

ARTICLE

Megachile parietina (GEOFFROY, 1785), a new addition to the bee fauna of the Maltese Islands (Hymenoptera: Apoidea: Megachilidae)

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Abstract

Megachile parietina (GEOFFROY, 1785), the black mud bee, is recorded from the Maltese Islands for the first time on the basis of two adult nesting females and four nests from Pembroke (north-east of Malta). This addition to the Maltese entomofauna brings the number of bees known from the archipelago to 106. The possibility that this species could be a suitable pollinator of the endemic orchid *Ophrys melitensis* (SALK.) DEVILLERS-TERSCHUREN & DEVILLERS, 1994 is discussed, and further investigation is encouraged.

Keywords | *Chalicodoma* • pollinators • new record • orchid • Mediterranean basin

***Megachile parietina* (GEOFFROY, 1785), un nouvel ajout à la faune des abeilles des îles maltaises (Hymenoptera : Apoidea : Megachilidae)**

Résumé

Megachile parietina (GEOFFROY, 1785) est signalée pour la première fois dans les îles maltaises sur la base de deux femelles adultes nicheuses et de quatre nids à Pembroke (nord-est de Malte). Cet ajout à l'entomofaune maltaise porte à 106 le nombre d'abeilles connues de l'archipel. La possibilité que cette espèce puisse être un pollinisateur de l'orchidée endémique *Ophrys melitensis* (SALK.) DEVILLERS-TERSCHUREN & DEVILLERS, 1994 est discutée et une enquête plus approfondie est encouragée.

Mots-clefs | *Chalicodoma* • pollinisateurs • nouveau signalement • orchidée • Bassin méditerranéen

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INTRODUCTION



The bees of the Maltese Islands have not been extensively studied, but the last decade has seen a renewed interest in the Maltese apoidean fauna; so far, 105 species from five families have been recorded in the archipelago, in addition to three dubious records (ALFKEN, 1929; VALLETTA, 1971, 1979; SCHEMBRI, 1982; BALZAN *et al.*, 2016, 2017, 2023; CASSAR & MIFSUD, 2020a). The known bee fauna of the Maltese archipelago is composed largely of species with widespread distributions throughout the Palearctic, with nearly all species also found elsewhere in South Europe, and the bee faunas of Sicily and Malta share a strong resemblance

(BALZAN *et al.*, 2016). The bee fauna of the Maltese archipelago is still not wholly known, and ongoing studies continue to reveal new discoveries. This article reports one such discovery of another widely-distributed Palearctic species – the first record of the black mud bee *Megachile parietina* (GEOFFROY, 1785). The discovery of this species in the Maltese Islands is not only of interest from an entomological perspective as it is possible that *M. parietina* may act as a pollinator for the scarce endemic orchid *Ophrys melitensis*.

MATERIAL AND METHODS

While filming orchids in Pembroke, north-east Malta, the author encountered a dark bee, around 15 millimeters in

length, constructing a pedotrophic nest cell attached to exposed coralline limestone. After further investigation, an

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additional female and three completed nests were found, and the bee was identified to belong to the taxon *Megachile parietina* (GEOFFROY, 1785) based on morphological traits described in PRAZ (2017). The areas of Pembroke in which the bees were collected and observed are part of an expanse of coastal karstic garigue, characterized by exposed, weathered coralline limestone with shallow depressions (kamenitzas), terra-rossa soils, low-growing aromatic shrubs,

and geophytes. The area is subject to anthropic activities; a large reverse-osmosis plant occurs nearby; a metal walkway cuts across the garigue; and some parts nearer to the shore are subjected to the activities of the Armed Forces of Malta. In more disturbed areas of the garigue, such as the margins close to walkways, footpaths and roads, the vegetation becomes increasingly characterized by therophytes and ruderal species.

NEW RECORD

Megachile (Chalicodoma) parietina (GEOFFROY, 1785)

Material examined

Malta. 1 ♂ (TC), Pembroke, 3.IV.2023, T. CASSAR leg.; 1 ♀, Pembroke, 8.IV.2023, T. CASSAR obs.

Notes

This species is a widely distributed one, occurring in West, East (including North Caucasus and Crimea) and South Europe, much of the Middle East, Central Asia and North Africa (FATERYGA *et al.*, 2018). *Megachile parietina* collects particles of soil and binds them with a labial secretion, constructing dome-shaped nests containing multiple cylindrical cells provisioned with pollen and nectar – favouring that of Fabaceae – all sealed with mud. The nests are usually built directly on exposed rock surfaces and walls but may occasionally be constructed around twigs and branches (REBMANN, 1969; WESTRICH, 1989; MÜLLER *et al.*, 1997; VEREECKEN *et al.*, 2010; GOGALA, 2014). In many respects, the nesting biology of *M. parietina* closely matches that of its consubgenus *Megachile sicula* (ROSSI, 1792) which is common and widespread in the Maltese Islands and occurs in the karstic coastal garigue of Pembroke (figure 1), where the specimens of *M. parietina* were found.



Figure 1. General habitat in which bees were encountered constructing nests – coastal karstic garigue with rocky exposed ground, shallow soil and low-lying aromatic shrubs. Photo T. CASSAR.

Two females were encountered in Pembroke. The first, which was collected by the author (figure 2), had recently begun constructing a pedotrophic nest in a shallow depression in exposed limestone, with one cell complete and the wall of another still being constructed. The second was encountered 300 m away (coordinates: 35°55'59.1" N, 14°28'52.0" E) in the very final stages of completing an entire nest (also on exposed coralline limestone) by sealing the cells, and another two freshly completed nests were found less than one m from this activity (figure 3). This latter female was filmed by the author but not collected.



Figure 2. *Megachile (Chalicodoma) parietina* (Geoffroy, 1785), ♀, from Pembroke, Malta Front view and lateral view. Photo T. CASSAR.

Because of this species' widespread distribution in the Mediterranean, *M. parietina* can be assumed to be a native species which has simply remained undetected during previous samplings of Maltese Apoidea. However, the species is a large and distinctive one, having a robust build, conspicuous black colouration, wholly infuscated wings and an upper bound of length closely approaching two centimetres. Thus, it would seem unlikely to avoid detection



Figure 3. Completed nest of *M. parietina* from Pembroke, Malta.
Photo T. CASSAR.

unless particularly rare, and the possibility that it may represent an introduced species for Malta is not entirely excluded. Certainly, other hymenopterans are known to have entered the Maltese Islands (and subsequently established themselves) through the accidental transport of pedotrophic nests attached to goods, marine vessels and so on (CASSAR & MIFSUD, 2020b). However, it seems unlikely

that *M. parietina* would construct its nest on a marine vessel itself, as it tends to build its nests directly on exposed rock and, less frequently, branches and twigs (REBMANN, 1969; VERECKEN *et al.*, 2010). The most likely explanation in the view of the author, therefore, is that the bee represents a native species which has remained undetected due to (i) its rarity, (ii) the lack of previous sampling for bees carried out in a particular area to which it may be localized (Pembroke), and/or (iii) the lack of previous sampling for bees carried out during the flight period of this species.

It is interesting to note that in both areas in which the author observed females of *M. parietina* constructing nests, small populations of the endemic and scarce orchid *Ophrys melitensis* (SALK.) DEVILLERS-TERSCH. & DEVILLERS (figure 4) were in flower. So far, the only known pollinator of this plant is the male of *Megachile (Chalicodoma) sicula*, with pollinia being attached to the male's frons upon pseudocopulation (SALKOWSKI, 2000). The possibility that males of *M. parietina* could also serve well as pollinators of this orchid is not entirely excluded; *M. sicula* and *M. parietina* are closely related species (PRAZ, 2017). The author remained at the site were the second *M. parietina* female was completing its nest and closely observed the *Ophrys melitensis* flowering there for four hours (10:00 – 14:00) a day for three days (8–10 April 2023), but no males of *M. parietina* were seen pseudocopulating with *O. melitensis*. Nevertheless, the author encourages further investigation to ascertain whether this bee may be an additional pollinator of the scarce and endemic taxon *O. melitensis*.



Figure 4. One of multiple *Ophrys melitensis* plants growing about one metre from nesting *M. parietina*.
Photo T. CASSAR.

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