

First report of the Curtonotidae Enderlein, 1914 family and the *Curtonotum anus* (Meigen, 1830) species (Diptera Ephydroidea) from the Sicilian fauna (Italy)

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ABSTRACT

The authors, on the basis of recent research on the pollinators of *Galium litorale* Gussone, 1827 (Gentianales Rubiaceae), carried out in western Sicily (Italy), report *Curtonotum anus* (Meigen, 1830) for the first time in this island. This species belongs to the Curtonotidae Enderlein, 1914 family, which is also new to the island. With this report, there are 3 families of Ephydroidea known for Sicily. In this work, some ecological considerations on *C. anus* are also reported.

KEY WORDS

Curtonotidae; *Galium litorale*; *Curtonotum anus*; Sicilian fauna.

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INTRODUCTION

During a project (LIFE20 NAT/IT/001468 SEEDFORCE “Using SEED banks to restore and reinFORCE the endangered native plants of Italy”) intended to deepen knowledge on the reproductive strategies of *Galium litorale* Gussone, 1827, a species of Rubiaceae family endemic to western Sicily, a dipteran was collected which, upon closer examination, it was possible to attribute to the Curtonotidae family and to the *Curtonotum anus* (Meigen, 1830) species, both new for the Sicilian fauna, thus bringing the number to 3 of Ephydroidea families known from the island.

The Curtonotidae Enderlein, 1914 are a family of dipterans Ephydroidea (Duda, 1934) and widespread mainly in tropical regions with over 100 species included in 4 genera (Lindsay et al., 2019; Evenhuis & Pape, 2023) and represented in Europe with only one taxon, the *C. anus* (Kirk-Spriggs &

Freidberg, 2007). Knowledge on the biology of this family is incomplete and mostly limited to reports regarding the habitat and trophic niche. Greathead (1958) found the larvae of *Curtonotum* Macquart, 1843 on decomposing eggs of *Schistocerca gregaria* (Forskål, 1775) and it was hypothesized (McAlpine, 1987; Papp, 1998) that the juvenile stages of this genus establish a trophic relationship with the eggs of Orthoptera Caelifera, on which they would develop as parasitoids or oophagous predators. Adults of *Cyrtona albomacula* (Curran, 1933) have been found on human faeces in Zimbabwe (Cuthbertson, 1936).

MATERIAL AND METHODS

Study area

The study area is located in the municipal territory of Salemi (Trapani), Borgo Aquila,

37°44'41.5"N, 12°43'29.9"E (western Sicily, Italy). The site is characterized by a calcarenitic substrate on which stands an arid xerophilous garrigue dominated by *Chamaerops humilis* Linnaeus, 1753 and *Ampelodesmos mauritanicus* (Poir.) on which several tufts of *G. litorale* are planted (Fig. 1).

Sampling methods

Curtonotum anus was collected with a timed direct collection as described in Bonelli et al. (2022). This method consists in the vacuum collection of all visitors who have stopped inside the floral corolla of *G. litorale* for at least 5 seconds during a 15 minute session. For identification of this species, we used as reference Kirk-Spriggs & Freidberg (2007), Oosterbroek (2006) and Ozerov & Krivosheina (2013). The sample was preserved in a 5 ml "Eppendorf" tube containing 70° alcohol and kept in the C. Muscarella collection (Palermo, Italy).

RESULTS

Curtonotum anus (Meigen, 1830) (Fig. 2)
= *Diastata anus* Meigen, 1830: 95

MATERIALS. ITALY • 1 specimen, Sicily (Trapani), Salemi, Borgo Aquila, 37°44'41.5"N, 12°43'29.9"E, 200 m asl, 19 Jun. 2023, legit C. Muscarella.

DISTRIBUTION. Species with a Palearctic distribution known for Albania, Austria, France, Greece, Hungary, Israel, Italy, Kazakhstan, Moravia, Romania, Serbia, Slovakia, Turkey, Turkmenistan, Pakistan and, doubtfully, in Japan (Okada, 1960; Papp, 1984, Kirk-Spriggs & Freidberg, 2007; Ozerov & Krivosheina, 2013). In Italy it is known from Trentino Alto Adige and Calabria (Bächli et al., 1995; Stoch, 2003; Rossi, 1993; Kirk-Spriggs & Freidberg, 2007; Roháček, 2016).

BIOLOGY. Information on the biology and ecology of *C. anus* is scarce and fragmentary. It has been hypothesized by some authors (Meier et al., 1997; Kirk-Spriggs & Freidberg, 2007; Roháček, 2016), that, similarly to the related species *C. helvum* (Loew, 1862), the larval stages are linked to the eggs of Orthoptera Caelifera, on which they would develop as parasitoids or oophagous predators. Adults of *C. anus* are associated, in the Mediterranean area, with sandy habitats and are found on shaded, sandy or muddy river banks (Papp, 1998;



Figure 1. Study area of *Curtonotum anus*: Salemi, Borgo Aquila (Sicily, Italy).

Kirk-Spriggs & Freidberg, 2007; Roháček, 2016). They have been cited as crepuscular or even nocturnal, inactive and hidden in shaded locations during daylight hours and attracted to decaying substrates (dung, insect carcasses, etc.) (Roháček, 2016). Adults are attacked by Laboulbeniales ascomycetes (Rossi, 1993). It is therefore of some interest to have observed this species in a predominantly xeric habitat, in the hottest hours of the day, and intent on sucking the nectar of *G. litorale*, suggesting a broader ecological niche than previously known.

REMARKS. *Curtonotum anus* was described on a specimen labeled “Italien” preserved at the Zoological Museum in Copenhagen by Meigen (1830) and since then it has only been cited for two localities in Trentino Alto Adige (Rossi, 1993; Kirk-Spriggs & Freidberg 2007) and, generically, for Calabria (Roháček, 2016). The specimen collected is therefore of extreme interest because it represents the first report of this family for the Sicilian fauna.

DISCUSSION AND CONCLUSION

The presence of *C. anus* in Sicily expands the known range of this species, especially for the Italian territory.

Considering also the little information on the biology of this species, it is therefore of some interest to have observed this species in a predominantly xeric habitat, in the hottest hours of the day, and intent on sucking the nectar of *G. litorale*, suggesting a broader ecological niche than previously known.

The discovery of this new family confirms how knowledge on the Sicilian diptera fauna, to date, can still be considered scarce and fragmentary. In the first study on Sicilian dipterans Bezzi & de Stefani-Perez (1897) cited 850 species for Sicily claiming that they were less than a quarter of those actually present; Stoch (2003), after more than a century, reports only 1300 taxa for the island. Over the last twenty years, various contributions have increased knowledge on Sicilian diptera with the reporting of many new species or even entire families (Ebejer & Nicolosi, 2022). The information on the real presence of this group in Sicily is still unsatisfactory in relation, above all, to the importance that dipterans play in numerous ecosystems such as those linked to pollination (Ssymank et al., 2011; Orford et al., 2015). This gap is directly related to



Figure 2. *Curtonotum anus* from Salemi, Borgo Aquila (Sicily, Italy). Photo by I. Sparacio.

the small number of entomologists working on these groups (Hopkins & Freckleton, 2002; Hochkirch, 2022).

It would therefore be desirable for the relevant bodies to begin new research and study projects to improve knowledge of those systematic groups that are still little known but of great importance in the balance of natural ecosystems.

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