

The record of Mesozoic fishes from Gondwana (excluding India and Madagascar)

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Abstract

Mesozoic fish faunas from the Gondwanan continents of South America, Africa, Australia, and Antarctica are relatively more poorly known than their northern counterparts. The best studied faunas known so far are those of the Jurassic (Oxfordian) of Quebrada del Profeta in Chile, of the Lower Cretaceous (Aptian-Albian) of the Araripe Basin in northeastern Brazil, and of the Upper Cretaceous (Cenomanian) of Lebanon and Morocco. Many other promising localities have been reported, but they need to be revised or thoroughly studied in the light of modern ideas of phylogeny and biogeography. These include the Triassic faunas of the Cuyo Basin in Argentina and of Gosford, Brookvale and St. Peters in Australia, the Jurassic faunas of the Cañadón Calcáreo Formation in Argentina, Talbragar in Australia, the Stanleyville Beds in Africa, and the Cretaceous faunas of the La Cantera and Lagarcito Formations of Argentina, the Apon Formation of Venezuela, many Albian fish assemblages of Africa, and the Santa Marta Formation of Antarctica among others. The geographic distribution of known Mesozoic fish localities on these continents mainly follows the more densely populated and/or geologically better explored areas. Stratigraphically, the Mesozoic fish record is far from complete, with the Cretaceous generally better represented than either the Triassic or the Jurassic on all continents. At the current state of knowledge, Mesozoic fish evolution in Gondwana seems to have followed the same general pattern as in the Northern Hemisphere, but too little is still known to establish the detailed sequence of events. Mesozoic fish faunas from Gondwana have already been demonstrated to be of great importance for our understanding of fish evolution and biogeography, and there is a great potential for further discoveries and studies.

Introduction

During the approximately 180 million years of the Mesozoic era, the Earth underwent major physical changes related to the breakage of Pangea, which had drastic effects on the ancient biota in both marine and continental environments, producing major biological changes shaping the evolution of modern biodiversity. Accordingly, drastic changes in the composition of Mesozoic fish faunas are well documented. However, our knowledge of these changes is largely based on the fossil record of the Northern Hemisphere. Research on Mesozoic fishes from the Gondwanan continents of South America, Africa, Australia, and Antarctica has a long history, but material from these continents has only rarely been included in modern studies of fish phylogeny and historical biogeography. Thus, many aspects of the evolution, phylogenetic relationships and geographical distribution of Mesozoic fishes from Gondwana remain largely unknown.

In the present paper, I present an evaluation of our current state of knowledge of the Mesozoic fish faunas from South America, Africa, Australia, and Antarctica. It will not be possible to give an extensive overview in the limited space of a single article, so I will only refer to the better studied and/or more significant faunas of each continent. More detailed information on African Mesozoic fish faunas can be found in MURRAY (2000). The most complete and recent review of Australian Mesozoic ichthyofaunas can be found in VICKERS-RICH et al. (1991) and KEMP (1996), the Mesozoic fishes of Antarctica have been summarized in YOUNG (1991), and the Mesozoic fish faunas of southern South America only have been reviewed by ARRATIA & CIONE (1996).

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