



Ultrastructure of cephalic organs of *Laemobothrion maximum* (Phthiraptera : Amblycera) infesting black kite, *Milvus migrans*

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ABSTRACT: Present report supplements information on the ultrastructure of cephalic organs viz. mandibles, maxillary palps, labial palps and cephalic ctenidia located on the ventral side of head of amblyceran louse, *Laemobothrion maximum* (on the basis of SEM). Sharply pointed mandibles of the louse might be involved in process of blood intake. © 2017 Association for Advancement of Entomology

KEY WORDS: Phthiraptera, Amblycera, Cephalic organ, *Laemobothrion maximum*

Impact of parasitism of avian Phthiraptera mainly depends upon their feeding habits and population density. Genus *Laemobothrion* encompass large sized swiftly moving amblyceran species occurring on many avian Orders. It most commonly parasitizes the birds belonging to Falconiformes (Nelson and Price, 1965). Perez *et al.* (1995) have recorded the morphological features of *L. maximum* infesting buzzard, *Buteo buteo* and also indicated its haemetophagous nature. Srivastva (1974) reported that the nymphs and adult females of *L. percnopteri*, Gervais (infesting white scavenger vulture, *Neophron percnopterus* actively feed on host blood which forms a significant part of their diet. Zlotorzycska and Danecki (1969) reported the death of a lammergeier due to heavy infestation of *L. vulturis daneckii*. In order to expedite the mechanism of blood intake, it was found worthwhile to observe the nature of cephalic organs *L. maximum*.

Selected workers have performed SEM studies on the morphological features of cephalic organs of

few phthirapteran species (Miller, 1971; Eichler and Sixl, 1974; Stendel and Holm, 1975; Eichler *et al.*, 1976; Zlotorzycska, 1990). In the present study, Scanning Electron Microscopic studies were performed on the ventral side of head of *L. maximum* parasitizing black kite, *Milvus migrans* to provide supplementary information on the cephalic structure of its head. Adult lice (3 males, 2 females) were collected from an accidentally electrocuted black kite, *Milvus migrans*, encountered in District Rampur (U.P.) The head of an adult louse was separated from thorax and subjected to cleaning (0.1M Phosphate buffer), dehydration (ethanol series) and air drying followed by gold coating with palladium in Neo Coater 100-240V and examined under SEM (Neo JCM-6000).

On the basis of morphological characters i.e. sitophore sclerite of hypopharynx with two holes, prominent preocular swellings in front of eye and presence of four stout spiniform setae on proximodorsal part of femure second, the specimens were distinguished as *L. maximum* (Nelson and

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Plate I

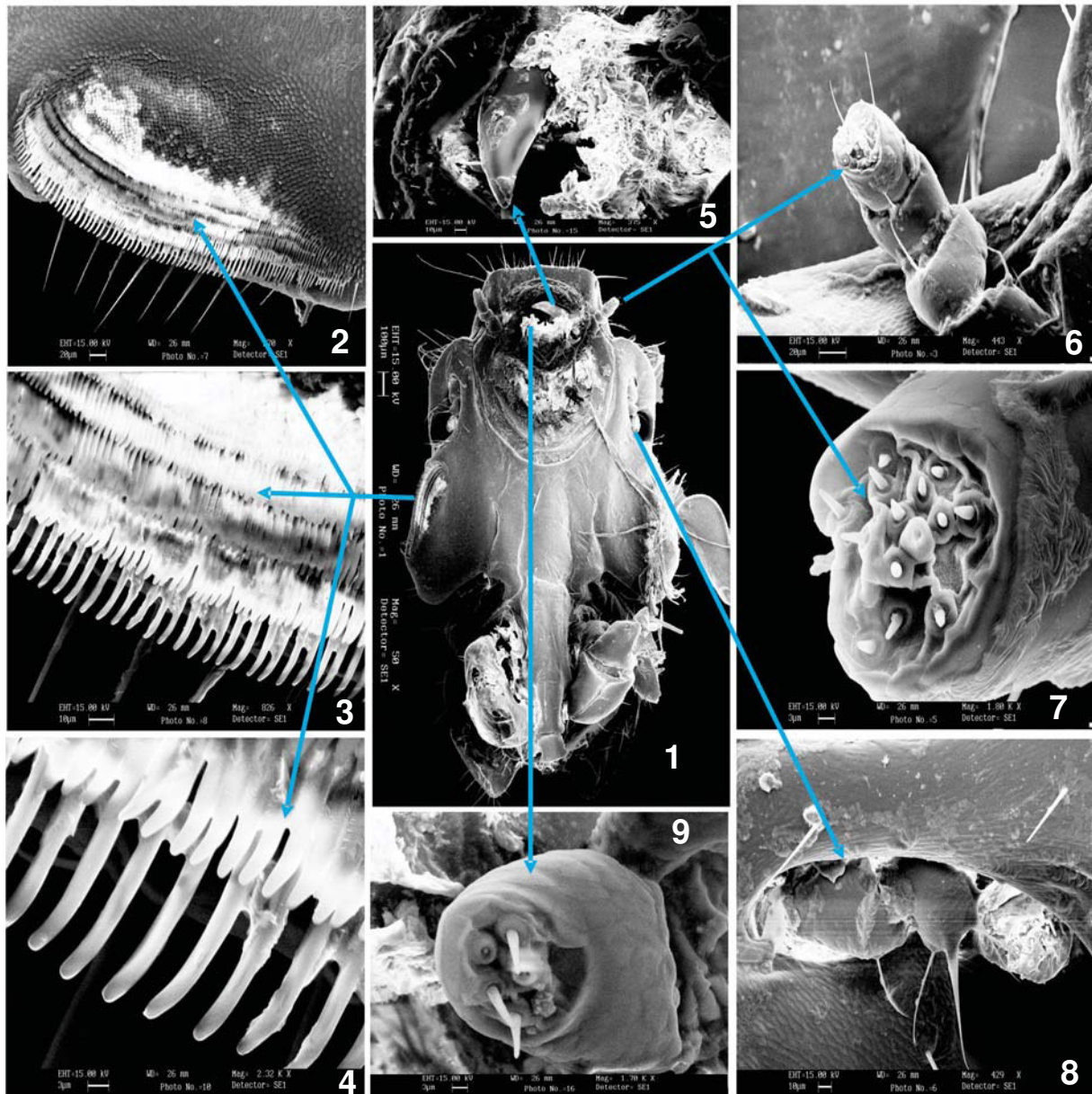


Fig. 1. SEM of ventral part of head of *Leamobothrion maximum*

Fig. 2. SEM of pleural view of head at the level eye, showing the location of cephalic ctenidia

Fig. 3, 4. Enlarged view of cephalic ctenidia. More enlarged view of cephalic ctenidia

Fig. 5. SEM of mandible of *L. maximum*

Fig. 6. SEM of maxillary palp of *L. maximum*

Fig. 7. Enlarged view of apex of terminal segment of maxillary palp segment of *L. maximum*

Fig. 8. SEM of antenna of *L. maximum*

Fig. 9. SEM of tip of terminal segment of labial palp of *L. maximum*

Price, 1965; Dik, 2006). The long head was broadest at the temple (Fig.1). The small antennae were concealed in pit like depressions on the ventral side of the swellings. Each antenna arose from the clavate apical segment (Fig. 8) and projected out of depression. The round temple gave the head a characteristic appearance. Roughly triangular mandible appeared to have pointed tip (Fig. 5). Small maxillary palpi (4 jointed) occurred at the junction of rectangular pre-antennal region, arising from capsule like swelling. The maxillary palp (Fig. 6) bore several trichoid sensilla. The apex of terminal flegellomere (Fig. 7) carried five basiconic sensilla. Most of sensilla appeared normal but 2-3 remain partially folded. One sensillum appeared globular in nature. The tips of labial palps bore 5 basiconic sensilla (Fig. 9). Two of the sensilla appeared basally folded. Pleural view of head exhibited (below the level of eyes; Fig. 2, 3 and 4) the presence of at least 6 rows of rigid spine shaped structures, arranged in comb like pattern. Each row contained at least 70-80 spines (often termed as cephalic ctenidia). However, the exact role of cephalic ctenidia deserves investigation.

Haematophagous amblycerans are of great concern to veterinarians/ parasitologists, as they do not only affect the vitality and productivity of the host birds but often act as carrier and transmitter of pathogens (Clayton *et al.*, 2016). Since, avian lice are telemophages and cannot cannulate the host blood (Lavoipierre, 1967), the mechanism of intake of host blood deserves further investigation. Attempt to correlate the presence of host blood in the gut with the nature of mandibles of a dog louse *Trichodectes canis* has been made by Bouvier (1945). Clay (1948) recorded three closely associated stylet like structures (which may be used for piercing) in a louse *Tricholectes*, occurring on humming birds. Rao *et al.* (1975) indicated that strong teeth and denticles located on lateral process of lateral lobe of amblyceran louse, *Gliricola porcelli* may also help in haematophagy. Sharp mandibles of *L. maximum* might be used for injuring the skin to obtain the host blood. Perez *et al.* (1995) further noted that indented rigid prolongations located near mandible may also help in the process. Thus, the mechanism through which haemetophagous

Amblycera imbibe the host blood exhibit considerable variation.

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