

COMPARATIVE MICROMORPHOLOGICAL SPECIALIZATIONS OF THE PHTHIRAPTERA AS REVEALED BY SCANNING ELECTRON MICROSCOPY.

Edward D. Green & M. L. Turner¹

*Department of Anatomy and ¹Electron Microscope Unit,
Medical University of Southern Africa, Box 232, MEDUNSA 0204, South Africa.*

Scanning Electron microscopy (SEM) has become a major tool used in the description of new species of Arthropod ectoparasites during the past three decades, due to the greatly increased depth of field and magnification of SEM compared to light microscopy. A number of morphological characteristics that have traditionally received little attention will be presented as well as a number of new micromorphological features only visible by SEM but which may have taxonomic importance in the future studies of lice.

The live lice were collected from their respective hosts and fixed in 70% ethanol. The specimens were cleaned by ultrasonication, routinely processed for SEM, gold and carbon sputter coated and viewed in a Leica Stereoscan 420 SEM at 7 to 10 kV.

The complex specializations the heads of the 'Mallophaga' with their biting/chewing/rasping mouthparts were compared with those of Anoplura having simple sucking mouthparts. The structure of the antennae that are often sexually dimorphic as well as the structure and position of the three main types of antennal sensoria were compared using SEM. Differences between these sensoria may be species-specific as in *Bovicola caprae* and *B. limbatus*.

As obligatory parasites it is essential for the lice to remain attached to their hosts. The legs and mandibles showed interesting specializations for holding on to different feather types when compared to the adaptations of those holding onto the different hairs of mammal hosts.

Micromorphological differences between lice of different families was further illustrated by the distinctive internal surface structure of the spiracles of Menoponidae (Amblycera), Trichodectidae (Ischnocera), Linognathidae and Haematopinidae (Anoplura), which besides keeping the spiracles open, may also filter the air entering the tracheae of some groups of lice.

The SEM studies on the structure of the female genitalia usually confirmed the accepted light microscopic descriptions but with greater clarity. However, when the everted male genitalia were present, the SEM shed new light on the uniqueness of the micromorphology of these species-specific organs, as well as the process of how the parameres and pseudopenis unfold outside the genital opening.

This paper illustrates how valuable the SEM is in examining micromorphological specializations as well as in the ongoing search for new taxonomic associations.