Structure of the Tibial Brush Setae of the Bedbug, *Cimex lectularius* L. (Hemiptera: Cimicidae)

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The bed bug, *Cimex lecturlarius* (Hemiptera: Cimicidae) has a worldwide distribution and is easily distributed on human clothes and luggage and also transportation vehicles [2,4]. Bed bugs are blood feeders and are a serious pest in the hotel industry and in poultry operations [3,11]. Bed bugs are known to crawl over relatively smooth surfaces like walls and stainless steel poultry cages. A paucity of information exists on the structures that are involved in surface adhesion and crawling in Hemiptera. Only a very brief description of the bed bug tibial brush by [6,13] are the main sources of information. The present study uses SEM and TEM to describe the tibial brush setae of *Cimex lectularius*.

Eight female and two male specimens were fixed in Karnovsky's fixative and then post-fixed in 2% OsO_4. The legs on the left side were processed for SEM and examined with a JEOL JSM-6500F at 5kV legs on the right side were used for TEM and they were embedded, sectioned and examined with a JEOL EM-1230 at 100kV. Images were digitally recorded.

A tuft of setae is located at the apex of the tibia of each leg on the ventral surface, on a pad-like extension of the tibia (Fig. 1). The setea varied in length from 35.6µm to 59.3µm. The pad-like extension at the apex of the tibia has a very rugose surface and many possible glandular openings (Figs 1, 2). Near the apex of the brush setae they become spatulate with a smooth dorsal surface and round protuberances on the ventral surface (Figs. 3, 4). The tibial brush setae are hollow and have a porous cuticle (Figs 5, 6). A glandular epithelium is associated with the tibial brush setae and the base of the setae open on to these cells (Fig 7). There is a significant difference in the number of tibial brush setae on legs I-II-III (Fig. 8).

Setae that are used for surface adhesion are found in many insect orders [1,8,14] and also in various families of Hemiptera [5,7,12]. Adhesive setae are used in climbing, holding a mate and other functions. The tibial brush setae of the bed bug probably come into play during the mating process and for climbing on various surfaces such as walls and the stainless steel cages of poultry operations.

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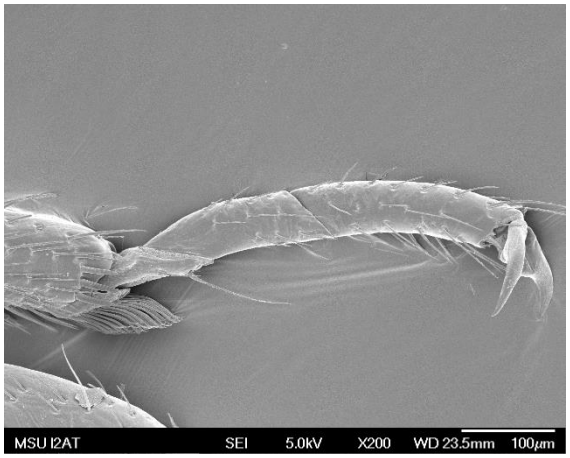

Fig. 1. Leg 1 of the bed bug.

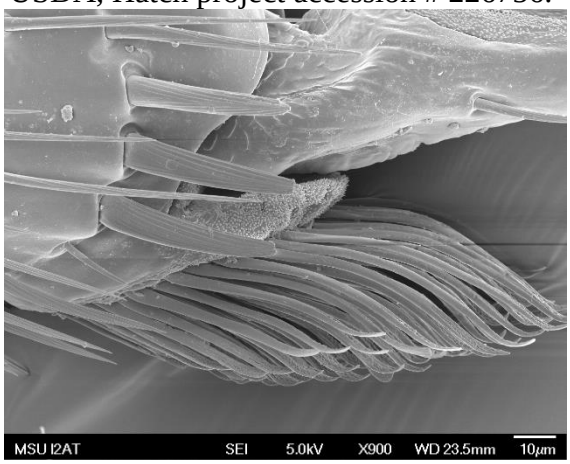

Fig. 2. Setae of the tibial brush.

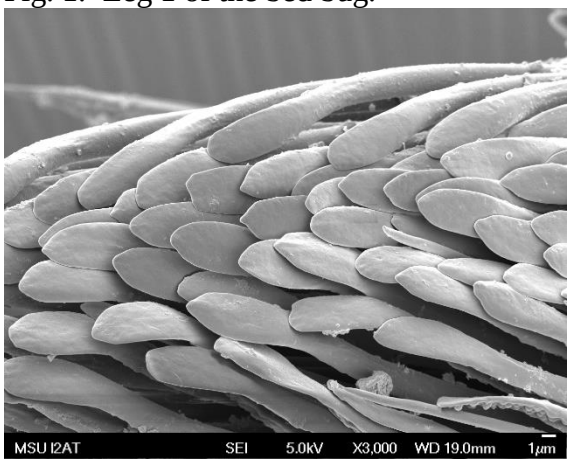

Fig. 3. Dorsal surface of brush setae.

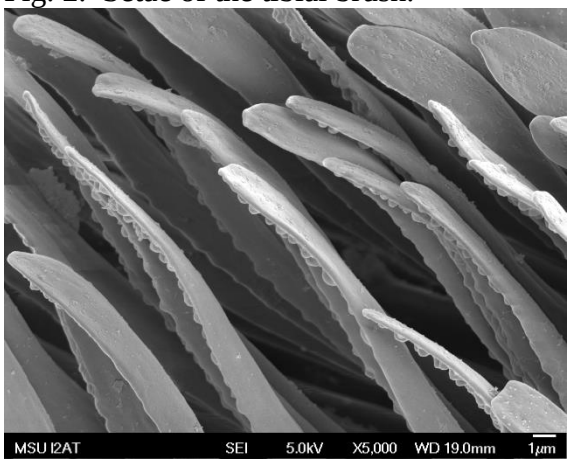

Fig. 4. Protuberances on ventral surface.

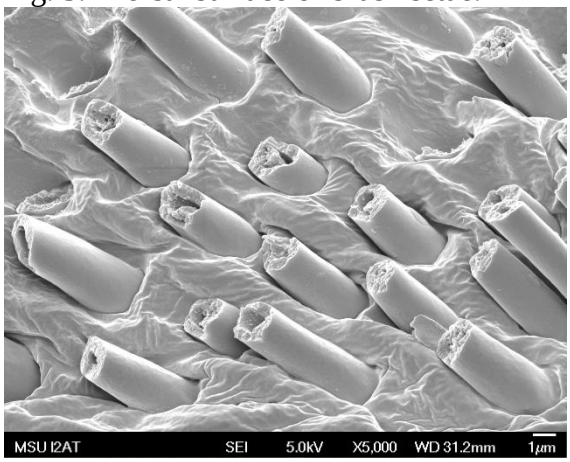

Fig. 5. Hollow brush setae.

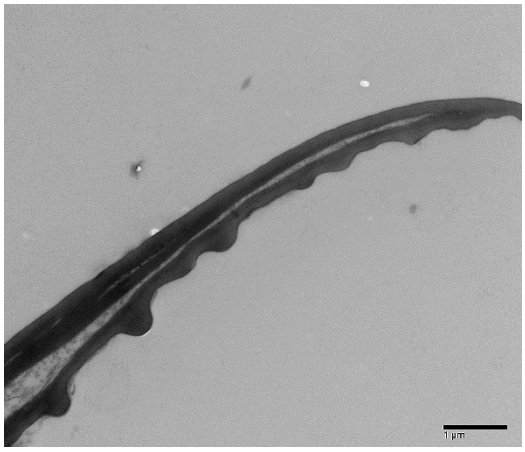
Fig. 6. TEM of setal apex.