AN EXAMPLE OF DIVERSITY OF IMMATURE LACEWINGS – A QUANTITATIVE COMPARISON OF APHID LIONS OVER GEOLOGICAL TIME

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Lacewings (Neuroptera) are holometabolan insects with prominent larvae. Best known are the predatory antlions, but also the other lineages of Neuroptera possess larvae with similar feeding habits. Aphid lions, the larvae of Chrysopidae (green lacewings) or Hemerobiidae (brown lacewings) received their name due to their ecological function as predators on aphids. Accordingly, they play a role in biological pest control. Like most lacewing larvae, aphid lions have mouthparts formed as stylets. These are shaped like pliers and form venom-injecting and sucking tubes, which are used for sucking the liquids of the prey. Fossils that have been interpreted as aphid lions are preserved in amber of various ages including Cretaceous, Eocene, and Miocene. We here report 58 new aphid lion specimens from 100 million-year-old amber. To investigate possible changes in morphological diversity of these larvae over geological time, the shapes of the heads and the stylets were compared quantitatively between the different time periods. Together with the new fossils and the specimens accessible from the literature, a total of 361 specimens could be included into the analysis. The results indicate an increase in the diversity of the shape of head and stylets in Hemerobiidae, while the diversity of the shape of head and stylets in Chrysopidae remains more or less the same over time. In other ingroups of Neuroptera, a distinct decrease in diversity of the shape of head and stylets over time could be observed. This demonstrates that the diversity of lacewings did not simply decrease over time, as generally assumed; at least some lineages diversified since the Cretaceous.