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Distribution and host plants of the genus *Dicyphus* in the Alpine valleys of NW Italy

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Abstract

The genus *Dicyphus* Fieber includes zoophytophagous mirid bugs, some of which are well-known as effective pest control agents in horticultural crops in Europe. To complete the information gathered on their distribution and host plants in northwestern Italy, *Dicyphus* species were sampled in eighteen valleys of Piedmontese Alps, from June to September 2000. The collected species were *Dicyphus* (*Brachyceroea*) *geniculatus* (Fieber), *D.* (*B.*) *globulifer* (Fallén), *D.* (*B.*) *ononidis* Wagner, *D.* (*Dicyphus*) *cerastii* Wagner, *D.* (*D.*) *epilobii* Reuter, *D.* (*D.*) *errans* (Wolff), *D.* (*D.*) *escalerae* Lindberg, and *D.* (*D.*) *flavoviridis* Tamanini. The Alpine valleys of Piedmont host seven of the sixteen Italian *Dicyphus* species, and *D. cerastii* is here recorded for the first time in Italy. *D. errans* and *D. flavoviridis* were the most abundant and widespread species, characterized by a broad range of host plants. Therefore, wild host plants are a good reservoir of *D. errans*, so far the only species reported as a useful pest predatory bug in horticultural crops, both in the open air and in greenhouses, in northwestern Italy.

Key words: Heteroptera Miridae, pest control agent, faunistics, zoophytophagy, Piedmontese Alps.

Introduction

The genus *Dicyphus* Fieber, 1858, includes zoophytophagous mirid bugs, some of which are well-known for their role in the control of several pests of horticultural crops in Europe. The genus is organized in four subgenera, and includes more than 20 species in the Mediterranean region. Within subgenera, species may be grouped according to their morphology; however general external features are not reliable when identifying *Dicyphus* species, so the characters to be taken into account are biometry and male genitalia.

In Italy, the predatory activity of Dicyphini on different preys and host plants has been reported (Arzone *et al*., 1990; Calabrò and Nucifora, 1993; Tavella *et al.*, 1997). In particular, *Dicyphus* (*Dicyphus*) *errans* (Wolff) is the species usually found in horticultural crops of northwestern Italy, but other *Dicyphus* species, also reported in Italy, have been observed elsewhere in the crops of the Northmediterranean Basin. With the aim to contribute to the knowledge on this group, surveys were carried out to assess distribution and host plants of the species of the genus *Dicyphus* in horticultural areas of northwestern Italy (Tavella and Goula, 2001). The present work is a complement to those previous data, through sampling in the valleys of Piedmontese Alps.

Materials and methods

Dicyphus species were collected on different herbaceous plants in the valleys of Piedmontese Alps from June to September 2000; valleys from North to South of Piedmont, and number of samples (in brackets) were: Antigorio and Devero Valleys (9); Sesia Valley (5); Canavese (5); Lanzo Valleys (5); Susa Valley (9); Chisone, Germanasca and Pellice Valleys (17); Upper Po Valley (3); Varaita Valley (13); Maira and Grana Valleys (7); Stura and Gesso Valleys (15); Pesio, Corsaglia and Upper Tanaro Valleys (10). Several plants were prospected, and mirids were collected by beating plants on a white canvas (700×700 mm). Samples were put separately per plant species into glass vials with ethanol 70% and transferred to the laboratory where individuals were then counted and identified according to Ribes and Baena (2006), Tamanini (1949), and Wagner (1951). All sampled plants, on which *Dicyphus* species were or were not found, were also brought to the laboratory where they were identified using Pignatti (1997).

Results and discussion

During surveys, eight *Dicyphus* species were collected (table 1 and figure 1). Some of them were found on various plants showing a wide host range, such as *D. errans* and *Dicyphus* (*Dicyphus*) *flavoviridis* Tamanini, whereas the others were strictly associated with one or two plants, like *Dicyphus* (*Dicyphus*) *epilobii* Reuter, *Dicyphus* (*Brachyceroea*) *ononidis* Wagner, *Dicyphus* (*Brachyceroea*) *globulifer* (Fallén) and *Dicyphus* (*Dicyphus*) *escalerae* Lindberg (table 1). The former two species were very widespread in the Alpine valleys of Piedmont and represented 4/5 of the totally collected samples (with about 900 examined adults), because of their broad range of host plants and the abundance of their host plants in the investigated territory. Moreover, the presence of *Dicyphus* (*Dicyphus*) *cerastii* Wagner is here reported for the first time in Italy.

Comparing *Dicyphus* species reported in horticultural areas of Piedmont (Tavella and Goula, 2001), *Dicyphus* (*Brachyceroea*) *albonasutus* Wagner and *Dicyphus* (*Dicyphus*) *eckerleini* Wagner, collected on *Silene* spp., and on *Geranium* spp. and *Galeopsis tetrahit* L., respectively, were not found in the Alpine valleys, whereas

Table 1. Species of the genus *Dicyphus*, with their host plants, sampled in the Alpine valleys of Piedmont in 2000.

Dicyphus species	Host plants
Dicyphus (*Brachyceroea*) *geniculatus* (Fieber 1858)	*Salvia glutinosa* L., *Digitalis grandiflorum* Miller
Dicyphus (*Brachyceroea*) *globulifer* (Fallén 1829)	*Silene alba* (Miller) Krause, *Silene dioica* (L.) Clairv., *Silene* spp.
Dicyphus (*Brachyceroea*) *ononidis* Wagner 1951	*Ononys repens* L., *Ononys spinosa* L.
Dicyphus (*Dicyphus*) *cerastii* Wagner 1951	*S. glutinosa*, *D. grandiflorum*
Dicyphus (*Dicyphus*) *epilobii* Reuter 1883	*Epilobium hirsutum* L.
Dicyphus (*Dicyphus*) *errans* (Wolff 1804)	*Antirrhinum majus* L., *Calendula officinalis* L., *Circaea lutetiana* L., *D. grandiflorum*, *Galeopsis tetrahit* L., *Geranium pyrenaicum* Burm., *Geranium robertianum* L., *Geranium rotundifolium* L., *Geranium* sp., *Hieracium* sp., *S. glutinosa*, *S. alba*, *S. dioica*, *Solanum nigrum* L., *Stachys sylvatica* L.
Dicyphus (*Dicyphus*) *escalerae* Lindberg 1934	*A. majus*
Dicyphus (*Dicyphus*) *flavoviridis* Tamanini 1949	*Calamintha nepeta* (L.) Savi, *C. lutetiana*, *Hieracium* sp., *E. hirsutum*, *G. tetrahit*, *G. pyrenaicum*, *G. robertianum*, *G. rotundifolium*, *Geum molle* Vis. et Pančić, *O. repens*, *S. glutinosa*, *S. alba*, *S. dioica*, *S. nigrum*, *S. sylvatica*

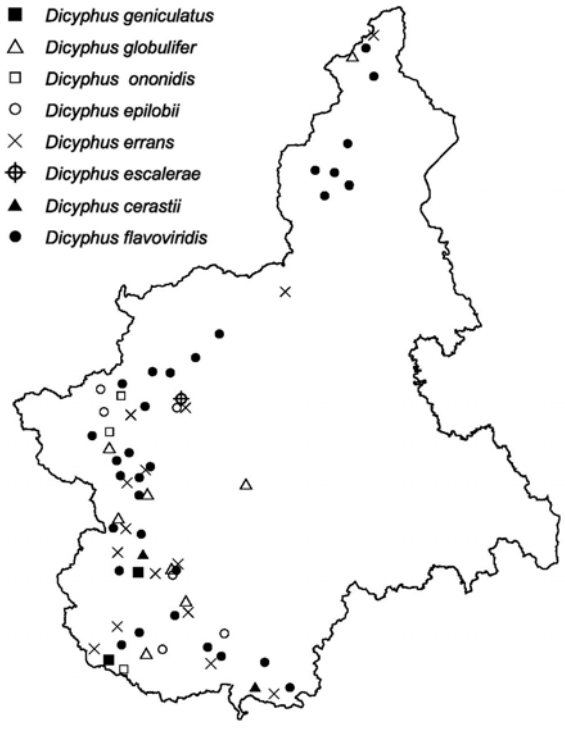

Figure 1. Distribution of *Dicyphus* species collected in the Alpine valleys of Piedmont in 2000.

D. globulifer and *D. ononidis*, collected on *Silene* spp., and on *Ononys* spp., respectively, were sampled only in the Alpine valleys. Therefore, the same plant (i.e. *Silene*) can host different species in relation to the environmental condition.

In conclusion, the Alpine valleys of Piedmont host a very rich *Dicyphus* species fauna, including seven of the sixteen Italian *Dicyphus* species (Faraci and Rizzotti Vlach, 1995), and one, *D. cerastii*, recorded for the first time in Italy. Among them, *D. errans*, so far the only one reported in horticultural crops both in the open air and greenhouses of northwestern Italy, has been widely collected on wild plants, that are then a good reservoir of this species reputed as a useful pest control agent.

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