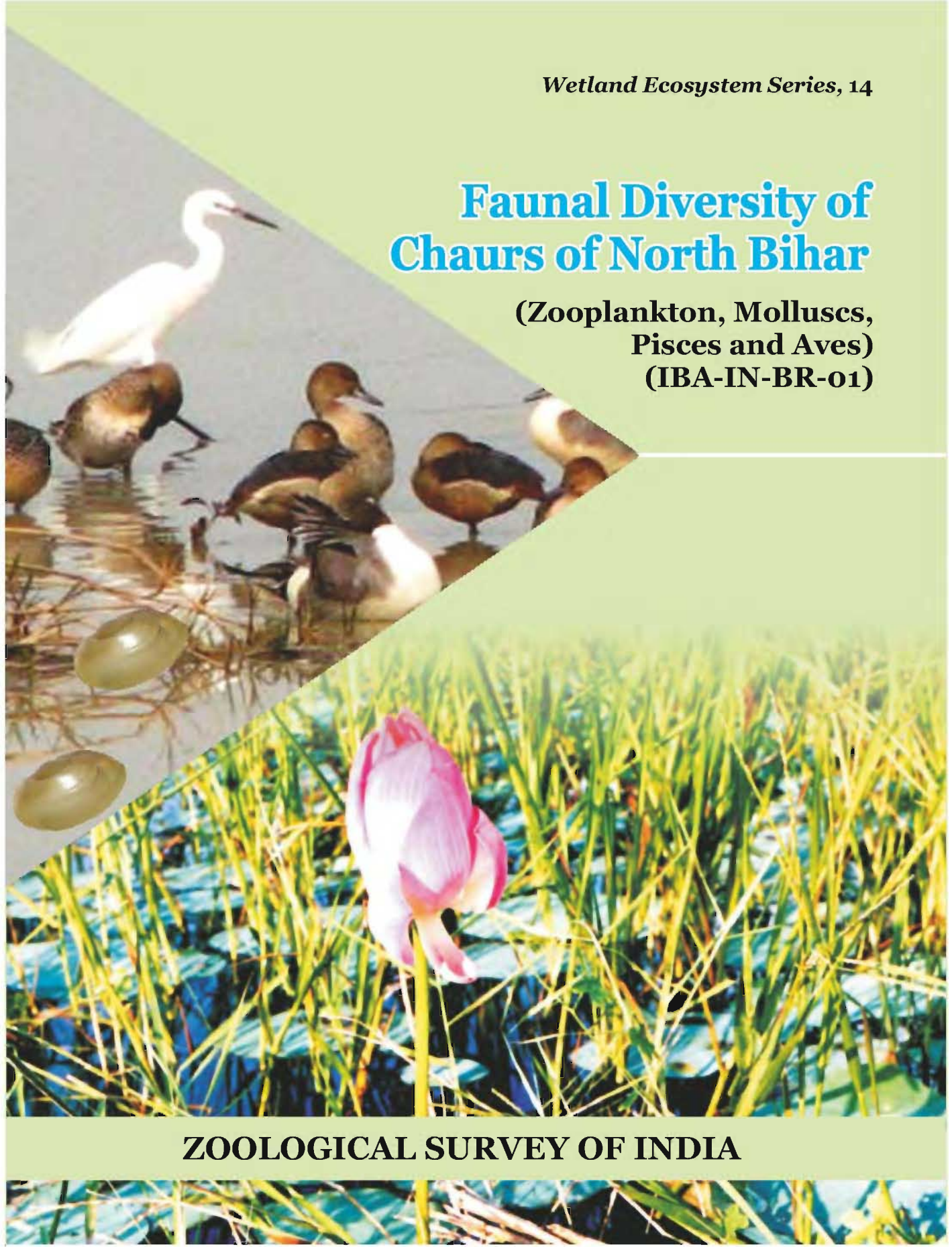


Wetland Ecosystem Series, 14

Faunal Diversity of Chours of North Bihar

**(Zooplankton, Molluscs,
Pisces and Aves)
(IBA-IN-BR-01)**



ZOOLOGICAL SURVEY OF INDIA

Wetland Ecosystem Series, 14

**Faunal Diversity of Chours
of North Bihar**
(Zooplankton, Molluscs, Pisces and Aves)
(IBA-IN-BR-01)

Edited by the Director, Zoological Survey of India, Kolkata



Zoological Survey of India
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WETLAND ECOSYSTEM SERIES
FAUNAL DIVERSITY OF CHAURS OF
NORTH BIHAR

No. 14	2011	1-113
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OVERVIEW

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INTRODUCTION

North Bihar (31°55' to 27°31' lat and 83°20' to 88°17' long) is rich in floodplain wetlands which are locally called chours. Bowl shaped physiography of North Bihar coupled with a moderate to high rainfall cause water logging to an immense scale. The state of Bihar shares one sixth of the total flood inundations all over the country. This is despite the fact that 3500 kms long embankments have been raised to control floods in the post independence years. There has been a 2.5 times increase in the flood affected areas as compared with the situation when the embankments were not there. The state now has 9-lac hectare land area under permanent water logging of which 8 lac hectares lie in north Bihar. This tells about the agricultural productivity and there is no wonder the farmers are raising there protest and are demanding drainage of these inundated sites. It is simply beyond the capacity of the state coffers to meet huge expenses on the exercise.

The lotic system forms a fine network of rivers, which are notorious for changing their courses over millennia. This has resulted into the formation of hundreds of ox-bow lakes (maun) and land depressions (Chours), which form the lifeline of the region. Besides, thousands of big and small ponds (pokhari) cater to the needs of irrigation and are also used for rearing fishes, which form a significant component of the dietary preference in this area. An obvious advantage with the prolonged water-loggings is in the form of recharging of ground water and the region escapes the deficiencies of surface and ground water as witnessed in the other parts of the country.

The region is known for its rich aquatic biodiversity e.g. fishes, molluscs, zooplankton, birds and reptiles. Earlier the quantum of fish production through capture fisheries was sufficient and the local fish were in high demand for their quality and taste.

The present study was carried out during 2005-2007 under the Zoological Survey of India, Gangetic Plains Regional Centre, Annual Action Plan in the entire stretch of North

Bihar Chauras (Small wetlands), IBAs sites (2004). Special emphasis was given on aquatic faunal diversity of Kowar Lake wetland near Manjhaul in Begusarai districts, (Bihar). Kowar Lake is internationally known as the migratory bird paradise especially in the winter season.

Chauras of North Bihar at a glance

IBA Site Code	:	IN-BR-01
State	:	Bihar
Coordinates	:	26°07'30" N 86°10'00" E
Ownership	:	State/Private
Area	:	40,00,000 ha
Altitude	:	30-75m
Rainfall	:	1,000mm
Temperature	:	5° C to 45° C
Biogeographic zone	:	Gangetic Plains
Habitats	:	Freshwater swamp, Seasonal Marsh

Thirteen Important Bird Areas (IBA 2004) so far have been recognized in Bihar, out of these only four IBAs are protected. The IBAs of Bihar and River Ganga are also important for some threatened species.

STUDY AREA

Geology and Hydrology :

North Ganga plain is a major physiographic unit of the Indian landmass. It extends from the Himalayan terrain in the north to the river Ganga in the south covering about 56980 km², roughly quadrilateral shape. Generally northern piedmont belt where water oozes to the surface, followed by a broad belt of swampy lands, depressions and lakes and finally an aggregation of alluvial fans as all these northern streams bend to form confluence points with the Ganga (Singh & Kumar, 1970). Hence, the surface is characterized by palaeo levees, swamps or flood basins locally called "Chauras", relict palaeo channels aggraded in varying degrees, meander belts, ox-bow lakes and cut-of loops (Ahmad, 1971). The Ghaghra-Gandak interfluvies, the Gandak-Kosi interfluvies and the western Kosi fan belt dominate its alluvial geomorphology from west to east. Some of these rivers frequently change their channels. Their channels are called by different names in different parts of their courses. According to a study in 1976 on Wetlands in Bihar by Govt. of Bihar, natural wetlands of more than 100 ha. each covered about 46828 ha. (Directory of Wetlands, Govt. of Bihar)

North Bihar Chauras, in general, is a low-lying flat terrain (MSL 45 m - 32 m) having a southerly to southeasterly slope. This factor governs the flow of streams. Geomorphologically it is a part of the Gandak-Kosi interfluvies.

Recent publications have emphasized the role of neotectonic changes in shifting river courses. Mohindra et al. (1992) attribute the shifting of the river Gandak to geotectonic tilting of the megafan eastward. However, the recent westward shifting of the Gandak River to its present channel from the Burhi Gandak channel suggests that there are also other factors (auto cyclic), which play an important role in shifting of river courses. A detailed analysis of the causes of shifting of the Kosi river (Neil, J r. et al. 1987) leads to the conclusion that the major shifts are "stochastic and auto cyclic " and they do not well correlate with many severe earthquakes and floods, though they may have primed the system for shifts.

Sampling Sites :

North Bihar Chours are capable to sustain and supply food to immense variety of species of microbes, plants, insects, amphibians, reptiles, birds, fishes, zooplanktons and mammals.

These Chours or small freshwater lakes lie scattered in the Gangetic plains in Bihar. These small wetlands are inundated by overflow from the River Ganga and its tributaries like Ghaghra, Gandak, Burhi Gandak, Kosi and rainwater. Most of these Chours are between 10 and 20 hectare in area, while a few exceed 100 hectare (IBA-2004). These Chours are particularly abundant in many small temporary wetlands/ water bodies in the entire North Bihar from Valmiki Nagar in west to Araria in East and cover an area of about half of the total area of the Bihar State. Some of the major surveyed Chours of these areas are Hardia Chatti Chaur 27°15'32" N 83°57'59" E at Valmiki Nagar, Kerai Berai 27°18'05" N 83°57'13" E at Valmiki Nagar in West Champaran, Maran Chaur, 26°08.817'N 85°59.164' E in Darbhanga, Isharain Chaur 26°10.239' N 86°21.153' E in Darbhanga, Majilsa Chaur (26°07.895'N 86°01.936'E in Darbhanga, Muriakatwa Chaur 26°11.839'N 86°00.208'E, in Darbhanga, Jeevach Dhar 26°07.895'N 86°01.567'E in Darbhanga, Motipur Chaur 26°16'23"N 85°08'41" E in Muzaffarpur, Turkey Chaur 26°02.306'N 85°20.201' E in Muzaffarpur, Manikamann Chaur : 26°05'19" N 85°27'23" E in Muzaffarpur, Hathiacle Chaur 25°31.849' N 86°43.101' E in Khagaria, Tin Dobha Chaur 25°37.315' N 86°43.569' E, in Khagaria, Baraila J heel 25°44.973' N 85°35.216' E, in Vaishali, Dandari Chaur, 25°35.110' N 86°10.071' E in Begusarai, Kumbhi Chaur 25°39'03" N 86°05'36" E in Begusarai, Nagri Chaur 25°37'28" N 86°03'07" E in Begusarai, Chalki Chaur 25°41'57" N 86°04'41" E in Begusarai, Kawar Lake 25°35.410' N 86°09.071' E in Begusarai, Manikpur Chaur 25°37'55" N 86°09'49" E in Begusarai, Manipur Chaur 26°14'26" N 85°21'25" E in Begusarai, Kumbhi Chaur 25°39'03" N 86°05'36" E in Begusarai, Rajaura Chaur 25°37.225' N 86°09.731' E in Begusarai, Saraunja Chaur 25°39'03" N 86°05'36" E in Begusarai, Karu Gamaill Chaur 25°39.129'N 86°10.500' E in Begusarai, Pathkaul Chaur 25°30.715' N 86°01.480' E in Begusarai, Naula Chaur 25°31.222' N 86°02.149' E in Begusarai, Satanpur Chaur at Pir Ashthan 25°42.263' N 85°48.357' E in Samastipur, Ghopa Chaur 26°17.634' N 86°59.900' E in Madhepura, Ghelar Chaur 25°58.863' N 86°40.958' E in Madhepura, Samsolia Chaur 25°56.948' N 86°40.582' E in Madhepura, Sarsopahi Chaur 26°14.288' N

86°10.791' E in Madhubani, Bhoga Chaur 26°17.634' N 86°19.900' E in Madhubani, Simri Estate 25°43'34" N 86°57'59" E in Saharsa, Matsagandha Chaur, 25°54.274' N 86°35.024' E in Saharsa, Maisi Chaur 25°51.537' N 86°27.864' E in Saharsa, Chatar Chaur, 26°00.024' N 87°30.111' E & Kajradhar Chaur (26°06.17' N 87°16.23' E in Araria districts.

Land use pattern : Mainly agricultural and fishing as well as Trapa (The water caltrop or water chestnut) and Makhana (*Euryale ferox*) also known as fox nut.

Flood disaster : Flood disaster is a very serious problem in north Bihar. Because of devastating flood there is heavy loss of man and materials both in agriculture and non - agricultural sectors. Sometimes even urban sector is also affected. The net economic loss is very significant. This reduces employment to the labourers also. Out of the total disasters 7% of disaster is due to flood in India.

In order to reduce the intensity of flood, several measures have been suggested in the past. These are of both structural and non-structural nature. However, in recent years several economists and geographers have suggested to connect two and more rivers for flood mitigation. The reason behind this is that all rivers do not overflow simultaneously in adjoining areas in the monsoon. Therefore connectivity can reduce overflowing in the river through diverting water to the dry river.

Rivers Causing Flood : Burdhi Gandak, Harha, Massan, Pandai, Lalbakiya, Bakaiya, Bagamati, Dhaunsa, Adhawara Group of Rivers, Kamala, Jeevachh, Bhutahi, Balan, Kareh, Baya, Kosi, Paraman, Kankai, Mahananda, Naraini, Ghaghara and Ganga.

Flood Affected Districts : (i) West Champaran, (ii) East Champaran, (iii) Sheohar, (iv) Sitamarhi, (v) Muzaffarpur, (vi) Madhubani, (vii) Darbhanga, (viii) Samastipur, (ix) Begusarai, (x) Khagaria, (xi) Saharsa, (xii) Supaul, (xiii) Madhepura, (xiv) Bhagalpur (Nawagachhiya Sub-division) (xv) Araria, (xvi) Kishanganj, (xvii) Purnia, (xviii) Katihar.

CLIMATE

Winter : In Bihar the cold weather commences early in November and comes to an end in the middle of March. The climate in the cold weather is pleasant. The days are bright and warm and the sun is not too hot. As soon as the sun sets the temperature falls and the heat of the day yields place to a sharp bracing cold. The mean temperature in November varies from 5°C to 10°C. January is the coldest month in North Bihar.

Summer : The hot weather then sets in and lasts till the middle of June. The highest temperature is 45°C often registered in May which is the hottest month in the state. Like the rest of the Northern India, North Bihar also experiences dust-storms, thunder storm and dust raising winds during the hot season. Dust storms having a velocity of 48-64 Km/hour are most frequent in May and second maximum in April and June. The hot winds (loo) of Bihar plains blow during April and May with an average velocity of 8-16 Km/hr. This hot wind greatly affects human comfort during this season.

Monsoon : Soon after Mid June the rainy season commences and continues till the end of September, the beginning of this season occurs when a storm from the Bay of Bengal passes over Bihar. The commencement of monsoon may be as early as the last week of May or as the first or second week of July. The rainy season begins in June. The July and August are months with the heaviest rainfall. The rains are the gifts of the south west monsoon.

Post Monsoon : An important feature of the retreating monsoon season in this area is the invasion of tropical cyclones originating in the Bay of Bengal at about 12° N latitude. North Bihar is also influenced by the typhoons originating in the South China Sea. The maximum frequency of the tropical cyclones in the area is during September-November. These cyclones are essential for the maturing of paddy, and are required for the moistening of the soil for the cultivation of Rabi crops.

Rainfall : The average annual rainfall in this belt of Ganga- Burhi Gandak is 1384 mm of which 83% falls between Mid June to Mid October.

Flora : It includes sheesham, khair, bent, mangroves and other scrubs. The majestic banyan tree (*Ficus bengalensis*) and the related pipal (*Ficus religiosa*) dots the entire landscape of the north Bihar.

Besides the timber North Bihar yield valuable commercial products. Cane trees are, used in the manufacture of an indigenous product for making furniture. A resinous material secreted by the lac insect is valuable commercially. It is the source of shellac. Also, bangles made of lac are very popular among women of Bihar.

Paddy, wheat, lentils, sugarcane, jute and hemp (related to the marijuana plant, but a source of tough fibers and "gunny bags") are the major crops of north Bihar.

The principal fruits are : mango, banana, jackfruit and litchis. This is one of the very few areas outside China which produces litchi. There is very little industry in the plain region except for the sugar factories that are scattered all over the northern plains, particularly in the western region.

Fauna : Among the wildlife, notable are: deer, bears, numerous species of birds, including the peacock, pheasant, wild fowl, nilgai, wild boar, sambar, Chital, kakar and most notably, the tiger. The forest around Valmiki Nagar, West Champaran is one of the last remaining refuges of this highly endangered species.

The Ganges River Dolphin or soons are found in the tributories of Ganga like Ghaghara, Gandak and Kosi. Now this river dolphin is the national aquatic animal of India. It is now considered amongst the most endangered mammal of the region.

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ZOOPLANKTON DIVERSITY

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INTRODUCTION

The zooplankton occupies significant position in an aquatic ecosystem as they form a major link in the entire food chain and are main food for the fishes. It occupies a higher trophic position in the wetlands as energy transfer depends heavily on secondary productivity in aquatic ecosystem (Allan, 1995). The zooplankton of lentic water has not received as much attention of limnologists as it deserves. However, in past years some work on zooplankton of North Bihar with special reference to Kawar Lake and some ponds of central Bihar have been done by Prasad (1995), Sharma and Dudhani (1992) and Singh and Sinha (1995) etc.

The rotifers are also known as wheel animalcules because of the synchronized beating of cilia at the anterior end which give an illusion of rotating wheel and hence derive the name Rotifera, ("Rota" meaning wheel and "ferra" meaning bear.)

In the present study only Rotifera, Cladocera and Copepoda have been considered.

MATERIAL AND METHODS

The material for the present study was collected from the North Bihar Chours (Small wetlands). These Chours are particularly abundant around small temporary wetlands/ water body in the entire North Bihar from Valmiki Nagar in west to Araria in East and cover an area of about half of the total area of the Bihar State. More than 12 districts of North Bihar have been covered during the survey.

Three series of collections i.e. in the winter, summer and post monsoon were made.

The zooplanktons were collected from the different places of the same water body to make a composite sample of a particular Chaur. Water samples were collected by filtering 50 liters of sub surface water (collected randomly) through plankton net (made of bolting

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silk cloth no. 25 with 64 μ mesh opening) and preserved in 4% neutral formaline for qualitative and quantitative analysis. The zooplankton were identified up to species levels (wherever possible) with the help of relevant literatures (Needhan and Needham 1962, Wards and Whiple 1959, Michael and Sharma 1988, Sharma 1983 and Battish 1992) for qualitative analysis. The organisms were counted using Sedgwick rafter Cell. After proper dilution and mixing of the concentrated samples, a sub sample of 1ml was taken with volumetric pipette, which was added to a Sedgwick rafter Cell and covered with a cover glass. The organisms were counted with a good binocular microscope having different magnifications and identified with the help of available literatures.

SYSTEMATIC LISTS

Phylum ROTIFERA

Subclass EUROTATORIA

Super order MONOGONONTA

Order PLOIMA

Family BRANCHIONIDAE

Genus **Brachionus**

1. *Brachionus angularis* Gosse, 1851
2. *Brachionus caudatus* Borrois and Daday, 1894
3. *Brachionus caudatus* (Wulfert, 1966)
4. *Brachionus forficula* (Wierzejski, 1891)
5. *Brachionus calyciflorus* Pallas, 1776
6. *Brachionus diversicornis* (Daday, 1883)
7. *Brachionus plicatilis* Müller, 1773
8. *Brachionus patulus* (O.F. Müller)
9. *Brachionus rubens* Ehrenbergh, 1838

Genus **Keratella** Bory de St. Vincent

10. *Keratella cochlearis* (Gosse, 1851)
11. *Keratella lenzi* (Hauer, 1938)
12. *Keratella procurva* (Thorpe, 1891)
13. *Keratella tropica* (Apstein, 1907)
14. *Keratella valga* (Ehrenbergh, 1834)

Family LECANIDAE

Genus **Lecane** Nitzsch, 1827

15. *Lecane luna* (O.F. Müller, 1776)
16. *Lecane elasma* Harring and Myers 1926
17. *Lecane leontina* (Turner, 1892)
18. *Lecane unguitata* (Fadeev, 1925)
19. *Lecane* sp.

Genus **Monostyla** Ehrenbergh, 1832

20. *Monostyla bulla* Gosse, 1851

Family FILINIDAE

Genus **Filinia** de St. Vincent

21. *Filinia longiseta* (Ehrenbergh, 1834)

22. *Filinia opoliensis* (Zach, 1898)

Family ASPLANCHNIDAE

Genus **Asplanchna** Gosse

23. *Asplanchna* sp.

24. *Asplanchna brightwelli* Gosse, 1850

Genus **Mytilina**

25. *Mytilina ventralis* (Ehrenbergh, 1832)

Genus **Polyarthra**

26. *Polyarthra vulgaris* (Carline, 1943)

Genus **Testudinella**

27. *Testudinella patina* (Herman, 1783)

Genus *Trichocerca*

28. *Trichocerca* sp.

29. *Trichocerca porcellus* (Gosse, 1886)

Super class CRUSTACEA

Class BRANCHIOPODA

Super order CLADOCERA

Family CHYDORIDAE

Subfamily ALONINAE

Genus **Alona** Baird

30. *Alona* sp.

31. *Alona pulchella* King, 1853

32. *Alona taraporevalae* Shirgur & Naik, 1977

Family CHYDORIDAE Stebbing

Genus **Chydorus**

33. *Chydorus parvus* Daday, 1898

34. *Chydorus ventricoccus* Daday, 1898

Family BOSMINIDAE

Genus **Bosmina**

35. *Bosmina longirostris* (O.F. Müller, 1776)

36. *Bosminopsis deitersi* (Richard, 1895)

Family DIAPHANOSOMA Fischer

- 37.
- Diaphanosoma excisum*
- Sars

Family DAPHANIA Müller

- 38.
- Daphnia lumholtzi*
- Sars, 1885

Family MACROTHRICIDAE

Genus **Echinisca**

- 39.
- Echinisca triserialis*
- (Brady, 1886)

Family MOINIDAE

Genus **Moina** Baird

- 40.
- Moina brachiata*
- (Jurine, 1820)

- 41.
- Moina macrocopa*
- (Straus, 1820)

- 42.
- Moina micrura*
- Kurz, 1874

- 43.
- Moina weismanni*
- Ishikawa, 1896

- 44.
- Moina*
- sp.

Family SIDIDAE

Genus **Pseudosida** Baird

- 45.
- Pseudosida bidentata*
- Herrick, 1884

Phylum ARTHROPODA

Super class CRUSTACEA

Class COPEPODA

Family DIAPTOMIDAE

Subfamily DIAPTOMINAE

Genus **Allodiatomus**

- 46.
- Allodiatomus*
- sp.

Family CYCLOPOIDAE

Genus **Cyclops** O.F. Müller

- 47.
- Cyclops*
- sp.

Genus **Diaptomus** Westwood

- 48.
- Diaptomus*
- sp.

Genus **Heliodiaptomus**

- 49.
- Heliodiaptomus viduus*
- (Gurney, 1916)

Order CYCLOPOIDA

Family CYCLOPOIDAE

Subfamily EUCYCLOPOINAE

Genus **Mesocyclops** Claus

- 50.
- Mesocyclops hyalinus*
- (Rehberg, 1880)

- 51.
- Nauplii*
- sp.

Table 1 Distribution of Zooplankton in the different Chaur (small wetlands) of North Bihar (IBAs Site no. 1) – 2005-2007

Sl. No.	Organisms	Sampling Sites																				
		Daruabari Chaur, VALMIKI NAGAR	Motipur Chaur, MUZAFFARPUR	Turkey Chaur, MUZAFFARPUR	Manikamann Chaur, MUZAFFARPUR	Dandari Chaur, BEGUSARA	Kawar Lake, BEGUSARAI	Baraila J heel, VAISHALI	Maran Chaur, DARBHANGA	Murikatwa, DARBHANGA	Kausar Chaur, DARBHANGA	Samsolia Chaur, MADHEPURA	Matsaganda Chaur, SAHARSA	Mahisi Chaur, SAHARSA	Ghopa Chaur, MADHEPURA	Samsolia Chaur, MADHEPURA	Kajra Dhar, ARARIA	Chatar Chaur, ARARIA	Hathia cole, KHAGARIA	Tindobha Chaur, KHAGARIA	Isharain Chaur, MADHUBANI	
	ROTIFERA																					
1.	<i>Brachionus angularis</i> Gosse, 1851	+	+	-	-	-	+	+	-	+	-	-	+	+	-	-	-	-	-	-	-	-
2.	<i>Brachionus caudatus</i> (Wulfert, 1966)	-	-	-	-	+	+	+	-	-	-	+	-	-	-	+	-	-	+	-	-	+
3.	<i>Brachionus caudatus</i> Borrois and Daday, 1894	-	-	-	-	+	-	+	-	-	-	+	-	-	-	+	-	-	+	-	-	-
4.	<i>Brachionus calyciflorus</i> Pallas, 1776																					
5.	<i>Brachionus forficula</i> (Wierzejski, 1891)	-	+	+	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6.	<i>Brachionus patulus</i> (O.F. Müller)	-	+	+	-	-	-	+	+	-	-	-	+	+	-	-	-	-	-	-	-	-
7.	<i>Brachionus plicatilis</i> Müller, 1773																					
8.	<i>Brachionus rubens</i> Ehrenberg, 1838	+	-	+	-	-	+	-	+	-	-	+	+	-	-	+	-	-	-	-	-	+
9.	<i>Keratella cochlearis</i> (Gosse, 1851)	-	-	+	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10.	<i>Keratella lenzi</i> (Hauer, 1938)	-	-	-	+	-	+	+	-	+	-	-	-	+	-	-	-	-	-	+	-	+
11.	<i>Keratella procurva</i> (Thorpe 1891)	+	+	-	-	-	-	-	-	-	+	-	-	-	-	-	+	-	-	-	-	-
12.	<i>Keratella tropica</i> (Apstein, 1907)	-	+	+	-	+	-	-	-	-	-	+	-	-	-	-	+	-	+	-	-	-

Table 1 Contd.

Sl. No.	Organisms	Sampling Sites																				
		Daruabari Chaur, VALMIKI NAGAR	Motipur Chaur, MUZAFFARPUR	Turkey Chaur, MUZAFFARPUR	Manikamann Chaur, MUZAFFARPUR	Dandari Chaur, BEGUSARA	Kawar Lake, BEGUSARAI	Baraila Jheel, VAISHALI	Maran Chaur, DARBHANGA	Muriakatwa, DARBHANGA	Kausar Chaur, DARBHANGA	Samsolia Chaur, MADHEPURA	Matsaganda Chaur, SAHARSA	Mahisi Chaur, SAHARSA	Ghopa Chaur, MADHEPURA	Samsolia Chaur, MADHEPURA	Kajra Dhar, ARARIA	Chatar Chaur, ARARIA	Hathia cole, KHAGARIA	Tindobha Chaur, KHAGARIA	Isharain Chaur, MADHUBANI	
13.	<i>Keratella valga</i> (Ehrenberg, 1834)	+	+	-	+	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14.	<i>Lecane luna</i> (O.F. Müller, 1776)	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-
15.	<i>Lecane elasma</i> Harring and Myers, 1926	-	-	-	-	-	-	-	+	-	-	+	+	-	-	-	-	-	-	-	-	+
16.	<i>Lecane leontina</i> (Turner, 1892)		+	+	-	-	-	+	-	-	+	-	-	-	-	-	+	+	+	+	-	-
17.	<i>Lecane unguitata</i> (Fadeev, 1925)	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	-	-
18.	<i>Lecane</i> sp.	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19.	<i>Filinia longiseta</i> (Ehrenbergh, 1834)	-	-	-	+	+	-	-	+	-	+	+	-	-	-	+	-	-	-	-	-	+
20.	<i>Filinia opoliensis</i> (Zach., 1898)	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-
21.	<i>Asplanchna</i> sp.	-	-	-	-	+	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
22.	<i>Asplanchna brightwelli</i> Gosse, 1850	-	+	+	-	-	+	+	+	-	-	+	-	+	+	-	-	-	-	-	-	-
23.	<i>Monostyla bulla</i> Gosse, 1851	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24.	<i>Mytilina ventralis</i> Ehrenbergh, 1832	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25.	<i>Polyarthra multiappendiculata</i> Arora, 1962	-	-	-	-	+	+	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-

Table 1. Contd.

Sl. No.	Organisms	Sampling Sites																			
		Daruabari Chaur, VALMIKI NAGAR	Motipur Chaur, MUZAFFARPUR	Turkey Chaur, MUZAFFARPUR	Manikamann Chaur, MUZAFFARPUR	Dandari Chaur, BEGUSARA	Kawar Lake, BEGUSARAI	Baraila J heel, VAISHALI	Maran Chaur, DARBHANGA	Murikatwa, DARBHANGA	Kausar Chaur, DARBHANGA	Samsolia Chaur, MADHEPURA	Matsaganda Chaur, SAHARSA	Mahisi Chaur, SAHARSA	Ghopa Chaur, MADHEPURA	Samsolia Chaur, MADHEPURA	Kajra Dhar, ARARIA	Chatar Chaur, ARARIA	Hathia cole, KHAGARIA	Tindobha Chaur, KHAGARIA	Isharain Chaur, MADHUBANI
26.	<i>Testudinella patina</i> (Herman, 1783)	-	-	-	+	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
27.	<i>Trichocerca</i> sp.	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-
28.	<i>Trichocerca porcellus</i> (Gosse, 1886)	-	+	+	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-	-	-
	Total	7	9	8	4	10	13	12	7	1	1	7	9	6	2	6	2	3	7	2	5
	CLADOCERA																				
29.	<i>Alona</i> sps.	+	-	-	+	-	-	+	-	-	-	+	-	-	-	-	-	-	-	+	-
30.	<i>Alona pulchella</i> King, 1853	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-
31.	<i>Alona taraporevalae</i> (Shirgur & Naik, 1977)	-	-	-	-	-	+	-	+	-	-	-	+	-	-	-	-	-	+	-	-
32.	<i>Bosmina longirostris</i> (O.F. Müller, 1776)	-	-	-	-	+	+	-	+	-	+	-	-	-	-	-	-	-	-	-	+
33.	<i>Bosminopsis deitersi</i> (Richard, 1895)	+	-	-	-	+	-	-	+	-	+	-	-	-	-	-	-	+	-	-	-
34.	<i>Chydorus parvus</i> Daday, 1898	+	-	-	-	-	-	+	-	-	+	-	-	-	-	+	-	-	-	+	-
35.	<i>Chydorus ventricoccus</i> (Daday, 1898)	-	+	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
36.	<i>Diaphanosoma excisma</i> Sars (Fischer, 1850)	+	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-	+	-

Table 1. Contd.

Sl. No.	Organisms	Sampling Sites																				
		Daruabari Chaur, VALMIKI NAGAR	Motipur Chaur, MUZAFFARPUR	Turkey Chaur, MUZAFFARPUR	Manikamann Chaur, MUZAFFARPUR	Dandari Chaur, BEGUSARA	Kawar Lake, BEGUSARAI	Baraila J heel, VAISHALI	Maran Chaur, DARBHANGA	Muriakatwa, DARBHANGA	Kausar Chaur, DARBHANGA	Samsolia Chaur, MADHEPURA	Matsaganda Chaur, SAHARSA	Mahisi Chaur, SAHARSA	Ghopa Chaur, MADHEPURA	Samsolia Chaur, MADHEPURA	Kajra Dhar, ARARIA	Chatar Chaur, ARARIA	Hathia cole, KHAGARIA	Tindobha Chaur, KHAGARIA	Isharain Chaur, MADHUBANI	
37.	<i>Daphnia lumholztzi</i> Sars, 1885	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
38.	<i>Echinisca triserialis</i> (Brady, 1886)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
39.	<i>Moina brachiata</i> (Jurine, 1820)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40.	<i>Moina macrocopa</i> (Straus, 1820)	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41.	<i>Moina micrura</i> (Kurz, 1874)	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42.	<i>Moina weismanni</i> (Ishikawa, 1896)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
43.	<i>Moina</i> sp.	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
44.	<i>Pseudosida bidentata</i> Herrick, 1884	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total	8	4	2	1	5	3	6	7	4	3	6	2	2	1	2	2	2	3	5	4	
	COPEPODA																					
45.	<i>Allodiaptomus</i> sp.	+	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-
46.	<i>Cyclops</i> sp.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47.	<i>Diaptomus</i> sp.	-	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-

RESULTS AND DISCUSSION

The analysis of zooplankton included quality analysis of zooplankton contents. Counting and determination of the species was difficult because of the great number of phytoplankton in the chours of the study area

The zooplankton analysis showed a good diversity of zooplankton community; mainly consisting of Rotifera, Cladocera and Copepoda groups. Altogether 51 sps. of zooplankton including 25 Rotifers, 18 Cladocerans and 8 Copepods were identified (Table 1).

Among the species identified, Nauplius, *Brachionus caudatus*, *Brachionus rubens*, *Asplanchna brightwelli*, *Filinia longiseta*, *Filinia opoliensis* and *Keratella tropica* were recorded throughout the sampling period.

In the present study Rotifers showed numerical superiority over the other group of Zooplankton with 4 families of 1 order, Cladoceran with 8 families of 1 order and Copepods with 5 families of 4 Orders. The percent composition was 55%, 31% and 14% of Rotifera, Cladocera and Copepoda respectively. The highest number of 22 species of zooplanktons were found in the Baraila Jheel (Lake) in Vaishali district of North Bihar.

In terms of species composition, rotifers have a high species number in the Chours of North Bihar. Total number of species of zooplankton was 51sps. Rotifers accounted nearly 55% of total Zooplankton during study period and confirm a broadly tropical character (Sinha et al., 1992). This group depicted higher qualitative diversity (28 species) than other groups. Nauplius larvae were observed as dominant species throughout the study period and was found more than adult forms, which were determined mainly as diaptomus species.

The heterogeneity in habitat conditions of the Chours favours high taxonomic diversity of fauna.

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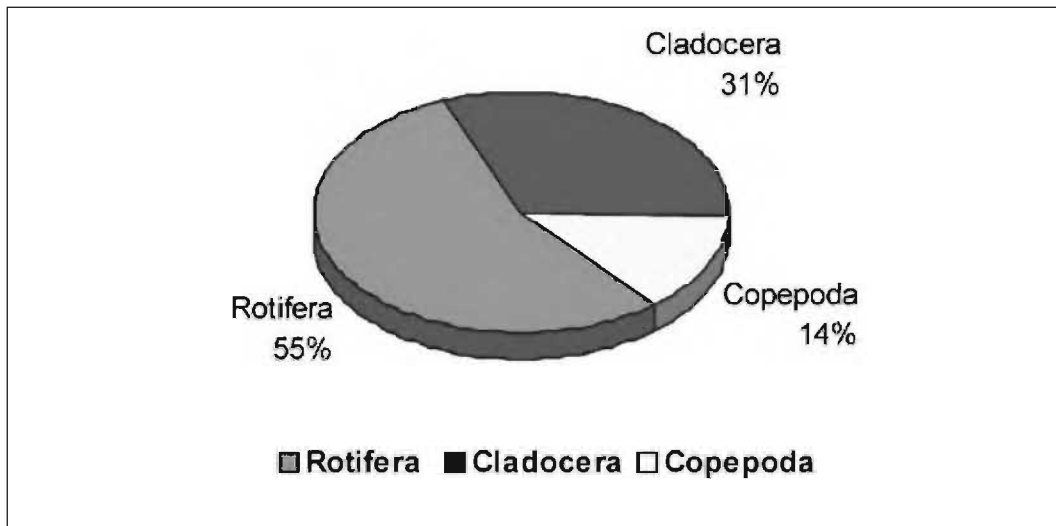


Fig. 1. Percentage of Zooplankton in the Chaurs of North Bihar

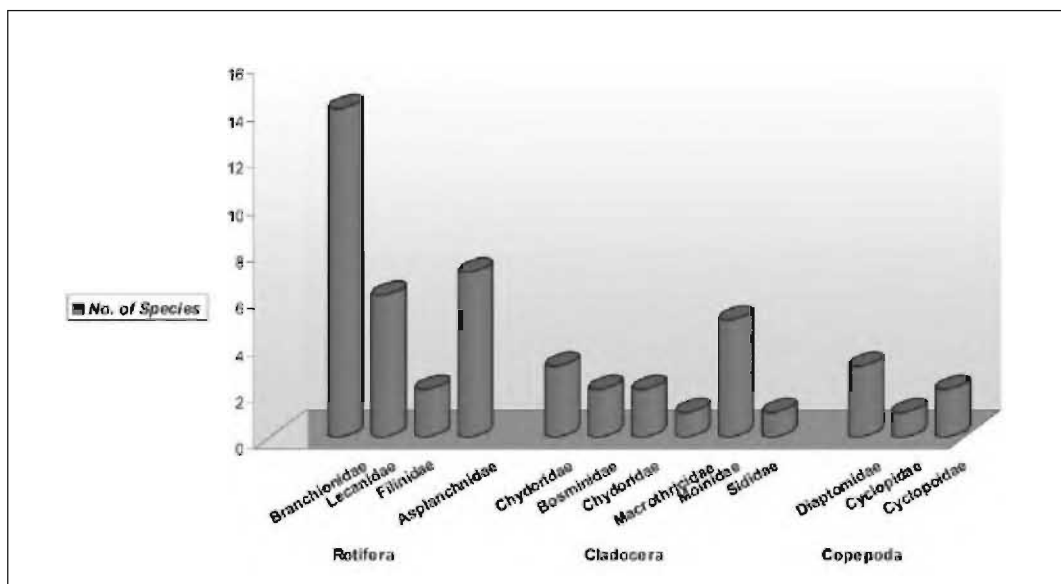


Fig. 2. Family wise number of species of Zooplankton in the Chaurs of North Bihar

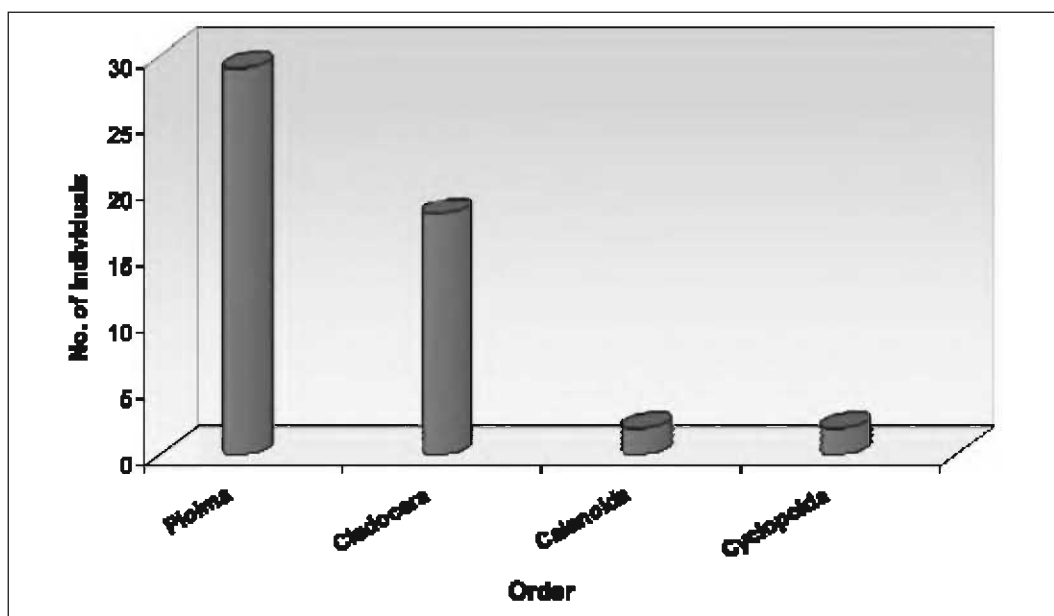


Fig. 3. Species diversity of Zooplankton in the Chaurs of North Bihar

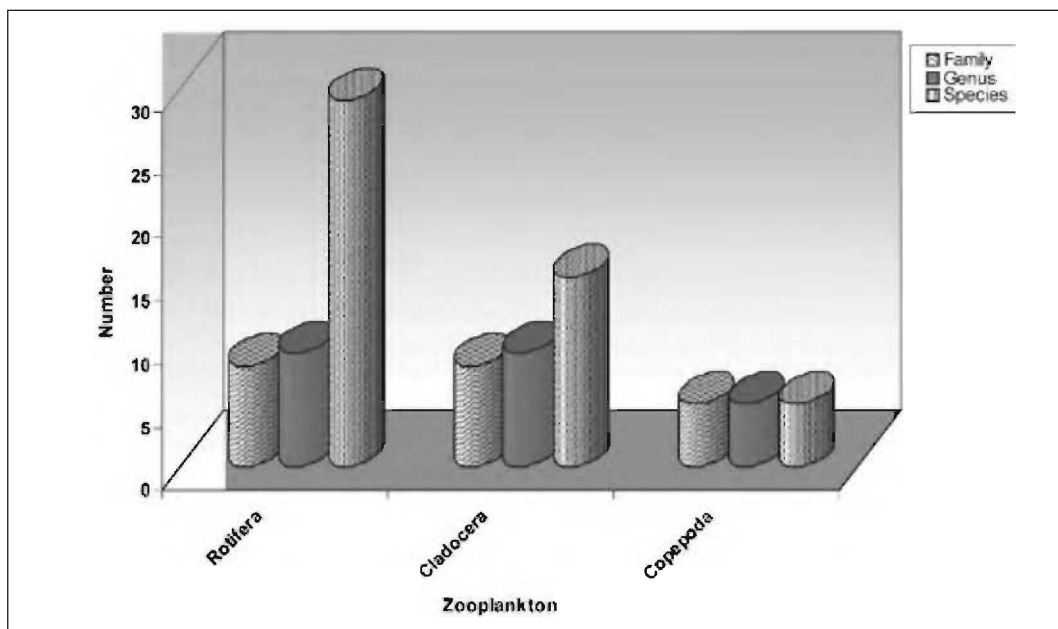


Fig. 4. Family, genus and species of Zooplankton in the Chaurs of North Bihar

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MOLLUSCAN DIVERSITY

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INTRODUCTION

Freshwater molluscs are those members of the Phylum Mollusca which live in freshwater habitat, i.e. lotic (flowing water) such as rivers, streams, canals, springs and underground cave streams (stygobite species) and lentic (still water) such as lakes, ponds (including temporary or vernal ponds and ditches).

These animals are defined as a soft bodied, non metallic, triploblastic, coelomic, basically a bilaterally symmetrical invertebrate, typically having an anterior head, a ventral muscular foot, the visceral mass enclosed in a thin fleshy mantle, well protected by an external calcareous shell. They have free swimming trochophore larvae normally present in the embryonic development.

Mollusca is the second largest group of animals after insect, highly adaptive and occupy all possible habitats except aerial. Originated from sea, they migrated to freshwater and from there to land.

The freshwater habitats are taxonomically impoverished in comparison to the marine habitats. Marine molluscs have received more attention because of their aesthetic and gastronomic appeals (Subba Rao 1993). In comparison, freshwater molluscs are drab coloured and have attracted less attention. A perusal of literature shows a paucity of information on several aspects of these molluscs. Priston (1915) published the fauna of British India (Freshwater Gastropoda and Palecejpoda) and gave a comprehensive account of freshwater molluscs. Since then a vast amount of knowledge has been accumulated on the freshwater molluscs.

The estimated number of molluscs in Indian sub continent is around 5072 species, out of the estimated 66535 species of the world, falling under the families : 242 marines, 22 freshwater and 26-land forms. (Abbott 1950, Alfred & Ramakrishna 2004).

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Freshwater molluscs have been known to play significant roles in the public and veterinary health and thus need to be scientifically explored more extensively. They need to be considered as a part of whole freshwater community, particularly the role in food chains linking up to the edible fish, which is an important source of protein for human being. Not only many aquatic animals thrive on them but they also serve as food for human in many part of the country. They are the intermediate host of many trematodes. At the other hand many bivalves are parasitic on gill of fishes. So, their role in wetlands have tremendous importance.

The two major classes of molluscs have representatives in freshwater : the Gastropod and the bivalve (or clams). It appears that the other classes within the Phylum Mollusca, the cephalopods, scaphopods and polyplacophorans etc. never made the transition from a fully marine environment to a freshwater environment.

A few species of freshwater molluscs are among the most notorious invasive species (Annandale 1922a). In contrast, numerous others have become threatened or have become extinct in the face of anthropogenic activities.

MATERIAL AND METHODS

The molluscan were studied in different Chours (small water bodies-wetlands) of North Bihar from April 2005 to January 2007 for several days in different seasons. Frequent visits were made in the month of June, September and January to March during two years of surveys.

Collections were made both by hand using hand net (soft plastic) and with the help of sediment sampler taken with brass sieve net of 22.5 × 22.5mm mesh size.

The collected animals were fixed and preserved in 70% alcohol. Formalin is not used for molluscan fixation. Screw capped borosil glass tubes; glass/plastic jars of suitable sizes were used for keeping the collected material. Specimens of bigger sizes were wrapped in gauze cloth and to preserve in sufficient big jars.

The dry molluscan shell were preserved after removing the soft body part of the animal and were boiled in water for about 30-60 minutes to clear the remnant tissues.

The collected material was labeled with hand written waterproof lead pencil in the field. Sometimes tracing paper was used for labeling. Dry shells were packed with sufficient cotton padding to avoid damage. Container of suitable sizes was used for preservation of specimens and transportation to the official laboratory.

After reaching the laboratory the specimens were sorted out in different groups, followed by species wise manually. Relevant literatures (Fauvel, 1953; Pennak; 1978; Tonapi, 1980; Subba Rao, 1989; Neseemann et.al. 2003 and 2005, Alfred and Ramakrishna, 2004 and Ramakrishna and Dey 2007) and the museum specimens were used as the source material for identification.

SYSTEMATIC LIST

Class GASTROPODA

Subclass ARCHEOGASTROPODA

Order MESOGASTROPODA

Family VIVIPARIDAE

Subfamily BELLAMYINAE

Genus **Bellamyia** Jousseaume, 1886

1. *Bellamyia bengalensis* f. *typica* (Lamarck)
2. *Bellamyia crassa* (Benson, 1836)
3. *Bellamyia dissimilis* (Müller, 1774)

Family AMPULARIIDAE

Genus **Pila** (Bolton) Roeding, 1798

4. *Pila globosa* (Swainson, 1822)

Superfamily RISSOIDEA

Family BITHYNIIDAE

Genus **Bithynia** Leach, 1818Subgenus **Digoniostoma** Annandale, 1920

5. *Bithynia* (*Digoniostoma*) *cerameopoma* (Benson, 1830)
6. *Bithynia* (*Digoniostoma*) *pulchella* (Benson, 1836)

Superfamily CERITHIOIDEA

Family THIARIDAE

Subfamily THIARINAE

Genus **Melanoides** Olivier, 1804

7. *Melanoides tuberculata* (Müller, 1774)

Subclass PULMONATA

Order BASOMMATOPHORA

Superfamily LYMNAEOIDEA

Family LYMNAEIDAE

Genus **Lymnaea** Lamarck, 1799

8. *Lymnaea acuminata* f. *typica* Lamarck, 1822
9. *Lymnaea luteola* f. *typica* Lamarck, 1822
10. *Lymnaea luteola* f. *ovalis* Gray, 1822

Superfamily PLANORBOIDEA

Family PLANORBIDAE

Subfamily PLANORBINAE

Tribe PLANORBEAEA

Genus **Gyraulus** Charpentier, 183711. *Gyraulus convexiusculus* (Hutton, 1849)12. *Gyraulus euphraticus* (Mousson, 1874)

Tribe SEGMENTININEAE

Genus **Segmentina** Fleming, 1817Subgenus **Polypylis** Pilsbry, 190613. *Segmentina (Polypylis) calatha* (Benson, 1850)Genus **Hippeutis** Agassiz in Charpentier, 1837Subgenus **Helicorbis** Benson, 185514. *Hippeutis (Helicorbis) umbilicalis* (Benson, 1836)

Subfamily BULLININAE

Genus **Indoplanorbis** Annandale and Prashad, 192115. *Indoplanorbis exustus* (Deshayes, 1834)

Class BIVALVIA

Subclass PALEOHETERODONTA

Order TRIGONOIDA

Superfamily UNIONOIDEA

Family UNIONIDAE

Subfamily AMBLEMINEAE

Tribe AMBLEMINI

Genus **Lamellidens** Simpson, 190016. *Lamellidens corrianus* (Lea, 1834)17. *Lamellidens marginalis* (Lamarck, 1819)18. *Lamellidens jenkinsianus* (Benson, 1862)Genus **Parreysia** Conrad, 1853Subgenus **Parreysia** s. st.19. *Parreysia (Parreysia) favidens* (Benson, 1862)Subgenus **Radiatula** Simpson, 190020. *Parreysia (Radiatula) caerulea* (Lea, 1831)

Superfamily CORBICULOIDEA

Family CORBICULIDAE

Genus **Corbicula** Megerle von Muehlfeld, 1811

21. *Corbicula bensoni* Deshayes, 1854
 22. *Corbicula striatella* Deshayes 1854

SYSTEMATIC ACCOUNTS

Class GASTROPODA

Subclass ARCHEOGASTROPODA

Order MESOGASTROPODA

Family VIVIPARIDAE

Subfamily BELLAMYINAE

Genus **Bellamyia** Jousseaume, 1886**Key to the species**

- Shell with dark colour bands *B. bengalensis* (Lamarck)
- Shell without any colour bands (2)
- Shell ovately conical, spire high, suture not deeply impressed
 *B. dissimilis* (Müller)
- Shell globose, spire not high and suture deeply impressed *B. crassa* (Benson)

1. *Bellamyia bengalensis* f. *typica* (Lamarck, 1822)

1822. *Paludina bengalensis* Lamarck, Hist. Nat. Anim. Sans. Vert., **6**(2) : 174.

1889. *Bellamyia bengalensis* f. *typica* : Subba Rao, Handbook Freshwater Molluscs of India : 45, fig. 55.

2007. *Bellamyia bengalensis* f. *typica* : Ramakrishna and Dey, Handbook on Indian Freshwater Molluscs, p.79, figs. 39 A & B.

Material examined : India, North Bihar, 30exs. 22-ix-2005; Kowar Lake in Begusarai, 1 ex. 25-ix-2005; Jeevach Dhar in Darbhanga, 87 exs. 17-i-2006; Manikamann Chaur in Muzaffarpur, 9 exs. 18-i-2006; Bhoga Chaur in Madhubani, 14 exs. 24-iii-2006; Baraila Jheel in Vaishali, 14 exs. 25-iii-2006; Manikamann Chaur in Muzaffarpur, 11 exs. 2-iv-2006; Kowar Lake in Begusarai, 14 exs. 3-iv-2006; Hathiacole Chaur in Khagaria, 13 exs. 6-iv-2006; Samsolia Chaur in Madhepura, 2exs. 7-iv-2006; Matsaganda Chaur, in Saharsa, 8 exs. 23-vi-2006; Chatar Chaur, Araria, 42 exs. 30-i-2006; Manikamann Chaur in Muzaffarpur, 2 exs. 23-vi-2006; Chatar Chaur, Araria, 15 exs. 25-vi-2006; Samsolia Chaur in Madhepura, 25 exs. 26-vi-2006; Baraila Jheel in Vaishali; 3 exs. 30-vi-2006; Manikamann Chaur in Muzaffarpur; 18 exs. 15-i-2007; Chatar Chaur, Araria; 11 exs.

7-i-2007; Motipur Chaur in Muzaffarpur, 9exs. 8-i-2007; Daruabari Chaur, Valminki Nagar, 5exs. 15-i-2007; Chatar Chaur, Araria, 4exs. 10-i-2007; Manikamann Chaur in Muzaffarpur and 2exs. 16-i-2007; Chatar Chaur & Kajradhar Chaur in Araria districts. coll. Gopal Sharma and party.

Measurements (in mm) :

Length	Diameter	Height of the aperture
29.60-21.76	21.32-14.32	14.87-10.97

Distribution : India : common throughout the country.

Elsewhere : Bangladesh, Myanmar and Sri Lanka.

Diagnostic character : Shell thin, body whorl also equal to spire; whorls tumid, not biangulate, suture shallow; umbilicus narrow; aperture sub-circular with a narrow black margin; body whorl with irregular, variable alternating broad and narrow bands. Very common in the wetlands of Bihar.

Remarks : It is used as food in Andhra Pradesh, Bihar, Jharkhand, Manipur, Meghalaya, Mizoram, Orissa and West Bengal. Annandale (1921) studied the ornamentation of the shell and systematic, while Sewell (1921) discussed the anatomy and bionomics of the species. In Chinsurah (and pandua) areas of West Bengal the species is considered as a pest of *Azola pinnata*, a plant that is used as a bio-fertilizer in paddy field.

2. *Bellamyia crassa* (Benson, 1836)

1836. *Paludina crassa* (Hutton Ms) Benson, J. Asiat. Soc. Bang. **5** : 745

1989. *Bellamyia crassa* : Subba Rao, Handbook of Freshwater Molluscs of India p. 48. figs. 60-61.

2007. *Bellamyia crassa* : Ramakrishna and Dey, Handbook on Indian Freshwater Molluscs, p. 89, figs. 49 A & B.

Material examined : India, North Bihar, 14exs. 17- i-2007; at Jeevach Dhar, Darbhanga, coll. Gopal Sharma and party.

Measurements (in mm) :

Length	Diameter
29.62-23.44	22.90-18.67

Distribution : India : Bihar : Begusarai; Andhra Pradesh, Assam, Gujarat, Karnataka, Meghalaya, Orissa, Uttar Pradesh & West Bengal.

Diagnostic character : Shell globose, olive brown, without colour bands; spire small, blunt; sculpture with fine wavy spiral lines; aperture suboval, columella arched, anterior margin almost straight, outer lip arched.

This species is found burrowing in mud or sand in shallow waters, even in favourable conditions (Preston, 1915)

Remarks : It buries itself in the mud or sand in shallow water, often in large numbers although there are favorable conditions.

3. *Bellamyia dissimilis* (Müller, 1774)

1774. *Neritina dissimilis* Mueller, Hist. Verm. Test. pt. 2 : 184.
 1989. *Bellamyia dissimilis* : Subba Rao, Handbook of Freshwater Molluscs of India, p. 48, figs. 64-67.
 2007. *Bellamyia dissimilis* : Ramakrishna and Dey, Handbook on Indian Freshwater Molluscs, p. 90, figs. 50 A & B.

Material examined : India, North Bihar, 2exs. 18-i-2006; Bhoga Chaur in Madhubani, 2 exs. 21-i-2006; Daruabari Chaur, Valmiki Nagar, 18 exs. 25-iii-2006; Manikamann Chaur in Muzaffarpur, 3 exs. 26-vi-2006; Baraila Jheel in Vaishali, 6 exs. 12-i-2006; Turkey Kuleshra Chaur in Muzaffarpur, 1 ex. 30-vi-2006; Manikamann Chaur in Muzaffarpur, 18 exs. 3-vii-2006; Hardia Chatti Chaur at Valmiki Nagar, 4 exs. 7-i-2007; 17 exs. 10-i-2007; Turkey Kuleshra Chaur in Muzaffarpur, and 6exs. 23-i-2006; Chatar Chaur, Araria districts, coll. Gopal Sharma and Party.

Measurements (in mm) :

Length	Diameter
18.12 - 11.21	12.15 - 7.66

Distribution : Common throughout India.

Elsewhere : Bangladesh, Malaysia, Myanmar, Pakistan and Sri Lanka.

Diagnostic character : Shell small, without dark spiral bands; spire swollen, suture deeply impressed; body whorl with slightly elevated ridge or broad and obscure, pale spiral band. Rim of aperture often black; operculum thicker and muscular scar well developed.

Remarks : It is used as food in Bihar, Jharkhand, Meghalaya and Orissa.

It prefers stagnant waters, wetlands and even temporary water bodies. It is also found in riparian floodplains.

Family AMPULARIIDAE

Genus **Pila** (Bolton) Roeding, 1798

4. *Pila globosa* (Swainson, 1822)

1798. *Pila* (Bolton) Roeding, Mus. Bolton. pt. 2 : 145 (in part). Type species : *Helix ampullacea* subsequent designation, Dall. 1904.
 1822. *Ampullaria globosa* Swainson, Zool. Illustration, **2** : pl. 19. (Type Locality : Rivers of India).
 1989. *Pila globosa* : Subba Rao, Handbook Freshwater Molluscs of India, p. 58, figs. 80-82

2007. *Pila globosa* : Ramakrishna and Dey, Handbook on Indian Freshwater Molluscs, p. 299, figs. 205-206 A & B.

Material examined : India, North Bihar, 6 exs. Kumbhichaur in Begusari, 3 exs. 25-ix-2005; Jeevach Dhar in Darbhanga, 16 exs. 12-i-2006; Turkey Chaur in Muzaffarpur, 3 ex. 17-i-2006; 17 exs. 25-iii-2006; Manikamann Chaur in Muzaffarpur, 4 exs. 24-iii-2006; Baraila Jheel in Vaishali, 2 exs. 2-iv-2006; Kawar Lake in Begusarai; 23 exs. 03-iv-2006; Hathiacle Chaur in Khagaria, 1 ex. 6-iv-2006; Samsolia Chaur in Madhepura, 12 exs. 26-vi-2006; Baraila Jheel in Vaishali, 1 ex. 27-vi-2006; Kawar Lake in Begusarai, 14 exs. 29-vi-2006; Kausar Chaur, Darbhanga, 23 exs. 30-vi-2006; Manikamann Chaur in Muzaffarpur, 1 ex. 03-vii-2006; Hardia Chatti Chaur at Valmiki Nagar, 2 exs. 22-ix-2006; Kawar Lake in Begusarai, 1 ex. 07-i-2007; Motipur Chaur in Muzaffarpur and 4 exs. 20-i-2007; Amawa Chaur, Betiah district; coll. Gopal Sharma and party.

Measurements (in mm) :

Length	Diameter	Height of the aperture
41.23– 29.39	39.34– 27.43	32.6– 28.6

Distribution : India : Assam, Bihar, Jharkhand, Himachal Pradesh, Maharashtra, Madhya Pradesh, Meghalaya, Orissa, Rajasthan, Uttar Pradesh, West Bengal.

Diagnostic character : Shell globose, with inflated body whorl; spire depressed, suture shallow; colour bands visible from inside of the aperture. It shows remarkable variation in shape, elevation of spire and body whorl.

Remarks : It is used as food in Bihar, Jharkhand, Orissa and West Bengal. It lives in temporary water bodies, which are dry for at least one time per year (important for reproduction). Adults survive in the dry season and remain buried in soil. It inhabits wetlands, where it is usually very common. The species prefers the stagnant water, but it lives occasionally in rivers. Often animals may migrate into running water or they are drifted by flood/current.

Family BITHYNIIDAE

Genus **Bithynia** Leach, 1818

Subgenus **Digoniostoma** Annandale, 1920

Key to the species

- Spire shorter than body whorl, lip at the base of columella produced
..... B. (D.) *cerameopoma* (Benson)
- Spire equal or more than bodywhorl, lip at the base of columella not produced
..... B. (D.) *pulchella* (Benson)

5. **Bithynia (Digoniostoma) cerameopoma** (Benson, 1830)

1830. *Paludina cerameopoma* Benson, Gleaning in Science, Calcutta, 2 : 125.

1989. *Digoniostoma cerameopoma* : Subba Rao, Handbook of Freshwater Molluscs of India, p. 79, fig. 121.
2007. *Digoniostoma cerameopoma* : Ramakrishna and Dey, Handbook on Indian Freshwater Molluscs, p. 118, figs. 72 A & B.

Material examined : India, North Bihar, 31 exs. 23. ix.2005, Majilsa Chaur in Darbhanga, 1 ex. 25-vi-2006, Samsolia Chaur in Madhepura, 1 ex. 27-vi-2006, Kawar Lake in Begusarai, 1 ex. 7-i-2007, Motipur Chaur in Muzaffarpur, 1 ex. 8-i-2007, Daruabari Chaur, Valmiki Nagar, 10 exs. 10-i-2007, Manikamann Chaur in Muzaffarpur and 1 ex. 20-i-2007; Amawa Chaur, Betiah, coll. Gopal Sharma and Party.

Measurements (in mm) :

Length	Diameter
7.35 - 5.34	4.96. 2.27

Distribution : India : Andhra Pradesh, Assam, Bihar, Delhi, J harkhand, Madhya Pradesh, Meghalaya, Punjab, Rajasthan & West Bengal.

Elsewhere : Pakistan.

Diagnostic character : Shell oblong-ovate, whorl 5, regular and rapidly increasing; sculpture with growth lines, suture well impressed, umbilicus moderate, narrow and deep, peristome continuous and oblique. Operculum calcareous, concave with sub central nucleus.

Remarks : Their population, habit and habitat where they occur and many other observations done.

6. *Bithynia (Digoniostoma) pulchella* (Benson, 1836)

1836. *Paludina pulchella* Benson, J . asiat. Soc. Beng., **5** : 746.
1915. *Bithynia pulchella*, Preston, Fauna of British India, 73.
1921. *Digoniostoma pulchella*, Annandale and Prasad, 1921, Rec. of Ind. Mus., **22** : 541.
1989. *Digoniostoma pulchella* Subba Rao, Handbook of Freshwater Molluscs of India, p. 80, figs. 113, 114, 119, 120.
2007. *Digoniostoma pulchella* : Ramakrishna and Dey, Handbook on Indian Freshwater Molluscs, p. 120, figs. 74 A & B.

Material examined : India, North Bihar, 31 exs. 23-ix-2005, Majilsa Chaur in Darbhanga, 2 exs. 2-iv-2006, Kawar Lake in Begusarai, 6 exs. 23-vi-2006, Chatar Chaur, Araria, 16 exs. 25-vi-2006, Ghopa Chaur in Madhepura, 10 exs. 27-vi-2006, Kawar Lake in Begusarai, 1 ex. 29-vi-2006, J eevachdhar in Darbhanga, 1 ex. 30-vi-2006, Manikamann Chaur, Muzaffarpur and 8 exs. 17-i-2007, Kawar Lake, Begusarai, coll. Gopal Sharma and party.

Measurements (in mm) :

Length	Diameter	Height of the aperture
6.67-4.46	4.67-2.87	

Distribution : Throughout India.

Elsewhere : Myanmar, Malay Archipelago and Pakistan.

Diagnostic character : Shell elongate, spire longer than body whorl, sutures depressed, umbilicus almost closed; aperture oval.

Remarks : It lives in lentic part of the rivers, wetland and ponds. *B. pulchella* often was observed in very high density of individuals on mud substrate, between aquatic macrophytes and attached on hard substrate with algae, cover such as shell of large bivalves or stones.

Superfamily CERITHIODEA

Family THIARIDAE

Subfamily THIRRINAE

Genus **Melanoides** Olivier, 1804

7. **Melanoides tuberculatus** (Müller, 1774)

1774. *Nerita tuberculata* Mueller, Hist. Verm. Terr. Fluv. **2** : 191.

1989. *Thiara (Melanoides) tuberculata* : Subba Rao, Handbook of Freshwater Molluscs of India, p. 103, figs. 183, 184.

2007. *Melanoides tuberculata* : Ramakrishna and Dey, Handbook on Indian Freshwater Molluscs, p. 161, figs. 108 A & B.

Material examined : India, North Bihar, 14 exs. 25-vi-2006, Baraila Jheel in Vaishali, 1 ex. 27-vi-2006, Kowar Lake in Begusarai, 5 exs. 5-vii-2006, Baraila Jheel in Vaishali, 1 ex. 7-i-2007, Motipur Chaur in Muzaffarpur and 1 ex. 20-i-2007; Amawa Chaur, Betiah district, coll. Gopal Sharma and Party.

Measurements (in mm) :

Length	Diameter
24.79- 17.8	7.65- 4.78

Distribution : Widely distributed throughout India except Kashmir.

Elsewhere : North and South Africa, South East Asia, Southern China, Japan, Malaysia, Malay Archipelago, North Australia, Pacific Islands and New Hebrides.

Diagnostic character : Shell with high spire and moderately large body whorl; whorls 10-14, convex, evenly rounded; spire five times than the aperture; sculpture with conspicuous vertical ribs and spiral striate, more distinct and raised on upper whorls; Shell with dark red-brown dots and flames, either irregularly distributed or longitudinally arranged, flatter on the lower ones; Radula with 11 cups in central teeth.

Remarks : It is mainly found in Gangetic plains, being rare in the Hills.

Subclass PULMONATA
Order BASOMMATOPHORA
Superfamily LYMNAEOIDEA
Family LYMNAEIDAE
Genus **Lymnaea** Lamarck, 1799

Key to the species

- Spire acuminate, outer lip very much expanded and convex in outline.....
..... L. acuminata Lamarck
- Spire less acuminate, outer lip not very much expanded and almost Straight in outline
..... L. luteola Lamarck

8. Lymnaea acuminata f. typica Lamarck, 1822

1822. *Limnaea acuminata* Lamarck, Hist. nat. Anim., Sans. Vert., **6**(2) : 160.

1989. *Lymnaea acuminata* f. *typica* Subba Rao, Handbook of Freshwater Molluscs of India, p. 127, figs. 258, 259.

2007. *Lymnaea* (*Pseudosuccinea*) *acuminata* f. *typica* Ramakrishna and Dey, Handbook on Indian Freshwater Molluscs, p. 198, fig. 141 A& B.

Material examined : India, North Bihar, 2 exs. 22-ix-2005, Kavar Lake in Begusarai, 1 ex. 25-ix-2005, Jeevach Dhar in Darbhanga, 9 exs. 17-i-2006, Manikamann Chaur in Muzaffarpur, 1 ex. 21-i-2006, Motipur Chaur in Muzaffarpur, 1 ex. 24-iii-2006, Baraila Jheel in Vaishali, 22 exs. 25-iii-2006, Manikamann Chaur in Muzaffarpur, 30 exs. 2-iv-2006, Kavar Lake in Begusarai, 2 exs. 7-iv-2006, Matsagandha Chaur in Saharsa, 1 ex. 26-vi-2006, Baraila Chaur in Vaishali, 6 exs. 27-vi-2006, Kavar lake in Begusarai, 19 exs. 30-vi-2006, Manikamann Chaur in Muzaffarpur, 2 exs. 5-vii-2006, Baraila Lake in Vaishali, 9 exs. 7-i-2007, Motipur Chaur in Muzaffarpur and 4 exs. 17-i-2007, Kavar Lake in Begusarai District, coll. Gopal Sharma and Party.

Measurements (in mm) :

Length	Diameter	Height of the aperture
20.21-12.52	12.78-5.32	14.80-10.20

Distribution : Throughout India.

Diagnostic character : Shell thin, ovate, spire short, acuminate, body whorl much inflated, a little angular above with a large aperture.

Remarks : Its habitat is slowly running rivers, streams, ponds, lakes and wetlands with submerged vegetation, low lands.

9. *Lymnaea luteola f. typica* Lamarck, 1822

1822. *Limnaea luteola* Lamarck, Hist. Nat. Anim. Sans. Vert., **6**(2) : 160.

1989. *Lymnaea* (*Pseudosuccinea*) *luteola f. typica* : Subba Rao, Handbook of Freshwater Molluscs of India, p. 129, figs. 275, 276.

2007. *Lymnaea* (*Pseudosuccinea*) *luteola f. typica* : Ramakrishna and Dey, Handbook on Indian Freshwater Molluscs, p. 209, figs. 151 A & B.

Material examined : India, North Bihar, 2 exs. 8-i-2007, Daruabari Chaur in Valminki Nagar, 2 exs. 30-vi-2007, Manikamann Chaur in Muzaffarpur and 11 exs. 25-vi-2006, Ghopa Chaur in Madhepura District, coll. Gopal Sharma and Party.

Distribution : Throughout India.

Elsewhere : Bangladesh, Myanmar, Nepal and Pakistan.

Diagnostic character : Shell thin and glossy, less inflated, relatively smaller and laterally compressed; spire gradually tapering and more produced; aperture narrow.

Remarks : Its habitat is rivers, streams and wetlands with decaying plant material and leaf litter, lowlands.

10. *Lymnaea luteola f. ovalis* Gray, 1822

1822. *Limnaea ovalis* Gray, in Sowerby's Gen. Rec. Foss. Shells : pl. 178.

1989. *Lymnaea* (*Pseudosuccinea*) *luteola f. ovalis* Subba Rao, Handbook of Freshwater Molluscs of India, p. 129, figs. 266, 267, 283, 284.

2007. *Lymnaea* (*Pseudosuccinea*) *luteola f. ovalis* : Ramakrishna and Dey, Handbook on Indian Freshwater Molluscs, p. 212, figs. 154 A & B.

Material examined : India, North Bihar, 4 exs. 18-i-2006, Bhoga Chaur in Madhubani, 1 ex. 7-iv-2006, Matsagandha Chaur, in Saharsa, 1 ex. 26-vi-2006, BarailaJ heel in Vaishali, 1 ex. 7-i-2007, Motipur Chaur in Muzaffarpur, 8 exs. 8-i-2007, Daruabari Chaur in Valminki Nagar, 2 exs. 16-i-2007, Chatar Chaur & Kajradhar Chaur in Araria and 5 exs. 17-i-2007; Kawar Lake in Begusarai District, coll. Gopal Sharma and Party.

Measurements (in mm) :

Length	Diameter
23.56-17.98	14.69-9.07

Distribution : throughout India.

Elsewhere : East Indies, Myanmar, Sri Lanka.

Diagnostic character : Shell larger than in preceding species, last whorl much inflated without any compression, spire short and abruptly acuminate.

Remarks : Its habitat is stagnant waters, ponds, oxbow lakes and wetlands of riparian

floodplains with rich submerged aquatic vegetation sporadically in west Bengal, Bihar and Terai of Nepal. Lowland species of lentic water bodies with highly diversified fauna.

Superfamily PLANORBOIDEA

Family PLANORBIDAE

Subfamily PLANORBINAE

Tribe PLANORBEAEA

Genus **Gyraulus** Charpentier, 1837

11. Gyraulus convexiusculus (Hutton, 1849)

1849. *Planorbis convexiusculus* Hutton, J. asiat. Soc. Beng. **18**(2) : 657.

1989. *Gyraulus convexiusculus* : Subba Rao, Handbook of Freshwater Molluscs of India, 154, figs. 362-364.

2007. *Gyraulus convexiusculus* : Ramakrishna and Dey, Handbook on Indian Freshwater Molluscs, p. 234, figs. 172 A & B.

Material examined : India, North Bihar, 1 ex. 25-vi-2006, Samsolia Chaur in Madhepura, 1 ex. 10-i-2007, Manikamann Chaur in Muzaffarpur, 63 exs. 8-i-2007, Daruabari Chaur in Valmiki Nagar and 53 exs. 17-i-2007, Kawar Lake in Begusarai district, coll. Gopal Sharma and Party.

Measurements (in mm) :

Height	Diameter
9.79-1.19	5.97-3.18

Distribution : India : Common throughout.

Elsewhere : Iran to Philippines and Japan.

Diagnostic character : Shell small, not more than 5mm in diameter, discoidal, with 4-5 depressed whorl; umbilicus wide, transparent, periphery subangulate, closely and obliquely striatulate aperture ovate, lunate. Radula with well developed central, bearing sharp, pointed cusps, inner laterals with two stout, sharply pointed cusps, outers with three cusps, marginal with four to six similar and slender cusps. A very common species occurring in lakes, ditches, ponds and rice fields.

Remarks : Inhabitants of various types of running and stagnant water bodies.

12. Gyraulus euphraticus (Mousson, 1874)

1874. *Planorbis euphraticus* Mousson, J. Conchyl. 22 : 44. Type-locality : "La-Basse-Mesopotomie"

1989. *Gyraulus euphraticus* : Subba Rao, Handbook of Freshwater Molluscs of India, 155, figs. 365-367.

2007. *Gyraulus euphraticus* : Ramakrishna and Dey, Handbook on Indian Freshwater Molluscs, p. 236, figs. 174 A & B.

Material examined : India, North Bihar, 1 ex. 2-iv-2006, Kavar Lake in Begusarai, coll. Gopal Sharma and Party.

Measurements (in mm) :

Length	Diameter
4.96-2.67	1.63-0.98

Distribution : India : Bihar, Manipur, Jharkhand, Punjab & West Bengal.

Elsewhere : Baluchistan, Afghanistan.

Diagnostic character : Superficially it resembles *G. convexiusculus* but differs from it in being more compressed and more strongly carinate, shell larger, more opaque and more coarsely and irregularly sculptured, body whorl deviates from the spiral of the upper whorls.

Remarks : They occur in lakes, ponds and slow running rivers and streams with rich plant growth.

Tribe SEGMENTINI NEAE

Genus **Segmentina** Fleming, 1817

Subgenus **Polypylis** Pilsbry, 1906

13. **Segmentina (Polypylis) calatha** (Benson, 1850)

1850. *Planorbis calathus* Benson, Ann. Mag. Nat. Hist., **5**(2) : 348.

1817. *Segmentina (Polypylis) calatha* : Subba Rao, Handbook of Freshwater Molluscs of India, p. 150, figs., 339-341.

2007. *Segmentina (Polypylis) calatha* : Ramakrishna and Dey, Handbook on Indian Freshwater Molluscs, p. 246, figs. 182 A & B.

Material examined : India, North Bihar, 56 exs. 8-i-2007, Daruabari Chaur in Valminki Nagar and 1 ex. 16-i-2007, Chatar Chaur in Araria Districts, coll. Gopal Sharma and Party.

Measurements (in mm) :

Length	Diameter
4.54-2.98	1.93-0.88

Distribution : Widely distributed in northern India, Tripura.

Elsewhere : Myanmar and Sri Lanka.

Diagnostic character : Shell small, thin, glossy, whorls four-body whorl angular, sutures impressed, aperture sub-triangular, parietal laminae obliquely transverse lamellae wide space. Vergic sac with two flagella.

Remarks : Common species of swamps, ponds, lakes and wetlands, in decaying plant material and leaf litter.

Genus **Hippeutis** Agassiz in Charpentier, 1837

Subgenus **Helicorbis** Benson, 1855

14. **Hippeutis (Helicorbis) umbilicalis** (Benson, 1836)

1836. *Planorbis umbilicalis* Benson, J. Asiat. Soc. Beng., **5** : 741.
 1989. *Hippeutis (Helicorbis) umbilicalis umbilicalis* : Subba Rao, Handbook of Freshwater Molluscs of India, p. 148, figs., 333-335.
 2007. *Hippeutis (Helicorbis) umbilicalis umbilicalis* : Ramakrishna and Dey, Handbook on Indian Freshwater Molluscs, p. 251, figs. 188 A & B.

Material examined : India, North Bihar, 52exs. 8-i-2007, Daruabari Chaur at Valmiki Nagar in West Champaran District, coll. Gopal Sharma and Party.

Measurements (in mm) :

Length	Diameter
7.65-4.33	2.09-1.00

Distribution : India : Assam, Bihar, Manipur and Uttar Pradesh.

Elsewhere : Myanmar, Indonesia, Southern China, Taiwan and Philippines.

Diagnostic character : Shell depressed, small, narrowly coiled, umbilicate, whorls 3, very rapidly increasing in width, round, convex above, flattened below, bluntly angulated at the periphery, aperture heart shaped.

Remarks : They are very common species of swamps and wetlands, especially on macrophytes.

Family BULLINIDAE

Subfamily BULLININAE

Genus **Indoplanorbis** Annandale and Prasad, 1921

15. **Indoplanorbis exustus** (Deshayes, 1834)

1834. *Planorbis exustus* Deshayes in Belanger, voy. Indes-Orientales : 417, pl. 1, figs. 11-13.
 1989. *Indoplanorbis exustus* Subba Rao, Handbook of Freshwater Molluscs of India, p. 142, figs. 326, 327.
 2007. *Indoplanorbis exustus* Ramakrishna and Dey, Handbook on Indian Freshwater Molluscs, p. 253, figs. 190A & B.

Material examined : India, North Bihar, 1 ex. 22-ix-2005, Kowar Lake in Begusarai, 4 exs. 25-ix-2005, Jeevach Dhar in Darbhanga, 1 ex. 17-i-2006, Manikamann Chaur in Muzaffarpur, 1 ex. 6-iv-2006, Samsolia Chaur in Madhepura, 1 exs. 25-vi-2006, Samsolia

Chaur in Madhepura, 1 ex. 30-vi-2006, Manikamann Chaur in Muzaffarpur, 12 exs. 7-i-2007, Motipur Chaur in Muzaffarpur, 2 exs. 15-i-2007, Chatar Chaur, Araria and 4exs. 18-i-2007, Dandari Chaur in Begusarai District, coll. Gopal Sharma and Party.

Measurements (in mm) :

Length	Diameter
15.77-12.95	5.84-3.62

Distribution : India : Widely distributed.

Elsewhere : Bangladesh, Iran, Pakistan, Persia, Sri Lanka, Myanmar, Malaya, Indo-China, Tibet, Thailand, Vietnam, Sumatra, Java and Celebes.

Diagnostic character : Shell large, thick, discoidal, sinistral, rounded at periphery, aperture ear-shaped, suture deeply impressed.

Remarks : Habitat is of various types of stagnant waters with dense vegetation. *Indoplanorbis exustus* lives in moderately running streams and rivers of the lowlands. It appears to be the most pollution tolerant species among the family Planorbidae.

Class BIVALVIA

Subclass PALEOHETERODONTA

Order TRIGONOIDA

Superfamily UNIONOIDEA

Family UNIONIDAE

Subfamily AMBLEMINEAE

Tribe AMBLEMINI

Key to the genera

- Shell elongate, comparatively broader, cardinal teeth elongate and compressed
.....*Lamellidens* Simpson
- Shell not elongate, not broader, cardinal teeth compressed with vertical striation .
.....*Parreysia* Conrad

Genus **Lamellidens** Simpson, 1900

Key to the species

- Shell narrow with elongate posterior end *L. jenkinsianus*
(Benson) Shell broad, posterior end not elongate, gradually sloped (2)
- Umbo prominent, light brown colour with lighter band along margin
..... *L. marginalis* (Lamarck)
- Umbo less prominent, colour uniformly dark..... *L. corrianus* (Lea)

16. *Lamellidens corrianus* (Lea, 1834)

1834. *Unio corrianus* Lea, Trans. Amer. Philos. Soc., **6**(2) : 65, pl. 9, fig. 25. Type locality : India.
 1900. *Lamellidens corrianus* : Simpson, Proc. U.S. Natn. Mus., **22** : 857.
 1921. *Lamellidens corrianus* : Prashad, Rec. Indian Mus., **22** : 609, fig. 29c.
 1989. *Lamellidens corrianus* : Subba Rao, Handbook of Freshwater Molluscs of India, p. 165, figs., 386-387.
 2007. *Lamellidens corrianus* : Ramakrishna and Dey, Handbook on Indian Freshwater Molluscs, p. 299, figs. 205-206 A & B.

Material examined : India, North Bihar, 2 exs. 2-iv-2006; Kowar Lake in Begusarai, 7 exs. 3-iv-2006; Hathiacle Chaur in Khagaria and 2 exs. 26-iii-2006; Turkey Kuleshra Chaur in Muzaffarpur District, coll. Gopal Sharma and party.

Measurements (in mm) :

Length	Width	Depth
72.24-61.46	26.37-22.67	22.33-19.48

Distribution : North Bihar wetlands, Fatuha in Bihar, Yamuna at Allahabad in Uttar Pradesh. Damodar River downstream in Panchet dam Jharkhand. Commonly found in throughout India.

Elsewhere : Bangladesh and Myanmar.

Diagnostic character : Shell elongate, elliptical; periostracum smooth and dark brown; umbone slightly inflated; dorsal margin long and almost straight; each valve with two cardinal teeth.

Remarks : *L. corrianus* is used as food in Bihar, Jharkhand, Orissa, West Bengal and Manipur. This is a very abundant species. They prefer sand, silts and mud substrate of large lowland rivers for their habitat.

17. *Lamellidens jenkinsianus* (Benson, 1862)

1862. *Unio jenkinsianus* Benson, Ann. Mag. Nat. Hist., **10**(3) : 185. Type locality : "Berhampooter River, Assam".
 1920. *Lamellidens jenkinsianus* : Prashad, Rec. Indian Mus., **19** : 172. Pl. ix, figs. 3, 4.
 2007. *Lamellidens jenkinsianus* : Ramakrishna and Dey, Handbook on Indian Freshwater Molluscs, p. 285, figs. 208 A & B.

Material examined : India, North Bihar, 7 exs. 3-04-2006; Jeevach dhar in Darbhanga District, coll. Gopal Sharma and Party.

Measurements (in mm) :

Length	Width	Depth
98.65-82.43	35.92-23.87	51.3-34.7

Distribution : India : Assam, Bihar : Bhagalpur.

Elsewhere : Bangladesh.

Diagnostic character : Shell thick, transversely elongated, tumid; anterior end short and rounded, posterior end sloping, cardinals two in right valve, lower long, thick and heavily built, upper one thin, a single blade like lateral, left valve with a small pad-like tooth from inner margin of the umbo, lamellar teeth two.

Remarks : Stagnant waters, large ponds with high natural organic load (eutrophication), occasionally found in rivers, ponds and Chours of North Bihar.

18. *Lamellidens marginalis* (Lamarck, 1819)

1819. *Unio marginalis* Lamarck, Hist. Nat. Anim. Sans. Vert., **4** : 79, Type locality : Bengal.

1989. *Lamellidens marginalis* : Subba Rao, Handbook of Freshwater Molluscs of India, p. 168, figs., 404, 405.

2007. *Lamellidens marginalis* : Ramakrishna and Dey, Handbook on Indian Freshwater Molluscs, p. 288, figs. 211 A & B.

Material examined : India, North Bihar, 1ex. 17-01-2006, Manikamann Chaur in Muzaffarpur; 10 exs. 31-ii-2006, Kausar Chaur in Darbhanga; 1 ex. 3-iv-2006, Hathiacle Chaur in Khagaria; 1 ex. 2-iv-2006, Kawar Lake in Begusarai; 14 exs, 30-vi-2006, Manikamann Chaur in Muzaffarpur and 1 ex. 15-i-2007, Chatar Chaur in Araria District; coll. Gopal Sharma and party.

Measurements (in mm) :

Length	Width	Depth
67.61-45.63	37.32-28.46	16.34-14.89

Distribution : India : Widely distributed.

Elsewhere : Bangladesh, Myanmar and Sri Lanka.

Diagnostic character : Shell oblong ovate, periostracum blackish brown with light brown border along ventral margin, umbo not elevated, posterior side broad, roundedly angular, margin produced narrow wing, dorsal margin slightly curved, central margin slightly contracted in middle, hinge with two cardinals in right valve, interior nacreous.

Remarks : *L. marginalis* is used as food in Bihar, Jharkhand, Orissa, West Bengal and Meghalaya. Pearl is also produced from this species. Live organisms were mostly observed in sand substrate. Various chours, oxbow lakes, smaller rivers and streams, widespread

but not everywhere common. *L. marginalis* is forming dense population in the effluents of stagnant water bodies, e.g. Nepal Terai

Genus **Parresysia** Conrad, 1853

Key to the subgenera

- Shell thin, ventral margin almost straight, beak sculpture not strong, radiating or zig zag or divaricate *Radiatula* Simpson
- Shell thick, ventral margin convex swollen at centre, beak sculpture strong,
..... *Parresysia* Conrad

Subgenus **Parresysia** s. st.

19. Parresysia (Parresysia) favidens (Benson, 1862)

1862. *Unio favidens* Benson, Ann. Mag. Nat. Hist, **(3)**10 : 188, Type locality : Bhitoura on the Ganges between Cawnpore (Kanpur) and Allahabad.”
1969. *Parresysia favidens* : Subba Rao, Handbook of Freshwater Molluscs of India, p. 180, figs., 466, 467, 484, 485.
2007. *Parresysia (Parresysia) favidens* : Ramakrishna and Dey, Handbook on Indian Freshwater Molluscs, p. 299, figs. 220 A & B.

Material examined : India, North Bihar, 12 exs. 3.iv.2006, Hathiacle Chaur in Khagaria and 3 exs. 26-vi-2006, Baraila J heel in Vaishali District, coll. Gopal Sharma and party.

Measurements (in mm) :

Length	Width	Depth
25.67-21.28	17.94-14.27	7.33-5.96

Distribution : India : Andhra Pradesh, Assam, Bihar, J harkhand, Gujarat, Maharashtra, Meghalaya, Orissa, Tamil Nadu, Uttar Pradesh & West Bengal.

Elsewhere : Bangladesh, Pakistan.

Diagnostic character : Shell thick, heavy, inflated with strong zig-zig ribs on beak, inequilaterally and angulated both on anterior and posterior margins, cardinal teeth strong and broad.

Remarks : It is used as food in Bihar, J harkhand, Manipur, Mizoram, Orissa and West Bengal. It is also used in preparation of button in North Bihar industries in Muzaffarpur district. It prefers gravel, sand and mud substrate of lowland streams and small lowland rivers, also abundant in running waters under good ecological condition.

20. Parresysia (Radiatula) caerulea (Lea, 1831)

1831. *Unio caeruleus* Lea, Trans. Amer. Phil. Soc., **4** : 95, pl. 13, fig. 25. Type locality : “Hooghly River, 100 miles above Calcutta.”

1989. *Parreysia (Radiatula) caerulea* : Subba Rao, Handbook of Freshwater Molluscs of India. p. 188, figs. 516, 517.

2007. *Parreysia (Radiatula) caerulea* : Ramakrishna and Dey, Handbook on Indian Freshwater Molluscs, p. 316, figs. 237 A & B.

Material examined : India, North Bihar, 1 ex. 30-iv-2006; Hathiacle Chaur in Khagaria district, coll. Gopal Sharma and Party.

Measurements (in mm) :

Length	Width	Depth
35.67	23.43	8.93

Distribution : Andhra Pradesh, Assam, Bihar, Jharkhand, Meghalaya, Orissa, Punjab, Rajasthan, Uttar Pradesh and West Bengal.

Elsewhere : Bangladesh, Myanmar, Nepal and Pakistan.

Diagnostic character : Variable, in grown up valves sculpture restricted to umbonal region, in case of young the whole surface sculptured, posterior umbonal carina very distinct.

Remarks : It is used as food in Bihar, Jharkhand, Mizoram, Orissa and West Bengal. It is the less specialized and most widespread species. It colonizes gravel, sand and mud substrate of low land streams and lowland rivers, also abundant in running water. *Parreysia (Radiatula) caerulea* is common in large ponds with high nutrient and well-oxygenated water.

Superfamily CORBICULOIDEA

Family CORBICULIDAE

Genus **Corbicula** Megerle von Muehlfeld, 1811

Key to the species

- Shell with prominent concentric striae..... *C. striatella* Deshayes
- Shell with very fine concentric striae and microscopic *C. bensoni* Deshayes

21. **Corbicula bensoni** Deshayes, 1854

1854. *Corbicula bensoni* Deshayes, Proc. Zool. Soc. Lond., 1854 : 345, Type locality : Bengal.

1911. *Corbicula tribeniensis* Preston, Rec. Indian Mus., **6** : 40, fig. 3. Type locality : Tribeni near Calcutta.

1928. *Corbicula bensoni* : Prasad, Mem. Indian Mus., **9** : 23, pl. 4, figs. 1-4.

2007. *Corbicula bensoni* : Ramakrishna and Dey, Handbook on Indian Freshwater Molluscs, p. 339, Figs. 257 A & B.

Material examined : India, North Bihar, 1 ex. 26-vi-2006, Baraila Jheel in Vaishali District; coll. Gopal Sharma and Party.

Measurements (in mm) :

Length	Width	Depth
7.88	6.48	2.33

Distribution : India : Bihar, West Bengal.

Elsewhere : Bangladesh.

Diagnostic character : Shell sub-trigonal, transversely ovate, thin, striae fine and microscopic.

Remarks : It is the pollution-sensitive species. Prefers always-lotic sand substrate in the north Bihar Chours.

22. *Corbicula striatella* Deshayes 1854

1854. *Corbicula striatella* Deshayes, Proc. Zool. Soc. Lond. **22** : 344. Type locality : Pondicherry.

1928. *Corbicula striatella* Prashad, Mem. Indian Mus., **9** : 18, pl.3, figs. 9-11

1989. *Corbicula striatella* Subba Rao, Handbook of Freshwater Molluscs of India, p. 204, figs. 575, 576.

2007. *Corbicula striatella* Ramakrishna and Dey, Handbook on Indian Freshwater Molluscs, p. 343, Figs. 261 A & B.

Material examined : India, North Bihar, 2 exs. 26-vi-2006; Baraila Jheel in Vaishali District; coll. Gopal Sharma and party.

Measurements (in mm) :

Length	Width	Depth
22.43- 19.45	18.65- 12.56	6.50- 5.55

Distribution : Throughout India.

Elsewhere : Afghanistan, Bangladesh, Myanmar and Pakistan.

Diagnostic character : Shell thick, tumid, triangular to ovate, dorsal margin arched, more on anterior side, umbones prominent, periostracum shining lemon yellow in juvenile, darker and often brownish in adult, striae regular, concentric and raised into ridges, pallial line with a trace of sinus, muscle scars fairly deeply developed.

Remarks : It occurs in various types of Rivers, stream and Lakes. Animal prefers fine gravel, sand or mud substrate. They are mostly confined to lowland and a few adjacent inner Himalayan valley.

Table 1. Contd.

Sl. No.	Family / Scientific Name	Sampling Sites																		
		Kawar Lake, Begusarai	Ghopa Chaur, Madhepura	Jeevach Dhar, Darbhanga	Manikamann Chaur, Muzaffarpur	Bhoga Chaur, Madhubani	Baraila J heel, Vaishali	Hathiacole Chaur, Khagaria	Samsolia Chaur, Madhepura	Matsaganda Chaur, Saharsa	Chatar Chaur, Araria	Daruabari Chaur, Valminki Nagar	Motipur Chaur, Muzaffarpur	Turkey Chaur, Muzaffarpur	Kumbhi Chaur, BeguSaarai	Amawa Chaur, Betiah	Dandari Chaur, Begu Sarai	Kausar Chaur, Darbhanga	Majilsa Pokhar, Darbhanga	Hardia chatti Chaur, Valmiki Nagar
	Family LYMNAEIDAE																			
8.	<i>Lymnaea accuminata</i> f. <i>typica</i> Lamarck, 1822	+++	-	+	+++	-	+	-	+	-	-	+	-	-	-	+	-	-	-	-
9.	<i>Lymnaea luteola</i> f. <i>Typica</i> Lamarck, 1822	-	++	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
10.	<i>Lymnaea luteola</i> f. <i>ovalis</i> Gray, 1822	+	-	-	-	-	+	+	-	-	+	+	-	-	-	-	-	-	-	-
	Family PLANORBIDAE																			
11.	<i>Gyraulus convexiusculus</i> (Hutton, 1849)	+++	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
12.	<i>Gyraulus euphraticus</i> (Mousson, 1874)	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13.	<i>Segmentina</i> (<i>Polypylis</i>) <i>calatha</i> (Benson, 1850)	-	-	-	-	-	-	-	-	-	+	+++	-	-	-	-	-	-	-	-
14.	<i>Hippeutis</i> (<i>Helicorbis</i>) <i>umbilicalis</i> (Benson, 1836)	-	-	-	-	-	-	-	-	-	+++	-	-	-	-	-	-	-	-	-

Table 1. Contd.

Sl. No.	Family / Scientific Name	Sampling Sites																		
		Kawar Lake, Begusarai	Ghopa Chaur, Madhepura	Jeevach Dhar, Darbhanga	Manikamann Chaur, Muzaffarpur	Bhoga Chaur, Madhubani	Baraila Jheel, Vaishali	Hathiacole Chaur, Khagaria	Samsolia Chaur, Madhepura	Matsaganda Chaur, Saharsa	Chatar Chaur, Araria	Daruabari Chaur, Valminki Nagar	Motipur Chaur, Muzaffarpur	Turkey Chaur, Muzaffarpur	Kumbhi Chaur, Begusarai	Amawa Chaur, Betah	Dandari Chaur, Begu Sarai	Kausar Chaur, Darbhanga	Majisa Pokhar, Darbhanga	Hardia chati Chaur, Valmiki Nagar
	Family BULLINIDAE																			
15.	<i>Indoplanorbis exustus</i> (Deshayes, 1834)	+	-	+	+	-	-	+	-	-	-	++	-	-	-	+	-	-	-	-
	Family UNIONIDAE																			
16.	<i>Lamellidens corrianus</i> (Lea, 1834)	+	-	-	-	-	++	-	-	-	-	-	+	-	-	-	-	-	-	-
17.	<i>Lamellidens marginalis</i> (Lamarck, 1819)	+	-	-	+	-	+	-	-	-	-	-	-	-	-	-	++	-	-	-
18.	<i>Lamellidens jenkinsianus</i> (Benson, 1862)	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19.	<i>Parresysia (Parresysia) favidens</i> (Benson, 1862)	-	-	-	-	-	++	-	-	-	-	-	-	-	-	-	-	-	-	-
20.	<i>Parresysia (Radiatula) caerulea</i> (Lea, 1831)	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
	Family CORBICULIDAE																			
21.	<i>Corbicula bensoni</i> Deshayes, 1854	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
22.	<i>Corbicula striatella</i> Deshayes 1854	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total No. of Taxa	12	2	7	10	3	9	6	5	3	8	6	4	1	3	1	2	2	1	1

+ = Rare (1-5 Individuals), ++ = Common (6-20 Individuals), +++ = Abundant (>20 Individuals)

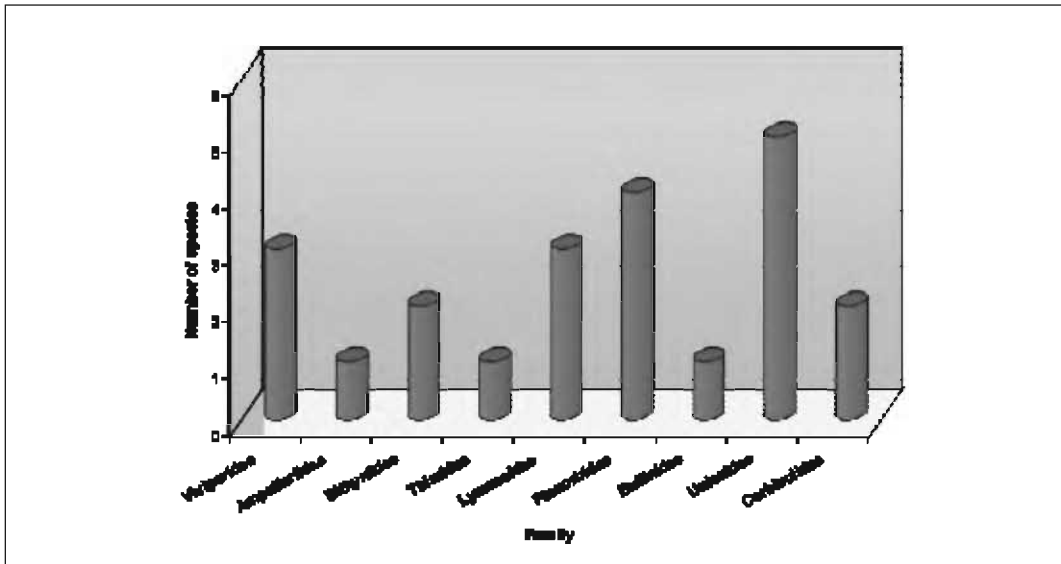


Fig. 1. Family wise number of species of Mollusca in different sites of Chauras of North Bihar

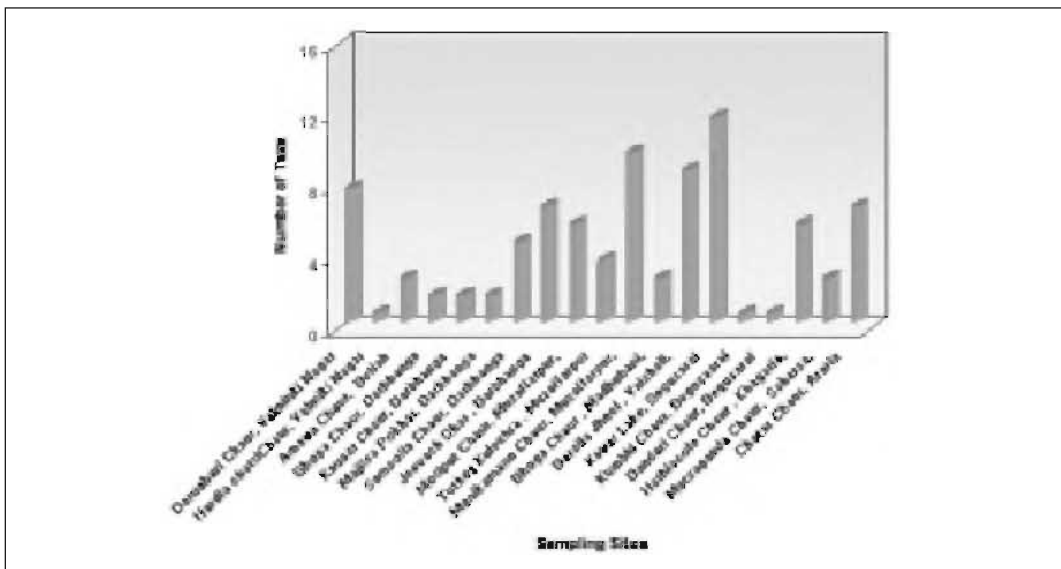


Fig. 2. Abundance of Molluscan fauna on different sites in the Chauras of North Bihar

RESULTS AND DISCUSSION

During the survey 15 species of Gastropods under 02 orders and 6 families and 07 species of Pelecypoda under 02 orders and 02 families were collected from the different districts of North Bihar Chauras and identified with the help of available literatures and by comparison with the identified collections housed in the museum of the GPRC, ZSI, Patna.

Freshwater molluscs, especially gastropods are important from the medical and veterinary public health point of view. About 100 species of freshwater gastropods are reported to act as intermediate hosts for the diagnostic trematode parasites and among Prosobranchs, members of the family Piliidae and Thiaridae were recorded to harbor larval trematodes (Subba Rao 1993). *Melanoides tuberculata* and *Melanoides granifera* are medically important because they can serve as first intermediate host for the human lung fluke *Gastropoda*, *Paragonimus westermani* (Thompson 1984, Harasewych 1998, Dundee and Paine 1999).

There is no any special significance in the occurrence of these molluscs in the Chauras of North Bihar because these Chauras are the oxbow lakes of the different rivers those who are coming from Nepal. All the collected species are among the common freshwater molluscs of India having wide range of distribution across the country.

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FISH DIVERSITY

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INTRODUCTION

Under the Annual plan of research of Gangetic Plains Region Centre of Zoological Survey of India, Patna during 2005-2007, the total no. of 1367 specimens of fishes were collected from the different Chours of North Bihar and identified as belonging to 48 species under 13 families, 9 Orders and 31 genera.

The review of the literatures revealed that there were no much-published work on the Fish fauna of Chours of north Bihar fishes except fish fauna of Kawar lake wetland and work of Srivastava (1980) on the Fishes of Uttar Pradesh and Bihar, Shaw and Shebbeare (1937) on the fishes of Northern Bengal. In addition to this, the general nature and distribution of Fishes in Peninsular region in India are given by Dey (1889), J ayaram (1981, 1999), J erdon (1849), Menon (1999) Misra (1959, 1969, 1976) and Talwar & J hingran (1991)

The present data includes diagnostic characters and geographical distribution. The classification adopted in this paper is that of J ayaram (1981), Talwar and J hingran (1991), Menon (1987) and Srivastava (1980).

These fishes were collected directly from the Chours (small wetland) from North Bihar by random sampling (Table 1). Some times special boatmen were used for fishing in the Chours.

The classification in communication is up-to the species level. The genera under their respective families and subfamilies and the species and sub species under their respective genera are arranged in alphabetical order.

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SYSTEMATICS

Phylum VERTEBRATA

Subphylum CRANIATA

Superclass GNATHOSTOMATA

Series PISCES

Order CYPRINIFORMES

Division CYPRINI

Suborder CYPRINOIDEI

Family CYPRINIDAE

Subfamily CYPRININI

Genus **Amblypharyngodon** Bleeker**1. Amblypharyngodon microlepis** (Bleeker 1853)1853. *Leuciscus microlepis* Bleeker, Bengal. En Hind. p. 1411878. *Amblypharyngodon microlepis* Day, Fish India, P. 555, pl. cxxxv. fig. 5.1889. *Amblypharyngodon microlepis* Day, Fauna of Brit. India Fish., I, p. 2911968. *Amblypharyngodon microlepis* Srivastava, Fishes of Eastern Uttar Pradesh p. 22.

Material examined : India, North Bihar, 1 ex. from Kajradhar Chaur in Araria, Bihar in the month of June 2006, (Reg. No. V. 3196), coll. Gopal Sharma & party.

Diagnostic characters : Dii 7; Aii 5; P I 13; V I 8. Body elongated, its depth 4-4.4 times in standard length.

Eyes large, its depth 3.6 to 4 times in head length, Scales very small; lateral line incomplete, ceases after a few scales; 55 to 60 scales in lateral series; 5 rows of scales between lateral line and pelvic fin base. Colour : in life, bronze on upper side, flanks brassy to golden with a broad dull greenish-silver longitudinal band from operculum to base of caudal fin; belly whitish. Fin hyaline to yellowish.

Distribution : Gorakhpur, Gorra Nala, U.P., Hooghly through Orissa, Coromondal coast of Madras, During present survey it was collected from Saharsa Chaur at Saharsa.

Local name : Dhawai

Genus **Catla** Cuv. & Val.**2. Catla catla** (Ham.) 18221822. *Cyprinus catla* Ham. Fish. Ganges, pp. 287, 318, 387.1878. *Catla buchanani* Day, Fish. India, p. 553.1889. *Catla buchanani* Day, Fauna Brit. India, Fish., I, p. 287.

1968. *Catla catla* Srivastava, *Fishes of Eastern Uttar Pradesh*, p. 2

Material examined : India, North Bihar, and 1 ex. from Chatar Chaur in Araria in the month of June 2006, (Reg. No. V. 3197); coll. Gopal Sharma and party.

Diagnostic characters : D. 18-19 (3/15-16); P. 19; V.9; A. 8 (3/5) C. 19; L.1 43.

Eyes-situated in the anterior half of the length of head; diameter 6.5 (7 to 7) in the length of head; 2.5 from the end of snout and 3.65 (3.3 to 4) in the interorbital width. Dorsal profile is more convex than that of abdomen. Mouth is wide and the lower jaw is prominent. Pores on the snout are present. Greatest width of head equals its length behind the middle of the eye. Barbells-absent. Fins-dorsal fin commences slightly in advance of the ventral fin, rather just opposite to it and has convex upper edge. Pectoral fin is located slightly behind the ventral fin, and the latter, not extending to the anal fin. Anal fin extends to the base of the caudal fin which is forked. Scales-are moderate in size, with 6½ rows between lateral line and the base of the ventral fin. Lateral line-complete and commences from the upper margin of the gill cover. Colour-grayish above, becoming silvery along the side and beneath. Fins are dark black.

Distribution : Throughout Northern India.

Elsewhere : Pakistan, Burma and up-to Siam.

Local name : Catla

Genus **Chela** Hamilton

3. **Chela laubuca** (Ham.) 1822

1822. *Cyprinus* (*Chela*) *laubuca* Hamilton – Buchanan, *Fishes of Ganges* : 260, 384. (Type-locality : ponds in northern parts of Bengal).

1878. *Perilampus laubuca* Day, *Fish. India*, p. 598, pl. Cli, 1889, *Fauna Brit. India, Fishes*, **1** : 360, fig. 112.

1895. *Danio* (*Danio*) *menoni* Barman, *J. Bombay nat. Hist. Soc.* **82** (3) : fig. 602 (Type locality : Mosampat, Abndhra Pradesh); Tilak and Jain, 1987, *J. Bombay nat. Hist. Soc.*, **84**(3) : 693.

1968. *Chela laubuca* Srivastava, *Fishes of Eastern Uttar Pradesh*.

Material examined : India, North Bihar, 10exs. Kawar Lake in Begusarai and 11 exs. Muriakatwa Chaur in Darbhanga, (Reg. No. V. 3198); coll. Gopal Sharma and party.

Diagnostic characters : D. 10/ 11' V.5' A. 23; C. 19; L.1 34; L.tr. 6/5.

Eyes-diameter 3 in the length of head; 0.75 from the end of snout and 1.25 in the interorbital width. Fins-dorsal commences distinctly behind the origin of anal, pectoral fins not reaching the anal, caudal forked. Lateral line-strongly curved downwards 3½ rows of scales between the lateral line and base of ventral fin. Barbells-absent. Colour-silvery, with fine black dots over the body.

Distribution : Uttar Pradesh, Bihar, Orissa and Bengal,

Elsewhere : East Pakistan, Assam, Bangladesh, Sri Lanka, Malay Peninsula, Sumatra and Myanmar.

Local name : Dandua.

Genus **Esomus** Swainson

4. **Esomus danricus** (Ham.) 1822

1822. *Cyprinus danrica* Ham, Fish. Ganges, Pp. 325-327, pl.xvi.

1878. *Nuria danrica* (in part) Day, Fish. India, p. 583. pl.cxliv.

1889. *Nuria danrica* (in part) Day, Fauna Brit. India, Fish, I, p. 334.

1968. *Esomus danricus* Srivastava, Fishes of Eastern Uttar Pradesh, p, 38.

Material examined : India, North Bihar, 5 exs. from Chatar Chaur Araria, 6 exs. from Saharsa Chaur Saharsa, 2 exs. from Tin Dobha Chaur in Khagaria, 23 exs. from Kawar Lake in Begusarai, 4 exs. from Muriakatwa Chaur in Darbhanga and 12 exs. from Maran Chaur in Darbhanga, and 8 exs. from Isharain Chaur in Madhubani Districts, (Reg. No. V. 3199), coll. Gopal Sharma and party.

Diagnostic characters : D.8-9 (2/6-7); P.11-12; V. 8; A. 9. (3/6); L.1 27 to 30, L.tr. 8.

Eyes-diameter 4 in the length of head, 0.9 from the end of snout and is 1.3 in the interorbital width. Barbells -rostral reaches nearly the posterior part of the orbit, while the maxillaries extend to the middle of the pectoral fin. Fins-dorsal originating a little anterior to the anal fin and continues over its anterior half. Pectoral fin extends slightly beyond the base of the ventral fin and the ventral extends nearly to the base of the anal. The outer rays of the paired fins usually extend for a considerable distance beyond the fin membrane. Caudal fin forked. Scales-large; pre-dorsal scales are 16 to 17; 14 scales present around the caudal peduncle. Lateral line-absent. Colour-there is a broad black lateral band extending from the posterior end of the eye to the base of the caudal fin. The body is silvery in fresh condition, upper half being slightly dark.

Distribution : Ponds and ditches of India

Elsewhere : Pakistan.

Local name : Dendua

5. **Labeo gonius** (Ham.) 1822

1822. *Cyprinus gonius* Ham., Fish. Ganges, p. 38.

1878. *Labeo gonius* Day, Fish. India, p. 537, pl. cxxvii.

1889. *Labeo gonius* Day, Fauna Brit. India Fish., I, pp. 261, 262.

1968. *Labeo gonius* Srivastava, Fishes of Eastern Uttar Pradesh.

Material examined : India, North Bihar, 3 exs. from Muriakatwa Chaur in Darbhanga, (Reg. No. V-3200), coll. Gopal Sharma & party.

Diagnostic characters : D. 16 (3/13); P. 17; V. 9; A. 7 (2/5); C. 19; L.1 74; L.tr. 16/17.

Eyes-diameter 4.8 (4.5 to 5) in the length of head, 16 from the end of snout and 2.5 in the inter-orbital width. Dorsal profile more convex than that of abdomen. The greatest width of head is shorter than the head excluding the snout. Mouth is narrow, its gape equaling 3.5 in the length of head. Lateral lobe is absent. There are numerous pores on the snout in addition to a few on the head. Lips thick and fringed with a disinter inner fold along the entire circumference. Both the jaws are provided with a horny covering on the inner side. Barbells-are very minute, two pairs of rostral and maxillary. Fins-dorsal fin commences nearer to the snout than to the base of the caudal fin. Pectoral fin is sub equal to the head excluding the snout. Ventral fin commences below the middle of the dorsal fin. Caudal fin is deeply forked. Scales-small, with 12-13 rows between the lateral line and the base of the ventral fin. Colour-greenish black on the dorsal side, gradually getting fainter laterally up to the lateral line; rest of the body is silvery white. Black longitudinal bands extend from the anterior to the posterior end.

Distribution : Northern part of India

Elsewhere : Pakistan and Burma.

Local name : Church

6. *Labeo pangusia* (Ham.) 1822

1822. *Cyprinus pangusia* Hamilton, Fish Ganges, Pp. 285-386.

1878. *Labeo pangusia* Day, Fish India, p. 541, pl. cxxxi, fig. 1

1962. *Labeo pangusia* C.S.I.R., Wealth India, Raw Mat. Fish and Fisher., **IV**, p. 16.

Material examined : India, North Bihar, 2exs. from Saharsa Chaur Saharsa and 3exs. from Muriakatwa Chaur in Darbhanga District (Reg. No. V-3201); coll. Gopal Sharma and party.

Diagnostic characters : D. 2/ 10-11; P. 14-16; V. 9; A.2/ 5; C. 19; L.1 40-42; L.tr. 15-16; Barbels 1 pair.

Height of the dorsal fin is 11 (11 to 12) in the height of the body. Length of pectoral fin is 0.9 in the length of the ventral fin. Shape of body-elongated with rounded abdomen. Mouth is inferior with a thin fold of lips, which are continuous in both the jaws. Dorsal profile is more convex than the abdominal. Snout-projects beyond the mouth with a lateral prolongation. Fins-dorsal fin originates a little anterior to the ventral fin. Neither the pectoral fins reaches the ventral nor the latter does the anal fin. Caudal fin is deeply forked. Barbells-only the Maxillary pair of barbells is present. They are very minute and concealed within the folds of the upper lips. Scales-Moderate in size, wedge shaped and thin. There are 5 rows of scales between the lateral line and the base of the ventral fin. Lateral line-complete and starts from the upper part of the posterior margin of the opercula,

descending gently up to the posterior end of the base of dorsal fin and then running straight to the middle of the base of the caudal fin. Colour-dark gray dorsally; about one fourth of the height of the body from ventral side becomes silvery. The cheeks below the eyes are also silvery. Dorsal and caudal fins are gray, whereas ventral and anal fins are pale white.

Distribution : Bihar, West Bengal and Assam in India

Elsewhere : Burma, Pakistan and Bangladesh.

Local name : Bolla Rewa,

7. **Labeo dero** (Ham.) 1822

1822. *Cyprinus dero* Ham. Fish Ganges, pp. 277, 331, 385, pl. xxii.

1878. *Labeo diplostomus* (in part) Day, Fish. India, p. 540, pl. cxxix.

1889. *Labeo diplostomus* (in part) Day, Fauna Brit. India, Fish. I, Pp. 265-266.

1968. *Labeo dero* Srivastava, Fishes of Eastern Uttar Pradesh, p. 41

Material examined : India, North Bihar, 4 exs. Matsagandha Chaur in Saharsa District, (Reg. No. V-3202); coll. Gopal Sharma and party.

Diagnostic characters : D. 12-13 (3/9-10); P. 16-17; V.9; A. 8 (3/5); C.19; L.1. 38-43; L.tr. 8/6-7; Barbels 1 pair (maxillary).

The dorsal surface of the lower lip provided with tubercles. Both the lips are continuous at the angle. Barbells-only one, very short maxillary pair; no rostral pair, Fins-dorsal fin is nearly as high as the head and commences nearer to the snout than to the base of the caudal fin. Pectoral fin as long as the head but does not reach the ventral fin nor the latter reaches the anal fin. Caudal fin long and is deeply forked. Scales-large, 4 to 4 ½ rows of scales between the lateral line and the base of the ventral fin. The base of the anal fin is covered over with tile-like scales. Colour-dorsal brownish getting silvery along the side and the belly.

Distribution : Along the Himalayas in India

Elsewhere : Pakistan and Burma.

8. **Labeo rohita** (Ham.) 1822

1822. *Cyprinus rohita* Ham. Fish. Ganges. pp. 301, 388, pl. xxxvi,

1878. *Labeo rohita* Day, Fish India, p. 538, pl. cxx vii,

1879. *Labeo rohita* Day, Fauna Brit. India Fish. I, Pp. 262-263.

1968. *Labeo rohita* Srivastava, Fishes of Eastern Uttar Pradesh, p. 44.

Material examined : India, North Bihar, 2 exs. from Tindobbha Chaur in Khagaria District. (Reg. No. V-3203); coll. Gopal Sharma & party.

Diagnostic characters : D. 16 (3/13); P. 17; V. 9; A. 7 (2/5); C. 19; L.1 40-41; L.tr. 6½-7½; Barbells 1 pair.

Eyes-diameter 6 in the length of head; 2 (1.5 to 2.5) from the profile more convex than that of the abdomen. Snout obtuse and projects beyond the jaws. The latter being devoid of lateral lobes. Lips very thick and fringed, with a distinct inner fold. Barbells-a short thin maxillary pair. Fins-the dorsal fin with its upper edge moderately concave, it is not as high as the body and arises about mid way between the snout and the base of the caudal fin. Ventral fin is inserted below the third or fourth dorsal ray. Caudal fin is deeply forked. Scales-large, 6½ rows between lateral line and the base of the ventral fin. Colour-bluish black along the back, becoming reddish black along the sides and silvery beneath. There is a red mark on each scale surrounded by dark margin. Fins are black.

Distribution : Fresh waters of Northern India

Elsewhere : Pakistan and Burma

Local name : Rohu

Genus **Osteobrama** Heckel

9. **Osteobrama cotio** (Ham.) 1822

1822. *Cyprinus cotio* Ham. Fish. Ganges, pp. 339, 393, pl. xxxix.

1878. *Rohtee cotio* Day, Fish. India, p. 587, pl. cli, fig. 1; pl. cxlvii.

1889. *Rohtee cotio* Fauna Brit. India Fish. I, Pp. 340-341.

1968. *Osteobrama cotio* Srivastva, Fishes of Eastern Uttar Pradesh, p. 45,

Material examined : India, North Bihar, 5sex. from Dandari Chaur in Begusarai District, (Reg. No. V-3204); coll. Gopal Sharma and party.

Diagnostic characters : D. 11 (2/9); P. 14-15; V. 10; C. 19; L.I. 66; L.tr. 13/16.

Eyes-diameter 2.75 (2.5 to 3) in the length of head; 0.7 from the end of snout and 1.17 (1.0 to 1.25) in the inter-orbital width. Profile over nape or occipitals concave, from there it rises abruptly up-to the base of the dorsal fin. Upper jaw is slightly longer. Barbells-absent. Fins-second osseous ray of dorsal fin is weak and is serrated internally. Pectoral fin over reaches the origin of ventral fin and the latter over reaches the origin of the anal fin. Caudal fin forked. Scales-small, 24 pre-dorsal rows of scales. Colour-silvery, the back being colored yellowish green with dull black dots. A faint longitudinal broad silvery lateral band runs along its entire length. A black blotch at the nape (occipital) and similar black blotch at the base of the dorsal fin.

Distribution : Fresh and brackish waters of India (except South of River Krishna and Malabar Coast),

Elsewhere : Pakistan and Burma.

Local name : Gurda

Genus **Puntius** Hamilton10. **Puntius conchoni** (Ham.) 1822

1822. *Cyprinus conchoni* Ham. Fish, Ganges, pp. 317,389.

1878. *Barbus conchoni* Day, Fish. India, p. 576, pl. CXLII,

1889. *Barbus conchoni* Day, Fauna Brit. India Fish. I, pp. 325.

1968. *Puntius conchoni* Srivastva, Fishes of Eastern Uttar Pradesh, p. 50.

Material examined : India, North Bihar, 3 exs. from Samsolia Chaur & 5 exs. from Saharsa Chaur in Saharsa District, 3 exs. from Tin Dobha Chaur in Khagaria District, 4 exs. from Kawar Lake in Begusarai and 1ex. Muriakatwa Chaur in Darbhanga District, coll. Gopal Sharma and party. (Reg. No. V-3206).

Diagnostic characters : D. 11 (3/8); P. 13-15; V. 9; A. 8 (3/5); C. 19; L.1 26-27; L.tr. 5½-6½.

Eyes-diameter 3.2 (3.1 to 3.4) in the length of head; 1 from the end of snout and 1.3 (1.2 to 1.4) in the inter-orbital width. Barbells-absent Fins-Dorsal commences before the insertion of the ventral fin, its last undivided ray osseous, spinous and serrated, it is about as long as the head without the snout. Caudal forked. Lateral line-incomplete, ceasing after 10 to 12 scales from its commencement; with 4½ to 5 scales between it and the base of the ventral fin. A row of 10 to 11 pre-dorsal scales. Colour-silvery, dark along the back. All the scales with black bases. A black blotch is located from 18th to 20th scale on the lateral line. Fins transparent. In one of the specimens in my collection upper half of the dorsal fin, ventral fin and anal fin are tinged black.

Distribution : Freshwaters of India

Elsewhere : Pakistan.

Local name : Pothi

11. **Puntius sophore** (Ham.) 1822

1822. *Cyprinus sophore* Ham. Fish, Ganges, pp. 310, 389, pl. xix, f

1878. *Barbus stigma*, Day, Fish. India, p. 579, pl. cxli,

1889. *Barbus stigma*, Day, Fauna. Brit. India, Fish. I, p. 329.

1968. *Puntius sophore* Srivastava, Fishes of Eastern Uttar Pradesh, p. 52.

Material examined : India, North Bihar, 3exs. from Kajradhar in Araria, 12 exs. from Samsolia Chaur in Madhepura, 17 exs. from Matsagandha Chaur in Saharsa, 14 exs. from Tindobha Chaur in Khagaria, 15 exs. from Dandari Chaur in Begusarai, 10exs. from Kawar Lake in Begusarai, 5 exs. from Muriakatwa Chaur in Darbhanga 16 exs. from Kausar Chaur in Darbhanga, 10 exs. from Ishrain Chaur in Madhubani, 16 exs. from Turkey

Chaur in Muzaffarpur, 2exs. from Baraila Chaur in Vaishali and 13 exs. Daruabari Chaur at Valmiki Nagar in West Champaran District, coll. Gopal Sharma and party, (Reg. No. V-3207).

Diagnostic characters : D. 11 (3/8); P. 15-16; V. 9; A. 8 (3/5); C. 19; L.1 25-26; L.tr. 5-5½ / 5-5½.

Eyes—diameter 3.7 (3.5 to 4) in the length of head; 1 from the end of snout and 1.25 (1.3 to 1.4) in the inter-orbital width. Barbells-absent. Fins—dorsal is inserted opposite the insertion of ventral; midway between the end of snout and the base of the caudal fin and is ½ to 2/3 as high as the body. Its last undivided ray is of moderate strength, osseous entire and as long as head (without the snout) or even less. Caudal fin forked. Lateral line—complete 3½ rows of scales between it and the base of the ventral fin. A row of 9 pre-dorsal scales. Colour—silvery with the dorsum darker. Only in the breeding season appears a scarlet red lateral band extending from the base of the gill to the base of the caudal fin, otherwise there is a faint black band placed along the lateral line. When preserved in formaline the scarlet red band gradually fades and finally disappears after about a fortnight. Opercles shot with gold and red patches. There are two black blotches one at the base of the 3rd to 5th branched dorsal rays, and the other at the base of the caudal fin over 22nd and 23rd scales 23rd and 24th scales along the lateral line. In all the forty juveniles (measuring 3 to 3.5 cm.) examined, the caudal blotch is absent.

Distribution : Fresh and brackish waters of India

Elsewhere : Pakistan and Burma.

Local name : Pothi

12. *Puntius phutunio* (Ham. 1822)

1822. *Cyprinus phutunio* Hamilton, Fish, Ganges, pp. 316 and 390.

1869. *Barbus phutunio* Day, Proc. Zool. Soc., London, p. 375.

1878. *Barbus phutunio* Day, Fish India., p. 578, pl. CXLV, fig. 4.

1889. *Barbus phuntunio* Day, Fauna. Brit. India, Fish. I, P. 327

1937. *Barbus phuntunio* Shaw and Shebbeare, Tourn. Roy. Asiat. Soc. Bengal Sc., III, p. 39,

Material examined : India, North Bihar, 1ex. from Tindobha Chaur in Khagaria, 3exs. Kawar Lake in Begusarai and 1ex. from Maran Chaur in Darbhanga District, coll. Gopal Sharma and party. (Reg. No. V-3208).

Diagnostic characters : D. 2/8-9; P. 9-10; V. 9; A. 2-3/5; C. 19; L. 1, 20-23; L. tr. 3/4; Barbells absent.

Eyes—diameter of the eye in the length of head is 3.1 (3.0 to 3.3), snout and inter-orbital are 1.0. Height of the head is 1.1 (1.0 to 1.2) and its width is 1.4 (1.3 to 1.5) in its own length. Height of the dorsal fin is 3.1 (2.7 to 3.5) in the height of the body. Length

of the pectoral fin is 0.9 in the length of the ventral fin. Shape of body-It is laterally compressed with dorsal profile more elevated than the abdominal. Mouth is small. Barbells-absent Fins- The dorsal osseous ray is serrated, and the dorsal fin commences opposite to the ventral fin. Pectoral fin does not reach the ventral and the latter also does not touch the anal fin. Caudal fin is forked. Barbells-absent Scales-small, circular, thin, transparent and cycloid. There are three rows of scales between the lateral line and the base of the ventral fin. Lateral line-complete and visible only unto 3 scales from the opercle. These scales extend almost in a straight line Colour-Body is reddish brown with black dots in fresh condition. Abdomen is pale whitish in preserved specimen. A dark triangular spot with apex towards caudal end extends from the dorsal side to the middle region of the pectoral fin. Another black round spot situated at the caudal end just before the posterior mark in the base of the anal fin.

Distribution : Assam, Bihar, Goa, Orissa, Tripura, West Bengal and Punjab.

Elsewhere : Bangladesh, Myanmar and Pakistan

Local name : Pothia

13. **Puntius sarana** (Ham.) 1822

1822. *Cyprinus sarana*, Ham. Fish, Ganges, pp. 307, 388.

1878. *Barbus sarana*, Day, Fish. India, pp. 560, 561, pl. cxxxvi.

1889. *Barbus sarana*, Day, Fauna Brit. India, Fish., I, pp. 300, 301

1968. *Puntius sarana* Srivastava, Fishes of Eastern Uttar Pradesh, p. 51,

Material examined : India, North Bihar, 11 exs. from Kajradhar Chaur, 5 exs. from Chatar Chaur in Araria, 3 exs. from Ghopa Chaur, Madhepura, 2 exs. from Samsolia Chaur in Madhepura, 2 exs. Kawar Lake in Begusarai and 2exs. from Ishrain Chaur in Madhubani District, coll. Gopal Sharma and party. (Reg. No. V-3209).

Diagnostic characters : D. 11-12 (3/8-9); P. 15-16; V. 8-9; A. 8-(3/5); C. 19; L.1 33-34; L. tr. 6½ /6; Barbells 2 pairs.

Eyes- diameter 4.8 (4.75 to 4.9) in the length of head; 1.3 (1.3 to 1.4) from the end of snout and 2 in the inter-orbital width. Pores on the snout absent. Barbells-2 pairs rostra about as long as the orbit while the maxillary pair is slightly longer. Fins- dorsal commences slightly near the snout than the base of the caudal fin (young forms), but in the more mature forms it is approximately midway and situated opposite the insertion of ventral fin. Its last undivided ray is osseous, strong, and finely serrated posteriorly. The serrations are in two rows with a groove in-between.

Distribution : Freshwaters of India

Elsewhere : Pakistan and Burma.

Local name : Potah

14. **Puntius ticto** (Hamilton-Buchanan)

1822. *Cyprinus ticto*, Hamilton-Buchanan, Fishes of Ganges : 314, 398, pl. 8, fig. 87, Murthy, 1977, Proc. Indian Acad. Sci., **85B**(3) : 130
1865. *Puntius punctatus* Day, Proc. zool. Soc. Lond. : 302 (type-locality : Cochin); Hora, Misra and Malik, 1939, Rec. Indian Mus., **41**(3) : 263
1871. *Barbus (Puntius) stoliczkanus* Day, J. Asiat. Soc. Beng. **40**(2) : 328, Hora, Misra and Malik, 1939, Rec. Indian Mus., **41**(3) : 263 .
1878. *Barbus ticto* : Day, Fishes of India : 576 pl. 144, fig.7; Day, 1889, Fauna Br. India, Fishes, 1 : 325; Hora, and Misra, 1938, J. Bomb. nat. Hist. Soc., **40**(1) : 28, fig.3.
1878. *Barbus punctatus* : Day, Fishes of India, 577, pl. 144, fig. 5; Day, 1889, Fauna Br. India, Fishes, **1** : 326.
1878. *Barbus stoliczkanus* : Day, Fishes of India, 577, pl.144, fig. 5; Day, 1889, Fauna Br. India, Fishes, **1** : 326; Silas, 1952, Proc. nat. Inst. Sci. India, **18**(5) : 431

Material examined : India, North Bihar, 2exs. from Daruabari Chaur at Valmikinagar in West Champaran District and 4exs. from Motipur Chaur in Muzaffarpur District coll. Gopal Sharma and party, (Reg. No. V-3210).

Diagnostic characters : Diii-iv 8; an ii-iii 5; P I 12-14; V i8.

Body elongated but older fishes are often high-backed. Its depth 2.4 to 2.9 times in standard length. Head length 3.5 to 4 times in standard length. Mouth terminal and small; no barbells. Dorsal fin inserted slightly posterior to pelvic fin origin; its last unbranched ray osseous, fairly strong and serrated at its posterior edge. Scales medium; lateral line usually complete, often ceases after six to eight scales; 23 to 25 scales in longitudinal series; lateral transverse scale-rows 4-5/4; pre-dorsal scales 9 to 11. Colour; in life, back grey to grassy-green; flanks brilliant shining silver, belly whitish; a long, transverse black blotch above the pectoral fin and another similar but golden-edged, on caudal peduncle over the end of anal fin. Fins delicate, greenish outside the breeding season; dorsal fin in male with a thick red border.

The arching reddish area in the dorsal fin of the male easily distinguishes the species; the dorsal fin of the female is pale, except for a faint rose at breeding time.

Distribution : Bihar/Jharkhand

Elsewhere : Pakistan : lower Swat river drainage; India; Nepal; Sri Lanka; Bangladesh; Burma; and Thailand.

Local name : Kaoli, Pothee.

Genus **Rasbora** Bleeker

15. **Rasbora daniconius** (Ham.) 1822

1822. *Cyprinus daniconius* Ham. Fish, Ganges, pp. 327, 391, pl. xv,

1878. *Rasbora daniconius* Day, Fish. India, p. 584, pl. cxlvi, (var. *R. Neilgherriensis*).

1889. *Rasbora daniconius* Day, Fauna Brit. India, Fish. I, Pp. 336-337

1968. *Rasbora daniconius* Srivastava, Fishes of Eastern Uttar Pradesh, p. 55,

Material examined : India, North Bihar, 4 exs. from Saharsa Chaur in Saharsa, 4 exs. Kawar Lake in Begusarai District and 1 ex. from Isharain Chaur in Madhubani District, coll. Gopal Sharma and party, (Reg. No. V-3211).

Diagnostic characters : D. 9 (2/7); P. 15; V. 9; A. 7 (2/5); C. 19; L.1, 31; L.tr. 5½ / 4½.

Eyes- diameter 3.8 (3.6 to 4) in the length of head; 1 from the end of snout and 1.5 apart. Cleft of mouth oblique and its opening is wavy. Lower jaw is provided with a central and two lateral prominences, one on either side of the central one, which fit into the corresponding imaginations of the upper jaw. Barbells-absent. Fins- dorsal fin commences rather nearer the origin of the ventral fin than that of the anal fin. Last three rays of the pectoral fin are very weak and poorly developed gradually with 2½ rows of scales between the lateral line and the base of the ventral fin. A row of 14 pre-dorsal scales. Colour-upper half is greenish yellow and is shot with black dots. A clear prominent blue-black band extends across the mid-lateral line right from the posterior end of the orbit and runs up to the tip of the tail or even continues up to the bifurcation of the caudal fin. Lower half of the body is silvery white. The fins with their tips brownish black or deep yellow.

Distribution : Throughout India

Elsewhere : Pakistan Ceylon, Burma and Malaya Archipelago.

Local name : Dendua,

Family COBITIDAE

Subfamily BOTIINI

Genus **Botia** Gary

16. **Botia lohachata** Chaudhuri 1922

1922. *Botia lohachata* Chaudhuri, Rec. Indian Mus., vol. VII(5) p. 441, Type locality : Gandak River in Saran, Bihar; Sterba, 1963, Freshwater Fishes of the world : 347, fig 493; Yazdani, 1980, J. Bombay nat. Hist. Soc. 77(2) : 152

1968. *Botia lohachata* Srivastava, Fishes of Eastern Uttar Pradesh,

Material examined : India, North Bihar, 1 ex. from Mahisi Chaur in Saharsa District, coll. Gopal Sharma and party, (Reg. No. V-3212).

Diagnostic characters : D. 11 (2/9); P.13-15; V. 8; A. 7 (2/5); C. 19; Barbells 4 pairs.

Eyes-not situated wholly in posterior half of the head, but just a small portion of it is situated in the anterior of the head; diameter 5.2 (5 to 5.5) in the length of head; 2.3 (2.25 to 2.5) from the end of snout and 1.75 in the inter-orbital width. Suborbital spine is bifurcated at its base. The upper branch is shorter and curved while the lower one is

longer and reaches nearly the posterior end of the orbit and is sickle-shaped. Barbels-4 pairs; rostra two pairs united at their bases, the anterior pair being longer than the posterior one; maxillary one pair, as long as the anterior rostra pair; mandible one pair, and is the shortest. Lower lip is feebly fringed. Fins-dorsal arises in front of the ventral. Caudal fin is deeply forked. Scales-very indistinct. Lateral line-present and complete. Colour-general body is yellow. There are numerous black bands arranged variously on the body. There is a median longitudinal black line over the snout, a band with a dorsal loop in the occipital region; three loops on the dorsum of the body, one anterior, one posterior and one over the dorsal fin. There is a ring-like band at the base of the tail. Each loop has a vertical band on either side reaching the abdominal edge; in between these bands there are three to four short vertical bands. There are three bands in the region of the caudal fin; the first is at the base, the second and third are at the lobes of the fin. An oblique band is found on the dorsal, pectoral and anal fins but none on the ventral fin.

Distribution : Hill streams of Himalayas.

Elsewhere : Indus in Pakistan, Bangladesh and Nepal.

Local name : Lohachata

Subfamily COBITINI

Genus **Lepidocephalichthys** Bleeker

17. **Lepidocephalus guntea** (Ham.-Buch.) 1822

1822. *Cobitus guntea* Ham., Fish. Ganges, pp. 353, 394.

1878. *Lepidocephalichthys guntea* Day, Fish. India, p. 609, pl. clv,

1878. *Lepidocephalichthys guntea*, var. *L. balgara* Day, Fish. India, p. 609, pl. clvi.

1889. *Lepidocephalichthys guntea* Day, Fauna Brit. India Fish. I, Pp. 220-221,

1968. *Lepidocephalichthys guntea*, Srivastava, Fishes of Eastern, Uttar Pradesh, p. 62,

Material examined : India, North Bihar, 5exs. from Chatar Chaur in Araria District, (Reg. No. V-3213), 4 exs. from Mahisi Chaur in Saharsa (Reg. No. V-3214), 3 exs. from Samsolia Chaur (Reg. No. V-3215) in Madhepura, 4exs. from Saharsa Chaur in Saharsa District (Reg. No. V-3216), 2 exs. from Muriakatwa Chaur in Darbhanga District (Reg. No. V-3217), 3 exs. from Isharain Chaur in Madhubani District (Reg. No. V-3218), coll. Gopal Sharma and party.

Diagnostic characters : D. 8(2/6); P. 8; V. 7; A. 7(2/5); C. 16; L.1. 115; Barbells 4 pairs.

Eyes-diameter 5 in the length of head; 2 from the end of snout and 1 in the inter-orbital width. Barbells-two pair rostra, one pair maxillary, all longer than the orbit. The maxillary pair reaching the middle of the orbit. A fleshy flap from the lower surface of mandible on either side joins the maxillary barbell, each with two or three barbells at the tip. Fins-dorsal fin is located opposite the ventral and the caudal fin is entire. Scales-

minute. Colour-generally dirt yellowish brown. A black ocellus above the middle of the bases of these caudal fin, placed just above the lateral band. A broad longitudinal black band extends over the whole of the dorsal side, beginning from the occipital region and reaching over base of the caudal fin. Caudal and dorsal fins with numerous rows of dark spots.

Distribution : Throughout Northern India

Elsewhere : Pakistan.

Local name : Guntii.

Division SILURI
Order SILURIFORMIS
Suborder SILUROIDEI
Superfamily SILUROIDAE
Family SILURIDAE
Genus **Ompok** Lacepede

18. Ompok bimaculatus (Bloch.) 1797

1797. *Silurus bimaculatus* Bloch, Ich. Hist. Nat. d. Poiss., II p. 17, pl. cccl xiv.
1878. *Callichrous bimaculatus* Day, Fish. India, p. 476, pl. cx,
1878. *Callichrous pabda*, Day, ibid, p. 479, pl. cxi,
1878. *Callichrous sindensis* Day, ibid, p. 476, pl. cx,
1878. *Callichrous macropthalmus*, Day, ibid, p. 478, pl. cx,
1878. *Callichrous malabaricus*, Day, ibid, p. 478, pl. cxi,
1889. *Callichrous bimaculatus*, *pabda*, *sindensis*, *macropthalmus*, *malabaricus*, Day, Fauna Brit. India, Fish. I, Pp. 130-134,
1937. *Callichrous bimaculatus*, *pabda* Shaw & Shebbeare, T. Roy. Asiat. Soc., Bengal Sci., III, Art No. 1, Pp. 82-83.
1968. *Ompok bimaculatus* Srivastva, Fishes of Eastern Uttar Pradesh, p. 66,

Material examined : India, North Bihar, 2 exs. from Kajradhar Chaur in Araria District (Reg. No. V-3219), 3 exs. from Mahisi Chaur (Reg. No. V-3220), 3 exs. from Samsolia Chaur in Madhepura District (Reg. No. V-3221), 3 exs. from Kavar Lake in Begusarai District (Reg. No. V-3222), 1 ex. from Muriakatwa Chaur in Darbhanga District (Reg. No. V-3223) and 1 ex. from Isharain Chaur in Madhubani Dist. (Reg. No. V-3224), coll. Gopal Sharma and party.

Diagnostic characters : D. 4; P. 1/13-14; V. 8; A. 65-69 (2/63-67); C. 18; Barbels 2 pairs.

Eyes-situated behind the angle of the mouth and diameter 5 (4.6 to 5.5) in the length of head; 1.6 from the end of snout and 2.7 (2.5 to 3) in the interorbital width. The lower

jaw is prominent and is slightly longer than the upper. Barbels-2 pairs, the maxillary pair reach the origin of the anal fin or even beyond, the mandibular pair reaches the hinder edge of the orbit. Teeth-vomerine teeth are not continuous and are small oval patches. Fins-dorsal fin is weak and commences at 2/7 of the body.

Pectoral spine is strong and is as long as the head behind the angle of the mouth and serrated internally. Anal fin is not continuous with the caudal fin. The latter is forked with its upper lobe slightly longer. Colour-silvery but varies with the habitat. It may be white, yellow or grey. A black spot on the shoulder and another at the tail is present. Another distinct, translucent blister just anterior to the shoulder spot is also present. The anal fin is covered with a leathery flap on either side.

Distribution : Freshwaters of India

Elsewhere : Pakistan, Ceylon, Burma to Java, Sumatra, Borneo, Malaya Siam and Indo China.

Local name : Papta

19. **Ompok pabda** (Hamilton-Buchanan)

1822. *Silurus pabda* Hamilton-Buchanan, *Fishes of Ganges* : 150, 374, pl. 25, fig. 47 (type-locality : ponds and rivers of Bengal).

1877. *Callichrous Pabda* Day, *Fishes of India* : 479, pl. 111, fig. 2, 3; Day, 1889, *Fauna Br. India, Fishes, I* : 133.

1976. *Ompok Pabda* Misra, *Fauna of India, Fish.* (2nd ed.), 3 : 194, fig.37; Coad, 1981, *Nat. Mus. nat. Sci. Ottawa*, (14) : 16.

Material examined : India, North Bihar, 1ex. from Saharsa Chaur in Saharsa district, (Reg. No. V-3231) and 2exs. from Kowar Lake in Begusarai (District Reg. No. V-3232); coll. Gopal Sharma and party.

Diagnostic characters : D 4-5; A ii 48-54; P I 11-13; V i 6-7. Body elongate and compressed.

Eyes moderate, its lower border below level of cleft of mouth. Mouth large and oblique; teeth in villiform bands of jaws; teeth on vomer in two small oval patches. Barbells two pairs; maxillary pair extends usually as far as middle of pectoral fin (often to tip), the mandibular barbells extend to posterior border of eye. Anal fin long, inserted usually opposite to origin of dorsal fin. Pectoral spine moderately strong, serrated on its inner edge in males, often feeble in females. Caudal fin forked, its lobes pointed.

Colour in live : silvery-gray with a tinge of yellow, dark on back, fading to dull gray on belly, often with two dark lateral bands on body; a dark oval shoulder spot on lateral line.

Distribution : Northern India tanks and Ponds

Elsewhere : Afghanistan, Pakistan : Indus plain and adjoining hilly areas; Bangladesh and Burma.

Local name : Pallu

Genus **Wallago** Bleeker20. **Wallago attu** (Bl. & Schn.) 1801

1801. *Silurus attu* and *athu* Bl. Schn., Syst. Ichth., p. 378, pl. lxxv.

1878. *Wallago attu* Day, Fish. India, p. 479, pl. cxi, fig. 4.

1889. *Wallago attu* Day, Fauna Brit. India Fish, I, Pp. 126-127, fig. 54.

1968. *Wallago attu* Srivastva, Fishes of Eastern Uttar Pradesh, p. 67, fig. 43.

Material examined : India, North Bihar, 3 exs. from Muriakatwa Chaur (Reg. No. V-3233) in Darbhanga District, coll. Gopal Sharma and party.

Diagnostic characters : D. 5; P. 1/14; V. 10; A. 86 (4/82); C. 17; Barbels 2 pairs.

Eyes-with free lids, diameter 8 in the length of head; 2.3 from the end of snout and 3.5 in the interorbital width. Width of head equals to its length behind the middle of the orbit. Snout is produced, the cleft of mouth extending to one diameter behind the orbit. Lower jaw is slightly longer than the upper jaw. Barbels-2 pairs, maxillary about twice as long as the head are the longest and extend to behind the origin of anal fin. The mandibular pair is as long as the snout. Teeth-numerous and cardiform in both the jaws, with an oblique patch on either side of the vomer but none on the palatines. Fins-dorsal fin is nearly as long as pectoral, the latter with its spine finely serrated on its internal margin. Anal fin is long and not confluent with the caudal fin. Caudal fin deeply forked with longer upper lobe. Colour-varies with the habitat but is generally white with gray yellowish along the back.

Distribution : Fresh waters of India, Pakistan,

Elsewhere : Ceylon, Burma to Java, Sumatra, Siam and Indo China.

Local name : Boyari

Family BAGARIDAE

Genus **Mystus** Gronov (emend. scopoli)21. **Mystus bleekeri** (Day) 1878

1878. *Macrones bleekeri* Day, Fish. India, p. 451, pl. ci.,

1889. *Macrones bleekeri* Day, Fauna Brit. India Fish., I, p. 162.

1968. *Mystus (Mystus) bleekeri* Srivastava, Fishes of Eastern Uttar Pradesh, p. 70,

Material examined : India, North Bihar, 5 exs. from Kajradhar in Araria District (Reg. No. V-3234), 9 exs. from Mahisi Chaur in Saharsa District (Reg. No. V-3235) and 3exs. from Isharain Chaur in Madhubani District (Reg. No. V-3236); coll. Gopal Sharma and party.

Diagnostic characters : D. 1/7/0; P. 1/9-10; V. 6; A. 9-10 (3/6-7); C. 17; Barbells 4 pairs.

Eyes-diameter 4.75 (4.5 to 5) in the length of head; 1.75 (1.5 to 2) from the end of snout, and 1.25 in the interorbital width. Width of head equals its length behind the nostrils. The snout is obtuse. Width of the gape of the mouth is nearly holds the length of the head. Upper surface of the head, opercles, occipital bone and the humeral process are granulated. The Median longitudinal groove on the head is shallow and reaches the base of the occipital process, which is twice as long and as wide at its base and extends up-to the basal bone of the dorsal fin. Occipital process is not grooved but has ridged line. Barbells-four pairs, nasal reaching to the hinder edge of the eye; maxillary reach the anal fin; the external mandible extending beyond the base of the pectoral, and the internal mandible barbell is a bit shorter than the outer one. Teeth-palate carries an uninterrupted semi lunar band of teeth. Fins-the dorsal spine, equal to half the length of head, is smooth and is not as high as the body. Adipose dorsal, with its base twice the length of the head and thrice the length of the base of the rayed dorsal fin, commences just behind the rayed fin. Pectoral spine is stronger than that of the dorsal spine, is denticulate internally with 12-14 teeth, and is as long as the head excluding the snout. Caudal fin with its pointed lobes is forked, the upper lobe being longer than that of the lower. Colour-brownish gray with two light longitudinal bands above and below the lateral line (not clear in preserved specimens). In addition to this there is a dark shoulder spot on either side below the lateral line.

Distribution : Entire northern Part of India,

Elsewhere : Burma and Sumatra.

Local name : Palwa.

22. *Mystus cavasius* (Ham.) 1822

1822. *Pimelodus cavasius* Ham. Fish, Ganges, pp. 203, 379, pl. xi.

1878. *Macrones cavasius* Day, Fauna Brit. India, Fish., p. 447, pl. c.

1889. *Macrones cavasius* Day, Fauna Brit. India, Fish. I, p. 155.

1976. *Mystus (Mystus) cavasius* Misra Fauna of India Pisces (2nd ed), **3** : 87, fig. 18

Material examined : India, North Bihar, 12 exs. from Samsolia Chaur Madhepura District (Reg. No. V-3247), 2 exs. from Kajradhar in Araria (Reg. No. V-3248), 6 exs. from Chatar Chaur in Araria (Reg. No. V-3249), 1 ex. from Ghopa Chaur in Madhepura (Reg. No. V-3250), 2 exs. from Samsolia Chaur in Madhepura District (Reg. No. V-3251), 3 ex. from Saharsa Chaur in Saharsa District (Reg. No. V-3252), 1exs. from Kawar Lake in Begusarai District (Reg. No. V-3253), 1exs. from Muriakatwa in Darbhanga District (Reg. No. V-3254), 1 ex. from Kausar Chaur in Darbhanga District (Reg. No. V-3255), 1 ex. from Turkey Chaur and 1 ex. Manikamann Chaur (Reg. No. V-325 to V-3257) in Muzaffarpur District; coll. Gopal Sharma and party.

Diagnostic characters : D. 1/7/0; P. 1/9; A. 11 (3-4/7-8); C. 16; Barbells 4 pairs.

Eyes-diameter 3.68 (3.5 to 4) in the length of head; 1.26 (1.25 to 1.33) from the end of snout and 1 in the inter-orbital width. The greatest width of the head equals its length excluding the snout. Snout is obtuse and the upper jaw is slightly longer than the lower. Width of the gape of mouth equals $\frac{2}{5}$ the length of the head and the base of the cleft extends half way to below the orbit. Upper surface of the head is slightly roughened and its median longitudinal groove reaches the base of the occipital process. The latter is 4 times as long and as wide at its base. There is no inter-space between occipital process and posterior end of the basal bone of dorsal fin. Barbels-4 pairs, nasal barbells as long as the head; the maxillaries extend beyond the base of the caudal fin; external mandibular barbells extend almost up-to the base of ventral, while the internal mandibles as long as the head. Teeth-both the jaws carry teeth; those on the palatine are in one continuous crescentic band. Fins-dorsal spine, higher than the body, is entire, pointed and as the head excluding the snout. The adipose dorsal commences just behind the rayed one is fairly long, its base is nearly 3 times as long as the base of the rayed dorsal. Pectoral spine is as long as the dorsal spine but is stronger than the dorsal and is smooth externally while denticulated internally with 11-17 teeth (number of teeth increases according to age more teeth being added towards the proximal end where they are mere tubercities in the young but grow in the pointed teeth in the adult, so in young forms only 11 and older forms have 17 teeth). Ventral fin arises just behind the last dorsal ray. Caudal fin, with its upper lobe the longer and more pointed, is forked. Colour-leaden superiorly, becoming yellowish brown along the abdomen (varies according to locality). There is a black spot covering the basal bone of the dorsal fin, and a bluish band along the lateral line with a black spot above the base of the pectoral. Just behind this there is a blister of air bladder.

Distribution : Northern Parts of India, in the south it extends up-to Chilika Lake and Madras.

Elsewhere : Pakistan and Burma.

Local name : Palwa, Tengra.

23. *Mystus vittatus* (Bloch) 1797

1797. *Silurus vittatus* Bloch, Ichthyol. Hist. Nat., vol. **XI**, p. 40, pl. cclxxi.

1878. *Macrones vittatus* Day, Fish. India, p. 448, pls. xcvi & xcix.

1889. *Macrones vittatus* Day, Fauna Brit. India Fish. **I**, p. 157.

1968. *Mystus (Mystus) vittatus* Srivastva, Fishes of Eastern Uttar Pradesh, Pp. 75.

Material examined : India, North Bihar, 3exs. from Kajradhar, in Araria District (Reg. No. V-3237), 4 exs. from Chatar Chaur in Araria District (Reg. No. V-3238), 3 exs. from Ghopa Chaur in Madhepura District, (Reg. No. V-3239), 1 ex. from Saharsa Chaur in Saharsa District (Reg. No. V-3240), 2 exs. from Samsolia Chaur in Madhepura, District (Reg. No. V-3241), 9 exs. from Kawar Lake in Begusarai District (Reg. No. V-3242), 8 exs. from Muriakatwa Darbhanga District (Reg. No. V-3243), 11 exs. from Kausar Chaur in

Darbhanga District (Reg. No. V-3244), 12 exs. Turkey and Manikaman Chaur in Muzaffarpur District (Reg. No. V-3245); coll. Gopal Sharma and party.

Diagnostic characters : D. 1/7/0; P. 1/8; V. 6; a. 11 (2/9); C. 17; Barbells 4 pairs.

Eyes-diameter 5.13 (5 to 5.6) in the length of head; 1.6 (1.5 to 1.8) from the end of snout and 1.8 (1.5 to 2) in the inter-orbital width. The greatest width of the head leaving the snout is equal to its length. Median longitudinal groove on the head is shallow and does not reach the base of the occipital process. It reaches only up-to middle of the hinder border of the eye and the bases of the occipital process, which is rough. Occipital process is 2.5 times as long as wide at its base. A very short space exists between it and the basal bone of the dorsal fin. Opercle is with radiating lines. Shoulder bone with its triangular portion little longer and wide at its base, has granulated rough lines. Barbells-4 pairs, maxillary barbells extend slightly behind the ventral, the nasal ones reach a little behind the posterior margin of the eye but not the opercle; the external mandibles reach the middle or even beyond the middle of the pectoral spine and the internal one is short and reaches nearly the base of the pectoral spine. Teeth-are in a continuous semi lunar band across the palate. Fins-dorsal spine with 3 to 4 teeth interiorly, half as long as the head and is finely serrated posterior. The length of the base of the adipose fin is twice the base of the rayed dorsal fin, and thrice the inter-space between the two fins. Pectoral spine is denticulate internally with 14 to 16 teeth, it is strong and is as long as the head excluding the snout. Caudal fin is forked and its upper lobe is longer than the lower. Colour-golden, with dark bluish shoulder spot. A broad black longitudinal band extends along and on either side of the lateral line. Another broadband is present below and above these bands. Another band is found along the dorsal side of the body. So in all there are 4 bands on either side of the lateral wall and one along the dorsal line.

Distribution : Throughout India

Elsewhere : Pakistan, Ceylon, Burma and Siam.

Local name : Palwa, Tenggara

Genus **Pseudeutropius** Bleeker

24. **Pseudeutropius atherinoides** (Bloch) 1794

1794. *Silurus atherinoides* Bloch, Naturges. Ausland. Fisce, VIII.

1878. *Pseudeutropius atherinoides* Day, Fish. India, p. 473, pl. cix.

1889. *Pseudeutropius atherinoides* Day, Fauna Brit. India Fish. I, pp.

1968. *Pseudeutropius atherinoides* Srivastava, Fishes of Eastern Uttar Pradesh, p. 101,

Material examined : India, North Bihar, 19 exs. from Muriakatwa Chaur in Darbhanga District (Reg. No. V-3258 to V-3259) and 17 exs. from Isharain Chaur in Madhubani District (Reg. No. V-3258 to V-3259); coll. Gopal Sharma and party.

Diagnostic characters : D. 1/6/10; P. 1/7; V. 6; C. 17; Barbells 4 pairs.

Eyes-situated partially on the lower surface of the head, is provided with free orbital margin and is devoid of adipose lid; diameter 2.75 (2.5 to 3) in the length of head; 1 from the end of snout and 1 in the inter-orbital width. Upper jaw is longer. The median longitudinal groove on the head is broad and shallow and reaches the base of the occipital process, which is four times as long and as broad at its base and extends up-to the basal bone of the dorsal fin. Barbels-4 pairs, the nasal barbell is slightly longer than the head while the maxillary reaches the base of anal in one specimen while in the other it reaches only up-to the ventral, and the mandible barbells are 4 in number and are longer than the head and reach near the base of the pectoral fin. They are situated at the anterior margin of the lower jaw and placed in a straight line. Teeth-premaxillary teeth anterior to the mandibles and the vomero palatine patches are in a narrow transverse band. Fins-the anteriorly rugose and finely serrated posterior dorsal spine, is 2/3 as long as the head. Pectoral spine, with 13 denticulations internally is longer and stronger than the dorsal. Ventral fin is half as long as the head. Caudal fin is deeply forked. Air-bladder forms blister-like translucent area above the pectoral fin. Colour-silvery, below but the dorsum is greenish black with 3 to 4 longitudinal bands along the sides composed of minute black dots. Occipital process and the anterior portion of the dorsal fin are colored dark black.

Distribution : Indian freshwaters

Elsewhere : Pakistan.

Local name : Patasi

Genus **Heteropneustes** Mueller

25. **Heteropneustes** fossilis (Bloch) 1785

1785. *Silurus fossilis* Bloch, *Ichtyol*, 370,

1878. *Saccobranhus fossilis* Day, *Fish. India*, Pp. 486- 487, pl. xiv,

1889. *Saccobranhus fossilis* Day, *Fauna Brit. India Fish.*, I Pp. 125- 126,

1968. *Heteropneustes fossilis* Srivastava, *Fishes of Eastern Uttar Pradesh*, P. 104,

Material examined : India, North Bihar, 2 exs. from Kajradhar Chaur in Araria District (Reg. No. V-3260), 3 exs. from Chatar Chaur in Araria District (Reg. No. V-3261), 3 exs. Mahisi in Saharsa District (Reg. No. V-3262), 2 exs. from Samsolia Chaur in Madhepura District (Reg. No. V-3263), 2 exs. from Saharsa Chaur in Saharsa District (Reg. No. V-3264), 4 ex. from Dandari Chaur in Begusarai District (Reg. No. V-3265), 6exs. from Kavar lake in Begusarai (Reg. No. V-3266), 7 exs. from Muriakatwa Chaur in Darbhanga District (Reg. No. V-3267), 2 exs. from Isharain Chaur in Madhubani District (Reg. No. V-3268), 1 ex. from Motipur Chaur in Muzaffarpur District (Reg. No. V-3269) and 1ex. from Manikamann Chaur in Muzaffarpur District (Reg. No. V-3270); coll. Gopal Sharma and party.

Diagnostic characters : D. 6; P. 1/7; V. 6; A. 62-66; C. 19; Barbels 4 pairs.

Eyes-diameter 8.3 (8 to 8.75) in the length of head; 2.8 (2.7 to 3) from the end of snout and 4.25 (4 to 4.5) in the inter-orbital width. Barbels-4 pairs, the maxillary extends beyond the pectoral fin. Fins-the dorsal fin commences in the anterior 1/3 of the body and the venserrated internally with a few serrations at its anterior end externally. It is 2/3 as long as the head. Anal and caudal fin are separated by a distinct notch. Colour-dark leaden brown, the young are reddish. The pectoral spine is capable of inflicting wound, which is very painful so people are afraid of handling this fish without breaking the pectoral spines.

Distribution : Freshwaters of India

Elsewhere : Pakistan, Ceylon, Burma and China

Local name : Singhee

Genus **Clarius** Gronov (emend. scopoli) (Mangur)

26. **Clarias batrachus** (Linn.) 1758

1758. *Silurus batrachus*, Linn. Syst. Na. ed. X a I.

1878. *Clarias magur* Day, Fish, India,

1889. *Clarias magur* Day, Fauna Brit. India Fish. I,

1951. *Clarias batrachus* Menon, Proc. National Ins. Sci. India, XVII,

1968. *Clarias batrachus* Srivastava, Fishes of Eastern Uttar Pradesh, p. 105,

Material examined : India, North Bihar, 2exs. from Saharsa Chaur in Saharsa District (Reg. No. V-3271) and 1ex. from Dandari Chaur in Begusarai District (Reg. No. V-3272); coll. Gopal Sharma and party.

Diagnostic characters : 65-70; P. 1/8; V. 6; A. 47; C. 17; Barbells 4 pairs.

Eyes-diameter 10.2 in the length of head; 4 from the end of snout and 5.6 (5.5 to 5.75) in the inter-orbital width. The width of the inter-orbital space equals one half the length of the head. The greatest width of head equals its length. Upper jaw is longer than the lower. The width of the gape of mouth is equal to .44 in the length of head. Head is shagreened superiorly and is covered with fine granules. Two depressions on the head, an anterior deeper, oblong and situated behind the eyes; and another posterior one is oval shallow and placed midway between the posterior extremity of the anterior fossa and the end of the occipital process. The occipital process is rounded behind; the width of its base is more than twice its length. Barbels-4 pairs, the nasal barbells reach the base of the occipital process; the maxillary run only up to the middle of the pectoral and the mandibular up to the base of the pectoral fin. Teeth-vomerine teeth are villiform while those on the jaws appear to be blunt and are smaller than the former and form an interrupted band. Fins-pectoral fin reaches below the commencement of the dorsal, its spine is finely serrated both externally and internally, the external serrations being more prominent. Dorsal fin

is very long, it commences little behind the occipital process and ends a bit anterior to the base of the caudal fin. The caudal fin is free. All the fins are covered with thick skin. Colour-brownish black.

Distribution : Fresh and brackish waters of India,

Elsewhere : Pakistan, Ceylon, Burma and Malaya Archipelago.

Local name : Mangoor

Order BELONIFORMES
Suborder SCOMBERESOCOIDEI
Family BELONIDAE
Genus **Xenentodon** Regan
27. **Xenentodon cancila** (Ham.) 1822

1822. *Esox cancila* Ham. Fish. Ganges, pp. 213, 380, pl. xxvii, fig. 70.

1878. *Belong cancila* Day, Fish, India, p. 511, pl. cxiii,

1889. *Belong cancila* Day, Fauna Brit. India, Fish. I, Pp. 420-421.

1968. *Xenentodon cancila* Srivastava, Fishes of Eastern Uttar Pradesh, p. 108.

Material examined : India, North Bihar, 2 exs. from Muriakatwa Chaur in Darbhanga District (Reg. No.V-3273), 1 ex. from Baraila Chaur in Vaishali District (Reg. No. V-3274), 3 exs. from Kajradhar Chaur in Araria District (Reg. No. V-3275), 4exs. from Chatar Chaur in Araria District (Reg. No. V-3276), 2 exs. from Saharsa Chaur in Saharsa District (Reg. No. V-3277), 6exs. from Dandari Chaur in Begusarai District (Reg. No. V-3278) and 2 exs. from Kawar lake in Begusarai District (Reg. No. V-3279); coll. Gopal Sharma and party.

Diagnostic characters : D. 16-17; P. 11; V. 6; A. 17; C. 15.

Eyes-diameter 3 from the hind edge of opercle and 1 in the inter-orbital width. A deep longitudinal groove runs along the upper surface of the head. Lower jaw is slightly longer. Supra-orbital margin is smooth. Teeth-both the jaws are provided with a row of large sharp widely separated teeth and an external row of numerous fine ones, which are more on the lower jaw. Fins-dorsal fin commences opposite the anal fin. Caudal fin slightly emarginated. The last few anal and dorsal rays are not elongated. Scales-small and irregularly arranged. Some are found on the posterior end of the groove of the head, and on the sides of head except the opercles. Body is sub cylindrical with compressed free portion of tail. Colour-greenish gray above becoming whitish along the abdomen, silvery streak having a dark margin extends along the body from opposite the orbit and runs up to the middle of the base of the caudal fin. The entire upper 2/3 of the body is marked with closely set fine black dots. Eyes-are golden.

Distribution : Fresh waters of India.

Elsewhere : Pakistan, Ceylon and Burma.

Local name : Kauwa lol

Order CHANNIFORMIS

Family CHANNIDAE

Genus **Channa** Gronov

28. Channa orientalis Bloch & Schneider

1801. *Channa orientalis* Bloch & Schneider, Syst. Ichth. : 496, pl. 90, fig. 2 (type-locality : India); Day, 1876, Fishes of India : 368, pl. 78, fig. 2; Day, 1889, Fauna Brit. India, Fishes, **II** : 365, fig. 119; Deraniyagala, 1929, Spolia Zeyl. **15**(2) : 97, pl. 27.
1822. *Ophiocephalus gachua* Hamilton-Buchanan, Fishes of Ganges : 68, 367, pl.21, fig. 21 (type - locality : Bengal); Day, 1876, Fishes of India : 367; Day, 1889, Fauna Br. India, Fishes, 2 : 364; Dewitt, 1960, Stanford Ichth. Bull. **7**(14) : 81.
1861. *Ophiocephalus apus* Canestrini, Arch. Zool. Anat. Comp. **1** : 77, pl. 4, fig. 7 (type-locality :? Burma); Tortonese, 1964, Doriana, **3**(145) : 1.
1918. *Ophiocephalus harcourt-butleri* Annandale, Rec. Indian Mus., **14**(1) : 54, pl. 2, fig. 7 and pl. 4, figs. 16, 17 (type-locality : Inle lake, S. Shah States, Burma); Hora and Mukerji, 1934, Rec. Indian Mus., **36**(1) : 135.
1955. *Ophiocephalus gachua* Kelaarti Gunther : Munro, Marine and Fresh Water Fishes of Ceylon : 100.
1919. *Channa burmanica* Chaudhuri, Rec. Indian Mus., **16**(4) : 284, pl. 22, fig. 4 (type locality : Sen-Ben-Ti River, Irrawaddy system, Burma); Hora, and Mukerji, 1934, Rec Indian Mus., **36**(1) : 137.

Material examined : India, North Bihar, 2 exs. from Kajradhar Chaur, Araria District (Reg. No. V-3284), 2 exs. from Chatar Chaur in Araria District (Reg. No. V-3285), 5 exs. from Mahisi Chaur in Saharsa District (Reg. No. V-3286), 1 ex. from Samsolia Chaur in Madhepura District (Reg. No. V-3287), 1ex. from Saharsa Chaur in Saharasa District (Reg. No. V-3288), 2 exs. from Dandari Chaur in Begusarai District (Reg. No. V-3289), 2 exs. from Ishrain Chaur in Madhubani District (Reg. No. V-3290) and 1 ex. from Baraila Lake in Vaishali District (Reg. No. V-3291); coll. Gopal Sharma and party.

Diagnostic characters : D 32-37; A 20-23; P 14-15; V 6.

Eyes moderate, its diameter 5 to 6 times in head length. Mouth large; lower jaw with 10 to 20 canines behind a single row of villiform teeth which deepens to about seven rows at symphysis; teeth on vomer and palatines. Pectoral fins extend to anal fin; pelvic fin (often absent) less than 50% of pectoral fin length. Caudal fin rounded. Scales on summit of head large rosette of head-scales situated behind orbit so that it touches frontal head-scale in front and basal head-scale behind; 4 or 5 scale-rows between pre-opercular angle and posterior border of orbit; pre-dorsal scales 12; scales in longitudinal series 40 to 50. Colour; in life, dorsal side and flanks green, ventral sides pale with a faint bluish or

reddish tinge; a row each of dark oblique bands run above and below the lateral line. Pectoral fin with a series of distinct alternating blue and pale orange vertical bands; outer margin of caudal fin bright orange and barred. Young often with a large ocellus on last five dorsal fin rays.

Distribution : Afghanistan, Iran and Pakistan.

Elsewhere : Nepal, Sri Lanka, Bangladesh and Burma.

Local name : Chainga and Chenga

Genus **Channa** Gronov

29. **Channa marulius** (Ham.) 1822

1822. *Ophiocephalus marulius* Ham. Fish. Ganges, pp. 65, 367.

1878. *Ophiocephalus marulius* Day, Fish India, pp. 363, 364.

1889. *Ophiocephalus marulius* Day, Fauna Brit. India Fish. II.

1968. *Channa marulius* Srivastava, Fishes of Eastern Uttar Pradesh,

Material examined : India, North Bihar, 1 ex. from Mahisi Chaur, Saharsa District (Reg. No. V-3292), 1 ex. from Samsolia Chaur in Madhepura District (Reg. No. V-3293), 1 ex. from Muriakatwa in Darbhanga District (Reg. No. V-3294), 1 ex. from Ishrain in Madhunbani District (Reg. No. V-3295); coll. Gopal Sharma and party.

Diagnostic characters : D.46; P. 18; V. 6; A. 32; L. 1 65-66; L.tr. 6/11

Eyes-diameter 6.5 in the length of head; 1 from the end of snout and 1.25 (1 to 1.5) in the inter-orbital width. Greatest width of head 0.6 of its length. Teeth-villiform; in numerous rows on jaws, vomer and palate. An additional posterior row of about 12 large conical teeth on each ramus of mandible. Fins-pectoral more than half the length of head, but not reaching the origin of anal fin. Ventral fin 2/3 as long as pectoral. Scales-of moderate size on the summit of head; a row of 16 pre-dorsal scales, and a row of 10 scales between the orbit and the angle of the pre-opercle. Lateral line-runs straight up to 17th scale, then descends down 2 rows of scale and subsequently runs straight up to the centre of caudal fin. Colour-varies with age and locality, dorsum of the body dark green; the juveniles (measuring 10 to 12 cm) with a brilliant orange band passing from tip of snout over the eyes to the tip of the caudal fin, while in the forms nearing maturity there are 4 to 5 rounds of black blotches located below the lateral line in between the pectoral fin and the base of caudal fin. Abdomen whitish. There is a large black prominent ocellus with orange boundary at the upper part of the base of caudal fin.

Distribution : Fresh waters of India,

Elsewhere : Pakistan, Ceylon and China.

Local name : Bhor.

Genus **Channa** Gronov30. **Channa punctatus** (Bl.) 1785

1785. *Ophiocephalus punctatus* Block. 1793, Natures. Ausland. Fishche, (7) : 139, pl.358 (type-locality : river and lake of coromandal coast); Day 1876. Fishes of India : 367, pl. 78, fig. 1 : Day, 1889, Fauna Br. India, Fishes, **2** : 364; Deraniyagala, 1929, Spolia Zeyl; **15**(2) : 90, pl. 26
1876. *Ophiocephalus punctatus* Day, Fish. India, Pp. 367- 368, pl. lxxviii,
1968. *Channa punctatus* Srivastava, Fishes of Eastern Uttar Pradesh. P. 119.

Material examined : India, North Bihar, 4 exs. from Chatar Cahur in Araria District (Reg. No. V-3296), 10 exs. from Mahisi Chaur in Saharsa District (Reg. No. V-3297), 2 exs. from Ghopa Chaur in Mahdepura District (Reg. No. V-3298), 1 ex. from Samolia Chaur in Madhepura District (Reg. No. V-3299), 2 exs. from Saharsa Chaur in Saharsa District (Reg. No. V-3300), 3 exs. from Tindobha Chaur in Darbhanga District (Reg. No. V-3301), 2 exs. from Dandari Chaur in Begusarai District (Reg. No. V-3302), 1 ex. from Kawar Lake in Begusarai District (Reg. No. V-3303), 2 exs. from Muriakatwa Chaur in Darbhanga District (Reg. No. V-3304), 2 exs. from Kausar Chaur in Darbhanga District (Reg. No. V-3305), 1 exs. from Ishrain Chaur in Madhubani District (Reg. No. V-3306), 1 ex. from Motipur Chaur in Muzaffarpur District (Reg. No. V-3307), 3 exs. from Turkey Chaur in Muzaffarpur District (Reg. No. V-3308), 3 exs. from Manikamann Chaur in Muzaffarpur District (Reg. No. V-3309), 6 exs. from Baraila in Vaishali District (Reg. No. V-3310), 2 exs. from Daruabari Chaur at Valmikinagar in West Chamaparan District (Reg. No. V-3311); coll. Gopal Sharma and party.

Diagnostic characters : D. 29-30; P. 16-17; V.6; A. 20-22; C. 12; L. 1. 35-37; L.tr. 4-5/7.

Eyes-diameter 7 (6.6 to 7.5) in the length of the head; 1.36 (12.5 to 15) from the end of snout, and 1.58 (15 to 16) in the inter-orbital width. Teeth-lower jaw with a posterior row of 4 to 5 conical teeth, upper jaw with numerous teeth, vomers and palatine also bear teeth. Fins-pectoral fin may or may not be overreaching the origin of anal fin more than the anal fin in height. Scales-on summit of head large and irregular in shape; a row of 12 pre-dorsal scales, a row of 5 scales between the eye and the angle of the pre-opercle, Day (1889, p. 365) mentions opercle instead of pre-opercle which is probably due to oversight. Lateral line-practically straight with a slight curve over the fourth anal ray. Colour-varies with the locality. Dorsum of the body mostly black or dark gray, becoming light gray or even dull white on the abdomen. Several bands pass from the dorsum of the body downwards to the middle of body. In some cases these markings appear as irregular spots. Fins are spotted.

Distribution : Freshwaters of Northern India, More common in stagnant waters of pools and ponds.

Elsewhere : Pakistan and Ceylon

Local name : Garai.

Genus **Channa** Gronov31. **Channa stewartii** (Playfair) 1867

1867. *Ophiocephalus stewartii* Playfair, Proc. Zool. Soc., 14.
 1878. *Ophiocephalus stewartii* Day, Fish. India I, p. 367. pl. lxxvii,
 1937. *Ophiocephalus stewartii*, Shaw and Shebbeare, J. Asiat. Soc. Bengal Sci., 3 : p. 123.
 1962. *Channa stewartii* Varma, Chitray and Saxena, Nat. Acad. of Sciences, India, Pp. 229-230.

Material examined : India, North Bihar, 1ex. examined from Chatar Chaur in Araria District (Reg. No. V-3313); coll. Gopal Sharma and party.

Diagnostic characters : D. 39-40; P. 17; V. 6; A. 27; C. 14; L.1 47-50; L.tr. 4½ -5½/9-7.

Eyes-diameter 6.5 in length of head the snout is 1.25, and inter-orbital 2. Height of head is 0.5 in its own length. Length of dorsal fin is 0.7 in the height of the body. Length of pectoral fin is 0.33 in the length of ventral fin. Shape of body cylindrical. Teeth-some conical ones in the lower jaw, also on the vomer and palate. Fins-dorsal commences over the base of the pectoral fin and higher than the anal. Pectoral fin as long as the postorbital length of the head and extends to nearly or quite above the commencement of the anal fin. Barbells-absent. Scales-the plate-like ones on the upper surface of the head rather large, 13 rows between the snout and the base of dorsal fin, 5 between the eye and angle of pre-opercle; those on the upper surface of head roughened by lines almost surrounding a central spot, whilst those on the body are arched. Lateral line-straight and complete. Colour-purplish black superiorly, becomes lighter on the sides and beneath. Many of the scales on the body with a round black mark. Fins dark, the pectoral fin in the young yellow in its lower half with a blue basal spot, external to which it has several vertical black bands, dorsal edge with yellow.

Distribution : Eastern Himalaya Cachar and Assam, Kanpur (U.P), also reported from the clear stream in the forest of Duars.

Local name : Garai

Genus **Channa** Gronov32. **Channa striatus** (Bloch) 1785

1785. *Ophiocephalus striatus* Bl., 359
 1878. *Ophiocephalus striatus* Day, Fish. India. P. 366.
 1889. *Ophiocephalus striatus* Day, Fauna Brit. India, Fish., II, p. 363.
 1968. *Channa striatus* Srivastava, Fishes of Eastern Uttar Pradesh, p. 121.

Material examined : India, North Bihar, 1ex. from Kajradhar Chaur in Araria District (Reg. No. V-3314), 1 ex. from Kawar Lake in Begusarai District (Reg. No. V-3315), 1 ex.

from Muriakatwa in Darbhanga District (Reg. No. V-3316), 1 ex. from Ishrain Chaur in Madhubani District (Reg. No. V-3317) and 1ex. from Motipur Chaur in Muzaffarpur District (Reg. No. V-3318); coll. Gopal Sharma and party.

Diagnostic characters : D. 41-43; P. 16-18; V. 6; a. 24-25; L.1. 58-6; L.tr. 7/10.

Eyes-diameter 7.15 (6 to 7.5) in the length of head; 1 from the end of snout and 1.56 (1.5 to 1.75) in the inter-orbital width. Teeth-in lower jaw with an inner conical row, palatine with cardiform teeth. Scales-large, irregularly shaped scales on summit of head. A row of 18 to 20 Pre-dorsal scales. A row of 9 scales between the orbit and the angle of pre-opercle; 7 rows between lateral line and dorsal fin. Lateral line-curves downwards below 12th dorsal ray (or 16th to 17th scales). Colour-dark grayish or blackish dorsally depending upon the locality, yellowish white beneath, cheeks and lower surface of the mouth spotted with gray or black. Transverse bands of gray or black descend from the sides to the abdomen. Ventral and anal fins grayish.

Distribution : Throughout the plains of India

Elsewhere : Pakistan, Ceylon, Burma, China and Philippines.

Local name : Sauri, Saura.

Order OPHIOCEPHALIFORMES (CHANNIFORMES)

Family OPHIOCEPHALIDAE

Genus **Amphipnous** Müller

33. **Amphipnous cuchia** (Ham.) 1822

1822. Unibranchapertura cuchia Ham., Fish. Ganges, pp. 16, 363, Amphipnous cuchia Day, Fish. India. p. 656,

1889. Amphipnous cuchia Day, Fauna Brit. India Fish. I, p. 69, Amphipnous cuchia Srivastava, Fishes of Eastern Uttar Pradesh.

Material examined : India, North Bihar, 4 exs. from Kowar Lake in Begusarai District (Reg. No. V-3319); coll. Gopal Sharma and party.

Diagnostic characters : D. very rudimentary, just a fold of skin, P., V., A. and C. Absent.

Eyes-small, diameter 12 (11 to 13) in the length of head; 2 from the end of snout, and is 1.7 in the inter-orbital width. First pair of valve nostrils opens above the orbit. The second pair is located in front of the snout. Lips are fleshy. Teeth-a single row of small teeth is present in the pre-maxillaries, except opposite the symphysis of the lower jaw. A single band of large curved and backwardly directed teeth on the palatines, and a single row of small teeth on the lower jaw is also present. Fins- a rudimentary dorsal with just a fold of skin, commences slightly before a vertical line drawn through the anus. Scales-small but distinct and are longitudinally arranged. Gill openings inferior and joined together. Colour-dark brown above with numerous black spots. The lower portion of the body is orange brown and without any spots.

Distribution : Fresh and brackish waters of Northern part of India

Elsewhere : Pakistan and Burma.

Local name : Anhaya Baam,

Order PERCIFORMES

Suborder PERCOIDEI

Superfamily PERCOIDAE

Family AMBASSIDAE

Genus **Pseudambassis** Bleeker

34. **Pseudambassis baculis** (Hamilton-Buchanan)

1822. *Chanda baculis* Hamilton-Buchanan, Fishes of Ganges : 112, pl. 22, fig. 7 (type-locality : north-eastern parts of Bengal).

1875. *Ambassis baculis*, Day, Fishes of India : 51, fig. 1; Day, 1889, Fauna Brit. India, Fishes, I : 485.

Material examined : India, North Bihar, 9 exs. from Saharasa Chaur in Saharsa District (Reg. No. V-3320) and 10exs. from Kawar Lake in Begusarai District (Reg. No. V-3321); coll. Gopal Sharma and party.

Diagnostic characters : D VI+II 12-13; AN III 12-13; P i 11-12; V I 5. Body small and rather slender. Mouth oblique, lower jaw included when mouth closed. Gill rakers about 11 on lower arm of first arch. Scales small; lateral line with about 90 scales; cheek with 7 transverse scale-rows. A silvery longitudinal band on flank. Fins hyaline, the membrane often dusky.

Distribution : Inhabits freshwaters ponds, ditches, pools and rivers of Gangetic basin.

Elsewhere : Bangladesh, Pakistan : Indus basin.

Local name : Chanari.

Genus **Chanda**

35. **Chanda nama** Ham. 1822

1822. *Chanda nama* Ham., Fish. Ganges, pp. 109, 371,

1878. *Ambassis nama* Day, Fish. India, p. 50,

1889. *Ambassis nama* Day, Fauna Brit. India Fish. I,

1968. *Chanda nama* Srivastava, Fishes of Eastern Uttar Pradesh,

Material examined : India, North Bihar, 116 exs. from Kawar Lake in Begusarai District (Reg. No. V-3322); coll. Dr. Gopal Sharma & party.

Diagnostic characters : D. 1+7/ 1/ 16-17; P. 12-13; V. 1/5; A. 3/ 16-18; C. 17; L.tr. Scales deciduous.

Eyes-diameter 3 in the length of head; 0.75 from the end of snout, and 0.75 in the inter-orbital width. Lower jaw is much longer than the upper. Postero-superior margin of the pre-orbital is denticulated while the vertical border of the pre-opercle is entire, except near the angle. The doubled horizontal border of the pre-opercle is slightly denticulated at its lower edge. Both the sub and the inter opercles are entire. Teeth-two large curved canines on either side of the lower jaw are present. Both the jaws are with an outer and an inner row of teeth. Fins-the third dorsal spine is the longest, (very nearly equal to second and fourth) is as long as the first ray. The rays gradually decrease in length. The third anal spine is the longest, strongest and is equal to the height of this longest ray of the dorsal fin. Caudal fin is deeply forked. Scales-minute. Lateral line-broken or absent or even very indistinct in some specimens. Colour-in fresh condition whitish yellow with black dots all over the body. The dots on the shoulders form an oblong vertical patch (not so distinct in young form). Summit of head and top of eyes are black. Anal fin has spots at the base of the spine.

Distribution : Throughout the freshwaters of India.

Elsewhere : Pakistan and Burma.

Local name : Chanari

Genus **Chanda**

36. **Chanda ranga** Ham. 1822

1822. *Chanda ranga* Ham. Fish. Ganges, pp. 113, 371, pl. xvi

1878. *Ambassis ranga* Day, Fish. India, p. 51, pl. xiv

1889. *Ambassis ranga* Day, Fauna Brit. India Fish. I, p. 485

1968. *Chanda ranga* Srivastava, Fishes of Eastern Uttar Pradesh, p. 129

Material examined : India, North Bihar, 2 exs. from Chatar Chaur in Araria, 3 exs. from Samsolia Chaur in Madhepura District (Reg. No. V-3323), 5 exs. from Saharsa Chaur in Saharsa District (Reg. No. V-3324), 2 exs. from Dandari Chaur in Begusarai District (Reg. No. V-3325), 3 exs. from Kavar Lake in Begusarai District (Reg. No. V-3326), 6 exs. from Maran Chaur in Darbhanga District (Reg. No. V-3327), 1 ex. from Turkey Chaur in Muzaffarpur District, 1 ex. from Manikamann in Muzaffarpur District (Reg. No. V-3328), 5 exs. from Baraila Chaur in Vaishali (Reg. No. V-3329) and 1 ex. from Daruabari Chaur in West Champaran District (Reg. No. V-3330; coll. Gopal Sharma and party.

Diagnostic characters : D. 1+7/1/13; P. 11-13; V. 1/5; a. 3/14-16; C. 17; L. 1 Scales deciduous.

Eyes-Diameter 3 in the length of head; 0.66 from end of snout and 0.6 in the inter-orbital width. Vertical border of the pre-opercle is entire or sometimes serrated. The double horizontal margin of the pre-opercle is serrated, but the inter and sub opercles are entire. Pre-orbital is with denticulations on its interior edge, a strong tooth on its antero-

superior angle is directed towards the eye, and 5 more teeth along the upper edge of the same are also present. There is another spine at the middle of the posterior margin of the orbit and its upper half has 5 more spines which decrease in size. Teeth-all small, but none on the tongue. Fins-third dorsal spine is the longest and the second anal spine is shorter than the third. Colour-white, spotted with black dots. A dark mark composed of closely set dots on the shoulders is present. Margins of the vertical fins are dark, but in some young specimens they are dark orange colored.

Distribution : Throughout India

Elsewhere : Pakistan and Burma.

Local name : Chanda.

Class ACTINOPTERYGII

Order PERCIFORMES

Family NANDIDAE

Subfamily BADINAE

Genus **Badis** Bleeker

37. **Badis badis** (Ham.) 1822

1822. *Labrus badis* Ham., Fish. Ganges, pp. 70, 368,

1878. *Badis buchanani* Day, Fish. India, Pp. 128-129,

1889. *Badis buchanani* Day, Fauna Brit. India Fish. II, Pp. 80-81,

1968. *Badis badis* Srivastava, Fishes of Eastern Uttar Pradesh, p. 132,

Material examined : India, North Bihar, 6 exs. from Kowar Lake in Begusarai District (Reg. No. V-3333), coll. Gopal Sharma and party.

Diagnostic characters : D.16/8; P. 12; V. 1/5; A. 3/7; C.16; L. 1 27; L.tr. 2½ / 8½.

Eyes-diameter 3.3 in the length of head; 0.6 from the end of snout and 1 in the inter orbital width. General form of the body is elongated, oval and the sides are compressed. Opercle has one sharp spine. Teeth-villiform in jaws, vomer, palatines, pre-sphenoids and the epiphyll. Fins-dorsal spine is somewhat slender, its soft portion elongated and pointed. Anal spines are short. Scales-ctenoid, and extend over the body and the head with two small rows along the base of the dorsal and the anal fins. Lateral line-is interrupted at 22nd scale and below the posterior extremity of the dorsal fin. Colour-dark black in fresh condition, a black spot about one full scale in dimension is located behind the opercle and above the pectoral fin. Another prominent black spot behind the eye and faint and larger black spot is situated at the base of the caudal fin. Body is spotted with irregular black spots. A dotted orange pigmented area at the anterior and posterior end of the anal fin, and the inner edge of the ventral fin, is generally washed away after preservation.

Distribution : Freshwaters of India.

Elsewhere : Pakistan and Burma.

Local name : Sumha.

Family NANDIDAE

Subfamily NANDINAE

Genus **Nandus** Valenciennes

38. **Nandus nandus** Hamilton-Buchanan

1831. *Nandus nandus* Cuv. & Val, Histoire naturelle des poissons, vii., p. 481.

Material examined : India, North Bihar, 1 ex. from Kajradhar in Araria District (Reg. No. V-3324), 1 ex. from Mahisi Chaur in Saharsa District (Reg. No. V-3324), 1 ex. from Samsolia Chaur in Madhepura District (Reg. No. V-3325), 1 ex. from Saharsa Chaur in Saharsa District (Reg. No. V-3326), 1 ex. from Muriakatwa Chaur in Darbhanga District (Reg. No. V-3327), 1 ex. from Isharain Chaur in Darbhanga District (Reg. No. V-3328), 1 ex. from Manikamann Chaur in Muzaffarpur District (Reg. No. V-3329), coll. Gopal Sharma and party.

Diagnostic characters : D. XII, Branchiostegals are 6 in number and the pseudobranchia is absent. Body is oblong and compressed. Mouth with its deep cleft is very protractile. Opercle with 1 to 2 spines. Preopercle is either serrated or more or less smooth, as are also the preorbital and the sub and inter opercles. Teeth on the jaws, vomers, palatines and the tongue are villiform. Ventrals 1/5 Spinous portion of the dorsal fin is longer than its rayed portion. Anal fin has 3 spines. Ctenoid scales are of moderate size. Lateral line is interrupted. Air bladder is large and simple while the pyloric appendages are absent

Distribution : Freshwaters of India.

Elsewhere : Pakistan, Burma and Siam

Local name : Dhebari.

Suborder ANABANTOIEI

Family ANABANTIDAE

Genus **Anabas** Cuv. & Cloquet

39. **Anabas testudineus** (Bloch) 1785

1785. *Anthias testudineus* Bloch, Ichthyologie, p. 322.

1878. *Anabas scandens* Day, Fish. India, p. 370, *Anabas scandens* Day, Fauna Brit. India, Fish. II, p. 367, fig. 120.

1968.. *Anabas testudineus* Srivastava, Fishes of Eastern Uttar Pradesh.

Material examined : India, North Bihar, 2 exs. from Chatar Chaur in Araria (Reg. No. V-3341), 2 exs. from Mahisi Chaur in Saharsa (Reg. No. V-3342) and 6 exs. from Saharsa Chaur in Saharsa District (Reg. No. V-3343); coll. Gopal Sharma and party.

Diagnostic characters : D. 17/9-10; P. 15; V. 1/5; A. 10-11; C.17; L.1 29; L.tr.4/9.

Eyes-Diameter 5 in the length of head; 1 from the end of snout, and 1.75 in the inter-orbital width. Pre-orbital is strongly denticulate but the posterior edge of the opercle, subopercle and interopercle are strongly spinous. Teeth-The outer row of villiform teeth in the jaws is the largest. Vomers have smaller teeth while the palatines are toothless. Fins spinous portion of the dorsal fin is 0.8 in the entire length of the fin, while the soft portion is higher than spinous one. Scales-strongly ctenoid. Some scales are found over the bases of the dorsal, pectoral, anal, and caudal fins also. Lateral line-is interrupted at 18th one. Colour-grayish black along the dorsal side, becoming lighter along the sides and abdomen. A black spot at the posterior end of the opercle and another black blotch on the side of the base of the tail are present.

Distribution : Throughout India in canals, lakes, ponds and swamps.

Elsewhere : Pakistan, Bangladesh Sri Lanka, Myanmar, and Malaya Singapore and Philippines.

Local name : Kawai.

Genus **Colisa** Cuv. & Val.

40. **Polycanthus chuna** (Ham.) 1822

1822. *Trichopodus chuna* Hamilton, Fish. Ganges, pp. 121 and 372.

1869. *Trichogaster chuna* Day, Proc. Zool. Soc. London p. 520.

1878. *Trichogaster chuna* Day, Fish India, Pp. 373-374.

1937. *Trichogaster chuna* Shaw and Shebbeare, Fish of Northern Bengal, J. Roy. Asiat. Soc. Bengal, Sc. III.

Material examined : India, North Bihar, 6 exs. from Kowar Lake in Begusarai District (Reg. No. V-3344), coll. Dr. Gopal Sharma & party.

Diagnostic characters : D. 17/7; P.9; V. 1; a. 17/10-12; C. 15; L.1 27- 29; L.tr. 5/10.

Eyes-diameter is 2.9 (2.8 to 3.0) in the length of head, snout is 0.7 (0.6 to 1.8), and its width is 2.0 (1.9 to 2.0) in its own length. Height of the dorsal fin is 2.6 (2.5 to 2.8) in the height of the body. Length of the pectoral fin is 1.0 in the length of the head. Shape of body-Body is deep and compressed laterally. Preorbital and lower edge of preopercle is serrated. The snout is obtuse. Fins-Pectoral fin is as long as the head. Ventral fin is longer than head. The anal fin originates at the level of the dorsal and the soft anal rays are the longest in its middle. The caudal fin is slightly emarginated. Barbells-absent. Scales- These are ctenoid, of moderate size and extend slightly over the soft portion of the anal fin forming a short sheath for its spines. Lateral line-It is distinct but interrupted after 14th scale and then it descends two rows of scales, and then runs to the base of the caudal fin. Colour- The body is brownish and lighter along the abdomen. Dark bands, one

in the upper third of the dorsal fin and the other on the back spot at its base. There are 14 vertical and oblique dark and light bands running from the dorsal line to the ventral one.

Distribution : Bihar, Jharkhand, Upper Assam and Bengal only.

Local name : Kholisa.

Family BELONTIIDAE

Subfamily TRICHOASTERINAE

Genus **Colisa** Cuv. & Val.

41. Polycanthus fasciatus (Bl. & Schn.) 1801

1801. *Trichogaster fasciatus* Bloch & Schn. Ichthyologie,

1878. *Trichogaster fasciatus* Day, Fish. India, Pp. 374-375, pl. 1xxviii,

1889. *Trichogaster fasciatus* Day, Fauna Brit. India Fish. II, Pp. 372-373,

1968. *Colisa fasciatus* Srivastava, Fishes of Eastern Uttar Pradesh,

Material examined : India, North Bihar, 6 exs. from Chatar Chaur in Araria District (Reg. No. V-3345), 2 exs. from Mahisi Chaur in Saharsa District (Reg. No. V-3345) 4 exs. from Ghopa Chaur in Madhepura District (Reg. No. V-3346), 6 exs. from Samsolia Chaur in Madhepura District (Reg. No. V-3347), 12 exs. from Matsagandha Chaur in Saharsa District (Reg. No. V-3348), 16 exs. from Tindobha Chaur in Darbhanga District (Reg. No. V-3349), 30 exs. from Dandari Chaur in Begusarai District (Reg. No. V-3350), 22 exs. from Kavar Lake in Begusarai District (Reg. No. V-3351), 6 exs. from Muriakatwa Chaur in Darbhanga District (Reg. No. V-3352), 7 exs. from Kausar Chaur in Darbhanga District (Reg. No. V-3353), 22 exs. from Maran Chaur in Darbhanga District (Reg. No. V-3354) 18 exs. from Isharain Chaur in Madubani District (Reg. No. V-3355), 2 exs. from Motipur Chaur in Muzaffarpur District (Reg. No. V-3356), 3 exs. from Turkey Chaur in Muzaffarpur District (Reg. No. V-3357), 3 exs. from Manikamann Chaur in Muzaffarpur District (Reg. No. V-3358), 2 exs. from Baraila Chaur in Vaishali District (Reg. No. V-3359), 3 exs. from Daruabari Chaur in Valmikinagar West Champaran District (Reg. No. V-3360) and 12 exs. from Kajradhar Chaur in Araria District (Reg. No. V-3361); coll. Gopal Sharma and party.

Diagnostic characters : D. 16-17/ 10-11; P. 10; V. 1; A. 16-17-16; C. 15; L.I. 29-30; L.tr. 5½ / 11-12.

Eyes-diameter 3.5 in the length of head; 0.75 from the end of snout, and 1.75 in the inter-orbital width. Pre-orbitals, pre-opercles, inter-opercles and sub-opercles are all serrated. Fins-last dorsal spine is the longest and is equal to postorbital length of the head. Its soft portion is pointed and 1.25 to 2 times longer than the last spine. Soft anal fin resembles the soft dorsal fin. Caudal fin is truncated. Scales-a few scales on the anal and the vertical fins are also present which are strongly ctenoid. Colour-greenish blue above, dirty white below and with bluish spots on the gill cover. Eyes are black with a red

spot in the white area. 14 orange colored oblique bands descend downwards and backwards from the back to the abdomen. Vertical fins are variegated with white and orange. Dorsal, caudal and anal fins are spotted orange. The anal fin is edged with deep red. In preserved specimens the orange colored oblique bands become black.

Distribution : Fresh and estuarine waters of India,

Elsewhere : Pakistan and Burma.

Local name : Khosti.

Suborder GOBIOIDEI

Superfamily GOBIOIDAE

Family GOBIIDAE

Subfamily GOBIINI

Genus **Glossogobius** Gill

42. **Glossogobius giuris** (Ham.) 1822

1822. *Gobius giuris* Ham., Fish. Ganges, pp. 51, 366, pl. xxxiii,

1878. *Gobius gutum* Day, Fish. India, p. 294.

1878. *Gobius gutum* Day, Fauna Brit. India Fish, **II**, p. 265.

1889. *Gobius giuris* Day, Op. Cit., p. 266.

1968. *Glossogobius giuris* Srivastava, Fishes of Eastern Uttar Pradesh, p. 139,

Material examined : India, North Bihar, 1 ex. from Chatar Chaur in Araria District (Reg. No. V-3362), 1 ex. from Ghopa Chaur in Madhepura District (Reg. No. V-3363), 1 ex. from Saharsa Chaur in Saharsa District (Reg. No. V-3364), 1 ex. from Kawar Lake in Begusarai District (Reg. No. V-3365), 2 exs. from Muriakatwa Chaur in Darbhanga District (Reg. No. V-3366) and 3 exs. from Manikamann Chaur in Muzaffarpur district (Reg. No. V-3367); coll. Gopal Sharma and party.

Diagnostic characters : D. 6/1/9; P.20; V. 1/5; A. 1/8; C. 17; L.1. 35; L.tr. 12.

Eyes-diameter 7 (6 to 8) in the length of head; 2 from the end of snout and .62 (0.5 to 0.75) in the inter-orbital width. Inter-orbital space is slightly concave. Width of head 0.55 (0.5 to 0.6) of its length; height about half its length. Lower jaw longer and maxilla extends up to below the anterior end of the orbit. Lips are thick. Teeth-in outer and inner row enlarged and the front teeth caninoid. Tongue is bilobate. There are 3 to 5 longitudinal mucous canals over the cheek. Head is scaled above behind the eyes, and on upper part of opercle. Anterior scales are cycloid but the posterior scales are ctenoid, pre-dorsal scales are 15 to 20. Fins-first and second dorsal are close together. First dorsal with 2nd, 3rd and 4th rays the longest. Anal fin is pointed posterior. Ventral fins a little shorter than pectoral and united at their bases for a considerable distance to form a cup-like structure. Caudal fin is oblong. Colour-variable generally cream colour (depicting transparent glassy

look) with light black markings on the head. Irregular markings on the body are also present. Vertical fins are spotted.

Distribution : Bihar, Jharkhand and Uttar Pradesh.

Elsewhere : East Coast of Africa, India, Pakistan, Ceylon and Burma, Philippines, China, Japan and New Caledonia.

Order MASTACEMBELEFORMES

Family MASTACEMBELIDAE

Genus *Macrogathus* Lacepede

43. ***Macrogathus aculeatus*** (Bloch) 1787

1785. *Ophidium aculeatum*, Bloch, *Ichthyol.*, V. p. 60, pl. 159,

1878. *Rhynchobdella aculeata* Day, *Fish. India*, p. 338, pl. lxxii,

1889. *Rhynchobdella aculeata* Day, *Fauna Brit. India Fish.*, II, Pp. 331-332,

1968. *Macrogathus aculeatus* Srivastava, *Fishes of Eastern Uttar Pradesh*, p. 142,

Material examined : India, North Bihar, 3 exs. from Saharsa Chaur in Saharsa District (Reg. No. V-3368) 6 exs. from Kawar Lake in Begusarai District (Reg. No. V-3369), 4 exs. from Muriakatwa Chaur in Darbhanga District (Reg. No. V-3370); coll. Gopal Sharma and party.

Diagnostic characters : D. 18-22/47; P. 19; A.3/46-50; C. 15; Vert. 18/30.

Eyes-diameter 13 in the length of head; 6 from the end of snout and 1 in the inter-orbital width. Snout is fleshy with a trilobbed extremity and a concave, transversely striated lower surface. Lower jaw is much shorter than the upper one. Pre-opercle is entire. Pre-orbital spine absent. Fins-first dorsal fin consists of spines which increase in size from the anterior to the posterior side (the anterior most is the shortest and the last but one is the longest). Last spine is as long as 1st to 3rd spines. Caudal fin is rounded. Second dorsal fin and the anal fin are separated from the caudal fin by a notch above and below (i.e. dorsal and anal fins not confluent). Anal spines are 3, of which the second is the longest and the strongest, ventral fin is absent while the pectoral fin is very short due to the muddy habit. Colour-brownish or greenish-yellow above and becoming yellowish or lighter below. A light band along the body just above the lateral line. A series of 3-6 large black ocelli with a white boundary are situated along the base of soft dorsal fin on either side. Caudal fin with 5 to 6 vertical brown bars.

Distribution : Bihar

Elsewhere : India, Pakistan, Burma, Thailand, Indo-china, Malaya and East Indies.

Local name : Bami, Gainchi.

Genus **Mastacembelus** Gronovius44. **Mastacembelus armatus** (Lacepede) 1800

1800. *Macrognathus armatus* Lacepede, Hist. Nat. Poissons, **II**, p. 286.
 1878. *Mastacembelus armatus* Day, Fish. India, p. 340, pl. lxxiii,
 1889. *Mastacembelus armatus* Day, Fauna Brit. India Fish., **II**, p. 334.
 1968. *Mastacembelus armatus* Srivastava, Fishes of Eastern Uttar Pradesh, p. 143.

Material examined : India, North Bihar, 2 exs. from Mahisi Chaur in Saharsa District (Reg. No. V-3371), 1 ex. from Saharsa Chaur in Saharsa District (Reg. No. V-3372) and 3 exs. from Muriakatwa Chaur in Darbhanga District (Reg. No. V-3371); coll. Gopal Sharma and party.

Diagnostic characters : D. 24-26/30-37; P. 19, A. 3/31-40; C. 12.

Eyes-small and are situated before the middle of the length of the head; 0.75 to 1 diameter in the inter-orbital width. Snout is trilobed at its extremity. At the angle of the pre-opercle there are strong denticulations, its lower borders provided with 3 to 5 teeth. Fins-dorsal spines short gradually increasing in length posteriorly. Its last spine is short and is equal to the third and fourth spines. The last but one spine being the longest and strongest, the dorsal fin spines commence over the middle of the pectoral. Soft dorsal and anal are separated by a notch from the caudal. Caudal fin is short and rounded. Second anal spine is the longest and strongest. Ventral fins are absent. Scales-18 rows between lateral line and commencement of dorsal rays. Colour-greenish olive along back, yellowish beneath or variously colored. In some specimens yellowish white spots over the side of the body while in others the posterior portion of the body or the entire body is vertically striped. Soft dorsal, pectoral, caudal and anal fins are yellow with numerous black spots, which are arranged, in transverse bars on the anal fin. A distinct streak of elongated spots runs along the lateral line from eye to the base of the tail.

Distribution : Throughout India (except Coromandel Coast).

Elsewhere : Pakistan.

Local name : Bami, Bam.

Genus **Mastacembelus** Gronovius45. **Macrognathus pancalus** Hamilton-Buchanan

1822. *Macrognathus pancalus* : Hamilton-Buchanan, Fishes, Ganges : **30**, 364, pl. 22, fig. 7; (type-locality : tanks of Gangetic provinces).
 1876. *Mastacembalus pancalus* Day, Fishes of India : 340, pl.72, fig. 4; Day, 1889, Fauna Brit. India, Fishes, **II** : 333; Sufi, 1956, Bull. Raffles Mus., (27) : 120, pl. 22, fig. 20.

(Reg. No. V-3374), 2 exs. Ghopa Chaur in Madhepura District (Reg. No. V-3375), 2 exs. Saharsa Chaur in Saharsa District (Reg. No. V-3376), 3 exs. Dandari Chaur in Begusarai

District (Reg. No. V-3377), 8 exs. Kawar Lake in Begusarai District (Reg. No. V-3378), 2 exs. Muriakatwa Chaur in Darbhanga District (Reg. No. V-3379), and 7 exs. Manikamann Chaur in Muzaffarpur District (Reg. No. V-3380); coll. Gopal Sharma and party.

Diagnostic characters : D. XXIV-XXVI 30-42; A III 31-46; P 17-19; C 12.

Body eel-like and slightly compressed. Rostrum rounded in cross-section, devoid of tooth plates. Pre-opercle with 2 to 5 spines; pre-orbital spine strong and pierces skin. Mouth small. Dorsal fin inserted above middle of pectoral fins; dorsal and anal fins separate from caudal fin. Colour in live, greenish-olive along back, yellowish on belly, with many yellowish-white spots on flanks and often striped with dark brown vertical stripes join together forming a network. Soft dorsal, anal, pectoral and caudal fins yellow with numerous minute black spots.

Distribution : Throughout India

Elsewhere : Pakistan, and Bangladesh.

Local name : Gaincha, Bami, Malya, Patya and Malga.

Class OSTEICHYES/OSTEIGLOSIFORMES

Subclass ACTINOPTERYGII

Order OSTEOGLOSSIFORMES

Suborder NOTOPTEROIEI

Family NOTOPTERIDAE

Genus **Notopterus** Lacepede

46. **Notopterus notopterus** (Pallas 1767)

1767. *Gymnotus notopterus* Pallas, Spec. Zool. **I**, (7), p. 40, t. VI,

1969. *Gymnotus notopterus* Pallas. Spec. Zool., **7** : 40, pl. 6 fig.2

1976. *Notopterus notopterus* Misra, Fauna of India, Pisces (2nd Edn.) **2**, 278, fig 77 and pl. 7 fig. 3

1878. *Notopterus kaporat* Day, Fish. India, p. 653, pls. clix,

1889. *Notopterus kaporast* Day, Fauna Brit. India Fish., **I**, p. 406.

1968. *Notopterus notopterus* Srivastva, Fishes of Eastern Uttar Pradesh, p. 17,

Material examined : India, North Bihar, 2 exs. from Mahisi Chaur in Saharsa District (Reg. No. V-3381), 1 ex. from Samsolia Chaur in Madhepura District (Reg. No. V-3382), 3 exs. from Kawar Lake in Begusarai District (Reg. No. V-3383), 4 exs. from Muriakatwa Chaur in Darbhanga District (Reg. No. V-3384), 1 ex. from Isharain Chaur in Madhubani District (Reg. No. V-3385), and 1 ex. from Manikamann Chaur in Muzaffarpur District (Reg. No. V-3386); coll. Gopal Sharma and party.

Diagnostic characters : D 7-9; A + C 100-110; V 5-6.

Body oblong and strongly compressed. Head compressed, its length about 4.5 times in standard length; preorbital serrated. Mouth moderate, maxilla extends to mid orbit. Dorsal fin inserted from snout to back of caudal fin. Pectoral fin moderate and extends beyond anal fin origin. Scales minute, considerably larger on opercles than on body.

Colour : in life, silvery-white with numerous fine gray spots on body and head which are dark along the narrow back.

Eyes-diameter 4.58 (4.25 to 5) in the length of head; 1 from the end of snout and 1 in the inter-orbital width.

Distribution : Fresh and brackish waters of India

Elsewhere : Pakistan, Myanmar, Malaya Archipelago and Philippines.

Local name : Moi.

Order TETRODONTIFORMES

Suborder TETRODONTOIDEI

Family TETRODONTIDAE

Genus **Tetrodon** Linn.

47. **Tetrodon cutcutia** (Ham.) 1822

1822. *Tetrodon cutcutia* Ham., Fish, Ganges, pp. 8, 362, pl. xviii.

1878. *Tetrodon cutcutia* Day, Fish. India, p. 703, pl. clxxxii.

1889. *Tetrodon cutcutia* Day, Fauna Brit. India, Fish. II, p. 493.

1969. *Tetrodon cutcutia* Srivastava, Fishes of Eastern Uttar Pradesh, p. 146,

Material examined : India, North Bihar, 2 exs. from Kowar Lake in Begusarai District (Reg. No. V-3387) and 2 exs. from Muriakatwa Chaur in Darbhanga District (Reg. No. V-3388); coll. Gopal Sharma & party.

Diagnostic characters : D. 10; P. 21; A. 10; C. 7.

Caudal fin is 6 in the total length. Eyes-1.5 diameter from the end of snout and 2.5 in the inter-orbital width. Back is broad and tapers towards the tail. Inter-orbital space is flat and broad. Nostril is in the form of a single orifice and is situated in a very short simple tube. Fins-Pelvic fin spines are absent, all the fins are rounded. Scales-entirely absent. Colour-upper surface greenish black, with light bars extending from dorsum to lateral side. The ventral surface is white. A well-marked ocellus is just above the anal fin on either side.

Distribution : Fresh waters of Uttar Pradesh, Orissa, Bengal, Assam.

Elsewhere : Bangladesh.

Local name : Galphulani.

Order PERCIFORMIS
Family AMBASSIDAE PERCIFORMIS
Genus **Pseudombassis**

48. **Pseudombassis ranga** (Hamilton-Buchanan)

1822. Chanda ranga Hamilton-Buchanan, Fishes of Ganges : pp. 113, 371, pl. 16, fig. 38 (type-locality : Freshwaters of all parts of Gangetic provinces).
1875. Ambassis ranga : Day (partim), Fishes of India : 51, pl. 14, fig. 6; Day (partim), 1889, Fauna Brit. India, Fish. I : 485

Material examined : India, North Bihar, 24 exs. from Manikamann Chaur in Muzaffarpur District (Reg. No. V-3389); coll. Gopal Sharma & party.

Diagnostic characters : D VII+ 11-14; A III 13-15; P i 11-12; V I 5.

Body stout, deep and compressed. Preopercular hind edge smooth, almost with one or two serrations at angle. Mouth oblique. Gill rakers 15 or 16 on lower arm of first arch. Scales small; lateral line with 47 to 63 scales; cheek with 7 transverse scale-rows.

Colour in live, transparent with a greenish-yellow tinge and a silvery gloss on versum; a silvery broad lateral stripe on side of body; a definite dusky spot on shoulder. Fins hyaline, dorsal and caudal fins with blackish edges.

Distribution : Pakistan, India, Bangladesh, Burma, Thailand and Malaysia.

Local name : Chanda.

CONCLUSION

The Indian inland fishes comprise a vivid spectrum of ichthyofauna, offering challenging avenues of taxonomical and biological pursuits. Although considerable work has been done by ichthyologists and fish biologists, much still remains to be accomplished, particularly in those areas where environments are rapidly changing due to human impact of one sort or another. In recent times fishes, especially freshwater fishes of the Indian Region, are threatened due to loss of habitat, as small wetlands are being dammed and are cleared for agriculture and for other purposes. Deleterious effects also result from over fishing, catching of breeding fish and fry, pollution of small wetlands due to indiscriminate use of pesticides.

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Table 1 Contd.

Sl. No.	Scientific Name	Sampling Sites																		
		Kajradhar Chaur, Araria	Chatar Chaur, Araria	Kawar lake, Begusarai	Dandari Chaur, Begusarai	Saharsa , Saharsa	Mahisi Chaur, Saharsa	Matsagandha Chaur, Saharsa	Tin Dobha Chaur, Khagaria	Kausar Chaur, Darbhanga	Maran Chaur, Darbhanga	Muriakatwa Chaur, Darbhanga	Isharain Chaur, Madhubani	Samsolia Chaur, Madhepura	Ghopa Chaur, Madepura	Turkey Chaur , Muzaffarpur	Motipur Chaur, Muzaffarpur	Manikaman Chaur, Muzaffarpur	Baraila Chaur, Vaishali	Daruabari Chaur, Valmiki Nagar
18.	<i>Ompok bimaculatus</i> (Bloch.) 1797	+	-	+	-	-	-	-	-	-	-	+	+	+	-	-	-	-	-	-
19.	<i>Ompok pabda</i> (Ham.-Buch.)	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20.	<i>Wallago attu</i> (Bl. & Schn.) 1801	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
21.	<i>Mystus bleekeri</i> (Day) 1878	+	-	-	-	-	-	+	-	-	-	-	+	-	-	-	-	-	-	-
22.	<i>Mystus cavasius</i> (Ham.) 1822	+	+	+	-	+	-	-	-	+	-	+	-	+	+	+	-	+	-	-
23.	<i>Mystus vittatus</i> (Bloch) 1797	+	+	+	-	+	-	-	-	+	-	+	-	+	+	-	+	+	-	-
24.	<i>Pseudeutropius atherinoides</i> (Bloch) 1794	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-
25.	<i>Heteropneustes fossilis</i> (Bloch) 1785	+	+	+	-	+	-	+	-	-	-	+	+	+	-	-	+	+	-	+
26.	<i>Clarias batrachus</i> (Linn.) 1758	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27.	<i>Xenentodon cancila</i> (Ham.) 1822	+	+	+	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	+
28.	<i>Channa orientalis</i> Bloch & Schneider	+	+	-	+	+	-	-	-	-	-	+	+	+	-	-	-	-	+	+
29.	<i>Channa marulius</i> (Ham.) 1822	-	-	-	-	-	-	+	-	-	-	+	+	+	-	-	-	-	-	-
30.	<i>Channa punctatus</i> (Bloch) 1785	-	+	+	+	+	+	-	+	-	-	+	+	+	+	+	+	+	+	+
31.	<i>Channa stewartii</i> (Playfair) 1867	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32.	<i>Channa striatus</i> (Bloch) 1785	+	-	+	-	-	-	-	-	-	+	+	-	-	-	+	-	-	-	-
33.	<i>Amphipnous cuchia</i> (Ham.) 1822	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34.	<i>Pseudambassis baculis</i> (Ham.- Buch.)	-	-	+	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 1. Contd.

Sl. No.	Scientific Name	Sampling Sites																		
		Kajradhar Chaur, Araria	Chatar Chaur, Araria	Kawar lake, Begusarai	Dandari Chaur, Begusarai	Saharsa , Saharsa	Mahisi Chaur, Saharsa	Matsagandha Chaur, Saharsa	Tin Dobha Chaur, Khagaria	Kausar Chaur, Darbhanga	Maran Chaur, Darbhanga	Murikatwa Chaur, Darbhanga	Isharain Chaur, Madhubani	Samsolia Chaur, Madhepura	Ghopa Chaur, Madepura	Turkey Chaur , Muzaffarpur	Motipur Chaur, Muzaffarpur	Manikaman Chaur, Muzaffarpur	Baraila Chaur, Vaishali	Daruabari Chaur, Valmiki Nagar
35.	Chanda nama Ham. 1822	-	-	+++	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
36.	Chanda ranga Ham. 1822	-	+	+	+	+	-	-	-	-	+	-	-	+	+	-	+	+	+	
37.	Badis badis (Ham.) 1822	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
38.	Nandus nandus Ham.-Buch.	+	-	-	-	+	+	-	-	-	-	+	+	+	-	-	-	+	-	
39.	Anabas testudineus (Bloch)1785	-	+	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	
40.	Colisa chuna (Ham.) 1822	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
41.	Colisa fasciatus (Bl. & Schn.) 1801	-	++	+++	++++	-	+	+++	+++	++	+++	+	+++	+	+	+	+	-	-	
42.	Glossogobius giuris (Ham.) 1822	-	+	+	-	+	-	-	-	-	-	+	-	-	+	-	-	-	-	
43.	Macrognaathus aculeatus (Bloch) 1787	-	-	+	-	+	-	-	-	-	-	+	-	-	-	-	-	-	-	
44.	Mastacembelus armatus (Lacepede) 1800	-	-	-	-	+	+	-	-	-	-	+	-	-	-	-	-	-	-	
45.	Macrognaathus pancalus Ham. - Buch.	-	+	+	+	+	-	-	-	-	-	+	-	+	-	-	+	-	-	
46.	Notopterus notopterus (Pallas 1767)	-	-	+	-	-	+	-	-	-	-	+	+	+	-	-	-	+	-	
47.	Tetrodon cutcutia (Ham.) 1822	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	
48.	Pseudambassis ranga (Ham.-Buch.)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+++	-	-	
	Total no. of Taxa	12	16	26	7	21	13	3	7	4	4	25	16	15	6	5	5	10	5	7

+ = Rare (1-5 Individuals), ++ = Low (6-10 Individuals), +++ = Medium (11-20 Individuals), ++++ = High (>21 Individuals)

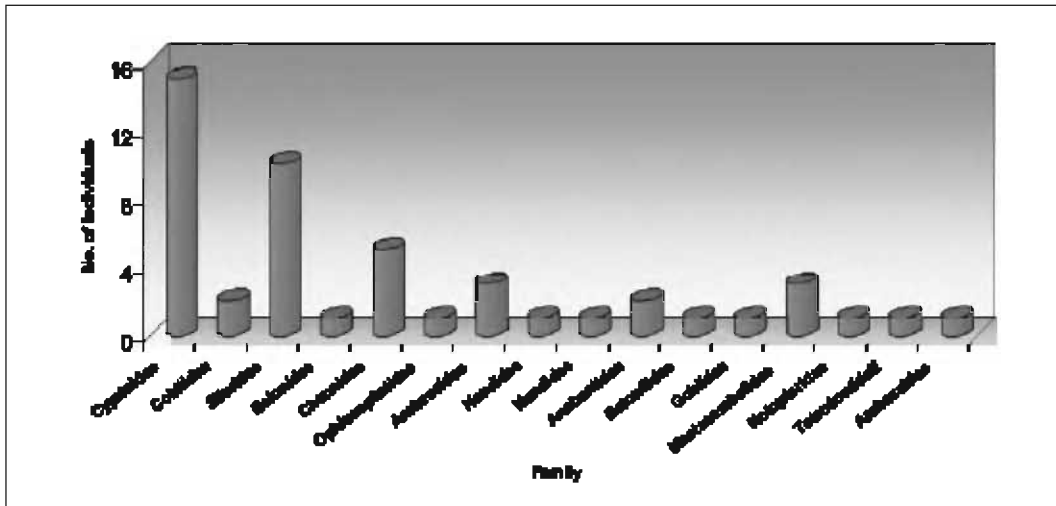


Fig. 1. Family wise species diversity of fishes in the Chours of North Bihar

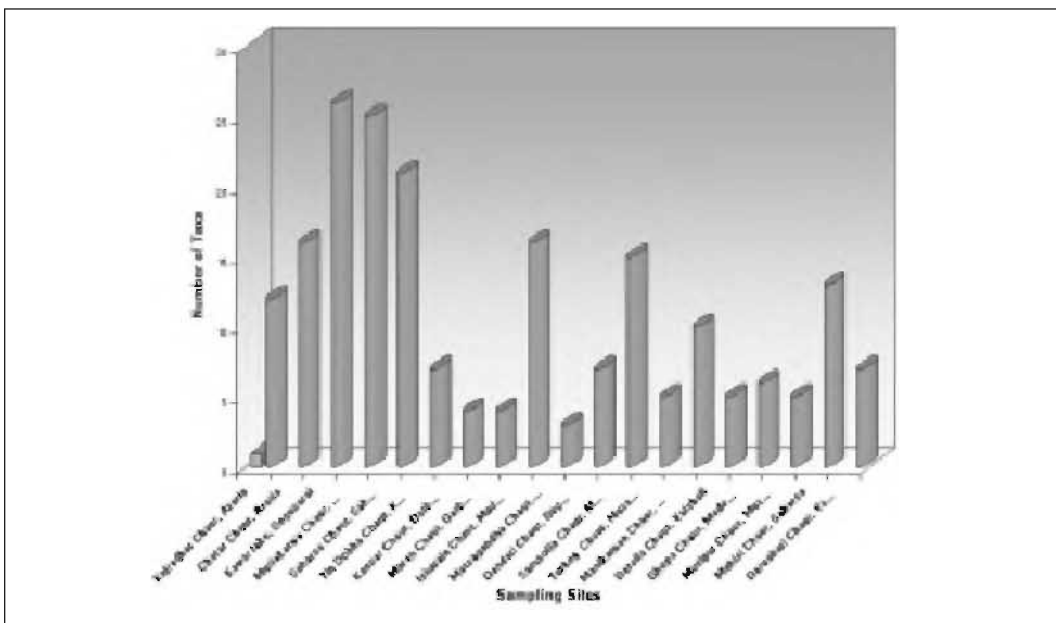


Fig. 2. Site wise abundance of fish taxa in the chours of North Bihar

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AVIAN DIVERSITY

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INTRODUCTION

The North Bihar Chours are known as the most important wetlands for aquatic birds, especially the anatids and waders visiting during the winter season. These Chours are very similar to the Hoars of Bangladesh (Bird Life International 2001), which also act as the important wintering grounds for large numbers of ducks, egrets, herons, waders and raptors.

In the present study, aquatic birds have been observed which are visiting open water, mudflats and wetlands having submerged, floating and emergent vegetation. Birds were recorded by direct sightings in the Chours. The data were recorded during the surveys in different seasons in the year 2005-2007.

A total of 841 species of birds have been recorded in Nepal (Inskipp and Inskipp, 1991). As many as 193 species are dependent on wetlands, and among them 187 species are dependent on the terai (foothills) wetlands of Nepal (Bhandari, 1998). The birds of this area have been studied by many ornithologists and naturalists (Inskipp and Inskipp, 1985; Scott, 1989; Suwal, 1993 and Baral, 2000). The population of birds was surveyed from April 2005 to March 2007, thrice in a year but extensive surveys were conducted during the winter season as the migratory birds are visiting the area regularly. Direct counting method was adopted and the species were identified with the help of relevant literatures and guidebooks Sahi (1982), Ali and Ripley (1986, 1989), Grimmett and Inskipp (1999), Ali (1989, 1990), Inskipp and Inskipp (1991), Fleming et al. (2000), Shrestha (2000). The birds of Bihar, specially the North Bihar have been studied by Singh et al. (1989, 1989a), Anon (1990), Yasmin (1997), Mishra (1999, 2000 a, 2000 b, 2001, 2004 a, 2004 b, 2005, 2006), Choudhary et al. (2004), Mishra et al. (2005), Mishra et al. (2006) and Choudhary et al. (2006).

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MATERIALS AND METHODS

Specific details were observed with the help of 10 × 40 Binocular and where ever possible the photographs were taken with the help of 70-210 mm Nikon Zoom lens with 35 mm digital SLR Camera. Listing and abundance of water birds has been done as per the guidelines of Asian Waterfowl Census Site and Count Form 2008 and help was taken from the books, Expedition Field Techniques - Bird Surveys by Colin Bibby, Martin Jones and Stuart Marsden; Bird Life International, UK (1998), an introduction to bird survey and census techniques; Coursework handbook; by Richard D. Gregory & Paul F. Donald, RSPB, UK. (1998) and Field methods for Bird surveys by Salim Javed and Rahul Kaul (2002). The status of the species has been taken into the account in accordance with the Threatened Birds of India, Birdlife International's 2001 IUCN Red List.

STUDY AREA

Numerous rivers and streams drain the wetlands of North Bihar. The most important ones are the tributaries of River Ganga i.e. Ghaghra, Gandak, Bagmati, Burhi Gandak and Kosi. This area of gangetic flood plains is famous for its wetlands, which are the result of copious rainfall in this area, and also the rivers originating from the Himalayas. Large area of North Bihar is annually flooded and when the floodwater recedes, it leaves the low-lying areas inundated. These wetlands are extremely productive in terms of vegetation biomass and avian diversity (Howes, 1995). The slope of the area is from north to south and then continues towards southeast.

In local parlance the small wetlands are known as Chours or Chawars in North Bihar.

The important chours/wetlands of eleven districts of North Bihar namely Araria, West Champaran, Muzaffarpur, Vaishali, Madhubani, Darbhanga, Khagaria, Samastipur, Saharsa, Madhepura and Begusarai were selected for the study of avian diversity and abundance.

RESULTS AND DISCUSSION

Altogether 72 species were enlisted out of which 39 species of water birds were belonging to 11 families and 30 genera. Other 33 species recorded were the riparian/terrestrial species of birds, which were observed in and around the Chours of North Bihar belonging to 22 families 26 genera. It comprises 28 winter visitors and 46 local migratory or residents (Table 1-4). Out of 39 species of water birds, 14 species were migratory, 4 were local migratory and 21 species were the resident ones. Whereas, among the riparian/terrestrial birds observed, 12 species were migratory and 21 were resident. Comparatively, the Kowar Lake area was found to be very rich in avian diversity with 27 species. This may be due to the availability of suitable habitat and food. The maximum winter visitor species occurred in the month of January followed by February and March.

Altogether, 4 near threatened species i.e. Darter (*Ahninga melanogaster*), Black headed Ibis (*Threskiornis melanocephalus*), White eyed Pochard (*Aythya nyroca*) and Eurasian Curlew (*Nemienus arquata*) and 1 vulnerable species Lesser Adjutant (*Leptoptilos*

javanicus) of water birds were observed and rest 34 water bird species are falling under the least concern or lower risk category. Whereas, only a single bird species Rufous vented Prinia (*Prinia burnesii cinerascens*) was found to be near threatened and 32 were having the status of least concern or lower risk category among the terrestrial birds. Earlier studies on the avifauna of Kawar Lake reveals the distribution of 59 migratory species belonging to 34 genera, 16 families, 9 orders and 107 residential forms under 81 genera, 35 families and orders. (Ramakrishna et al, 2002)

Threats

The diversity of birds recorded during this study period was compared with earlier records (Scott, 1989) and a decreasing trend was observed in the abundance of Pintail, Garganey, Lesser Whistling Teal and Ruddy Shelduck specially. There may be various reasons for the decrease in abundance of species. They might have found a more suitable and safe place early in their migration route or looking at the disturbance and not suitable habitat in this area, they moved further. The other apparent reasons observed by us were the hunting, poaching and trapping in this area or probably the massive hunting was taking place somewhere else in their migration route or at the stop over sites. Disturbance in their native or the breeding grounds may also have caused the decline in their number. One of the most important observations was made during the survey that the entire Kawar Lake was dried up in summer in 2006 leaving no space for water birds specially. Besides these, extreme human interference due to fishing and collection of the wetland produces in winter, food shortage due to drying of lake in summer and deposition of silt in the channels of water sources and in the surrounding Chours around the Kawar Lake are some other obvious reasons, which may be attributed to the declining avifauna.

Report on Bird Massacre

S.P. Sahi (1982) reports 200 birds mainly Coot, Common Teal, Pintail, Shoveller and pochards were sold in Manjhaul market on as single day (27.1.1982). He further states, "Shahnis are the traditional fishermen and birds trappers of the village" netted 30,000 birds in November 1981; 30,000 in December 1981, 5000 in January 1982 and about 2000 during February of the same year. Overall 70,000 birds, including ducks and teals were netted and sold in Manjhaul market alone. He estimated that around, 1,50,000 migratory birds visited during that winter. However, according to the State Forests Authorities, "Birds trapping" has never been a profession of the Sahanis. There is also no concrete evidence as to how and when Sahanis started birds trapping business in the lake. This they attribute to the population explosion of the Sahanis that compelled them to adopt birds trapping business as a subsidiary occupation. But during the current study period, it was found that the birds trapping were far less barring a few evidences of occasional trappings in the remote and inaccessible area of the Kawar Lake. This is to be noted that in recent past years, the migratory birds are not visiting the lake in good number due to various factors i.e unavailability of good habitat, some threats as they were coming earlier in the Kawar Lake and in the Chours of North Bihar. More awareness and education among the local communities and law enforcement by Government Officials and NGOs is needed in the area to reduce the birds trapping and trading.

Table 1 Status of water birds in and around the Chours of North Bihar during 2005-2007

Sl. No.	Family	Common Name	Zoological Name	Status	IUCN Status	Abundance	Habitat
Cormorants/ Shags							
1.	Phalacrocoracidae	Little Cormorant	Phalacrocorax niger	R	LR-LC	+++	Ow, B
2.	Phalacrocoracidae	Intermedian Cormorant	Phalacrocorax fuscicollis	R	LR-LC	+	Ow
3.	Phalacrocoracidae	Great Cormorant	Phalacrocorax carbo	R/LM	LR-LC	+	Ow
4.	Anhingidae	Darter	Anhinga melanogaster	R/LM	THR-NT	+	Ow, B, Cm
Heron, Egrets & Bitterns							
5.	Ardeidae	Grey Heron	Ardea cinerea	R/LM	LR-LC	+	Sv, Cm
6.	Ardeidae	Purple Heron	Ardea purpurea	R	LR-LC	++	Cm
7.	Ardeidae	Pond Heron	Ardeola grayii	R	LR-LC	++	Sv, Cm, Sw
8.	Ardeidae	Cattle Egret	Bubulcus ibis	R	LR-LC	+++	Sv,Cm,Sw
9.	Ardeidae	Great Egret/ Large Egret	Casmerodius albus	R	LR-LC	++	Ow, Cm
10.	Ardeidae	Intermediate Egret	Mesophoyx intermedia	R	LR-LC	++	Cm, Sw
11.	Ardeidae	Little Egret	Egretta garzetta	R	LR-LC	++	Cm, Sw
12.	Ardeidae	Little Bittern	Ixobrychus minutus	R	LR-LC	+	Cm
Storks							
13.	Ciconidae	Asian Openbill Stork	Anastomus oscitans	R	LR-LC	+++	Ow, H
14.	Ciconidae	Lesser Adjutant Stork	Leptoptilos javanicus	R	THR-Vu	+	Cm
Ibises & Spoon bill							
15.	Threskiornithidae	Black Headed Ibis/ White Ibis	Threskiornis melanocephalus	R	THR-NT	++	Cm
16.	Threskiornithidae	Black Ibis/ Red Naped Ibis	Pseudibis papillosa	R	LR-LC	++	Cm
17.	Threskiornithidae	Spoon bill	Platelea leucoroidea Major	LM	LR-LC	+	Ow, H
Swans, Geese & Ducks							
18.	Anatidae	Lesser Whistling Teal/Duck	Dendrocygna javanica	R	LR-LC	+++	Ow
19.	Anatidae	Northern Pintail	Anas acuta	M	LR-LC	+++	Cm

Table 1 Contd.

Sl. No.	Family	Common Name	Zoological Name	Status	IUCN Status	Abundance	Habitat
20.	Anatidae	Red Crested Pochard	Netta rufina	M	LR-LC	++	Ow
21.	Anatidae	White Eyed Pochard/ Ferruginous Pochard	Aythya nyroca	M	THR-NT	+++	Ow
22.	Anatidae	Common Pochard	Aythya ferina	M	LR-LC	+	Ow
23.	Anatidae	Common Teal	Anas crecca	M	LR-LC	++	Ow
24.	Anatidae	Northern Shoveller	Anas clypeata	M	LR-LC	+	Cm
25.	Anatidae	Mallard	Anas platyrhynchos	M	LR-LC	+	Ow
26.	Anatidae	Ruddy Shelduck	Tadorna ferruginea	M	LR-LC	++	Ow
Moorhen, Rail, Coot							
27.	Rallidae	Indian Moorhen/ Common Moorhen	Gallinula chloropus	R	LR-LC	++	Ow, Sv
28.	Rallidae	Common Coot	Fulica atra	M	LR-LC	+++	Ow
Jacana							
29.	Jacaniidae	Pheasant Tailed Jacana	Hydrophasianus chirurgus	R	LR-LC	+++	Cm, Ow
30.	Jacaniidae	Bronze Winged Jacana	Metopidius indicus	R	LR-LC	++	Cm,Ow
Sandpiper and Snipe							
31.	Charadriidae	Wood Sandpiper/ Spotted Sandpiper	Tringa glareola	M	LR-LC	+++	Cm
32.	Charadriidae	Ruff & Reeve	Philomachus pugnax	M	LR-LC	+	Ow
33.	Charadriidae	Fantail Snipe/Common Snipe	Gallinago gallinago	M	LR-LC	++	Cm
34.	Charadriidae	Pintail Snipe	Gallinago stenura	M	LR-LC	+	Cm
Kingfisher							
35.	Alcedinidae	Common Kingfisher	Alcedo atthis	R	LR-LC	++	Cm, Ow
36.	Alcedinidae	Stork Billed Kingfisher	Halcyon capensis	R	LR-LC	+	Cm, Ow

Table 1 Contd.

Sl. No.	Family	Common Name	Zoological Name	Status	IUCN Status	Abundance	Habitat
37.	Alcedinidae	White Breasted Kingfisher/ White Throated Kingfisher	Halcyon smyrnensis	R	LR-LC	++	Cm,Ow
38.	Alcedinidae	Lesser Pied Kingfisher	Ceryle rudis	R	LR-LC	++	Cm, Ow
Curlew							
39.	Scolopacidae	Eurasian Curlew	Numenius arquata	M	THR-NT	+	Cm

M-Migratory, R-Resident, LM-Local Migration, THR-Threatened, THR-NT-Nearly Threatened, THR-V-Vulnerable, LR-LC-Lower Risk-Least Concern, BR-Biome Restricted, MAL-Indian Malayan Dry Zone, INDG-Indo Gangetic Plain, Family description (Ali & Ripley)
 + = rare; ++ = common; +++= very common; Ow = Open water; Sw = Shallow water; Cm = Chaur margin; Sv = Submerged vegetation;
 H = Heronary; Cmt = Chaur margin trees; Gl = Grass land; B = Bushes;

Table 2. Abundance of water Birds in and around the Chauras of North Bihar with special reference to Kowar Lake during 2005–2007

Sl. No.	Common Name/ Scientific Name	Sampling Sites with GPS																							
		Turkey Chaur (Muzaffarpur) 26°02.306'N 85°20.201'E	Harpur Machia Chaur (Muzaffarpur) 26°08.230'N 85°22.171'E	Baraila Lake (Vaishali) 25°44.973'N 85°35.216'E	Bhoga Chaur (Madhubani) 26°17.634'N 86°69.900'E	Sarsopahi Chaur (Madhubani) 26°14.288'N 86°10.791'E	Muriakatwa Chaur (Darbhanga) 26°11.839'N 86°00.208'E	Maran Chaur (Darbhanga) 26°08.817'N 85°59.164'E	Majilsa Pokhar Chaur (Darbhanga) 26°07.895'N 86°01.936'E	Hathia Cole (Khagaria) 25°31.849'N 86°43.101'E	Tin Dobha Chaur (Khagaria) 25°37.315'N 86°43.569'E	Satanpur Chaur (Samastipur) 25°42.263'N 85°48.357'E	Matsa Gandha Chaur (Saharsa) 25°54.274'N 86°35.024'E	Ghelar Chaur (Madhepura) 25°58.863'N 86°40.958'E	Samsolia Chaur (Madhepura) 25°56.948'N 86°40.582'E	Kawar Lake (Begusarai) 25°35.410'N 86°09.716'E	Rajaura Chaur (Begusarai) 25°37.225'N 86°09.731'E	Karu Gamail Chaur (Begusarai) 25°39.129'N 86°10.500'E	Pathkaul Chaur (Begusarai) 25°35.410'N 86°09.716'E	Dandari Chaur (Begusarai) 25°28.139'N 86°18.100'E	Naula Chaur (Begusarai) 25°31.222'N 86°02.149'E	Chatar Chaur (Araria) 26°00.024'N 87°30.111'E			
	Family PHALACROCORACIDAE (Cormorant/ Shag)																								
1.	Little Cormorant Phalacrocorax niger	-	++	-	-	+	-	+	-	++++	-	++++	-	++	++++	-	+	-	+	-	+	-	-	-	++++
2.	Intermediate Cormorant Phalacrocorax fuscicollis	-	+	+++	-	-	-	-	-	++	-	-	-	-	++++	-	-	-	-	-	-	-	-	-	-
3.	Great Cormorant Phalacrocorax carbo	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4.	Darter Anhinga melanogaster	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Family ARDEIDAE (Egret, Bittern, Herons)																								
5.	Grey Heron, Ardea cinerea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6.	Purple Heron, Ardea purpurea	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7.	Indian Pond Heron Ardeola grayii	-	++	+++	-	+	+	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 2. Contd.

Sl. No.	Common Name/ Scientific Name	Sampling Sites with GPS																				
		Turkey Chaur (Muzaffarpur) 26°02.306'N 85°20.201'E	Harpur Machia Chaur (Muzaffarpur) 26°08.230'N 85°22.171'E	Baraila Lake (Vaishali) 25°44.973'N 85°35.216'E	Bhoga Chaur (Madhubani) 26°17.634'N 86°69.900'E	Sarsopahi Chaur (Madhubani) 26°14.288'N 86°10.791'E	Muriakatwa Chaur (Darbhanga) 26°11.839'N 86°00.208'E	Maran Chaur (Darbhanga) 26°08.817'N 85°59.164'E	Majilsa Pokhar Chaur (Darbhanga) 26°07.895'N 86°01.936'E	Hathia Cole (Khagaria) 25°31.849'N 86°43.101'E	Tin Dobha Chaur (Khagaria) 25°37.315'N 86°43.569'E	Satanpur Chaur (Samastipur) 25°42.263'N 85°48.357'E	Matsa Gandha Chaur (Saharsa) 25°54.274'N 86°35.024'E	Ghelar Chaur (Madhepura) 25°58.863'N 86°40.958'E	Samsolia Chaur (Madhepura) 25°56.948'N 86°40.582'E	Kawar Lake (Begusarai) 25°35.410'N 86°09.716'E	Rajaura Chaur (Begusarai) 25°37.225'N 86°09.731'E	Karu Gamail Chaur (Begusarai) 25°39.129'N 86°10.500'E	Pathkaul Chaur (Begusarai) 25°35.410'N 86°09.716'E	Dandari Chaur (Begusarai) 25°28.139'N 86°18.100'E	Naula Chaur (Begusarai) 25°31.222'N 86°02.149'E	Chatar Chaur (Araria) 26°00.024'N 87°30.111'E
8.	Cattle Egret <i>Bubulcus ibis</i>	.	+++	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
9.	Great Egret <i>Casmerodius albus</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
10.	Intermediate Egret <i>Mesophoyx intermedia</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
11.	Little Egret <i>Egretta garzetta</i>	+++	.	+++	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
12.	Little Bittern <i>Isobrychus minutus</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
13.	Family CICONIIDAE (Storks)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
14.	Asian Open bill Stork <i>Anastomus oscitans</i>	.	.	++++	++	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
14.	Lesser Adjutant Stork <i>Leptoptilos javanicus</i>	.	.	.	++	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
15.	Family THRESKIORNITHIDAE (Ibises & Spoon bills)	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
15.	White Ibis/Black Headed Ibis <i>Threskionis melanocephalus</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

Table 2. Contd.

Sl. No.	Common Name/ Scientific Name	Sampling Sites with GPS																				
		Turkey Chaur (Muzaffarpur) 26°02.306'N 85°20.201'E	Harpur Machia Chaur (Muzaffarpur) 26°08.230'N 85°22.171'E	Baraila Lake (Vaishali) 25°44.973'N 85°35.216'E	Bhoga Chaur (Madhubani) 26°17.634'N 86°69.900'E	Sarsopahi Chaur (Madhubani) 26°14.288'N 86°10.791'E	Muriakatwa Chaur (Darbhanga) 26°11.839'N 86°00.208'E	Maran Chaur (Darbhanga) 26°08.817'N 85°59.164'E	Majilsa Pokhar Chaur (Darbhanga) 26°07.895'N 86°01.936'E	Hathia Cole (Khagaria) 25°31.849'N 86°43.101'E	Tin Dobha Chaur (Khagaria) 25°37.315'N 86°43.569'E	Satanpur Chaur (Samastipur) 25°42.263'N 85°48.357'E	Matsa Gandha Chaur (Saharsa) 25°54.274'N 86°35.024'E	Ghelar Chaur (Madhepura) 25°58.863'N 86°40.958'E	Samsolia Chaur (Madhepura) 25°56.948'N 86°40.582'E	Kawar Lake (Begusarai) 25°35.410'N 86°09.716'E	Rajaura Chaur (Begusarai) 25°37.225'N 86°09.731'E	Karu Gamail Chaur (Begusarai) 25°39.129'N 86°10.500'E	Pathkaul Chaur (Begusarai) 25°35.410'N 86°09.716'E	Dandari Chaur (Begusarai) 25°28.139'N 86°18.100'E	Naula Chaur (Begusarai) 25°31.222'N 86°02.149'E	Chatar Chaur (Araria) 26°00.024'N 87°30.111'E
16.	Black ibis/Red napped Ibis <i>Pseudibis papillosa</i>	.	.	++	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
17.	Spoon Bill <i>Platalea leucoroides</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Family ANATIDAE (Swans, Geese & Ducks)																					
18.	Lesser Whistling-teal <i>Dendrocygna javanica</i>	.	.	.	+++	.	.	.	+	.	.	.	++++	.	.	.	.	.	.	.	.	.
19.	Northern pintail <i>Anas acuta</i>	.	.	.	++	.	.	.	+	.	.	.	+++	.	.	.	.	.	.	.	.	.
20.	Red Crested Pochard <i>Nettion rufina</i>	.	.	++	.	.	.	+	.	.	.	.	.	+	.	.	.	.	.	.	.	.
21.	Common Teal <i>Anas crecca</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	++++	.	.	.	.	++
22.	Northern Shoveller <i>Anas clypeata</i>	.	.	.	.	.	.	.	+++	.	.	.	.	.	.	.	.	.	.	.	.	.
23.	Mallard <i>Anas platyrhynchos</i>	.	.	.	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.
24.	White eyed Pochard <i>Aythya nyroca</i>	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	+++	.	.	.	.	.

Table 2. Contd.

Sl. No.	Common Name/ Scientific Name	Sampling Sites with GPS	
25.	Common Pochard <i>Aythya ferina</i>	Turkey Chaur (Muzaffarpur) 26°02.306'N 85°20.201'E	.
		Harpur Machia Chaur (Muzaffarpur) 26°08.230'N 85°22.171'E	.
		Baraila Lake (Vaishali) 25°44.973'N 85°35.216'E	.
		Bhoga Chaur (Madhubani) 26°17.634'N 86°69.900'E	.
		Sarsopahi Chaur (Madhubani) 26°14.288'N 86°10.791'E	.
		Muriakatwa Chaur (Darbhanga) 26°11.839'N 86°00.208'E	.
		Maran Chaur (Darbhanga) 26°08.817'N 85°59.164'E	.
		Majilsa Pokhar Chaur (Darbhanga) 26°07.895'N 86°01.936'E	.
		Hathia Cole (Khagaria) 25°31.849'N 86°43.101'E	+++
		Tin Dobha Chaur (Khagaria) 25°37.315'N 86°43.569'E	.
		Satanpur Chaur (Samastipur) 25°42.263'N 85°48.357'E	.
		Matsa Gandha Chaur (Saharsa) 25°54.274'N 86°35.024'E	.
		Ghelar Chaur (Madhepura) 25°58.863'N 86°40.958'E	++
		Samsolia Chaur (Madhepura) 25°56.948'N 86°40.582'E	++
		Kawar Lake (Begusarai) 25°35.410'N 86°09.716'E	+++
		Rajaura Chaur (Begusarai) 25°37.225'N 86°09.731'E	.
		Karu Gamail Chaur (Begusarai) 25°39.129'N 86°10.500'E	.
Pathkaul Chaur (Begusarai) 25°35.410'N 86°09.716'E	.		
Dandari Chaur (Begusarai) 25°28.139'N 86°18.100'E	.		
Naula Chaur (Begusarai) 25°31.222'N 86°02.149'E	.		
Chatar Chaur (Araria) 26°00.024'N 87°30.111'E	.		
26.	Ruddy Shelduck <i>Tadorna ferruginea</i>	.	.
		.	.
27.	Indian moorhen <i>Gallinula chloropus</i>	.	+
		.	.
28.	Common Coot <i>Fulica atra</i>	.	.
		.	.
29.	Pheasant-Tailed Jacana <i>Hydrophasianus chirurgus</i>	.	.
		.	+
30.	Bronze-winged Jacana <i>Metopidius indicus</i>	.	.
		.	+
31.	Wood/Spotted Sandpiper <i>Tringa galarola</i>	.	+++
		.	+
32.	Ruff and Reeve <i>Philomachus pugnax</i>	.	.
		.	.

Table 2. Contd.

Sl. No.	Common Name/ Scientific Name	Sampling Sites with GPS																					
		Turkey Chaur (Muzaffarpur) 26°02.306'N 85°20.201'E	Harpur Machia Chaur (Muzaffarpur) 26°08.230'N 85°22.171'E	Baraila Lake (Vaishali) 25°44.973'N 85°35.216'E	Bhoga Chaur (Madhubani) 26°17.634'N 86°69.900'E	Sarsopahi Chaur (Madhubani) 26°14.288'N 86°10.791'E	Muriakatwa Chaur (Darbhanga) 26°11.839'N 86°00.208'E	Maran Chaur (Darbhanga) 26°08.817'N 85°59.164'E	Majilsa Pokhar Chaur (Darbhanga) 26°07.895'N 86°01.936'E	Hathia Cole (Khagaria) 25°31.849'N 86°43.101'E	Tin Dobha Chaur (Khagaria) 25°37.315'N 86°43.569'E	Satanpur Chaur (Samastipur) 25°42.263'N 85°48.357'E	Matsa Gandha Chaur (Saharsa) 25°54.274'N 86°35.024'E	Ghelar Chaur (Madhepura) 25°58.863'N 86°40.958'E	Samsolia Chaur (Madhepura) 25°56.948'N 86°40.582'E	Kawar Lake (Begusarai) 25°35.410'N 86°09.716'E	Rajaura Chaur (Begusarai) 25°37.225'N 86°09.731'E	Karu Gamaill Chaur (Begusarai) 25°39.129'N 86°10.500'E	Pathkaul Chaur (Begusarai) 25°35.410'N 86°09.716'E	Dandari Chaur (Begusarai) 25°28.139'N 86°18.100'E	Naula Chaur (Begusarai) 25°31.222'N 86°02.149'E	Chatar Chaur (Araria) 26°00.024'N 87°30.111'E	
33.	Fantail Snipe/Common Snipe Gallinago gallinago	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
34.	Pintail snipe Gallinago stenura	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
35.	Blue/Common Kingfisher Alceda athi	.	+	.	.	+	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
36.	Stork-billed Kingfisher Halcyon capensis	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
37.	White Breasted/throated Kingfisher Halcyon smyrnensis	+	.	+	.	.	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.
38.	Lesser Pied Kingfisher Ceryle rudis	.	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
39.	Eurasian Curlew Numenius arquata	++	.	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
	Total no. of Taxa	3	5	9	7	3	3	10	7	5	9	6	7	7	6	27	4	5	3	7	7	9	

+ = Rare (1-5 Individuals), ++ = Common (6-10 Individuals), +++ = Abundant (11-20 Individuals), ++++ = Most Abundant (>21 Individuals)

Table 3. Status of Riparian /Terrestrial Birds in and around the Chours of North Bihar during 2005-2007

Sl. No.	Family	Common Name	Zoological Name	Status	IUCN Status	Abundance	Habitat
1.	Alaudidae	Greater short-toed lark	<i>Calandrella brachydactyla</i>	M	LR/LC	+	Cm
2.	Accipitridae	Pariah Kite/Black Kite	<i>Milvus migrans govinda</i>	R	LR/LC	+++	Cm
3.		Black winged Kite/Black Shouldered Kite	<i>Elanus caeruleus</i>	R	LR/LC	+	Cmt
4.		Eurasian Marsh Harrier	<i>Circus aeruginosus</i>	M	LR/LC	+	Tree
5.		Shikra	<i>Accipiter badius</i>	R	LR/LC	+	Cmt
6.	Columbidae	Ring Dove/Eurasian Collared Dove	<i>Streptopelia decaocto</i>	R	LR/LC	+++	B
7.	Cuculidae	Crow Pheasant/Greater Coucal	<i>Centropus sinensis</i>	R	LR/LC	++	B
8.	Coracidae	Indian Roller	<i>Coracias benghalensis</i>	R	LR/LC	++	Cm
9.	Capitonidae	Large Green Barbet/ Brown Headed Barbet	<i>Megalaima zeylanica</i>	R	LR/LC	++	Gl
10.	Corvidae	Indian Tree Pie/Rufous Tree Pie	<i>Dendrocitta vagabunda</i>	R	LR/LC	++	Cmt
11.		Common Crow/House Crow	<i>Corvus splendens</i>	R	LR/LC	++	B
12.		Jungle Crow/Large Billed Crow	<i>Corvus macrorhynchos</i>	R	LR/LC	+++	Plains
13.	Charadriidae	Red wattled Lapwing	<i>Vandellus indicus</i>	R	LR/LC	+++	Cm
14.		Grey headed Lapwing	<i>Vandellus cinereus</i>	M	LR/LC	+	Cm
15.	Cisticolidae	Long Tailed Grass Warbler/ Rufous Vented Prinia	<i>Prinia burnesii cinerascens</i>	M	THR-NT	+	Bushy Plant
16.	Dicruridae	Black Drongo	<i>Dicrurus macrocercus</i>	R	LR/LC	+++	Cmt
17.	Hirudinidae	Barn Swallow	<i>Hirundo rustica</i>	M	LR/LC	+	Plain
18.	Lanidae	Long Tailed Shrike/ Rufous Backed Shrike	<i>Lanius schach</i>	R	LR/LC	+	Cmt
19.	Musicappidae	Red Breasted Flycatcher/ Red Throated Flycatcher	<i>Ficedula parva</i>	M	LR/LC	++	Bushy Plant
20.	Oriolidae	Golden Oriole	<i>Oriolus oriolus</i>	R	LR/LC	+	Cmt
21.	Picnonotidae	Red Vented Bulbul	<i>Pycnonotus cafer</i>	R	LR/LC	++	Bushy Plant /B

Table 3. Contd.

Sl. No.	Family	Common Name	Zoological Name	Status	IUCN Status	Abundance	Habitat
22.	Picidae	Yellow Fronted Pied Woodpecker/ Yellow Crowned Woodpecker	<i>Dendrocopos mahrattensis</i>	R	LR/LC	+	Cmt
23.	Motacillidae	Water Pipit	<i>Anthus spinoletta</i>	M	LR/LC	+	Cm
24.		Yellow Headed Wagtail / Citrine Wagtail	<i>Motacilla citreola</i>	M	LR/LC	++	Bushy Plant
25.		Vinaceous Breasted Pipit/Rosy Pipit	<i>Anthus roseatus</i>	M	LR/LC	+	Bushy Plant
26.	Strigidae	Spotted Owlet	<i>Athene brama</i>	R	LR/LC	+	Tree/ Old Building
27.	Sturnidae	Asian Pied Starling/Pied Myna	<i>Sturnus contra</i>	R	LR/LC	++	Cmt
28.		Common Myna	<i>Acridotheres tristis</i>	R	LR/LC	++	B
29.	Sylviinae	Blyth's Reed Warbler	<i>Acrocephalus dumetorum</i>	M	LR/LC	+	Cmt
30.	Timalinae	Jungle Babbler	<i>Turdoides striatus</i>	R	LR/LC	++	Bushy Plant
31.	Turdinae	Magpie Robin	<i>Copsychus saularis</i>	R	LR/LC	++	Plain
32.		Black Redstart	<i>Phoenicurus ochruros</i> <i>phoenicuroides</i>	M	LR/LC	+	Plain
33.		Common Stone Chat/ Pied Bush Chat	<i>Saxicola caprata</i> <i>ola caprata</i>	M	LR/LC	+++	Bushy Plant

M- Migratory, R- Resident, LM- Local Migration, THR- Threatened, THR-NT- Nearly Threatened, THR-V- Vulnerable, LR/LC- Lower Risk/ Least Concern, Family description (Ali & Ripley).

+ = rare; ++ = common; +++ = very common; Ow = Open water; Sw = Shallow water; Cm = Chaur margin; Sv = Submerged vegetation; H = Heronary; Cmt = Chaur margin trees; Gl = Grass land; B = Bushes;

Table 4. Contd.

Sl. No.	Common Name/ Scientific Name	Sampling Sites with GPS POSITION																					
		1	2	3	4	5	6	7	8	9	10												
		Turkey Chaur (Muzaffarpur) 26°02.306'N 85°20.201'E																					
		Harpur Machia Chaur (Muzaffarpur) 26°08.230'N 85°22.171'E																					
		Baraila Lake (Vaishali) 25°44.973'N 85°35.216'E																					
		Bhoga Chaur ((Madhubani) 26°17.634'N 86°69.900'E																					
		Sarsopahi Chaur (Madhubani) 26°14.288'N 86°10.791'E																					
		Muria Kathwa Chaur (Darbhanga) 26°11.839'N 86°00.208'E																					
		Maran Chaur (Darbhanga) 26°08.817'N 85°59.164'E																					
		Majilsa Pokhar Chaur (Darbhanga) 26°07.895'N 86°01.936'E																					
		Hathia Cole (Khagaria) 25°31.849'N 86°43.101'E																					
		Tin Dobha Chaur (Khagaria) 25°37.315'N 86°43.569'E																					
		Satanpur Chaur (Samastipur) 25°42.263'N 85°48.357'E																					
		Matsa Gandha Chaur (Saharsa) 25°54.274'N 86°35.024'E																					
		Ghelar Chaur (Madhepura) 25°58.863'N 86°40.958'E																					
		Samsolia Chaur (Madhepura) 25°56.948'N 86°40.582'E																					
		Kawar Lake (Begusarai) 25°35.410'N 86°09.716'E																			++		
		Rajaura Chaur (Begusarai) 25°37.225'N 86°09.731'E																					
		Karu Gamil Chaur (Begusarai) 25°39.129'N 86°10.500'E																					
		Pathkaul Chaur (Begusarai) 25°35.410'N 86°09.716'E																					
		Dandari Chaur (Begusarai) 25°28.139'N 86°18.100'E																					
		Naula Chaur (Begusarai) 25°31.222'N 86°02.149'E																					
		Chatar Chaur (Araria) 26°00.024'N 87°30.111'E																					
		Total No. of Taxa	7	4	5	1	2	4	6	3	2	4	3	2	3	4	18	3	6	3	5	6	
31.	Water Pipit Anthus spinoletta		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32.	Vinaceous Breasted/Rosy Pipit Anthus roseatus		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33.	Yellow headed/Citrine Wagtail Motacilla citreola		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

+ = Rare (1-5 Individuals), ++ = Common (6-10 Individuals), +++ = Abundant (11-20 Individuals), ++++ = Most Abundant (>21 Individuals)

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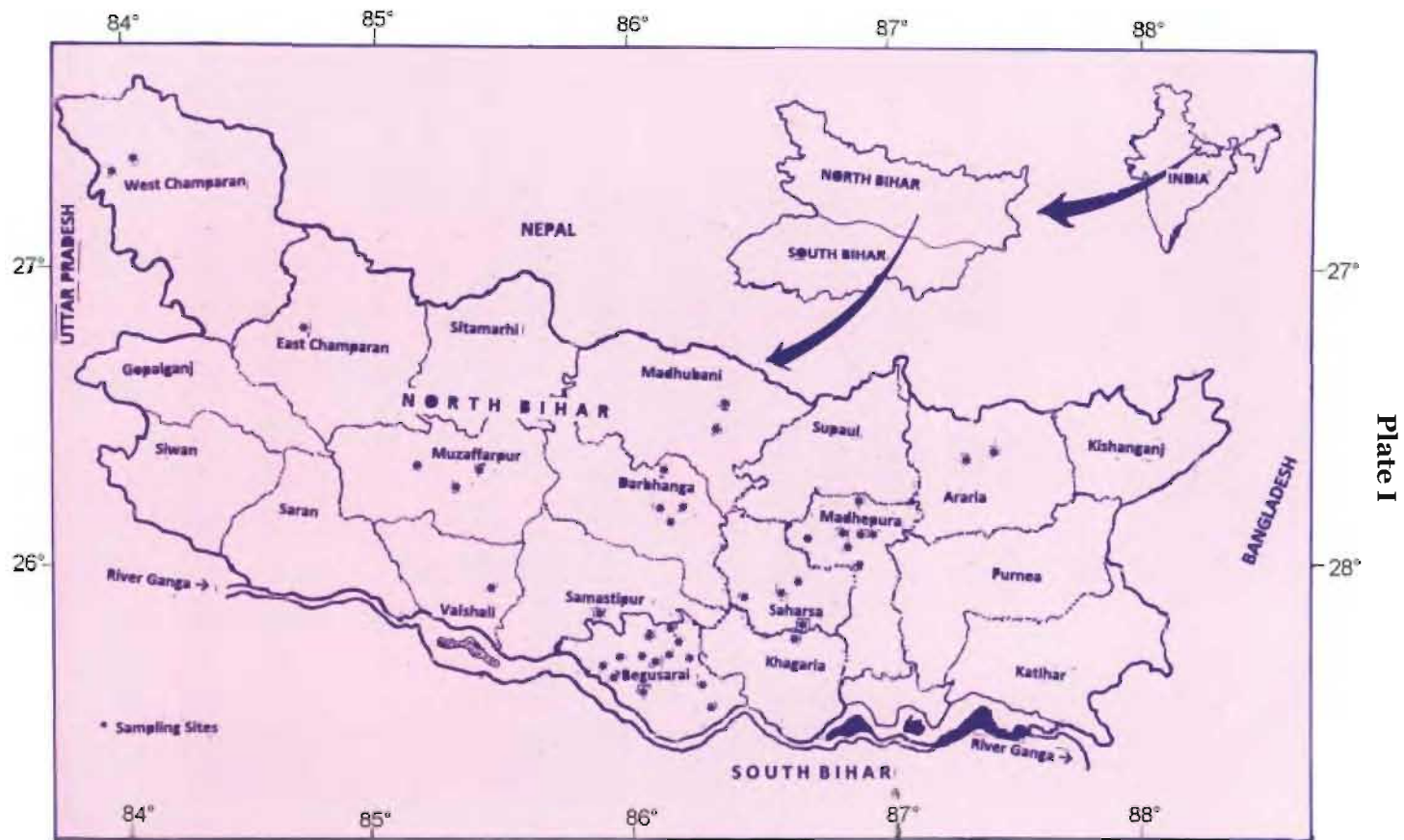


Plate I

Fig. 1. Map of North Bihar showing the sampling sites (Chaus)

Plate II



Kawar lake in Begusarai, Bihar



Isharain Chaur in Madhubani, Bihar

SHARMA : *Overview*

Plate III



Baraila jheel in Vaishali, Bihar



Chatar Chaur in Araria, Bihar

Plate IV



a. *Lamellidens marginalis*



b. *Lamellidens marginalis*



a. *Parreysia favidens* (left valve, outer view)



b. *Parreysia favidens* (left valve, inner view)



a. *Radiatula caerulea* (right valve, outer view)

Plate V



a. *Wallago attu*



b. *Xenentodon cancila*



c. *Tetraodon cutcutia*



d. *Channa punctata*



e. *Polycanthus fasciatus*



f. *Anabus testudinius*

Plate VI



Black Winged Stilt (*Himantopus himantopus*)



Grey Heron (*Ardea cinerea*)



Large Egret & Pond Heron
(*Ardea alba* and *Ardea grayii*)



Large Egret (*Casmerodius albus*)



Lesser Adjutant Stork (*Leptoptilos javanicus*)



Little egret (*Egretta garzetta*) &
Northern pintain (*Anas acuta*)

Plate VII



Northern pin tail (*Anas acuta*)



Pond Heron (*Ardeola grayii*)



Purple Heron (*Ardea purpurea*)



Red Wattled Lapwing (*Vanellus indicus*)



White Breasted King Fisher (*Halcyonidae smyrnensis*)



White Ibis (*Threskionis melanocephalus*)