

Research article

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Taxonomic notes on some species of *Charopus* Erichson, 1840 in the Mediterranean Region (Coleoptera: Cleroidea, Melyridae, Malachiinae)

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Abstract

The results of the study of several hundred specimens of the genus *Charopus*, preserved in public and private collections from the Mediterranean region are here presented. For *C. rotundatus* Erichson, 1840 the neotype is here described. *C. nitidus* Küster, 1849 **stat. rest.** and *C. multicaudis* Kiesenwetter, 1866 **stat. rest.** are resurrected from synonymy with *C. rotundatus* and regarded as valid species. For *C. nitidus* Küster, 1849 **stat. rest.** a neotype is designated and described. *Charopus varipes* Baudi di Selve, 1872 **stat. rest.** is resurrected from synonymy with *C. pallipes* (A.G. Olivier, 1790) and regarded as a valid species. Elements for identification of the above mentioned species are provided in the form of comparative tables, and distributional data; list of known localities are also supplied. The distributions of *Charopus apicalis* Kiesenwetter, 1859, *C. concolor* (Fabricius, 1801) and *C. flavipes* (Paykull, 1798) are also briefly discussed. The new synonymy *Cyrtosus* (*Oogynes*) *reitteri* Abeille de Perrin, 1890 = *Charopus crassicornis* Wittmer, 1975 is proposed. A partial key to known males of Western Palaearctic species is also provided.

Key words: Soft-winged Flower Beetles, identification, distribution, Mediterranean region, taxonomy.

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Introduction

The genus *Charopus* Erichson, 1840 includes several species with an overall Turano-European-Mediterranean distribution type (Vigna-Taglianti et al. 1992, 1999). The type species is *C. pallipes* (A.G. Olivier, 1790). Two Himalayan species described as members of this genus (*C. laptelensis* Champion, 1925 and *C. tibetanus* Champion, 1925) may belong to a different one instead. Apart from those, the included species have never been disputed, even though the genus has been considered as “difficult to assign a certain place” (e.g. Mulsant & Rey 1867; p. 752, note 3). Its monophyly, however, is not well supported by genetic data (Gimmel et al. 2019). The western species are typical of open habitats, from coastal dunes to mountain meadows, and can be found in spring and early summer on grasses and flowers such as *Cistus*, *Convolvulus* etc.

During the second half of the 19th Century various authors described a number of taxa from the Mediterranean area, but most of them were subsequently reduced to junior synonyms, as summarised in Mayor’s Catalogue (2007).

The aim of this paper is to re-examine some of these taxa in an attempt to clarify their statuses, distinguishing characters and distributions.

Materials and Methods

The specimens examined are preserved in the following collections:

CEJ	Coll. E. Jiroux, Conflans Sainte Honorine, FR
CGF	Coll. G. Franzini, Milano, IT
CGL	Coll. G. Liberti, Uboldo, IT
CLS	Coll. L. Saltini, Modena, IT
CZM	Coll. Z. Malinka, Opava, CZ
MNB	Museum für Naturkunde, Berlin, DE
MRSN	Museo Regionale di Scienze Naturali, Torino, IT
MSNG	Museo Civico di Storia Naturale, Genova, IT
MSNMI	Museo Civico di Storia Naturale, Milano, IT
MSNVE	Museo di Storia Naturale, Venezia, IT
MSNVR	Museo di Storia Naturale, Verona, IT
NHMB	Naturhistorisches Museum, Basel, CH
SDEI	Senckenberg Deutsches Entomologisches Institut, München, DE
ZSM	Zoologische Staatssammlung München, DE

For each species, all localities reported have been checked by the author and are listed, by region and province, in alphabetical order, with the altitude when specified on the label. After each locality the repository of the specimens has been added.

Bibliography for each species includes the original description and the main articles supporting their identification or providing additional significant information.

Line drawings have been made using the Inkscape™ software package.

Morphometric measurements were taken using an ocular micrometer mounted on a stereoscope Leica S9E. The following abbreviations are used:

AL	Antennal length
EL	Elytron length from humerus to apex
EW	Elytra width measured across both elytrons at the base
HW	Head width including the eyes
IOW	Interocular width, the minimum distance between the inner margins of the eyes
PL	Pronotal length
PW	Pronotal width
TL	Total body length

Systematics

Males of the genus *Charopus*, like most Malachiinae, have excitators – i.e. paired secretory organs located in various parts of the body – whose secretion is used for precopulatory behavior (Matthes 1962). In the genus *Charopus* they are located at the elytral apex, and consist of either one or two appendages (Matthes 1962), with different degrees of modification to the apex itself (inwardly folding, presence of protrusions and/or setae, extension of the sutural angle). These structures are reliable characters for identification of species, but their evaluation in dried specimens is often made difficult by the small size and the weak sclerotisation of these anatomical parts. It must be added that differences in pronotal shape (more or less rounded) – as reported by various Authors – are to be taken very cautiously, as this character is frequently subject to distortion during drying. No reliably constant differences between species have been found in either male genitalia or the last abdominal segments, therefore they have not been considered in descriptions and comparisons. Females are always apterous, with elytral shape rounded and humeral callous absent and display only tiny differences (if any) between species; therefore it may be impossible to identify old, worn female specimens collected from areas where multiple species occur. Apterous males have sometimes been observed, but with no clear correlations to ecological factors (Constantin 2013).



Fig. 1 – *Charopus rotundatus* Erichson 1840: Neotype ♂ habitus (Tresnuraghes, Oristano, MNB).

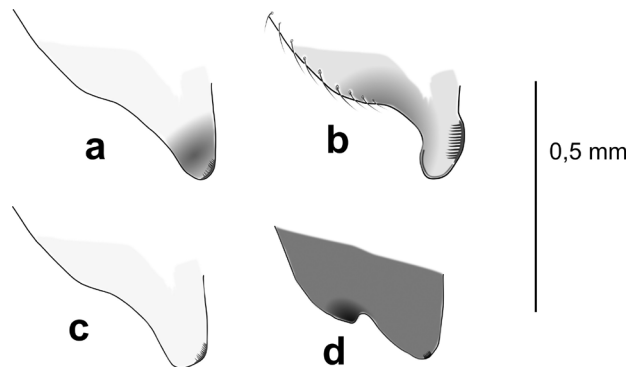


Fig. 2 – Apex of left elytra ♂: a, *Charopus rotundatus* Erichson 1840; b, *Charopus nitidus* Küster, 1849; c, *Charopus multicaudis* Kiesenwetter, 1866; d, *Charopus concolor* (Fabricius, 1801).

Results

Charopus rotundatus Erichson, 1840 (Figs 1, 2a, 3)

Charopus rotundatus Erichson, 1840: 121. Type locality (Neotype): Tresnuraghes, Oristano province, Sardinia. Peyron 1877: 211; Abeille de Perrin, 1890a: 250; Mayor 2007: 442.

Charopus saginatus Kiesenwetter, 1852: 621. Type locality: Sardinia; Peyron 1877: 210 [synonymized by Abeille de Perrin, 1885a: 153].



Fig. 3 – *Charopus rotundatus* Erichson 1840: ♀ habitus (Cantoniera Rio Gironi, Cagliari, CGL).



Fig. 4 – *Charopus nitidus* Küster, 1849: Neotype ♂ habitus (Nuxis env., Cagliari, MSNG).

Types. Of the two syntypes in collection of MNB, one is lost, only a fragment of a middle leg remaining. The extant one is in fact a female of *Troglops brevis* Erichson, 1840. The extant syntype being in disagreement with the prevailing usage, a request has been issued to the International Commission on Zoological Nomenclature (ICZN) to set it aside, according to Article 75.6 of ICZN, and a Neotype has been designated (Franzini 2021) (Fig. 1).

Diagnosis. A *Charopus* with integument dull due to very short, thick whitish pubescence, entirely dark legs and elytra with a bluish metallic reflection; male with elytral apex orange-yellow, bimucronate and with a dark thorny appendage. It differs from all other *Charopus* with dark legs and pale elytral apices because it is visibly dull.

Description

Male Neotype: Habitus as in Fig. 1. **Measurements:** TL 2,9 mm; HW 0,7 mm; IOW 0,5 mm; AL 1,6 mm; PL 0,7 mm; PW 0,7 mm; EL 1,9 mm; EW 0,8 mm. **Colour:** body surface black with a bluish metallic reflection and an orange-yellow spot at elytral apex. Antennae infuscate, almost black, with antennomeres II–IV more or less brownish-testaceous, especially on underside. Epistoma dark, clypeus brownish-yellow, mandibles, maxillary and labial

palpi entirely dark. Legs entirely dark. Integument covered by short, dense, recumbent whitish vestiture, giving a dull aspect, “*opacus*” as stated by Erichson (1840) in his diagnosis. **Head:** width including eyes, slightly wider than pronotum; vertex somewhat depressed; antennae reaching basal third of the elytra, antennomere I thickened distally, II short and subglobose, III to X obconical and obtusely serrate, XI longer than X, spindle-shaped and pointed. **Pronotum:** trapezoidal, about as long as wide, moderately convex; anterior margin prominent, sides narrowed towards the base without visible sinuosity; base straight and slightly raised. **Scutellar shield:** transverse. **Elytra:** about 2.2 times longer than pronotum, base slightly wider than the pronotum at its greatest width; humeral callus rounded and somewhat prominent; sides subparallel in basal half, then gradually widened; apex folded inwards transversely; upper edge of fold concave, bimucronate with some black and rigid bristles at tip; inner margin at middle with a dark, spiny appendage; lower part of the fold (Fig. 2a) rounded, at tip with thicker edge and some short dark spinulae curved upwards. **Ventral surface:** dark, including mesepimera. **Legs:** slender, covered with short, fine, uniform pubescence; pro- and mesotibiae straight, distal part of metatibiae weakly arched; inner side of metatibia keeled in basal half.

The female (Fig. 3) differs by having the elytra uniformly dark, simple at the apex, without folds or append-

ages and with rounded sutural angles, leaving the last two or three abdominal segments exposed, and metatibiae not keeled.

Variability. Bluish reflections of body surface may have a greenish hue. In males the orange spot at the elytral apex may have a variable extension, although no specimens without this feature have been observed.

Notes. *C. rotundatus* is the most abundant species of the genus in South-Central Sardinia, apparently with a preference for low altitude and sandy areas. It indeed occurs together with *Troglops brevis* on flowers in early spring. It has been reared from dried stems of wild fennel (R. Rattu, pers. comm.). Its confirmed distribution includes Sardinia, Corse, Is. Lampedusa and coastal central North Africa, so that its distributional range is considered to be Tyrrhenian. Citations for other regions of Italy, both Northern (Gredler 1882; Pasqual 2010) and Southern (Pasqual & Angelini 2001), are thought to be either determination or labelling mistakes. The only one that the writer has been able to check (Trentino: Val Genova, MSNVE) is in fact a female *Micrinus heteromorphus* (Abeille de Perrin, 1869). Females of *C. rotundatus* do look similar to apterous females of *Micrinus* Mulsant & Rey, 1867 and some *Cyrtosus* Motschulsky, 1854, but can be recognised by the different position of the antennal insertion and the simple elytral pubescence, without erect setae.

All the specimens studied from the Iberian peninsula and Morocco labelled as *C. rotundatus* turned out to be the similar *C. multicaudis* Kiesenwetter, 1866, up to now confused with it (see below).

List of localities

ITALY: Sardegna: Porto Conte (Sassari) (MSNVR); Is Arenas (Oristano) (CGF); Sale Porcus Pond (Oristano) (MSNVR); Tresnuraghes (Oristano) (CGF); Capo Comino (Nuoro) m 190 (CGF); Villagrande Strisaili (Nuoro) m 190 (CGL); Cantoniera Rio Gironi (South Sardinia) (CGL); Carloforte – San Pietro Island (South Sardinia) (CGL); Chia – S’Acqua Pond (South Sardinia) (MSNG); Domus de Maria (South Sardinia) (CGL); Esterzili (South Sardinia) m 750 (CGL); Flumentorgiu (South Sardinia) (MSNM); Gonnosfanadiga (South Sardinia) (CGF); Marina di Arbus (South Sardinia) (CGL); Montevecchio (South Sardinia) m 150 (CGL); Quirra – San Giorgio (South Sardinia) (CGL); San Nicola – Corr’e Cerbu (South Sardinia) (CGL); San Priamo (South Sardinia) (MSNG); San Priamo – Arco dell’Angelo (South Sardinia) (CGL); Sant’Anna Arresi (South Sardinia) (CGL); Sant’Antioco (South Sardinia) (CGL); Seui – Tonneri Genna ‘e Medau (South Sardinia) m 950-1000 (MSNG); Siliqua – Arceda Mount m 60-100 (South Sardinia) (MSNG); Terresoli (South Sardinia) m 180 (CGL); Torre di Murtas (South Sardinia) (CGL); Villasimius (South Sardinia) (MSNG); Cagliari (Cagliari)

(MSNM, CGF); Cantoniera Campu Omu (Cagliari) m 375 (CGL); Geremeas (Cagliari) (CGL); Molentargius Pond (Cagliari) (MSNG); Uta – Genna de Su Cerbu (Cagliari) m 100-130 (MSNG). Sicilia: Lampedusa Island (MSNM).

FRANCE: Corse: without locality (MNB); Ajaccio (MNB); near Bonifacio (MNB); N-O Bonifacio (MNB).

ALGERIA: Constantine (MNB); Gouraya (MNB); Philippeville (MNB).

TUNISIA: Korba – 10 km N (MNB); Saouaf (MNB); Souk El Arba (MNB); Tabarka (MNB); Zaghouan (MNB).

LIBYA: Garian (MSNM).

***Charopus nitidus* Küster, 1849 stat. rest.** (Figs 2b, 4, 5)

Charopus nitidus Küster, 1849: 18. Type locality: Sardinia near Cagliari; Kiesenwetter 1852: 621; Mulsant & Rey 1867: 882; Baudi di Selve 1872: 130, note 35; Peyron 1877: 213; Abeille de Perrin 1890a: 253.

Charopus rotundatus (pars): Uhagón 1901: 59.

Types. the types of *C. nitidus* have not been found, the Küster collection has been lost and, today, it is not possible to determine the true identity of his *C. nitidus*. However, two distinct species of *Charopus*, both with dark legs in females, do occur in Sardinia. One of them, the opaque one, has been identified as *C. rotundatus* of Erichson, discussed above; the other –with shinier integuments– fits the Küster description closely enough to



Fig. 5 – *Charopus nitidus* Küster, 1849: ♀ habitus (Nuxis env., Cagliari, MSNG).

justify, in the author's opinion, the continued use of the name *C. nitidus* for it, as has already been done in the past by the above mentioned Authors. Consequently, in order to preserve the stability of this taxon, a Neotype from a locality as close as possible to the original one has been designated here, as follows:

Neotype ♂ (Carlo Meloni collection, housed at MSNG) labelled: "SARDEGNA (CA) / NUXIS / e dintorni / m 190 slm" // "Is Pittaus / 14.IV.1999 / legit / Meloni C." // "*Charopus* sp. / det. C. Meloni [19]99" // "Neotypus / *Charopus nitidus* / Küster, 1849 / G. Franzini des. 2020" (red, handwritten). MSNG maintains a research collection, with proper facilities for preserving name-bearing types, and the institution also makes these accessible for study.

Diagnosis. A *Charopus* with integument shiny, with long, sparse whitish vestiture, entirely dark legs and elytra with a bronze-green metallic reflection; male with elytral apex orange-yellow bimucronate with large setae at distal margin, a pale thorny appendage and an apical lobe armed with spines at inner margin.

Description

Male Neotype: Habitus as in Fig. 4. **Measurements:** TL 2,6 mm; HW 0,6 mm; IOW 0,4 mm; AL 1,22 mm; PL



Fig. 6 – *Charopus multicaudis* Kiesenwetter, 1866: ♂ habitus (Villas Rubias, Salamanca, CGL.)

0,6 mm; PW 0,6 mm; EL 1,75 mm; EW 0,7 mm. **Colour:** Body shining black with greenish-metallic reflections, with a yellowish spot at the elytral apex. Antennae infuscate, almost black, with antennomeres II–IV brownish-testaceous. Epistoma brownish-yellow, mandibles, maxillary and labial palpi entirely dark. Legs entirely dark. Integument covered with long, recumbent whitish pubescence. **Head:** with eyes included, slightly wider than the pronotum; vertex slightly depressed; antennae reaching the basal third of elytra; antennomere I thickened distally, II short and subglobose, III to X obconical and weakly serrate, XI longer than X, spindle-shaped and pointed. **Pronotum** trapezoidal, about as long as wide, moderately convex; anterior margin prominent, sides narrowed towards the base but without visible sinuosity; base straight and slightly raised. **Scutellar shield** transverse. **Elytra** about two and a half times longer than pronotum, base as or slightly wider than the pronotum in its greatest width; humeral callus rounded and somewhat prominent; sides subparallel in basal half, then gradually widened; distal margin of elytra rounded, with some equidistant large setae, then sinuate; apex folded transversally inwards; upper edge of fold concave and sharply bimucronate, with some black and rigid bristles at tip; at middle of inner margin a membranous, pale, thorny appendix with spiniform apex is observed; the lower part of the fold (Fig. 2b) forms a distinct lobe, with about ten long teeth on inner edge. **Ventral surface:**



Fig. 7 – *Charopus multicaudis* Kiesenwetter, 1866: ♀ habitus (Palencia, Baltanas, CGL.)

dark, including mesepimera. **Legs** slender, covered with short and fine, uniform pubescence; pro- and mesotibiae straight, distal part of metatibiae weakly arched; inner side of metatibia keeled throughout their length.

The female (Fig. 5) differs by having elytra uniformly dark, exposing the last two or three abdominal segments, simple at the apex, without folds or appendages and with rounded sutural angles, and metatibiae not keeled.

Variability. The pale spot at elytral apex of males may have variable extension, although no specimens without it have been observed.

Notes. Küster (1849) described *C. nitidus* on females only, separating it from *C. rotundatus* based on differences in gloss and pubescence of elytra. For a few decades it was accepted as a valid species, even though both anatomy and distribution were not ever clearly highlighted [two distinctive characters from *C. rotundatus* were reported: more glossy appearance (true) and less rounded pronotum (false)]. Uhagón (1901), after a rather convoluted reasoning and notwithstanding a long discussion on variability, proposed its synonymy with *C. rotundatus*. He was not followed unambiguously at first, as *C. nitidus* was still considered a valid species e.g. by Sainte-Claire Deville (1914), Porta (1929), Luigioni (1929), and Normand (1935). The synonymy was stated again in Greiner's Catalog (1937), and thereafter *nitidus* has been treated at most as a variety of *rotundatus*, e.g. by Evers (1962).

C. nitidus seems to have less preference for sandy habitats than *C. rotundatus*, but the two species often occur together. Based on the materials studied, its distribution is Tyrrhenian and appears narrower than that of *C. rotundatus*, being limited to Sardinia, Corsica, Tunisia and Algeria.

List of localities

ITALY: Sardegna: Asinara Island (Sassari) (MSNG); Martis (Sassari) m 200 (CGL); Golfo Aranci (Sassari) m 380 (CGF); Oschiri (Sassari) (CGF); Osilo (Sassari) m 380 (CGL); Palau – Mouth River Liscia (Sassari) (CGF); Pilo Pond (Sassari) (CGL); Ploaghe (Sassari) m 500 (CGL); Porto Conte (Sassari) (MSNVR); Stintino (Sassari) (MSNVR); Aritzo – Sa Casa Pass (Nuoro) m 1040-1060 (MSNG); Bolotana – Punta Palai (Nuoro) m 1200 (CGF); Cala Gonone (Nuoro) (MSNG); Campeda – Macomer (Nuoro) (MSNG); Gennargentu – Aritzo (Nuoro) (MSNM); Lula (Nuoro) m 625 (MSNG); Siniscola (Nuoro) m 300-500 (CGF); Bosa (Oristano) m 280 (CGL); Bosa – Mount Mannu (Oristano) m 600 (CGF); Cabras – Is Arutas (Oristano) (MSNG); Santu Lussurgiu (Oristano) m 800 (CGF); Suni (Oristano) (CGL); Domus de Maria (South Sardinia) (CGL); Esterzili (South Sardinia) m 650 (CGL); Flumentorgiu (South Sardinia) (MSNM); Gonnosfanadiga (South Sardinia) (CGF); Montevecchio (South Sardinia) m 150 (CGL); Sant'Antioco Island (South Sardinia)

(MSNG, CGL); Villaputzu (South Sardinia) (CGL); Elmas (Cagliari) (MSNG); Nébida – Punta Mezzodi (Cagliari) m 200-210 (MSNG); Nuxis (Cagliari) m 190 (MSNG); Quartu S. Elena – Simbirizzi Pond (Cagliari) (MSNG); San Priamo – Sa Spadula (Cagliari) (MSNG).

FRANCE: Corse: Bastia – Col de Teghime m 600 (CGL); near Bonifacio (MNB); Cap Corse – Maginaggio (MNB); Nebbio m 250 (MNB); Porto Vecchio (CEJ); Vizzavona (MNB).

ALGERIA: Azagza – oued Sebaou (MNB); Bou Adenane – Grande Kabylie m 900 (MSNVR); Gouraya (MNB); Grande Kabylie -Yakouren 700-850 m (MNB); Grande Kabylie – Yakouren – ravine over Tala Tezgirine 860 m (MNB); Theniet el Had (MSNM).

TUNISIA: Tabarka 12 km E (MNB).

Charopus multicaudis Kiesenwetter, 1866a **stat. rest.** (Figs 2c, 6, 7)

Charopus multicaudis Kiesenwetter, 1866a: 383. Type locality: Andalusia (Sierra de Jaen, Cordoba, Granada); Peyron 1877: 212; Uhagón 1879: 213; Abeille de Perrin 1885a: 153 [synonymy with *C. rotundatus* proposed].

Charopus nitidus: Escalera 1914: 233 (not Küster); Pic & Lindberg, 1932: 13.

Charopus nitidus var. *macroderus* Abeille de Perrin, 1890a: 253. Type locality: Badajoz (Spain) [**syn. nov.**]



Fig. 8 – *Charopus varipes* Baudi di Selve, 1872: ♂ habitus (Castel d'Aiano, Bologna, CGF).

Charopus rotundatus: Uhagón 1901: 54; Plata-Negrache 1987: 558; Plata-Negrache & Santiago Hernández 1990: 449 (not Erichson).

Charopus rotundatus var. *nitidus* Evers 1962: 167 (not Küster); [**syn. nov.**].

Types: It has not been possible to locate specimens labelled as per Kiesenwetter's description in his collection at ZSM. However, all the *Charopus* with apex of elytra pale studied from the Iberian Peninsula, including Andalusia, were found to belong to a single species, so its identification with *C. multicaudis* seems solid enough to continue using this name even in the absence of a type.

Notes. Kiesenwetter stated that his *C. multicaudis* was "easy to separate from all known species because of the peculiar structure of the male elytral apex" (1866b). Despite the optimism of the Author, *C. multicaudis* held out as a valid species only until Uhagón (1879). In later works, since Abeille de Perrin (1885a) and Uhagón himself (1901), *C. multicaudis* has been treated as a synonym of either *C. rotundatus* or *C. nitidus*, depending on each Author's view about those taxa.

The Iberian material previously referred to *Charopus rotundatus* (Figs 2c, 7, 8) and to *Charopus multicaudis* does show constant differences from both *rotundatus* Erichson, 1840 and *nitidus* Küster, 1849. It is closer in habitus to *C. nitidus*, but the following differences can be observed in apex of elytra of males: the distal margin lacks large setae,

the appendage is longer and darker, the apical lobe (Fig. 2c) is less distinct, and the spines on its inner margin are much smaller. The shiny aspect and the longer and sparser pubescence set it apart from *C. rotundatus*. The antennae and legs of both sexes are also proportionally longer than in either of the above species. Therefore *C. multicaudis* must be reconsidered as a third valid species in this group. *C. nitidus* var. *macroderus* Abeille de Perrin (1890a) has been described from Badajoz (Estremadura, Spain), on the basis of its pronotum being longer than in *nitidus*, at that time still considered a valid species, but Uhagón (1901) lumped it together with *C. rotundatus*. This synonymy was stated again by Mayor (2007). Specimens examined from Badajoz do not display differences in length of pronotum from those of other Iberian localities, so the new subjective synonymy *Charopus multicaudis* Kiesenwetter, 1866 = *Charopus nitidus* var. *macroderus* Abeille de Perrin, 1890 is proposed here.

The confirmed distribution of *C. multicaudis* is of W Mediterranean type: it includes most of the Iberian Peninsula, Balearic Islands, Algeria and Morocco. For the latter country it has been cited by Evers (1962) as *C. rotundatus* var. *nitidus*, but all the specimens examined from Morocco belong to *C. multicaudis*. The new subjective synonymy *Charopus multicaudis* Kiesenwetter, 1866 = *Charopus rotundatus* var. *nitidus* Evers, 1962 is proposed here.



Fig. 9 – *Charopus varipes* Baudi di Selve, 1872: ♀ habitus (Muraglione Pass, Firenze, CGL).

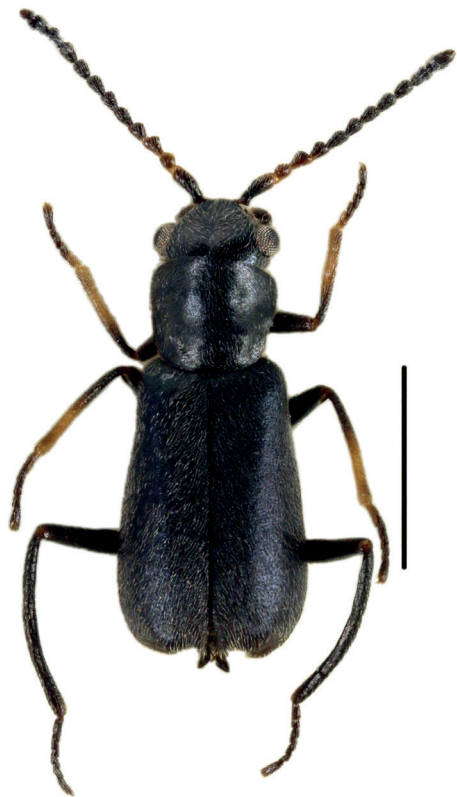


Fig. 10 – *Charopus pallipes* A.G. Olivier, 1790: ♂ habitus (Corno alle Scale, Bologna, CGL).

List of localities

PORTUGAL: Alentejo – Cuba (MNB); Algarve – São Brás de Alportel (MNB); Estremadura – Sesimbra (MNB); Lisboa (MSNM).

SPAIN: “Hispania” (MNB); Albufera (MNB); Algeciras (MSNM); Almoraima (MNB); Aracena – Huelva (MNB); Badajoz (MNB); Faén (MNB); Granada (ZSM); Malaga (MNB); Palencia (MNB); Palencia – Baltanas (CGL); Ronda (MNB); Tarifa – Facinas (MNB); Tarifa – P. Paloma (MNB); Tarifa – Sierra de Luna (MNB); Tarifa – Tiradero (MNB); Villablanca (MSNG); Yunquera (MNB).

Balearic Islands: no locality (MNB); Mallorca: Cala Ratjada (MNB); Mallorca: Miramar (MNB); Mallorca: Punta Negra (MNB); Mallorca: Vallerrosa (MNB); Minorca (MNB).

MOROCCO: Boulhaut (MNB, MSNM); Ouezzane (MNB); Safi (MNB); Rif – Ain Defali (MNB); Tanger (MNB, MSNM); Tarmilate, near Oulmes (MNB); near Tiflet (MNB).

ALGERIA: Algier (MSNM); Bouzaréah m 350 (MNB); Misserghin (MNB).

Charopus apicalis Kiesenwetter, 1859

Charopus apicalis Kiesenwetter, 1859: 33. Type locality: Athen. Peyron 1877: 215; Abeille de Perrin 1890a: 253; Mayor 2007: 441.

Notes. *C. apicalis*, unlike the species discussed above, does not pose problems of interpretation. It is known to occur in the Balkan Peninsula, Southern Italy, Sicily, Malta, Pantelleria, Tunisia, Algeria and Morocco. Citations of this species for Northern Italy (Pasqual 2010) are thought to be either determination or labelling mistakes. The specimens labelled as *C. apicalis* studied by the writer for this area (from MSNVE and MSNG) were found to belong to *C. concolor* (Fabricius, 1801), see below. However, the writer has also examined two males from Central Italy: Porto d’Ascoli (Ascoli Piceno, Marche) (MSNG), so there is the possibility that the range of this species on Adriatic coasts is extended Northwards further than is known at present.

The ranges of the four species with apex of elytra orange/yellow in males have significant overlaps in Mediterranean region, especially in Algeria where all of them occur. To help with their identification, Table 1 summarises their main differential male characters.

Charopus concolor (Fabricius, 1801) (Fig. 2d).

Malachius concolor Fabricius, 1801: 310. Type locality: Austria.

Malachius furcatipennis A.Villa & G.B. Villa, 1837: 17. Type locality: hills of Brianza (Lombardia, Italy) [synonymy in Gaubil 1849: 118].

Charopus concolor: Erichson, 1840: 121; Kiesenwetter, 1863: 615; Mulsant & Rey, 1867: 879; Horion, 1953: 87; Evers, 1979: 59; Mayor 2007: 441.

Malachius nigripes Kolenati, 1846: 44. Type locality: Elisabéthopol and Karabagh (Eastern Caucasus) [synonymized by Abeille de Perrin: 1885c: 258].

Notes. *C. concolor* is close to the group of species discussed above, having entirely dark legs, apex of elytra bimucronate, folded inwards and with a linear appendage. The pubescence of dorsum is similar to that of *C. rotundatus*, but the apex of elytra is always dark as the rest, and the sutural angle of elytra is not prolonged in a lobe (Fig. 2d). No specimens from W-Mediterranean have been identified during this study, even though citations for the area exist; the one for Sicily in Horion (1953, specimen at NHMB) refers to a female of *C. apicalis*. Its range seems limited to Central and South-Eastern Europe, and it can be considered a vicariant of the four species previously discussed. As for the synonymy with *Malachius nigripes* Kolenati, 1846 (not *Ebaeus* as often cited), it might be referred also to one of the other species with dark legs occurring in the Caucasus area (*C. docilis* Kiesenwetter, 1852 and *C. philoctetes* Abeille de Perrin 1885).

Charopus varipes Baudi di Selve, 1872 **stat. rest.** (Figs 8, 9)

Charopus varipes Baudi di Selve, 1872: 128 Type locality: Lake Trasimeno and Sardinia. Abeille de Perrin, 1885b: 23.



Fig. 11 – *Charopus pallipes* A.G. Olivier, 1790: ♀ habitus (Colle del Melogno, Imperia, CGL).

Charopus pallipes var. *varipes* Peyron 1877: 219; Abeille de Perrin, 1890a: 250.

Charopus pallipes var. *variipes* Abeille de Perrin, 1891: 411 [unjustified emendation].

Charopus pallipes Auct. [pars]

Types. Baudi di Selve reported Lake Trasimeno (Umbria, Italy) and Sardinia as type localities for this taxon. It has not been possible to find any specimen with either provenance in his collection at MRSN, but in collection of MSNG a few specimens from “Toscana” have been found, determined by Baudi di Selve himself (1873) as *C. varipes*, providing contemporary evidence of his standpoint.

Notes. Baudi di Selve characterized his *C. varipes* against *C. pallipes* mainly on the pubescence of elytra being sparser towards apex. The first Author to demote *C. varipes* to a variety of *C. pallipes* was Peyron (1877). Abeille de Perrin treated it at first (1885b) as a valid species, pointing also to the different shape of pronotum and colour of elytral appendages. After a few years however (1890a), he stated that the differences from *pallipes* were too weak to keep the two taxa apart. Subsequently, the opinion of Abeille de Perrin has been generally accepted, the only exceptions known to the writer being the mentions in the Catalogues of Bertolini (1899–1904) for some regions of Central Italy, and of Holdhaus (1912) for Mount Gargano.

The examination of specimens attributed to *C. pallipes* from the Italian Peninsula and Sardinia revealed that they actually are a mixture of two distinct taxa, one identical to the European *C. pallipes*, the other corresponding to Baudi di Selve’s *C. varipes*. Table 2 summarises the main differences between the two above mentioned taxa.

The observed ranges of the two taxa overlap widely over Apennines until Abruzzo; all the specimens examined from the southernmost part of the Italian peninsula, Sicily and Sardinia belong to *C. varipes* instead. No specimens with intermediate characters have been found. No cases of syntopy have been observed, and on the few mountainous areas where both species occur *C. varipes* seems to prefer lower altitudes than *C. pallipes*. No specimens of either species have been studied from Corse or Tuscan Archipelago. *C. varipes* must be considered, based on current knowledge, an Italian endemic. Even though it has not been possible to retrieve original type specimens, there are no particular taxonomic problems, and in fact some of the ancient specimens already bear labels as “*varipes* Baudi”. Therefore in the writer’s opinion the use of the name *varipes* should not mandate the designation of a Neotype.

Some apterous male specimens have been found in the examined material.



Fig. 12 – *Charopus crassicornis* Wittmer, 1975: Holotype ♂ habitus (Bingöl, Turkey, NHMB).

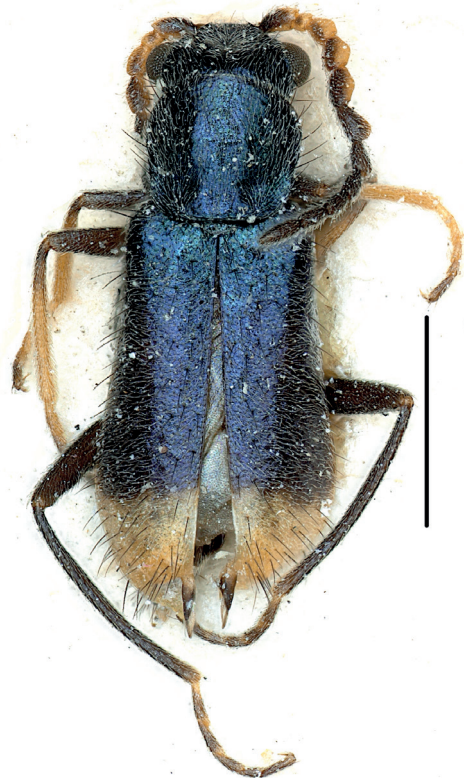


Fig. 13 – *Cyrtosus (Oogynes) reitteri* Abeille de Perrin, 1890, Syntype ♂ habitus (Araxesthal, Armenia, NHMB). Scale bars = 1 mm, except for Fig. 2 = 0,5 mm.

Table 1 – Main differential male characters of *Charopus rotundatus*, *C. nitidus*, *C. multicaudis* and *C. apicalis*.

Character	<i>rotundatus</i>	<i>nitidus</i>	<i>multicaudis</i>	<i>apicalis</i>
Pubescence of dorsal surface	short and dense	long and sparse	long and sparse	long and sparse
Folding of elytral apex ♂	deep	deep	deep	shallow
Upper margin of folding ♂	bimucronate	sharply bimucronate	sharply bimucronate	curved smoothly
Appendage of excitators ♂	dark	pale	dark	pale
Sutural angle of elytral apex ♂	rounded with thickened edge and a few small spines (Fig. 2a)	lobe-shaped with a row of large spines at inner margin (Fig. 2b)	lobe-shaped with a row of small spines at inner margin (Fig. 2c)	simply rounded
Setae on apical margin of elytra ♂	absent	present	absent	absent

List of localities

ITALY: Emilia-Romagna: Canossa – Cerezzola (Reggio Emilia) (CGF); Casina – Pantano (Reggio Emilia) m 650 (CGL); Pievepelago (Modena) m 800 (CGL); Sant’Anna Pelago (Modena) m 1250 (CLS); Sestola – Mount Cimone (Modena) W slope m 1600 (CGL); Bologna (Bologna) (MSNG, MSNM); Castel d’Aiano (Bologna) (CGF); Gaibola (Bologna) (MSNVR); Lizzano in Belvedere (Bologna) m 800 (CGF); Madonna dell’Acero (Bologna) (MSNG); Monte San Pietro – San Martino (Bologna) (CGF); Mount Capra (Bologna) (MSNM); Mount Mario (Bologna) (MSNM); San Giovanni Persiceto – Le Budrie (Bologna) (CGF); Sasso Marconi (Bologna) (CGF); Vidiciatico (Bologna) m 875 (CGL); Zena Valley – Pianoro (Bologna) (CGF); Montetiffi (Forlì-Cesena) (CGF); Talamello – Mount Pincio (Rimini) (CGF). Toscana: Muraglione Pass (Firenze) – N-E slope m 800 (CGL); Cutigliano (Pistoia) (MSNG, MSNM); La Lima (Pistoia) m 800 (CGL); Pracchia (Pistoia) (CGL, MSNG); Arbia river (Siena) (MSNG); Montagnola (Siena) m 300 (MSNG); Monte Amiata (Siena) m 300 (MSNVR); Viamaggio Pass (Arezzo) (MSNVE); Arcidosso (Grosseto) (MSNM). Note: localities cited in the Catalogue for Pratomagno of Papi & Franzini (2018) for *C. pallipes* are likely to be referred to *C. varipes* instead. Marche: Bolognola (Macerata) (MSNVR); Montemonaco (Ascoli Piceno) m 1000 (MSNG). Umbria: Perugia (MSNG); Trevi – Pettino (Perugia) m 800 (CGL). Lazio: Ninfa (Latina) (MSNVR). Abruzzo: Maiella – Mount Amaro (Pescara) W slope m 1570 (CGL); Camosciara (L’Aquila) m 1500 (MSNVR); Castelli (L’Aquila) (MSNM); Baronessa (Chieti) (CGF). Molise: Gallo (Campobasso) (MSNVR); Guardiaregia (Campobasso) (MSNVR); Ripabottoni (Campobasso) m 600 (MSNG); Isernia (MSNG). Campania: Gallo Matese (Caserta) m 845 (CGL); Lake Matese (Caserta) (MSNVR); San Biase Ceraso (Salerno) (CGL, MSNM); Vallo della Lucania – Mount Centaurino (Salerno) (MSNM); Vallo della Lucania – Mount Sacro (Salerno) (CGL, MSNM); Vallo della Lucania – Mount Scuro (Salerno) (MSNM). Basilicata:

Muro Lucano – Mount Paratiello (Potenza) (CGF); Viggianello – Pantone (Potenza) (CGL). Calabria: Camigliatello (Cosenza) (MSNVR); Campi di Reggio (Reggio Calabria) (MSNVR); Gambarie (Reggio Calabria) (MSNVR); Piani di Lopa (Reggio Calabria) (MSNVR). Sicilia: Palermo (SDEI). Sardegna: Aritzo (Nuoro) (MSNM); Fonni – Bruncu Spina (Nuoro) m 1325-1820 (CGF, CGL, MSNG); Fonni – River Aratu (Nuoro) m 960 (CGL); Mount Spada (Nuoro) m 1270 (CGL).

SAN MARINO: San Marino (MSNM).

Charopus pallipes (A.G. Olivier, 1790) (Figs 10, 11)

Malachius pallipes A.G. Olivier, 1790: n. 27. Type locality: Paris area.

Charopus grandicollis Kiesenwetter 1852: 620 [synonymy in Jacquelin du Val 1857: 93].

Charopus pallipes: Jacquelin du Val, 1857: 93; Kiesenwetter, 1863: 614; Mulsant & Rey 1867: 885; Horion, 1953: 86; Mayor 2007: 442.

Notes. *C. pallipes* has a wide W-Mediterranean distribution: Morocco, Iberian Peninsula, Central Europe. The writer has not studied specimens from Algeria, where the species was doubtfully cited by Abeille de Perrin (1890a, 1891). In Italy it is apparently limited to South Piemonte, South Lombardia, Liguria, Emilia-Romagna, Toscana,

Table 2 – Main differential male characters of *C. pallipes* and *C. varipes*.

Character	<i>pallipes</i>	<i>varipes</i>
Pubescence of body	dense, uniform along entire elytra, except the inner area of the folding of ♂	more sparse, even more so towards the apex of elytra
Appendages at apex of elytra of ♂	very short and dark	longer and paler
Upper sutural angle of folding of ♂	blunt	sharply pointed

Marche, and Abruzzo, more and more scattered and restricted to mountain areas southwards. In some of these regions, as said above, it partly overlaps with *C. varipes*, and in the southernmost ones it is replaced by it. The citation by Porta (1929) for Trentino-Alto Adige might refer to *C. flavipes* (Paykull, 1798) instead, see below.

Also for *C. pallipes*, some apterous male specimens have been found in the examined materials.

List of localities

ITALY: Piemonte: Carnino – Mount Mongioie (Cuneo) m 1300 (CGL); Ormea – Chionea (Cuneo) m 1220 (CGL); Viozene – Montenegro (Cuneo) m 1800 (CGL); Cartosio (Alessandria) m 180 (CGL). Liguria: Colla di Langan (Imperia) m 1130 (CGL); Colle del Melogno (Imperia) m 1000 (CGL); Monesi (Imperia) m 1600 (CGL); Mount Ceppo (Imperia) m 1450 (CGL); Nava (Imperia) (MSNM); Pass Tegli (Imperia) m 1390 (CGL); Perinaldo (Imperia) m 1200 (MSNM); Ponte di Nava (Imperia) (CGL); San Romolo (Imperia) (CGL); Sanremo – Mount Bignone (Imperia) m 1200 (MSNM); Ventimiglia (Imperia) m 1200 (CGL); Andora (Savona) m 350-500 (CGL); Colle dei Giovetti (Savona) (MSNG); Colle del Melogno (Savona) (CGL, MSNG); Finale Ligure (Savona) (MSNG); Finale Ligure – Portio (Savona) (CGL); Giovo Ligure (Savona) m 500 (CGL); Laigueglia (Savona) (CGL); Monti di Alassio (Savona) (CGL); Mount Beigua (Savona) (MSNVR); Mount S. Giorgio (Savona) (MSNG); Piana di Andora (Savona) (CGL); Sassello (Savona) (CGL); Arenzano (Genova) (MSNVR); Belvedere (Genova) (MSNM); Brevenna Valley – Sorri (Genova) (MSNG); Certosa (Genova) (MSNM); Creto (Genova) (MSNVR); Fontanigorda (Genova) (MSNVR); Fort Castellaccio (Genova) (MSNM); Genova (Genova) (MSNG, MSNM); Giovi (Genova) (MSNM); Isoverde (Genova) (MSNM); Lagaccio (Genova) (MSNVR); Molassana (Genova) (MSNG); Mount Antola (Genova) (MSNG); Mount Fasce (Genova) (MSNG); Mount Penna (Genova) (MSNG); Mount Portofino (Genova) (CGL, MSNG, MSNM); Neirone (Genova) (MSNVR); Pass Faiallo (Genova) m 850 (CGL); Pass Turchino (Genova) m 600 (CGL); Piani di Creto (Genova) (MSNM); Santa Tecla (Genova) (MSNM); Santo Stefano d'Aveto (Genova) (MSNG); Torriglia (Genova) (MSNM); Vittoria (Genova) (MSNG); Carro (La Spezia) (MSNG). Lombardia: Mount Penice (Pavia) m 1000 (CGL); Pass Brallo (Pavia) (MSNM). Emilia-Romagna: Ferriere – Canadello (Piacenza) m 700 (CGL); Mount Bue (Piacenza) NE slope m 1500 (CGL); Mount Vallestra (Reggio Emilia) m 1700 (MSNVR); Mount Ventasso (Reggio Emilia) m 1700 (CGL); Mount Cimone (Modena) NE slope m 1750 (CGL); Dogana (Modena) m 1000 (MSNVR); Corno

alle Scale (Bologna) m 1800-1915 (CGF, CGL). Toscana: Mount Tambura (Lucca) m 1400-1700 (MSNVR). Marche: Mount Vettoreto (Ascoli Piceno) S slope m 1920 (CGL). Abruzzo: Gran Sasso (L'Aquila) m 2400 (MSNVR); Pescasseroli (L'Aquila) m 1820 (CGL); Blockhaus (Chieti) m 2200 (MSNVR); Passo Lanciano (Chieti) m 1400 (CGL); Pretoro (Chieti) m 800 (MSNVR); La Maielletta (Pescara) m 1940 (CGL); Passo Lanciano – la Maielletta (Chieti) m 1800 (CGL).

Charopus flavipes (Paykull, 1798)

Malachius flavipes Paykull, 1798: 274. Type locality: Finland. *Malachius graminicola* Dejean, 1833: 109. Type locality: Styria [synonymy in Baudi di Selve 1872: 128].

Charopus pallipes Erichson, 1840: 120; Küster 1847: 64; Gaubil 1849: 118 (*nec* A.G. Olivier, 1790).

Charopus flavipes: Jacquelin du Val, 1857: 93; Kiesenwetter, 1863: 613; Mulsant & Rey 1867: 877; Horion, 1953: 86; Evers, 1979: 59; Mayor 2007: 442.

Notes. This Centro-European species does not pose particular taxonomic problems. It has been cited in the past for various Italian regions: Piemonte, Lombardia, Toscana, Lazio, Campania, Sardegna (Luigioni, 1929); Basilicata (Pasqual & Angelini, 2001), but during this study only specimens from North-East Italy have been confirmed. The writer believes that reports for other regions should be considered doubtful, as all the abundant material studied from these regions has been found to belong to either *C. pallipes* or *C. varipes*. One possible cause for misidentification may be the table in Porta (1929), that does not mention the difference in length:width ratio of pronotum, i.e. the best differential character between females of *C. flavipes* and the other two species. Males cannot be mistaken, as in *C. flavipes* the apex of elytra is not folded and the excitators have a single appendage pointing upwards.

Charopus crassicornis Wittmer, 1975 (Fig. 12)

Charopus crassicornis Wittmer, 1975: 266. Type locality: Turkey, 30 km east of Bingöl.

Notes. Male holotype is shown in Fig. 12 (courtesy of NMHB). The description of this species sets it apart from the rest of the genus, in particular antennomeres 3-6 are widened and the pubescence has black erect setae. The same characters occur also in *Cyrtosus (Oogynes) reitteri* Abeille de Perrin (1890b), type locality "Caucasus", of which a male syntype from Araxes Valley (Armenia) kept at NHMB is shown in Fig. 13 (courtesy NHMB). As might be expected from the similarities in the two descriptions, the holotype of *C. crassicornis* and the syntype of *C. (O.) reitteri* share the same habitus. The writer has examined another corresponding male specimen also from Armenia: Mount Arailer, leg. Z. Malinka (CZM). *Cyrtosus (Oogynes) reitteri* has also been cited by Yildirim & Bulak (2012) for Turkey: Erzurum, not so far from Bingöl. In the

writer's opinion, characters like modifications of anten-
nomeres and double pubescence are more consistent with
placement in *Cyrtosus* (*Oogynes*) than in *Charopus*; there-
fore the following new subjective synonymy is proposed:
Cyrtosus (*Oogynes*) *reitteri* Abeille de Perrin, 1890 = *Cha-*
ropus crassicornis Wittmer, 1975.

Conclusions

It has not been possible to frame all the species described
for the area under study, due to shortage of available mater-
ial. The type specimen of *C. diversipennis* Pic, 1906 (type
locality: Adana, Turkey) could not be found in Pic's col-
lection at MNHN (A. Mantilleri, pers. comm.). The only
male specimen so determined that the writer was able to
locate (Tarsus, Turkey, NHMB) maybe belongs to to ge-
nus *Anthocomus* Erichson, 1840, e.g. near *A. smyrnensis*
Wittmer, 1971 (type locality: road Izmir-Efes, Turkey) or
A. kinzelbachi Wittmer, 1981 (type locality: Tartus, Syria).
As for *C. rubronotatus* Pic, 1911 (type locality: Elisabet-
pol, nowadays in Azerbaijan), the male is still unknown,
and based on the available information it should be better
to consider it as *species incertae sedis*.

Partial key to W-Palaeartic species of *Charopus* (male specimens only)

1. Legs all dark 2
 - At least part of some tibiae pale 4
2. Upper margin of folding at apex of elytra bimucronate
..... *concolor* (Fabricius, 1801),
nitidus Küster, 1849, *multicaudis* Kiesenwetter, 1866,
rotundatus Erichson, 1840
 - Upper margin of folding at apex of elytra not bimucronate 3
3. Appendage of excitators bent at angle downwards,
elytra all dark, metatibiae more or less flattened at apex
..... *docilis* Kiesenwetter, 1852 (= *bona-*
donai Pardo, 1962), *nubilus* Hodgson & Plata-Ne-
grache, 1987, *philoctetes* Abeille de Perrin, 1885
 - Appendage of excitators straight, apex of elytra pale,
metatibiae never flattened *api-*
calis Kiesenwetter, 1859
4. Apex of elytra folded inwards, excitators with two ap-
pendages: one thin, one wide *pallipes*
(A.G. Olivier, 1790), *varipes* Baudi di Selve, 1872
 - Apex of elytra impressed but not folded inwards,
excitators with a single thin appendage pointing up-
wards 5
5. Pronotum completely dark
..... *flavipes* (Paykull, 1798), *nigricans* Peyron, 1877
 - Base of pronotum pale *bicolor*
Peyron, 1877, *madidus* Kiesenwetter, 1863, *thoracicus*
Morawitz, 1861

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