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## ***Copelatus annae* n. sp., a new Afrotropical species of the *irinus*-group**

(Insecta: Coleoptera: Dytiscidae)

### **Abstract**

*Copelatus annae* n. sp. from Senegal is described and figured. It belongs to the group “*irinus*” of *Copelatus* Erichson 1832 and is characterised by the peculiar shape of the median lobe of the aedeagus.

Key words: *Copelatus*, *irinus* group, Dytiscidae, new species, Senegal.

### **Riassunto**

[*Copelatus annae* n. sp., una nuova specie africana del gruppo “*irinus*”. (Insecta: Coleoptera: Dytiscidae)]

Si descrive e si illustra una nuova specie di *Copelatus* Erichson 1832, denominata *Copelatus annae*, n. sp., che appartiene al gruppo “*irinus*”. La nuova specie è stata raccolta in Senegal, nei dintorni di Ziguinchor sulle rive del fiume Casamance.

### **Introduction**

Currently, *Copelatus* Erichson 1832 is the most diverse genus among African Dytiscidae (MILLER & BERGSTEN, 2016 and 2023; NILSSON & HÁJECK, 2024). This great infrageneric richness was well known since the early Sixties of the Twentieth Century. Actually, in his revision of African Dytiscidae, GUIGNOT (1961), recorded 100 species of *Copelatus*. Over the next forty years, a remarkable development in the knowledge of the wide diversity characterising this genus was achieved, and in late Nineties, NILSSON *et al.* (1996) were able to list 240 species attributable to it. Since then, other species belonging to the genus *Copelatus* have been described (see, for instance, BILARDO & ROCCHI, 1999, 2008, 2011 and 2019; PEDERZANI & HÁJECK, 2005; PEDERZANI & SCHIZZEROTTO, 2017; RANIRILALATIANA & BERGSTEN, 2019; RAMAHANDRISON *et al.*, 2022) from the Afrotropical region. Nevertheless the threshold mentioned above has not significantly changed because of: i) a rather obvious reduction in the likelihood of discovering new entities, given the very big amount of those already identified; ii) the discovery of new synonymies; and iii) the transfers of some formerly *Copelatus* species either to already existing other genera or to new genera established in the meantime (MILLER & BERGSTEN, 2023).

At present, 247 Afrotropical species of *Copelatus* appear in the World Catalogue of Dytiscidae by NILSSON & HÁJECK (2024). To them a new one, described here below, has to be added.

## Material and methods

The single known specimen of the new species was studied and dissected using a Leica S6G7 stereomicroscope with led reflected light. Measurements were taken with a millimetre microscope slide. Aedeagus, together the sixth and seventh abdominal segments, were mounted on a plastic transparent card, covered by a thin layer of HDF, and then stuck on the same pin as that of the insect.

The pictures of habitus, median lobe and left paramere of aedeagus were taken by means of an Amscope MU100 digital camera, mounted on the stereomicroscope. For each subject several images were taken at different levels, then stacked with CombineZP® software program.

For the sake of visual immediacy, male genitalia are figured and described according to the traditional standards. Therefore, one has to bear in mind that the pictures of the lateral and dorsal aspects of the median lobe of the aedeagus, as well as that of its left paramere, are images variously rotated of their actual anatomical position during copulation.

The comparison with *C. crassus* Régimbart, 1895 is based on 34 specimens (22♂ and 12♀) collected in Benin (1 ex), Burkina-Faso (1 ex.), Central African Republic (3 exx.), Ivory Coast (24 exx), and Senegal (5 exx.).

## Taxonomy

### *Copelatus annae* n. sp.

Figs. 1, 2, 3, and 4.

**Type locality.** Senegal, Ziguinchor, Boukitengo, near Casamance river 12°32'11" N 16°17'16" W, 16 m asl.

**Type material.** Holotype: 1 ♂ labelled "Senegal, Ziguinchor, Boukitengo/ 12°32'11" N 16°17'16" W 16 m/ 26-27. VII.2008, leg. P.Moretto [white label]// *Copelatus annae*/ Schizzerotto & Toledo 2024/ holotypus [red label].

**Depository.** The holotype of the new species is kept in Schizzerotto's collection, which is deposited at MUSE, the Science Museum of Trento (Italy).

## Description of holotype

**Habitus.** Length 5.4 mm, width 2.9 mm. Oval, with continuous outline. Dorsal surface submat, almost uniformly brown (fig. 1).

**Head.** Brownish, somewhat lighter than the rest of the dorsal surface, with two couples of small horizontal depressions: the longer one before eyes, that shorter

halfway along their inner margin. Micro-reticulated by very small isodiametric polygonal meshes. Punctuation double, but all punctures rather small and light. Antennae and palpi ferrugineous.

**Pronotum.** Brown, slightly paler at sides, with a lateral rim, except at the anterior angle. Discal reticulation and punctuation similar to those of the head. Anterior margin with a row of coarse setigerous punctures. On each side, a triangular area, covering about one third of the basis and progressively reduced towards the anterior angle, bears rather dense and quite impressed coarse punctures. Two short lateral depressions near the basis (running from the second to the fourth elytral striae), and two others, parallel to the pronotal sides and extending from their middle almost to their front can be seen.

**Elytra.** Brown, microreticulated by very small isodiametric polygonal meshes. Punctuation made up by rather small and light punctures of two different sizes. Six well impressed discal striae and one sub-marginal stria on each elytron. First stria very short (0.75 mm), covering about 1/5 of the elytral length (4.1 mm). Sixth stria reaching the elytral basis, fifth and fourth striae somewhat shorter than the sixth but equally long, third and second striae slightly shorter than the fifth and fourth ones but with the same length.

**Legs.** Ferrugineous. Male pro-tibiae very broadened, club shaped, largest in the apical third. First three segments of pro- and meso-tarsi distinctly enlarged and bearing 3-4 adhesive setae on their ventral side. Pro and mid claws simple. Longer spur of metatibiae rectilinear.

**Ventral side.** Brown ferrugineous, quite shiny and almost entirely microreticulated by light, transversal, oval-shaped meshes. Prosternal process lanceolate with lateral rims. Metaventrite slightly microreticulated, without any incision. Metacoxae displaying in their apical part several, almost horizontal and rather impressed wrinkles that sometimes are intersected by lighter vertical lines starting from the metacoxae distal part. Metacoxal lines well impressed. Visible abdominal ventrites II-IV with oblique incisions, V-VII quite shiny.

**Male genitalia.** Median lobe, in lateral view (fig. 2) divided into two sections: basal 2/3 robust, trunk-like, basically linear, even though slightly sinuous; distal 1/3 beginning latero-apically from basal part, light, rather regularly curvilinear, with sinuous, swan-head looking, apex.

In dorsal view (fig 3) basal trunk bearing a clear right lateral expansion and terminal part of the distal third seemingly bifid because of the rotation of the beak of the swan-head like apex around its vertical axis. Dorsal profile of inner face of left paramere (fig. 4) regularly curved, bearing a rather long, club shaped, apical lobe; ventral profile rather linear, with a small apical tuft of quite short setae.

**Female.** Unknown.

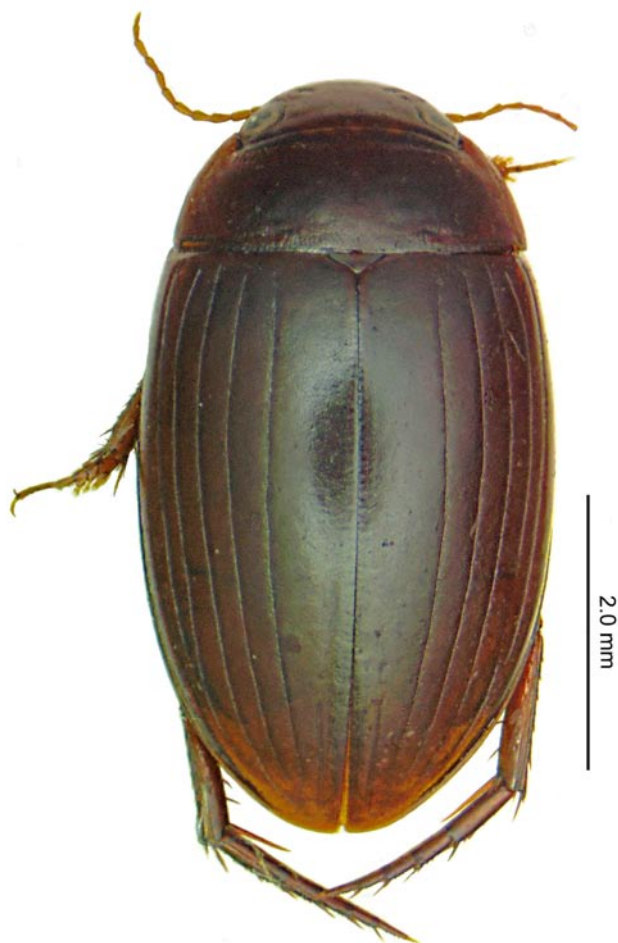


Fig. 1 - *Copelatus annae* n. sp. habitus.

**Differential diagnosis.** Because of the pattern of its elytral striae, *Copelatus annae* n. sp., belongs to the *irinus*-group *sensu* GUIGNOT (1961). Externally it looks very similar to *C. crassus* Régimbart, 1895. However, on average *C. crassus* is somewhat larger (mean length = 5.8 mm; mean width = 3.0 mm) and possesses a first elytral stria long about 1/4 of the whole elytra ( $\approx 1.05$  mm over  $\approx 4.10$  mm), definitely longer, in absolute and relative terms, than that of *C. annae* n. sp. Moreover, the elytral microreticulation of *C. crassus* is more impressed and shows a denser punctuation. The parameres of the aedeagus of the two species are similar, but their median lobe is definitely different. In lateral view, that of *C. crassus* is

evenly curved, while that of *C. annae* n. sp. displays a clearly discontinuous profile, made up – as shown below – by two very different segments: a vertical rather long basal trunk followed by a shorter curvilinear, beak shaped, apical section. Within the species of the “*irinus*” group, this structural pattern is shared by those grouped in the Oriental *C. latipes* complex by HÁJECK & SHETH (2024) and, among the African species, by *C. piriensis* Omer-Cooper, 1965, *C. kalaharii* Gschwendtner, 1935, *C. scytalotus* Guignot, 1956, *C. latus* J. Balfour-Browne, 1950, *C. epactus* Guignot, 1948, *C. brancuccii* Rocchi, 1979 and *C. rivalis* Guignot, 1952. Quite obviously, the medial lobes of all these species are definitely different from that of *Copelatus annae* n. sp.

**Etymology.** The new species is named after Anna Dalle Molle. The noun is in genitive singular.

**Distribution.** Known only from the type locality.

**Biology.** Unknown because the new species was collected at light.

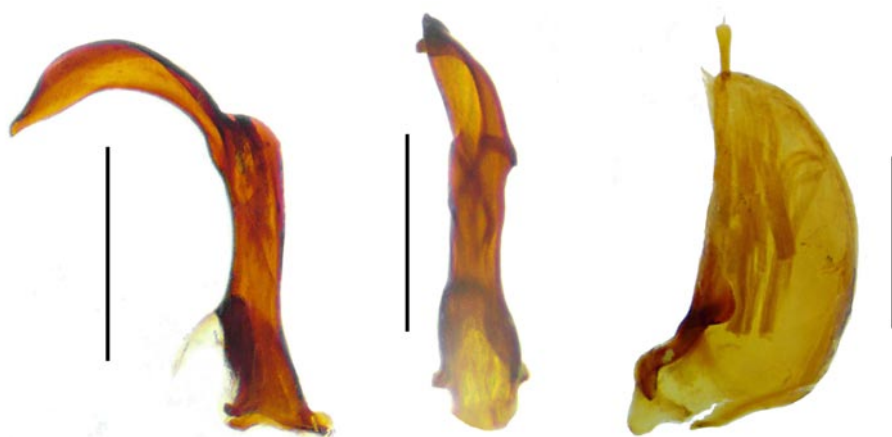


Fig. 2 - *Copelatus annae* n. sp. median lobe of the aedeagus, lateral view.

Fig. 3 - *Copelatus annae* n. sp. median lobe of the aedeagus, dorsal view.

Fig. 4 - *Copelatus annae* n. sp. left paramere, inner face. (Scale bar = 0.5 mm)

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