

FISH DIVERSITY AND STATUS

Key words: Fishes, Corals, Diversity, Endemic

INTRODUCTION

Ichthyodiversity refers to variety of fish species; depending on context and scale, it could refer to alleles or genotypes within piscian population, to species of life forms within a fish community, and to species of life forms across aquaregimes (Burton *et.al.*, 1992). Biodiversity is also essential for stabilization of ecosystems, protection of overall environmental quality, for understanding intrinsic worth of all species on the earth (Ehrlich & Wilson, 1991). Positive correlations between biomass production and species abundance have been recorded in various earlier studies (Nikolsky, 1978). The species diversity of an ecosystem is often related to the amount of living and nonliving organic matter present in it. However, apparently, species diversity depends less on the characteristics of a single ecosystem than on the interaction between ecosystems, e.g., transport of living animals across the different gradient zones in the waterbody. The effect of such transport is an important 'information' exchange enhancing the genetic diversity. The genetic imprinting of various populations of lentic fish species is essential since the freshwater ecosystems constitute crucial parts of their life-support systems by providing nursing grounds and feeding areas (Hammer *et al.*, 1993). Further, species diversity is a property at the population level while the functional diversity concept is more strongly related to ecosystem stability and stress, physical and chemical factors for determining population dynamics in the lentic ecosystem. Also, the various organisms including the plankton play a significant role in the dynamics of the ecosystem (Kar & Barbhuiya, 2004).

Fish constitutes almost half of the total number of vertebrates in the world. They live in almost all conceivable aquatic habitats. They exhibit enormous diversity of size, shape and biology, and in the habitats they occupy. Of the 39,900 species of vertebrates in the world, Nelson (1984) estimated 21,723 extant species of fish under 4,044 genera, 445 families and 50 Orders in the world, compared to 21,450 extant tetrapods. Of these, 8,411 are freshwater species and 11,650 are marine. Other researchers, have arrived at different estimates, most of which range between 17,000 and 30,000 for the numbers of currently recognized fish species. The eventual number of living fish species may be close to 28,000 in the world. Day (1889) described 1418 species of fish under 342 genera from the British India. The fish fauna of the major tropical regions, Southern Asia, Africa, South and Central America are generally different with respect to genera; but, some families have members in two or all of the continents. In Southern Asia the predominant fish groups are the carps (Cyprinidae) and the cat fishes (Siluroidea) (Berra, 1981).

India is one of the megabiodiversity countries in the world and occupies the ninth position in terms of freshwater megabiodiversity (Mittermeier & Mittermeier, 1997). The Indian fish population represents 11.72% of species, 23.96% of genera, 57% of families and 80% of the global fishes. Out of the 2200 species so far listed, 73 (3.32%) belong to the cold freshwater regime, 544 (24.73%) to the warm fresh waters domain, 143 (6.50%) to the brackish waters and 1440 (65.45%) to the marine ecosystem. This bewildering ichthyodiversity of this region has

been attracting many ichthyologists both from India and abroad. Concomitantly, the northeastern region of India was identified as a biodiversity hotspot by the World Conservation Monitoring Centre (WCMC, 1998). This rich diversity of this region could be assigned to certain reasons, notably, the geomorphology and the tectonics of this zone. The hills, and the undulating valleys of this area gives rise to large number of torrential hill streams, which lead to big rivers; and, finally, become part of the Ganga-Brahmaputra-Barak-Chindwin-Kolodyne-Gomati-Meghna system (Kar, 2005).

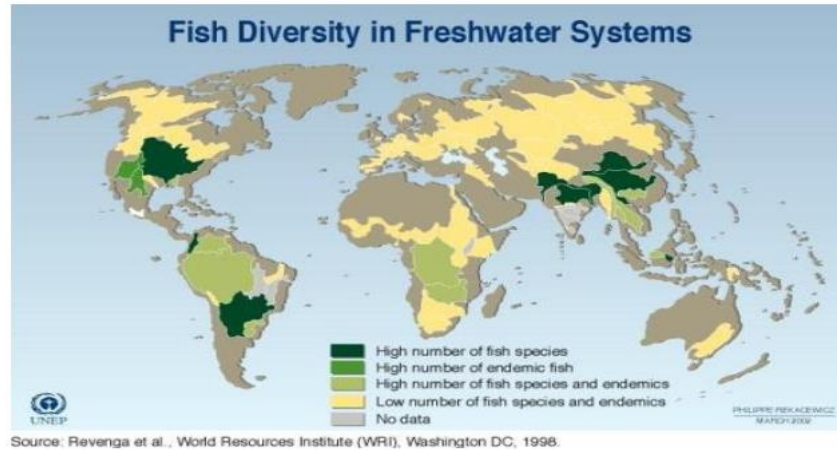


Fig – 3.1

The Indian fish fauna is divided into two classes, viz., Chondrichthyes and Osteichthyes. The Chondrichthyes are represented by 131 species under 67 genera, 28 families and 10 Orders in the Indian region. The annual average landings of the Indian Chondrichthyes is 33,442 tonnes, of which, 15,537 tonnes come from the east coast and 17,605 tonnes come from the west coast and the rest come from the Andaman and Nicobar, and Lakshadweep Islands.

The Indian Osteichthyes are represented by 2,415 species belonging to 902 genera, 226 families and 30 orders, of which, five families, notably the family Parapsilorhynchidae are endemic to India. These small hillstream fishes include a single genus, viz., *Parapsilorhynchus* which contains 3 species. They occur in the Western Ghats, Satpura mountains and the Bailadila range in Madhya Pradesh only. Further, the fishes of the family Psilorhynchidae with the only genus *Psilorhynchus* are also endemic to the Indian region. Other fishes endemic to India include the genus *Olytra* and the species *Horaichthys setnai* belonging to the families Olyridae and Horaichthyidae respectively. The latter occur from the Gulf of Kutch to Trivandrum coast. The endemic fish families form 2.21 per cent of the total bony fish families of the Indian region. 223 endemic fish species are found in India, representing 8.75 per cent of the total fish species known from the Indian region and 128 monotypic genera of fishes found in India, representing 13.20 per cent of the genera of fishes known from the Indian region.

There are about 450 families of freshwater fishes globally. Roughly 40 are represented in India (warm freshwater species). About 25 of these families contain commercially important species. Number of endemic species in warm water is about 544. Major warm water species are:

Bagarius bagarius, *Catla catla*, *Channa marulius*, *C. punctatus*, *C. striatus*, *Cirrhinus mrigala*, *Clarias batrachus*, *Heteropneustes fossilis*, *Labeo bata*, *L. calbasu*, *L. rohita*, *Aorichthys seenghala*, *Notopterus chitala*, *N. notopterus*, *Pangasius pangasius*, *Rita rita*, *Wallago attu*.

Cyprinids (family: Cyprinidae), Live fish (family: Anabantidae, Clariidae, Channidae, Heteropneustidae), Cat fish (family: Bagridae, Siluridae, Schilbeidae), Clupeids (family: Clupeidae), Mulletts (family: Mugilidae), featherbacks (family: Notopteridae), Loaches (family: Cobitidae), Eels (family: Mastacembelidae), Glass fishes (family: Chandidae) and Gobies (family: Gobiidae) are the major groups of fresh water fishes found in India.

The Western Ghats, one of the well-known biodiversity hotspots of the world, harbours 289 species of freshwater fish of which 119 are endemic. The ecosystems in this region have been, over the past 150 years or so, experiencing tumultuous changes due to the ever-increasing human impacts. In this regard, a study was conducted in Sharavathi River, central Western Ghats to understand fish species composition with respect to landscape dynamics. The study, using a combination of remote-sensing data as well as field investigations shows that the streams having their catchments with high levels of ever greenness and endemic tree species of the Western Ghats were also richer in fish diversity and endemism, compared to those catchments with other kinds of vegetation. This illustrates that the composition and distribution of fish species have a strong association with the kind of terrestrial landscape elements and the importance of landscape approach to conservation and management of aquatic ecosystems. (**Fish diversity in relation to landscape and vegetation in central Western Ghats, India**; Sreekantha, M. D. Subash Chandran, D. K. Mesta, G. R. Rao, K. V. Gururaja and T. V. Ramachandra).