

Present biodiversity status of freshwater catfishes at the Barnai river of Rajshahi district

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Abstract: The present biodiversity status of freshwater catfishes of the Barnai river, Rajshahi were studied for a period of 13 months. The data were collected from the fish landing center, fish market and the fishermen. Secondary data were also collected from the related literature and GO's and NGO's personnel. Eighteen species under 6 families were identified of which 3 critically endangered (CR), 9 endangered (EN), 5 available and 1 threatened species reported by IUCN. The non-availability and less availability of some of the species can indicate the alarming of the biodiversity of the surveyed area. Without appropriate evaluation and documentation of existing catfish biodiversity, there is potential for unknown species with limited distribution decline or even become extinct.

Key words: Fish bio-diversity, Threatened, Critically endangered

Introduction

“Biodiversity” is the short expression of Biological Diversity. The different life forms both in plants and animals, which we encountered on this planet, comprise the global biodiversity. The variations in their form, life style, choice of different habitats, their existence and abundance in a given geographical area etc. lead to this diversity concept as Biodiversity. Biodiversity thus refers to variety within the living world. The term biodiversity is indeed commonly used to describe the number, variety and variability of the living organisms.

Rahman (2005) listed 266 species of freshwater fishes under 12 orders and 55 families from Bangladesh. Cypriniformes and Perciformes are two largest orders, which are most abundant in Bangladesh as regards individuals and species. Another very prominent group in the fresh water fish fauna is the catfish. At least 55 species of catfishes belonging to 35 genera have been recorded so far in Bangladesh (Rahman, 2005). They generally grow with natural care. These fishes are popular due to their taste and size and have high demand also. The meat of catfishes is well known for its palatability and has great market value. It is much esteemed as food for convalescence and invalids (Bhuiyan, 1964).

Catfishes of Bangladesh include a wide range of species but their status is poorly documented. Most of our catfish production comes from the natural sources especially from the rivers, floods plains, beels, and ponds. According to the report of FRSS (2004-05), catfish (Rita, Boal, Silon, Bacha, Pangas, Aor) production in Inland fisheries was 39,935 mt. which was 37,037 mt. in 2003-2004 and 32,457 mt. in 2002-2003. That means total production of catfish from inland fisheries is gradually increasing. However, this data excludes the catch of Shing, Magur and other small catfishes. Though the total production of catfishes is increasing in recent years, availability of some catfishes is declining day by day. According to IUCN (2000), among the 55 species of cat fishes 17 species are threatened and among them 6 species (*Rita rita*, *Clupisoma gaura*, *Eutropiichthys vacha*, *Pangasius pangasius*, *Bagarius yarrellii*, *Sisor rhabdophorus*) are critically endangered 6 species (*Aorichthys seenghala*, *Batasio tengara*, *Ompok bimaculatus*, *Ompok pabda*, *Silonia silondia*, *Chaca chaca*) are endangered 4 species

(*Aorichthys aor*, *Mystus cavasius*, *Ailia punctatus*, *Plotosus canius*) are vulnerable.

However the present study was undertaken to know the biodiversity status of freshwater catfishes of the Barnai rivers, Rajshahi, Bangladesh.

Materials and Methods

The study was conducted for a period of 13 months from October 2006 to November 2007. Data were collected from the fishermen, fish traders, key informants (KI) and personnel of different GO's and NGO's who are closely engaged with fisheries sector.

Study area: Barnai River originating from the Manda Beel of Tanore Upazila in Rajshahi district, the Shiba River flows south for about 45 km and creates a great meander near Nowhata where it is renamed as the Barnai and flows northeast. The river receives the Fakirni River, a tributary of the Atrai on its left-bank near Bagmara and turns southeast. From here it of the river follows a tortuous course up to Belgharia and bifurcates into two branches. The right arm of the river flows southwest as the Musa Khan and meets the Baral at Atrai. Another arm flows retaining the name Barnai to meet the Gurnai near Morkal Bazer. The joint flow of Gurnai and Barnai flows southeast as the Gurnai and meets the Gur River at the place named Kalamnagar Para. Again the joint flow of the Gurnai and Gur River advances a little distance and joins the Gumani River to fall into the Hurasagar. The total length of the Shiba-Barnai-Gurnai River is about 130 km and the course is without tidal influence (Murshed, 2003).

Data collection methods: The fishes were collected mainly from the fishermen on the spot and also the retail fish market of the study area. Visit to the different spot and fish market were made almost once within a fifteen days. The collected specimens were identified preliminary on the spot with help of related book. Those which appeared difficult to be identified were marked and brought to the Department of Fisheries, University of Rajshahi. For identification of the fish sample mainly Rahman (2005) taxonomic key was used. The collected specimens were preserved in 5-10% formalin according to the size. Plastic jar were used to collect and preserve the fish. Individual color photographs were taken in different angles and in different views of the collected fishes and it was done in fresh condition by using digital camera (Model: Sony Cyber Shot; 4.1 mega pixels; Japan).

Results and Discussion

A total of 18 freshwater catfish species under 6 families were identified during the study period (Table 1). Rahman (2005) described 55 species of freshwater cat fishes under 11 families in his book "Fresh Water Fishes of Bangladesh". But according to IUCN (2000), 54 species of fishes were under the order Siluriformes (catfish order). Sylhet-Mymensingh basin fish stock assessment (2002)

recorded a total of 92 species of fish and prawns from the Sylhet-Mymensingh basin and among this total number of species, 21 species were catfishes whereas, Ali *et al.* (2004) reported 12 catfish species. From the literature it can be said that about 60 species of freshwater catfishes are available in Bangladesh. Out of 18 collected species 5 species can be categorized under small indigenous species (SIS) and the larger type species were *Wallago attu*, *Rita rita*, *Silonia silondia*.

Table 1. Check list of collected and identified catfish species from the Barnai river

Order	Family	Scientific name	Fish base name	Local name
Siluriformes	Siluridae	<i>Wallagonia attu</i> (Bloch)*	Boal	Boal
		<i>Ompok bimaculatus</i> (Bloch)***	Indian butter catfish	Kani, boali pabda
		<i>Ompok pabda</i> (Hamilton)***	Pabdah catfish	Pabda, Modhu pabda
	Heteropneustidae	<i>Heteropneustes fossilis</i> (Bloch)*	Stinging catfish	Singh, jiol, chanus,
	Chacidae	<i>Chaca chaca</i> (Hamilton)***	Indian chaca	Beng-sabbah, cheka
	Schilbeidae	<i>Silonia silondia</i> (Hamilton)**	Silondia vacha	Shilong
		<i>Pseudeutropius atherinoides</i> (Bloch)*	Indian potasi	Batasi
		<i>Eutropiichthys vacha</i> (Hamilton)***	Batchwa vacha	Bacha
	Bagridae	<i>Clupisoma garua</i> (Hamilton)**	Garua bachcha	Ghaura, garua
		<i>Rita rita</i> (Hamilton)*	Rita	Rita
		<i>Sperata seenghala</i> (Sykes)**	Gint river catfish	Thailla air, guizza air
		<i>Hemibagrus menoda</i> (Hamilton)***	Menoda catfish	Gang magur
		<i>Mystus cavasius</i> (Hamilton)***	Gangetic mystus	Kabasi tengra
		<i>Mystus vitatus</i> (Bloch)*	Striped dwarf catfish	Tengra
		Sisoridae	<i>Glyptothorax telchitta</i> (Hamilton)***	Telchitta
	<i>Gagata cenia</i> (Hamilton)***		Indian gagata	Cenia
	<i>Gagata yossoufi</i> (Rahman)***		Gang tengra	Gang tengra
	<i>Hara hara</i> (Hamilton)***		Kosi hara	Kutakanti

Here, * = Available, ** = Critically endangered (CE) and *** = Endangered

Family- Siluridae (Butter catfishes, Freshwater sharks)

Species- *Wallago attu* (Bloch)

Species- *Ompok bimaculatus* (Bloch)



Photo: *Wallago attu* (Bloch)

Taxonomic formula: D. 5; P₁.1/13-14; P₂. 10; A. 85-89

Description of the species: Body elongate and compressed. Eyes small. Mouth wide, its gape extends posteriorly to beyond eyes. Barbels two pairs; maxillary pair long extends posteriorly to well beyond origin of anal fin. The mandibular pair much shorter, about as long as snout. Dorsal fin short. Pectoral spine weak. Caudal fin deeply forked. Color grey above and white below but the fins grey.

Habit and Habitat: *Wallago attu* inhabit fast running as well as sluggish water of deep and shallow pools, beels, haors, rivers and streams of Bangladesh. It is voracious and carnivorous; it can not be stocked in pond with other fishes.

Economic importance: Good price in the market very big in size common throughout the year.

Photo: *Ompok bimaculatus* (Bloch)

Taxonomic formula: D. 4; P₁.12-15 (1/11-14); P₂. 8; A. 66-73

Description of the species: Nostrils widely separated from each other. Caudal deeply forked and its upper lobe long. Dorsal side grey, a transverse blackish spot present, behind the operculum on the lateral line, caudal striped with black spots; besides, there are purple and yellowish spots throughout the body.

Habit and Habitat: It is a fresh water fish, extensively in rivers, rivulets, streams, beels, canals, flooded jute fields in the rainy season. It feeds on the rainy season. It feeds on the crustacean larvae, algae, protozoans, a little mud and sand.

Economic importance: It is great demand on account of its good flavour and invigorating effect.

Species- *Ompok pabda* (Hamilton)



Photo: *Ompok pabda* (Hamilton)

Taxonomic formula: D. 4; P₁.12-14(1/11-13); P₂ 8; A. 53-59

Description of the species: Maxillary barbels much shorter, extend only to middle or tip of pectoral fin. Bhuiyan (1964) states that color silvery grey, dark on the back and fading to white on the belly. Two longitudinal whitish bands, one above and one below the lateral line.

Habit and Habitat: Clear water of streams. River and pools is its main habitat, *Ompok pabda* feeds on algae, roots of some higher plants, protozoa, crustaceans, a little quantity of mud and sand.

Economic importance: His fish is highly esteemed as food by the people of Bangladesh. Physicians prescribe this fish for the invalids.

Family- Heteropneustidae (Stinging cat fish)

Species- *Heteropneustes fossilis* (Bloch)

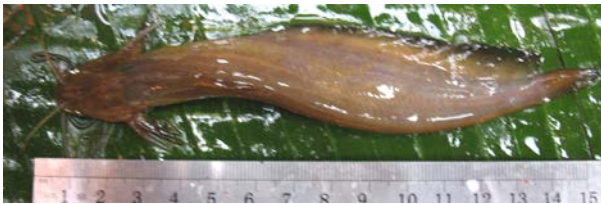


Photo: *Heteropneustes fossilis* (Bloch)

Taxonomic formula: D. 6-7; P₁.1 (1/6-7); P₂ 6; A. 62-70

Description of the species: Anal fins separated from caudal fin by a deep notch; occipital process not extending to base of dorsal fin. Color brown, almost black. There are two longitudinal yellowish narrow bands extending from head to tail.

Habit and Habitat: This fish can be reared and stocked for a long period. It can be carried alive for a distance. It prefers shallow water and may invade rice fields in which it sometimes deposits its eggs. It eats voraciously and in muddy holes during summer.

Economic importance: This fish is especially recommended for patients after recovery from malaria for its invigorating quality.

Family- Chacidae (Square-head catfishes)

Species- *Chaca chaca* (Hamilton)



Photo: *Chaca chaca* (Hamilton)

Taxonomic formula: D. 5 (1/4); P₁. 6 (1/5); P₂ 6; Caudo-dorsal; 20-25 + 10-11 + 8-12

Description of the species: Flattened flaps of skin present along dorsal surface of head and immediately posterior to eyes. The whole upper surface covered with tubercles and with many low and elongated spines which also occur along the edges of the lower lip. Color dark brown.

Habit and Habitat: *Chaca chaca* is a disagreeable and horrid animal. It conceals itself in mud. It is very difficult to catch. In rivers, beels, canals and similar water bodies throughout Bangladesh.

Family- Schilbeidae (Schilbid catfish)

Species- *Silonia silondia* (Hamilton)



Photo: *Silonia silondia* (Hamilton)

Taxonomic formula: D. 1/7; P₁. 1/12-13; P₂ 6; A. 41- 46

Description of the species: Mouth large, gape a little over half of head length, lower jaw a little longer. A pair of small maxillary barbels. Eyes with narrow adipose lids, snout rounded. Occipital process broad, triangular. Dorsal spine weak and posteriorly serrated. Pectoral spine strong and serrated internally. Color silvery below, dark on the back. Base of pelvic, anal and caudal yellowish and rest part grey.

Habit and Habitat: *Silonia silondia* is known as a freshwater shark and a scavenger of the rivers. It is Carnivorous and voracious.

Economic importance: Its liver-oil is light brown in color and contains Vit-A.

Species- *Pseudeutropius atherinoides* (Bloch)



Photo: *Pseudeutropius atherinoides* (Bloch)

Taxonomic formula: D. 1/5- 6; P₁. 1/7; P₂ 6; A. 33- 40

Description of the species: Eyes partially on lower surface of head. Upper jaw a little longer, maxillary barbells extend up to anal fin, anal fin inserted slightly (about half eye diameter) behind dorsal. Caudal fin deeply forked. Color silvery, greenish on back, a pale golden stripe along lateral line ending in a dusky spot at nape and infant of dorsal fin, are above pectoral fins translucent.

Habit and Habitat: This is one of the streams and rivulets especially in the paddy and jute fields and cannals in the rainy season.

Economic importance: Its bright color and small-size has attracted the attention of aquarists. This catfish is small sized but costly fish in the market.

Species- *Eutropiichthys vacha* (Hamilton)



Photo: *Eutropiichthys vacha* (Hamilton)

Taxonomic formula: D. 1/7; P₁. 1/13-14; P₂. 6; A. 3- 4/4- 48

Description of the species: Nasal barbels rarely extend up to posterior border of head. Dorsal spine weak, equals the distance between middle of eye and end of opercle, smooth, anteriorly, serrated posteriorly. Silvery, grayish along the back pectorals and caudal black edged.

Habit and Habitat: It is migratory and carnivorous in habit and occurs in all the streams. It moves in shoals. It feeds insects, larvae and on small fishes, clotted blood, raw liver and raw meat.

Economic importance: *Eutropiichthys vacha* is elegant cat fish is an excellent table fish. It is a sporting fish with coloured teeth. But its culture is not recommended as it is very destructive to other small fishes.

Species- *Clupisoma garua* (Hamilton)



Photo: *Clupisoma garua* (Hamilton)

Taxonomic formula: D. 1/7; P₁. 1/11; P₂. 6; A. 3/ 27-30

Description of the species: Head slightly depressed. Two pairs of prominent nostrils mouth wide and sub terminal; teeth small. Nasal barbels extend nearly up to the anterior margin of eye. Maxillary barbell reaches up to the middle of pelvic. Internal pair of mandibular barbels slightly longer than the external pair. Lateral line complete. Color-dorsally dark, ventral portion silvery and lateral sides slightly dark.

Habit and Habitat: It is migratory and carnivorous in habit. The food of this fish comprises crustaceans, insect larvae, small fishes and decaying matter.

Economic importance: Big sized fish, price is also very high in the market. Small fry not found in the river.

Family- Bagridae (Bagrid catfish)

This family includes some important food fishes of Bangladesh. All members of this family are primarily fresh water. In the present study 4 species were observed under this family.

Species- *Rita rita* (Hamilton)



Photo: *Rita rita* (Hamilton)

Taxonomic formula: D. 11/6; P₁. 1/10; P₂. 8; A. 11- 13

Description of the species: Strongly built fish with rather depressed head. Ventral profile of head flattened. Nostrils set widely a part, posterior with a barbell. Eyes minute and situated at the anterior half of head. Dorsal with a very strong spine and sharply pointed. Pectoral spine serrated and strong and does not extend up to pelvic. Color greenish brown dorsally but ventrally whitish brown.

Habit and Habitat: It is carnivorous fish. In the adult stage, it feeds on insects, mollusks, shrimps and fishes and in earlier stages on insects and roots of aquatic plants. It prefers muddy to clear water.

Species- *Mystus seenghala* (Sykes)



Photo: *Sperata seenghala* (Sykes)

Taxonomic formula: D. 1/6; P₁. 1/9; P₂. 1/5; A. 11- 12

Description of the species: Maxillary barbells reach up to adipose dorsal, nasal barbells up to the middle of the orbit, external mandibular barbels up to the pectoral. The snout spatula-like, upper jaw longer. Caudal fin deeply forked and upper lobe pointed and longer than the lower one. Color brownish along the back and silvery on the sides and back.

Habit and Habitat: *Mystus seenghala* is predatory and very destructive to tender carp fry. Widely distributed in rivers, canals, beels, inundated fields and other freshwater area in Bangladesh.

Species- *Hemibagrus menoda* (Hamilton)



Photo: *Hemibagrus menoda* (Hamilton)

Taxonomic formula: D. 1/7; P₁. 1/7- 8; P₂. 6; A. 11

Description of the species: Clusters of small vertical spots along anterior part of lateral line, maxillary barbels reach end of pelvic to origin of anal, outer mandibulars reach base of pectoral, nasals reach posterior edge of orbit.

Grayish brown above, dull white below, several rows of vertically arranged punctuate marks along middle of sides.

Habit and Habitat: This species inhabits rivers, canals and other freshwater area in Bangladesh. It prefers bottom muddy water.

Economic importance: Costly fish in the market, less catch from the studied river.

Species- *Mystus cavasius* (Hamilton)



Photo: *Mystus cavasius* (Hamilton)

Taxonomic formula: D. I/7; P₁. I/8; P₂. 6; A. 11

Description of the species: There are 4 pairs barbells, the longest maxillary pair reach nearly up to the base of the caudal fin. External mandibular barbells reach beyond the internal ones as long as the head, the adipose dorsal commences just behind the rayed one. Pectoral spine stronger than dorsal one, smooth externally and denticulate internally; caudal pointed and the upper lobe longer. Color leaden superiorly yellowish abdomen. A black spot behind the operculum.

Habit and Habitat: *Mystus cavasius* generally bottom feeder and carnivorous, sometimes it herbivorous behavior. Insect, small fish prefer as food.

Economic importance: *Mystus cavasius* a common food fish but costly in the market.

Species- *Mystus vittatus* Bloch



Photo: *Mystus vittatus* Bloch

Taxonomic formula: D. I/7; P₁. I/9; P₂. 6; A. 11

Description of the species: Color if life grey-silvery to shining golden with a dark shoulder spot and a narrow longitudinal black band on either side of lateral line, a lighter parallel one below and one or two darker ones above. Dorsal spine weak, finely serrated on its inner edge. Adipose a little longer than head, originating in advance of anal. Barbells 4 pairs. Maxillary pair extends posteriorly beyond pelvic fins, often to end of anal fin. Median longitudinal groove on head dose not extend to base of occipital process.

Habit and Habitat: Very widely distributed in study area. In habits standing and flowing waters.

Economic importance: It is a popular food fish. This small sized catfish in caught in large quantities and has minor fishery importace.

Species- *Glyptothorax telchitta* (Hamilton)



Photo: *Glyptothorax telchitta* (Hamilton)

Taxonomic formula: D. I/6; P₁. I/9; P₂. I/5; A. 1/11

Description of the species: Body spindle-shaped. Head depressed, bluntly pointed anteriorly; occipital process separated from basal bone of dorsal fin. Mouth inferior lipis papillated. Barbells four pair all shorter than head. Colour dark brown or cement grey above and on sides, dirty yellow below. Dorsal, anal and paired fins with spotted bands.

Habit and Habitat: This cat fish is a riverine fish which descends to the plains from the fast flowing waters during rains.

Economic importance: It is not fairly catfish in the study area and is sold in the markets in small quantities.

Species- *Gagata cenia* (Hamilton)



Photo: *Gagata cenia* (Hamilton)

Taxonomic formula: D. II/6; P₁. 1/8; P₂. 1/5; A. 3- 4/10- 11

Description of the species: A rather small and slender species, dorsal and ventral profile slightly arched. Head flattened on ventral surface, more or less rounded anteriorly. Eyes large, dorso-lateral in position situated at centre between snout tip and posterior margin of opercle. Dorsal spine short and strong finely serrated along anterior edge. Pelvic fins extend usually to vent. Color grayish, distal parts of dorsal, anal, pectoral and pelvic fins. Caudal fin with a black strip on each lobe, 5 bands along dorsal surface, one at occipital region, one at beginning of dorsal, one below posterior base of dorsal, one below adipose and one in the tail.

Species- *Gagata youssoufi* Rahman



Photo: *Gagata youssoufi* Rahman

Taxonomic formula: D. II/6; P₁. I/8-9; P₂. I/5; A. 3- 4/11- 14; C. 18

Description of the species: Head pointed anteriorly, compressed at sides, flattened ventrally. Eyes large, sub-cutaneous, dorso-lateral in position. Mouth small, inferior and horizontal. Nostrils close together, separated by a short barbell, situated at middle of snout. Barbels 4 pairs, nasal short. Yellowish above, silvery below. Two dark bands over the head and four black bands over the body. The first band of the head is in between the orbits, the second wider one over the occiput. The first band of the body is at the anterior base of dorsal fin, the second larger one behind the posterior base of dorsal, the third at the base of dorsal, the third at the base of adipose dorsal and the last at the caudal peduncle.

Species- *Hara hara* (Hamilton)



Photo: *Hara hara* (Hamilton)

Taxonomic formula: D. I/5; P₁. I/6; P₂. 6; A. 9; C. 14

Description of the species: Ventral profile in front of pelvic nearly horizontal. Head depressed, flattened below. Mouth small inferior, upper jaw longer. Eyes small, situated at beginning of posterior half of head. Upper jaw longer. Barbels 4 pairs, nasal does not reach eye, maxillary reaches base of pectoral outer mandibular goes beyond head, inner mandibular to gill-opening. Dorsal arise midway between snout tip and posterior edge of adipose fin. Pelvic originate from below anterior half of dorsal. Pectoral spine moderately long. Dorsal spine smooth at anterior margin. Skin rough, provided with rounded bony tubercles which run in parallel lines along the posterior half of body. Color blackish, irregularly banded on body. Caudal, anal and pelvic banded.

Habit and Habitat: Generally bottom feeder and widely distributed slow-moving fresh water in river.

Economic importance: Very rare in the market, commercial value nil but common catch in the post monsoon (Rainy season).

Among the total number of species found during the study, 9 species were endangered based on IUCN (2000) list of threatened fishes of Bangladesh. According to IUCN (2000), Bangladesh National Categories, we found 3 critically endangered and 5 available catfishes. Highest numbers of catfish's species were found from the endangered categories. Among the endangered catfish

species *Ompok pabda*, *Chaca chaca*, *O. bimaculatus*, *E. vacha*, *C. garua*, *S. seenghala*, *H. menonda*, *G. cenia*, *Hara hara* were found very few numbers from the collection sites. *Wallago attu*, *P. atherinoides*, *H. fossilis*, *M. vittatus* were dominant species and found all over the year.

Catfishes were available more or less round the year. But all the species were not available in all seasons. There were some rare species, which were very incidentally or occasionally available. Among the observed catfish species *Wallago attu*, *Rita rita*, *M. cavasius* were more available in winter. In summer *H. fossilis*, *Mystus vittatus*, *P. atherinoides* etc were more available. Some species *Hara hara*, *G. cenia*, *G. youssoufi*, *G. telechitta* were incidentally found. The species like *Mystus vittatus*, *H. fossilis*, *Rita rita* and *Wallago attu* were widely distributed throughout the study river. *Gagata* sp., *G. telechita*, *S. seenghala*, *S. silondia* was found from only one spot.

The high demand and low supply are making many catfishes endangered. If effective conservation measures are not taken at this very moment many of fishes valuable catfishes will be extinct in near future. Without concrete and significant changes in the process of accessing fisheries resources for fishermen, ensuring their tenure and financial, technological and marketing support, little positive change can be expected. Improvement of fish habitat is essential in this very moment to conserve the valuable catfishes of our country. Strengthening and enforcing fishing law is also essential. Considering the importance and biodiversity value, quantitative and qualitative study on the availability of catfishes and thorough and country wide habitat study are undesirable.

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