

# *Ammobates (Euphileremus) oraniensis* (LEPELETIER 1841) and its host, *Eucera* *dimidiata* BRULLÉ 1832 in Crete (Hymenoptera, Apidae)

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**Abstract.** We here provide observations on the host relationships of the cleptoparasitic bee *Ammobates (Euphileremus) oraniensis* (LEPELETIER 1841) in Crete (Greece). Our surveys on this greek island indicate that *Eucera dimidiata* BRULLÉ 1832 (Hym. Apidae) is the primary host of *A. oraniensis*, and our observations suggest that nests of *E. algira* BRULLÉ 1840 (Hym. Apidae) might also be parasitized by this cuckoo bee. A description of both sexes is provided, as well as photographs made in situ and a distribution map of our records.

**Résumé.** Nous fournissons ici des observations relatives aux hôtes de l'abeille cleptoparasite *Ammobates (Euphileremus) oraniensis* (LEPELETIER 1841) en Crète (Grèce). Nos recherches sur cette île grecque indiquent qu'*Eucera dimidiata* BRULLÉ 1832 (Hym. Apidae) est l'hôte principal d'*A. oraniensis*, et nos observations suggèrent que les nids d'*E. algira* BRULLÉ 1840 (Hym. Apidae) pourraient également être parasités par cette abeille coucou. Nous fournissons une description des deux sexes, ainsi que des photographies faites in situ et une carte de la distribution géographique de nos observations.

**Key words.** *Ammobates oraniensis*, cleptoparasitism, *Eucera dimidiata*, *Eucera algira*, Crete.

## Introduction

The tribe Ammobatini Handlirsch (Apidae: Nomadinae) is largely distributed at the worldwide scale, with representatives found in the Afrotropical (Eardley & Brothers 1997), the Nearctic (Rozen 1992) and (primarily) the Palaearctic (Warncke 1982, 1983) regions. Within this tribe of cleptoparasitic species, the genus *Ammobates* LATREILLE is considered to be the largest with ca. 40 species described to date (Michener 2007) for which revisions and illustrations were published by several authors, including Radoszkowski (1885), Popov (1951), Iuga (1958), Mavromoustakis (1968) and Warncke (1983). Michener (2007) and Engel (2009) recognise three different subgenera in the genus *Ammobates*, namely *Ammobates s.s.* (39 spp.), *Xerammbates* (3 spp.) and *Euphileremus* (6 spp.). The subgenus *Euphileremus* was revised by Warncke (1983) and it contains species that are found from the Canary Islands, Morocco and Spain through southwestern Asia and southern Russia to Uzbekistan.

As far as is known, the *Euphileremus* species are cleptoparasites associated to species in the genus *Tetraloniella* (tribe Eucerini, Apidae) (Warncke 1983). However, our knowledge on the identity and the taxonomic spectrum of hosts associated to these cuckoo bees is far from being complete.

In this paper, we provide observations on the host relationships of the cleptoparasitic bee *Ammobates (Euphileremus) oraniensis* (LEPELETIER 1841) in Crete (Greece), as well as a description of both sexes of this species and a synthesis on host-parasitic relationships in the subgenus *Euphileremus*.

## Observations in Crete

In 2005, one of us (BJ) observed and photographed several individuals of *A. oraniensis* on March 27 close to the village of Laga (Rethymno, 35.342709°N 24.677181°E, WGS84). The bees were nectaring on daisy-like composite flowers in and near a nesting aggregation of *Eucera (Heteuocera) algira* BRULLÉ 1840 (ID: Stefan Risch). No actual entering of *Eucera* nests by the *A. oraniensis* was observed, so at this stage there was only circumstantial evidence for a host-parasite relationship between both species. Although *Eucera dimidiata* BRULLÉ 1832 was seen and photographed in several other localities in Crete at the same time, none were observed near Laga.

In 2012, two of us (NJV & GDP) sampled both sexes of *A. oraniensis* at several locations during late March to early April in southern and northwestern Crete. The largest population of *A. oraniensis* was found in the surroundings of Tympaki (35.072932°N 24.768621°E, WGS84) where several tens of specimens were flying around a very dense monospecific nesting aggregation of *E. dimidiata*. Both males and females of *A. oraniensis* were nectaring on *Chrysanthemum coronarium* L. 1753 (Asteraceae) and the observations coincided with the

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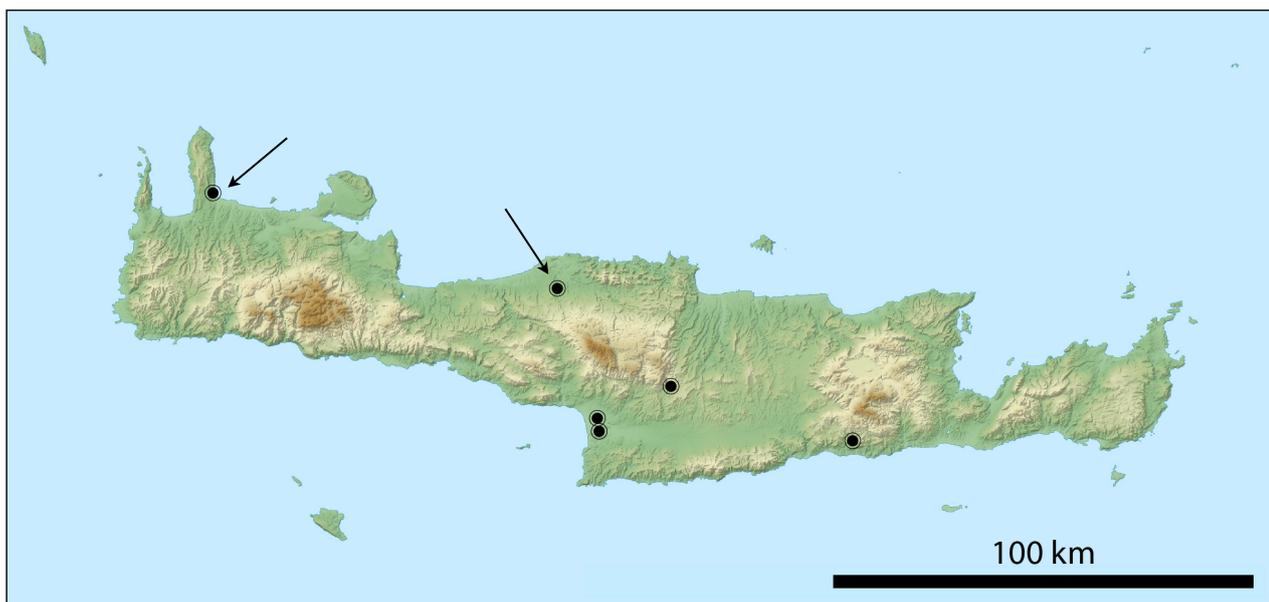


**Figure 1.** A mating pair of *Eucera dimidiata* Brullé 1832 (Apidae), 20.iii.2012, Panasos, Crete, Greece (Photo NJ Vereecken).

peak reproductive period of *E. dimidiata* (Figure 1). Within a few days, the female Eucerine bees had started drilling galleries and provisioning their brood cells with pollen collected on various plants including *Anchusa azurea* P. MILL. (Boraginaceae). On multiple occasions, the females of *A. oraniensis* were observed inspecting and entering the active nest burrows of *E. dimidiata* females for several minutes. The nesting aggregation of *E. dimidiata* was very dense at this locality, and the specimens of *A. oraniensis* were only observed either on the nearby flowers, or at the entrance of active nests of *E. dimidiata*. The same phenomenon was observed in

smaller and monospecific nesting aggregations of *E. dimidiata* in other localities of Crete, except in a population northwest of the island where both sexes of *A. oraniensis* were observed patrolling around a nesting aggregation of *E. algira*. This would tend to confirm the earlier observations from 2005 described above and might suggest that *A. oraniensis* could be a cleptoparasitic bee associated with different host species.

All the localities where *A. oraniensis* was observed are mapped in Figure 2.



**Figure 2.** Sampling localities of *Ammobates oraniensis* (LEPELETIER 1841) in Crete (Greece). Black arrows indicate populations where *Eucera algira* BRULLÉ 1840 was the dominant Eucerini species and the presumed local host of *A. oraniensis*. The other black dots indicate localities where *Eucera dimidiata* BRULLÉ 1832 was found to be the host of *A. oraniensis* (Hym. Apidae).

**Table 1.** List of known or suspected host species associated within different taxa in the subgenus *Ammobates* subgenus *Euphileremus*.

<i>Ammobates (Euphileremus) spp.</i>	Host species	References
<i>A. aurantiacus</i> POPOV 1951	?	-
<i>A. latitarsis</i> FRIESE 1899	?	-
<i>A. muticus</i> SPINOLA 1843	<i>Eucera nigrifacies</i> LEPELETIER 1841	Warncke (1983)
	<i>Eucera seminuda</i> BRULLÉ 1832	
<i>A. oraniensis</i> LEPELETIER 1841	<i>Eucera armeniaca</i> (MORAWITZ 1878)	Warncke (1983)
	<i>Eucera algira</i> BRULLÉ 1840 ?	present study
	<i>Eucera dimidiata</i> BRULLÉ 1832	present study

### Description of *Ammobates (Euphileremus) oraniensis* (LEPELETIER 1841)

Species in the genus *Ammobates* generally exhibit a partially (sometimes completely) red metasoma. The finding of an *Ammobates* species with a completely black and white habitus is therefore surprising for those of us who are not familiar with the genus (Figure 3). The sexual dimorphism is very limited in this species, and it is sometimes difficult to tell the males apart from the females in the field. Based on the specimens collected in Crete, we provide below a short description of both sexes to highlight some of their diagnostic characters.

♀ ♀. Apex mandibles entirely overlapping in repose; labrum about 1.5 times as long as the basal width, face almost flat. Sternum 6 (S6) bifurcate, consisting of two projecting spines (Figure 4), apex of S5 U-shaped and defined by a ridge of golden-silvery hairs. Metatarsi 1-3 narrow, not apically widened. Metasoma completely black with narrow, dense lateral patches of snow-white hairs on Terga 1-5 (T1-T5). Similar patch of dense, white hairs on the lateral sides of the metathorax, just below the tegulae. Superficial, dense punctuation on metasomal terga, T1 shiny. External surface of tibiae covered in silvery hairs intermixed with small, black spines. Labrum relatively short, 1.5 times as long as its basal width. Body length : 10.5-11.65mm (7 specimens measured).



**Figure 3.** Male of *Ammobates oraniensis* (LEPELETIER 1841) (Photo NJ Vereecken)

♂ ♂. Aspect similar to that of the female. Body length : 10.8-12.25mm (7 specimens measured). The genital capsule is illustrated by Iuga (1958).

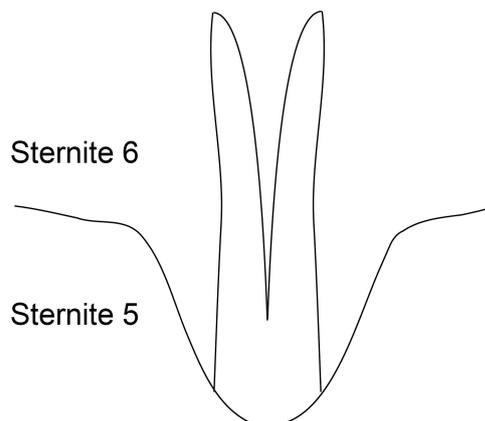
### Synonymy of *Ammobates (Euphileremus) oraniensis* (LEPELETIER 1841)

*A. oraniensis* was originally described as *Phileremus oraniensis* by Lepeletier (1841) from Oran (northwestern Mediterranean coast of Algeria) after specimens he received from his son.

We provide below a list of synonyms that are found in the literature:

*Phileremus melectoides* SMITH 1854; *Ammobates oraniensis* var *manni* FRIESE 1895; *Ammobates oraniensis tenuicornis* POPOV 1951; *Ammobates (Euphileremus) oraniensis melectoides* (SMITH 1854); *Pasites (Euphileremus) oraniensis melectoides* (SMITH 1854); *Pasites (Euphileremus) oraniensis anatolicus* WARNCKE 1983; *Ammobates (Euphileremus) oraniensis anatolicus* (WARNCKE 1983); *Pasites (Euphileremus) oraniensis tenuicornis* (POPOV 1951).

Finally, it seems important to note that the look-alike species *Ammobatoides melectoides* RADOSZKOWSKY, 1868 is also known from Crete. Friese (1895) erroneously gave the description of *Phileremus melectoides* by Smith (1854) precedence over the homonymous one by Radoszkowsky fourteen years later.



**Figure 4.** Ventral view of the U-shaped S5 and bifurcate S6 in females of *Ammobates oraniensis* (LEPELETIER 1841)

The bees described by Smith in 1854 belong to *Ammobates oraniensis*, though, described by Lepeletier fourteen years earlier, so Smith's name is a junior synonym of the former.

### Host relationships in *Euphileremus* and beyond

Our observations suggest that *A. oraniensis* is a cleptoparasite of nests of *E. dimidiata*, and possibly also of *E. algira*. This apparent specialisation in the parasitism of Eucerini hosts is paralleled by findings in closely-related species. For example, within the subgenus *Euphileremus*, at least *A. (E.) muticus* SPINOLA 1843 is known to have two Eucerini as hosts, namely *E. nigrifascies* LEPELETIER 1841 and *E. seminuda* BRULLÉ 1832 (Table 1). Collectively, these observations suggest that a certain pattern of host phylogenetic conservatism might prevail in the subgenus *Euphileremus*.

Further away from the subgenus *Euphileremus*, the probable hosts of species in the subgenus *Ammobates* s.s. include *Ancyla* (Ancylini), *Tetraloniella* (Eucerini), and *Anthophora* (Anthophorini) (Warncke 1983). For example, *Ammobates (Ammobates) punctatus* (FABRICIUS 1804) is a specific nest parasite of *Anthophora bimaculata* (PANZER 1798) (Apidae). As far as we know, there is no available data on the host relationships of species in the subgenus *Xerammbates* (see also Michener 2007).

Much remains to be discovered about the host relationships in the tribe Ammobatini, and field observations should be encouraged to uncover more details about the behaviour and ecology of these fascinating cuckoo bees.

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