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NEW RECORDS OF THREE SPECIES OF FISH IN THE UPPER REACHES OF THE BRAHMAPUTRA AND SURMA-MEGHNA RIVER BASINS, MEGHALAYA, INDIA

S. Dey¹, M. Manorama² & S.N. Ramanujam³

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^{1,2,3} Fish Biology Laboratory, Department of Zoology, School of Life Sciences, North Eastern Hill University, Shillong, Meghalaya 793022, India

¹sankhodey@gmail.com, ²maisnamanorama@gmail.com, ³ramanujamsunkam@gmail.com (corresponding author)

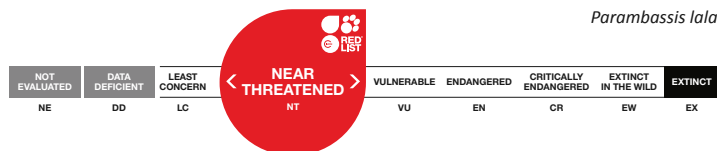
Abstract: Three species of fishes, viz., *Bagarius yarrelli*, *Parambassis lala*, listed Near Threatened and *Hemibagrus menoda*, Least Concern by IUCN, respectively belonging to the families Sisoridae, Ambassidae and Bagridae have been newly recorded from the upper reaches of the Brahmaputra and Surma-Megna river basins of Meghalaya. Diagnostic characters and brief notes on the habitat ecology of the fishes are given in this paper.

Keywords: Diagnosis, ichthyodiversity, new records, Meghalaya.

The northeastern region of India is one of the hotspots of freshwater fish biodiversity in Asia (Kottelat & Whitten 1996) and its rich ichthyological diversity is yet to be explored properly. The region shares its fish fauna predominantly with that of the Indo-Gangetic fauna and to a small extent with the Burmese and South China fish fauna (Yadava & Chandra 1994). The hills and the undulating valleys of this area give rise to a large number of torrential hill streams, which lead to big rivers and finally, become part of the Gang-Brahmaputra, Surma-

Meghna-Barak, Kolodyne and Chindwin river systems. Some of the major works on ichthyofaunal diversity carried out in northeastern India include Hora & Mukherji (1935), Menon (1974), Yazdani (1977), Sinha (1994), Nath & Dey (1997), Sen (1995, 2000, 2003), Mahapatra et al. (2003), Kar et al. (2006), Kar & Sen (2007), Vishwanath et al. (2007, 2010), Ramanujam et al. (2010).

The state of Meghalaya located in the northeastern region of India is bounded by Assam in the north and east and the plains of Bangladesh in the south and west. The state covers an area of 22,429km² and lies between 25°–26°10'N & 89°45'–92°47'E. The water bodies of the state harbour diverse fish fauna having various adaptive features suited to their hill stream environment. Important north flowing rivers of the State are Umiang, Kopili, Myntang, Jingiram and Rongai which join the Brahmaputra drainage and the south flowing rivers include Simsang Rongdi, Shella, Balat, Kynshi, Umngot, Myntdu and Bugi which drain in the Surma-Meghna



Parambassis lala



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drainage system. The species endemic to the State of Meghalaya include *Puntius shalynius*, *Garra lissorhynchus*, *Aborichthys garoensis*, *Schistura barapaniensis*, *Schistura sijuensis*, *Mesonemacheilus reticulofasciatus*, *Pillaia indica*, and *Garo khajuriai* (Sen 2003). The present study was aimed at updating and documenting the occurrence of new records of fish species from the upper reaches of the Brahmaputra and Surma-Meghna River basins in Meghalaya.

MATERIALS AND METHODS

Random field surveys were conducted between 2008 and 2011 in the rivers and streams of Meghalaya. Fish samples were collected using cast nets, gill nets, drag nets, triangular scoop nets and a variety of local made traps and also with the help of the local fishermen. The specimens were preserved in 10% formaldehyde and deposited in the Fish Biology Lab Museum (FBLM), Department of Zoology, North Eastern Hill University, Shillong after taking digital photographs of the specimens

which were in a fresh condition. Identification was done following the standard literature (Vishwanath et al. 2007; Jayaram 2010) and with the help of expertise available at the Zoological Survey of India, Shillong. Measurements were made point to point with dial calipers to the nearest 0.1mm for 15 morphometric characters. Latitude, longitude and altitude were recorded at each site using GPS-72 (Garmin, Germany).

RESULTS

The study revealed the new records of three fish species occurring in the upper reaches of the Brahmaputra and Surma-Meghna River basins in Meghalaya. The 33 study sites in Meghalaya are shown in Fig.1. *Bagarius yarrelli* was recorded from the Bugi River (collection site - 25°21'50.22"N & 90°20'34.14"E; elevation 172m), *Hemibagrus menoda* from the Simsang River (collection site - 25°11'30"N & 90°38'30"E; elevation 153m) and *Parambassis lala* from two rivers, the Ganol (collection site - 25°31'43.14"N & 90°06'33.78"E, elevation 120m)

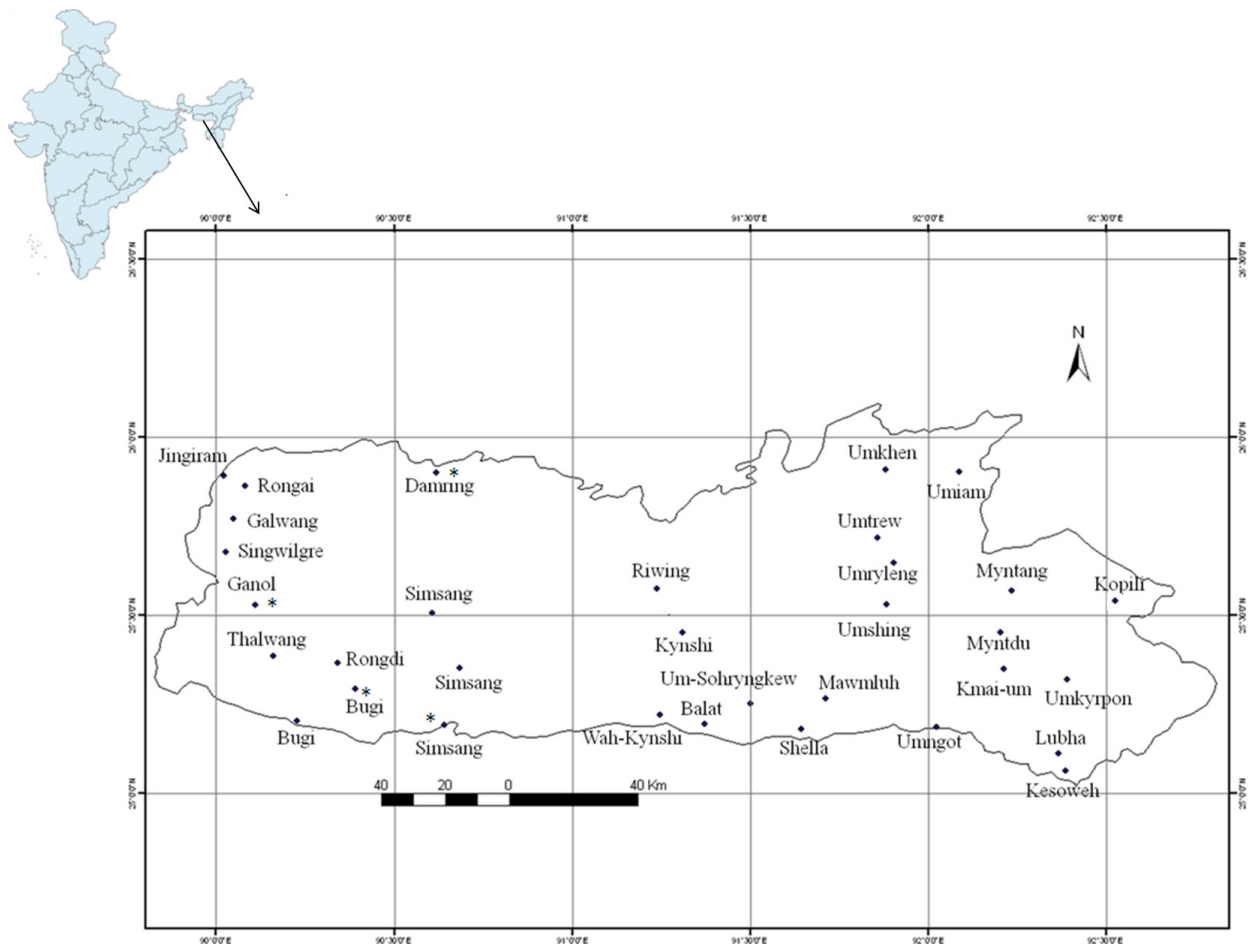


Figure 1. Showing the 33 collection sites in Meghalaya. (* Shows the collection site of the three new records)

and the Damring River (collection site - 25°53'51.54"N & 90°37'7.26"E; elevation 71m). Photographs of the collected specimens of *Bagarius yarrelli*, *Hemibagrus menoda* and *Parambassis lala* are shown in Images 1, 2 and 3. The morphometric measurements of the three new records are given in Table 1. Systematic accounts of the three new records from Meghalaya are given below:

***Bagarius yarrelli* (Sykes, 1839)**

Material examined: FBLM 14.1-14.5, 5, 26.0–52.0 cm SL, 23.x.2010, Bugi River, Deku.

Diagnosis: Body and abdomen elongate, flattened up to pelvics. Head broad and body entirely or almost entirely covered by heavily keratinised skin, superficially differentiated into unculiferous plaques or tubercles. Snout sharply conical, not pointed. Mouth terminal, wide, slightly inferior. Eyes small, subcutaneous, dorsally placed at posterior half of head, not visible from below ventral surface. Lips thick. Teeth sharp, unequal in size in bands on jaws; those on lower jaw markedly heterodont, consisting of two or three rows of relatively numerous, widely separated, and much larger conical teeth. Four pairs of barbels; one pair each of maxillary, nasal and two of mandibular; maxillary barbels large. Rayed dorsal fin inserted above base of pectoral fin with seven rays and a smooth spine with an elongated soft termination. Adipose dorsal fin moderately long, posteriorly free. Pectoral fins with 9–14 rays and a spine serrated along inner edge and also with a soft prolongation. Pelvic fins with six rays. Anal fin short, with 14–16 rays. Caudal fin deeply forked, upper lobe longer. Pelvic fin origin usually posterior to a vertical line through base of last dorsal-fin ray. Lateral line complete, simple.

Distribution: Bangladesh, China (Yunnan), India, Nepal (IUCN 2012).

Habitat and Ecology: This species inhabits a variety of fluviatile habitats, although it is typically associated with swift, clear rivers with a substrate of rocks and sand (IUCN 2012).

Differences between *Bagarius bagarius* and *Bagarius yarrelli*: In *B. bagarius* the pelvic fin is inserted slightly behind the last dorsal fin ray, skin anterior and posterior to adipose fin not forming ridges or bumps, sharply contrasting light and dark colour. In *B. yarrelli* the pelvic fin is inserted well behind the last dorsal fin ray, skin anterior and posterior to adipose fin not forming ridges or bumps, faint light and dark colour patches on body. Similar observation in two species had been noted earlier by Vishwanath et al. (2007).

***Hemibagrus menoda* (Hamilton, 1822)**

Material examined: FBLM 15.1–15.5, 5, 16.4–17.4 cm SL, 29.ix.2009, Simsang River, Bagmara.

Diagnosis: Dorsal profile rising evenly but not steeply from the tip of snout to origin of dorsal fin. Body short or moderately elongated. Head depressed, broad, ventrally flattened. Eyes moderately large, oval with wide inter-orbital space. Jaws sub-equal, mouth opening crescentic. Teeth numerous, villiform and in curved bands across palate and upper jaw. Four pairs of barbels; maxillary pair longer than head length. Rayed dorsal fin with a long spine, inner surface serrated. Adipose dorsal fin moderately long, with considerable inter-space from rayed dorsal. Pectoral fins with seven or eight branched rays. Pelvic fins do not reach anal fin. Anal fin not reaching caudal base. Caudal fin deeply forked, upper lobe unequal. Lateral line complete. Large sensory pores arranged in vertical columns along side of the body. Sensory pores of lateral line system readily visible. Black dots arranged in vertical columns on the sides of body; snout convex and broad.



Image 1. Side view of *Bagarius yarrelli*, Catalogue No. FBLM 14.5, 52.0cm SL



Image 2. Side view of *Hemibagrus menoda*. Catalog No. FBLM 15.1, 17.4cm SL

Distribution: Bangladesh; India (Assam, Bihar, Maharashtra, Manipur, Orissa, Tripura, West Bengal); Nepal (IUCN 2012).

Habitat and Ecology: This species inhabits rivers and larger streams (IUCN 2012).

Parambassis lala (Hamilton, 1822)

Material examined: FBLM 16.1–16.5, 10, 2.4–3.1 cm SL, 21.x.2010, Ganol River, Garobadah. FBLM 17.1–17.5, 5, 2.5–2.7 cm SL, 27.xi.2010, Damring River, Mendipathar,

Diagnosis: Body elongate, compressed. Abdomen rounded. Head short, compressed. Snout pointed. Mouth large, gape oblique, extending to anterior border of orbit. Eyes large, superior, not visible from below ventral surface. Lips thin. Interoperculum smooth. Lateral line complete with 30–10 scales. Head moderate size, narrower than body, oval and sharp. Two dorsal fins united with six or seven spines, second dorsal with 12–14 soft rays; anal fin with three spines and with 14–16 rays. Body with three longitudinal dusky bands along sides. Caudal fin deeply emarginated.

Distribution: India (Assam, Bihar, Orissa, Tripura, West Bengal); Myanmar (IUCN 2012).

Habitat and Ecology: Inhabits ponds, ditches and pools; perhaps also brackish waters (Talwar & Jhingran 1991).

DISCUSSION

Bagarius bagarius has been reported from Meghalaya (Mahapatra et al. 2003; Sen 2003) but *B. yarrelli* has not been reported so far. *Hemibagrus menoda* and *P. lala* have been reported from Assam in Northeast India but they have not been reported from Meghalaya (Sen 2003). *Hemibagrus menoda* is often referred to as *Mystus* in the literature, and has sometimes been erroneously listed as *Mystus corsula* (due to the erroneous labelling of the



Image 3. Side view of *Parambassis lala*, Catalogue No. FBLM 16.5, 3.1cm SL

figure accompanying the original description as “*Mugil corsula*”) by Ng & Ferraris (2000). Several authors have considered *Parambassis lala* as a synonym of *Parambassis ranga* (Day 1875; Menon 1999). Because of the small size of *Parambassis lala* it is also considered as the juvenile of *Parambassis ranga* (Fraser-Brunner 1955). Other workers, however, consider *Parambassis lala* as an undoubtedly distinct species (Talwar & Jhingran 1991; Roberts 1994; Jayaram 1999). All the three species mentioned above are considered as food fishes. *Parambassis lala* is an important ornamental fish and is over-exploited for the ornamental fish trade. It has been found out that the distribution of *Bagarius yarrelli* and *Hemibagrus menoda* is confined to only one location each, while *Parambassis lala* is found in two different locations out of the 33 sites surveyed. The restricted distributions of these may be either due to overexploitation or other anthropogenic activities which if continued, may threaten their survival. *B. yarrelli* and *P. lala* have already been listed as near threatened species in the IUCN Red List. Precautionary measures to lessen the destruction of the habitat have to be taken to conserve these species.

Table 1. Morphometric measurements of the three newly recorded species of fishes.

Measurements	<i>Bagarius yarrelli</i> (n=5)	<i>Parambassis lala</i> (n=10)	<i>Hemibagrus menoda</i> (n=5)
	Mean (cm)±SD	Mean (cm)±SD	Mean (cm)±SD
Total length	52.06±9.73	3.50±0.30	22.08±2.54
Standard length	41.2±9.93	2.64±0.28	16.88±0.95
Body depth	6.84±1.34	1.42±0.11	3.70±0.86
Caudal peduncle depth	3.68±0.87	0.32±0.04	2.24±0.26
Head depth	4.66±0.82	0.92±0.08	2.18±0.15
Head length	9.54±1.58	1.00±0.07	5.14±0.27
Eye diameter	0.65±0.07	0.36±0.05	0.60±0.07
Snout length	4.46±0.76	0.32±0.04	1.84±0.11
Post-orbital Length	4.66±0.76	0.42±0.04	2.74±0.24
Pectoral fin length	12.74±2.57	0.68±0.04	2.92±0.97
Dorsal fin length	5.02±1.05	0.92±0.11	3.12±0.27
Adipose dorsal fin length	3.58±0.55	—	1.90±0.22
Pelvic fin length	5.84±1.20	0.64±0.31	2.16±0.24
Anal fin length	5.18±0.88	0.62±0.04	2.12±0.13
Caudal fin length	14.66±2.24	0.86±0.05	4.88±0.95

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