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Short scientific note

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First record of *Onthophagus (Furconthophagus) sellatus* Klug, 1845 for Europe (Coleoptera: Scarabaeidae, Onthophagini)

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Abstract
Onthophagus (*Furconthophagus*) *sellatus* Klug, 1845 (Coleoptera Scarabaeidae: Onthophagini) is recorded for the first time for Europe based on specimens collected in the south-eastern coastal area of Sicily (Siracusa province). The species exhibits a wide distribution encompassing the north-eastern Africa, Middle East and Arabian peninsula, as well as a great portion of the Afrotropical region.

Keywords: Faunistics, Italy, dung-beetles, African species.

Introduction

The Italian fauna includes 22 species belonging to the genus *Onthophagus* Latreille, 1802, currently subdivided into five subgenera: *Furconthophagus* Zunino, 1979, *Onthophagus* Latreille, 1802, *Paleonthophagus* Zunino, 1979, *Parentius* Zunino, 1979 and *Trichonthophagus* Zunino 1979. For two of these species: *O.* (*Paleonthophagus*) *vitulus* (Fabricius, 1776) and *O.* (*Parentius*) *punctatus* (Illiger, 1803) there are only quotations from the old literature and their occurence in Italy is therefore doubtful. As regards Sicily, 12 species of *Onthophagus* have been confirmed up to now (Ballerio et al. 2014).

In June 2021 one of the authors (D. P.) made a sample of scarab dung beetles (Scarabaeoidea) in two distinct locations (Anapo and Ognina) on the south-eastern coast of Sicily in the province of Siracusa, in horse, dog and human dung. Taxonomic identification, with the help of Stefano Ziani allowed to discover a species of *Onthophagus* new to the European fauna: *Onthophagus* (*Furconthophagus*) *sellatus* Klug, 1845.

Material & Methods

The terminology and systematics used follows (Ziani & Bezděk 2016) and Ziani (2020).

The abbreviation of the collections mentioned in this publication are as follows:

DPCR – Daniel Patacchiola private collection, Roma, Italy
FFCP – Fabrizio Fabbriciani private collection, Pistoia, Italy
GMOC – Giulio Montanaro private collection, Creazzo, Vicenza, Italy
MSNC – Natural Science Museum of Calci Pisa, (University of Pisa), Italy
MSNVE – Natural History Museum of Venice, Italy
The material examined from Sicily has the following data:
Italy, **Sicily**, Siracusa, bank of the Anapo river, nearwd the temple of Jupiter, (37.0526 N, 15.2590 E), 04-08 Jun 2021, D. Patacchiola leg, 8 ♂♂, 17 ♀♀ (5 ♂♂, 12 ♀♀ DPCR; 3 ♂♂, 5 ♀♀ FFCP
Italy, **Sicily**, Siracusa, Ognina, (36.9752 N, 15.2602 E) , 05 Jun 2021, D. Patacchiola leg, 4♂♂, 5♀♀ DPCR.

The material examined for comparison has the following data:
Sudan, Khartoum, 09 Dec 1980, Rallo leg, 1 ♂, 1 ♀ GMOC.
Sudan, Khartoum North, 07 Dec 1980, Rallo leg, 1 ♀ MSNVE
Sudan, Khartoum, 09 Dec 1980, Rallo leg, 8 ♂♂, 5 ♀♀ MSNVE
Sudan, Omdurman, near Nilo river, 08 Dec 1980, 1 ♂ MSNVE
Oman, Taqah, env., 23 m, (17.0314 N, 54.2558 E), 4 Sept 2000, M. Dellacasa leg, 1 ♀ MSNC

The male genitalia of the Sicilian specimens were extracted, hydrated and cleaned with a solution of KOH (Potassium Hydroxide) at 5% w/w, subsequently the endophallus and with all its sclerified structures were separated (Zunino

1978). The lamina copulatrix and other components of the endophallus have been included in DMHF (Dimethyl Hydantoin Formaldehyde) (Steedman 1958).

An initial analysis of the external characters (with the help of Stefano Ziani, com. pers. to F.F.) allowed to identify 34 specimens of *O. sellatus* Klug, 1845, whose outer morphology is consistent with the original description and the subsequent treatment of the species by more recent authors (d' Orbigny 1913; Balthasar 1963; Baraud 1985; Kabakov 2006; Ziani et al. 2019; Ziani 2020) (Figs. 1 A-C)

Male genitalia (aedeagus and endophallus) of 12 ♂♂ from the two Sicilian localities (Figs. 1 D-F) were extracted and compared with those of specimens of *O. sellatus* from Sudan. The comparison of the male genitalia confirmed the identification.

Ecology

Onthophagus (Furconthophagus) sellatus was found in two distinct locations on the south-eastern coast of Sicily: Anapo (Station 1) and Ognina (Station 2).

The first station (Fig. 2), which made it possible to collect the largest number of specimens in horse dung and dog dung, is located a few kilometers south of the town of Siracusa. This area is characterized by a Mediterranean evergreen bushland, with traits of a strong anthropic impact, as usually observed the agricultural areas of Siracusa, where the native scrub vegetation became interspersed with carob, almond and olive tree plantation. The location is between the confluence of the Ciane and Anapo rivers, in proximity to the Natural Reserve of the Ciane River and Saline of Siracusa, established in 1984.

The second station (Fig. 3) is located about 10 km southwest of the first one, and is characterized by coastal garrigue with very low and sparse vegetation that slopes sharply towards the coast leaving room to small sandy depressions. The neighboring area, as ascertained by one of us (D.P.), is used as cattle pasture during the Autumn and Winter seasons. Here the species was collected in human dung.

In the Anapo station the species cohabited with following dung beetles species: *Onthophagus* (*Onthophagus*) *taurus* (Schreber, 1759), *Cheironitis furcifer* (Rossi, 1792), *Cheironitis irroratus* (Rossi, 1790), *Labarrus lividus* (Olivier, 1789) and *Bodiloides ictericus ghardimaouensis* (Balthasar, 1929); all species more or less common in Sicily, with a typical late Spring-Summer phenology (Ballerio et al. 2014).

Onthophagus sellatus displays a wide ecological and trophic adaptability (Alfieri 1976; Ziani et al. 2019) and there are also numerous records in the Island of Réunion (Mascarene Islands) made through the use of light traps (Lacroix & Poussereau 2019).

It should also be mentioned, with regard to the high degree of adaptability of this species and its relative abundance in some Middle Eastern countries, that recent researches made in Israel found that the species is an intermediate host of a dog esophageal nematode parasite (*Spirocerca lupi*) (Gottlieb et al. 2011, 2014).

Discussion

According to Ziani et al. (2019), Ziani (2020) and Schoolmesters (2021), the distribution of *O. sellatus* currently includes a portion of the Palaearctic and of the Afrotropical region as follows:

Palaearctic (Syria, Cyprus, Libya, Jordan, Egypt, Saudi Arabia, Yemen, Oman).

Afrotropical Region (Liberia, Guinea, Benin, Nigeria, Cameroon, Republic of Equatorial Guinea, São Thomé and Principe Island, Gabon, Democratic Republic of Congo, Sudan, Eritrea, Angola, Mozambique, La Réunion).

The discovery of this species in the south-eastern Sicilian coastal area represents the first record data of *O.*

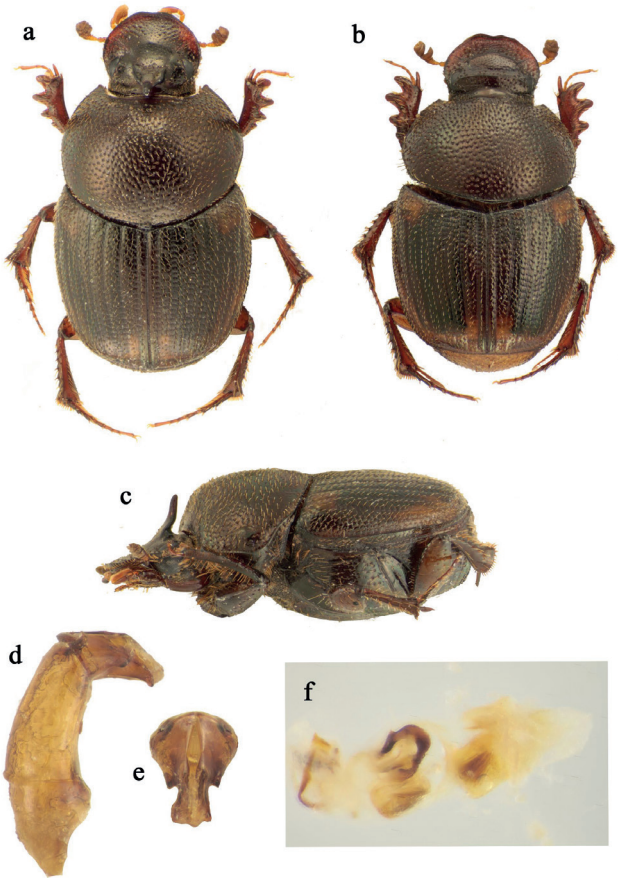

Fig. 1 – a, Habitus of *Onthophagus* (*Furconthophagus*) *sellatus* ♂ from Ognina (Siracusa); **b**, habitus ♀ from Ognina (Siracusa); **c**, lateral view ♂, idem; **d**, edeagus in lateral view; **e**, lateral tooth placed below the apex of the parameres; **f**, endophallus and copulatrix lamina.

Fig. 2 – Collecting site of *Onthophagus* **(***Furconthophagus***)** *sellatus* near the temple of Jupiter (Station 1).

sellatus for the European continent. The Sicilian fauna has been intensively studied for almost 180 years, even if some areas remain less investigated, and among these there is undoubtedly the south-eastern part of the island (Arnone & Romano 2020). The few avalable data do not allow us to understand if the presence of the species is due to a recent accidental introduction, or of an introduction in historical times due to the numerous commercial exchanges that took place in the Mediterranean area, in fact Siracusa was an important harbor during Pre-Roman and Roman times (Bejor 1983). Nevertheless the occurence of this species in Sicily may also be due to natural dispersion in prehistorical times as hypothesized for other Sicilian taxa which show an Eastern Mediterranean distribution pattern, especially when they inhabit the south-eastern part of the island where the species was found (La Greca 1957; 1996).

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Fig. 3 – Collecting site of *Onthophagus* **(***Furconthophagus***)** *sellatus* in Ognina (Station 2).

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