

Catfish Morphology, Phylogeny and Macroevolution

A Case Study in Theoretical Phylogeny
and Macroevolution

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ABOUT THE BOOK ●

Catfishes, or Siluriformes, with 35 families, about 437 genera and more than 2700 species, represent about one-third of all freshwater fishes and are one of the economically important groups of fresh-water and brackish-water fishes in the world. They have a wide geographical distribution and are found in North, Central and South America, Africa, Eurasia, South-East Asia, Japan and Australia, with fossil catfishes having even been reported in Antarctica. Catfish are not only remarkable for their amazing taxonomic diversity and biogeographic distribution, but also for the diversity in several other respects, such as their anatomy, their ethology, their ecology or their functional morphology. It is precisely this amazing diversity and complexity that provided the rationale to undertake this work: 1) the amazing diversity and complexity of the catfishes renders very difficult the study of this group of fishes as a whole, in particular in what concerns their general phylogeny and evolution; 2) at the same time, the amazing diversity and complexity of the catfishes, either from a taxonomic, an anatomical, a morphofunctional, an ethological, a biogeographic, or a ecological point of view, renders this group a very appropriate, useful, subject for a case study concerning macroevolution and theoretical phylogeny in general. The major aim of this work is, thus, to help to clarify the still largely unresolved, and puzzling, but unquestionably interesting higher-level interrelationships of catfishes, an issue not only enormously interesting and impelling by itself, but also with major implications on the study of the general evolution of these fishes. Therefore, a great part of this work deals with a cladistic analysis of catfish higher-level phylogeny based on extensive morphological data, in which are included some terminal taxa not included in previous analyses, but principally a large number of characters traditionally excluded from those analyses, with particular attention being given to catfish myology. This analysis will give particular importance to complex, integrated structures, and will, thus, pave the way for a discussion on the evolution of these complex structures within the whole order, as well as on catfish evolution in general. Lastly, this focus on catfish higher-level phylogeny and evolution will allow a more broader, theoretical reflection on general phylogeny and macroevolution.

