

Venation pattern and revision of Orthoptera *sensu nov.* and sister groups.

Phylogeny of Palaeozoic and Mesozoic Orthoptera *sensu nov.*

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Abstract

After the revision of several fossils and observations of recent taxa, we propose a new interpretation of the wing venation pattern for the 'orthopteroid lineage'. The Orthoptera and several taxa previously assigned to the paraphyletic group 'Protorthoptera' are included in a common clade, Archaeorthoptera *taxon nov.* The Orthoptera and some closest relative groups are included in the Panorthoptera *sensu nov.* These assignments are based on new autapomorphies based on venation patterns. A cladistic phylogenetic analysis of the Orthoptera is performed for the first time on the fossil record of this group, based on 74 characters (131 informative states). Three taxa assigned to the Archaeorthoptera *nec* Panorthoptera compose the outgroup. The ingroup is composed of three Panorthoptera *nec* Orthoptera and 63 Orthoptera, mainly from the Palaeozoic and Mesozoic. Following this initial phylogeny, we propose several nomenclatural changes; the Ensifera are redefined and the relationships between Caelifera and Ensifera *sensu nov.*, and those between the major clades of modern Ensifera *sensu nov.*, are clarified. Relationships within the 'oedischoid' stem-group remain unclear. The evolution of the venational structures within the Orthoptera is discussed and in this analysis the Orthoptera were not clearly affected by the Permo-Triassic biodiversity "crisis". The capacity of the fossil taxa to be used in phylogenetic analyses is discussed, using the example of the 'orthopteroid' insects.

Key words: Insecta, Archaeorthoptera *taxon nov.*, Panorthoptera *sensu nov.*, Ensifera, Caelifera, fossil, cladistics, forewing, morphology, evolutive trends.