ABSTRACT

The research contained in this thesis explores the phylogenetic systematics, taxonomy, evolution and biogeography of tribe Megasternini (Coleoptera: Hydrophilidae: Sphaeridiinae). Megasternines are an oustandingly diverse group of terrestrial water scavenger beetles with almost 600 described species and probably up to 1,000 species in total. Its species can be found in a wide array of habitats with abundant decaying material like humid leaf litter, dung, rotten cacti, beach wrack, flowers, etc. The specific and ecological diversity as well as their global distribution makes Megasternini an interesting model group for the understanding of processes underlying the diversification, biogeography and evolution of beetles. The scientific part of the thesis contains seven papers: three published, one accepted, one submitted and two manuscripts. **Chapters 1–4** are focused on the taxonomy of selected groups. These chapters aim to cover a variety of cases in terms of biogeography (the Greater Antilles, northern Neotropics, Africa and Southeast Asia), ecology (species associated with leaf litter, dung, flower and rotten cacti) and different taxonomic scenarios. One new extant genus and eight new extant species are described in these chapters. **Chapter 5** is a revision of all known hydrophilid fossils from Baltic amber. I used micro-CT technology in order to observe their morphology otherwise not accessible due to the suboptimal preservation of the specimens. Three new fossil species are described and their systematic relationships discussed. The identity of the only fossils specimen reported as belonging to Megasternini (*Cercyon* sp.) is corrected as a member of the family Phalacridae. The diversification and evolution of ecological preferences in family Hydrophilidae is investigated in **Chapter 6** on the basis of a comprehensive sampling of terrestrial representatives and incorporating the findings from **Chapter 5** for the divergence dating analyses. Megasternini tribe was found to have the most extended increase in diversification in the family. Diversification patterns in terrestrial hydrophilids are linked to their ability to transition between habitats. In **Chapter 7** I present a a phylogenetic analyses based on a multigene dataset obtained from an extensive sampling of tribe Megasternini. Our results support the division of Megasternini in two main clades: Oosternina new subtribe and Megasternina, These lineages are diagnosable based on the morphology of male terminalia. Our analyses on the historical biogrography indicate that the hypethermic conditions of the early Eocene allowed the intercontinental dispersion of megasternines in multiple and opposite directions. The climatic changes that ocurred during the Eocene seem to have had a differential effect on the diversification patterns in both subtribes.