

First report of *Palloptera muliebris* (Harris, 1780) (Diptera: Pallopteridae) in Calabria (Southern Italy)

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ABSTRACT

Palloptera muliebris (Harris, 1780) (Diptera: Pallopteridae) has been recorded for the first time in the region Calabria (Southern Italy). Several individuals of the species, identified on morphological bases, were captured within a monitoring project of Diptera Brachycera in protected areas and in a rural area between 2018 and 2021.

Key words: Calabria, Italy, *Palloptera muliebris*, Pallopteridae, protected areas, rural area.

RIASSUNTO

Prima segnalazione di *Palloptera muliebris* (Harris, 1780) (Diptera: Pallopteridae) in Calabria

La presenza di *Palloptera muliebris* (Harris, 1780) (Diptera: Pallopteridae) è stata segnalata per la prima volta nella regione Calabria. Numerosi individui di questa specie, identificati su base morfologica, sono stati catturati nell'ambito di un progetto di monitoraggio dei Diptera Brachycera in aree protette e in una area rurale, condotto tra il 2018 e il 2021.

Parole chiave: aree protette, area rurale, Calabria, Italia, *Palloptera muliebris*, Pallopteridae.

INTRODUCTION

The members of the family Pallopteridae, belonging to the order Diptera, are commonly known as “flutter flies” because of the habit of males to vibrate their wings (MCALPINE *et al.*, 1987). The adults are 3-5 mm long and have a greyish-yellowish body, usually with wings characterized by brown spots of different shape according to the species (MCALPINE *et al.*, 1987). The family includes 12 genera with about 70 species (PAPE *et al.*, 2011) whose biology is not well known. The larvae of some species live under the bark of conifers and deciduous trees, sometimes preying on larvae of Coleoptera belonging to the families Cerambycidae and Scolytidae. In other species, the larvae have been found on flower heads and stems of Asteraceae and Apiaceae (MCALPINE *et al.*, 1987; ROTHERAY & LYSZKOWSKI, 2012; ROTHERAY, 2014). The adults of other species have been found on flowers of the same plant families, but there also saproxylic species whose adults are found on dead or cut wood (MCALPINE *et al.*, 1987; ROTHERAY & LYSZKOWSKI, 2012).

A monitoring project on presence and ecology of Diptera Brachycera in the region Calabria (Southern Italy) was conducted between 2018 and 2021 in protected areas and a rural area. Within this project, the presence of *Palloptera muliebris* (Harris, 1780) (Diptera: Pallopteridae) was recorded for the first time in the region Calabria (Southern Italy).

MATERIALS AND METHODS

A monitoring project on Diptera Brachycera involving protected areas in Calabria (Parco Nazionale dell'Aspromonte, Parco Nazionale della Sila and Parco Regionale delle Serre Calabresi) and a rural area inside the campus of University of Calabria (Rende, Cosenza, Italy), used as an experimental area, was conducted between 2018 and 2021. Three types of traps were used: bait bottle traps (HWANG & TURNER, 2005; GRECO *et al.*, 2014), Malaise traps (TOWNES, 1972) and yellow pan traps (SHRESTHA *et al.*, 2019). The Diptera collected were selected and identified by a specific dichotomous key and a guide (COLLIN, 1951; STOREY, 2018). Some individuals were dry preserved and others preserved in 80% ethanol in test tubes. All samples were included in the entomological collection of the University of Calabria.

RESULTS AND DISCUSSION

Individuals of *Palloptera muliebris* (Harris, 1780) (Diptera: Pallopteridae) (Fig. 1a and b) were captured in Parco Nazionale dell'Aspromonte (Fig. 2a and b), in Parco Regionale delle Serre Calabresi (Fig. 2c-e) and in the rural area in the campus of the University of Calabria (Fig. 2f). No individuals of *P. muliebris* were captured in Parco Nazionale della Sila. Here below are reported the sites where the species was found in

the areas, together with the geographic coordinates, environments, altitude, type of trap, month, year and number of individuals captured.

Parco Nazionale dell'Aspromonte

- Gambarie, municipality Santo Stefano D'Aspromonte (Reggio Calabria), 38.153833 N 15.832750 E, 1370 m asl, pine forest. Bait bottle trap: July, 2018, 1; August, 2018, 1; September, 2019, 1.

- Monte Basilicò - Torrente Listi, municipality Santo Stefano D'Aspromonte (Reggio Calabria), 38.146592 N 15.835544 E, 1400 m asl, beech forest. Bait bottle trap: July, 2018, 1.

- Municipality Cardeto (Reggio Calabria), 38.120861 N 15.886556 E, 1650 m asl, beech forest. Bait bottle trap: June, 2018, 4.

Parco Regionale delle Serre Calabresi

- Municipality San Sostene (Catanzaro), 38.593662 N 16.424006 E, 1030 m asl, grazing land. Bait bottle trap: July, 2020, 1.

- Municipality San Sostene (Catanzaro), 38.592224 N 16.422994 E, 1010 m asl, beech forest. Bait bottle trap: July, 2020, 3; September, 2020, 3; July, 2021, 1; August, 2021, 3; September, 2021, 2.

- Municipality Brognaturo (Vibo Valentia), 38.580150 N 16.414000 E, 1060 m asl, pine forest. Bait bottle trap: July, 2020, 1; September, 2020, 1.

- Municipality Fabrizia (Vibo Valentia), 38.499417 N 16.245778 E, 1189 m asl, beech forest. Bait bottle trap: October, 2020, 1.

Campus of the University of Calabria

- Municipality Rende (Cosenza), 39.359783 N 16.231784 E, 220 m asl, rural area with juvenile trees. Bottle trap: May, 2020, 16; June, 2020, 10; September, 2020, 2; October, 2020, 152; November, 2020, 4; December, 2020, 1; May, 2021, 3; June, 2021, 9; August, 2021, 2; September, 2021, 10; October, 2021, 138; September, 2021, 9; December, 2021, 3. Yellow pan trap: July, 2021, 1.

A total of 384 adults were captured, of which 383 with bait bottle traps and only 1 with pan traps. No individuals of *P. muliebris* were captured by Malaise traps. These data suggest a marked preference of the species towards olfactory cues of decomposing material, supporting the saprophagous habits of *P. muliebris*. Information about the biology and ecology of this species are limited. The adults are known to be attracted by traps loaded with a mixture of vinegar, brandy, beer and food-grade liquid (SLADONJA *et al.*, 2023). The adults are often found on windows (SÉGUY, 1934) and in indoor environments (CANNINGS & GIBSON, 2019). In Ireland the adults have been found in oak woods towards the end of summer (SPEIGHT, 1986). The larvae have been detected under pine bark, feeding on powderpost of Bostrichidae (SÉGUY, 1934) and recently as saproxylophagous and carnivorous in tunnels dug by xylophagous Coleoptera (MALTZEFF & RIVOSECCHI, 2013).

In our study, the highest number of individuals (360) were captured in the rural area in the campus of the University of Calabria, followed by the 4 sites in Parco Regionale delle Serre Calabresi (16) and by the 3 sites in Parco Nazionale dell'Aspromonte (8). Based on the individuals captured, the altitude range of the species is between 220 and 1650 m, with higher

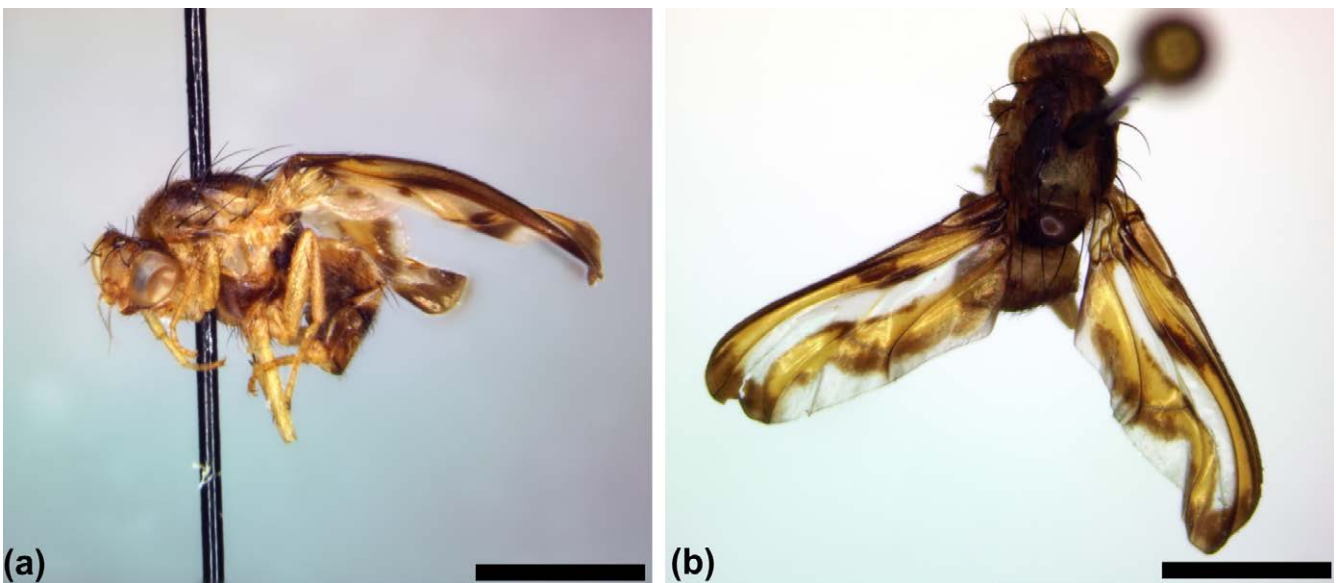


Fig. 1. Adult of *Palloptera muliebris*. Habitus in lateral view (a) and dorsal view (b). Scale bar = 2 mm.

abundance at lower altitude (220 m). As expected, at lower altitude the period of the year when *P. muliebris* was found was longer, from May to December, while at higher altitude the species was found only from June to October.

In Europe the species was previously reported in Ireland (SPEIGHT, 1986; WALLACE & O'CONNOR, 1997), United Kingdom (EMLEY, 1992; ROTHERAY & LYSZKOWSKI, 2012; WEDDLE, 2019), Switzerland (MERZ, 1997), Belgium (MERZ, 1997; GROOTAERT *et al.*, 2023), Austria (MERZ, 1997), and recently in Croatia (SLADONJA *et al.*, 2023). According to the zoological taxonomy index Fauna Europaea (<https://fauna-eu.org/>), the species is present in all countries of Western Europe. Out-

side Europe, the species has been reported in British Columbia (Canada) (CANNINGS & GIBSON, 2019).

Concerning the Italian territory, based on the Checklist of the species of the Italian fauna, *P. muliebris* is indicated as present in "N" (Northern Italy) and "S" (Peninsular Italy) (<https://www.faunaitalia.it/checklist/>). In detail, the species was detected in the region Lazio (MALTZEFF & RIVOCCHI, 2013) and two specimens of *P. muliebris* were found among samples collected in region Sicily in 1999 (EBEJER & NICOLSI, 2022).

The first report on the presence of *P. muliebris* in region Calabria suggests that more studies should be conducted about the complex dipteran fauna of this region.



Fig. 2. Examples of sites in the region Calabria where *P. muliebris* was found. Parco Nazionale dell'Aspromonte: (a) pine forest, (b) beech forest; Parco Regionale delle Serre Calabresi: (c) pine forest, (d) beech forest, (e) grazing land; Campus of the University of Calabria: (f) rural area.

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