



Predatory Mirids In Tomato Crops



Background

Some species of mirid bugs are important predators of whiteflies in tomato crops. In the Mediterranean basin and surrounding regions, they spontaneously colonise open field and greenhouse crops when not disturbed by pesticides. They are very efficient in the control of whiteflies, mainly in tomatoes but also in cucumbers and other crops. Since they are polyphagous they also feed on other pests as aphids, leafminers, spider mites, and lepidoptera, contributing to their control. The species found on tomato belong to *Macrolophus*, *Dicyphus*, and *Nesidiocoris*, all of the tribe Dicyphini. However, other mirids may be found in other crops, and in neighbouring non-crop vegetation. Many of those may also be predaceous, as are the Deraeocorinae found in cucurbits and beans.

Sample preparation and identification

Field collected insects may be kept in alcohol (70%) for conservation, but dried prepared specimens are preferred for identification. Mirids are difficult to identify because many characters have to be observed, and they are not always clear. High magnification is required to accurately observe identification characters. This happens both to adults and to nymphs. Therefore, material should always be sent to specialists for proper identification, and voucher specimens should be deposited in established collections.

Identification

We will only refer to the species of the Dicyphini genera recorded until now on tomato. The visual key aids in quick identification of the genus, but the following descriptions should also be checked. They are based on palaeartic species.

Above: Adult *Macrolophus* feeding on whitefly larvae.

Macrolophus species are yellowish. Head is pentagonal shaped, usually with dark longitudinal stripes running from the eyes to the pronotum. The first antennal segment and the tip of the clavus are also darkened. Calli of pronotum are visible but not prominent. Membrane greyish, with dark spots. Femora and tibiae yellowish, tip of tarsi darkened. *Macrolophus* is present in holarctic and neotropical regions. Seven species are known from the west palaeartic, but only three are recorded from vegetable crops.

M. melanotoma (A. Costa, 1853), and ***M. pygmaeus*** (Rambur, 1839). Two *Macrolophus* species have traditionally been mentioned or used as predators in several vegetable crops: *M. caliginosus* Wagner, 1951, and *M. nubilus* (Herrich-Schäffer, 1835). According to Josifov (1992) and Carapezza (1995), valid names are now *M. melanotoma* and *M. pygmaeus*, respectively. The separation between both species is difficult (Goula & Alomar 1994), and is under study. It is not improbable that the name *pygmaeus* is actually a senior synonym of *melanotoma* (Kerzhner & Josifov 1999). Their distribution should be verified.

M. costalis Fieber, 1858. *M. costalis* can easily be separated from the previous species by the black tip of the scutellum. Recorded from tomato in Bulgaria and pepper in Israel, although widely distributed in mediterranean Europe, Middle East and North Africa (Tunisia).

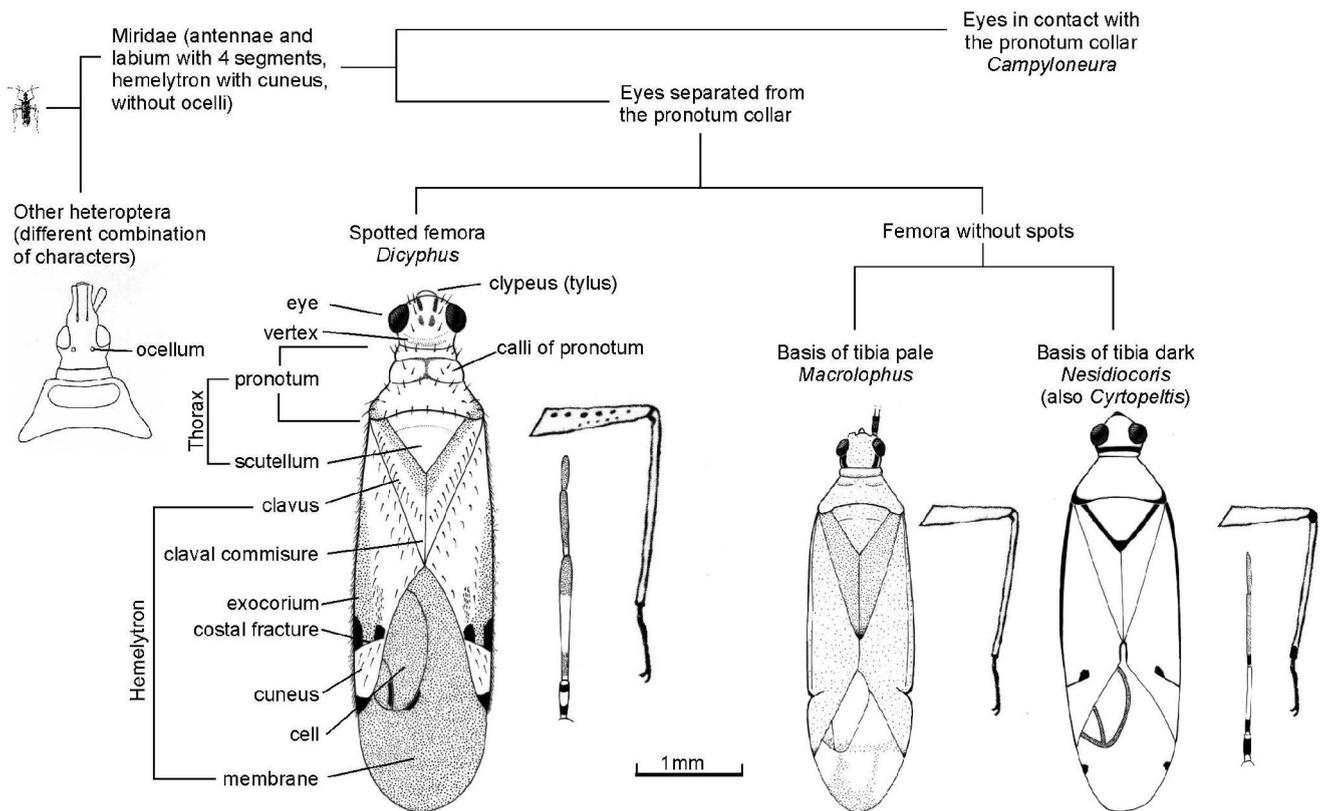
Nesidiocoris is mainly distributed in tropical regions. Only one species is found in the west palaeartic.

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Visual key for the identification of Dicyphini genera present in tomato crops



N. tenuis (Reuter, 1895). General yellowish coloration. Head is oval. Conspicuous black transversal stripe on the vertex. Black rings on the antennae. Clypeus dark. Calli of pronotum are almost invisible. Margin of scutellum and hemelytra dark. Membrane greyish. Femora and tibiae yellowish, but basis and tip of tibiae, and tarsi dark. Originally of tropical regions, *N. tenuis* has expanded its range. It is now cosmopolitan in the Mediterranean basin, and recorded from several vegetable crops.

Cyrtopeltis geniculata Fieber, 1861. Found once on tomato in Spain. It is known from mediterranean and central Europe. Its general colouration is yellowish. Inexperienced observers may confuse *Macrolophus*, *Nesidiocoris*, and *Cyrtopeltis*, but they are easily distinguished by the yellow and dark pattern, shape of head, and calli of pronotum.

Dicyphus is easily distinguished from the previous genera by its overall brownish coloration, with dark spots on head, hemelytra, and legs. Antennae, legs and dorsum hairy. On the dorsum, hairs are placed on conspicuous spots. Oval shaped head, and often dark rings on antennae. Pronotum transversally divided in two regions. The anterior one contains very prominent and brilliant calli. The posterior one is wider and dull. Brownish membrane. *Dicyphus* is present in holarctic and neotropical regions. Thirty species are known from the west palaeartic, but only four are recorded from vegetable crops. Identification of *Dicyphus* species based only on external appearance may easily lead to misidentifications. The examination of male genitalia is required.

D. tamaninii Wagner, 1951. Recorded from several vegetable crops in Spain, although widely distributed in mediterranean Europe, Middle East and N. Africa (Tunisia).

D. errans (Wolff, 1804). Recorded from several vegetable crops in Spain, France and Italy, although widely distributed in Europe, the northern records coming from Great Britain.

D. cerastii Wagner, 1951. Recorded from tomato crops in Portugal, although widely distributed in mediterranean Europe, reaching Bulgaria.

D. hyalinipennis (Burmeister, 1835). Recorded from tomato crops in Hungary, although present in Europe and North Africa.

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