



A new synonymy in the *fidius* group of *Copris* Müller 1764 (Coleoptera: Scarabaeidae: Scarabaeinae) and a new species from the highland grasslands of South Africa

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Abstract

The *fidius* group constitutes the basal clade in a phylogeny of the Afrotropical members of the genus, *Copris* Müller, 1764. In this paper we describe *Copris crassus* Deschodt and Davis as a new species in this group. We also demonstrate that the distributional function between two body dimensions (lateral horn length and mid-line elytron length) differs between *Copris fidius* (Olivier 1789) and *C. crassus*. *Copris bihamatus* Balthasar, 1965 is also a member of the *fidius* group. Nguyen-Phung (1988) suspected that it was a synonym of *C. fidius* (Olivier) so we compare specimens of similar body size and use the distributional function between body dimensions to demonstrate that *C. bihamatus* is indeed a synonym of *C. fidius*. We provide a key for all known valid species in the *fidius* group, except *C. serius* Nguyen-Phung, 1987.

Key words: Scarabaeidae, Scarabaeinae, New species, *Copris*, *crassus*, *fidius*, *bihamatus*, endemic, New synonym

Introduction

The group of species allied to *Copris fidius* (Olivier, 1789) (Nguyen-Phung 1987; 1988, Marchisio & Zunino 2012) forms the most basally-derived clade in a phylogeny of the Afrotropical members of the genus *Copris* Müller, 1764 (Cambefort & Nguyen-Phung 1996). These Afrotropical species have speciated in the forests, savannas, and highlands on the eastern side of the continent (seven species) with a single species distributed from west to northeast and east-central Africa (Nguyen-Phung 1987; 1988; Marchisio & Zunino 2012). In this paper we describe a new species of the group recorded primarily from high altitude grasslands along the eastern escarpment of South Africa. We also investigate the validity of *Copris bihamatus* Balthasar, 1965, described from a male holotype and two paratypes housed in the NMPC.

Copris crassus Davis and Deschodt **n. sp.** shows closest affinities to *C. fidius*, a species that is centred on forest patches, both along the eastern coastline of South Africa as far as the extreme south of Mozambique, and at higher altitude along the edge of the eastern escarpment in the north of its South African range. Other published records for *C. fidius* outside of South Africa (Nguyen-Phung 1988) probably represent old labeling errors.

As prominence of secondary sexual characters varies with body size and body size varies between species, as part of the description, we have used the relationship between lateral horn length and mid-line elytral length to demonstrate two parallel but separate scatters of data points for *C. fidius* and *C. crassus*. This is akin to the relationship between horn length and body size (thorax width) measured for *Onthophagus taurus* Schreber, 1759, which generated a sigmoidal distribution (Moczek & Emlen 1999).

In the case of *C. bihamatus*, Nguyen-Phung (1988) was unable to see the type specimens for her review of the *fidius* group but she suggested that it would likely be a synonym of *C. fidius*. In the plot of the horn length against elytral length, we demonstrate that *C. bihamatus* is close to *C. fidius* and distant from *C. crassus*. Furthermore, by comparing material of similar body size, we concur with Nguyen-Phung (1988) that *C. bihamatus* Balthasar is, indeed, a junior synonym of *C. fidius* (Olivier) so that, with the addition of *C. crassus*, the number of species in the *fidius* group remains at a total of eight.

coastline of southeast Mozambique. It is found primarily in shade and forest patches. It shows a coastal distribution along the entire southern and eastern seaboard of South Africa as well as along the edge of mountain blocks in the Western Cape and the lower edge of the eastern escarpment from the Eastern Cape to Limpopo Provinces.

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