Zoogeography of Indian freshwater fishes*

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Abstract. The geographical distribution of 89 genera of primary freshwater fishes of India is discussed. It is shown that the fish fauna comprises three components: Indian, Indo-Chinese and Malayan, with indigenous Gondwana elements and intrusive genera. The Indo-Chinese element is dominant, whereas the Malayan element is comparatively poor. The original peninsular fauna is found as relicts in isolated hill tops where suitable ecological niches are found. There were faunal transgressions from the east via the Assam gateway and also from the west. The biogeography of the peninsula and the distribution patterns of the various genera are discussed. It is surmised that a major part of the fauna may have had an origin in the Indo-Chinese amphitheatre radiating and intruding in all directions. A list of the 89 fish genera is also appended.

Keywords. Freshwater fishes; zoogeography.

1. Introduction

The geographical distribution of freshwater fishes of India has attracted the attention of a number of workers. Despite many inquiries dating from the days of Blanford, even now there is considerable confusion. Of the 2000 species, under 342 genera, known to inhabit India, Pakistan, Sri Lanka, Bangladesh and Burma, 63% belong to the Oriental Realm, with the Ostariophysi ans dominating. The remaining 37% comprise Madagascan-African, Palaeartic and other elements. The fish fauna comprises three components: Indian, Indo-Chinese and Malayan. Before we discuss the distribution of these components, it is necessary to reiterate here certain basic facts of the biogeography of the area under discussion.

2. Biogeography of the peninsula

The Indian peninsula is one of the oldest blocks, which has remained as a stable mass of Archaean and pre-Cambrian formations for well over 60 million years. The major mountain building or any orographic changes in the peninsula were all over by pre-Cambrian times. It is a compact natural unit where much geomorphological and biogeographical evolution has taken place from the Cretaceous period onwards. A little more than half area of this ancient block alone is now exposed as original Archaean and Cambrian rock formations the remaining part being covered

by Gondwana and Deccan lava flows. It was once a much larger landmass, a major part of which now lies concealed under the alluvium of the northern plains, and also thrust under the Himalaya and Tibet. Compared to this ancient landmass, the Himalaya, the Indo-gangetic plains or more aptly called the extra-peninsular area are all subsequent formations of the tertiary Era. The Himalaya itself arose out of the intense squeezing out of the Tethyan geosyncline between Laurasia, advancing from the north, and the Gondwana block consisting of the Indian peninsula from the south. The opposing fronts squeezed the soft contents of the Tethyan geosyncline into the east-west Himalaya. However, since the Indian block is much narrower than the Laurasian mass, its advance threw sediments on either side to form the north-south folds of Baluchistan in the west and Burma, Arakanyomas in the east. Laurasia overrode the peninsular block, and the latter also buckled, tilted gently northwards and dived under Laurasia to form the Tibetan plateau. Thus it is clear that India in the strictest sense must be described as the peninsula, with the Himalaya and other extra-peninsular areas as mere biogeographical appendages of recent origin. Thus the peninsula per se is biogeographically India vera the largest and the oldest region of differentiation of not only fauna but also of flora. The northern limit of this peninsula lies along with the Indo-gangetic plain. This peninsula had its own indigenous fauna. This fauna was essentially a humid tropical forest fauna which was depicting the ecological conditions that prevailed then. The different species were continuously distributed not only throughout the peninsula, but even up to the foot of the newly rising Himalaya. It was highly stable having attained the maximum level of differentiation of species in relation to the available habitats (after Mani 1974). These changes have caused concomitant changes in the drainage pattern and evolution of distribution patterns of fish.

3. Distribution patterns

We may now consider the present day distribution pattern of freshwater fish genera in the peninsular and extra-peninsular areas.

3.1. Indigenous fauna of the peninsula

Very little is known about the peninsular autochthonous fauna prior to the Pleistocene times. The Narmada gravels and the Karnul caves of some vertebrate fossils other than fish are of Pleistocene age. The general character of the fauna is typical of the senile topography of the region, with flat-topped mountains, devoid at present of humid tropical forest cover. The fauna itself is characterized by marked impoverishment, regression, evolutionary stagnation and with ecological anomalies in distribution (Mani, op. cit.)

There are two groups of the component elements of the present day fauna.

3.1.1 Derivatives of the older faunas differentiated in the Gondwana landmass.

These are:

I. Bagridae
1. Rita
2. Mystus

II. Schilbeidae
3. Eutropiichthys
4. Proeutropiichthys