



Diversity of freshwater fish under Genus *Channa*, Snakehead (Teleostei:Channidae) from Dooars region of West Bengal, India

Sukanta Debnath^{1*}, Mithun Das², Arpita Dey³ and Tapan Sarkar⁴

¹Dept. of Biology, Jenkins School, Coochbehar, West Bengal, 736101, India.

²Dept. of Biology, Coochbehar Rambhola High School, Coochbehar, West Bengal, 736101, India.

³Dept. of Zoology, Alipurduar University, Alipurduar, West Bengal, 736122, India

⁴Dept. of Zoology, Raiganj University, College para, Raiganj, Uttar Dinajpur, West Bengal, 732103, India.

*Ph.No.8900432844, E.Mail Id-debnathsukanta571@gmail.com, ORCID:0000-0001-9629-0863

Abstract

A survey was conducted on diversity of indigenous freshwater fish under Genus *Channa* (snakehead) from Dooars region of West Bengal, India and emphasis has been given to their ornamental value and local abundance. During the study, small freshwater fish species has been surveyed covering different parts of Dooars region of West Bengal. Specimens have been collected from different rivers of Dooars region (Cooch behar, Alipurduar and Jalpaiguri district) and are preserved and identified. Sampling was done on the monthly interval. It has been observed that the study area represent the existence of eight species of genus *Channa*. Among the recorded eight species, three species, namely *Channa andrao* (Britz), *Channa torsaensis* (Dey) and *Channa amari*(Dey) are highly ornamental. All the eight species are potential to be regarded as ornamental fish. Study on the distribution of fishes in particular biosphere is very important to understand the ecological significance of the species.

Key words : *Channa*, Dooars region, Eight species, Ornamental fish.

1 Introduction

The Northern part of West Bengal, commonly called North Bengal lies within 24°40' N/87°45'E to 27°03'N/88°26'E including the district of Darjeeling, Jalpaiguri, Coochbehar, Alipurduar, North Dinajpur, South Dinajpur and Malda. The area covers the most and dense riverine forest of the Bengal Dooars. The unique climate and ecological condition makes North Bengal an unique home for a large variety of mega - fauna and flora. Dooars is the gateway to the hill station of North Bengal and Bhutan. All the rivers of the Dooars region are rich in fish diversity. Channids are highly specialized air breathers (Day, 1868; Liem, 1980) enabling them to survive outside of water and cross short distance over land. Channid taxonomy and nomenclature in general is different and riddled with confusion. One of the reasons for this confusion is the wide variation in body size (ranging from 10cm in *Channa andrao* Britz, 2013 to over 1m in *Channa micropeltes* Cuvier and Valenciennes, 1831). There are substantial difficulties for accurate species identification (Haniffa, 2013). *Channa* is a genus of predatory fish in the family channidae, commonly known as snake head, native to fresh water habitats in Asia. This genus contains about 50 scientifically described species. A particularly high richness of species exists in Myanmar (Burma) and North eastern India. Different scientists reported different fish diversity from the study area but none reported the species of the genus *Channa* separately from the study area. Therefore, the present report is an attempt towards the comprehensive study of *Channa* Sp. diversity of Dooars region of West Bengal, India. Snakehead are fish belonging to the family channidae (Rainboth, 1996). The family channidae consists of two genera, Parachanna and Channa native to Africa and Asia, respectively (Nelson, 1994). A recently updated database has shown that genus *Channa* has 57 valid species (Fricke et al., 2020). *Channa amari*, a new ornamental species is described from Bhalka forest, West Bengal, India (Dey et al).

2 Materials and Method

The present study was carried out in four rivers of Dooars region at four different sampling sites covering mostly rural areas. Monthly sampling was carried out (from April 2020 to March 2021) in the rivers of Dooars region at four sampling sites following fisherman or local people who used to catch fish in this region.

Table 1: Details of study sites in Dooars region

Sl No	Sampling station	latitude and longitude of sampling station
1	Gadadhar river, chhat Genduguri, Coochbehar, West Bengal	26°36' N latitude, 89°61'E longitude

2	Ghargharia river, Coochbehar, West Bengal.	26°31'41" N latitude, 89°55'41"E longitude
3	Kaljani river, Birpara, Alipurduar, West Bengal	26°48' N latitude, 89°51'E longitude
4	Jaldhaka, Jaldhaka fishing point, Jalpaiguri, West Bengal	26°86' N latitude, 89°80'E longitude

2.1 Collection of fish Samples and Preservation

Fish sample were collected from various sampling sites and much other valuable information were collected from local fisherman. Fishing was carried out with the help of local fisherman using castnet(small in size, r=1.2m, weight about 5kg, mesh size ranging from 0.5 to 1.5cm with an average 1.0cm and cover an area about 4.5m²), gillnet, drag net, scoop net including hooks and lines.

The sample were photographed (Nikon, Coolpix L24), immediately prior to preservation as formalin decolorizes the fish colour on long preservation. As soon as the small fishes were collected they were directly placed in a wide mouth jar having 2 litre capacity with 8% formalin solution (Bagra). Separate jars were used for preserving individual species and brought to the laboratory for identification.

2.2 Identification

The samples were identified based on keys for fishes of the Indian subcontinent (Talwar and Jhingran). Classification were carried out on lines of Jayaram. Data were analysed on the basis of availability of species at river sites and markets fed by the riverine resource. The IUCN Red list of threatened species and CAMP was followed to assign the conservation status of the fish species collected.

3 Result and Discussion

Snakeheads are any of the members of the freshwater fish family Channidae, order Channiformes often known as Murals, the snakehead can be recognized by the shape of their head which resembles that of a snake. These fishes are elongated, more or less cylindrical with long, entirely soft - rayed dorsal and anal fins, large mouth with toothed jaws and palate and head depressed with large shield - scale above. They have two accessory air breathing pharyngeal air cavities. Snakeheads live in the freshwater bodies like ponds, swampy areas, flood plains, reservoirs, lakes and rivers (Froese and Pauly,2014). All of them are carnivorous and mainly feed on different aquatic organisms. Snakeheads are highly esteemed as food in tropical Asia (Benziger et al.,2011). They are monogamous and show highly developed parental care (Adamson et al.,2010). Nest building behavior is prominent in these fishes.

It has been observed that the study area represents the existence of eight species of genus *Channa*.

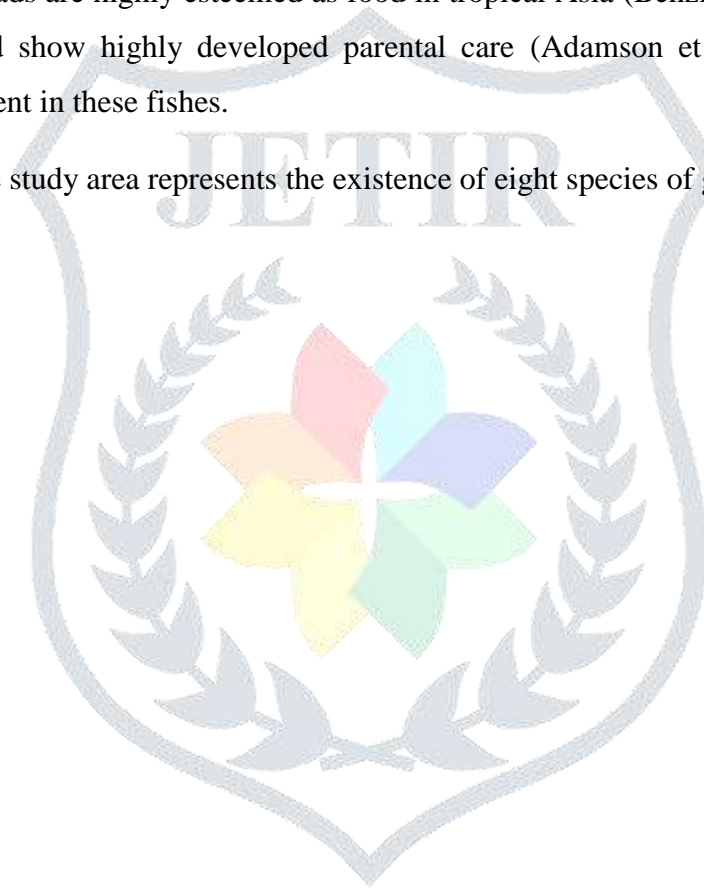


Table2: *Channa* (snakehead) fish diversity at different sampling sites of Dooars region in West Bengal.

Sl No	Local Name	Scientific Name	Family	Conservation Status	Relative Abundance	Feeding Habit	Economic Importance	Site I	Site II	Site III	Site IV
1	Lalcheng	<i>Channa andrao</i> (Britz)	Channidae	Not evaluated	+	C	Highly Ornamental	-	-	✓	-
2	Neelcheng	<i>Channa torsaensis</i> (De y)	Channidae	Data deficient	+	C	Highly Ornamental	✓	✓	-	-
3	Chocolate Bleheri	<i>Channa amari</i> (Dey)	Channidae	Data deficient	+	C	Highly Ornamental	-	-	✓	-
4	Blue bleheri	<i>Channa stewartii</i> (Playfair)	Channidae	Least concern	++	C	Ornamental	✓	✓	✓	✓
5	Bothua chang	<i>Channa gachua</i> (Hamilton)	Channidae	Least concern	+++	C	Ornamental and food value	✓	✓	✓	✓
6	Lata	<i>Channa punctatus</i> (Bloch)	Channidae	Least concern	+++	C	Commercially important	✓	✓	✓	✓
7	Shol	<i>Channa striata</i> (Bloch)	Channidae	Least concern	+++	C	Commercially important	✓	✓	✓	✓
8	Sal	<i>Channa marulius</i> (Hamilton)	Channidae	Least concern	+++	C	Commercially important	✓	✓	✓	✓

Note: Conservation status: According to IUCN(2020), **Relative abundance:**

+++ = Abundant, ++ = Common, + = Rare, **Feeding habit:** C = Carnivorous.

Relative abundance of fish species showed that four were abundance which were collected from all locations throughout the year. Whereas one species were found common but the number of specimens collected with respect to each species was relatively less. Rest, three species were found rare in number this area.



Fig. 1 *Channa andrao*



Fig. 2 *Channa torosaensis*



Fig. 3 *Channa amari*



Fig. 4 *Channa stewartii*



Fig. 5 *Channa gachua*



Fig. 6 *Channa punctatus*

Fig. 7 *Channa striata*Fig. 8 *Channa marulius*

3.1 Scientific Name: *Channa andrao*(Britz)

Local Name: Lal cheng

Common Name: Bluebleheri

Systematic position:

Order- Perciformes Suborder- Channidae

Family-Channidae Genus-*Channa*

Species-*andrao*

Diagnostic Characters:

- *Channa andrao* is one of several *Channa* species to lack pelvic fin.
- These species have no orange spots and blotches in the caudal fin.

Distribution: Endemic to the Brahmaputra river basin in India.

IUCN status: Not evaluated.

Fishery information: This species is highly ornamental fish.

3.2 Scientific Name: *Channa toraensis*(Dey)

Local Name: Neelcheng

Common Name: Cobalt Blue Channa

Systematic position:

Order- Perciformes Suborder- Channidae Family-Channidae

Genus-*Channa* Species- *torsaensis*

Diagnostic Characters:

- Dorsal, anal and caudal fin being blueish with a broad dark blue border having a tinge of orange border covering the dark blue border and dorsal fin with numerous back spots.
- Caudal fin with 9-10 black bands; 5-6 oblique greyish blue bands present on the body; lateral fin paired scales 46 in number, dorsal fin rays 36-38, anal fin rays 22-25; total vertebrae 44-45(16+28).

Distribution: India.

IUCN status: Data deficient.

Fishery information: This species attains a length of about 30cm. It is highly ornamental fish.

3.3 Scientific Name: *Channa amari*(Dey)

Local Name: Cheng

Common Name:

Chocolate bleheri

Systematic position:

Order- Perciformes Suborder- Channidae Family-Channidae

Genus-*Channa* Species- *amari*

Diagnostic Characters:

- Eye small and three sensory pores present under eye area and fifteen sensory pores present in lower jaw.
- Absence of pelvic fin, 37 dorsal fin rays 12-13 pectoral fin rays with 4-5 black bands, 23-25 anal fin rays .

Distribution: India, Dooars region of Alipurduar District, West Bengal.

IUCN status: Data Deficient.

Fishery information: This species attains a length of about 13.5cm. It is ornamental fish.

3.4 Scientific Name: *Channa stewartii*(Playfair)**Local Name:** Blue bleheri**Common Name:** Assamese snakehead**Systematic position:**

Order- Perciformes Suborder- Channidaei

Family-Channidae Genus-*Channa*Species- *stewartii***Diagnostic Characters:**

- Eye moderate and mouth large, anal fin rays 27, dorsal fin with 39-40 rays. Circular black spot on many scale of body.
- Dark brown to back fading to lighter on flanks and belly, dorsal fin with a deep blue indidence along its base, outer edge of fins light orange in life.

Distribution: India (Eastern Himalaya), and Nepal.**IUCN status:** Least concern.**Fishery information:** This species attains a length of about 25cm. It has ornamental value.**3.5 Scientific Name:** *Channa gachua*(Hamilton)**Local Name:** Bothuachang **Common Name:**

Asiatic snakehead

Systematic position:

Order- Perciformes Suborder- Channidaei

Family-Channidae Genus-*Channa*Species- *gachua***Diagnostic Characters:**

- Anal fin rays 20-23, Lateral line scale 32-37. Young with a large ocellus on last 5 dorsal fin rays.
- On dorsal side flanks green, ventral side pale with a faint blueish or redish tinge.

Distribution: South East Asia.

IUCN status: Least concern.

Fishery information: This species having ornamental and food value.

3.6 Scientific Name: *Channa punctatus*(Bloch)

Local Name: Lata

Common Name: Spotted snakehead

Systematic position:

Order- Perciformes Suborder- Channidaei

Family-Channidae Genus-*Channa* Species- *punctatus*

Diagnostic Characters:

- Body elongated, dorsal fin rays 28-33, cheek scales 5, scales 37-40 in lateral series. Young with a large ocellus on last 5 dorsal fin rays.
- In life span colour varies from black to light green on dorsal side and flanks. Fin dark grey with a reddish tinge, paired fins pale orange.

Distribution: India, Pakistan, Nepal, Bangladesh, Myanmar, Sri Lanka, china.

IUCN status: Least concern.

Fishery information: This species attains a length of about 29.8cm. It is commercially important fish.

3.7 Scientific Name: *Channa striata*(Bloch)

Local Name: Shol

Common Name: Banded snakehead

Systematic position:

Order- Perciformes Suborder- Channidaei Family-Channidae

Genus-*Channa* Species-*striata*

Diagnostic Characters:

- Dorsal fin rays 42-45, anal fin rays 25-29, lateral line scales 50-57, caudal fin dark with 2 distinct pale vertical bands on the base.
- In life adult grey-green to black-green on upper side, from middle to side upwards very pale, yellow to silvery, belly usually pure white.

Distribution: India, Pakistan, Nepal, Bangladesh, Myanmar, Sri Lanka, china, Thailand.

IUCN status: Least concern.

Fishery information: This species attains a length of about 100cm. It is commercially important fishes.

3. 8 Scientific Name: *Channa marulius*(Hamilton)

Local Name: Sal

Common Name: Giant snakehead

Systematic position:

Order- Perciformes Suborder- Channidaei

Family-Channidae Genus-*Channa* Species- *marulius*

Diagnostic Characters:

- A black white edged acellus on basal portion of caudal fin present.
Lateral line 60-70 scales.
- In life 5-6 dark oval blotches on flank which terminate below later line.
Juvenilies with an orange band running from eye to middle of caudal fin.

Distribution: India, Pakistan, Nepal, Bangladesh, Myanmar, Sri Lanka, china, Thailand.

IUCN status: Least concern.

Fishery information: This species is commercially important fish.

4 Conclusion

Study on the distribution of fishes in particular ecosystem is very important to understand the ecological significance of the species. Many factors such as altitude, water temperature, habitat type, food availability, predator and ecological barrier etc are the determining factors for distribution of species in aquatic habitats. During the study period we identified species of genus *Channa* such as *Channa andrao* (Britz), *Channa toraensis* (Dey), *Channa amari* (Dey), *Channa stewartii* (play fair), *Channa gachua* (Hamilton), *Channa punctatus* (Bloch), *Channa striata* (Bloch), *Channa marulias* (Hamilton) from different parts of Dooars region of North Bengal. Most of the species listed here has potentially to be established as ornamental fish because of their body colour, spot, and attractive behavior. Comparative study of eight species of *Channa* showed morphological variation of a particular species in different locations in India. This is due to variation of different environmental factors that govern the morphometry and growth of species. Variation in the body proportions in the same species according to hydrographic condition have also been reported by various authors (Hubbs,1922; Barlow,1961). Therefore, present study will certainly be a land mark for future researchers and policy planners to study on the group from the study area.

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