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Pioneering Taxonomic Studies on the Beel Fishes in Barak Valley Region of Assam in the Eastern Himalayan Biodiversity Hotspot

Devashish Kar[1]* and Dimos Khynriam[2]

[1]*Microcentre for Water and Human Studies, India*

[2]*Zoological Survey of India, India*

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Corresponding author: Devashish Kar, Microcentre for Water and Human Studies, India

Abstract

Ichthyological survey in the Beels of Barak Valley Region in Assam within North-East India notably, Dholi Beel, Shushka Charua Beel, Sat Beel, Narapati Beel, Rani Meghna Beel, Javda Beel, and Karbhala Beel revealed the occurrence of 23 species of fishes. These include 1 species each under *Osteoglossiformes*, *Clupeiformes* and *Gobiiformes*, 8 species under *Cypriniformes*, 3 species under *Siluriformes*, 2 species each under *Synbranchiformes* and *Cichliformes* and 5 species under *Anabantiformes*. Detailed taxonomic studies revealed highest number of species among the *Cypriniformes* and lowest among the *Osteoglossiformes*, *Clupeiformes* and *Gobiiformes*. Distribution and conservation status of each species have been discussed in the present paper.

Introduction

The aquatic biota is much pressure due to human interventions. Incidentally, effects on fish and their habitats have been studied by different workers [1-8]. However, further studies with regard to fish fauna are required.

Fish forms about 50 % of the total number of vertebrates on the earth. India is regarded as one of the mega biodiversity countries in the World [9], and the North-Eastern (NE) region in the Eastern Himalayan (EH) stretch has been identified as a hotspot of biodiversity by the World Conservation Monitoring Centre [10]. The mountains and the undulating valleys of this zone gives rise to a large number of torrential rheophilic streams, which lead to big rivers; that, finally become part of the Ganga-Brahmaputra-Barak-Chindwin-Kolodyne-Gomati-Meghna system [1-6,11-15]. Incidentally, there are said to be c 2,500 species of fishes in India. Of these, c 930 are freshwater (FW) inhabitants and c 1,570 are marine [2,6,11-14,16]. This rich fish diversity of this region has been alluring many ichthyologists from various parts of the globe.

Notwithstanding the above, the fish fauna of the North-East (NE) India mainly features elements of the Indo-Gangetic region; and partly of the Myanmarese and South-Chinese regions. Concomitantly, there have been a significant number of works on the fish and fisheries of North-East (NE) India. Nath & Dey [17] noted 131 fish species from the drainages in Arunachal Pradesh. Sen [18] compiled a list of 267 species of fishes from NE India. Moreover, Sen [18] further opined that, out of the c 806 species of fishes inhabiting India's freshwaters [19], the NE region of India is represented by 267 species belonging to 114 genera under 38 families and 10 orders. It is c 33.13% of the total Indian FW fishes. Further, of the 267 species, *Cypriniformes* dominates with 145 species, followed by *Siluriformes* (72), *Perciformes* (31), *Clupeiformes* (7), *Anguilliformes* (3), *Cyprinodontiformes* (3), *Osteoglossiformes* (2), *Synbranchiformes* (2), *Syngnathiformes* (1) and *Tetraodontiformes* (1). In addition to above, Kar [11,12] reported 133 species of fishes through a pilot survey conducted in 19 rivers spread in Barak drainage (Assam), Mizoram, and Tripura. Kar [20] subsequently reported the occurrence of 103 species of fishes through an extensive survey conducted in six principal rivers in Barak Valley (Assam), Mizoram, and Tripura. Concomitantly, Kar & Sen [21] had done a detailed study on fish' biodiversity in North-East India with particular reference to Barak

drainage, Mizoram, and Tripura. Recently, Kar & Khynriam [22] worked on. Further Report on the Systematic, Distribution and Conservation of Ichthyospecies in the Headwaters of River Barak (Assam, Manipur and Mizoram), North East, India.

Concomitant to above, standing waters occur in depressions or in basins, which are doomed from the moment they are formed. Eroded sediments and plant remain from the surrounding land are washed-in and settle at the bottom along with debris from the resident aquatic plants and animals. Gradually, the lake or pond gets shallower until it becomes a `wetland'. Thus, Wetlands are basically `wet- lands' where the soil remains saturated with water for some time during the year, and, the depth of which generally does not exceed 6m [23].

In Assam, there are usually 3 kinds of wetlands. They are locally called as follows:

a) Beel: Perennial wetlands which contain water throughout the year.

b) Haor: Seasonal floodplain wetlands which contain water for some period of the year only, particularly, during the rainy season. As such, they are also called floodplain wetlands.

c) Anua: These are the river-formed perennial oxbow-type wetlands which are generally formed due to change in river course and which may or may not retain connection with the original river.

The present paper is a pioneering fish taxonomic study on the Beels in Barak Valley region of Assam in North-East (NE) India.

Material And Methods

Fish samples were collected through experimental fishing using cast nets (diameter 3.7 m - 1.0 m), gill nets (vertical height 1.0 m - 1.5 m; length 100 m - 150 m), drag nets (vertical height 2.0 m), triangular scoop nets (vertical height 1.0 m) and a variety of traps. Camouflaging technique had also been used to catch the fishes. Fishes were preserved in 10% formalin. Fishes were identified after standard literature ([16,19,24-33] www.Fishbase.org.). The arrangement of classification, followed here, is that of Jayaram [16,32,33,34], Kar & Khynriam [15] & Fricke et al. [35].

Results and Discussion

Pioneering ichthyological survey in the Beels of the Barak valley region of Assam in Eastern Himalayas Biodiversity hotspot, notably, Dholi Beel, Shushka Charua Beel, Sat Beel, Narapati Beel, Rani Meghna Beel, Javda Beel and Karbhala Beel, revealed the occurrence of 23 species of fishes. These include 1 species each under *Osteoglossiformes*, *Clupeiformes* and *Gobiiformes*, 8 species under *Cypriniformes*, 3 species under *Siluriformes*, 2 species each under *Synbranchiformes* and *Cichliformes* and 5 species under *Anabantiformes*. Detailed taxonomic studies indicated highest number of species among the Cypriniformes and lowest among the *Osteoglossiformes*, *Clupeiformes* and *Gobiiformes* (Table 1) [36].

Table 1: Distribution and conservation status of ichthyospecies in different Beels of Barak valley.

Sl. No.	Systematic list	Dholi	Shushka Charua	Sat	Narapati	Rani Meghna	Javda	Karbhala	Conservation status
	Phylum: Chordata Class: Actinopteri								
	Order: Osteoglossiformes Family: Notopteridae								
1	*Notopterus synurus* (Bloch & Schneider, 1801)					+			Least Concern
	Order: Clupeiformes Family: Dorosomatidae								
2	*Tenualosa Ilisha* (Hamilton 1822)		+						Least Concern
	Order: Cypriniformes Family: Danionidae								
3	*Amblypharyngodon mola* (Hamilton, 1822)			+	+				Least Concern
4	*Esomus danrica* (Hamilton, 1822)							+	Least Concern
	Family: Cyprinidae								

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5	*Cyprinus carpio* Linnaeus, 1758					+			Vulnerable
6	*Puntius chola* (Hamilton, 1822)			+		+			Least Concern
7	*Puntius sophore* (Hamilton, 1822)						+	+	Least Concern
	Family: Botiidae								
8	*Botia Dario* (Hamilton, 1822)					+		+	Least Concern
	Family: Cobitidae								
9	*Lepidocephalichthys guntea* (Hamilton, 1822)					+	+	+	Least Concern
	Family: Nemacheilidae								
10	*Paracanthocobitis botia* (Hamilton, 1822)		+						Least Concern
	Order: Siluriformes Family: Bagridae								
11	*Mystus vittatus* (Bloch, 1794)	+							Least Concern
	Family: Ailiidae								
12	*Ailia coila* (Hamilton, 1822)					+			Near Threatened
	Family: Heteropneustidae								
13	*Heteropneustes fossilis* (Bloch, 1794)	+						+	Least Concern
	Order: Synbranchiformes Family: Mastacembelidae								
14	*Macrognathus aral* (Bloch & Schneider, 1801)					+	+		Least Concern
15	*Macrognathus pancalus* Hamilton, 1822	+		+			+		Least Concern
	Order: Cichliformes Family: Ambassidae								
16	*Parambassis ranga* (Hamilton, 1822)			+					Least Concern
	Family: Cichlidae								
17	*Oreochromis mossambicus* (Peters, 1852)							+	Vulnerable
	Order: Gobiiformes Family: Gobiidae								
18	*Glossogobius giuris* (Hamilton, 1822)							+	Least Concern
	Order: Anabantiformes Family: Nandidae								
19	*Nandus nandus* (Hamilton, 1822)						+		Least Concern
	Family: Badidae								
20	*Badis badis* (Hamilton, 1822)							+	Least Concern
	Family: Anabantidae								

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21	*Anabas testudineus* (Bloch, 1792)							+	Data Deficient
	Family: Osphronemidae								
22	*Trichogaster fasciata* Bloch & Schneider, 1801	+		+		+	+	+	Least Concern
	Family: Channidae								
23	*Channa punctata* (Bloch, 1793)			+					Least Concern

Systematic account

Phylum: Chordata

Class: Actinopteri

Order: Osteoglossiformes

Family: Notopteridae

Genus: *Notopterus* Lacepede, 1800

Notopterus Lacepede, 1800, Hist nat Poiss 2: 190 (Type species: *Gymnotus notopterus* Pallas, by absolute tautonomy), Roberts, 1992, Ichthyol Explor Freshwaters 2(4): 361-383 (revisioin), Talwar & Jhingran [19], Inland Fishes 1: 62, Jayaram [33], FW Fishes of the Indian Region: 20, Menon [31], Rec Zool Surv India Occ Paper No. 175: 9.

Generic Characters: Body oblong, laterally compressed; cranio-dorsal profile straight or

slightly concave. Abdomen with 25-28 pre-pelvic double serrations. Head compressed. Mouth wide, cleft of mouth extending upto or beyond posterior border of eyes. Eyes moderate, dorso-lateral. Gill membranes partly united. Dorsal fin small, tuft-like, inserted near middle of body with 8-10 rays. Anal fin very long, low, ribbon-like, with 100-135 rays, confluent with the caudal fin. Pelvic fins rudimentary. Caudal fin small. Scales small. Lateral line complete, more or less arched with about 180 scales.

Material examined: 1 example from Rani Meghna Beel around Kaliganj in Karimganj Dist.

Assam, 23.3.2018, first report, Collector: Professor D Kar and Party.

Key to species: Cranio-dorsal profile straight of slightly concave.

***Notopterus synurus* (Bloch & Schneider, 1801)**

Distribution: Throughout India including Rani Meghna Beel around Kaliganj in Karimganj

District (first report), other water bodies India, Bangladesh, Indonesia Malaya, Nepal, Pakistan, Thailand, West Africa, etc.

IUCN status: Least Concern (LC).

Order: Clupeiformes

Family: Dorosomatidae

Genus: *Tenualosa* Fowler, 1934

Tenualosa Fowler, 1934 (Mirza 2003, uses this name in preference to Hilsa in a generic sense), Proc Acad nat Sci Philad 85: 246 (Type species: Alosa reevesii Richardson; Whitehead, 1985, FAO Fish Symp (125) 7(1): 222-227.

Generic Characters: Body compressed, oblong, abdomen serrated with 15-16 pre-pelvic and

11-16 post-pelvic scutes. Head large, compressed. Mouth terminal, cleft not extending to orbit. E Dyes large, lateral, with adipose lid. Lower jaw not projecting beyond upper. Dorsal fin inserted ahead of pelvic fins with 13-16 branched rays. Anal fin short with 16-20 branched rays. Caudal fin forked.

Material examined: 1 example from Shushka Charua Beel, 11-10-2008, first report, Collector,

Professor D Kar and Party.

Key to species: Gill rakers on inner arches curved outward. Scales perforated.

***Tenualosa ilisha* (Hamilton, 1822)**

Distribution: Wetlands in Assam like Shushka Charua Beel (First report), Sone Beel (First

report), Chatla Haor (First report including juveniles of Hilsa) other parts of North-East (NE) India, different parts of rest of India, Bangladesh, China, Myanmar etc.

IUCN status: Least Concern

Order: Cypriniformes

Family: Danionidae

Genus: *Amblypharyngodon* Bleeker, 1860

Amblypharyngodon Bleeker, 1860 [Physics Journal for the Dutch East Indies 20(3): 433] Masc Cyprinus mola Hamilton 1822. Type by being a replacement name.

Generic characters: Body moderately long, sub-cylindrical. Abdomen round. Head much

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compressed. Snout obtusely rounded. Mouth wide, antero-lateral and not protractile. Eyes centrally-placed and large; they are not visible from below ventral surface. Upper lip absent. Lower lip with a short labial fold. Lower jaw prominent with a thin sharp edge and a symphysial knob which fits into the upper jaw. Barbells absent. Dorsal fin inserted little behind insertion of pelvic fins. Anal fin short. Caudal fin forked. Scales minute.

Material examined: 2 examples from Sat Beel in Rongpur, Cachar, and, 4 examples from

Narapati Beel in Cachar, Collector: Professor D Kar and Party, Nov, 1998.

Key to species: Lateral line incomplete with 65-91 scales. A silvery lateral band with dark

markings on dorsal, anal and caudal fins present.

***Amblypharyngodon mola* (Hamilton, 1822)**

Distribution: Throughout India including Sat Beel in Cachar Assam (first report) Narapati

Beel in Cachar (first report), Afghanistan, Bangladesh, Myanmar, Nepal, Pakistan, and Sri Lanka, etc.

IUCN status: Least Concern (LC)

Genus: *Esomus* Swainson, 1839

Esomus Swainson, 1839, Nat Hist Fishes, 2: 285 (Type species: *Esomus vittatus* Swainson= *Cyprinus danrica* Hamilton-Buchanan by monotypy), Ahl,1923, Mitt Zool Mus Berlin, 11: 38-43 (revision), Talwar and Jhingran, 1999, Inland Fishes I: 373, Jayaram [33], FW Fishes of the Indian Region: 76, Menon, 1999, Rec Zool Surv. India Occ Paper No.175, Viswanath, 2002, Fishes of North-East India, NATP Pub.: 48.

Generic Characters: Body elongate, strongly compressed, Abdomen rounded. Head and snout

small, obliquely directed upwards. Presence of two pairs of barbels. Maxillary pair very long extending upto anal fin. Dorsal fin inserted in the interspace between anal and pelvic fins, nearer to anal fin than pelvic with 6 branched rays and no spine. Anal fin with five branched rays. Caudal fin forked. Lateral line, when present, is strongly arched anteriorly and runs in the lower half of caudal peduncle with 27 to 34 scales.

Material examined: 3 examples from Karbhala Beel, Cachar, Assam (First report), Collector:

Professor D Kar and Party. 5 3 2010.

Key to species: Absence of pre-caudal spot. Presence of broad lateral bands on sides. Presence

of 14 scales around caudal peduncle.

***Esomus danrica* (Hamilton, 1822)**

Distribution: Throughout India including Karbhala Beel, Cachar, Assam (First report),

Afghanistan, Bangladesh, Myanmar, Nepal, Pakistan, and Sri Lanka, etc.

IUCN status: Least Concern (LC).

Family: Cyprinidae

Genus: *Cyprinus* Linnaeus 1758

Cyprinus Linnaeus 1758, Systema Naturae, Ed 10(1): 320 (Type-species, *Cyprinus carpio* Linnaeus, by subsequent designation), Talwar and Jhingran, 1999, Inland Fishes 1: 184, Jayaram [33], FW Fishes of the Indian Region: 92, Nath and Dey, 2000, Fish and Fisheries of NE India (Arunachal Pradesh): 36.

Generic Characters: Body robust anteriorly, more or less compressed. Abdomen rounded.

Head moderate. Snout obtusely rounded. Mouth terminal, oblique; cleft not extending to anterior margin of eyes. Upper jaw more or less projecting. 2 pairs of barbels; one pair each of maxillary and rostral. Dorsal fin very long, inserted above tip of pectoral fins with 3 spines and 17 rays. Anal fin short with 3 spines. Caudal fin deeply emarginated. Lateral line straight with 36 scales.

Material examined: 1 example from Rani Meghna Beel around Kaliganj in Karimganj Dist

Assam: Collection: 23 3 2018, First report, Collector: Professor D Kar and Party.

Key to species: Caudal fin lobes generally pointed.

***Cyprinus carpio Linnaeus*, 1758**

Distribution: Global through America, China, Europe, Jaan Korea, etc. Throughout India

including Rani Meghna Beel around Kaliganj in Karimganj Dist (first report), other water bodies India, Bangladesh, Indonesia Malaya, Pakistan, Thailand, etc.

IUCN status: Vulnerable (VU)

Genus: *Puntius* Hamilton, 1822

Puntius Hamilton, 1822, Fish Ganges: 310, 388 (Type species, *Cyprinus sophore*, Hamilton-Buchanan, by subsequent designation), Jayaram, 1991, rec Zool Surv India Occ. Paper No. 135: 1-178 (revision), Talwar & Jhingran [19], Inland Fishes 1: 250, Jayaram [33], FW Fishes of the Indian Region: 108, Menon [31], Rec Zool Surv India, Occ Paper No. 175: 65, Nath and Dey, 2000. Fish and Fisheries of NE India (Arunachal Pradesh): 39, Vishwanath, 2002, Fish and Fisheries of NE India, NATP Pub.: 69.

Generic characters: Body short to moderately long, deep, compressed. Abdomen round. Head

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short. Snout obtuse, conical or pointed, sometimes, may be with tubercles. Mouth arched, anterior or inferior. Upper jaw may be protractile. Eyes moderate to large, dorsolateral, they are not visible from below ventral surface. Lips thin, cover the jaws, without any horny covering. Jaws simple without any tubercle at the symphysis. Barbells four, two or may be absent. Dorsal fin short inserted nearly opposite to pelvic fins. Anal fin short. Caudal fin forked. Scales small, moderate or large.

Material examined: 1 example each from Sat Beel, Rani Meghna Beel, Javda Beel Collection:

November, 1998, 23 6 2018, and 15 3 2008 respectively, all First report, Collector: Professor D Kar and Party.

Key to species: Body marked with two conspicuous dark blotches.

***Puntius chola* (Hamilton, 1822)**

Distribution: Throughout India including Sat Beel, Rani Meghna Beel, Javda Beel in Assam,

also in Bangladesh, Myanmar, Nepal, Pakistan, Sri Lamka, etc.

IUCN status: Least Concern (LC)

Material examined: 3 examples from Javda Beel, 15.3.2008 and 2 examples from Karbhala

Beel, 5.3.2010. All First reports, Collector: Professor D Kar and Party.

Key to species: Pre-dorsal scales 8-10. Presence of a black spot-on dorsal fin and on caudal

peduncle.

***Puntius sophore* (Hamilton, 1822)**

Distribution: Almost Throughout India including Javda Beel and Karbhala Beel in Assam; also

in Bangladesh, Myanmar, Nepal, Pakistan, Sri Lanka, etc.

IUCN status: Least Concern (LC)

Family: Botiidae

Genus: *Botia* Gray, 1831

Botia Gray, 1831, Zool Misc 8 (Type species, *Botiaalmorhae* Gray, by monotype), - Hora, 1922, Rec India Mus, 24: 313-321 (revision)- Banarescu and Nalbant, 1968, Mitt Hamburg Zool Mus Inst, 65: 341 (revision)-Taki, 1972, Jap J Ichthyol, 19(2): 63-81(review)-Menon, 1992, Fauna India, 4(2), p. 31 (revision)-Jayaram [33], Freshwater Fishes of the Indian Region: 209, -Menon [31], Rec Zool Surv India, Occ Paper No. 175: 155 (Check list).

Generic characters: Body oblong, short, moderately deep. Abdomen rounded. Head long,

pointed. Snout conical, ventrally flat. Mouth small. Eyes moderately large, superior, in mid-part of head without any skin covering them. Anterior nostrils tubular. Lips thick, fleshy. Presence of a bifid erectile sub-orbital spine below or in front of eyes. Dorsal fin inserted above origin of pelvic or slightly ahead. Anal fin short. Caudal fin deeply forked. Scales absent on head.

Material examined: 1 example each from Rani Meghna Beel and Karbhala Beel. Collection: 23.

6. 2018 and 5. 3. 2010 respectively, both first reports.

Key to species: Eye diameter 33.3 % snout length.

***Botia dario* (Hamilton, 1822)**

Distribution: Almost Throughout India including Rani Meghna Beel and Karbhala Beel in

Assam; also in Bangladesh, Myanmar, Nepal, Pakistan, Sri Lanka, etc.

IUCN status: Least Concern (LC).

Family: Cobitidae

Genus: *Lepidocephalichthys* Bleeker, 1858

Bleeker, 1858, NaTijdschr Ned Indet 16: 3: 303 (Type species, *Cobitis macrochir* Bleeker, Tilak and Hussain,1981, rec Zool Surv India Occ Paper No. 32: 3-28 (revision), Menon, Fauna India, 4(2), p. 52 (revision), Talwar and Jhingra, 1999, Inland Fishes, 1: 520, Jayaram [33], FW Fishes of the Indian Region: 216, Menon [31], rec Zool Surv India Occ Paper No. 175: 159.

Generic characters: Body elongate; caudal peduncle laterally compressed. Abdomen

rounded. Head short, conical. Snout blunt. Mouth inferior, narrow, slightly arched. Eyes small. Lower lip interrupted in the middle. Barbels six; one pair each rostral, mandibular and maxillary. Presence of a large erectile bifid sub-orbital spine below or in front of eyes. Origin of dorsal fin variable with 8 or 9 rays. Anal fin short with 7 to 8 rays. Caudal fin truncates or slightly emarginated. Scales small. Lateral line absent.

Material examined: 1 example each from Rani Meghna Beel, 23. 3.2018 and Karbhala Beel, 5.

3.2010 and 4 examples from Javda Beel, 15. 3.2008 respectively. All first reports, Collector: Professor D Kar and Party.

Key to species: Depth of body <16.7 % SL. Presence of a dark lateral band or dark grey spots

on the body.

***Lepidocephalichthys guntea* (Hamilton, 1822)**

Distribution: Throughout India including Rani Meghna Beel, Karbhala Beel and Javda Beel in

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Assam, also in Bangladesh, Myanmar, Nepal, Pakistan, etc.

IUCN status: Least Concern (LC)

Family: Nemacheilidae

Genus: *Paracanthocobitis* Grant, 2007

Paracanthocobitis Grant, 2007 (Ichthyofile No. 2:1-9, Fem Cobitis zonalternans Blyth 1860. Type by original designation)

Generic characters: Body deeper than in most other nemacheilines, strongly compressed

posteriorly. Head slightly compressed. Nostrils are placed close together. Snout blunt. Presence of a slight indication of an adipose keel. Upper lip covered by two or three rows of papillae. Lower lip broad on both the sides; interrupted in the middle and with numerous papillae. Dorsal fin with 10-18 branched rays. Edge of dorsal fin straight or slightly convex. Caudal fin slightly emarginated, linear or convex. Scales large all over the body. Lateral line complete, or, extend, at least up to under the dorsal fin. Presence of conspicuous black spot at the upper extremity of the caudal fin.

Material examined: 1 example from Shushka Charua Beel, 11.10.2008 (first report),

Collectors: Professor D Kar and Party.

Key to species: Dorsal fin with 9-11 branched rays. Body depth approximately 23.63 % of

Standard Length (SL). Lateral line complete.

***Paracanthocobitis botia* (Hamilton, 1822)**

Distribution: Almost throughout India except the Malabar coast and south of river Krishna,

Shushka Charua Beel in Barak valley region of Assam, river Khuolzangvadung, Dima Hasao District, Assam, also in Bangladesh, Bhutan, China, Myanmar, Nepal, Pakistan, Sri Lanka, Thailand, and Yunan.

IUCN Status: Least Concern (LC).

Order: Siluriformes

Family: Bagridae

Genus: *Mystus* Scopoli, 1777

Mystus Scopoli, 1777, Introduction and historiam naturalem: 451(Masc. *Bagrus halepensis* Valenciennes 1840. Type by subsequent designation).

Generic characters: Body short or moderately elongated. Head short, flattened. Snout obtuse

or rounded. Mouth sub-terminal, transverse. Eyes anteriorly situated, moderately large. Teeth numerous. Upper surface of head mostly smooth with one or two median longitudinal grooves of varying length. Occipital process long or short, situated superficially concealed under skin. Four pairs of barbells, one each of maxillary, nasal and two mandibular, two dorsal fins, an anterior rayed dorsal with seven or eight rays and a spine, a posterior smooth low adipose fin of varying lengths. Pectoral fins with seven to 11 rays and a strong spine serrated along the inner edge. Pelvic fins with six rays. Anal fin with nine to 14 rays. Caudal fin forked, bilobed with unequal lobes; lobes may be rounded, pointed or prolonged into filamentous extensions. Lateral line simple, complete.

Material examined: 2 examples from Dholi Beel, 26.3.2008 and 1example from Karbhala Beel,

5.3.2010, first report from both the Beels, collector: Professor D Kar and Party.

Key to species: Body with two parallel stripes on each side of lateral line. There may also be a

dark humeral spot.

***Mystus vittatus* (Bloch, 1794)**

Distribution: Almost throughout India, Beels in Assam like Dholi Beel and Karbhala Beel,

etc., other parts of North-East (NE) India, different parts of rest of India, Myanmar, Pakistan, Sri Lanka, etc.

IUCN status: Least Concern (LC)

Family: Ailiidae

Genus: *Ailia* Gray, 1830

Ailia Gray, 1830, Zool Miscellany, Pl 85 (Type species: *malapterus* (sic) (Ailia) bengalensis Gray= *Malapterus coila* Hamilton-Buchanan, by monotypy), Hora, 1941, Rec Indian Mus 43: 110-112, Jayaram, 2006, Catfishes of India: 117, Ferraris, 2007, Zootaxa, 1418: 356 (Ailichthys).

Generic characters: Body short compressed. Abdomen rounded. Head short, greatly

compressed. Mouth moderately wide. Eyes small lateral. Presence of 4 pairs of barbells: one pair each maxillary and nasal; and two pairs mandibular, all these barbels are usually longer than head. Rayed dorsal fin absent. Adipose dorsal fin small, short and posteriorly free. Pectoral fins with 13 to 16 rays and a spine. Pelvic fins with six rays; may sometimes be vestigial or absent. Caudal fin forked.

Material examined: 1 example from Rani Meghna Beel, Barak valley in Assam, First report,

Collector: Professor D Kar and Party. 23 3 2018.

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Key to species: Pelvic fins absent. Rayed dorsal fin also absent. Anal fin long with 48 to 90

rays.

***Ailia coila* (Hamilton, 1822)**

Distribution: Almost throughout India, Beels in Assam like Rani Meghna Beel, other parts

of North-East (NE) India, different parts of rest of India, Bangladesh, Nepal, Pakistan, etc.

IUCN Status: Near threatened.

Family: Heteropneustidae

Genus: *Heteropneustes* Muller, 1840

Heteropneustes Muller, 1840, Arch Anat Physiol.: 115 (Type species: *Silurus fossilis* Bloch), Hora, 1935, Rec Indian Mus, 38(2): 134, Jayaram, 2005, Catfishes of India: 313, Ferraris, 2007, Zootaxa: 1418.

Generic characters: Body slender, elongated, compressed. Abdomen rounded. Head gently

depressed. Snout flat. Mouth small, terminal. Eyes small, lateral and situated in the anterior part of the head. Rayed dorsal fin short; inserted above tip of pectoral fin with 6 to 8 raysand without any spine. Pectorals fin not much big, with 7 or 8 rays and a strong spine.

Material examined: 1 example from Dholi Beel, 26.3.2008 and 2 examples from Karbhala

Beel, 5.3.2010in Barak valley of Assam, First reports, Collector: Professor D Kar and Party.

Key to species: Body slender to deep; eyes small; pectoral fin short and rounded; half to one-

third the distance between pectoral and pelvic fin origin. Presence of a strong pectoral spine. Caudal fin rounded.

***Heteropneustes fossilis* (Bloch, 1794)**

Distribution: Almost throughout India, Beels in Assam like Dholi Beel and Karbhala Beel

in Barak valley of Assam; other parts of North-East (NE) India, different parts of rest of India, Bangladesh, Myanmar, Laos, Nepal, Pakistan, etc.

IUCN status: Least concern

Order: Synbranchiformes

Family: Mastacembelidae

Genus: *Macrognathus* Lacepede, 1800

Macrognathus Lacepede, 1800, Hist Nat Poiss, 2: 283 (Type species, *Ophidium aculeatum* Bloch, by subsequent designation), Sufi, 1953, Bull Raffles Mus No. 27: 99-105, Robert, 1980, Copeia, No.3: 385-391 (revision), Roberts, 1986, Jap J Ichthyol, 33 (2), 97-103, Bloch and Schneider, 1801, Syst Ichth, 478.

Generic Characters: Body deep, eel-like, compressed. Head long, pointed. Snout long, fleshy,

and, accommodate a concave prolongation of the upper jaw. Mouth inferior, cleft narrow. Dorsal fin inserted far behind the end of pectoral fins with 13 to 32 detached depressible spines and 42-58 rays. Anal fin with 3 spines and may be with 40 to 60 rays. Caudal fin rounded, distinctly separated from dorsal and anal fins. Scales small. Lateral line present.

Material examined: 1 example from Rani Meghna Beel, 23.3. 2018 and 3 examples from Javda

Beel, 15. 3. 2008; both in Barak valley, Assam and first reports; Collector: Professor D Kar and Party.

Key to species: Dorsal fin spines 16-23.

***Macrognathus aral* (Bloch and Schneider, 1801)**

Distribution: Wetlands in Assam like Rani Meghna Beel, Javda Beel, etc, other parts of

North-East (NE) India, different parts of rest of India, Bangladesh, Myanmar, Nepal, etc.

IUCN status: Least Concern (LC)

Material examined: 1 example each from Dholi Beel, 26. 3.2008 and Sat Beel, Nov, 1998 and

3 examples from Javda Beel, 15. 3. 2008 (All First reports), Collector, Professor D Kar and Party.

Key to species: Dorsal fin with 24 – 26 spines and with 30 – 42 soft rays.

***Macrognathus pancalus* Hamilton, 1822**

Distribution: Wetlands in Assam including Dholi Beel, Sat Beel, Javda Beel, etc. other parts

of North-East India and rest of India, Bangladesh, etc.

IUCN status: Last Concern (LC)

Order: Cichliformes

Family: Ambassidae

Genus: *Parambassis* Bleeker, 1874

Parambassis Bleeker, 1874, Nat Verh Holland Maatsch Wetensch 2(2): 102 (Type species, *Ambassis apogonoides* Bleeker by original designation), Guha and Talwar, 1975, J Inland Fish, Soc India, 8: 76, Roberts, 1994, Nat Hist Brit Siam Soc 42: 271-289.

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Generic Characters: Body elongate, compressed. Abdomen round. Head short, compressed.

Snout pointed. Mouth large, gape oblique, extending to anterior border of orbit. Eyes large, superior. Jaws straight or only slightly upturned. Supra-orbital ridge smooth or serrated, with one or two spines posteriorly. Presence of 2 dorsal fins with 6 or 7 spines and 11 to 14 rays, which are closely placed with a notch in between. Anal fin with 3 spines and with 11 to 16 rays.

Material examined: 2 examples from Sat Beel in Rongpur, Silchar, Cachar (First report),

Collector: Professor D. Kar and Party. Col.: Nov 1998.

Key to species: Body depth 41.7 to 43.4 %; caudal peduncle depth 0.9 to 12 % SL.

***Parambassis ranga* (Hamilton, 1822)**

Distribution: Throughout India including first report from Sat Beel, Bangladesh, Malaysia,

Mayanmar.

IUCN status: Least Concern (LC).

Family: Cichlidae

Genus: *Oreochromis* Guenther, 1889

Oreochromis Guenther, 1889, Ann Mag nat Hist 4(6): 70 (Type species: *Oreochromis hunter* (Gunther, by monotypy), Trewavas, 1983, Publ Brit Mus Nat Hist No. 878: 139-373.

Generic Characters: Body more or less elongate. Abdomen rounded. Head compressed, with

concave upper profile. Mouth terminal, large, cleft extending to below anterior border of eyes. Snout rounded. Eyes large, lateral, almost in middle of head. Dorsal fin inserted above base of pectoral fins with 15 or 16 spines and 10 or 12 rays. Anal fin generally with 3 spines. Caudal fin rounded.

Material examined: 1 example from Karbhala Beel, 5. 3. 2010, First report, Collector:

Professor D Kar and Party.

Key to species: Dorsal spinous portion longer than soft part, the latter may be prolonged with

a filamentous tip.

***Oreochromis mossambicus* (Peters, 1852)**

Distribution: Wetlands in Assam, including Karbhala Beel, other parts of North-East

India, different parts of rest of India, widely introduced in India, Bangladesh Sri Lanka, etc.

IUCN status: Vulnerable

Order: Gobiiformes

Family: Gobiidae

Genus: *Glossogobius* Gill, 1859

Glossogobius Gill, 1859, Proc Acad nat Sci Philad: 46 (Type species, *Gobius platycephalus* Richardson, by monotypy), Akihito, In: Masuda et al. 1984, Fish Jap Archipel: 274, Rema Devi, 1992, Rec zool Surv India, 90 (1-4): 174 (Ennore estuary).

Generic Characters: Body elongate, anteriorly cylindrical, compressed. Abdomen rounded.

Head depressed, little pointed. Snout obtusely rounded or pointed. Mouth a little oblique. Cleft not extending to eyes. Eyes large, superior, almost in middle of head. Gill openings continued far below the eyes. Presence of 2 dorsal fins, separated by a short interspace; first dorsal inserted above half or three-fourth of pectoral fins with six rays. Second dorsal fin with 6 to 10 rays. Pelvic fins united, oblong. Anal fin with 8 or 9 rays. Caudal fin oblong to rounded. Scales ctenoid on body, cycloid on head.

Material examined: 1 example from Karbhala Beel, 5.3.2010, First report, Collector: Professor

D Kar and Party.

Key to species: First dorsal fin with one black spot or without it. Gill membranes connected

to ischmus.

***Glossogobius giuris* (Hamilton, 1822)**

Distribution: Wetlands in Assam, including Karbhala Beel, other parts of North-East

India, different parts of rest of India; widely introduced in India, Bangladesh, Myanmar, Sri Lanka, etc.

IUCN status: Least Concern (LC)

Order: Anabantiformes

Family: Nandidae

Genus: *Nandus*, Valenciennes, 1831

Nandus, Valenciennes, 1831, In: Cuvier and Velenciennes, Hist, Nat Poiss, 7: 481(Type species, *Nandus marmoratus* Cuvier = Coius nandus Hamilton-Buchanan, by absolute tautonomy, Liem, 1970, Fieldiana (zool), 56: 1-166.

Generic Characters: Body oblong, compressed. Abdomen rounded. Head large, compressed.

Snout pointed, conical. Mouth terminal, very protractile; its cleft very wide extending to below posterior border of eyes or slightly beyond. Eyes large and situated in the anterior part of the head. Opercle with one spine. Dorsal fin inserted above pectoral fin base with 12 to 14 spines and 11 to 13 rays; spinous portion

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longer than soft portion. Anal fin with 3 spines and 7-9 rays. Caudal fin rounded. Lateral line scales 46 to 57.

Material examined: 1 example from Javda Beel, Assam, 15. 3.2008, First reports, Collector:

Professor D Kar and Party.

Key to species: Scales smaller on nape than on body.

***Nandus nandus* (Hamilton, 1822)**

Distribution: Wetlands in Assam Javda Beel, etc, other parts of North-East (NE) India,

different parts of rest of India, Bangladesh, Myanmar, Thailand, etc.

IUCN status: Least Concern (LC).

Family: Badidae

Genus: *Badis* Bleeker, 1853

Badis Bleeker, 1853, Verh Bat Genootsch, 25: 106 (Type species: *Labrus buchanani* Bleeker = Labrus Hamilton-Buchanan, by tautonomy), Kullander & Britz, 2002, Ichthyol Explor Freshwaters 13(4): 303.

Generic Characters: Body moderately elongated, compressed. Abdomen rounded. Head

usually large, compressed. Snout bluntly rounded. Mouth relatively small, slightly upturned, slightly protractile; cleft not extending to anterior margin of eye. Eyes large. Lower jaw longer. Opercle with one sharp spine. Presence of a single dorsal fin, inserted above base of pectoral fins; the spinous portion longer than soft portion with 16 to 18 spines and 7 to 10 rays. Anal fin with 3 spines and 6 to 8 rays. Caudal fin rounded. Lateral line scales generally 26 to 33. Unique characters include a black stripe along middle of dorsal fin and dark bars on trunk.

Material examined: 2 examples from Karbhala Beel, 5. 3. 2010, First report, Collector:

Professor D Kar and Party.

Key to species: Presence of usually 26 scales in lateral row.

***Badis badis* (Hamilton, 1822)**

Distribution: Wetlands in Assam including Karbhala Beel, other parts of North-East India,

different parts of rest of India, Bangladesh, Nepal, etc.

IUCN status: Least Concern (LC)

Family: Anabantidae

Genus: *Anabas* Cuvier, 1816

Anabas Cuvier, 1816, Le Regne Animal, 2: 339 (Type species: *Perca scandens* Daldorf, by monotypy).

Generic Characters: Body oblong, compressed. Abdomen rounded. Head moderate,

compressed. Snout slightly conical or bluntly rounded. Mouth relatively terminal, oblique, cleft not wide. Eyes large, lateral, in anterior part of head. Upper jaw weakly protrusible. Presence of a sigle dorsal fin, inserted above pectoral fin base with 16 to 18 spines and 8 to 10 rays, number of spines variable. Anal fin with 8 to 11 spines and 9 to 11 rays. Number of spines variable. Caudal fin rounded.

Material examined: 1 example from Karbhala Beel, 5.3.2010, First report, Collector: Professor

D Kar and Party.

Key to species: Body depth 28.6 to 33.3 % SL. Dorsal fin with 8 to 10 rays.

***Anabas testudineus* (Bloch, 1792)**

Distribution: Wetlands in Assam including Karbhala Beel, other parts of North-East India,

different parts of rest of India, Bangladesh, Myanmar, Borneo, The Philippies, Singapore, Sri Lanka, etc.

IUCN status: Least Concern (LC).

Family: Osphronemidae

Genus: *Trichogaster* Bloch and Schneider, 1801

Trichogaster Bloch and Schneider, 1801, Syst Ichth, p. 164 (Type species, *Trichogaster fasciatus*, *Trichopodus Lacepede*, 1801, Hist Nat Poiss, 3, p. 125 (Type species: *Labrus trichopterus* Pallas, by subsequent designation, Colisa Cuvier, 1831. IN: Cuvier and Valenciennes, Hist Nat Poiss, 7: 359 (Type species, *Colisa vulgaris* Cuvier=*Trichopodus colisa* Hamilton-Buchanan (by absolute tautonymy).

Generic characters: Body elevated, compressed. Head moderate, compressed. Snoutblunt.

Mouth upturned, terminal, cleft small. Eyes large, lateral, in middle of head, not visible from below ventral surface of head. Jaws a little protractile. Ventral border of pre-opercle usually serrated. Number of spines in dorsal and anal fins variable. Pelvic fins in the form of single long filiform ray, and a rudimentary adnate spine. Caudal fin slightly emarginated or truncate. Lateral Line (Ll) may be interrupted with 6-29 scales.

Material examined: 1 example each from Dholi Beel, 26.3.2008, Rani Meghna Beel, 23. 3.2018,

Javda Beel, 15.3.2008 and Karbhala Beel, 5.3.2010, 2 examples from Sat Beel in Rongpur, Silchar, Cachar, First report from each wetland. Collector, Professor D Kar and Party.

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Key to species: Bands on body 14 or more. Caudal fin may be slightly notched or cut-square.

***Trichogaster fasciatus* Bloch & Schneider, 1801**

Distribution: Wetlands in Assam including Dholi Beel, Rani Meghna Beel, Javda Beel,

Karbhala Beel, other parts of North-East India, different parts of rest of India, Bangladesh, Myanmar, Nepal, etc.

Family: Channidae

Genus: *Channa* Scopoli, 1777

Channa Scopoli, 1777, Introd Hist Nat.: 459 (Type species, *Channa orientalis* Bloch and Schneider, by subsequent designation).

Generic characters: Body elongated, sub-cylindrical anteriorly. Abdomen rounded. Head

large depressed with plate-like scales. Snout somewhat obtuse. Mouth reasonably large, opening moderate to wide; may extend to below orbit. Eyes lateral, moderate, in the anterior part of the head. The lower jaw protrudes beyond the upper. Gill openings wide. Membranes of two sides connected beneath the isthmus. Dorsal fin long, inserted almost above the pectoral fins with 29-55 rays and no spine. Anal fin long with 21 to 36 rays. Both dorsal and anal fins are free from caudal fin. Caudal fin rounded, scales small, cycloid or ctenoid, scales on the head are more extensive than those on the body. Lateral line abruptly curved or almost interrupted with 37 to 110 scales.

Material examined: 3 examples from Sat Beel in Cachar, Assam, November, 1998, First report,

Collectors: Professor D Kar and Party. Nov. 1998.

Key to species: Dorsal fin with 28-33 rays. A number of dark blotches on flanks, some with

many black spots on body and also on dorsal and caudal fins. Ventral side of body usually white or pale yellow.

***Channa punctata* (Bloch, 1793)**

Distribution: Wetlands in Assam including Sat Beel (first report), other parts of North-

East India and rest of India; Bangladesh, China, Malaya, Myanmar etc.

IUCN Status: Least Concern (LC).

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