

Fine Structure of Tarsal Attachment Organs
in the Lady Beetle *Harmonia axyridis*

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We have studied the fine structural characteristics of the tarsal appendages using scanning electron microscope to reveal the attachment system of the lady beetle *H. axyridis*. This beetle has distinctive attachment organs which composed of claws and adhesive soles. The claws which connected with pretarsal segment are mainly used to hold the rough substrates by their apical diverged hooks. In contrast, the adhesive soles have an adhesive function onto smooth surface. They are interspersed at the ventral adhesive sole of each tarsomere, and are composed of two kinds of hairy setae.

One type of the setae is located at the central region of each adhesive sole, and has a spoon-shaped endplate with long and narrow shaft including the rounded disc with a concave cuticular structure. Another type is interspersed along the marginal region of each adhesive sole, and has a hook-shaped spine near the tip.

The surface of each adhesive sole has numerous pores which seem to be related with the secretion of some adhesive material releasing toward the setae. Thus, based on our recent results, we may conclude that the main adhesive force in *H. axyridis* would be originated from either of the mechanical interlocking by hooked spines or the evacuated adhesion of the spoon-shaped endplate with the aid of some adhesive materials.

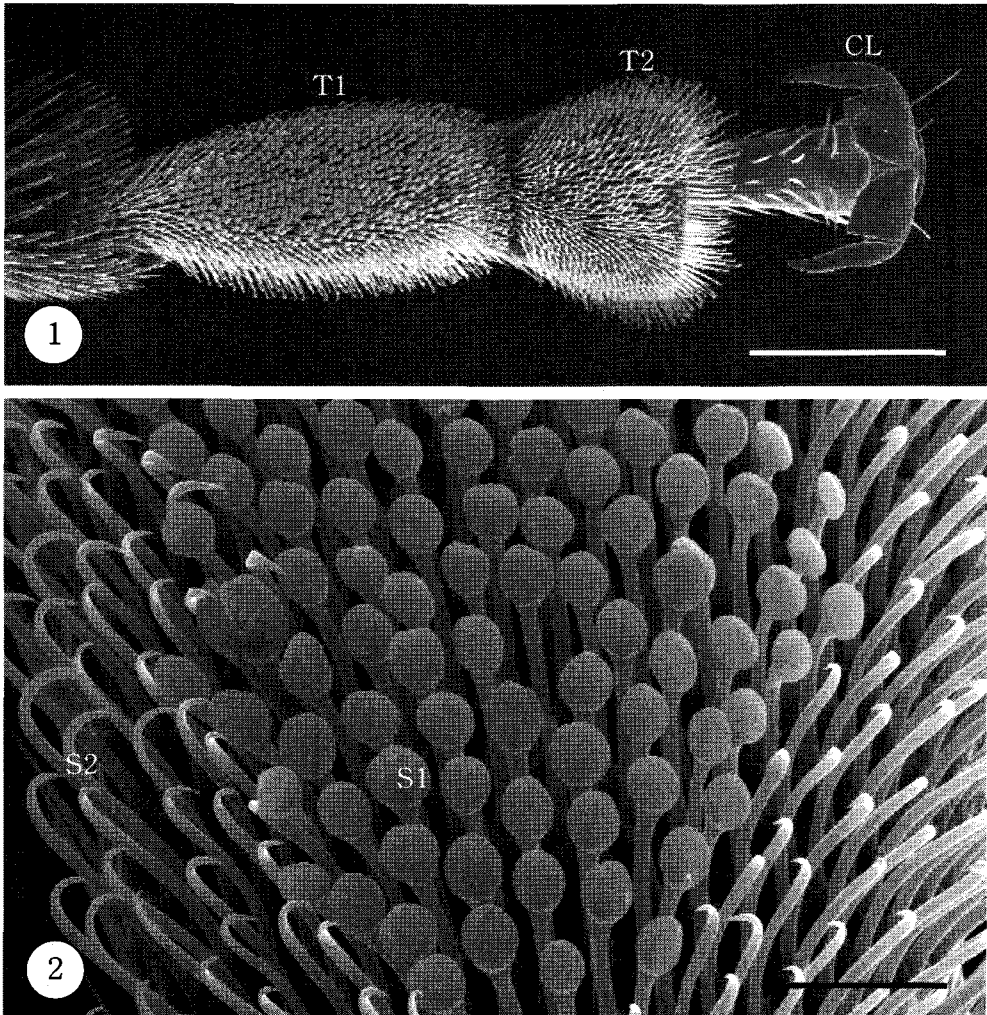


Fig. 1. Scanning electron micrograph of the attachment organ. This organ is composed of the claw (CL) and two groups of tarsal adhesive soles (T1, T2) on the tarsal segment of the leg. The claws are used to hold the rough substrates with their apical diverged hooks. Scale bar = 250 μm

Fig. 2. Scanning electron micrograph of the setae. One type of setae has a spoon-shaped endplate (S1) and another type has a substructure of hooked spine (S2) near the tip. Scale bar = 25 μm