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CONOPID FLIES IN TWO SITES OF FRIULI VENEZIA GIULIA (DIPTERA CONOPIDAE)*

DITTERI CONOPIDI IN DUE SITI DEL FRIULI VENEZIA GIULIA (DIPTERA CONOPIDAE)

Abstract - The Conopid flies (Diptera Conopidae) are solitary endoparasitoids, mainly of Aculeate Hymenoptera. At present, 62 Conopid species are known in Italy. In the years 1997-2000 Conopid flies were studied in two sites of Friuli Venezia Giulia (north-eastern Italy) characterized by a different degree of naturalness. Altogether, 13 Conopid species were found; 12 species were observed in the more natural site and 7 in the other. *Conops silaceus* WIEDMANN in MEIGEN, 1824 was the more frequent. The highest number of specimens and species was collected in August. The adults were found on several blooming herbaceous plants, mainly Compositae, but also Dipsacaceae, Labiatae, Ranunculaceae, Leguminosae, Boraginaceae and Convolvulaceae; the flowers of these plants are frequently visited by their potential hosts.

Key words: Diptera, Conopidae, Entomofauna, Biodiversity, Northern Italy.

Riassunto breve - I Ditteri appartenenti alla famiglia dei Conopidi sono endoparassitoidi solitari soprattutto di Imenotteri Aculeati. Attualmente sono note per l'Italia 62 specie. Negli anni 1997-2000 è stato condotto uno studio sui Conopidi in due siti del Friuli Venezia Giulia caratterizzati da un differente livello di naturalità. Nel complesso sono state reperite 13 specie di Conopidi, 12 nel sito più naturale e 7 nell'altro sito. La specie più frequente è risultata *Conops silaceus* WIEDMANN in MEIGEN, 1824. Il numero più elevato di esemplari e di specie è stato rilevato in agosto. Gli adulti sono stati osservati su diverse piante erbacee in fioritura, per lo più Compositae, ma anche Dipsacacee, Labiate, Ranunculacee, Leguminose, Boraginacee e Convolvulacee; i fiori delle stesse piante sono frequentemente visitati anche dai loro potenziali ospiti.

Parole chiave: Ditteri, Conopidae, Entomofauna, Biodiversità, Italia settentrionale.

Introduction

The larvae of Conopid flies (Diptera Conopidae) are solitary endoparasitoids of adult Aculeate Hymenoptera, in particular Apoidea and Vespidae; a few species are parasitoids of Orthoptera. Females assault the host while flying and very quickly introduce one egg into the host abdomen by means of a particular organ (theca).

(*) First contribution to the knowledge of the Conopid flies.

The adults frequent flowers of several plants, foraging for nectar and acting also as pollinators; the same plants are habitually visited also by their potential hosts.

Approximately 170 Conopid species are recorded from the Palaearctic region (CHVÁLA & SMITH, 1988); 62 species, belonging to 11 genera, are known for Italy (RIVISECCHI & SCARAMOZZINO, 1995; MEL, 2000).

In this note the results of a study on the Conopid flies in two sites of Friuli Venezia Giulia are reported.

Materials and methods

The survey was carried out during 1997-2000 in two sites of the Friuli Venezia Giulia region (north-eastern Italy), in the province of Udine; the sites are characterized by different degrees of naturalness:

- Site 1 (S1), locality S. Osvaldo (90 m u.s.l.), southern periphery of Udine; the site is located in a flat strongly anthropized area with annual and perennial crops, buildings and roadways;
- Site 2 (S2), locality Pagnacco (160 m u.s.l.), about ten kilometres north of Udine; the site is located in a hilly area in a semi-natural context, with scattered hedges, woods, permanent meadows and annual crops.

In each site samplings were carried out monthly from April to September on sunny days. At each sampling the Conopid flies were captured with a sweep net on blossoming herbaceous plants for about one hour.

In the laboratory the specimens were prepared and then identified using the keys of CHVÁLA (1961; 1965), SMITH (1969), ZIMINA (1989) and RIVISECCHI (1996), and by comparison with specimens from the Department collections. The scientific nomenclature is that of the checklist of the Italian fauna (RIVISECCHI & SCARAMOZZINO, 1995).

Results and discussion

In the two areas 60 specimens of Conopidae, belonging to 7 genera and 13 species, were collected (tab. I). Specimens of several species were found in few numbers, suggesting that in the two sites some Conopid populations are present at low density.

The highest number of specimens (49) and species (12) was observed in site 2, where the environment presents a good level of naturalness, while 11 specimens belonging to 7 species were found in the other site; 6 species were recorded in both sites (tab. I). *Conops silaceus* WIEDMANN in MEIGEN, 1824 was the species more frequently caught.

The finding of 12 Conopid species in site 2 suggests a high level of biodiversity in the area. In fact, in recent preliminary studies carried out in two natural environments of northern

Species	S1 No.	S2 No.	Months	Plants visited	Hosts (rielaborated from 1, 2)
<i>Conops ceriaeformis</i> MEIGEN, 1824	-	6	VIII, IX	<i>Mentha longifolia</i>	unknown (probably Apoidea and Vespidae)
<i>Conops flavipes</i> L., 1758	-	1	VIII	<i>Mentha longifolia</i>	<i>Bombus</i> spp., <i>Osmia</i> spp., <i>Vespula</i> sp.
<i>Conops scutellatus</i> MEIGEN, 1804	-	3	VIII	<i>Mentha longifolia</i> , <i>Ranunculus acris</i>	Vespidae
<i>Conops silaceus</i> WIEDMANN in MEIGEN, 1824	2	16	VIII, IX	<i>Taraxacum officinale</i> , <i>Scabiosa columbaria</i>	unknown (probably Apoidea)
<i>Conops vitellinus</i> LOEW, 1847	-	1	VIII	<i>Mentha longifolia</i>	unknown (probably Apoidea and Vespidae)
<i>Physocephala vittata</i> (FABRICIUS, 1794)	1	5	VIII, IX	<i>Mentha longifolia</i> , <i>Centaurea nigrescens</i> , <i>Trifolium pratense</i> , <i>Ranunculus acris</i>	<i>Bombus</i> spp., <i>Apis</i> sp., <i>Anthophora</i> spp., <i>Eucera</i> spp., <i>Megachile</i> spp., <i>Halictus</i> spp., <i>Chalicodoma</i> spp., Vespidae, <i>Sphingonotus</i> spp.
<i>Zodion cinereum</i> (FABRICIUS, 1794)	1	2	VII, VIII	<i>Mentha longifolia</i> , <i>Helianthus annuus</i>	<i>Halictus</i> spp., <i>Hyleus</i> spp.
<i>Myopa testacea</i> (L., 1767)	1	1	IV, VI	<i>Myosotis arvensis</i> , <i>Crepis taraxacifolia</i>	unknown (probably Apoidea and Vespidae)
<i>Melanosoma bicolor</i> (MEIGEN, 1824)	1	-	VI	<i>Centaurea scabiosa</i>	unknown
<i>Thecophora fulvipes</i> (ROBINEAU-DESVOIDY, 1830)	4	4	VI, VII, VIII, IX	<i>Ranunculus acris</i> , <i>Senecio inaequidens</i> , <i>Lapsana communis</i> , <i>Convolvulus arvensis</i> , <i>Taraxacum officinale</i> , <i>Scabiosa columbaria</i>	unknown (probably <i>Halictus</i> spp.)
<i>Thecophora melanopa</i> RONDANI, 1857 *	-	2	VIII	<i>Mentha longifolia</i> , <i>Ranunculus acris</i>	unknown (probably <i>Halictus</i> spp.)
<i>Sicus abdominalis</i> KRÖBER, 1915	1	1	VI	<i>Trifolium repens</i> , <i>Scabiosa triandra</i>	unknown
<i>Sicus ferrugineus</i> (L., 1761)	-	7	V, VI	<i>Crepis taraxacifolia</i> , <i>Crepis foetida</i> , <i>Succisa pratensis</i>	<i>Bombus</i> spp.
total specimens	11	49			
total species	7	12			

1) SMITH, 1969; 2) TOMASOVIC, 2000.

* one specimens (male) was identified as *Thecophora prope melanopa*.

Tab. I - Conopid species, number of specimens collected in the two sites (S1 and S2), months of collection (i. e. VIII = August), blooming plants visited and indication of the potential hosts.

- Specie di Conopidi, numero di esemplari raccolti nei due siti (S1 e S2), mesi di raccolta (es. VIII = agosto), piante in fioritura visitate e indicazioni sui potenziali ospiti.

Italy a lower number of Conopid species was found: 5 species in the "Bosco della Fontana" (Lombardy region, province of Mantova) (MEL, 2002) and 5 species in the "Oasi di Campotto" (Po Delta, Emilia Romagna region, province of Ferrara) (SOMMAGGIO, 2003). In a wide area on

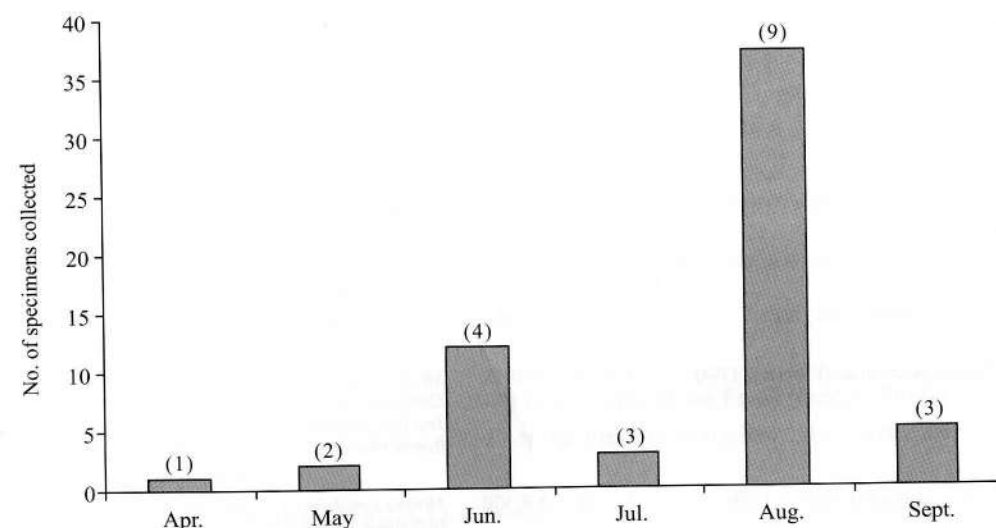


Fig. 1 - Number of Conopid specimens collected in the two sites in the different months (in brackets the number of species found in the month).

- Numero di esemplari di Conopidi raccolti nei due siti nei diversi mesi (fra parentesi il numero di specie reperite nel mese).

the outskirts of Rome (central Italy), instead, 29 Conopid species were found during investigations conducted for almost a century (RIVISECCHI & DI GIROLAMO, 2002).

Conopid specimens were found from April to September (tab. I). The highest number of specimens (37) and species (9) was caught in August; 12 specimens belonging to 4 species were collected in June (fig. 1).

Conopid adults were collected on several flowering plants belonging mainly to the Compositae family (genera *Taraxacum*, *Centaurea*, *Crepis*, *Lapsana*, *Helianthus*, *Senecio*) in agreement with the data of TOMASOVIC (2000) relative to Belgium and Luxembourg; adults were also observed on flowering plants of other families: Dipsacaceae (*Scabiosa*, *Succisa*), Labiatae (*Mentha*), Ranunculaceae (*Ranunculus*), Leguminosae (*Trifolium*), Boraginaceae (*Myosotis*) and Convolvulaceae (*Convolvulus*). Flowers of *Mentha longifolia* were visited by 7 Conopid species. In the same sites, the plants on which the flies were caught are frequently visited also by several species of Apoidea (QUARANTA et al., 2004).

On the basis of the literature, the potential hosts of the Conopid flies observed in this study are first of all Apoidea, then Vespidae and, in a single case, Orthoptera (Acrididae) (tab. I). Among the Apoidea, species belonging to genera *Bombus*, *Halictus*, *Osmia*, *Megachile* are victims of Conopid flies; these wild bees are the most efficient agents in the cross pollination of cultivated or wild plants. Instead, honey bees (*Apis mellifera* L., 1758) do not seem to be attacked by Conopids, although the possible parasitism by *Physocephala*

vittata (FABRICIUS, 1794) has been recorded (ZIMINA, 1989); *P. vittata* has the most elevated number of potential hosts.

As parasitoids, the Conopid flies can be included among bioindicator organisms of environmental quality in agroecosystems.

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