



Molecular and combined morphological-and-molecular phylogeny of the Ichneumonidae (Hymenoptera)

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Partial 28S rDNA sequences from 750 species, covering over 650 genera of ichneumonid wasps, have been generated and analysed both separately and in combination with morphology scored variously at genus, genus-group, tribe or subfamily level. The data set comprises all subfamilies and virtually all tribes. Length variation in the gene means that alignment is necessary. Attempts to run the data set with POY have proved futile due to the number of terminal taxa. Therefore Clustal multiple alignment was carried out using a large range of parameter combinations, and the resulting alignments analysed using TNT. Recovery of independently recognised monophyletic groups did not favour any particular combination of parameters. The large number of parameter combinations examined also made use of the Elision strategy impracticable. Therefore a modified form of Elision was performed. Some of the robust results will be illustrated and discussed and novel character states presented.

Origin and earliest evolution of Apocrita (Hymenoptera): new data from the Jurassic of China and Germany

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New fossils from the Middle Jurassic of Daohugou, China, and Lower Jurassic of Grimmen, Germany, imply a smooth transition from the most archaic Vespina (= Orussoidea + Apocrita) toward both Orussoidea and higher Apocrita. The apparently stem taxon (preliminarily assigned to Karatavitidae) looks perfectly morphologically ancestral to Paroryssidae and Orussidae. At the same time, this taxon appears ancestral also to advanced Karatavitidae like *Karatavites* Rasn. which is in turn morphologically transitional to Ephialtitidae. Other new fossils, some with the wings of *Proapocritus* Rasn. and assignable to Ephialtitidae, and others appearing like highly archaic Praeaulacidae, jointly form a smooth morphological transition toward the remaining Evanioidea. This indicates that the non-evanioid Apocrita either started from Ephialtitidae independently of Evanioidea, or else these non-evanioid Apocritans had an evanioid-like ancestor, that is, had the evanioid (high) position of the metasomal attachment on the propodeum.



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