

Abstract

The extinct insect group of Palaeodictyopteroidea (Insecta: Palaeoptera) comprised mainly phytophagous species and occurred from Upper Carboniferous to Upper Permian. Megaseoptera is one of several orders of belonging to this group. Although, the order Megaseoptera comprised over 20 described families, morphology of some body structures are insufficiently studied.

The present thesis deals with evaluation of new material comprising the extensive set of 76 fossil insect specimens from the Upper Carboniferous (Bashkirian) of northern China. The fossils having excellent state of preservation of the wings and other body structures provide new insights concerning the external morphology of Megaseoptera. All studied specimens were attributed based on wing venation pattern into two known megaseopteran genera within families Brodiopteridae and Sphecopteridae.

The aim of the present thesis is examine the morphology and variability of wing venation of two newly proposed species *Brodioptera* sp. n. and *Cyclocelis* sp. n. from site in northern China. In addition the following methods of geometric morphometrics based on landmarks were used for comparison of venational characters: a comparison of centroid size, procrustes analysis, principal component analysis and thin plate spline. Variability of wing venation and wing size between two species show differences. Intraspecific differences of wing venation are not significant enough. Thus, there is no need to separate more than two groups as one new species per genus. These results were more or less confirmed by comparison between results of wing venation variability analysis and wing venation morphology of other known species within both genera.

Finally, the morphology of other body parts of new species were described and discussed. Similarities between body structures of other megaseopteran families, selected diaphanopteroidea and already known similarity of male and female genitalia with extant Ephemeroptera and Odonoptera were observed. These facts could contribute for clarification of systematic position of Megaseoptera within Palaeodictyopteroidea.

Keywords: Insecta, Palaeodictyopteroidea, Megaseoptera, wing venation, geometric morphometry, Upper Carboniferous, Ningxia, China