

Diapriidae (Hymenoptera, Diaprioidea) of the Maltese Islands

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ABSTRACT. Five species, four genera, two subfamilies of Diapriidae and the family itself are all recorded as new to the Maltese Islands based on material collected from Verdala Palace by David Mifsud (DM). A provisional key to the genera of Maltese diapriids is provided to facilitate further research.

KEY WORDS. Malta, diapriids, new records, dichotomous key.

INTRODUCTION

Diapriids are small Hymenoptera, with an average body size of between 1.5 to 5.0 mm, a smooth and polished body surface, with most European species being black, brown, red or yellow in colour. They are distinguished from other Hymenoptera by their antennae, which are inserted above the clypeus, on a conspicuous transverse ledge with upwards facing antennal sockets. Most diapriids are pupal or larval-pupal endoparasitoids of Diptera but a few European species are parasitoids of ant larvae or beetle pupae. Since diapriids are mainly parasitoids of Diptera, a few species have been considered as biocontrol agents against pest flies and midges. Diapriids are most diverse in moist habitats from the temperate regions to the tropics. The subfamily Belytinae are particularly common in forests because of their association with fungus gnats, whereas the subfamily Diapriinae can also be found in drier habitats and have a wider range of hosts, also a small number are myrmecophiles (NOTTON, 1991, 1994, 1996; NOYES *et al.*, 1999). In Europe diapriids are represented by several hundred species although doubtlessly, many more remain to be discovered (JOHNSON, 1992). No species were previously recorded from the Maltese Islands.

MATERIAL AND METHODS

The specimens were collected or sourced by David Mifsud (DM) and prepared and identified by David Notton (DGN). Identification literature for many genera of European diapriids is still incomplete or preliminary, however some species are widespread and fairly easily recognised. The species presented in this paper were identified using NIXON (1980) for Diapriinae and MACEK (1996) for *Belyta*, then compared against named specimens and types in the collection of the Natural History Museum, London (NHMUK) (NOTTON, 2014). Specimens were deposited in NHMUK and DM's personal collection (DMPC). NHMUK specimens were assigned unique specimen numbers. Images were taken using a Canon EOS 550D digital camera, connected to a Leica M125 stereomicroscope and processed with Helicon Focus image stacking software. Specimen data and images for NHMUK specimens were recorded on the NHMUK database, and are publicly available through the NHMUK Data Portal (NATURAL HISTORY MUSEUM, 2014).

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**PROVISIONAL IDENTIFICATION KEY TO THE GENERA
OF MALTESE DIAPRIIDAE**

1. Female: antenna more or less thickened apically, 3rd or 4th antennal segment simple 2
 - Male: antenna not thickened apically, 3rd or 4th antennal segment modified, with emargination, projection and/or lamella 5
2. 15 antennal segments *Belyta*
 - 12 antennal segments 3
3. No veins touching anterior margin of fore wing; apex of wing notched *Coptera*
 - At least some veins touching anterior margin of forewing; apex of wing not notched 4
4. Forewing with basal vein; antenna with abrupt 3-segmented club *Basalys*
 - Forewing without basal vein; antenna with club various but if 3-segmented usually not this abrupt *Trichopria*
5. No veins touching anterior margin of forewing; apex of wing notched *Coptera*
 - At least some veins touching anterior margin of forewing; apex of wing not notched 6
6. Antenna with 3rd segment modified *Belyta*
 - Antenna with 4th segment modified 4
7. Forewing with basal vein *Basalys*
 - Forewing without basal vein *Trichopria*

ANNOTATED SPECIES LIST

DIAPRIIDAE

Diapriinae

***Basalys tritomus* Thomson, 1858**

(Fig. 1)

Material examined: Malta, Verdala Palace, near Buskett, Malaise trap, *Pinus halepensis* woodland, vii-x.2015, 1 ♀, NHMUK010576096.

Notes: This species was previously known as *Basalys tritoma* but the genus has masculine gender as explained by NOTTON (2014). *Basalys tritomus* is widespread in Europe and is well-known as a solitary endoparasitoid of puparia of the Carrot fly *Chamaepsila rosae* (Fabricius, 1794) (WRIGHT, GEERING & ASHBY, 1947) and the Fruit fly *Oscinella frit* (Linnaeus, 1758) (SIMMONDS, 1952). Additional species of *Basalys* are represented in the authors' samples from Malta but at present cannot be confidently identified to species level.



Figure 1: *Basalys tritomus* Thomson, 1858, Malta, Verdala Palace, ♀, NHMUK010576096. Scale bar 1 mm. Photo credit David G. Notton, The Natural History Museum, London.

***Trichopria fucicola* (Walker, 1834)**

Material examined: Malta, Verdala Palace, near Buskett, Malaise trap, *Pinus halepensis* woodland, xi.2014-i.2015, 2 ♀♀, NHMUK010576110, NHMUK010576111.

Notes: *Trichopria fucicola* is widespread in Europe in a wide range of habitats where wet decaying plant/fungal or dung material is found. It is a solitary endoparasitoid of puparia of small acalypterate flies, such as the lesser dung flies, Sphaeroceridae.

***Trichopria sociabilis* Masner, 1965**

Material examined: Malta, Verdala Palace, near Buskett, Malaise trap, *Pinus halepensis* woodland, vi-viii.2014, 3 ♀♀, NHMUK010576104, NHMUK010576105, DMPC; same data, 1 ♂, NHMUK010576107; same data but xi.2014-i.2015, 2 ♀♀, NHMUK010576106, DMPC.

Notes: *Trichopria sociabilis* is common and widespread in Europe and is a gregarious endoparasitoid of puparia of calypterate flies often as a pseudohyperparasitoid via Tachinidae (NIXON, 1980). Additional species of *Trichopria* are represented in the authors's samples from Malta but at present cannot be confidently identified to species level.

***Coptera* sp.**

Material examined: Malta, Verdala Palace, near Buskett, Malaise trap, *Pinus halepensis* woodland, xi.2014-i.2015, 1 ♂, NHMUK010576113; same data but vii-x.2015, 1 ♀, NHMUK010576112.

Notes: The specimen of *Coptera* could not be identified to species level, however it is a distinctive and important genus so is useful to include in this study. *Coptera* species are widespread in Europe and are solitary endoparasitoids of acalypterate Diptera, including some economically important species of Tephritidae (AMINI, SADEGHI, LOTFALIZADEH & NOTTON, 2014).

Belytinae

Belyta depressa Thomson, 1858

Material examined: Malta, Verdala Palace, near Buskett, Malaise trap, *Pinus halepensis* woodland, xi.2014-i.2015, 6 ♀♀, NHMUK010576114, NHMUK010576115, NHMUK010576116, NHMUK010576117, NHMUK010576118, NHMUK010576119, DMPC; same data, 1 ♂, NHMUK010576124; same data but vii-x.2015, 3 ♀♀, NHMUK010576121, NHMUK010576122, NHMUK010576123, DMPC; same data but vii-x.2015, 1 ♂, NHMUK010576125; same data but i.2016-iii.2016, 1 ♀, NHMUK010576120.

Notes: A very common and widespread species in Europe found in a wide variety of damp habitats, particularly parkland and forest. The host is unknown (MACEK, 1996).

Belyta sanguinolenta Nees, 1834

Material examined: Malta, Verdala Palace, near Buskett, Malaise trap, *Pinus halepensis* woodland, xi.2014-i.2015, 32 ♀♀, NHMUK010576134, NHMUK010576135, NHMUK010576136, NHMUK010576137, NHMUK010576138, NHMUK010576139, NHMUK010576140, NHMUK010576141, NHMUK010576142, NHMUK010576143, NHMUK010576144, NHMUK010576145, NHMUK010576146, NHMUK010576147, NHMUK010576148, NHMUK010576149, NHMUK010576150, NHMUK010576151, NHMUK010576152, NHMUK010576153, NHMUK010576154, NHMUK010576155, NHMUK010576156, NHMUK010576157, NHMUK010576164, DMPC; same data, 1 ♂, NHMUK010576170; same data but vii-x.2015, 8 ♀♀, NHMUK010576126, NHMUK010576127, NHMUK010576128, NHMUK010576129, NHMUK010576130, NHMUK010576131, NHMUK010576132, NHMUK010576133, DMPC; same data but vii-x.2015, 1 ♂, NHMUK010576169; same data but i-iii.2016, 3 ♀♀, NHMUK010576166, NHMUK010576167, NHMUK010576168.

Notes: A common and widespread species in Europe found in a wide variety of damp habitats, particularly parkland and forest. The host is unknown (MACEK, 1996).

DISCUSSION

Five species, four genera, two subfamilies of Diapriidae and the family itself are all recorded as new to the Maltese Islands, based on material collected from the Verdala Palace by DM. Some unidentified species of *Trichopria* and *Basalys* are also reported here. Any discussion of the Maltese diapriid fauna known so far can only be considered preliminary since this is a limited collection and further collecting in a wider range of habitats will certainly reveal more species and genera. So far, all species identified are common European species and none is endemic to Malta. It is however useful to note the occurrence of *Basalys tritonus*, since it is a potentially beneficial parasitoid of agricultural pests.

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