

Diversity of Cypriniformes Fish Fauna in Karala River, A Tributary of Teesta River at Jalpaiguri District of West Bengal, India

Amal Kumar Patra and Tanmay Datta

Department of Zoology, Ananda Chandra College, Jalpaiguri, West Bengal, India

Abstract: The diversity of Cypriniformes fish fauna of the Karala river at Jalpaiguri District of West Bengal has been studied from the period of February, 2009 to January, 2010. The objectives of that study were to find out the fresh water cypriniformes fish resource in that river and to detect their status on the basis of catch frequency (%). A total of 31 species belonging to 18 genera, 5 sub-families and 4 families were identified. Among the 31 species, 11 species were found under the sub-family Danioninae (Rasborinae); 14 species were found under the sub-family Cyprininae, two species were found under the sub-family Cobitinae, sub-family Noemacheilinae each and one species was found under the sub-family Cultrinae and family Psilorhynchidae each. Of these 31 species, on the basis of catch frequency, 6 (19.35%) were common, 3 each (9.68%) were abundant and frequent, 8 (25.8%) were occasional, 5 each (16.13%) were sporadic and rare species and one (3.23%) was extremely rare species. In this lotic system these fishes were distributed discontinuously. This discontinuous distribution is apparently attributed to the irregular depth of river and differential level of pollution.

Key words: Cypriniformes fishes, Karala river, fishes in tributary of teesta, fresh water fishes, minnows, carps, loaches

INTRODUCTION

The increasing population on the world has threatened mankind in several ways amongst which the most important one is the food problem. Fish being the valuable and easily accessible source of food, rich in protein content can be used to overcome the food problem to a certain extent.

From pre-historic period these aquatic animals have been used as protein-rich diet for human being. Its flesh is constituted by approximately 60-80% water, 13-20% protein, small amount of fat, minerals like calcium, phosphorus and iron and vitamins like A, D and B-complex. Fish provide almost 75% of required proteins for functioning of human body.

For these reasons the fishes are designated to us as an economically important fauna of water. The fishery resource in India can be broadly divided into inland-, estuary and marine fisheries. The inland fisheries contain rivers, streams, lakes, tanks, ponds, etc. The Indian rivers are quite full by either fresh water or brackish water. Northern part of West Bengal, popularly mentioned as North Bengal is endowed with numerous fresh water rivers. River Teesta is one of them. The main stream of this river is connected by different tributaries. One of

them is Karala which is also known as Kalla. It originates from the Baikunthapur forest and flows down to the river Teesta near Daspara (Mandal Ghat) in Jalpaiguri town. This river bisects the Jalpaiguri district town (located on the confluence of river Teesta and Karala) in two halves. The total catchment area of the river is 141 km² most of which is covered by arable land. The basin of this river sustains life and livelihoods of tea gardeners, fishermen and slum-dwellers. Tea gardeners utilize the water resource for tea plantation and drain off the utilized excess water which carries variety of pesticides and fertilizers to that river (Karala).

The fishermen utilize the downstream of this river for fish capture. Slum-dwellers utilize the water resource for bathing, washing of cloths etc. Sewage from municipality, garbage from markets and ash of cremation directly mix up with this river.

As a result the physical, chemical and biological characteristics of the river water are gradually changing and producing the harmful effect on aquatic biota and thereby also harming human beings.

The fresh water ichthyofauna diversity was studied by different ichthyologists (Sen, 1985; Madhyastha and Murugan, 1996; Arunachalam and Sankaranarayanan, 1999; Sarkar and Banerjee, 2000; Mishra *et al.*, 2003;

Karmakar *et al.*, 2008) in different rivers of India. In North Bengal, there is single reference available about the fish fauna diversity by Shaw and Shebbeare, 1937.

They studied the fish of rivers, streams and ponds in the hills and plains of Darjeeling district and adjoining Duars of North Bengal from 1918-1933 but they did not mention the name of river Karala and its fish fauna resources.

It is the first time report on ichthyofauna diversity in this lotic system. This communication reports the cypriniformes fish diversity in karala river of Jalpaiguri District, West Bengal, India.

The main aims of this study were to find out the fresh water cypriniformes fish resource in that river and to detect their status on the basis of catch frequency (%).

MATERIALS AND METHODS

The fishes were captured from 3 different study Karala sites (Fig. 1) of Karala River at 15 days interval. The station-I (Aquiduct) is near the origin of the river. Its latitude, longitude and elevation (from Mean Sea Level) are $26^{\circ}47'13''N$, $88^{\circ}32'17''E$ and 402 feet, respectively. From Jalpaiguri district town its distance by bus route is 32 km, water depth is 1.5-2 feet during pre-and post-monsoon and during rain and flood the depth increases to 14-18 feet approximately. At station-I the fishes were captured by cast net (mesh size 6×6 mm) and Naphi jal (local name), a rectangular net that is hung from two bamboo sticks which are attached perpendicularly with mesh size 5×5 mm. The station II is located in the district town and behind the hospital and market (Hakimpara). Its latitude, longitude and elevation (from Mean Sea Level)

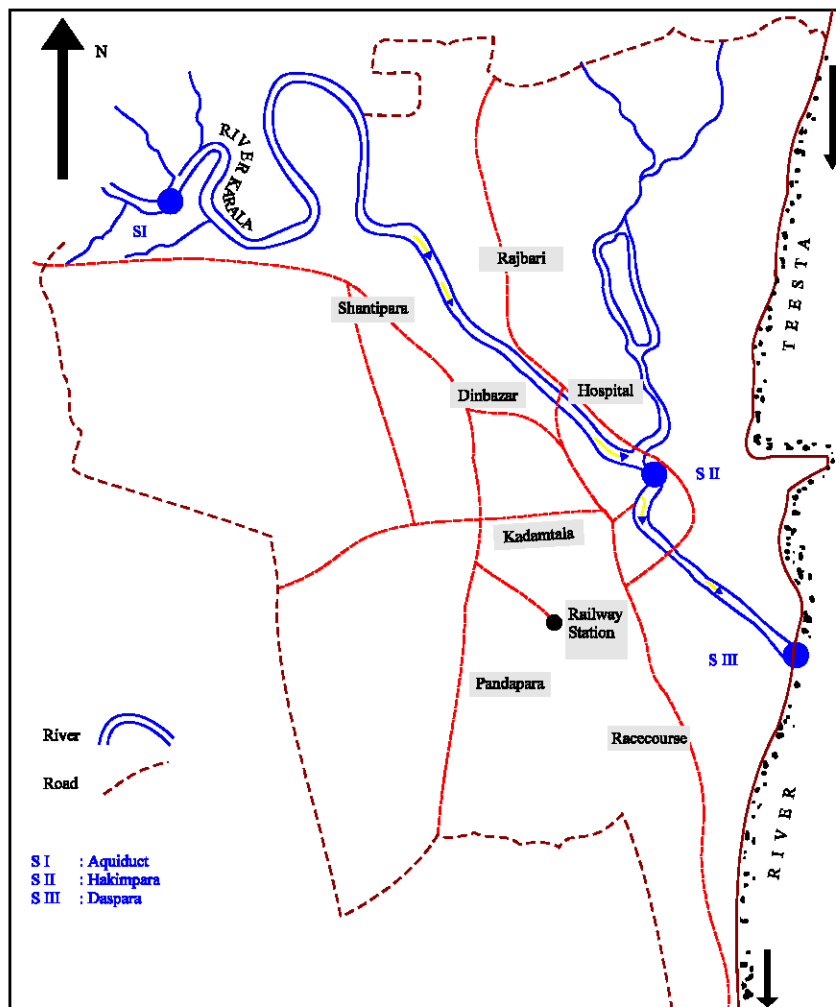


Fig. 1: Map showing origin and distribution of karala river with three different study sites

are 26°31'51"N, 88°43'23"E and 283 feet, respectively. From Jalpaiguri district town its distance by bus route is 0 km, regular water depth is 12-17 feet during pre- and post monsoon, during rain fall and flood the depth increase to 22-25 feet. The station III is located at the junction of Teesta and Karala near Daspara. Its latitude, longitude and elevation (from Mean Sea Level) are 26°28'42" N, 88°44'27"E and 268 feet, respectively. From Jalpaiguri district town its distance by bus route is 7 km, regular water depth is 12-15 feet during pre- and post monsoon period, respectively and during rain fall and flood it increases to 20-23 feet. In station II and III, the fishes were captured by vessel net or khara jal (local name, mesh size 6×6 mm) gill net (variable mesh sizes) and cast net (5×5 mm mesh size). After capture the color, color patterns, spots, etc. were noted immediately and their picture was taken by a powerful digital camera (Nikon coolpix S4). The fishes were killed by formalin solution containing one part commercial formalin (37-40% HCHO) +9 part glass distilled water and 7 g Borax L⁻¹ (Jayaram, 1981). The all fishes were kept in this buffer formalin solution for 4-5 h for proper fixation. The cypriniformes fishes were segregated from the master stock and subsequently identified by the literature of Jayaram (1999) and Talwar and Jhingran (1991). The frequency of occurrence of each species was calculated based on the number of occasions the species was collected during the samplings. The status of these fishes was determined with the help of standard catch frequency chart presented by Tamang *et al.* (2007) (Catch frequency; 91-100% = Common, 81-90 = Abundant, 61-80 = Frequent, 31-59 = Occasional, 15-30 = Sporadic, 05-14 = Rare and <5% = Extremely rare). The capture of fishes was done twice in a month at 15 days interval and from 8 am to 1 pm in each day. The study was carried out from February, 2009 to January, 2010.

RESULTS AND DISCUSSION

All together, 31 species of cypriniformes fishes were recorded in the present study. They have protractile and toothless mouth. The oral portions contain either barbells or not. Dorsal fins composed of soft branched rays but anterior ray unbranched and last simple ray often ossified into a spine which may bear weak or strong serrations. Presence of scale lesshead. Bodies are covered with cycloid scale. Lateral lines are completely present in many cases, while this is incomplete in other cases. These 31 species belong to 18 genera, 5 sub-families and 4 families. Among the 31 species, 11 species were belonging to the sub-family Danioninae (Rasborinae); 14 species were belonging to the sub-family Cyprininae, 2 species were belonging to the sub-family Cobitinae and sub-family

Noemacheilinae each and 1 species was belonging to the sub-family Cultrinae family Psilorhynchidae which has not any sub-family. A check list of captured cypriniformes fish species, their local name and status (On the basis of Catch Frequency) are given:

Order-Cypriniformes

Family; Cyprinidae

Sub-family; Danioninae (Rasborinae)

Genus; Danio Hamilton

Danio devario (Hamilton)

Common name; Chep Chela, Banspata

Status; common

Danio regina fowler

Common name; Gharbanka Chela

Status; occasional

Danio rerio (Hamilton)

Common name; Anju, Zebra

Status; frequent

Genus; Rasbora bleeker

Rasbora rasbora (Hamilton)

Common name; Dankoni, dodhikha, darkina

Status; occasional

Genus; Barilius hamilton

Barilius vagra (Hamilton)

Common name; Khoksa

Status; common

Barilius barna (Hamilton)

Common name; Joya, Bhola

Status; occasional

Barilius barila (Hamilton)

Common name; Caedra

Status; sporadic

Barilius bendelisis (Hamilton)

Common name; Khoksha

Status; frequent

Genus; Esomus swainson

Esomus danricus (Hamilton)

Common name; Danrika, dadhikha

Status; occasional

Genus; Amblypharyngodon bleeker

Amblypharyngodon mola (Hamilton)

Common name; Mourala, Mmorla

Status; sporadic

Genus; Aspidoparia Heckel

Aspidoparia morar (Hamilton)

Common name; Morar

Status; sporadic

Sub-family; Cultrinae

Genus; salmostoma swainson

Salmostoma phulo (Hamilton)

Common name; Chela

Status; abundant
 Sub-family; Cyprininae
 Genus; *Puntius hamilton*
Puntius conchoni (Hamilton)
 Common name; Kanchan punti, Bagha Punti
 Status; common
Puntius chola (Hamilton)
 Common name; Kerundi, Mona Punti
 Status; abundant
Puntius ticto (Hamilton)
 Common name; Tinth Punti
 Status; common
Puntius shalynius yadani and Talukder
 Common name; Bhusandi Punti
 Status; rare
Puntius sarana sarana (Hamilton)
 Common name; Kurti, Sar Punti
 Status; rare
Puntius sophore (Hamilton)
 Common name; Chaita Punti
 Status; frequent
Puntius vitatus day
 Common name; Tor.Mahasol, Mahasere
 Status; extremely rare
Puntius puntio (Hamilton)
 Common name; Puntio Barb
 Status; occasional
 Genus; *osteobrama heckel*
Osteobrama cotio cotio (Hamilton)
 Common name; Bhabar,Ggoonta
 Status; rare
 Genus; *Cirrhinus cuvier*
Cirrhinus reba (Hamilton)
 Common name; Raig Bata, kharke Bata
 Status; occasional
Cirrhinus mrigala (Hamilton)
 Common name; Mrigal, Mirca
 Status; sporadic
 Genus; *Crossocheilus kuhl and van hasselt*
Crossocheilus lutilus lutilus (Hamilton)
 Common name; Kalabata
 Status; rare
 Genus; *Chagunius smith*
Chagunius chagunio (Hamilton)
 Common name; Darangi
 Status; abundant
 Genus; *Labeo cuvier*
Labeo dyocheilus dyocheilus (McClelland)
 common name; Bhagna Bata.
 Status; Occasional
 Family; Balitoridae
 Sub-family; Noemacheilinae

Genus; *Acanthocobitis peters*
Acanthocobitis botia (Hamilton)
 Common name; Natwa, Striped Loach.
 Status; rare
 Genus; *Schistura maclelland*
Schistura savona (Hamilton)
 Common name; Khorka
 Status; sporadic
 Family; Cobitidae
 Sub-family; Cobitinae
 Genus; *Lepidocephalus bleeker*
Lepidocephalus guntea (Hamilton)
 Common name; Gutum, Poia
 Status; common
 Genus; *Somileptes bleeker*
Somileptes gongota (Hamilton)
 Common name; Ghor Poia
 Status; common
 Family; Psilorhynchidae
 Genus; *Psilorhynchus maclelland*
Psilorhynchus sucatio (Hamilton)
 Common name; River Stone Carp, Lathi Fish
 status; occasional

The results shown earlier suggest that of the 31 species, family cyprinidae to be the most dominant (84%), family balitoridae (6.5%) and cobitidae (6.5%) to be next dominant and psilorhynchidae (3%) to be the less dominant family. On the basis of catch frequency the *Danio devario*, *Barilius vagra*, *Puntius conchoni*, *Puntius ticto*, *Lepidocephalus guntea* and *Somileptes gongota* were common; *Salmostoma phulo*, *Puntius chola* and *Chagunius chagunio* were abundant; *Danio rerio*, *Barilius bendelisis* and *Puntius sophore* were frequent; *Danio regina*, *Rasbora rasbora*, *Barilius barna*, *Esomus danricus*, *Puntius puntio*, *Cirrhinus reba*, *Labeodyocheilus dyocheilus* and *Psilorhynchus sucatio* were occasional *Barilius barila*, *Amblypharyngodon mola*, *Aspidoparia morar*, *Cirrhinus mrigala* and *Schistura savona* were sporadic *Puntius shalynius*, *Puntius sarana sarana*, *Osteobrama cotio cotio*, *Crossocheilus lutilus lutilus* and *Acanthocobitis botia* were rare and *Puntius vitatus* was extremely rare.

India is one of the top 12 mega diversity countries of the world. The country is a developing one like Bangladesh, Myanmar, Nepa and Pakistan. The fish constitute one of the main food items of substance for many people of India. They provide a staple diet and supplement of proteins. Fish constitute almost half of the total number of vertebrates of world. The 39,900 identified vertebrates, fish contains 54.44% of which 38.72% is fresh water species (Jayaram, 1999). The Cypriniformes fish

fauna diversity of Karala River System of Jalpaiguri District, West Bengal, India contains 31 species belonging to 18 genera and four families. According to Shaw and Shebbeare (1937), there were 67 species of cypriniformes fishes in the rivers, streams and ponds of Darjeeling and adjoining Duars. They belong to 4 families viz., Cyprinidae (71.6%), Psilorhynchidae (3%), Homalopteridae (1.5%) and Cobitidae (23.9%). In this tributary, these fishes are discontinuously distributed. Their discontinuous distribution is apparently attributed to the irregular depth of the river by bank erosion during rain and flood, pollution of habitat by fertilizers and pesticides of tea gardens, solid wastes, drainage materials of market and hospital, ashes of cremation, activities of slum-dwellers, food deficiency and finally substratum's soil quality.

CONCLUSION

The knowledge of the diversity of fishes, their present status (According to IUCN), role in ecosystem and human economy are prerequisite for adopting the proper conservation strategies. The study has recorded 31 species of cypriniformes fishes from Karala River of Jalpaiguri District. Of these 31 species, 10 species (32.26%) are Near Threatened (NT), 7 species (22.58%) are Vulnerable (VU), 1 species (3.23%) is Endangered (E) and rest are out of danger or indeterminate. The factors responsible for threatening of ichthyofauna resources are habitat loss and degradation, over exploitation, role of introduces species etc. To over come the threatening of cypriniformes fish resources in this river, the suggestions are public awareness programs, monitoring on pollution, its prevention and control, habitat conservation, EIA clearance before tea plantation etc.

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