



## The Palaearctic types of Chrysididae (Insecta, Hymenoptera) deposited in the Linsenmaier collection. Part 4. Elampini: genus *Omalus* Panzer, 1801

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### Abstract

An illustrated catalogue of the Palaearctic types of species and subspecies described by Walter Linsenmaier in *Omalus* Panzer, 1801 is given. Linsenmaier described 16 species and subspecies of *Omalus*; most of the primary types are deposited in the collection at the Natur-Museum in Luzern, Switzerland, with the exception of four holotypes which are deposited at the Natural History Museum in London, UK; Nationalparkzentrum in Zerne, Switzerland; Eidgenössische Technische Hochschule in Zurich, Switzerland; and Museo de Naturaleza y Arqueología in St. Cruz de Tenerife, Spain. A list of the species described and pictures of 13 primary and secondary types are presented. A synthesis of his classification is given, with comments and comparison to modern classification.

**Key words:** Chrysidinae, Elampini, subgenera, catalogue, synonym

### Introduction

The present article is the fourth contribution dedicated to the Palaearctic types of Chrysididae deposited in the collection of Walter Linsenmaier (1917–2000) that is currently housed at the Natur-Museum in Luzern (Switzerland, NMLU) (Rosa *et al.* 2020b, 2022a, 2022b). An introductory work was previously published on the whole collection (Rosa *et al.* 2015a). The previous illustrated catalogues were focused on *Cleptes* Latreille, 1802 (Rosa *et al.* 2020b), *Hedychridium* Abeille de Perrin, 1878 (Rosa *et al.* 2022a), and *Hedychrum* Latreille, 1802 (Rosa *et al.* 2022b).

Walter Linsenmaier described more than 700 new species and subspecies, 16 of which belonging to *Omalus* Panzer, 1801. Linsenmaier (1959a, 1959b, 1968, 1987, 1994, 1997, 1999) always used a conservative interpretation of *Omalus* which he subdivided into five subgenera: *Omalus s.str.*, *Holophris* Mocsáry, 1890, *Philoctetes* Abeille de Perrin, 1879, *Chrysellampus* Semenov-Tian-Shanskij, 1932, and *Elampus* Spinola, 1806 (named *Notozus* Förster, 1853 until Linsenmaier 1994). This interpretation has been entirely or partially followed by recent authors (e.g. Kunz 1994; Arens 2014; Martynova & Fateryga 2014 and most most of the Russian researchers, see Rosa *et al.* 2019). Currently, two taxa, namely *Omalus (Chrysellampus) nigromaculatus* Linsenmaier, 1997, and *Omalus (Omalus) horvathi occidentus* Linsenmaier, 1968, are considered to be subjective junior synonyms of *Omalus (Chrysellampus) pici* (du Buysson, 1900) (Arens 2014) and *Omalus (Philoctetes) dusmeti* (Trautmann, 1926) (Linsenmaier 1997), respectively.

*Omalus sensu* Linsenmaier is heterogeneous, considering recent molecular and morphological analyses (Pauli *et al.* 2019, Lucena & Almeida 2022), and the definition of Linsenmaier's species groups is erroneous in the case of the *pusillus* group. This group is based on a species of the *Pseudomalus* clade, *O. pusillus* (Fabricius, 1804), but the remaining members of this group belong to the *Philoctetes* clade. Comments on the species included in Linsenmaier's subgenera and species-groups are provided in the Discussion, to update Linsenmaier's classification of *Omalus* for authors using his classification.

## Materials and methods

Linsenmaier collection includes about 56,750 specimens, 2,170 of which are *Omalus s.l.*, and approximately 4,380 types (Rosa *et al.* 2015a). It consists of specimens collected from all over the world, in more than 150 countries. The present catalogue is focused on the species described by Linsenmaier (1959a, b, 1968, 1987, 1994, 1997, 1999) in *Omalus*. We here follow the classification proposed by Linsenmaier (1959a and subsequent publications), with explanations on unavailable names used by Linsenmaier (Heteronychini and Omalini) and a final synthesis of his fragmented work, with comments.

We here report all data observed for primary and secondary types deposited in the collection. Species are listed alphabetically according to subgenus and species names, and the following data are given: type locality; category of the type; number and sex of specimens; complete label data, a single slash reveals the information handwritten on the back of the label, and labels are separated from each other by double slash.

As explained in Rosa *et al.* (2015a), Linsenmaier often added a colour label (grey or light blue) between the transparent labels bearing the specimens and the locality labels. These labels bear a generic locality only (e.g. Helvetia, Mongolia, etc.) and were added by Linsenmaier for a decorative effect only. They do not provide any relevant information and therefore they have been excluded from the list of labels.

The definitions of holotype, neotype, lectotype, etc. are used according to the International Code for Zoological Nomenclature (ICZN 1999), fourth edition.

The following abbreviations are used: cat. (catalogue), descr. (description), design. (designation), diagn. (diagnosis), distr. (distribution), fig. (figure), HT (holotype), pag. (page), NT (neotype), PT (paratype) s. str. (*sensu strictu*), tax. (taxonomic discussion).

Photographs of the types were taken with a Nikon D3400 and D700 connected to the stereomicroscope Tegal SCZ and stacked with the software Combine ZP. The white calibration of the photcamera was applied to reduce the blue effect of fluorescent light of the microscope.

CHUR—Nationalparkzentrum, Zernez, Engadin, Switzerland

ETHZ—Eidgenössische Technische Hochschule, Zürich, Switzerland

IMNS—Museo de Naturaleza y Arqueología, St. Cruz de Tenerife, Spain.

NHMUK—Natural History Museum, London, UK.

## Species and subspecies of *Omalus* described by Linsenmaier

Linsenmaier (1959a, 1959b, 1968, 1994, 1997, 1999) described 10 species and six subspecies of *Omalus*. In his collection there are primary and/or secondary types of almost all taxa described, excluding those holotypes given in parenthesis in the following list and deposited in other museums:

*Omalus (Chrysellampus) nigromaculatus* Linsenmaier, 1997  
*Omalus (Elampus) rufirostris* Linsenmaier, 1999  
*Omalus (Notozus) turcmenicus* Linsenmaier, 1968  
*Omalus (Omalus) chlorosomus mallorcanus* Linsenmaier, 1959a  
*Omalus (Omalus) helveticus* Linsenmaier, 1959a (CHUR)  
*Omalus (Omalus) horvathi occidentus* Linsenmaier, 1968  
*Omalus (Omalus) perraudini* Linsenmaier, 1968  
*Omalus (Omalus) puncticeps* Linsenmaier, 1994 (NHMUK)  
*Omalus (Omalus) punctulatus tricolor* Linsenmaier, 1999  
*Omalus (Omalus) pusillus bulgariensis* Linsenmaier, 1959a (ETHZ)  
*Omalus (Omalus) pusillus semicupreus* Linsenmaier, 1959b  
*Omalus (Omalus) riyadhensis* Linsenmaier, 1994  
*Omalus (Omalus) viridiminor* Linsenmaier, 1999  
*Omalus (Philoctetes) caudatus ortegae* Linsenmaier, 1993 (IMNS)\*  
*Omalus (Philoctetes) jemenensis* Linsenmaier, 1994  
*Omalus (Philoctetes) tenerifensis* Linsenmaier, 1959a

\**Omalus (Philoctetes) caudatus ortegae* Linsenmaier, 1997 is the emendation of *O. caudatus ortegai* Linsenmaier, 1993 (Linsenmaier 1997: 249).

Taxonomic part

Genus *Omalus* Panzer, 1801

*Omalus* Panzer, 1801: 13. Type species: *Chrysis aenea* Fabricius, 1787: 284 [= *Omalus aeneus* (Fabricius, 1787)], by monotypy.

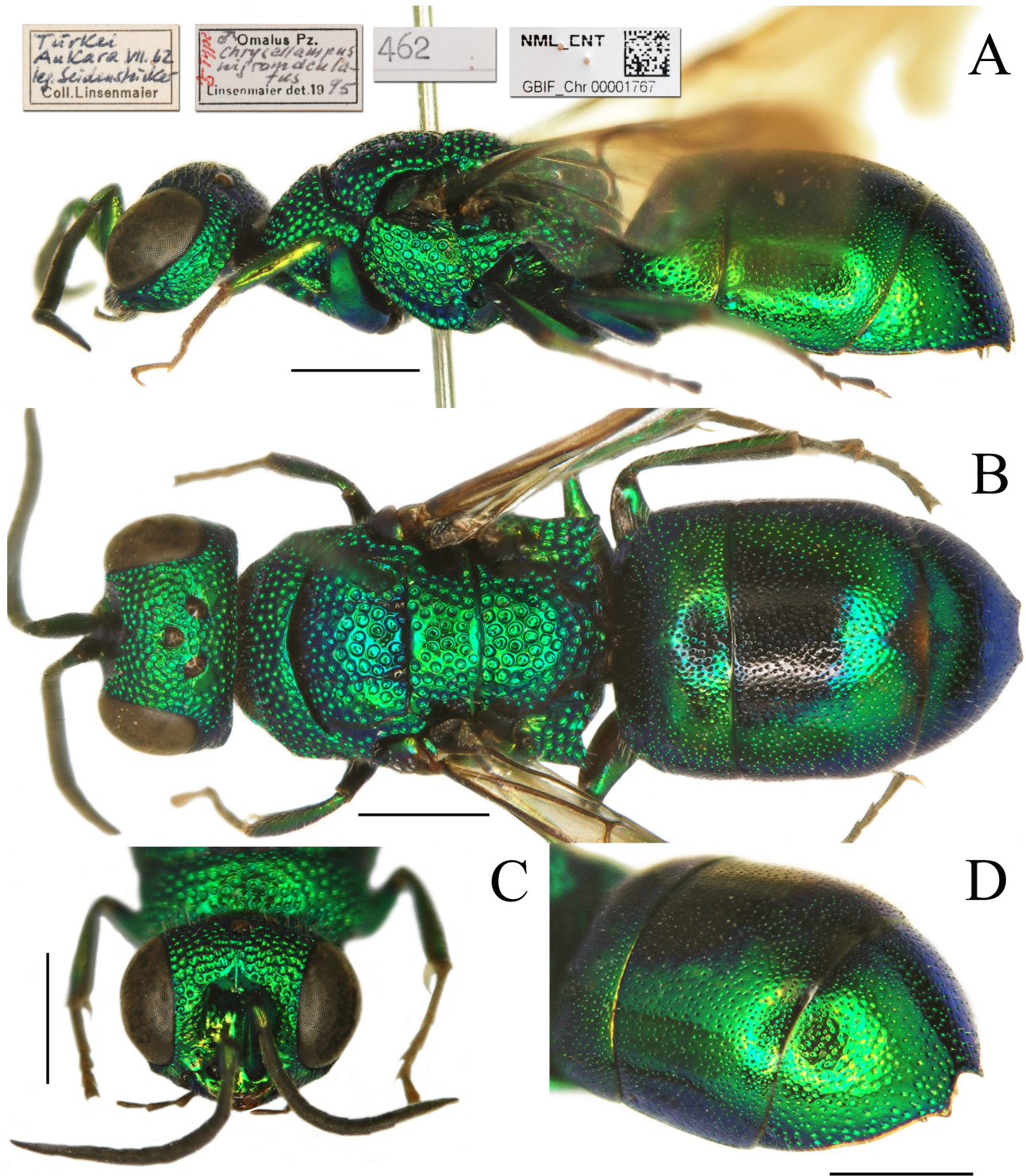


FIGURE 1. *Omalus (Chrysellampus) nigromaculatus* Linsenmaier, 1997, holotype, male. A) Habitus, lateral view. B) Habitus, dorsal view. C) Head, frontal view. D) Metasoma, postero-lateral view. Scale bars 1 mm.

## Catalogue of *Omalus* types described by Linsenmaier and deposited in his collection

### Subgenus *Chrysellampus* Semenov-Tian-Shanksij, 1932

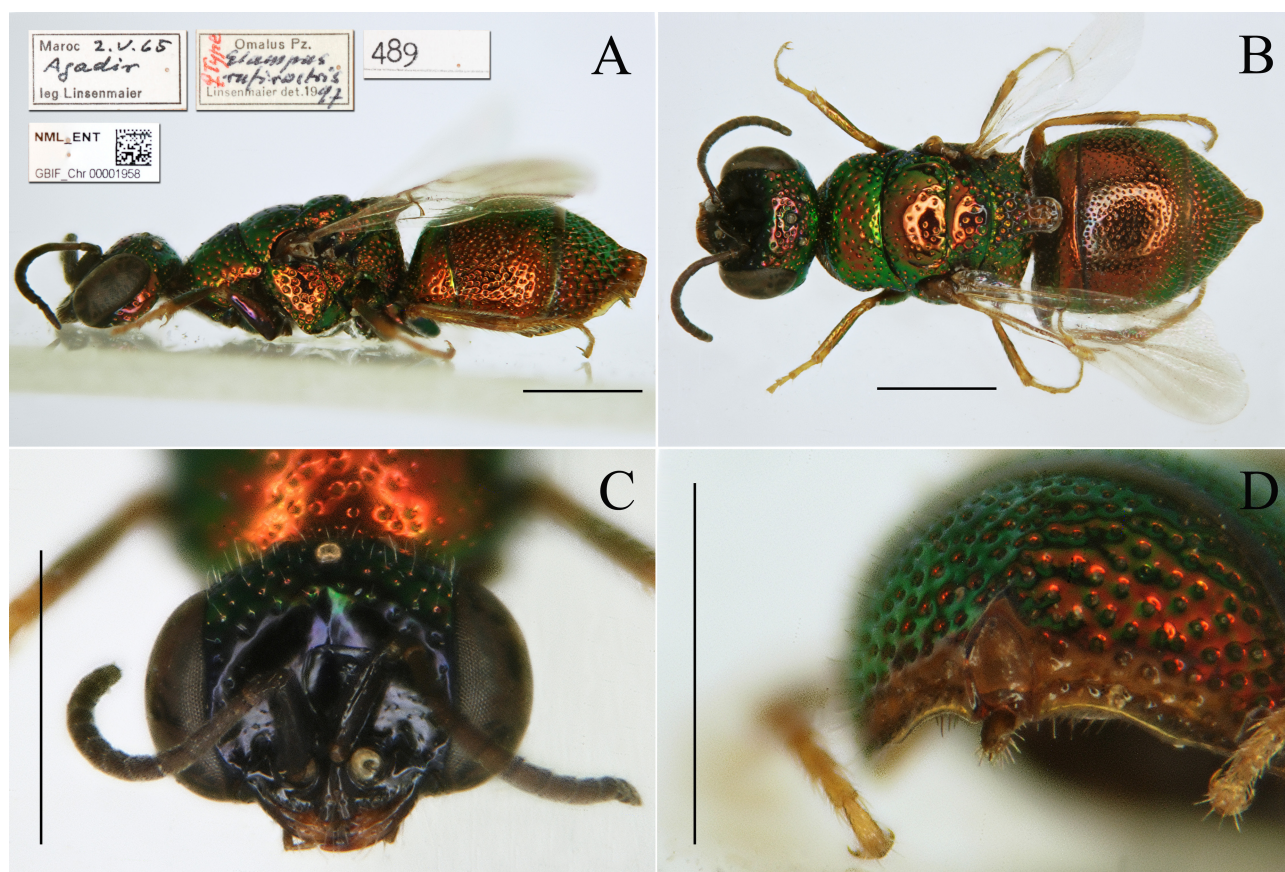
*Omalus (Chrysellampus) nigromaculatus* Linsenmaier, 1997  
(Fig. 1A–1D)

*Omalus (Chrysellampus) nigromaculatus* Linsenmaier, 1997: 249 (descr.), 295 (figs 194–197).  
*Omalus (Philoctetes) pici* (du Buysson, 1900): Arens 2014: 570 (synonymised).

**Type locality.** Turkey: "Turkey, ♂ (Holotypus) Ankara, VII.62, Seidenstücker, Coll. m."

**Holotype,** ♂: Türkei Ankara VII.62 leg. Seidenstücker Coll. Linsenmaier // ♂ Type *Omalus* Pz. *Chrysellampus nigromaculatus* Lins. Linsenmaier det. 1995 (ex type-collection) // NML\_ENT GBIF\_Chr0001767.

**Remarks.** *Omalus (Chrysellampus) nigromaculatus* was synonymised with *O. pici* (du Buysson) [currently *Chrysellampus*, described from Smyrne (= Ýzmir)] by Arens (2014). The species is known from East Mediterranean countries: Greece, Rhodos Is., and Turkey (Arens 2014). Linsenmaier (1959a) keyed and described *Omalus (Chrysellampus) pici*, but the latter was apparently overlooked by Linsenmaier (1997).



**FIGURE 2.** *Omalus (Elampus) rufirostris* Linsenmaier, 1999, holotype, female. A) Habitus, lateral view. B) Habitus, dorsal view. C) Head, frontal view. D) Third tergum, posterior view. Scale bars 1 mm.

### Subgenus *Elampus* Spinola, 1806

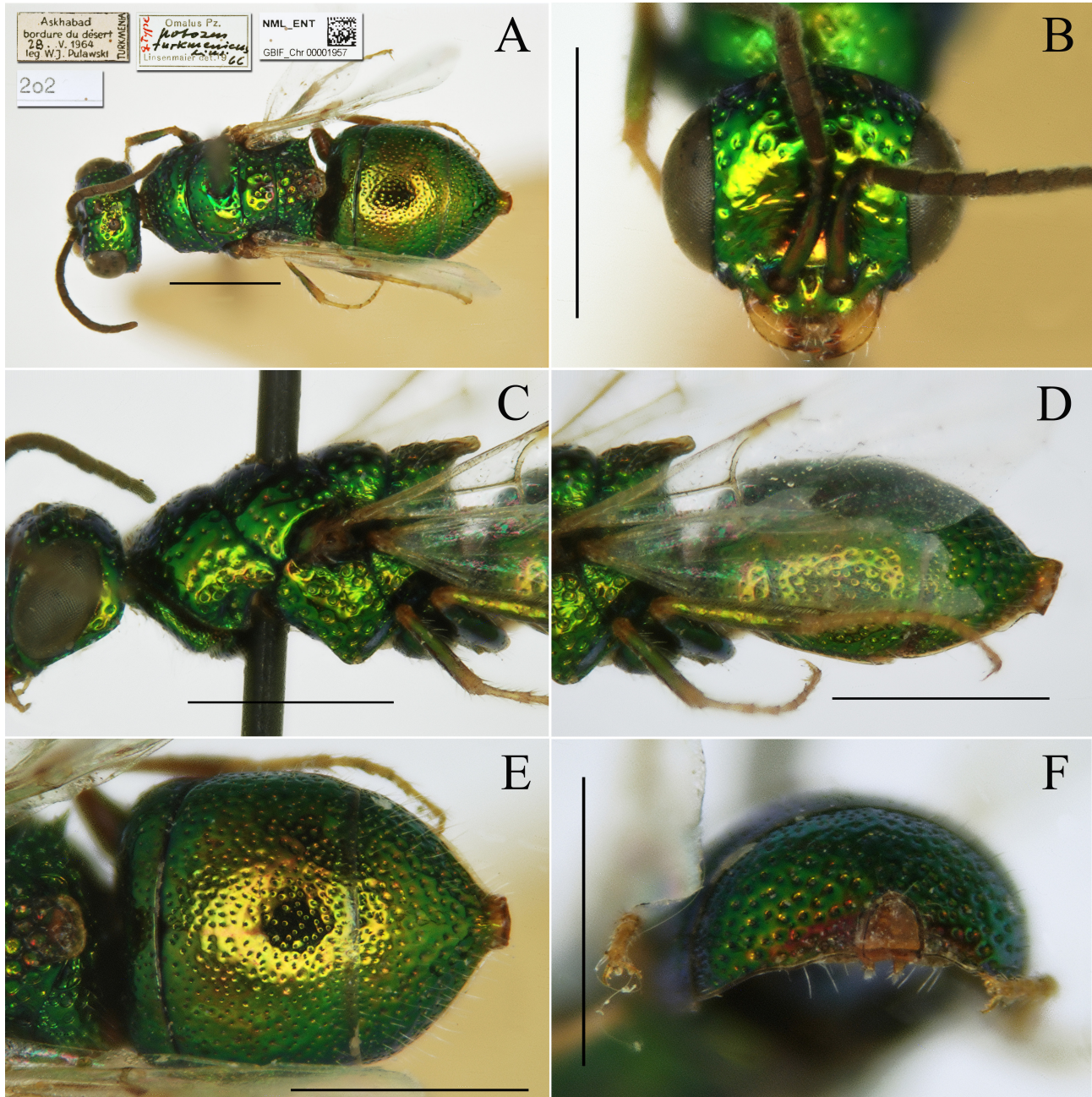
*Omalus (Elampus) rufirostris* Linsenmaier, 1999  
(Fig. 2A–2D)

*Omalus (Elampus) rufirostris* Linsenmaier, 1999: 15 (key), 25 (figs 25–29), 26 (descr.).  
*Elampus rufirostris*: Strumia 2008: 376.

**Type locality.** Morocco, Palestine: "Marokko, ♀ Type (Holotypus) Agadir 2.V.1965 (im lockeren Gras einer Binnendüne), leg. und Coll. m.; ♀ Paratype Val. Draa 28.V.1995, leg. und. Coll. Schmid-Egger. - Palästina, ♀ Paratype N. Elat, Iddam 8.V.1996, leg. Irwin, Coll. Niehuis".

**Holotype,** ♀: Maroc, Agadir, 2.V.65, leg. Linsenmaier // *Omalus* Pz. *Elampus rufirostris* Lins. Linsenmaier det. 1997 (ex type-collection) // NML\_ENT GBIF\_Chr0001958.

**Remarks.** Strumia (2008) reported this species from United Arab Emirates. Rosa *et al.* (2020a) considered this identification as doubtful, based on the picture of the Arabian specimen provided by Strumia (2008, plate 4).



**FIGURE 3.** *Omalus (Notozus) turkmenicus* Linsenmaier, 1968, holotype, male. A) Habitus, dorsal view. B) Head, frontal view. C) Mesosoma, lateral view. D) Metasoma, lateral view. E) Metasoma, dorsal view. F) Third tergum, posterior view. Scale bars 1 mm.

### ***Omalus (Elampus) turkmenicus* Linsenmaier, 1968**

(Fig. 3A–3F)

*Omalus (Notozus) turkmenicus* Linsenmaier, 1968: 13 (descr.).

*Elampus turkmenicus*: Kimsey & Bohart 1991: 171 (cat.).

**Type locality.** "Turkmenien, Askhabad, V.64, leg. Pulawski, ♀ Type in Coll. m."

**Holotype.** ♂ [not ♀]: Turkmenia Askhabad bordure du desert 28.V.1964 leg. W.J. Puławski // ♀ Type *Omalus* Pz. *Notozus turkmenicus* Lins. Linsenmaier det. 1966 (ex type-collection) // NML\_ENT GBIF\_Chr0001957.

**Remarks.** On the original type label is reported the name *turkmenicus*. The name was likely changed during the editing of the manuscript in the Latin form *turkmenicus*. This species was recently collected in the European part of Russia, in Astrakhan province (Rosa *et al.* 2017b). The specimen illustrated was a female (Rosa *et al.* 2017b, Fig. 4) with an intense flame red colouration. The male type here illustrated (Fig. 3) is entirely green, however the colouration seems to be turned into green post mortem. Also, Russian specimens showed some colour variability, which may turn after death, as in the case of species in other genera, e.g. *Spintharina* Semenow, 1892 [Semenow is one of the four different spelling/transliterations for him, and we here follow the name as given in the original publication].

### **Subgenus *Omalus s.str.***

### ***Omalus (Omalus) chlorosomus mallorcanus* Linsenmaier, 1959a**

(Fig. 4A–4D)

*Omalus (Omalus) chlorosomus mallorcanus* Linsenmaier, 1959a: 14 (key), 19 (descr.), 23 (figs. 12, 13).

**Type locality.** Spain: "Balearen. ♀ Type Coll. m., ♀ Paratypen Coll. Verhoeff. (leg. Verhoeff VI.1954)".

**Holotype,** ♀: Espana Mallorca 1-24 VI 1954 leg. Klokke Moll // Type ♀ *Omalus* Pz. *chlorosomus* Lucas *mallorcanus* Lins. det. Linsenmaier 58 (ex type-collection) // NML\_ENT GBIF\_Chr0001370.

**Paratype,** 1♀: Espana Mallorca 1-24 VI 1954 leg. Klokke Moll // Type ♀ *Omalus* Pz. *chlorosomus* Lucas *mallorcanus* Lins. det. Linsenmaier 58 // NML\_ENT GBIF\_Chr0001369.

### ***Omalus (Omalus) horvathi occidentus* Linsenmaier, 1968**

(Fig. 5A–5D)

*Omalus (Omalus) horvathi occidentus* Linsenmaier, 1968: 11 (descr.).

*Philoctetes horvathi occidentalis*: Kimsey & Bohart 1991: 256. Incorrect subsequent spelling.

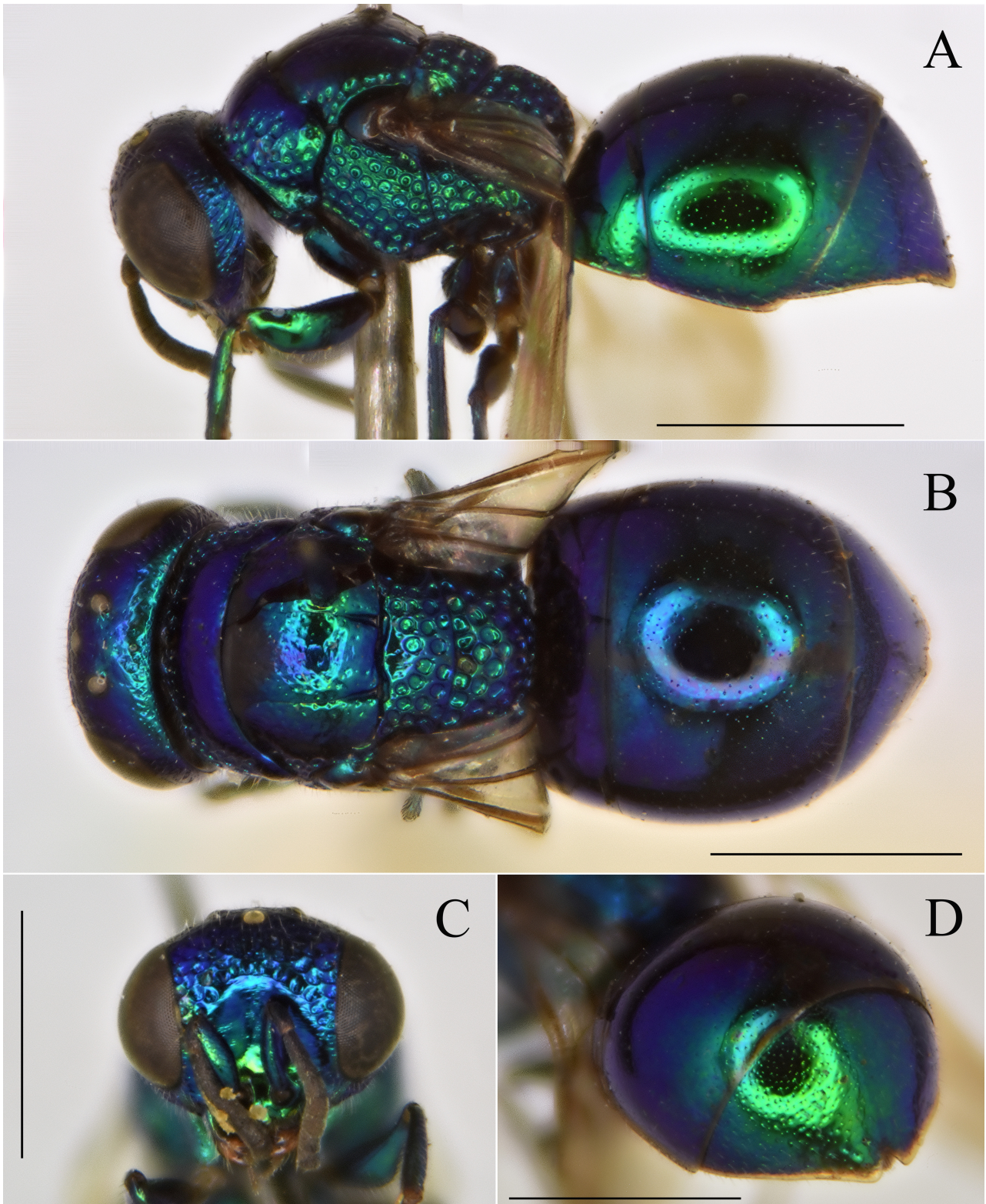
*Omalus (Philoctetes) dusmeti* Trautmann, 1926: Linsenmaier 1997: 248 (synonymised).

**Type locality.** Morocco, Spain: "Marokko, ♀ Type von Ifilt Marak, VI.62, leg. Schlaefle, in Coll. m. Spanien, ♀ Allotype von Castilien, in Coll. m."

**Holotype,** ♀: Maroc, Ifilt Marak E[Ende].6.62 W. Schläfle // ♀ Type *Omalus* Pz. *horvathi occidentus* Lins. Linsenmaier det. 1965 // ♀ *Omalus* Pz. *dusmeti* Tr. Linsenmaier det. 1977 (ex type-collection) // NML\_ENT GBIF\_Chr0001577.

**Allotype,** ♂: Spanien Soria 16.VI.64 Linsenmaier // ♂ Allotype *Omalus* Pz. *horvathi occidentus* Lins. Linsenmaier det. 1965 // ♂ *Omalus* Pz. *dusmeti* Tr. Linsenmaier det. 1977 // NML\_ENT GBIF\_Chr0001578.

**Remarks.** Linsenmaier (1997: 248) synonymized *Omalus horvathi occidentus* with *Omalus (Philoctetes) dusmeti* Trautmann, 1926.



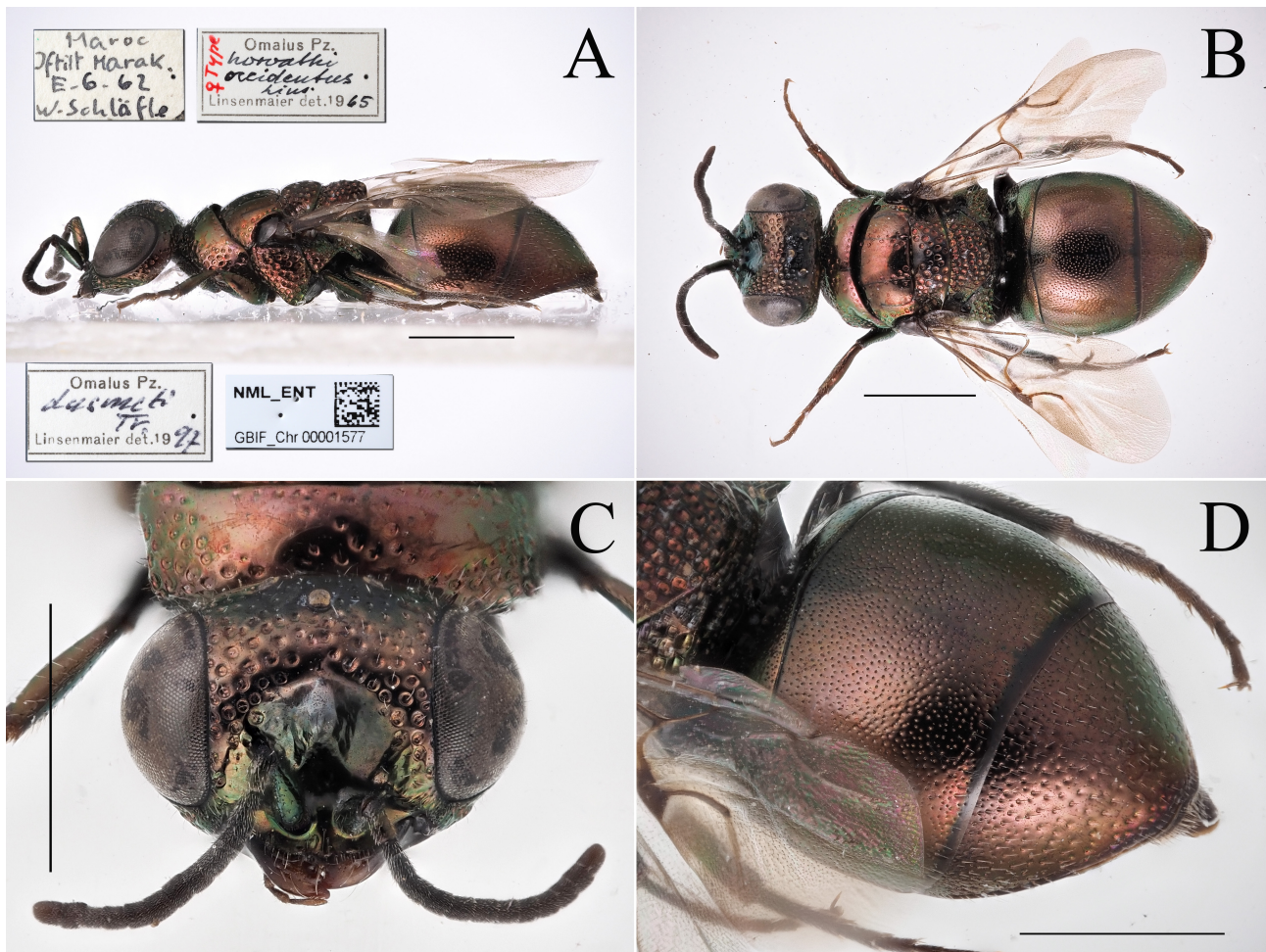
ESPAÑA  
MALLORCA  
1-24 VI 1954  
leg. Klokke Moll

*Omalus* Pz.  
*chlorosomus* Luc  
*sp. n.*  
*mallorcanus* Lins  
Linsenmaier det. 58

26 . .

NML\_ENT  
GBIF Chr 00001370

FIGURE 4. *Omalus (Omalus) chlorosomus mallorcanus* Linsenmaier, 1959a, holotype, female. A) Habitus, lateral view. B) Habitus, dorsal view. C) Head, frontal view. D) Metasoma, postero-lateral view. Scale bars 1 mm.



**FIGURE 5.** *Omalus (Omalus) horvathi occidentus* Linsenmaier, 1968, holotype, female. A) Habitus, lateral view. B) Habitus, dorsal view. C) Head, frontal view. D) Metasoma, postero-lateral view. Scale bars 1 mm.

### ***Omalus (Omalus) perraudini* Linsenmaier, 1968**

(Fig. 6A–6D)

*Omalus (Omalus) perraudini* Linsenmaier, 1968: 10 (descr.).

*Pseudomalus perraudini*: Kimsey & Bohart 1991: 268.

*Philoctetes perraudini*: Rosa 2003: 305.

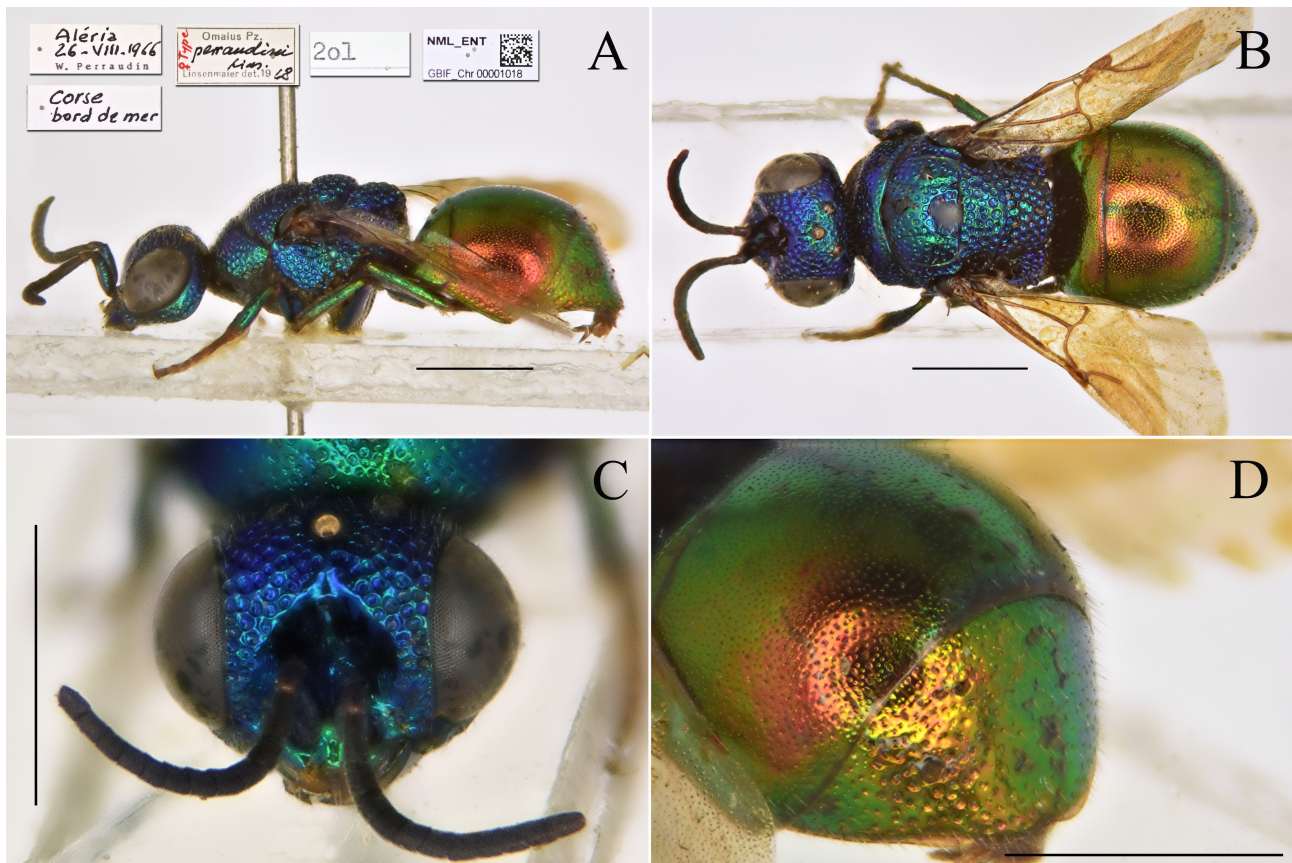
**Type locality.** France (Corsica): “Korsika, Aléria, VIII.1966, leg. Perraudin, ♀ Type, ♂ Allotype und Paratype in Coll. m., Paratypen in Coll. Perraudin”.

**Holotype**, ♀: Aléria 26.VIII.1966 W. Perraudin // ♀ Type *Omalus Pz. perraudini* Lins. Linsenmaier det. 1968 (ex type-collection) // NML\_ENT GBIF\_Ch0001018.

**Allotype**, ♂: Aléria Corse 24.VIII.1966 W. Perraudin // ♂ Allotype *Omalus Pz. perraudini* Lins. Linsenmaier det. 1968 // NML\_ENT GBIF\_Ch0001019.

**Paratypes**, 1♀: Aléria, Corse 24.VIII.1966 W. Perraudin // ♀ Paratype *Omalus Pz. perraudini* Lins. Linsenmaier det. 1968 (ex type-collection) // NML\_ENT GBIF\_Ch0001013; 1♂ and 1♀: Aléria, Corse, bord de mer 26.VIII.1966 W. Perraudin // Paratype *Omalus Pz. perraudini* Lins. Linsenmaier det. 1967 // Pr. Typus (ex Perraudin-collection) // NML\_ENT GBIF\_Ch0001014 and NML\_ENT GBIF\_Ch0001017; 1♂: Aléria, Corse 24.VIII.1966 W. Perraudin // ♂ Paratype *Omalus Pz. perraudini* Lins. Linsenmaier det. 1967 // Pr. Typus (ex Perraudin-collection) // NML\_ENT GBIF\_Ch0001015; 1♀: Bravone, Corse 19.VIII.1967 W. Perraudin // ♀ Paratype *Omalus Pz. perraudini* Lins. Linsenmaier det. 1967 (ex Perraudin-collection) // NML\_ENT GBIF\_Ch0001016.





**FIGURE 6.** *Omalus (Omalus) perraudini* Linsenmaier, 1968, holotype, female. A) Habitus, lateral view. B) Habitus, dorsal view. C) Head, frontal view. D) Metasoma, postero-lateral view. Scale bars 1 mm.

**Remarks.** One male labelled as paratype does not belong to the type series; it bears the following labels: Bravone, Corse, 1.IX.1969, niveau de mer W. Perraudin // ♂ Paratype *Omalus Pz. perraudini* Lins. Linsenmaier det. 1991 // NML\_ENT GBIF\_Ch0001012.

#### ***Omalus (Omalus) puncticeps* Linsenmaier, 1994**

(Fig. 7A–7D)

*Omalus (Omalus) puncticeps* Linsenmaier, 1994: 151 (descr.).  
*Philoctetes puncticeps*: Strumia 2008: 376.

**Type locality.** United Arab Emirates: “Holotype: ♀, U.A.E.: Shweib/Madam, 24.III.1987, Hamer, BMNH. Paratypes: 1♀, Shweib, 1.IV.1987; 1♀, Remah, 2.IV.1987; 1♀, Abu Dhabi, 6.II.1987; 1♀, Dubai Hatha, 22.II.1990; all Hamer, WLC; 1♂, Liwa, 23.III.1990, WLC; ♂ allotype, same data, BMNH”.

**Paratypes,** 1♂: UAE Liwa 23.III.1990 I.L. Hamer // ♂ Paratype *Omalus Pz. puncticeps* Lins. Linsenmaier det. 1992 (ex synoptic-collection) // NML\_ENT GBIF\_Ch0001373; 1♀: UAE Abu Dhabi (M) 6.II.87 I.L. Hamer // ♀ Paratype *Omalus Pz. puncticeps* Lins. Linsenmaier det. 1989 (ex synoptic-collection) // NML\_ENT GBIF\_Ch0001372; 1♀: UAE Dubai/Hatta 22.2.1990 I.L. Hamer // ♀ Paratype *Omalus Pz. puncticeps* Lins. Linsenmaier det. 1992 // NML\_ENT GBIF\_Ch0001374.

**Remarks.** Strumia & Dawah (2010) transferred *Omalus puncticeps* to *Philoctetes* (*sensu* Kimsey & Bohart 1991) and recorded it from Saudi Arabia.

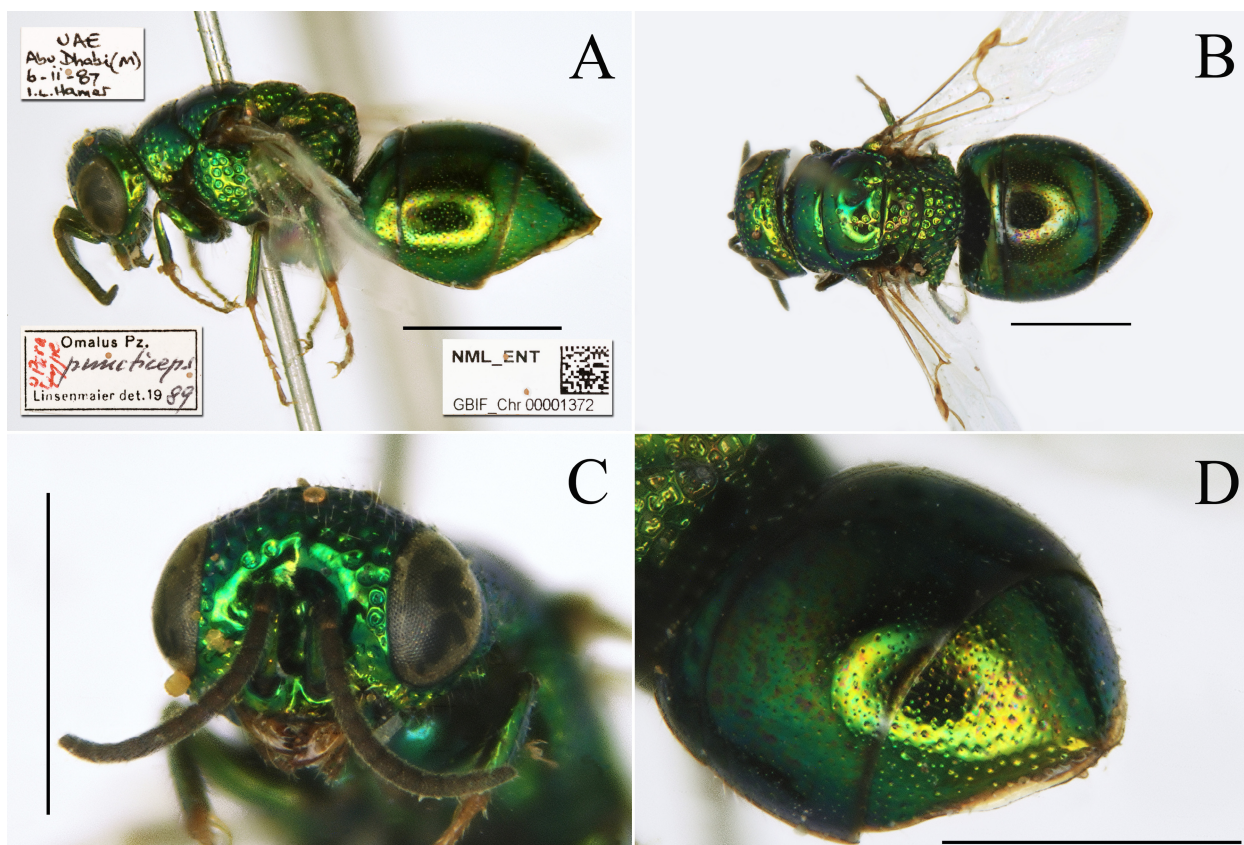


FIGURE 7. *Omalus (Omalus) puncticeps* Linsenmaier, 1994, paratype, male. A) Habitus, lateral view. B) Habitus, dorsal view. C) Head, frontal view. D) Metasoma, postero-lateral view. Scale bars 1 mm.

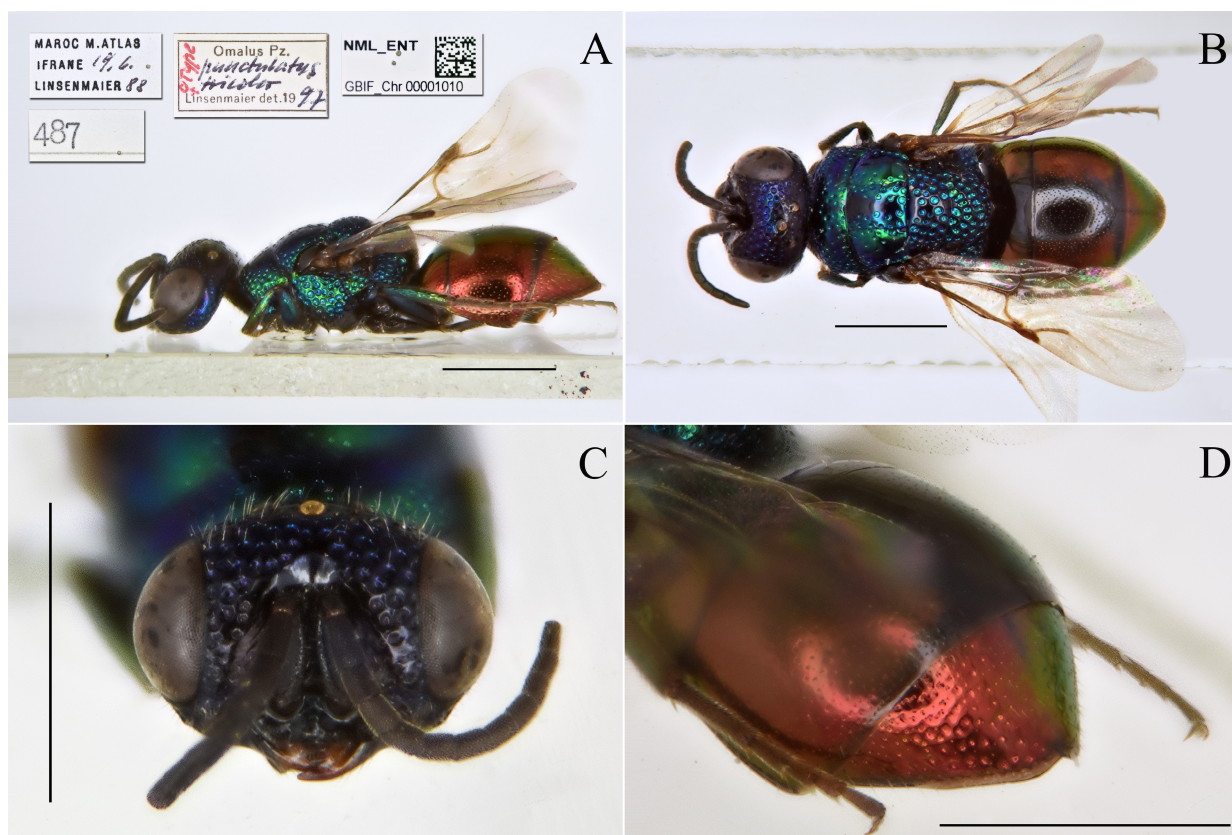


FIGURE 8. *Omalus (Omalus) punctulatus tricolor* Linsenmaier, 1999, holotype, female. A) Habitus, lateral view. B) Habitus, dorsal view. C) Head, frontal view. D) Metasoma, postero-lateral view. Scale bars 1 mm.

***Omalus (Omalus) punctulatus tricolor* Linsenmaier, 1999**

(Fig. 8A–8D)

*Omalus (Omalus) punctulatus tricolor* Linsenmaier, 1999: 17 (descr.).

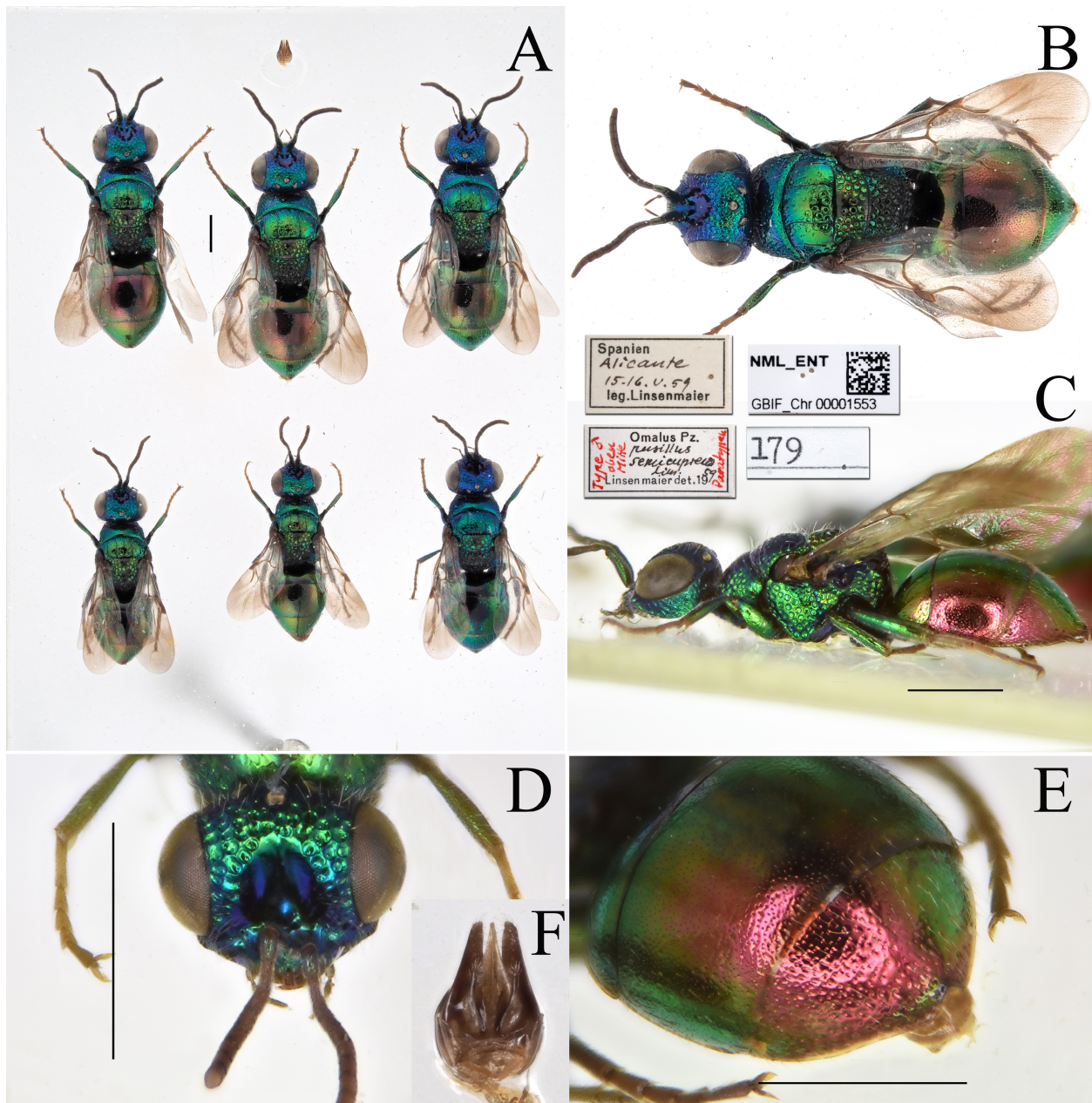
**Type locality.** Morocco: “Marokko. ♀ Type (Holotypus) M-Atlas, Ifrane 19.VI.1988, ♂ Allotype M-Atlas, Immouzer 18.VII.1963, leg. m.; ♂ Paratype H. Atlas, Tischka-Paß 2000m 13.VII.1975, A.W. Ebmer. Alle Coll. m.”.

**Holotype**, ♀: Maroc M. Atlas Ifrane 19.6.88 Linsenmaier // ♀ Type *Omalus* Pz. *punctulatus tricolor* Lins. Linsenmaier det. 1997 (ex type-collection) // NML\_ENT GBIF\_Chr0001010.

**Allotype**, ♂: Maroc M. Atlas Imouzer 18.7.63 leg. Linsenmaier // ♂ Allotype *Omalus* Pz. *punctulatus tricolor* Lins. Linsenmaier det. 1997 (ex type-collection) // NML\_ENT GBIF\_Chr0001011.

**Paratype**, 1♂: Marokko, Hoher Atlas Tichka-Pass-Süd 2000m 13.7.1975 leg. A.W. Ebmer // ♂ Paratype *Omalus* Pz. *punctulatus tricolor* Lins. Linsenmaier det. 1997 (ex synoptic-collection) // NML\_ENT GBIF\_Chr0001009.

**Remarks.** Following Kimsey & Bohart (1991) classification, this taxon belongs *Philoctetes*.



**FIGURE 9.** *Omalus (Omalus) pusillus semicupreus* Linsenmaier, 1959b, A) Holotype and paratypes, males. B) Holotype, habitus, dorsal view. C) Paratype, habitus, lateral view. D) Holotype, head, frontal view. E) Metasoma, postero-lateral view. F) Holotype, genital capsule. Scale bars 1 mm.

***Omalus (Omalus) pusillus bulgariensis* Linsenmaier, 1959a**

*Omalus (Omalus) pusillus bulgariensis* Linsenmaier, 1959a: 19 (descr.).  
*Pseudomalus pusillus bulgariensis*: Kimsey & Bohart 1991: 269 (cat.).

**Type locality.** Bulgaria: “Bulgarien, (Bilo) ♂ Type und Paratypen Coll. Schulthess (Zürich), Paratypen Coll. m.”.

**Paratypes**, 2 exx: Bilo Bulg. // Paratype *Omalus pusillus* ssp. *bulgariensis* Lins. det. Linsenmaier 57 // *Ell. pusillus* F. det. Mocsáry // NML\_ENT GBIF\_Ch0001539 and NML\_ENT GBIF\_Ch0001540.

**Remarks.** The holotype and two paratypes are deposited at ETHZ (Rosa & Greeff 2021).

***Omalus (Omalus) pusillus semicupreus* Linsenmaier, 1959b**

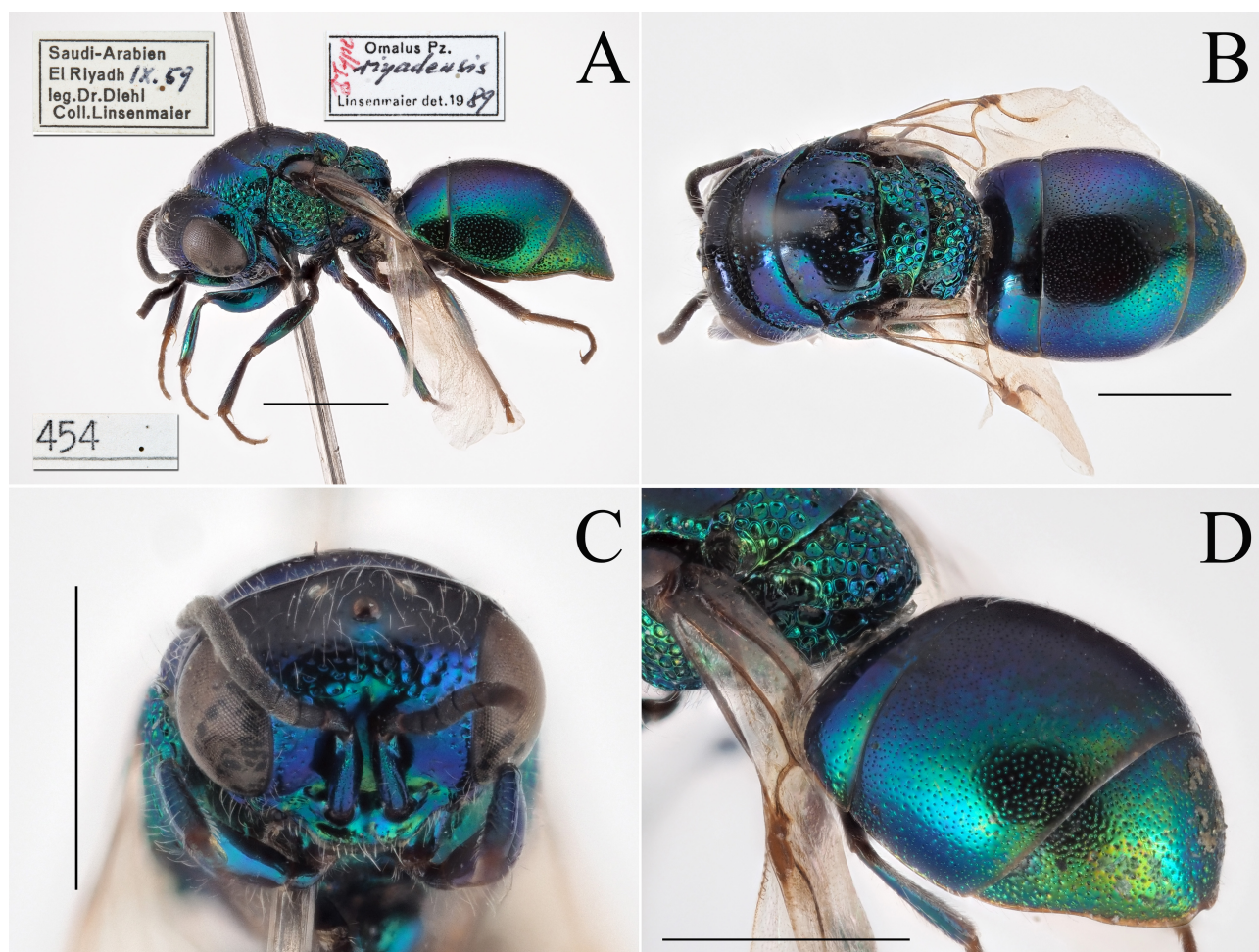
(Fig. 9A–9F)

*Omalus (Omalus) pusillus semicupreus* Linsenmaier, 1959b: 233 (descr.).  
*Pseudomalus pusillus semicupreus*: Kimsey & Bohart 1991: 269 (cat.).

**Type locality.** Spain: “Spanien (Alicante, Aranjuez), ♂ Type (Alicante) und Paratype Coll. m.”.

**Holotype**, ♂ and **Paratypes**, 5♂: Spanien Alicante 15.–16.V.59 leg. Linsenmaier // ♂ Type u. Paratypen *Omalus pusillus semicupreus* Lins. Linsenmaier det. 1959 (ex type-collection) // NML\_ENT GBIF\_Ch0001553.

**Paratypes**, 2♂: Spanien Aranjuez 25.V.59 leg. Linsenmaier // Paratypen *Omalus pusillus semicupreus* Lins. det. Linsenmaier 1959 (ex synoptic-collection) // NML\_ENT GBIF\_Ch0001543.



**FIGURE 10.** *Omalus (Omalus) riyadhensis* Linsenmaier, 1994, holotype, female. A) Habitus, lateral view. B) Habitus, dorsal view. C) Head, frontal view. D) Metasoma, postero-lateral view. Scale bars 1 mm.

***Omalus (Omalus) riyadhensis* Linsenmaier, 1994**

(Fig. 10A–10D)

*Omalus (Omalus) riyadhensis* Linsenmaier, 1994: 150 (descr.).

**Type locality.** Saudi Arabia: “Holotype: ♂, Saudi Arabia: Riyadh, IX. 1959, Diehl, WLC”.

**Holotype,** ♂: Saudi-Arabien El Riyadh IX.59 leg. dr. Diehl coll. Linsenmaier // ♂ Type *Omalus* Pz. *riyadhensis* Lins. Linsenmaier det. 1989 (ex type-collection) // NML\_ENT GBIF\_Chr0001371.

***Omalus (Omalus) viridiminator* Linsenmaier, 1999**

(Fig. 11A–11D)

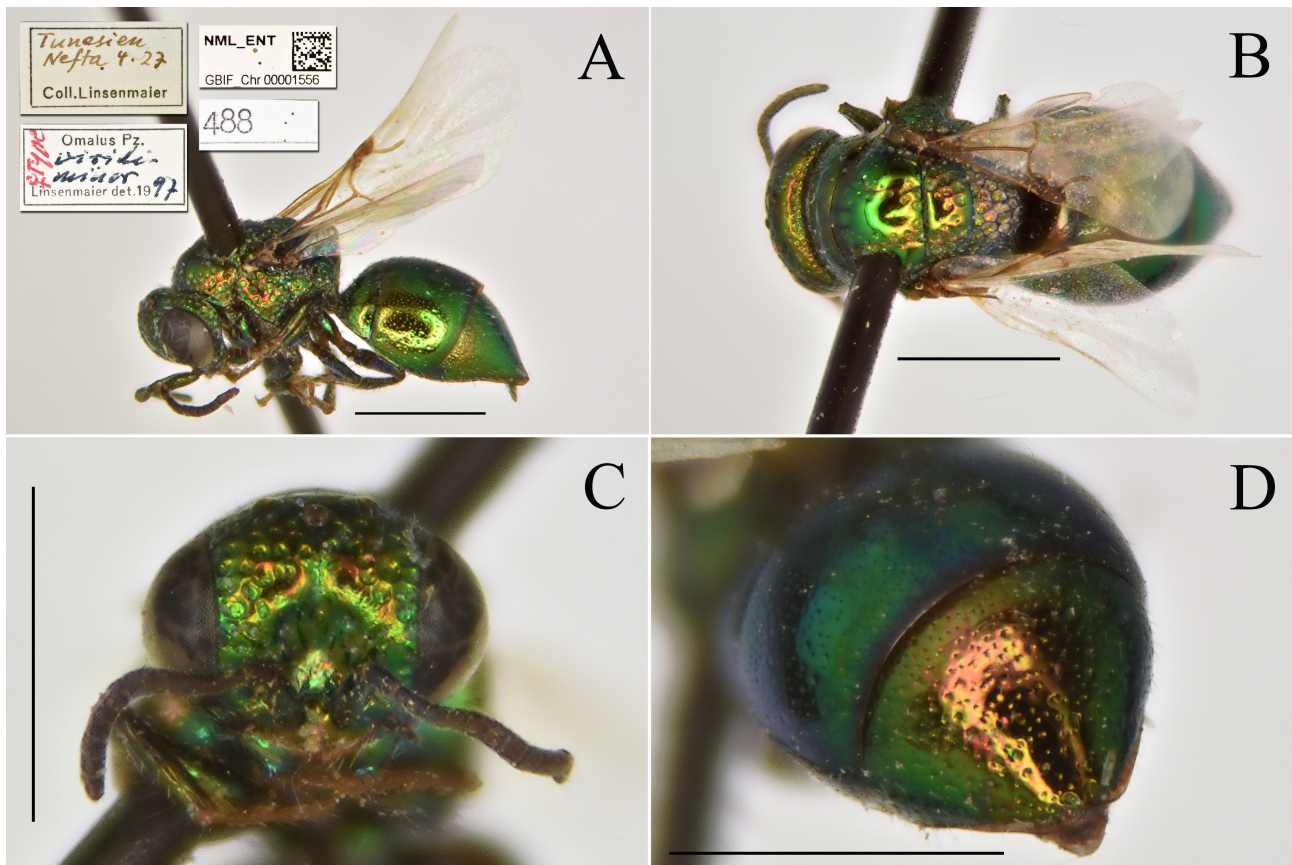
*Omalus (Omalus) viridiminator* Linsenmaier, 1999: 14 (key), 19 (descr.), 23 (figs. 12, 13)

**Type locality.** Tunisia: “Tunisien, Nefta IV.1927, ♀ Type (Holotypus), ♀ Paratype Coll. m.”.

**Holotype,** ♀: Tunisie Nefta 4.[19]27 // ♀ Type *Omalus* Pz. *viridiminator* Lins. Linsenmaier det. 1997 (ex type-collection) // NML\_ENT GBIF\_Chr0001556.

**Paratype,** ♀: Tunisie Nefta 4.[19]27 // ♀ Paratype *Omalus* Pz. *viridiminator* Lins. Linsenmaier det. 1997 // NML\_ENT GBIF\_Chr0001555.

**Remarks.** Following Kimsey & Bohart (1991) classification, this taxon belongs to *Philoctetes*.



**FIGURE 11.** *Omalus (Omalus) viridiminator* Linsenmaier, 1999, holotype, female. A) Habitus, lateral view. B) Habitus, dorsal view. C) Head, frontal view. D) Metasoma, postero-lateral view. Scale bars 1 mm.

***Omalus (Philoctetes) jemenensis* Linsenmaier, 1994**

(Fig. 12 A–12D)

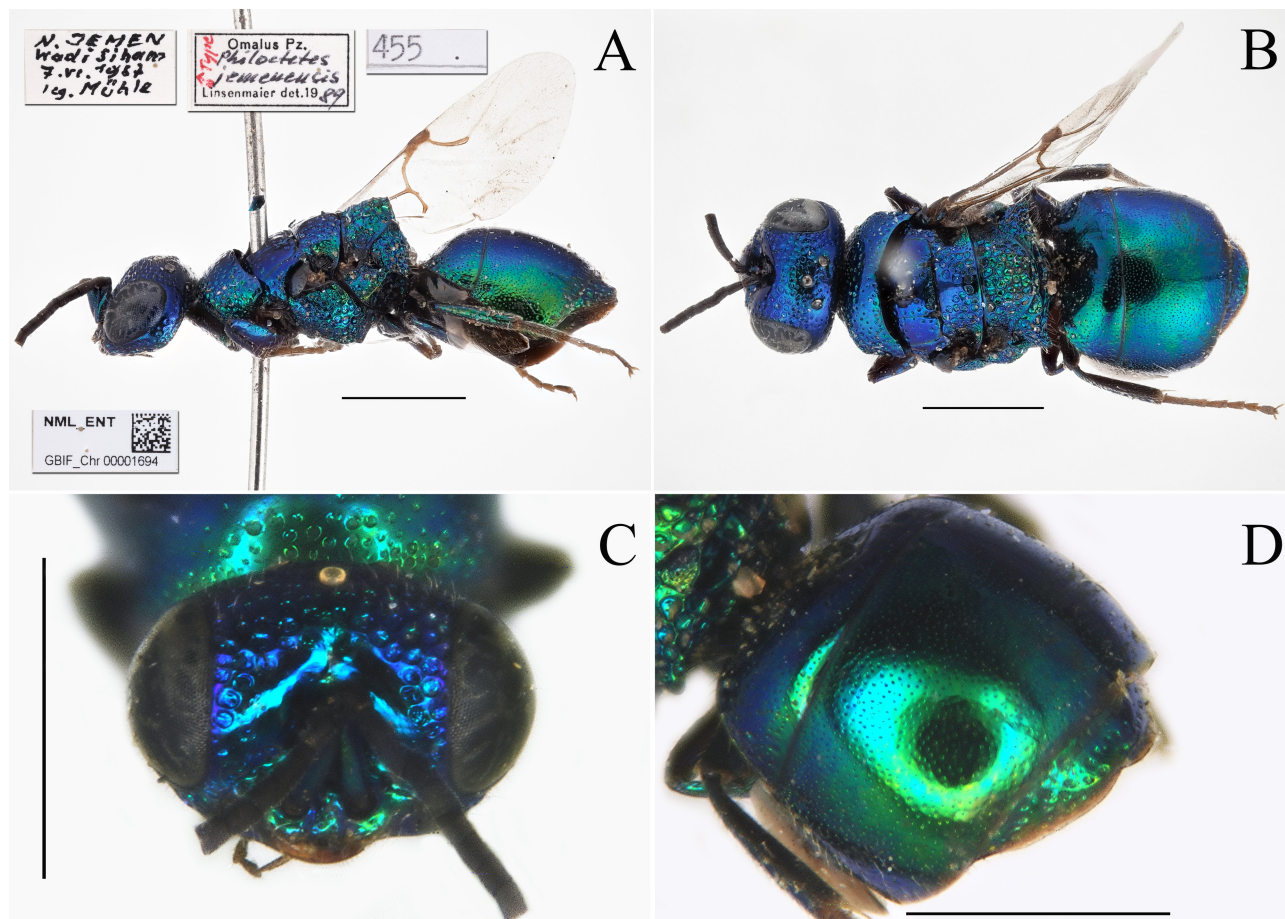
*Omalus (Philoctetes) jemenensis* Linsenmaier, 1994: 151 (key, descr.), 152 (figs 3, 4).

*Philoctetes jemenensis*: Strumia 2014: 472.

**Type locality.** Yemen: “Holotype: ♂, Yemen: Wadi Siham, 7.VI.1987, Mühle, WLC”.

**Holotype**, ♂: N Jemen Wadi Siham 7.VI.1987 leg. Mühle // ♂ Type *Omalus* Pz. *Philoctetes jemenensis* Lins. Linsenmaier det. 1989 (ex type-collection) // NML\_ENT GBIF\_Chr0001694.

**Remarks.** Strumia (2014) transferred this species to *Philoctetes* and recorded it from the United Arab Emirates.



**FIGURE 12.** *Omalus (Philoctetes) jemenensis* Linsenmaier, 1994, holotype, male. A) Habitus, lateral view. B) Habitus, dorsal view. C) Head, frontal view. D) Metasoma, postero-lateral view. Scale bars 1 mm.

***Omalus (Philoctetes) tenerifensis* Linsenmaier, 1959a**

(Fig. 13A–13D)

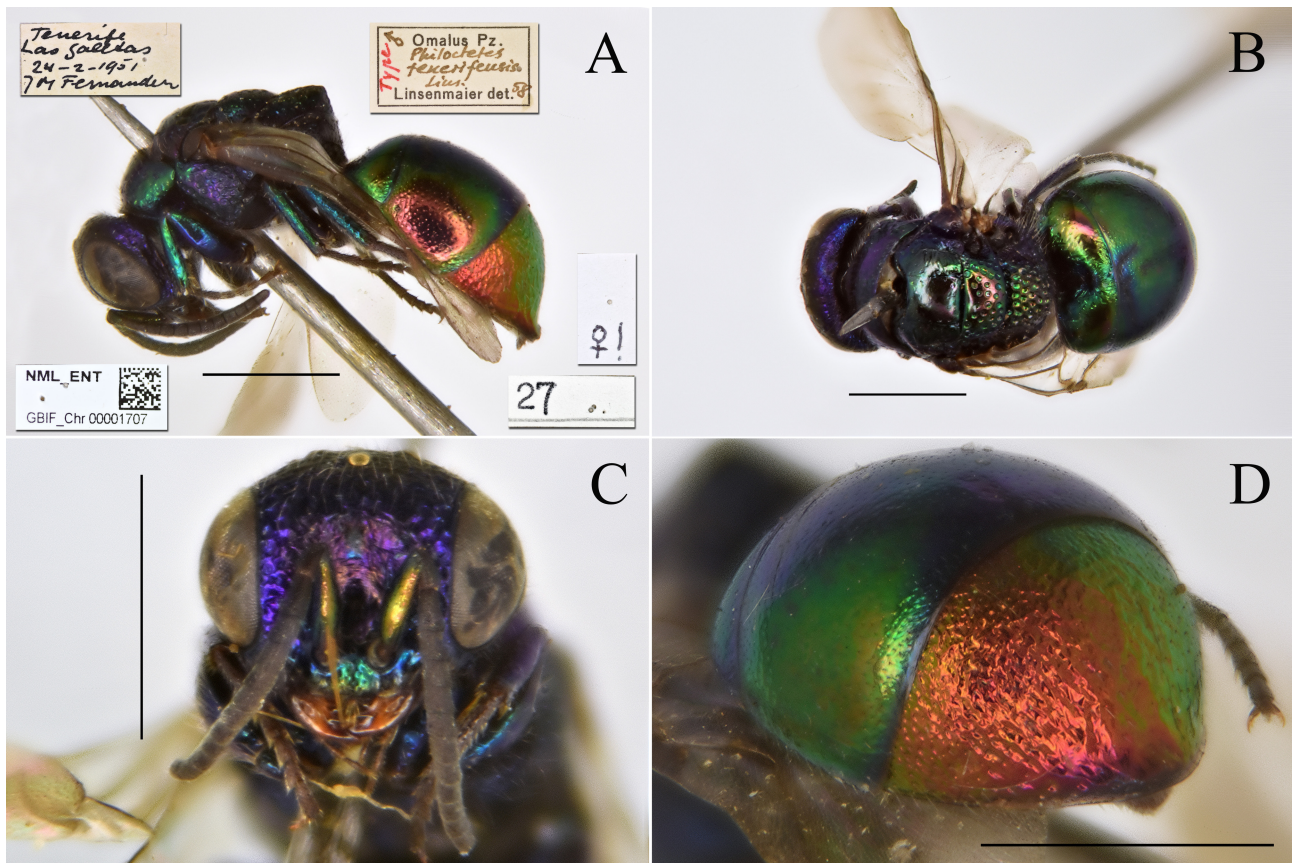
*Omalus (Philoctetes) tenerifensis* Linsenmaier, 1959a: 21 (descr.).

*Philoctetes tenerifensis*: Kimsey & Bohart 1991: 258 (cat.).

**Type locality.** Spain (Canary Isl.): “Kanarien. ♂ Type Coll. m. (Tenerife, 24.II.1951)”.

**Holotype**, ♀: Tenerife Las Galletas 24.2.1951 J M Fernandez // *Omalus Philoctetes tenerifensis* Lins. det. Linsenmaier 1958 (ex type-collection) // NML\_ENT GBIF\_Chr0001707.

**Remarks.** The type is a female and not a male.



**FIGURE 13.** *Omalus (Philoctetes) tenerifensis* Linsenmaier, 1959a, holotype, female. A) Habitus, lateral view. B) Habitus, dorsal view. C) Head, frontal view. D) Metasoma, postero-lateral view. Scale bars 1 mm.

## Other materials

### *Omalus helveticus* Linsenmaier, 1959a

*Omalus helveticus* Linsenmaier, 1959a: 16. Holotype ♀; Switzerland: Engadin, Il Fuorn (Chur).

*Pseudomalus helveticus*: Kimsey & Bohart 1991: 267.

*Philoctetes helveticus*: Tussac & Tussac 1993: 475.

*Pseudomalus putoni* (du Buysson, 1892): Strumia 2001: 89 (synonymised).

*Philoctetes helveticus*: Rosa 2005: 13. Reinstated.

**Type locality.** Switzerland: "Schweiz (Engadin, Il Fourn 1900 m, leg. de Beaumont), ♀ Type Nationalpark-Museum, Chur".

**Remarks.** The species was originally described as *incertae sedis*, as the holotype is a female and Linsenmaier (1959a) could not correctly place it in the subgenus *Omalus s.str.* or *Philoctetes* without examination of male hind legs. Later, Linsenmaier (1968) considered this species close to *Omalus bidentulus* (Lepelletier).

Linsenmaier described *Omalus helveticus* based on a female collected in Engadin by De Beaumont. This specimen is housed at the Nationalpark-Museum, Chur and must be considered as holotype by monotypy. In 1991, Linsenmaier labelled a male specimen in his collection as the allotype. This specimen bears the following labels: Allotype ♂ *Omalus* Pz. *helveticus* Lins. det. Linsenmaier 1991 // Chandolin CH. 4.VII.1982 Alpage 2200m W. Perraudin // 25. Linsenmaier cited this specimen in his latest revision of the European species (Linsenmaier 1997: 134) and included it in the type-collection. However, this specimen does not belong to the original type series, it was illustrated, and the species has been redescribed by Rosa *et al.* (2017d). Kimsey & Bohart (1991: 267) placed *helveticus* in *Pseudomalus* Ashmead, 1902; Tussac & Tussac (1993: 474) and Rosa (2006: 122) in *Philoctetes*. Strumia (2001: 89) synonymised *O. helveticus* with *Pseudomalus putoni* (du Buysson, 1892), without any type

examination. A female specimen of this rare Alpine species collected at Zermatt is also preserved in Linsenmaier's collection.

### Other types of *Omalus* housed in the Linsenmaier collection.

Besides the primary and secondary types of taxa described by Walter Linsenmaier, the collection includes types of taxa described by other authors from Palaearctic, Nearctic, and Oriental Region. Although they were described in different genera, they are listed together because all they can be considered part of *Omalus*, belonging to different subgenera:

*Omalus (Diplorrhos) downeyi* Bohart & Campos, 1960 1 PT

*Omalus (Diplorrhos) krombeini* Bohart & Campos, 1960 1 PT

*Omalus (Omalus) telfordi* Bohart & Campos, 1960 1 PT

*Omalus (Pseudomalus) trilobatus* Bohart & Campos, 1960 1 PT

*Leptopareia luzonensis* Rosa, Wei, Notton & Xu, 2016 HT

*Elampus gladiator* Rosa in Rosa *et al.*, 2021 HT [*Omalus (Elampus)* following Linsenmaier's classification]

*Elampus nitidus californicus* Huber & Pengelly, 1977 1 PT [*Omalus (Elampus)* following Linsenmaier's classification]

*Ellampus tshingiz* Semenov-Tian-Shanskij in Semenov-Tian-Shanskij & Nikol'skaya, 1954 [currently *Pseudomalus* following Kimsey & Bohart (1991) or *Omalus (Omalus)* following Linsenmaier's classification]

*Philoctetes acuminatus* Rosa & Boustani in Boustani & Rosa, 2022 HT [*Omalus (Omalus)* following Linsenmaier's classification]

*Hedychrum bidentulum* Lepeletier, 1806 NT (designated by Rosa & Xu 2015) [currently *Philoctetes bidentulus*]

### Linsenmaier's subgenera and species-groups

#### The genus *Omalus* in Linsenmaier's systematics

Linsenmaier (1959a, 1959b, 1968, 1987, 1994, 1997, 1999) subdivided *Omalus* into five subgenera: *Omalus s.str.*, *Holophris*; *Philoctetes*; *Chrysellampus*, and *Elampus* (named *Notozus* until 1994). *Omalus s.str.* and *Elampus* were subdivided in species-groups. *Holophris* was listed without any species from the West Palaearctic region. The list of the Palaearctic species reported below includes data taken from Linsenmaier's articles and from his collection. We added remarks to update his classification after type revisions and recent publications. The lists include mostly species from West Palaearctic and some species from Central Asia and Japan. Other species described by Semenov-Tian-Shanskij (1932, 1967), and Semenov-Tian-Shanskij & Nikol'skaya (1954), from Russia and Central Asia, were omitted because Linsenmaier had no access to Semenov-Tian-Shanskij's collection and listed only those species received in exchange with Nikol'skaya (Rosa *et al.* 2015a).

It should be noted that the tribe names used by Linsenmaier for *Omalus* are incorrect. Heteronychini du Buysson, 1892 (used in Linsenmaier 1994) is unavailable as it is a family-group name (originally described as Heteronychidae) not based on an available generic name. Omalini Balthasar, 1953 (used in Linsenmaier 1997) is currently a synonym of Elampini Mocsáry, 1889 (originally Ellampini, corrected in Elampini by Ashmead 1902).

### Genus *Omalus* Panzer, 1801

#### Subgenus *Omalus s. str.*

##### *auratus* group

*Omalus (Omalus) auratus* (Linnaeus, 1758)

= *O. incertus* Haupt, 1957

= *O. auratus anthracinus* (du Buysson, 1892)

= *O. contrarius* (Mader, 1939) [invalid name]

= *O. auratus cupratus* (Mocsáry, 1889)



= *O. curtiventris* (Tournier, 1879)  
 = *O. auratus indigoteus* (du Buysson, 1892)  
 = *O. auratus maculatus* (du Buysson, 1892)  
 = *O. minimus* (Dufour & Perris, 1840)  
 = *O. obscurus* (Tournier, 1889)  
 = *O. testaceicornis* (du Buysson, 1892)  
 = *Omalus auratus viridiventris* (Mocsáry, 1890)  
*Omalus auratus nigradorsus* (Tsuneki, 1953)  
*Omalus triangulifer* Abeille de Perrin, 1877  
*Omalus tshingiz* (Semenov-Tian-Shanskij in Semenov-Tian-Shanskij & Nikol'skaya, 1954)  
*Omalus abdominalis* (du Buysson, 1887)  
*Omalus violaceus* (Scopoli, 1763)  
 = *O. fuscipennis* (Dahlbom, 1829)  
 = *O. imperiale* (Shuckard, 1837)  
 = *O. nitidus* Panzer, 1805  
 = *O. similis* (Mocsáry, 1889)  
 = *O. violaceus virens* (Mocsáry, 1889)  
*Omalus joannisi* (du Buysson, 1909)  
*Omalus punctatus* (Uchida, 1927)  
*Omalus grandis* (Tsuneki, 1950)

**Remarks.** Currently, all species included in the *Omalus auratus* group *sensu* Linsenmaier are considered members of *Pseudomalus*, which was never adopted by Linsenmaier (1959a, b, 1968, 1987, 1994, 1997). The following species changed status or resulted belonging to a different genus:

*Pseudomalus auratus cupratus* Mocsáry, 1889 has been revalidated and raised to species rank by Rosa *et al.* (2017c); *Elampus curtiventris* Tournier, 1879 is actually a member of *Elampus* Spinola, 1806 (type examined).

### ***punctulatus* group**

*Omalus (Omalus) punctulatus* Dahlbom, 1854  
 = *O. parvulus* Dahlbom, 1854  
 = *O. socius* (Mocsáry, 1889)  
*Omalus punctulatus tricolor* Linsenmaier, 1999  
*Omalus perraudini* Linsenmaier, 1968  
*Omalus bidentulus* (Lepelletier, 1806)  
 = *O. appendicinus* Abeille de Perrin, 1878  
 = *O. bidentulus styx* Trautmann, 1926  
 = *O. bidentulus uniformis* (Trautmann, 1926)  
 = *O. wesmaeli* Chevrier, 1862  
 = *O. bidentulus bidentatus* Eversmann, 1858  
*Omalus helveticus* Linsenmaier, 1959a  
*Omalus hirtus* (Semenov-Tian-Shanskij, 1932)  
*Omalus hirsutus* (Semenov-Tian-Shanskij, 1932)  
*Omalus nikolskii* (Semenov-Tian-Shanskij, 1932)  
*Omalus politus* (du Buysson, 1887)  
*Omalus bogdanovii* (Radoszkowski, 1877)  
 = *O. bogdanovii cerberus* (Trautmann, 1926)  
 = *O. bogdanovi kerteszi* (Trautmann, 1926)  
 = *O. rudowi* (du Buysson, 1887)  
 = *O. bogdanovi unicolor* (Trautmann, 1926)  
*Omalus biaccinctus* (du Buysson, 1892)  
 = *O. gasperinii* (Mocsáry, 1889)  
 = *O. biaccinctus muelleri* (Trautmann, 1926)

**Remarks.** Currently, all species included in the *punctulatus* group *sensu* Linsenmaier are considered members of *Philoctetes*, excluding *Omalus nikolskii* (Semenov-Tian-Shanskij, 1932) (see Rosa *et al.* 2017a) and *O. politus*, which are truly *Omalus sensu* Kimsey & Bohart (1991).

*Omalus bidentulus uniformis* (Trautmann, 1926) could be a teratology of *Pseudomalus auratus* (Linnaeus, 1758) (type examined); *Omalus bidentatus* (Eversmann, 1858) was often considered as a valid taxon, nevertheless this name is an incorrect subsequent spelling of *Omalus bidentulus* (Lepeletier, 1806) (Rosa *et al.* 2015e); *Omalus biaccinctus* (du Buysson, 1892) has been considered as *nomen protectum* (Rosa *et al.* 2017c) because Linsenmaier (1951) and other researchers did not recognise the priority of the name *O. gasperinii* (Mocsáry, 1889), which was always incorrectly considered as a synonym of *O. biaccinctus* or its subspecies (see also Trautmann 1927 and Berland & Bernard 1938, the name *gasperinii* was also often misspelled as *gasparinii*).

### **aeneus group**

*Omalus (Omalus) aeneus* (Fabricius, 1787)  
= *O. affinis* (Wesmael, 1839)  
= *O. aeneus atratus* (Mocsáry, 1887)  
= *O. blandus* (Förster, 1853)  
= *O. chevrieri* (Tournier, 1877)  
= *O. freyi* (Tournier, 1889)  
= *O. aeneus pygialis* (du Buysson, 1887)  
= *O. pygmaeus* (Schenck, 1856)  
*Omalus aeneus puncticollis* (Mocsáry, 1887)  
*Omalus aeneus sauteri* (Mocsáry, 1913)  
*Omalus aeneus japonicus* (Bischoff, 1910)  
*Omalus chlorosomus* (Lucas, 1849)  
*Omalus chlorosomus mallorcanus* Linsenmaier, 1959a  
*Omalus imbecillus* (Mocsáry, 1889)  
*Omalus riyadhensis* Linsenmaier, 1994  
*Omalus puncticeps* Linsenmaier, 1994

### **pusillus group**

*Omalus (Omalus) pusillus* (Fabricius, 1804)  
= *O. minutus* (Wesmael, 1839)  
= *O. schmiedeknechti* (Mocsáry, 1889)  
*Omalus pusillus bulgariensis* Linsenmaier, 1959a  
*Omalus pusillus semicupreus* Linsenmaier, 1959a  
*Omalus viridimior* Linsenmaier, 1999  
*Omalus horvathi* (Mocsáry, 1889)  
= *O. splendens* (du Buysson, 1900)  
= *O. wesmaeli* (Mocsáry, 1882)  
*Omalus horvathi inflammatus* (Mocsáry, 1890)  
*Omalus dusmeti* (Trautmann, 1926)  
= *O. horvathi occidentus* Linsenmaier, 1968  
*Omalus sareptanus* (Mocsáry, 1889)  
*Omalus sareptanus schulthessi* (Mocsáry, 1890)  
*Omalus sareptanus subauratus* (Mocsáry, 1890)  
*Omalus magrettii* (du Buysson in Magretti, 1890)  
*Omalus deauratus* (Mocsáry, 1914)  
*Omalus sinensis* (Tsuneki, 1947)

**Remarks.** Currently, *Omalus pusillus* (Fabricius, 1804) is included in *Pseudomalus*. All other species listed by Linsenmaier in the *pusillus* group are members of *Philoctetes* (*sensu* Kimsey & Bohart 1991).

### **Subgenus *Holophris* Mocsáry, 1890**

**Remarks.** Linsenmaier (1959a) did not include any Palearctic species, but simply reported “Spezies in Nord- und Süd-Amerika, Afrika, Indonesien und Australien”.

### Subgenus *Philoctetes* Abeille de Perrin, 1879

*Omalus (Philoctetes) deflexus* (Abeille de Perrin, 1878)  
= *O. difficilis* (Tournier, 1889)  
*Omalus deflexus carveri* (Alfieri, 1913)  
*Omalus deflexus penelopeia* (Trautmann, 1926)  
*Omalus chobauti* (du Buysson, 1896)  
*Omalus jemenensis* Linsenmaier, 1994  
*Omalus micans* (Klug, 1835)  
*Omalus friesei* (Mocsáry, 1889)  
*Omalus abeillei* (du Buysson, 1892)  
*Omalus caudatus* (Abeille de Perrin, 1878)  
*Omalus caudatus ortegae* Linsenmaier, 1993  
*Omalus tiberiadis* (Abeille de Perrin in du Buysson, 1887)  
*Omalus syriacus* (du Buysson, 1887)  
*Omalus omaloides* (du Buysson, 1888)  
= *O. micans viridis* Traumann, 1926  
*Omalus tenerifensis* Linsenmaier, 1959a  
*Omalus obtusus* (du Buysson, 1892)

### Subgenus *Chrysellampus* Semenov-Tian-Shanskij, 1932

*Omalus (Chrysellampus) truncatus* (Dahlbom, 1831)  
= *O. anomalus* (Förster, 1853)  
= *O. minutus* (Dahlbom, 1854)  
*Omalus sculpticollis* (Abeille de Perrin, 1878)  
*Omalus medanae* (du Buysson in Magretti, 1890)  
*Omalus pici* (du Buysson, 1900)  
*Omalus nigromaculatus* Linsenmaier, 1997  
*Omalus duplipunctatus* (Tsuneki, 1948)

**Remarks.** Currently, *Chrysellampus* is considered as a distinct genus (Rosa *et al.* 2015b). *Omalus (Chrysellampus) truncatus* belongs to *Philoctetes* and not to *Chrysellampus* (Rosa *et al.* 2015b). *Omalus nigromaculatus* has been synonymised with *Omalus pici* by Arens (2014).

### Subgenus *Elampus* Spinola, 1806 (= *Notozus* Förster, 1853)

#### ***ambiguus* group**

*Omalus (Elampus) ambiguus* Dahlbom, 1854  
= *O. putoni* (du Buysson, 1892)  
*Omalus mongolicus* (du Buysson, 1901)  
= *O. cupratus* (Mocsáry, 1911)

**Remarks.** *Omalus ambiguus* Dahlbom, 1854 is synonym of *Elampus constrictus* (Förster, 1853) *sensu* Móczár (1964), whereas *O. ambiguus* Dahlbom, 1854 *sensu* Linsenmaier is actually *Philoctetes putoni* (Rosa *et al.* 2017d), both types of *E. ambiguus* and *P. putoni* examined.

#### ***bidens* group**

*Omalus (Elampus) bidens* (Förster, 1853)  
= *O. femoralis* (Eversmann, 1858)  
= *O. bidens rufescens* (du Buysson, 1896)  
= *O. spina* (Dahlbom, 1854)  
= *O. superbis* (Abeille de Perrin, 1878)

## **panzeri group**

*Omalus (Elampus) panzeri* (Fabricius, 1804)  
= *O. rufitarsis* (Tournier, 1879)  
= *O. scutellaris* (Panzer, 1798)  
*Omalus panzeri coeruleus* Dahlbom, 1854  
= *O. viridiventris* (Abeille de Perrin, 1878)  
= *O. soror* (Mocsáry, 1889)  
= *O. montanus* (Mocsáry, 1890)  
= *O. obesus* (Mocsáry, 1890)  
= *O. komarowi* (Radoszkowski, 1893)  
*Omalus eversmanni* (Mocsáry, 1889)  
*Omalus yasumatsui* (Tsuneki, 1948)  
*Omalus pyrosomus* (Förster, 1853)  
*Omalus spina* (Lepeletier, 1806)  
= *O. longicornis* (Tournier, 1889)  
= *O. mutans* (du Buysson, 1896)  
= *O. productus* Dahlbom, 1854)  
*Omalus constrictus* (Förster, 1853)  
*Omalus sanzii* Gogorza, 1887  
*Omalus albipennis* (Mocsáry, 1889)  
*Omalus mocsaryi* Radoszkowski, 1887  
*Omalus spinosus* Bischoff, 1910 (currently *bischoffi* Kimsey, 1991 in Kimsey & Bohart 1991, repl. name for *spinosus* Bischoff, 1910)  
*Omalus spinipes* (Mocsáry, 1890)  
*Omalus violascens* (Mocsáry, 1889)  
*Omalus kashmirensis* (Nurse, 1902)  
*Omalus discedens* (Zimmermann, 1940)  
*Omalus turcmenicus* Linsenmaier, 1968  
*Omalus rufirostris* Linsenmaier, 1999

**Remarks.** According to Móczár (1964), the interpretation of the names *panzeri* and *constrictus* in Linsenmaier's publication is inverted. Nevertheless, Linsenmaier (1969, 1987, 1997, 1999) went on using his species concepts, without following Móczár's (1964) classification.

The following species were considered to be synonyms of *Omalus (Elampus) panzeri* or *O. constrictus* by Linsenmaier (1951): *O. affinis* Schenck, *O. angustatus* Mocsáry, *O. bipartitus* Tournier, *O. elongatus* Schenck, *O. foveatus* Mocsáry, *O. kohli* Mocsáry, *O. konowi* du Buysson, *O. minutulus* Schenck, *O. olgae* Semenov-Tian-Shanskij, *O. pulchellus* Schenck, *O. unicolor* Trautmann, *O. viridiventris* Abeille de Perrin, *O. vulgata* du Buysson.

*Omalus (Elampus) foveatus* is currently considered to be a valid species, described from Bosnia and Herzegovina. *Omalus konowi* is currently considered to be a valid species (Wiesbauer *et al.* 2020) from the Baltic and Nordic countries, recently confused with *O. foveatus* by Niehuis (2001) and Paukkunen *et al.* (2015). *Omalus olgae* Semenov-Tian-Shanskij resulted a synonym of *E. panzeri sensu* Móczár (1964) (Rosa *et al.* 2017a). *Omalus viridiventris* Abeille de Perrin is an unnecessary replacement name for *Elampus caeruleus* Dahlbom, 1854. Types of other taxa listed by Linsenmaier as synonyms of *panzeri* or *constrictus* should be evaluated in a future revision of the genus.

## **Discussion**

The genus *Omalus* has been object of divergent and discordant interpretations. American authors have traditionally distinguished *Omalus*, *Pseudomalus*, *Elampus*, and *Diplorrhous* Aaron, 1885 (currently synonym of *Philoctetes*), whereas the European ones, including Trautmann (1927), Berland & Bernard (1938), and Linsenmaier (1959a and subsequent publications), have long united the European species of *Omalus*, *Pseudomalus* Ashmead, 1902, part of *Philoctetes*, and sometimes *Elampus* (the latter mostly under the name *Notozus* Förster, 1853) into a single genus, called from time to time *Omalus* or *Elampus* Agassiz (nec *Elampus* Spinola, 1806).

Although some authors are still using Linsenmaier's classification (see the Introduction), most active researchers use the classification system proposed by Kimsey & Bohart (1991). They considered *Elampus*, *Holophris*,

*Pseudomalus* and *Philoctetes* to be genera distinct, and modified the European interpretation of *Philoctetes* (Rosa 2006), also considering *Chrysellampus* as its synonym. The current subdivision into genera is however far from being clarified; the separation between the aforementioned genera is not always clear-cut. As a result, the checklist of the species included in *Philoctetes* by Kimsey & Bohart (1991) has been deeply modified, and now includes species previously considered by Kimsey & Bohart (1991) to be *Elampus*, *Holophris*, *Omalus*, and *Pseudomalus* (e.g. Tussac & Tussac 1993; Mingo 1994; Niehuis 2001; Rosa 2003, 2005, 2006; Rosa *et al.* 2014; Farhad *et al.* 2018). Moreover, *Chrysellampus*, previously synonymised by Kimsey & Bohart (1991), has been revalidated and ten species were moved from *Philoctetes* to *Chrysellampus* (Rosa *et al.* 2015b). More generally, several taxonomic changes affected the list of the Palaearctic Elampini *s.str.* as proposed by Kimsey & Bohart (1991); summarized here:

- *Elampus putoni* (du Buysson, 1892) was transferred to *Philoctetes* (Rosa 2005)
- *Holophris imbecillus* (Mocsáry, 1889) and *H. timidus* (Nurse, 1902) were transferred to *Omalus* (Rosa 2005, Rosa *et al.* 2015c).
- *Holophris abeillei* (du Buysson, 1892), *H. araraticus* (Radoszkowski, 1890), *H. chobauti* (du Buysson, 1896), *H. friesei* (Mocsáry, 1889) were transferred to *Philoctetes* (Mingo 1994; Rosa *et al.* 2015b).
- *Omalus bidentulus* (Lepelletier, 1806) and *O. hypocrita* (du Buysson, 1893) were transferred to *Philoctetes* (Niehuis 2001, Rosa 2009, Farhad *et al.* 2018); *O. magrettii* (du Buysson in Magretti, 1890) to *Pseudomalus* (Rosa 2009).
- The following species were moved from *Philoctetes* to *Chrysellampus*: *C. sculpticollis* (Abeille de Perrin, 1878), *C. medanae* (du Buysson in Magretti, 1890), *C. heros* (Semenov, 1892), *C. pici* (du Buysson, 1900) (= *C. nigromaculatus* Linsenmaier, 1997), *C. harmandi* (du Buysson, 1903), *C. praeteritorium* (Semenov-Tian-Shanskij, 1932), *C. duplipunctatus* Tsuneki, 1948, *C. tatianae* Semenov-Tian-Shanskij, 1967, *C. obtusidentibus* Rosa *et al.* 2015d and *C. proximocellis* Rosa *et al.* 2015d (Rosa *et al.* 2015d).
- *Philoctetes scrutator* (Semenov-Tian-Shanskij & Nikol'skaya, 1954) and *P. speculifer* (Semenov-Tian-Shanskij, 1932) were transferred to *Omalus* (Rosa *et al.* 2017a).
- *Pseudomalus deauratus* (Mocsáry, 1914), *Ps. helveticus* (Linsenmaier, 1959a), *Ps. hirtus* (Semenov-Tian-Shanskij, 1932), *Ps. mordvilkoii* (Semenov-Tian-Shanskij, 1932), *Ps. punctulatus* (Dahlbom, 1854), *Ps. perraudini* (Linsenmaier, 1968) were transferred to *Philoctetes* (Tussac & Tussac 1993; Rosa 2003, 2005; Rosa *et al.* 2014, 2017a).

The phylogeny based on multigene analyses showed two distinct clades for *Elampus* and the remaining allied genera including *Pseudomalus*, *Philoctetes*, *Omalus*, and *Holophris* (Pauli *et al.* 2019). At the same time, it raised questions on some species which are clearly distinct, as for *Omalus* sp. 1, or *Holophris* sp. 2, the first basal to all the aforementioned allied genera and the second basal to *Holophris* + *Omalus*. Pauli *et al.* (2021) also showed that *Philoctetes monticola* (Tsuneki, 1975) belongs to another independent clade. Only future molecular analyses based on a worldwide sampling will definitively resolve the intricate relationships among all the genera of the Elampini *s.str.*

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