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STUDIES ON FRESHWATER FISHES OF BELIAGHATA BHERIES, CALCUTTA

By

S. K. CHATTOPADHYAY

Zoological Survey of India, 8, Lindsay Street, Calcutta-16

INTRODUCTION

The reason for taking up the present study is the lack of much detailed taxonomic and ecological studies on freshwater fishes of West Bengal except for a brief account of North Bengal fishes by Shaw and Shabbeare (1937), a study of mullets by Sarojini (1957, 1958), a study on biology and growth of Hooghly catfish, *Mystus*, *Fangasius* and eel, *Anguilla* by Pantulu (1956, 1961, 1962), systematic studies on the Indian siluroid fishes by Jayaram (1954 *et seq.*) in which material from West Bengal was also included and a detailed systematic study of *Mystus* spp. from Bengal region (Babu Rao and Chattopadhyay, 1969). Hora (1943 and 1953) published ecological papers on vegetation of fishing tanks and salinity of Hooghly estuary. It is felt that a detailed systematic study of freshwater fishes of West Bengal with keys for identification is needed so that the future freshwater fish workers of this region can easily take up the field.

Though some biological studies were made in a few commercially important freshwater fishes yet much ecological work has not been done. Some scientific organisations and institutions like Central Inland Fisheries Research Institute are studying the ecology of riverwater but the ecological study of confined freshwater bodies throughout West Bengal is neglected. Since the past one year faunistic and ecological observations are being made at the freshwater Bheries at Beliaghata in Calcutta with special reference to the freshwater fishes. A brief preliminary account of the observations are presented in the following:

MATERIALS AND METHODS

One Bheri (a big freshwater tank) in Beliaghata area, Calcutta, was selected for study. The Bheri was visited fortnightly for collection of specimens and other necessary field observations. Specimens were collected from fishermen immediately after catch and after making necessary notes in fresh condition they were preserved in diluted formaldehyde. Any plant or animal available in the Bheri was collected for study. In the laboratory weight and length data of the fishes selected for study were taken. Plants were preserved in spirit. The present study started on 17th July, 1968 and is still in continuation.

Systematic Account

The following specimens were collected from the Bheri and identified.

Fishes:

Fam. Cyprinidae

Subfam. *CYPRININAE*

Gen. *Labeo*

Labeo rohita (Ham.)

Gen. *Catla*

Catla catla (Ham.)

Gen. *Cirrhina*

Cirrhina mrigala (Ham.)

Cirrhina reba (Ham.)

Gen. *Cyprinus*

Cyprinus sp.

Gen. *Chela*

Chela punjabensis Day

Gen. *Rasbora*

Rasbora sp.

Gen. *Puntius*

Puntius stigma (Cuv. & Val.)

Puntius terio (Ham.)

Puntius ticto (Ham.)

Puntius phutunio (Ham.)

Puntius gelius (Ham.)

Puntius chrysopterus (McClell.)

Fam. Percidae

Group *Apogonina*

Gen. *Ambassis*

Ambassis nama (Ham.)

Ambassis ranga (Ham.)

Fam. Cichlidae

Gen. *Tilapia*

Tilapia mossambica Peters

Fam. Gobiidae

Subdiv. *GOBIIFORMES*

Gen. *Gobius*

Gobius giuris Ham.

Gobius criniger Cuv. & Val.

Fam. NOTOPTERIDAE

Gen. *Notopterus*

Notopterus chitala (Ham.)

Fam. SCOMBRESOCIDAE

Gen. *Belone*

Belone strongylurus Hasselt

Fam. BAGRIDAE

Gen. *Mystus*

Mystus keletius (Cuv. & Val.)

Fam. SILURIDAE

Gen. *Clarias*

Clarias batrachus (Bl. Schn.)

Gen. *Heteropneustes*

Heteropneustes fossilis (Bloch)

Fam. RHYNCHOBDELLIDAE

Gen. *Mastacembelus*

Mastacembelus pancalus (Ham.)

Gen. *Rhynchobdella aculeata* (Bloch)

Fam. ANABANTIDAE

Gen. *Anabas*

Anabas testudineus (Bloch)

Gen. *Trichogaster*

Trichogaster fasciatus (Bl. Schn.)

Fam. OPHIOCEPHALIDAE

Gen. *Channa*

Channa punctatus (Bloch)

Channa gachua (Ham.)

Channa marulius (Ham.)

Channa striatus (Bloch)

Molluscs:

Cl. GASTROPODA

Fam. VIVIPARIDAE

Gen. *Viviparus*

Viviparus bengalensis (Lamarck)

race *annandelei*, Kobelt.

Fam. MELANIIDAE

Gen. *Melanoides*

Melanoides granifera var. *pergranosa* (Nevill.)

Gen. *Melanoides*

Melanoides tuberculatus (Müller)

Fam. PLANORBIDAE

Gen. *Indoplanorbis*

Indoplanorbis exustus (Deshayes)

Crustaceans:

(1) Prawn:

Fam. PALAEMONIDAE

Subfam. *PALAEMONINAE*

Gen. *Macrobrachium lamarrei lamarrei* H.Milne Edwards

(2) Crab:

Class CRUSTACEA

Order DECAPODA

Fam. POTAMONIDAE

Gen. *Paratelphusa* (Paratelphusa)

Paratelphusa (Paratelphusa) *spinigera* Wood Mason

Snake:

Fam. COLUBRIDAE

Subfam. *HOMAPOPSINAE*

Gen. *Enhydrus*

Enhydrus enhydrus Schneider

Insects:

Ord. ODONATA

Subord. *ANISOPTERA*

Nymph of *Anax* sp.

Ord. HEMIPTERA

Subord. *HETEROPTERA*

Fam. NEPIDAE

Gen. *Ranatra*

Ranatra soldidura

Fam. BELASTOMATIDAE

Gen. *Sphaerodema*

Sphaerodema annulatum

Ord. COLEOPTERA

Subord. *ADEPHAGA*

Fam. DYTISCIDAE

Subfam. *CYBISTRINAE*

Gen. *Cybister*

Cybister sp.

Plants:

MONOCOTYLEDONS:

Fam. HYDROCHARIDACEAE

Gen. *Valisneria*

Valisneria sp.

Fam. ARACEAE

Gen. *Pistia*

Pistia stratiotes

DICOTYLEDON:

Fam. EUPHORBIACEAE

Gen. *Croton*

Croton sp.

PTERIDOPHYTA:

Cl. PSILOPHYTINEAE

Ord. PSILOTALES

Gen. *Psilotum*

Psilotum sp.

Six commercially important genera of fishes were selected for seasonal study:

(1) *Puntius*

Puntius stigma is found to occur more or less throughout the year, the other species are mainly restricted to August-October period. Adult specimens of *P. stigma* are found in July-August period.

(2) *Anabas*

Anabas testudineus is found in the catches throughout the year, good numbers are being caught in August-September period. Juveniles were observed to occur during August-September period and again in April.

(3) *Channa*

The four available species of the genus, i.e., *C. punctatus*, *C. gachua*, *C. striatus* and *C. marulius* occurred throughout the year in the catches.

(4) *Mastacembelus*

Mastacembelus pancalus occurs throughout the year, adult specimens being mainly observed during July-August.

(5) *Trichogaster*

Trichogaster fasciatus occurs in good numbers throughout the year. Adult specimens are mainly found in July-August period.

(6) *Heteropneustes*

Heteropneustes fossilis occurs throughout the year, adults occurring in July-August period.

It has been noted that in fishes of the six selected genera, *Puntius* is found to have maximum number of species. In the colouration and meristic data *Puntius* spp. show some variations with Day's description. The presence of the pink lateral band in *P. stigma* seems to be variable seasonally. *Trichogaster* sp. is generally found in two colours—one with grey and bluish stripes and another with pink and grey stripes. Further it has been noted that the pink-grey striped forms fall in smaller length range group than the bluish pink group indicating colour variations with growth of the specimen. *Anabas* sp. shows some variations in colour and counts and *Mastacembelus* sp. in colour. So far *Channa* and *Heteropneustes* have not shown any remarkably variation from previous descriptions. *Channa gachua* is found to occur in smaller numbers in the catches whereas *Channa marulius* and *Channa striatus* occur in larger numbers.

Of the various species of *Puntius*, *P. stigma* is the most common form.

Observations on Ecology

General Ecology:

The Bheri is situated in Beliaghata area and formed due to low embankment of the land. The shape of the Bheri is like a pentagon and the approximate area is 100 acres. It is separated from the other Bheries at the sides by mud bundhs, sufficiently high to prevent water transfer from one to the adjoining Bheri, excepting at the time of heavy rains when the Bheri water level becomes equal with the encircling land. The Bheri is normally fed twice in an year from a canal with factory effluents. But excess mixing of the Bheri water with the sewage even at the time of heavy rains is prevented.

Bheri water is clear, colourless with a salinity value ranging from 0.5 p.p.m. (October-November) to 1.6 p.p.m. (July-August). The water plant, *Pistia stratiotes*, grows in small batches in the Bheri water throughout the year *Valisneria* sp. and *Psilotum* sp. are also found in Bheri water. In early summer (late February and early March) a huge mass of *Pistia* accumulates in the water to cover almost the entire surface so that fishing becomes impossible. Hence these plants are dragged aside by fishermen. In April-May, i.e., pre-monsoon time,

strong wind removes the plants which get accumulated at the banks. Some fishes in trying to avoid fisherman's nets take shelter under the *Pistia* bush resulting in poor catches. Normally juvenile fishes take shelter under this plant and escape fishing; consequently juveniles are found in small numbers in the catches.

So far the size of total catch composition is concerned, a definite seasonal variation is noted. In summer the number of fishes in a catch is quite high. But it declines in winter. Normally in rainy season number of fishes in a catch is good. But in winter rains, the catch size is not high.

Planktological studies:

Plankton is mostly found to contain phytoplankton and that too in the form of blooms. Of the phytoplankton studied the group Chlorophycae (green algae) shows the maximum number of genera followed by Bacillariophyceae (diatoms), Myxophyceae (blue green algae) and Desmidiaceae (desmids). Besides the individual genera identified a non-seasonal phytoplankton bloom formed by blue green algae was observed:

CHLOROPHYTA: This group of algae forms the major part of phytoplankton mass. The genera identified are *Scendesmus, Crucigenia, Microspora, Planktosphaeria, Kirchneviella, Pediastrum, Botryococcus, Protococcus, Utothrix, Ankistrodesmus, Selenastrum* and *Spirogyra.* Of these *Scendesmus* showed regular occurrence.

BACILLARIOPHYTA: This is the next major group of which the following genera are recorded *Nitzschia, Melosira, Cyclotella, Coscinodiscus, Frustalia, Navicula, Diatoma, Cymbella, Climacoshainia* and *Gyrosigma.* Of these *Melosira, Cyclotella* and *Coscinodiscus* are the comparatively dominant genera.

MYXOPHYTA: This group is represented by the following genera: *Gomosphaeria, Polycystis, Coelosphaerium, Merismopedia, Rivularia* and *Oscillatoria. Merismophedia* and *Oscillatoria* are the most common forms. Beside these, there is a heterogenous bloom formed by blue green algae which is non seasonal.

DESMIDIACEAE: This group is represented by only three genera and hence the smallest group of algae collected from the Bheri water. The genera are *Closterium, Staurastrum* and *Micrasterias,* the last one being the dominant form.

The variety and number of zooplankton collected from the Bheri is comparatively less than phytoplankton. The dominating group is Protozoa. The various groups collected are:

PROTOZOA: *Paramoecium, Euglena, Amoeba, Trinema, Dinobryon* and *Acanthocystis.* Of these *Paramoeciun* is the dominant genus.

ROTIFERS: *Epiphanes, Gastropus, Testudinella* and *Filina* form the rotiferan fauna of the Bheri.

CRUSTACEA: *Nauplius, Cypris, Acroperus,* many other Copepods and Copepodites form the Crustacean fauna. *Nauplius* and *Cypris* are the two dominant groups.

OTHER GROUPS: Occasional occurrence of Gastrotrichs and Nematodes is noted.

SUMMARY

A brief review of freshwater fish work in West Bengal is given and the necessity for ecological work in confined waters of Bengal region with special reference to freshwater fishes is pointed out. A brief account of the observations made on the ecology and fauna of Beliaghata Bheries is presented. The various freshwater fishes occurring in the Bheris are listed and the seasonal occurrence of important commercial species is given.

Ecological observations like the nature of water, other flora and fauna of the Bheris, plankton composition etc., are also presented.

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