

ECOLOGY OF ANAGRUS SPECIES, PARASITOIDS OF THE EGGS OF LEAFHOPPERS IN
JUNCUS STEMS.

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Biological and ecological studies have been made on parasitoids, Anagrus species (Hymenoptera: Mymaridae), which attack leafhopper eggs in Juncus stems.

These parasitoids have been studied previously by F.Enock (1914), E.L.MacGill (1934), P.E.S.Whalley (1956, 1958, 1969) and G.H.L.Rothschild (1967). W.Witsack (1973) has published an extensive study on the biology of Anagrus spp.. I.Walker (in press) describes four new species bred from leafhopper eggs.

Anagrus species are minute, ranging from 0.3 - 1.5 mm in length and coloured yellow, red, brown, deep brown with metallic reflection. The head is relatively large and broad. The female ovipositor usually exceeds the length of the abdomen, but varies in length from one species to another and is used to penetrate either through plant tissues or directly into host eggs. They deposit one or more eggs in the host and one or several parasitoids may survive.

The host eggs studied by me were from the planthoppers Conomelus anceps (Germar), Muellerianella fairmairei (Perris) and the leafhopper Cicadella viridis L.

Six closely related species of Anagrus have been found to attack leafhopper eggs in Juncus stems. The main morphological difference distinguishing them are ovipositor length, length of antennal segments, and hair distribution on the anterior wing. They also differ in biological characteristics. They have different patterns of oviposition behaviour by which they locate and attack their hosts. They show different reproductive strategies: some of them are unisexual and the others bisexual. Morphometric analyses using 26 characters have been made, the most significant characters proved to be the ovipositor, thorax and abdomen.

THE EFFECTS OF STYLOPISATION ON THE SEXUAL DEVELOPMENT OF DELPHACIDAE.

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The following subjects are discussed:

- a) The development of the primary, secondary and tertiary sexual characters/

organs and body characters in Javesella dubia (Kirschbaum) (Homoptera: Delphacidae) when parasitized by Elenchus tenuicornis (Kirby) (Strepsiptera: Elenchidae).

b) Similarities and differences of stylopisation by Elenchus jasumatsui Kifune & Hirashima to Nilaparvala lugens Stål and Sogatella furcifera Horváth.

c) The possible causes for the obscure formation of the sex organs and characters in styloped Delphacidae.

TYPHLOCYBINAЕ ON OFFICIAL PLANTS.

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Several species of Typhlocybinae live on wild aromatic plants, many of which are cultivated as officinal plants to be used in various herbal branches. Our recent investigations carried out on this topic revealed that Labiatae (Hyssopus, Melissa, Mentha, Ocimum, Origanum, Rosmarinus, Salvia, Satureja, Thymus) and Compositae (Anthemis, Artemisia, Chrysanthemum, Cnicus, Santolina) are the most important cultivated officinal plants in Piedmont (Italy). The following Typhlocybinae appeared attracted to such plants:

Eupteryx atropunctata Goeze, Empoasca decipiens Paoli, E. solani Curtis, Emelyanoviana mollicula Boh., more or less polyphagous species;

Eupteryx alticola Rib., E. decemnotata Rey, E. melissae Curtis, E. stachydearum Hardy, E. thoulessi Edw., E. zelleri Kirsch., oligophagous species on Labiatae;

Chlorita viridula Fall. oligophagous species on Compositae;

Zygina hyperici H.S., monophagous species on Hypericum.

All the above mentioned species were very abundant, but Z. hyperici, E. alticola and C. viridula appeared the most infesting. In general, they were attracted to cultivated plants from neighbouring wild hosts. However, E. alti originates from mountainous territories, while C. viridula usually living on Chrysanthemum vulgare, Artemisia campestris and Achillea millefolium was also found on Artemisia absinthium and Santolina chamaecyparissus.

These latter examples of allotopy and allotrophy suggest that many other Typhlocybinae living on wild Labiatae and Compositae, eventually may step over towards some of the above mentioned cultivated officinal plants. In particular cultivated Thymus and Santolina could be attractive respectively for several