

**STUDIES ON BIOLOGY AND CHROMOSOME
ANALYSIS OF SOME TELEOSTEAN
FISHES OF NORTH-EASTERN INDIA**

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The North-Eastern States of India have various types of fresh water ecosystems viz., artificial impoundments, ponds, lakes, hill streams and rivers. Proper utilization of these aquatic bodies for fishery development will go a long way in the improvement of the living standards of the people of this area. A prerequisite to fishery development is a thorough understanding of the fish fauna and a review of literature shows that such investigations are still lacking as compared to other parts of the country. We have, therefore, undertaken in our laboratory a long standing programme on systematic studies of the fish fauna available in the North-Eastern States of India, and the present study is a part of it.

In the present investigations we have selected four locally available fish species, Pillaia indica, Danio dangila, Garra annandalei and Semiplotus semiplotus. These four species though inhabiting the streams of this region, yet possess very different Taxonomical, Morphological and distributional attributes. It was therefore felt that these external differences may also be reflected in their histomorphological and chromosomal structures including other biological functions. Thus, Pillaia indica or the Khasi eel, is an endemic species being confined to the State of Meghalaya and the only representative of the family Pillaidae (YAZDANI, 1970). Danio dangila (HAM), inhabits clear streams of Khasi and Jaintia Hills although their distribution extends to Uttar Pradesh, Bihar, Bengal, Bangladesh, Assam and

Manipur (MENON, 1974). D dangila is quite a small species and serves as a weed fish. Garra annandalei Hora, the next species, is a typical hill stream fish with semi-circular inferior mouth followed by a suctorial disc on the chin which acts as a holdfast organ. The last species Semiplotus semiplotus Mc Clelland is an economically important fish of same habitat.

In the present investigation several aspects of biology of the above mentioned fishes have been undertaken viz., Morphotaxonomy with an interpretation to cytotaxonomy, food habit in relation to histomorphology of alimentary canal and Gonadal cycle, to bring out the relationships if any, within and between these species of fishes.

It has been found from the present study that among the three species of Cyprinidae D dangila, G annandalei and S semiplotus most of the adaptations have taken place as that in highly evolved teleosts. Thus D dangila, for example possesses 2 pairs of barbels which probably serves as mechanoreceptor organs. Further its omnivorous habits, more or less short and straight digestive tract, low R.L.G., somewhat long oesophagus indicative of rapid digestion and absorption and assimilation of food, presence of taste buds upto oesophagus, scales covering the body, bony operculum, teeth on both the jaws and apical mouth as organ of offence and defence for easy capture and killing of prey and spawning in rainy season favourable for the proper development of young are all characteristics of a highly evolved fish. Even its karyological status,

having metacentric and more submetacentric chromosomes indicates its evolutionarily advanced status. Most of the above mentioned characters are also found in G annandalei and S semiplotus except for the presence of teeth on the jaws, herbivorous habit with long alimentary canal, short oesophagus, higher R.L.G., absence of taste buds in pharynx and oesophagus in the former and absence of barbels in the latter, ventral mouth in G annandalei and sub-apical mouth in S semiplotus. Though these fishes are lacking the above mentioned characters yet their morphology show special adaptations for stream dwelling habit. Thus, G annandalei has the muscular pad-like structure on the chin, whereas in S semiplotus the tubercles are on the dorsal surface of the dorsal lip. In view of the above mentioned facts it can be inferred that these two fishes are very close to one another in their evolutionary status; but less advanced than D dangila. Their karyology (1 M + 14 sm + 10 t in G annandalei OM + 14 sm + 11 t in S semiplotus) also suggests such a close relationship though less advanced than D dangila in this feature well. The other species P indica possesses highly vascularised operculum, sharp teeth and apical mouth as organs of offence and defence and easy capture and killing of prey, short alimentary canal and long oesophagus. Though some of these features may be considered as advanced characters still they possess some pronounced primitive characters like eel like body, absence of scales, absence of barbels, membranous

operculum and absence of any gustatory sense. Considering all these facts enumerated above it can be stated that P indica is a less advanced, eel-like fish and even its karyological features (OM + 2 Sm + 2ot) having more acrocentric chromosomes only confirm such a view of its primitiveness.