hintz, 1919. In other species of *Apiogaster* these carinae are anastomosing to form a reticulate pattern (e.g. *A. sudrei* Adlbauer, 2003 and *A. femoralis* Hintz, 1919) or the carinae are missing altogether (e.g. *A. posticum* Jordan,

1903, *A. similis* Gahan, 1890, *A. centralis* Adlbauer, 2007).

**Sculpturing of frons.** Neither Gahan nor Aurivillius have given any attention to the ornamentation of the front of the head in any of their descriptions of the members of *Hexarrhopala*. In fact, all three members of this genus has a frons with a rather peculiar pattern of anastomosing, smooth and shiny, irregular raised veins (Figure 7). The frons of members of *Apiogaster* can be variously punctate or foveolate, but never with such raised and shiny veins.

**Tomentum.** In Gahan's description (1890 p. 309) of *H. apicalis* he says "The frons of the four anterior tibiae with a silky fulvous pile, the rest of the body almost destitute of pubescence beyond the rather long widely scattered cilia coming off from all parts." The fulvous pile of tibiae is common to all *Hexarrhopala* spp. and in fact to most *Apiogaster*. In addition, the long scattered cilia is a common generic character in *Hexarrhopala*, while only part of the *Apiogaster* species have this to any extent (present in e.g. *A. sudrei*, *A. posticum*, *A. zimbabweensis*, *A. collare*).

**Conclusion.** It seems the most reliable discriminating characters fully separating *Hexarrhopala* and *Apiogaster* are the shape of the scutellum and the sculpturing of the frons. All species of *Hexarrhopala* have pronota with a humped dorsal carina in posterior half while the species of *Apiogaster* in principle have acarinate pronota, *A. collare* being a notable exception.

From the genus *Dere* the species of *Hexarrhopala* differ in the carinate pronotum; all species of *Dere* are acarinate in this respect (cf. Bjørnstad 2013). Unlike in *Dere*, the pygidium in *Hexarrhopala* is never protruding beyond the elytra apices.

## Description of the species

### *Hexarrhopala apicalis* Gahan, 1890 (Figure 4)

*Hexarrhopala apicalis* Gahan, 1890: 309

**Examined material.** Holotype: ♀ Nyassa 77-50/Type/*Hexarrhopala apicalis* Gahan. Type in Coll. NHM. **Other material.** 1♀ RSA: Transvaal: Thabazimbi. 15.II.1992. Leg. P. Stobbia in Coll



**FIGURE 4.** *Hexarrhopala apicalis* Gahan, 1890 ♀ 12.7 mm (ABS)

ABS (AB 50131). 1♂ Mozambique: Zambezia: Gurue S. 708 m 15.35 S – 36.50 E. 10.XII.2006: E-Y: 3750 bushveld. Leg. Ruth Müller in Coll. TMSA

*Length.* 9.5–12.7 mm.

*Head.* Nearly all parts shiny. Mandibles with a very broad base provided with a few straight yellowish bristles. Mandibular apex glabrous, straight or only weakly curved. Inferior lobes of eyes semiorbicular in outline, semiglobose

**TABLE 1.** Key to the species and subspecies of *Hexarrhopala* Gahan, 1890.

1.	Elytra unicolorous orange-red, pronotum dark metallic blue .....	<i>H. rufipennis</i>
-	Elytra orange red with blue apices .....	2
2.	Pronotum and legs red and black .....	<i>H. apicalis</i>
-	Pronotum and legs black .....	<i>H. gahani</i>

in profile. Superior lobes small, narrow and short, ending just behind antennal socket. Vertex variously ridged.

*Antennas.* Joints 1–4 glossy with scattered pale yellow erect cilialike bristles, joints 5–11 appearing mat because of a dense cover of short adpressed pubescence. Antennomere 3 the longest: approximately twice the length of scapus and two to three times the length of joint 4. Joints 4–7 of nearly same length, from then onwards gradually shortened. In the females the antennae reaching to the middle of the elytra, slightly longer in the male. The last antennomeres are slightly more dilated/incrassate in the male than in females.

*Pronotum.* Slightly longer than wide (L/W ratio = 1.1), weakly convex laterally and with a carina in posterior half. Disc punctate with scattered long, pale cilia. The disc is essentially yellow orange to rufous (darker in older specimens) with a varying amount of bordering black anteriorly and posteriorly, sometimes also laterally (especially in HT).

*Scutellum.* Sparingly ciliate (Figure 2a).

*Elytra.* Slightly widened posteriorly and with apices as stated in Gahan's generic description (vide supra).

*Legs.* Largely black, but with orange to rufous femoral clubs.

*Ventral surface.* Rather densely covered with pale, erect bristly cilia.

**Differential characters.** Easily distinguished from the two other species by the essentially red pronotum and the bicoloured legs.

**Distribution:** 'Nyassa' [=Malawi?], Mozambique, South Africa

***Hexarrhopala gahani* Aurivillius, 1913** (Figure 5)

*Hexarrhopala gahani* Aurivillius, 1913: 236

**Examined type material.** Holotype: ♂ [Tanzania] D.O.A. [Deutsch Ost-Afrika]; Namupa/TYPE (red label)/*Hexarrhopala* [sic!]



**FIGURE 5.** *Hexarrhopala gahani* Aurivillius, 1913 ♂ 9.3 mm HT (ZSM)

*Gahani* Aur. Typus/Sammlung J.N.Ertl in Coll. ZSM

*Length.* 9.3 mm.

*Head.* Mandibles long and straight with a broad, bristly basal part, apex glabrous. Clypeus and palpi yellowish brown, ocelli of eyes dark reddish brown, otherwise, all parts of head glossy black. Antennal tubercles raised.

*Antennas.* Reaching three quarters down the elytra. Antennomeres 1–4 glossy with scattered erect cilia, joints 5–11 densely covered by minute, adpressed hairs. Antennomere 3 by far the longest: well over twice the length of any other joint. Scapus equally long as antennomeres 4 and 5. Joints 5–10 thickened and gradually shortened. Ultimate joint slender and pointed.

*Pronotum.* Glossy black, long and narrow, i.e. distinctly longer than wide (L/W ratio = 1.3) and with sides nearly parallel. The disc only shallowly and distantly punctured, and accordingly ciliation reduced. Carinate behind the middle.

*Scutellum.* Wide, but short (Figure 2b).

*Elytra.* rufous, but with dark cobalt blue sutural margins and apices. The elytra are densely and deeply punctate and ciliate, and with apices rounded laterally, but with a denticulate sutural angle.

*Legs.* Nearly totally black with glossy sheen, only the acarinate femoral clubs dark brown.

*Ventral surface.* Only shallowly punctate, but with long whitish erect cilia, especially on the lateral parts of metasternum and abdominal segments, as well as on the coxae.

**Differential characters.** Beside the characters mentioned in the key, *H. gahani* differs from the others in its long and narrow pronotum with sparse and shallow punctation.

**Distribution.** SE-Tanzania (only known from the holotype).

***Hexarrhopala rufipennis* Aurivillius, 1916**  
(Figure 6–7)

*Hexarrhopala rufipennis* Aurivillius, 1916 : 344

**Examined type material.** Holotype: ♀ [Tanzania] D.O.A. [Deutsch Ost-Afrika]: Tosamaganga/TYPER (red label)/*Hexarrhopala* [sic!] *rufipennis* Aur. n.sp. 1916 Type/Sammlung J.N.Ertl/BLNO000536 in Coll. USNM.

*Length.* 13.5 mm.

*Head.* Mandibles with straight apex. Antennal tubercles strongly raised and nearly bifid at apex ending in a triangular tooth.

*Antennas* (female). Reaching slightly beyond the middle of the elytra. Scapus irregularly punctate with a rounded apex. Third antennomere by far the longest, more than 1.5 times the



**FIGURE 6.** *Hexarrhopala rufipennis* Aurivillius, 1916. Photo: Steven Lingafelter, USNM ♀ 13.5 mm (USNM).



**FIGURE 7.** Head of *H. rufipennis* Aurivillius, 1916 (frontal face) to show venation of frons. Photo: Steven Lingafelter, USNM

length of the scapus, and nearly twice as long as the fourth. Antennomeres 4–10 gradually shortened and thickened. End segment simple, not canaliculate. Joints 1–4 shiny and with long and thin erect bristlelike cilia. Joints 5–11 mat and with only very short, barely visible adpressed greyish hairs.

*Pronotum.* About as long as wide, with evenly convex sides, and with greatest width slightly behind the middle. The surface punctate with one long, erect cilium from each depression. Posterior third of the pronotum carinate. The disc of the pronotum has two small, pointed tubercles or cornuti, one on each side slightly in front of the middle.

*Scutellum.* The scutellum is broadly semicircular (Figure 2c) and nearly glabrous.

*Elytra.* Rufous to orange-red, densely punctate and equipped with scattered erect cilia. Elytra apices evenly rounded, unarmed.

*Legs.* Dark with cobalt blue acarinate femora. These femora are strongly clavate. All tibiae widened distally. Protarsi with first joint as long as the second joint; in meso- and metatarsi only slightly longer.

*Ventral surface.* Metallic blue, punctate and evenly clad by long, erect cilia.

**Differential characters.** Apart from the characters given in the generic key, the unusual presence of the pronotal tubercles is a trait not met with in the other two species, neither in any species of *Dere* or *Apiogaster*.

**Distribution.** South-Central Tanzania (only known from the holotype).

## Discussion

For some reason all three members of *Hexarrhopala* are very poorly represented in collections. To the author's knowledge only 5 specimens are known. From this it would appear that the species are rare or have only a sporadic appearance or that we still just do not know where and how to look.

**Zoogeography, ecology, biology.** The records of *Hexarrhopala* cover a large area along the eastern part of the African continent from Tanzania



**FIGURE 8.** *Apiogaster collare* Jordan, 1903 14 mm (ABS).

to the Republic of South Africa. The two northern species are only represented by their respective holotypes from Tanzania: *H. gahani* was caught at Namupa, which is a ward in Lindi Rural District, coastal south-east Tanzania and thus belongs to the Zanzibar-Inhambane Regional Mosaic (White 1983). By comparison the unique type of *H. rufipennis* is from Tosamaganga (misspelled 'Tasamaganga' in Aurivillius' original description 1916), an area just outside the town of Iringa in the Southern Highlands of Tanzania. *H. rufipennis* therefore is found in the north-eastern part of the Zambezi Regional Centre of Endemism (White op.cit.). *H. apicalis* – although records are scarce – covers a much bigger geographical area, but all three localities are from the Zambezi Regional Centre. Nothing is known about the biology of the species of *Hexarrhopala*.

**Acknowledgements.** The following curators are hereby thanked for their co-operation in sending material on loan from their respective museum collections: Dr. Max Barclay

(NHM), Dr. Michael Balke (ZSM), Dr. Steven W. Lingafelter (USNM) and Ms. Ruth Müller (TMSA). Dr. Lingafelter has taken part of the photos used in this publication, the remaining by Karsten Sund (NHMO), and for this, they are dutifully thanked.

## References

- Adlbauer, K. 2003. Die Cleomenini-Gattung *Apiogaster* Peroud 1855. *Les Cahiers Magellanes* 29, 1–30
- Aurivillius, Ch. 1912. *Coleopterorum Catalogus*, Pars 39: Cerambycidae: Cerambycinae – W.Junk, Berlin. 574 pp.
- Aurivillius, C. 1913. Neue oder wenig bekannte Coleoptera Longicornia. 13. *Arkiv för Zoologi* 8(22), 229–263
- Aurivillius, C. 1916. Neue oder wenig bekannte Coleoptera Longicornia. 16. *Arkiv för Zoologi* 10 (19), 335–359 + 1 pl.
- Bjørnstad, A. 2013. Studies in Afrotropical Sestyrini (Col., Cerambycidae, Cerambycinae). I. Revision of the African members of the genus *Dere* White, 1855 with description of new species. *Norwegian Journal of Entomology* 60 (2), 246–282
- Gahan, C.J. 1890. On new Longicornia from Africa and Madagascar. – *Transactions of the Entomological Society of London* 1890(2), 297–328
- Kolbe, H.J. 1897. *Coleopteren. Die Käfer Deutsch-Ost-Afrikas*, IV. – Dietrich Reimer, Berlin.
- White, F. 1983. The vegetation of Africa. A descriptive memoir to accompany the UNESCO/ AETFAT// UNSO vegetation map of Africa. *UNESCO: Natural Resources Research* Vol. XX.

Received: 12 March 2014  
Accepted: 18 September 2014