

An overview of Mesozoic fishes in Asia

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Abstract

Although the Mesozoic fishes in Asia are abundant, their adequate studies are not. Among the publications, many are in the languages other than English and often in the journals not readily available. This paper has brought much of that information together, and based on it, has concluded on the patterns of succession, distribution, and tectonic implications of the Mesozoic fish faunas in Asia.

The integral parts of the present-day Asia had gone through drastic changes during the Mesozoic, and so had the freshwater fish faunas dwelled on them. The Triassic freshwater faunas in northern Asia are characterized by primitive actinopterygians such as palaeoniscids, scanilepids and perleidids. In contrast, the marine fish fauna in southern China contains edestids, hybodontiforms, perleidids, saurichthyids, birgerids and coelacanthiforms, with some primitive forms similar to those from the northern coast of the Mediterranean. The wide distribution of the Triassic freshwater fishes in Asia, even in part of southern China, suggests a more extensive landmass in Asia during the Triassic than previously reconstructed. The Jurassic freshwater fish faunas had even more extensive distributions, consisting of palaeoniscids, coccolepids, ptycholepid, 'pholidophoriforms', and primitive acipenseriforms. The marine Jurassic fishes include a pycnodontid from Tibet as well as coccolepids, 'pholidophorids', semionotids, amiiforms and ceratodontids from southern China's Hunan Province. Aside from reduced marine fish distributions, the Jurassic fish faunas were subjected to the similar conditions as those of the Triassic. The Early Cretaceous fish faunas from the mainland Asia plus Korea and Kyushu, Japan are all freshwater and consist mostly of archaeomaenids and teleosts, mainly osteoglossomorphs in the north and ichthyodectiforms and clupeomorphs in the south. These forms are divided into three assemblages, which are distributed in three SW-NE oriented areas parallel to the tectonic structures. The Late Cretaceous fish faunas are not well studied, but appear to be represented by more advanced, and more cosmopolitan, teleosts.

The succession of the Mesozoic fish faunas in Asia as elsewhere in the world reveals: 1) the distinctive compositions among the three periods of the Mesozoic, 2) the tectonic control of the drainages and thus its impact on the distributions of the freshwater fish faunas, and 3) the freshwater environments as the refuge for the pre-existing marine fishes.

Introduction

The Mesozoic era witnessed a fundamental reorganization of the continents and oceans on the Earth: the Pangea split up, the continents drifted apart, and they finally approached their current configuration. The available paleogeographical evidence indicates the parts of the land forming the present-day Asia had gone through drastic changes during the Mesozoic. In the Early Triassic, while Siberia and northern China were land masses, South China was covered with sea water. The Indian Peninsula was still a part of the Gondwana, and was situated between Africa and Antarctica. Later on, South China gradually emerged from the ocean as the marine water retreated towards south and southwest. India traveled all the way from the southern hemisphere towards the southern margin of Asia and later, in the Eocene only, collided with the mainland Asia and joined its extra-peninsular part. Throughout the Mesozoic, most of the today's Japanese Islands were under the sea, except a tiny area in western Honshu during the Late Triassic and northern Kyushu during the Early Cretaceous. Korea was also above the sea level at least during the Early Cretaceous based on its record of freshwater fishes of that age. This whole process had substantially shaped the characteristics of the Mesozoic ichthyofaunas from Asia.

The Mesozoic fishes are abundantly distributed in Asia. Yet most of them, especially those from the

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