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## 5.21 FINE STRUCTURE OF THE AXILLARY ORGANS OF *FUSOHERICIA LAWRENCEI* BAKER AND CROSSLEY (ASTIGMATA: ALGOPHAGIDAE)

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Members of the astigmatid mite family Algophagidae are found in aquatic habitats, ranging from semiaquatic (wading in fluid) to fully aquatic (submerged). Adults and instars other than the deutonymph are characterized by the possession of an axillary organ, a sclerotized band of cuticle located on each side of the propodosoma between legs I and II. Based on ultrastructural studies, Fashing (1984) postulated an osmoregulatory function for these organs. The fine structure of the axillary organs has been described for only *Algophagus pennsylvanicus* Fashing and Wiseman, a fully aquatic member of the subfamily Algophaginae which inhabits water-filled treeholes. We used scanning and transmission electron microscopy to describe the structure of the axillary organs of a second species, *Fusohericia lawrencei* Baker and Crossley, a semiaquatic member of the subfamily Hericiinae inhabiting sap flux on trees.

### MATERIALS AND METHODS

Specimens of *F. lawrencei* were collected from sap flux on a Tuliptree (*Liriodendron tulipifera* L.) in eastern Virginia, U.S.A. For transmission electron microscopy (TEM), the integument of the idiosoma was first ruptured to facilitate fixation and specimens then placed in a fixative of 3.5% gluteraldehyde, 2.5% paraformaldehyde, and 2% acrolein in cacodylate buffer (pH 7.4) for 12 h at 4°C. After several brief cacodylate buffer rinses, they were post-fixed for 1 1/2 h 4°C and an additional 1 1/2 h at room temperature in 1% OsO<sub>4</sub> in cacodylate buffer. Specimens were then briefly rinsed in 50% acetone and soaked overnight in 2% uranyl acetate 70% acetone solution at 4°C. Dehydration was completed in acetone, and Spurr's medium used for infiltration and embedding. Thin sections were stained in lead citrate, and TEM was performed on a Zeiss EM 109.

Specimens for scanning electron microscopy (SEM) were dehydrated in alcohol, dried using the critical point procedure, and coated in a sputter coater. Microscopy was performed on an AMR-1810.

### RESULTS AND DISCUSSION

The axillary organs of *F. lawrencei* are paired structures homologous to those found in *A. pennsylvanicus*, but much larger. The organs extend dorsally between legs I and II and are expanded somewhat slightly above the trochanters (Fig. 1). Ventrally they surround the base of Leg I and extend posteriorly as a wide band along the lateral margin of the idiosoma to a level just anterior to leg III (Fig. 2). A ridge of thickened cuticle outlines the margins and provides structural support. The posteriorly

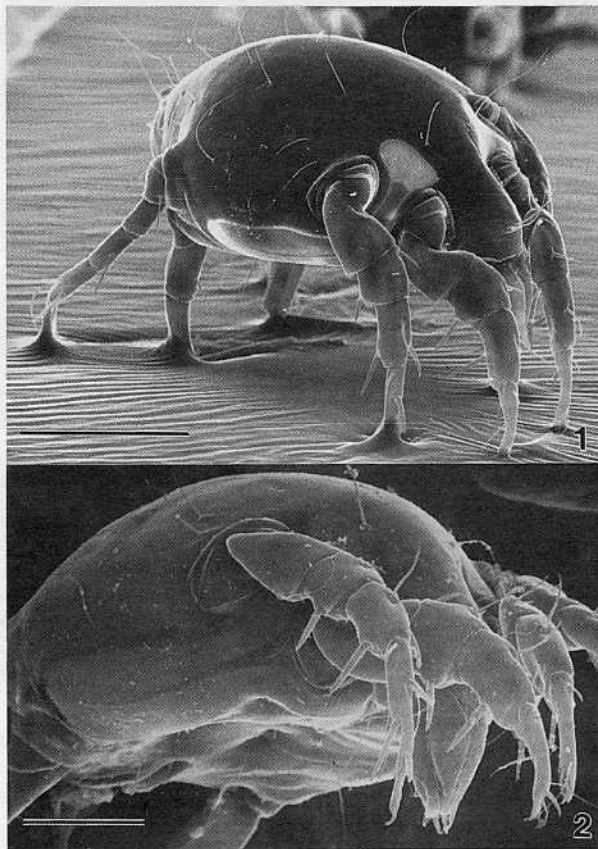


Fig. 1. Frontolateral SEM view. Bar = 100 $\mu$ .  
Fig. 2. Ventrolateral SEM view. Bar = 50 $\mu$ .

