

# Honeydew as a food source for insects and in particular for soldierflies (Diptera : Stratiomyidae)

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**Samenvatting.** Honingdauw als voedselbron voor insecten en in het bijzonder voor wapenvliegen (Diptera : Stratiomyidae)

Weinig is bekend van de voedingsgewoonten van wapenvliegen. Practisch alle waarnemingen lijken beperkt te blijven tot het voeden op bloemen. De auteur nam van verschillende soorten wapenvliegen waar, dat zij zich voedden met honingdauw. Aangezien in de literatuur geen verwijzingen werden gevonden naar honingdauw als voedselbron voor wapenvliegen, leek een publicatie op zijn plaats.

**Résumé.** Le miellat peut-il être considéré comme source nutritive des insectes en général et en particulier des Stratiomyidae? (Diptera : Stratiomyidae)

Peu de choses sont connues au sujet de la nutrition des Stratiomyidae. Pratiquement, toutes les observations relatent une nourriture à base de fleurs. L'auteur a observé quelques Stratiomyidae se nourrissant de miellat. Étant donné que la littérature est muette à ce sujet, il a paru justifié de publier la présente note.

**Abstract.** Little is known about the feeding habits of soldierflies. Virtually all records appear to be restricted to feeding on flowers. The author observed several species of soldierflies feeding on honeydew. Since no records of honeydew as a food source for soldierflies could be found a publication seemed appropriate.

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## Introduction

ROZKOŠNÝ (1982 : 29) considers soldierflies (Stratiomyidae) to be typical nectar feeders. The mouth parts are of the muscoid type and adapted for sucking up fluids. The list of visited flowering plants covers over ten families. Earlier in the same publication (p. 24) he states that many species have a short proboscis and fleshy labella (in contrast to an elongate proboscis and narrow labella, very suitable for nectar feeding) and that those species may well utilize pollen as a food source. According to OLDROYD (1969) some species of soldierflies, «at least, swallow grains of pollen, but possibly they do not suck nectar» (p. 13). BRUGGE (1987) only mentions both pollen and nectar as food sources.

*Beris* has been recorded from a fungus (pers. comm. N.P. KRIVOSHEINA) but whether it was feeding is not known to me.

After Mr L.J. VAN DER ENT (Wageningen, the Netherlands) drew my attention to hoverflies (Diptera : Syrphidae) drinking dew from leaves of larger herbs and shrubs, I started making observations on the feeding behaviour of some insects on leaves. Among the insects observed were soldierflies.

## Observations

The occasional observations were all made in a garden in Wageningen, the Netherlands, in the period from 1987 till 1989, though mainly in the spring and early summer of 1987 and the months August and September of 1989.

The honeydew utilized was either liquid (fresh drops or dried up drops that

were dissolved in rain or dew drops) or dried up. The drops were found by random search and probing as in sepsid flies (Diptera : Sepsidae) or visually as in soldierflies. A female of *Beris clavipes* (LINNAEUS) was observed licking up three drops from a leaf walking from one drop directly to the next.

Table 1 gives the numerous and the more interesting families feeding on honeydew. The records of soldierflies are presented in table 2. Per species some indications are given of number of observations and plant species on which they were found. The six species represent three of the five subfamilies present in Northwestern Europe.

Table 1. Insect families observed to be feeding on honeydew on leaves.

Order	Family
Hymenoptera	Tenthredinidae
	Formicidae
	Vespidae
Diptera	Tipulidae
	Hybotidae
	Stratiomyidae
	Syrphidae
	Pipunculidae
	Sepsidae
	Chloropidae
	Tachinidae

Table 2. Observations on soldierflies (Stratiomyidae) feeding on honeydew.  
B = Beridinae; S = Sarginae; P = Pachygasterinae

Species	On leaves of	Additional information
<i>Beris chalybata</i> (FORSTER)	<i>Prunus padus</i> LINNAEUS <i>Rosa</i> sp. <i>Cornus</i> sp.	B; mainly in May and June; males as well as females; honeydew on rose leaves from aphid colonies on <i>Prunus</i> .
<i>Beris clavipes</i> (LINNAEUS)	<i>Prunus padus</i> LINNAEUS	B; 18 May 1987; see text (Observations)
<i>Chloromyia formosa</i> (SCOPOLI)	<i>Prunus padus</i> LINNAEUS	S; 26 June 1987; male drinking from rain drops on leaf covered with honeydew.
<i>Microchrysa flavicornis</i> (MEIGEN)	<i>Salix</i> sp.	S; 31 August 1989; one female; honey dew from aphid colonies on <i>Prunus</i> bark.
<i>Microchrysa polita</i> (LINNAEUS)	<i>Impatiens glandulifera</i> ROYLE <i>Prunus padus</i> LINNAEUS	S; several specimens, mostly females; during whole period of activity.
<i>Pachygaster leachii</i> CURTIS	<i>Impatiens glandulifera</i> ROYLE	P; 28 July 1987; one female; honeydew from aphid colonies on <i>Salix</i> sp.

## Discussion

A. Although many families of different insect orders were found among the honeydew feeders, only few records are present in literature. The few records I found referred to insects in general (CHINERY 1975), Pipunculidae (Diptera) (COE 1966), and ants (Hymenoptera : Formicidae) (BRUES 1976). It may be known of many groups of insects that they feed on honeydew but for only a small number of these groups honeydew will be a main food source. So usually being only a food source of minor importance honeydew is not likely to be referred to often. The knowledge of the feeding habits of some families, e.g. soldierflies, is very limited and honeydew may be a main food source.

B. Many soldierflies are swept from leaves, are recorded to sit on leaves or, occasionally, reported to display courtship behaviour on leaves (BRUGGE 1987). Sitting on leaves they are usually said to be sunbathing and for many specimens this may be true. However, few entomologists will have taken the trouble to check if this was the actual activity and so feeding on honeydew may easily have been overlooked.

C. Virtually no information is available on the longevity of adult soldierflies (ROZKOŠNÝ 1982). Considering the fact that many larger species have occasionally or frequently been recorded from flowers one seems to be justified in assuming that all soldierflies are forced to take up some food to sustain themselves during the adult life. Some species, however, have never been observed visiting flowers, for example *Pachygaster atra* (PANZER) and other species of the subfamily Pachygasterinae, even though a species like *Pachygaster atra* sometimes is found in large numbers (ROZKOŠNÝ 1983). It is not improbable that feeding on honeydew of such species has until now been overlooked.

D. Some species of the Beridinae and Pachygasterinae occur in habitats that may shortly be described as forest with few or without flowering herbs in the period the soldierflies are active in. In this period, however, aphids are undoubtedly active so honeydew will be available to soldierflies.

E. Especially smaller soldierflies have not been found on flowers even though they may be common. Such flies will have much use of an easily available energy source, especially when one considers that they will probably need only relatively little of it.

F. ROZKOŠNÝ (1982) made some remarks on the mouth-part structure of some soldierfly species. A short proboscis and fleshy labella might well be used to utilize pollen as a food source. This type of mouth-part structure might even better be suitable for sucking up drops of honeydew or licking up dried up drops.

## Conclusion

So far no records had been published of adult soldierflies utilizing honeydew as a food source. A number of species were observed doing this.

This fills part of the gap in our knowledge of the feeding habits of adult soldierflies.

Soldierflies can utilize honeydew as a partial food source but in habitats with few or without flowering plants it may well constitute the major food source. That may also be the case when a species needs only little food in the adult stage.

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### Boekbesprekingen

**Gomez de Aizpurua, C. :** *Catálogo de los Lepidopteros de actividad nocturna (Heterocera) de Alava, Bizkaia y Guipuzcoa Tomo III*  
17 x 24 cm, 318, Departamento de Agricultura y Pesca, Vitoria-Gasteiz, 1988, paperback, Ptas 1060,- (ISBN 84-7542-533-X).

Deze catalogus bevat alle soorten Macroheterocera die tussen 1963 en 1987 op licht verzameld werden in de Noord Spaanse provincies Alava, Biskaia en Guipuzcoa. Bij elke soort worden de verschillende vindplaatsen opgesomd en de vliegtijd aangegeven met decaden. Achteraan volgen: een alfabetische lijst van de vindplaatsen met aanduiding van het UTM-hok, een alfabetische soortenlijst en een systematische lijst.

**Gomez de Aizpurua, C. :** *Atlas provisional de los Lepidopteros (Heterocera) de Alava, Bizkaia y Guipuzcoa Tomo IV. Lepidoptera Heterocera*  
17 x 24 cm, 366 p., 630 verspreidingskaarten, Departamento de Agricultura y Pesca, Vitoria-Gasteiz, 1988, paperback, Ptas 1060,- (ISBN 84-7542-535-6).

In dit boek wordt de verspreiding van de 630 soorten Macroheterocera die voorkomen in de Noord Spaanse provincies Alava, Bizkaia en Guipuzcoa grafisch voorgesteld op kaartjes van een halve pagina. Het boek is dus samen te gebruiken met de hoger besproken catalogus.

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