Chapter I

INTRODUCTION
Manipur, a hill girt state in the north east corner of India is a distinct geographical entity. The hills surround a lacustrine valley, also called an intermont plateau (Singh, 1982) of about 1,800 sq km in the middle, which one would like to call a little paradise on earth. The rocks are of young alpine system of folded mountain, formed 40 - 90 million years ago by tertiary foldings of sedimentary strata of the Tethys sea (Ansari, 1974). The Imphal River, also called 'Turel Acouba' (meaning : principal river) and its tributaries, viz, the Irlil, Thoubal, Sekmai and Khuga and Chakpi streams drain the plain from north to south. The Imphal receives a short course of river called the Khordak which is the outflow of the Loktak Lake. It also receives the Khuga river, originating from Churachandpur District at Ithai. Now the river, quite big in size is called the Manipur River. The river flows southward on the western side of important towns like Arong, Wangoo, Chairel, Sugnu and Serou (Census, 1971).

At Sherou, about 75 kms south of Imphal, the Chakpi stream, a hill stream originating from the hills of Chandel district and flowing through Mombi, Tera and Chakpikarong, joins the Manipur River. The principal river then follows a southward
course in the boundary line between Churachandpur and Chandel districts. The river bank south of Serou is not connected by any road and thus vehicular approach is not possible.

After harvesting of paddy, groups of expert fishermen of Sugnu often perform fishing tours towards south, either on foot or using dug out canoe. The basic needs for such a tour are: 1) fishing gears, such as, gill nets of different mesh sizes, rods and lines, suitable baits, ichthyotoxic plants and 2) supplies, usually food grains (rice, dal), vegetable oil, salt, utensils and match boxes. Most of the fishermen enjoy delicious rare fish curry during such trips. Such tours may last for weeks together. Fishes usually smoked and dried reach the market with high prices. The names of important places south of Serou towards south, as reported by fishermen are: Heiningpok, Phutap, Phuyang, Sita, Mantanglok, Makha Haokon, Nungoi Tengol, Yangmung. Two streams, viz., Kanan stream and Yankoolok join the principal river from the east. The first one joins between the Heiningpok and Phutap and the later, on the boundary between India and Myanmar as a small waterfall. The river then flows out of the Indian territory to Myanmar. The places towards south in the territory of Myanmar are: Samolok, Kangleibi etc. Fishermen of both the countries sometimes meet on the boarder and exchange their harvests. It is reported that some regular fishermen of both the sides are known to each other and they become good friends. The river flows in the Chin hills and then finally flows into the Chindwin river at Kalewa as River Myitha.

Another interesting feature of the river is that there is an elevation called the Sugnu Hump, also called the Sugnu Nungthong (Manipur: the gate of rocks), formed of huge stone blocks on the course of the river south of Sugnu, about 70 kms south of Imphal. During monsoon season when the water volume is large and speed of water current is fast, this hump causes obstruction on the water flow. This leads to the rushback of the river course and causes flood in the areas on the sides of the river. In the rainy season, the Chakpi, which is a fast running hill stream causes the temporary reversion of the course of the Manipur River.
The interesting fact in the geology of the state is that the east consists of limestone, and Disang group of rocks consisting of dark grey shales with minor mudstones, siltstone and sandstone formed in the eocene. The Barail group of the west consists of shales, sandstone, clay with abundant carbonaceous shales formed in upper eocene and oligocene (G.S.I., 1974). The Imphal alluvium of the recent overlays the Disang group in the Central plain. Thus the course of the river draining the central plain has muddy bottom where the flow is slow. The course further south where it passes through hilly terrain has the rocky, sandy and pebbly beds where the current is relatively faster. Further south, in Myanmar, after passing through the Chin hills, the river flows in a relatively lower altitude and warmer temperature.

The different ecological conditions prevailing in the Manipur river is of great interest from taxonomic point of view since it would support different types of specialized as well as widely adaptive fishes. A widely diverse biological fauna is expected from this stretch of river. As the river flows into the Chindwin, it is expected that upstream migrating stream fishes also occur.

Fish is the primary source of animal protein for the people of Manipur. The Loktak lake is the main centre for fish production of the state. Fish production of the state is not sufficient to meet the requirements of the people. The actual fish production of the state is 12,010 metric tonnes (Department of Fisheries, 1995) while the population is 20.64 lakhs (Directorate of Statistics, 1995). The estimated requirement of fish is about 73,000 tonnes per annum (calculated on the basis of 100 g of fish per capita per day). In order to meet the additional requirement, large quantities of iced and smoked fishes are purchased from neighbouring states. The Loktak is the lake from where the majority of the fishes required are supplied. The contribution of other lakes and rivers in supply of fish is far from satisfaction.
The river stretch south of the Loktak is a potential resource for the riverine fisheries of Manipur. There is no organized fishery in this area. At the same time, the transport of fishes is also a problem since there is no proper vehicular approach to remote areas where large amounts of fishes are caught. Thus fishes are smoked and brought on either headloads on hilly roads or on dug out canoes for long distances. Most of the catches are consumed locally and fail to reach the market.

In the present work, the Manipur river stretch from Sugnu to Yankoilok and the Chakpi stream joining the river has been thoroughly studied for a period of three years between 1992 and 1995 with the following objectives:

1. collection, detailed morphometric examination and identification and classification of fishes.
2. studies on the biology of a round the year available, new species of bariline fish *Barilius ngawa*, in respect of length-weight relation, condition, fecundity and food and feeding habits.
3. the seasonal variation in the proximate composition: moisture, ash, crude protein, and lipid of *B. ngawa* n. sp.