

Morphology and ultrastructure of the cephalic vesicles in two species of the *Gonatopus* genus: *Gonatopus camelinus* Kieffer and *Gonatopus clavipes* (Thunberg) (Hymenoptera, Dryinidae, Gonatopodinae)

M. CARCUPINO^{1*}, A. GUGLIELMINO², M. OLMI² and M. MAZZINI³

¹Dipartimento di Zoologia e Antropologia Biologica, Università di Sassari, 07100 Sassari, via Muronio, 25, Italy

²Dipartimento di Protezione delle Piante, Università della Tuscia, 01100 Viterbo, Italy

³Dipartimento di Scienze Ambientali, Università della Tuscia, 01100 Viterbo, Italy

Tel. +39 (079) 228664; e-mail carcupin@ssmain.uniss.it

Received 4 February 1998; Accepted 4 February 1998

Summary

The cephalic vesicles of the immature endo-ectoparasitic larvae of *Gonatopus camelinus* Kieffer and *Gonatopus clavipes* (Thunberg) were studied using light and electron microscopy. The vesicles appear as hollow evaginations of the cephalic body wall and their tegument consists of a monolayered epithelium externally surrounded by a permeable cuticle. In the first larval instars, the epithelial cells are pyramid-shaped and separated by large intercellular spaces. In the last larval instars they are polyhedral and the intercellular spaces are no longer evident. The vesicles have no connection with the gut of either the host or the larva. These data suggest that nutrients are absorbed by the dryinid larva from the haemolymph of the host through the permeable surface of the cephalic vesicles, where they are stored in the lumen and enter the larval haemolymph without passing through the gut. In all immature larval instars the mouth is closed.

Key words: Feeding habits, post-embryonic development, Dryinidae, endo-ectoparasite.

Introduction

Dryinidae are a small, cosmopolitan family of Hymenoptera Aculeata comprising about 1200 species belonging to 10 subfamilies (Olmi, 1984; 1986; 1987; 1989; 1993, 1996). Five of these, Aphelopinae, Anteoninae, Bocchinae, Dryininae and Gonatopodinae, may be important for the biological control of plant pests because they are both predators and parasitoids of Homoptera

Auchenorrhyncha (Guglielmino and Olmi, 1997). As well as causing direct damage to plants, the Homoptera Auchenorrhyncha are also vectors of virus and phytoplasma and so may cause considerable economic damage.

Little is known about the biology of Dryinidae. These insects are hypermetamorphic; their postembryonic development consists of 4 or 5 larval instars, the last of which is the mature larva (Perkins, 1905; Buyckx, 1948; Barrett et al., 1965; Hernández and Belloti, 1984;

*Corresponding author.