

Could Using Scanning Electron Microscope on Aedeagus Morphology Research Make Contributions to Systematics of the Family Elateridae (Coleoptera)?

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Aim of the study: In this study, aedeagi of 65 species from 23 genera and 5 subfamilies were examined taxonomically by using SEM and compared with drawings. Ultrastructural data of aedeagi in subfamilies and genera, general taxonomical comparisons between aedeagi drawings and SEM photos and ultrastructural examination of aedeagi's SEM photos of all species were discussed.

Material and Methods: Aedeagi of 65 species, which are deposited as dried specimens in Hacettepe University Applied Entomology Laboratory (HUAL), were dissected due to standart aedeagi dissecting methods, and their photos were taken by using Scanning Electron Microscope in Hacettepe University Earth Sciences Research and Application Center. One specimen were used per species in these study because comparisons were only made in the level of subfamilies and genera. Most of SEM photos (56 species) were compared with aedeagi drawings in literature (Kabalak, 2010; Kabalak and Sert, 2009, 2011a and 2011b; Platia, 1994) and SEM photos of 9 species (*Agrypnus murinus*, *Ampedus demaisonii*, *Athous* (O.) *anatolicus*, *Athous* (O.) *daccordii*, *Melanotus monticola*, *Stenagostus rhombeus*, *Zorochros alysidotus*, *Zorochros pilosellus* and *Zorochros stibicki*) were compared with aedeagi drawings which are unpublished drawings of author. General appearance and ultrastructural morphologies were examined.

Results: Scanning Electron Microscope photos of aedeagi are examined and compared with aedeagi drawings. This examination showed that those are compatible each other according to general morphology. On the other hand, some morphological structures were detected from fine-structure of Scanning Electron Microscope photos like Kabalak's (2014) findings in *Athous* (*H.*) *subfuscus*. As a result of this study, detected structures of aedeagus exhibit non-homogenous presence among subfamilies, genera and species. Aedeagi morphology of the subfamily Cardiophorinae and Negastrinae have the least structures which are long bristles, small pits with spine in some species. On the other hand, those structures were detected on some species and genera while not in other genera and species in subfamilies Agrypninae, Dendrometrinae, and Elaterinae. In addition to that, some detected structures could be important taxonomical characters and used to identification for some genera (*Ampedus* and *Athous*) and species (*Adrastus montanus*, *Aeoloderma crucifer*, *Drasterius bimaculatus*). More comprehensive studies that contain more species and more genera, could help to evaluate systematical importance of these structures in detail throughout to family.

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Keywords: Elateridae, Aedeagus, Scanning Electron Microscope, New structures.