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Two new records of Chalcidoidea (Hymenoptera) from the Maltese Islands with notes on their biology

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ABSTRACT. Two chalcidoids are reported from the Maltese Islands for the first time: *Megastigmus pistaciae* Walker (Megastigmidae) and *Chalcis biguttata* Spinola (Chalcididae). Notes on their biology are provided, with special reference to *M. pistaciae* reared from seeds of *Pistacia lentiscus* in Malta.

KEY WORDS. Megastigmidae, Chalcididae, new records, Malta.

INTRODUCTION

The Chalcidoidea of the Maltese Islands were not studied extensively until relatively recently; a preliminary checklist was first provided by Mifsud & Askew (2016), at that time recording 147 species from the archipelago. A further thirty-three species were added by Mifsud & Askew (2019), resulting in a total of 181 known species from seventeen different families. In recent years, three species were described as new to science based on material collected from Malta namely, *Baryscapus ecballi* Cassar, Askew & Mifsud, 2018, *Mesopolobus melitensis* Askew, 2014 and *Rhaphiteltus mathildae* Askew, 2018.

Chalcidoid material reared and collected by the authors has yielded two species which are here reported for the first time from the Maltese Islands, *Megastigmus pistaciae* and *Chalcis biguttata*. The former exhibited an interesting sex ratio dissimilar to that obtained in mainland Europe and North Africa, and notes about the biology of this species are provided.

MATERIALS AND METHODS

Chalcidoid material was collected by sweep-netting and rearing from infested plant material. *Megastigmus* specimens were identified using Roques & Skrzypczyńska (2003); the *Chalcis* specimen was identified by making use of Bouček (1951). Photographs of mounted specimens were taken with an Olympus TG-5 camera, on macro mode with focus stacking, in conjunction with a Leica M80 stereomicroscope.

Megastigmus pistaciae Walker, 1871

(Figs. 1-4)

Material examined. MALTA: Mosta (Tal-Wej), 19.ix.2020, 8♀♀ & 3♂♂ (swept from *Pistacia lentiscus*), leg. T. Cassar; same location but 27.ix.2020, 42♀♀ & 48♂♂ (swept from *Pistacia lentiscus*), leg. T. Cassar. **COMINO**: near pumping station (36˚00'39.8"N 14˚20'13.8"E), 11.ix.2020, 17♀♀ & 1♂ (swept from *Pistacia lentiscus*), leg. T. Cassar; same

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data but 17.ix.2020, 80♀♀ & 10♂♂ (reared from seeds of *Pistacia lentiscus*, emerged 17-24. ix.2020), leg. D. Mifsud. **GOZO**: Sannat (Ta' Ċenċ), 2.x.2020, 2♀♀ (swept from *Pistacia lentiscus*), leg. T. Cassar; same data but 16♀♀ & 2♂♂ (reared from seeds of *Pistacia lentiscus*, emerged 2-12.x.2020), leg. T. Cassar.

Notes. *Megastigmus pistaciae* is the second megastigmid chalcidoid recorded from the Maltese Islands, the only other species known so far being *Megastigmus wachtli* Seitner, 1916, a species associated with cypress seeds (Roques *et al*., 1999). A widespread Palaearctic species, *M. pistaciae* occurs in all countries of the Mediterranean region, its distribution also ranging eastward as far as Afghanistan and China; it is also known from the Afrotropical region (Roques *et al*., 2016). It oviposits and develops within the seeds of various *Pistacia* species, including *P. terebinthus*, *P. lentiscus* (from which all material from the Maltese Islands has been collected), *P. mutica*, *P. integerrima* and *P. atlantica* (Roques & Skrzypczyńska, 2003). The adults themselves range from 2 to 3.5 mm in length, and though females are pale to dark yellow, males vary greatly in colouration; some are pale and yellow-coloured, others are much darker, with the head and thorax brown-black (Fig. 2); in the wings the infuscation near the stigma may be reduced or extensive (Fig. 3).

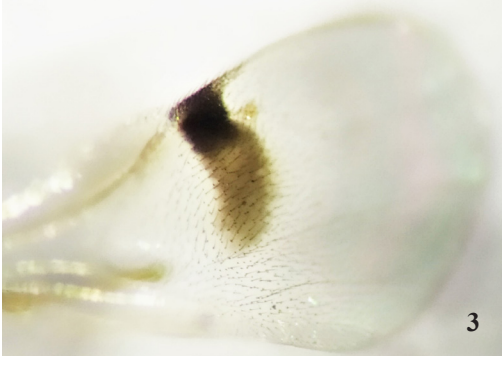

Figure 1: *Megastigmus pistaciae*, female. **Figure 2**: *M. pistaciae*, male. **Figure 3**: extensive infuscation on the wing of a male *M. pistaciae*. **Figure 4**: fruit produced by *Pistacia lentiscus*, from which material of *M. pistaciae* was reared.

Interesting to note is that, though *Megastigmus pistaciae* is considered to reproduce by thelythokous parthenogenesis, and indeed males are relatively rare in rearings from mainland Europe and North Africa, rearings and *in situ* net-sweeping in Malta have yielded a great number of males, with sex ratios as high as 1♂:7♀ (rearings) and about 6♂:5♀ (net-sweeps) - this high proportion of males has also been documented in the USA, where *M. pistaciae* occurs as an introduced species, and in Kenya where it is considered native (A. Roques, *pers. comm*., 2020).

***Chalcis biguttata* Spinola, 1808**

(Fig. 5)

Material examined. MALTA: limits of Mġarr, Wied tal-Imselliet (35°55'11.9"N 14°23'46.7"E), 4.vii. 2020, 1♂ (swept from vegetation near natural freshwater pool), leg. T. Cassar.

Notes. *Chalcis bigutatta* becomes the ninth species from the family Chalcididae known from the Maltese Islands, and the first record of the genus *Chalcis* from the archipelago. The genus is characterized by a particularly long petiole – longer in males than females – as well as a large first tergite, which constitutes about half the abdominal length; the thorax is covered with coarse punctures, and the scutellum is bilobed posteriorly. Like most chalcidids, the hind femora are noticeably swollen. *Chalcis biguttata* is a relatively large species, about 6 millimetres in length; the head is completely black, with thick but apically narrowed flagella; the legs and tegulae are marked with pale yellow; and the posterior femur bears a small basal dent. Similar to other *Chalcis* species, *C. bigutatta* is an endoparasiotoid of soldier flies in the genus *Stratiomys* (Diptera: Stratiomyidae), and thus can be found near freshwater as their hosts lay eggs in water and develop as aquatic larvae (Bouček, 1950). *Stratiomys longicornis* is common and widespread in the Maltese Islands (Ebejer, 1995), and indeed its larvae weere observed to occur in the same location as the *Chalcis biguttata* male was collected.

Figure 5: *Chalcis biguttata*, male.

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