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New Synonymy in the Genus *Chelotrupes* Jekel, 1866 (Coleoptera: Geotrupidae)

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New Synonymy in the Genus *Chelotrupes* Jekel, 1866
(Coleoptera: Geotrupidae)

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Abstract. In 2012, two articles were published describing new species of the genus *Chelotrupes* Jekel, 1866 (Coleoptera: Geotrupidae); the first one included five new species and the second a single species. However, the species described in the second article, *Chelotrupes annamariae* Byk 2012, is identical to *Chelotrupes algarvicus* Hillert, Král and Schneider 2012 and should be considered a junior synonym: *Chelotrupes algarvicus* Hillert, Král and Schneider 2012 = *Chelotrupes annamariae* Byk 2012, **syn. nov.**

Introduction

Jekel (1866) first established *Chelotrupes* as a subgenus of the genus *Geotrupes* Latreille, 1796 with *Scarabaeus momus* Olivier, 1789 as the type species. Subsequently, Boucomont (1912) considered *Chelotrupes* to be a subgenus of *Typhaeus* Leach, 1815 comprised of two species *Typhaeus (Chelotrupes) hiostius* (Gené, 1836) from Sardinia and *T. (Chelotrupes) momus* (Olivier, 1789) from the Iberian Peninsula.

Recently, Dellacasa and Dellacasa (2008) elevated *Chelotrupes* to genus rank and considered *C. matutinalis* (Baudi di Selve, 1870), formerly a synonym of *C. hiostius* (Gené, 1836), to be a valid species. In 2012, Hillert et al. published a detailed study of the genus *Chelotrupes* in the Iberian Peninsula in which they described five new species, two from Spain (*C. hendrichi* and *C. kyliesi*) and three from Portugal (*C. algarvicus*, *C. brancoi* and *C. feryi*) and re-established *C. laevipennis* (Mulsant and Godart, 1855) as a valid species. The same year, Byk (2012) published the description of a new species, *C. annamariae*, from within the known distribution of *C. algarvicus*. The latter article only considers two species from the Iberian Peninsula, *C. momus* and the newly described species, and does not refer to the publication by Hillert et al. (2012). From its description, *C. annamariae* Byk 2012 appeared to be a re-description of *C. algarvicus* Hillert, Král and Schneider 2012, and this hypothesis is tested below.

Material and Methods

Specimens Studied. Specimens were first chosen based on their geographical location (holotype, paratype or reported location of individual species in Hillert et al. 2012), and their identity checked based on external characters reported in the same publication. The aedeagus of the following male specimens were studied (all in collection of M. E. Miquel):

C. algarvicus: 6 sp., Portugal, Algarve, Sagres, 20.i.2013, leg. O. Boilly, 4 sp., Portugal, Faro, Vila do Bispo env., 10.xii.2012, leg. Ferreira P.

C. brancoi: 1 sp.: Portugal, Estremadura, Setubal, N. of Alfirim, Sesimbra env., S. of Lisboa, 06.iii.2010, leg. O. Hillert, [paratype].

C. feryi: 1 sp., Portugal, Algarve, Armação de Pêra, 26.x.2013, leg. Boilly O.

C. hendrichi: 2 sp., Spain, Andalusia, Castillo de Castellar, Algeciras, env. 10km N. of San Roque, 02.iii.2008, leg O. Hillert, [paratype], 18-27.iii.2013, leg O. Hillert | 2 sp.: Spain, Cadiz, Castillo de Castellar, 28-x-2013, leg. Boilly O.

C. kyliesi: 1 sp., Spain, Andalusia, Huelva, Aljaraque, 37°15.425N 07°04.078E, 25.ii.2009, leg. Hillert O., [paratype], 1 sp., Spain, Andalusia, Huelva, Hinojos, 27.x.2013, leg. Boilly O.

C. laevipennis: 2 sp., Spain, Andalusia, Cadiz, Algaida, 29.x.2013, leg. O. Boilly.

C. momus: 1 sp., Spain, Andalusia, NW of Tarifa, Algeciras env., open field, 25.ii.2011, leg. O. Hillert, 4 sp., Spain, Málaga, Torremolinos, 12-18-i-1996, leg. Delgado J., 1 sp., Spain, Cadix, Tarifa, 15.iv.1979, leg. Costessèque.

Dates of Publications. The article by Hillert et al. (2012) was originally received on the 6th of December 2011, accepted on the 27th of February 2012 and published on the 15th of August 2012; whereas the article by Byk (2012) was received on the 21st of October 2012 and accepted on the 15th of December 2012. Although, listed as published in November, all but one article in this issue of the *Baltic Journal of Coleopterology* were accepted on the 15th of December 2012 and consequently, the issue must have been published at the earliest on that date and not in November. In any case, the article by Byk (2012) has been both submitted and published after the publication date of the article by Hillert et al. (2012).

Geographical Origins of Type Materials. Holotypes of both species were described from the same locality: Portugal, Lagos, Vila do Bispo.

For *C. annamariae*, a further thirty-five paratypes were also studied, including twenty-five from the type locality (twenty from the same series as the holotype), ten from Sagres (Lagos) and a museum specimen without precise locality (“Lusit.”). The municipality of Sagres is adjacent to the municipality of Vila do Bispo.

For *C. algarvicus*, a further two hundred seventy-six (276) paratypes were studied from localities in the regions of Beja (Valle de Ferro) and Faro (including Carrapateira, Foia, Sierra de Monchique, Sagres and Vila do Bispo). In total, thirty-three paratypes came from Vila do Bispo and one hundred fifty-one (151) from Sagres.

Importantly, the same series of specimens from the type locality (Portugal, Lagos, Vila do Bispo, 7.xii.2006, leg. T. Gazurek) was used in both descriptions: holotype and twenty paratypes of *C. annamariae* and five paratypes of *C. algarvicus*, discrediting the validity of the former.



Figure 1–3. Male pronota. **1)** lateral view of *C. annamariae* after Byk (2012). **2)** lateral view and **3)** dorsal view of *Chelotrupes algarvicus* after Hillert et al. (2012).

Holotype Descriptions and Differential Characters. Descriptions given by Hillert et al. (2012) and Byk (2012), for both male and female, accurately match each other and, correspondence for each character can easily be established either in the text or the figures. To illustrate this point, mirrored descriptions for *C. algarvicus* are given for the characters used by Byk (2012) to differentiate *C. annamariae* and *C. momus* (Table 1). Photographs of the respective habitus are given in Fig. 4–7 for illustration.

It first appears that the aedeagus drawings of *C. annamariae* and *C. algarvicus* (Fig. 8–9) have marked differences that cannot be explained solely by the different drawing styles. However, on closer inspection it seems that the drawings for *C. momus* and *C. annamariae* have been inverted and taking this into account, the aedeagus do in fact match.

Aedeagus of *Chelotrupes*. In order to ascertain the above error, and to check for any variability in the shape of the aedeagus of *C. algarvicus*, ten specimens of the two localities of the type material of *C. annamariae* (Vila do Bispo and Sagres) were studied along with sixteen specimens of the other Iberian *Chelotrupes*. No variability was found within the specimens of *C. algarvicus*, and shape of the aedeagus of all species correlated well with diagrams provided by Hillert et al. (2012). This confirms the observation by Hillert et al. (2012) according to whom the differences in the aedeagus of the seven species of Iberian *Chelotrupes* are small with *C. algarvicus* (Fig. 9) being well differentiated from the six other species (Fig. 11–16). Furthermore, the authors do not mention any variability within species.

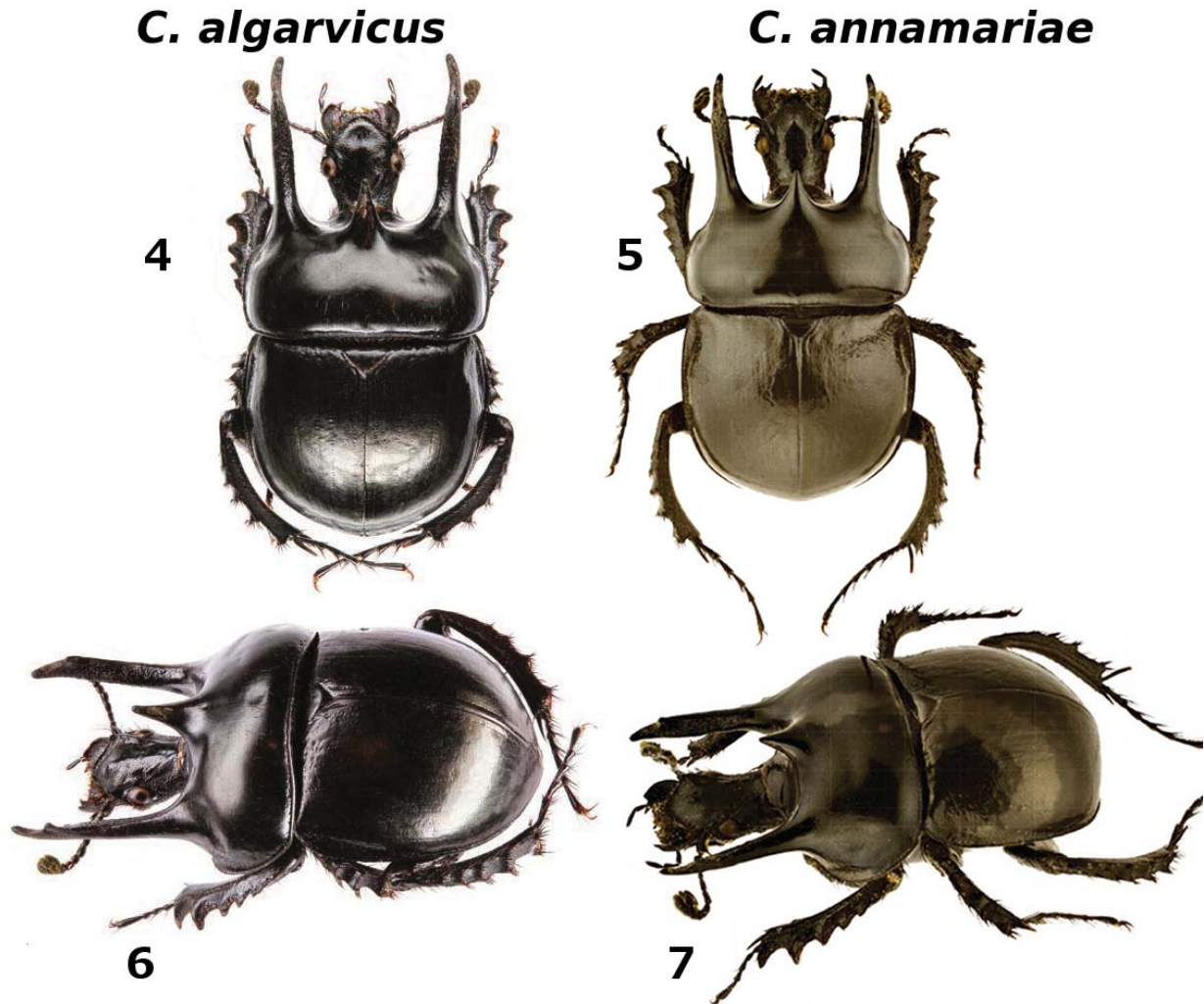


Figure 4–7. Habitus of *C. algarvicus* and *C. annamariae*. **4)** dorsal view of the holotype of *C. algarvicus* Hillert et al. (2012). **5)** dorsal view of *C. annamariae* Byk (2012). **6)** dorso-lateral view of the holotype of *C. algarvicus* Hillert et al. (2012). **7)** dorso-lateral view of *C. annamariae* after Byk (2012).

Aedeagi of at least six specimens of each species have been studied by Hillert et al. (2012) and those authors consider it to be the only strong differential character for minor males.

Conclusion

As it was described from the same locality and mainly from a series of specimens in part included in the description of *C. algarvicus*, and descriptions are in all manners identical, there is no possible doubt that *C. annamariae* is a re-description of the former species, albeit from a smaller and geographically more restricted type series. According to the principle of priority (ICZN 1999), *C. annamariae* is a junior synonym of *C. algarvicus*.

Acknowledgments

I am grateful to Oliver Hillert for reviewing both an early and the final version of the manuscript and for his pertinent comments on the aedeagi of the different species. I would also like to thank Olivier Boilly for reviewing the final manuscript.

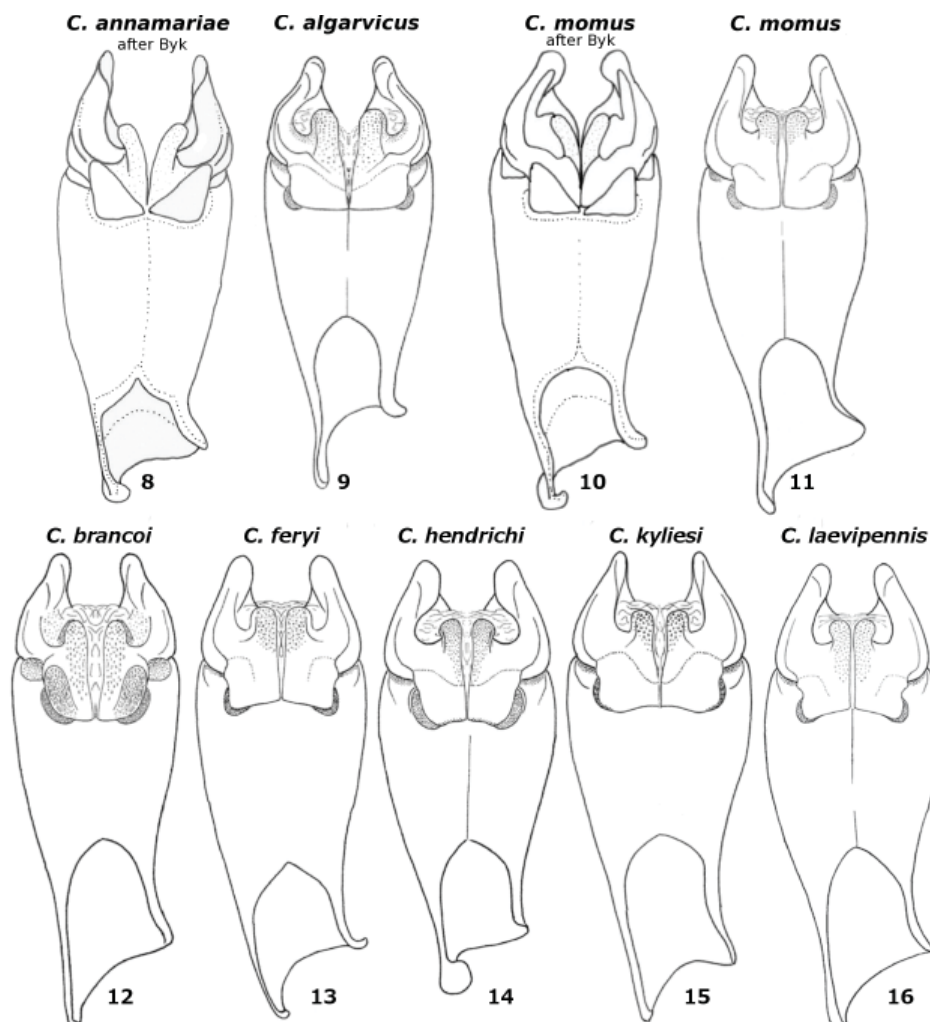


Figure 8-16. Aedeagus (dorsal view) of the different Iberian species of *Chelotrupes*, after Hillert et al. (2012) unless noted. **8)** *C. annamariae*, after Byk (2012). **9)** *Chelotrupes algarvicus*. **10)** *C. momus*, after Byk (2012). **11)** *C. momus*. **12)** *C. brancoi*. **13)** *C. feryi*. **14)** *C. hendrichi*. **15)** *C. kyliesi*. **16)** *C. laevipennis*.

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Table 1. Differential characters used by Byk (2012) for *C. annamariae* and mirrored description for *C. algarvicus* from Hillert et al. (2012). Formatting as in Byk (2012) with strong characters in bold. Text directly taken from the two publications with comments or minor editing in [square brackets].

<i>C. annamariae</i> Byk 2012	<i>C. algarvicus</i> Hillert, Král & Schneider 2012
Length of body 14-22 mm	Body Length 14-23 mm
Pronotum and elytra lustrous, elytral interstriae smooth	Dorsal surface black, not microsculptured, shiny [...] elytra with 8 [...] striae, interval flat, impunctate
Male	Male
Head extremely convex* with small tubercle at middle of front.	Head [...] tubercle shallowly and weakly keel-like elongated. [convexity not used as a character but visible in Fig. 3]
Head dorsally finely and shallowly punctured	Simply, finely and sparsely punctate
Middle horn of pronotum large (Fig. 1), longer than diameter of its base	Medial pronotal apophysis well developed. [diameter/base character not used but clearly visible in Fig. 2 & 3]
Denticle on lateral horns of pronotum placed near to apex (Fig. 1), horns not flattened at midlength between base and denticle	Lateral hornlike apophyses well developed [...] Surface regularly declivous from subapical tooth to base in lateral aspect. [Fig. 2 & 3]
Genitalia ** as in Fig. [8]	[Aedeagus ** in Fig. 9]

* head convexity not actually a differential character, Byk (2012) also describes *C. momus* in the same terms: "head extremely convex".

** please see comments in main text

Checklist of the Genus *Chelotrupes*

- 1- *Chelotrupes algarvicus* Hillert, Král and Schneider 2012: Portugal (Beja, Faro)
= *Chelotrupes annamariae* Byk 2012, **syn. nov.**
- 2- *Chelotrupes brancoi* Hillert, Král and Schneider 2012: Portugal (Santarém, Setúbal)
- 3- *Chelotrupes feryi* Hillert, Král and Schneider 2012: Portugal (Faro)
- 4- *Chelotrupes hendrichi* Hillert, Král and Schneider 2012: Spain (Andalucía: Cádiz)
- 5- *Chelotrupes hiostius* (Gené, 1836): Italy (Sardinia)
- 6- *Chelotrupes kyliesi* Hillert, Král and Schneider 2012: Spain (Andalucía: Huelva, Sevilla)
- 7- *Chelotrupes laevipennis* (Mulsant et Godart, 1855): Spain (Andalucía: Cádiz)
= *Geotrupes andalusiacus* Deyrolle, 1869
- 8- *Chelotrupes matutinalis* Baudi di Selve, 1870: Italy (Sardinia)
- 9- *Chelotrupes momus* (Olivier, 1789): Spain (Andalucía: Cádiz, Málaga)
= *Scarabaeus momus* Fabricius, 1792
= *Ceratophyus momus* var. *momoides* Reitter, 1893

