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Description of three new African species of *Copelatus* Erichson, 1832 with notes on *Copelatus angolensis* Peschet, 1924

(Insecta: Coleoptera: Dytiscidae)

Riassunto

[Descrizione di tre nuove specie africane di *Copelatus* Erichson, 1832, con note sul *Copelatus angolensis* Peschet, 1924 (Insecta: Coleoptera: Dytiscidae)]

Sono descritte tre nuove specie di *Copelatus* Erichson dell’Africa occidentale. Due di esse risultano prossime a *Copelatus angolensis* Peschet, del cui olotipo unico, che avrebbe dovuto trovarsi nel Museo Nazionale di Storia Naturale di Parigi, si sono da tempo perse le tracce. La posizione di queste due nuove specie rispetto a *C. angolensis* rimane pertanto poco chiara. L’altra nuova specie appartiene al gruppo *irinus* / *assimilis* ed è caratterizzata principalmente dalla forma particolare dell’edeago.

Abstract

Three new species of *Copelatus* Erichson from West Africa are described. Two appears closely related to *Copelatus angolensis* Peschet, whose unique holotype was not traceable at the MNHN of Paris. Therefore, their position towards *C. angolensis* could not be clarified. Another new species belongs to the *irinus* / *assimilis* group and is characterised by the peculiar shape of the aedeagus.

Key words: Dytiscidae, *Copelatus*, Africa, new species.

Introduction

Notoriously, *Copelatus* Erichson is the most diverse genus among African Dytiscidae (MILLER & BERGSTEN, 2016; NILSSON & HÁJEK, 2017) and new species belonging to it continue to be discovered very frequently. This is also our case. Within two sets of Dytiscidae specimens collected at light in western Africa we found two new species of *Copelatus* described here below as *Copelatus falciformis* n. sp. and *Copelatus saverii* n. sp.. The latter appears to be quite close to *C. angolensis* Peschet, 1924. Unfortunately, the holotype of *C. angolensis* is untraceable and its genital features are unknown. In the attempt of establishing the right taxonomic position of *C. saverii* n. sp. and its possible relation to *C.*

angolensis, we paid attention to a specimen of another *Copelatus* from Niger that looked very close to *C. angolensis* as well, but definitely different from *C. saverii*. In light of considerations and arguments given later on this paper, we decided to assign this specimen to a new species described here below as *Copelatus quadristriatus* n. sp..

The materials dealt with in this note were mostly collected in the Ivory Coast and Senegal by Philippe Moretto. Three specimens were loaned by Saverio Rocchi and the holotype of *C. quadristriatus* n. sp. has long been standing in collection FP with a doubtful identification.

The photo pictures were taken from dry mounted specimens and the genital pieces were photographed either by light transmission or by incident light.

Acronyms:

AS	Collection Antonio Schizzerotto (Trento)
FP	Collection Fernando Pederzani (Ravenna)
MNHN	Mu��m national d'Histoire naturelle (Paris)
MZUF	Museo Zoologico dell'Universit�� "La Specola" (Florence)
MZUR	Museo di Zoologia dell'Universit�� "La Sapienza" (Rome)
SR	Collection Saverio Rocchi (Florence)

Copelatus falciformis n. sp.

Material: 2 ♂♂ "C  te d'Ivoire, Dabakalla, Ouand  rama, 242 m, 8  38'35"N 4  24'06"W, light trap 22-27 May 2016, leg. P. Moretto".

Holotype: a male specimen 5.8 mm long and 2.9 mm wide, labelled: "C  te d'Ivoire, Dabakalla, Ouand  rama, 242 m, 8  38'35"N 4  24'06"W, light trap, 22-27 May 2016, leg.P. Moretto"/"*Copelatus falciformis* Holotypus". The holotype is deposited in coll. SR at MZUF.

Paratype: only one male paratype, 6.0 mm long and 3.1 mm wide, in coll. AS.

Diagnosis: A species of Guignot's "*irinus*" group, subgroup "*assimilis*" (elytral formula $\frac{1}{2} + 5 + 1$), greatly resembling other species of the subgroup, but clearly recognizable by the peculiar shape of penis. (fig.1)

Description:

Length 5.8-6.0 mm, width 2.9-3.1 mm.

Head brown ferrugineous, with regular reticulation more evident in front and a dense puncturation becoming larger behind. Palpi and antennae ferrugineous.

Pronotum brown-ferrugineous, paler at sides, with lateral rim shortly continued on the latero-basal angle, lightly reticulate, with visible puncturation becoming larger and denser at sides. Moreover pronotum bears an anterior submarginal row of large and sparse punctures, and a sub-basal row of spaced punctures, which become denser in two short depressions in line with the second elytral stria.

Finally, it displays a latero-basal depression with large and dense punctures and a few oblique scratches, continuing in the form of an arcuate line of punctures that is almost parallel to the pronotal side and reaches the pronotal distal quarter (fig. 2).

Elytra brown, with a pale transverse band at base and lighter interstriae. Six longitudinal striae on each elytra, and a submarginal stria extending beyond the middle. First stria much shortened in front. The striae are narrow but well visible because of their dark colour. Elytral reticulation very light, little visible. Punctuation dense and minute with a few, irregularly interspersed, large punctures.

Underside brown ferruginous. Prosternal process elongated and pointed with lateral rims. Metaventricle microreticulated by rather small, polygonal, irregular meshes and bearing some needle-shaped incisions. Metacoxae microreticulated by quite elongated, transversal and oblique oval-shaped meshes, and laterally displaying some quite long oblique incisions. Metacoxal lines clearly visible. Abdominal sternites II-V microreticulated by rather light and long transversal meshes. Abdominal sternites II-III incised by quite long, light longitudinal furrows. Abdominal sternites VI-VIII quite shiny and pointed by small, light scattered dots.

Legs ferruginous.

Sexual features: Pro- and mesotarsi broadly expanded. Aedeagus (fig. 3) peculiarly shaped like a sickle. Paramers broad, with lower side almost straight (fig. 4).

Female: unknown.

Etimology: Latin adjective in nominative singular referring to the sickle-shaped median lobe of the aedeagus.

Notice: Besides the peculiar penis, also the sculpture of pronotum is a suitable feature to identify the species.

Remarks on “*Copelatus longicornis*” group, subgroup “*nitidus*” in Africa

So far, the unique African species assigned to the subgroup *nitidus* was *Copelatus angolensis* Peschet, 1924.

The genital features of this species are unknown. The only reported specimen is the male holotype that should have been deposited in MNHN (GUIGNOT, 1961). Unfortunately, PESCHET (1924, 1925) did not explicitly confirm this location. He only stated that the material collected in Angola by the mission Rohan-Chabot “is a property” of MNHN. Since GUIGNOT (l.c.) wrote “m’est inconnu”, it is reasonable to assume that he was not able to find *C. angolensis* Peschet in the collections of MNHN. Not surprisingly, this museum, more recently, was not in the position of fulfilling ROCCHI’s (2000) request of burrowing the type of *C. angolensis*. Therefore, it appears very likely that the holotype of this species has been lost.

However, we know, first, that some specimens of *Copelatus* belonging to the subgroup *nitidus* were collected in West Africa over the years and, second, that in several cases they were doubtfully assigned to *C. angolensis* Peschet. For instance, ROCCHI (2000) reported specimens from Guinea, tentatively identified as *C. angolensis*. Quite recently, in the collections from Senegal dealt with in this note, we found several specimens identical to those recorded by Rocchi. Moreover, in coll. FP we found a male of *Copelatus* from Niger that was also tentatively identified as *angolensis*. None of these specimens entirely matches the description of *angolensis* Peschet. Besides that, the genital features of the specimen from Niger are different from those of the specimens collected in Guinea and Ivory Coast.

In light of all the above remarks, we decided to assign the sets of specimens we are discussing to two new species, even if, reappeared the type of *C. angolensis*, one of them would be synonymised.

***Copelatus saverii* n. sp.**

Material: 9 ♂♂ and 12 ♀♀ “Senegal, Tambacounda, Niokolo-Koba Nat.Park, Poste de Niokolo, 13°01’N 12°43’W, Nov. 2011, leg. P.Moretto”; 3 ♂♂ “Republique de Guinée, Faranah, F. Niger, Somorya, 10°28’40”N 10°26’42”W 17-21.I.1996 leg. M. Mei”.

Holotype: a male specimen 4.0 mm long and 2.0 mm wide, labelled “Senegal, Tambacounda, Niokolo-Koba Nat.Park, Poste de Niokolo, 13°01’N 12°43’W, Nov. 2011, leg. P.Moretto” / “*Copelatus saverii* Holotypus”. It is deposited in coll. SR at MZUF.

Paratypes: The 23 paratypes are in authors’ collections (AS and FP) and in coll. SR at MZUF.

Non-type material: According to ROCCHI (2000), some more specimens from Guinea, same locality as above, are deposited in coll. MZUR (not studied).

Diagnosis: a species of Guignot’s “*longicornis*” group, subgroup “*nitidus*” (elytral formula 4+0), close to *C. angolensis* Peschet (fig. 5).

Description:

Length: male 3.8-4.3 mm, female 3.7-4.3 mm. ($\mu_{\text{length}} = 4.01$, $\sigma = 0.17$; $\mu_{\text{width}} = 1.89$, $\sigma = 0.12$).

Head light brown, lightly reticulate, with sparse obsolete micro-puncturation. Palpi and antennae reddish testaceous.

Pronotum reddish testaceous to light brown, vaguely darkened on disc, with distinct brown lateral rim, lightly reticulate, with scant small punctures, not aciculate. Anterior submarginal row of larger punctures irregularly placed, and traces of a sub-basal row of shallow, spaced punctures, with a few large punctures in a small latero-basal depression.

Elytra light brown, lighter apically, with a narrow basal transverse band testaceous, sometimes indistinct.

Reticulation almost obsolete, with sparse very small puncturation. Four longitudinal striae on each elytron, without submarginal stria, the first and third stria shortened in front. Interstriae as wide as the distance between suture and the first stria. The space from fourth stria to elytral margin twice as large as the interstriae.

Underside testaceous, lighter than dorsal side. Abdominal surface almost smooth, shiny, with traces of minute striolation on metacoxae and a few small punctures on abdomen. Metacoxal lines shallow or nearly obsolete in male, more deeply incised in female, as a rule, and accompanied by a low ridge on the outside. Legs testaceous, like the abdomen.

Sexual features of male: Pro- and mesotarsi a little widened. Fore tibiae restricted at the middle and much widened at apex. Metacoxal lines less impressed than in female. Aedeagus as in figs 6 and 7. Right paramere as in fig. 8.

Etimology: dedicated to Saverio Rocchi, who first described the species (in ROCCHI, 2000), doubtfully assigning it to *C. angolensis* Peschet, as mentioned above. The christian name of Rocchi latinised to *Saverius* is here a noun in the genitive case.

Remarks: although, as stressed earlier, we could not compare the new species with the missed holotype of *C. angolensis* Peschet, the peculiar position of the elytral striae and the lack of lateral striolae on pronotum strongly suggest that *C. saverii* is a new species.

***Copelatus quadristriatus* n. sp.**

Material: 1 ♂ “Niger, Zinder, 30.VI.1980” without collector’s name, formerly in collection FP.

Holotype: the only male specimen, 3.6 mm long and 1.8 mm wide, labelled: “Niger Zinder 30.VI.1980”/”*Copelatus quadristriatus* Holotypus” from now on deposited in collection SR at MZUF.

Diagnosis: a species of Guignot’s “*longicornis*” group, subgroup “*nitidus*” (elytral formula 4+0), close to *C. angolensis* Peschet and *C. saverii* n. sp. distinguishable from the latter by smaller size, ferrugineous colour, position of elytral striae and shape of the aedeagus. (fig. 9)

Description:

Length 3.6 mm, width 1.8 mm.

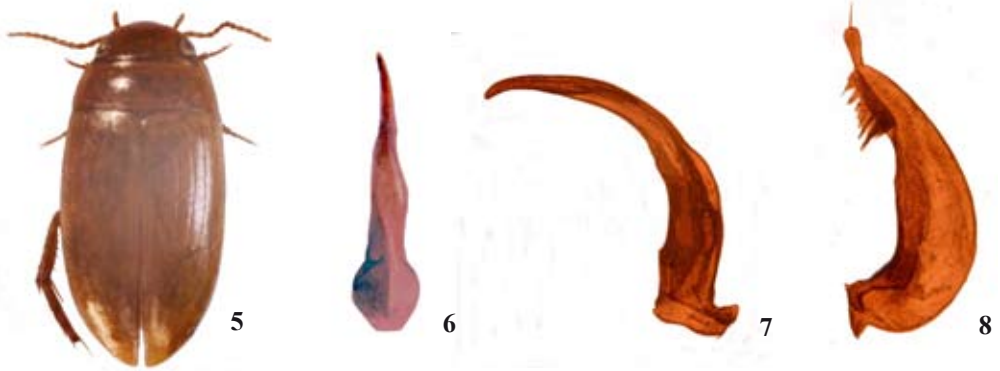
Oblong, entirely ferrugineous, shiny, broadest at shoulders and tapering to elytral apex.

Head with obsolete reticulation and very small, sparse punctures larger on the frons; two short longitudinal dimples beside the inner margin of eyes and two short transverse dimples in front of eyes and internally to them. Antennae ferrugineous,



Figs 1-4. *Copelatus falciformis* n. sp. (holotype)

1) habitus; 2) right side of pronotum; 3) penis in lateral view; 4) right paramere.



Figs 5-8. *Copelatus saverii* n. sp. - (paratype ♂ - Senegal)

5) habitus; 6) penis in dorsal view; 7) penis in lateral view; 8) right paramere.



Figs 9-12. *Copelatus quadristriatus* n. sp. - (holotype)

9) habitus; 10) penis in dorsal view; 11) penis in lateral view; 12) right paramere.

quite elongate.

Pronotum ferrugineous, with obsolete reticulation and very small and sparse puncturation. Lateral rim of the same colour. Some long, longitudinal scratches at the sides of base. Anterior submarginal row of large punctures irregularly placed and a few large punctures along the base.

Elytra coloured, reticulated and punctured like the pronotum, with narrow yellow stripes along suture and vague lighter area around scutellum. Four striae on each elytron commencing near base; the second almost attaining apex, the others quite shorter. An irregular row of a few larger punctures externally to fourth stria. Submarginal stria missing. The space between suture and the first stria nearly twice as broad as other inter-striae.

Underside testaceous, with metasternum and metacoxae brown. Metacoxal lines well impressed and little diverging in front. Metacoxae densely microreticulated by quite elongate, oblique, oval-shaped meshes, bearing quite long oblique incisions or scratches. Two basal segments of abdomen also evidently microreticulate, mat, bearing long longitudinal scratches. Other abdominal segments shiny with obsolete reticulation and puncturation; last segment with denser and larger punctures.

Legs ferrugineous; metafemurs paler.

Sexual features of male: Pro- and mesotarsi much widened; fore tibiae restricted at the middle and much widened at apex. Penis as in figs 10 and 11, right paramere as in fig. 12.

Female: unknown.

Etimology: Latin adjective, in nominative singular, referring to the number of longitudinal striae on each elytron.

Remarks: as in the case of *C. saverii* n. sp., this species was previously tentatively identified as *C. angolensis* Peschet.

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Literature

MILLER K.B. & BERGSTEN J., 2016 - Diving Beetles of the World. *Johns Hopkins University Press*, Baltimore. 336 pages.

NILSSON A.N. & HÁJEK J., 2017 - A World Catalogue of the Family Dytiscidae, or the Diving Beetles (Coleoptera, Adepaga). Version 31.I.2017, 304 pp. URL: <http://www.norrent.se> & <http://www.waterbeetles.eu>

- PESCHET .R., 1924 - Mission Rohan-Chabot dans l'Angola et dans la Rhodésia (1914). Description de Dytiscides nouveaux. *Bulletin du Muséum National d'Histoire Naturelle*, Paris 30(2): 140-144.
- PESCHET R. 1925 - Haliplidae, Dyticidae, Gyrinidae. In: Mission Rohan-Chabot. (1912-1914) Angola et Rhodesia. 4(3): 27-46. *Imprimerie Nationale*, Paris.
- ROCCHI S., 2000 - Contributo alla conoscenza dei Dytiscidi di Guinea con descrizione di due nuove specie (Coleoptera, Dytiscidae). *Fragmenta entomologica*, Roma, 32(1): 11-33.

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