

Original Paper

DISTRIBUTION AND CONSERVATION STATUS OF FISH SPECIES IN RIVERS TUICHONG AND TUIVAI IN MIZORAM: PIONEERING DETAILED TAXONOMIC STUDY AND REPORT

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Abstract

Fish diversity and taxonomic surveys in the River Tuichong at different locations from the headwaters to the downstream region in the province of Mizoram, done as a pioneering work (since updated), revealed the occurrence of 8 species of fishes under 8 genera, 3 sub-families, 7 families and 3 Orders. during the entire period of study. These include 5 ichthyospecies under Cypriniformes, 2 fish species under Siluriformes and one fish species under Anabantiformes. Conservation status and Distribution of each species of fish have been discussed in the present paper.

*Likewise, Fish faunal surveys in the **River Tuivai** at different locations and on different dates in the province of Mizoram, done as a pioneering work (since updated), revealed the occurrence of 9 species of fishes belonging to 9 genera, 4 sub-families, 6 families and 2 orders during the entire period of study. These included **6 species under Cypriniformes and 3 species under Siluriformes**. Conservation status and Distribution of each fish species have been discussed in the present communication.*

Keywords

Fish diversity and taxonomy, River Tuichong, River Tuivai, Mizoram, North-East India Himalayan Biodiversity Hotspot, Conservation

1. Introduction

Fish forms c 50 % of the total vertebrate population in the globe. They dwell almost in all aquatic domains in the earth. Approximately 21,723 species of living piscian fauna have been noted out of

approx. 39,900 species of vertebrates in the world (Jayaram, 2003, 2010; Nelson *et al.*, 2016, Kar, 2025 a, b, c, d). Out of these, c 8411 are freshwater (FW) forms and c 11,650 are marine. Incidentally, India is one of the Megabiodiversity countries in the world (Mittermeier & Mittermeier, 1997). In India, c 2500 species of fishes are said to have been noted; of which, c 930 species are said to live freshwater (FW) and c 1570 are marine (Jayaram, 2010; Kar, 2003, 2007, 2010, 2019, 2025 a,b,c,d). This bewildering piscian biodiversity of this region had been alluring innumerable ichthyologists both from India and abroad. Concomitantly, North-East (NE) region of India has been earmarked as a “Hotspot” of Biodiversity in the Eastern Himalayan belt, by the World Conservation Monitoring Centre (WCMC, 1998). This profic biodiversity of this region could be assigned to certain causes, notably, the geomorphology and the tectonics of this belt. The mountains and the undulating terrains of this region are said to give rise to innumerable torrential hill streams, which lead to big rivers; and, ultimately, become part and parcel of the Ganges-Brahmaputra-Barak-Chindwin-Kolodyne-Gomati-Meghna river system (Kar, 2000, 2007, 2013, 2019, 2021a, b, c, d, 2025a b c d).

There are numerous lentic and lotic water bodies in India. And, the province of Mizoram, situated in the NE Himalayan belt, is a hotspot of fish biodiversity dwelling in many lentic and lotic water bodies of various kinds, including rheophilic hill streams; and, to some extent, plainwater rivers and streams. Nevertheless, the water bodies and the biota in them, have been much affected by human interventions. A brief review of literature on Fish taxonomic works revealed that, Menon (1978) had dwelt upon an appraisal of Satpura Hypothesis of Distribution of the Malayan species to Peninsular India.

Concomitant to above, Kar (1990, 1996, 1999, 2000, 2003 a,b, 2005, 2007, 2013, 2015, 2019, 2021 a,b,c,d, 2022, 2024 a, b; 2025 a b c d; Kar and Kumar (2023), Kar and Das (2024) have been conducting large-scale research works in NE India on different aspects of fish and their habitats. Kar and Sen (2007) reported a detailed study on fish’ biodiversity in NE India with particular reference to Barak drainage, Mizoram, and Tripura. Recently, Kar and Khynriam (2020, 2022, 2023, 2024; Kar *et al.*, 2007, 2008, 2011, 2018, 2020) did extensive and intensive research works on the fish taxonomy and diversity and other related parameters in many water bodies in NE India.

Kar and Das, BK (2015) , Kar and Kumar (2023), Barbhuiya, A.H.; Singha, R; and, Kar, D. (2021) had studied the present status of aquatic bodies and human impact *vis-a-vis* sustainability of fishes, particularly the endangered mahseer fishes. Kar and Das B (2024) reported the ichthyo diversity in rivers in Karbi Anglong in Assam. Kar and Khynriam (2020 a, b) published pioneering taxonomic research works on the fishes of rivers Diyung, Vombadung, Khuolzangvadung, Tuikoi and Mahur; and, in River Jinam in Dima Hasao district of Assam. Kar and Khynriam (2022) published their research works on the fishes of River Barak at Karong. along Manipur-Nagaland border. In addition, Kar and Khynriam (2023) revealed Pioneering research studies on the Taxonomic Diversity of Fishes in the Headwaters of River Barak in Assam, Manipur and Mizoram in NE India. Further, Kar and Khynriam (2024), in continuation of their reconnaissance pilot survey, did further pioneering research works on the Taxonomy, Distribution and Conservation of Fish species in the Headwaters of River Barak (Assam,

Manipur and Mizoram) in NE India. Kar (2015) and Kar and Roy (2021 a, b) dealt with the *hitherto* unknown, virulent and enigmatic fish disease called Epizootic Ulcerative Fish Disease Syndrome (EUS). Kar *et al.* (2008 a, b, c, d; 2003, 2007, 2008, 2011, 2018 a, b) had worked on various aspects of fishes, including fish taxonomy, fish disease and fish parasites, zooplankton as fish food fauna, fishing gears and fish catching devices; and, so on. Incidentally, Das *et al.* (2018) worked on the zooplankton assemblage in the water bodies in Assam.

Notwithstanding the above, Kar, D. (2005 b) deliberated on the Fish Diversity in the Major Rivers in Southern Assam, Mizoram and Tripura at the 2nd International Symposium on GIS and Spatial Analyses in Fisheries and Aquatic Sciences, held at the University of Sussex at Brighton in the UK. In addition, Kar, D. (2007 b) presented his research findings on the Sustainability issues of Inland Fish Biodiversity and Fisheries in Barak drainage (Assam), in Mizoram and in Tripura at the International Symposium on 'Improved sustainability of Fish Production Systems and Appropriate Technologies for Utilisation' ("Sustain Fish", held at the Cochin University of Science and Technology(CUSAT) at Cochin in Kerala. Further, Kar D (2016 a) dwelt upon an overview of the Wetlands, Rivers, Piscian resources and Fish Disease in NE India at the International Symposium on Aquaculture and Fisheries (as part of the International Conference on Environmental Sustainability for Food Security (ENFOSE, 2016), held at Fisheries College and Research Institute (FCRI), Tamil Nadu Fisheries University (TNFU). In addition, Kar, D (2016 b) delivered his research results on the Wetlands, Rivers, Fish, Plankton resources and Fish disease and Aquaculture in North-East India as an Overview at the International Symposium, entitled, 'Lake 2016 organised by the Indian Institute of Science, Bengaluru, and the Alva's Education Foundation, Mengaluru (India).

Concomitant to above, some of the other significant works on the fishes and water bodies in India in general and NE India, in particular, are those of Ghosh. and Lipton, 1982; Barman, 1984, 1992, 1994; Jayaram, 1981, 1999, 2003, 2010; Sen, 1985; Kar *et al.*, 2007, 2008, 2011, 2018, 2020; Menon, 1974, 1999; Nath and Dey, 1989, 1997; Sinha, 1994; Sen, 2000; Sen and Khyndriam, 2014; Arunachalam, *et.al.* 2013; Das, *et.al.*, 2015; Dey, *et.al.*, 2015; Lalramliana *et.al.*, 2018; Lokeshwor *et.al.* 2013; Khyndriam and Sen, 2014). Incidentally, Bănađuc *et al.*, 2020 worked significantly on the water bodies in Romania.

Notwithstanding the above, Bailey (1994) had studied the fishes of River Nile in the Congo Republic. Moreover, Bailey (1996) had dealt with Fish and Fisheries Ecology of a lentic system in Tanzania. Bailey and Hickley (1986) had reported on *Nothobranchius virgatus* Chambers, a new killifish from southern Sudan. Further, Didem *et.al* (2012) reported a New Record of occurrence of *Symphodus bailloni* (Osteichthyes: Perciformes: Labridae) in the Western Black Sea Coast of Turkey. Notably, Kullander, *et.al.*, (2008) reported a new species of cyprinid fish from Myanmar. Further, Conway and Kottelat (2007) had published a new species of *Psilorhynchus* from the Ataran River Basin, in Myanmar. Wikramanayake, and Moyle (1989) had dealt with the ecological structure of Tropical Fish Assemblages in wet-zone streams in Sri Lanka.

Geographical position of the Sampling site and Study points in River Tuichong in Mizoram: River Tuichong The River Tuichong is an incoming tributary of River Karnafuli at Demagiri. Tuichong Village (Near Demagiri (Tlabung) River Tuichong in Mizoram Altitude: 215.8 m MSL

N 22 ° 54' 57.7"

E 92 ° 31' 50"

River Tuivai

On the other hand, the River Tuivai is a south bank tributary of River Barak. River Tuivai joins River Barak at Tipaimukh.

Geographical position at Tipaimukh:

N 24°14'8.9" E 93°01'2.1

Altitude above m.s.l. (m): 26

The diversity of ichthyofauna of River Tuichong along with their conservation status at the global and regional levels have been presented in Table 1. Likewise, the diversity of ichthyofauna of River Tuivai along with their conservation status at the global and regional levels have been presented in Table 2.

Further, Total Systematic list of Fishes and the corresponding Systematic description of the individual Fish Species of all Collections for the entire surveyed period for River Tuichong is given below:

Systematic List of Fishes of whole R Tuichong for all collections:

Order(I): Cypriniformes

Family (A): [Danionidae](#)

Sub-family(a): Chedrinae

Genus (i): *Salmostoma* Swainson 1839

Species (1): *Salmostoma phulo* (Hamilton, 1822)

Order(I): Cypriniformes

Family (A): [Danionidae](#)

Sub-family(a): Chedrinae

Genus (ii): *Opsarius* McClelland, 1838

Species (2): *Opsarius barna* (Hamilton, 1807)

Order(I): Cypriniformes

Family(B): [Cyprinidae](#)

Sub-family(b): Smiliogastrinae

Genus: (iii) *Pethia* Pethiyagoda, 2012

Species (3): *Pethia conchoni* (Hamilton, 1822)

Order(I): Cypriniformes**Family(C): Psilorhynchidae****Genus (iv): Psilorhynchus** McClelland, 1839Species (4): *Psilorhynchus balitora* (Hamilton, 1822)**Order(I): Cypriniformes****Family(D): Nemacheilidae****Genus (v): Schistura** McClelland, 1839**Species(5): Schistura scaturigina** McClelland, 1839**Order(II): Siluriformes**

Family (E): Schilbeidae

Genus (vi): Eutropiichthys Bleeker, 1862Species (6): *Eutropiichthys vacha* (Hamilton, 1822)**Order (II): Siluriformes**

Family (F): Sisoridae

Sub-family (c): Sisorinae

Genus (vii): Gagata Bleeker, 1856Species (7): *Gagata cenia* (Hamilton, 1822)**Order (III): Anabantiformes**

Family(G): Channidae

Genus (viii): Channa Scopoli, 1777Species (8): *Channa gachua* (Hamilton, 1822)**Gist: R Tuichong in Mizoram: Total No. of:****Order: 3****Family: 7****Sub-Family: 3****Genus: 8****Species: 8**

Concomitantly, the **Total Systematic list of Fishes and the corresponding Systematic description of the individual Fish Species of all Collections from River Tuivai** is given below:

Systematic List of Fishes of R Tuivai for all collections:

Order(I): Cypriniformes**Family (A): Danionidae****Sub-family(a): Chedrinae****Genus (i): Barilius** Hamilton, 1822**Species(1): Barilius barila** (Hamilton, 1822)**Order(I): Cypriniformes**

Family(B): Cyprinidae

Sub-family (b): Torinae

Genus:(ii): Tor Gray, 1834

Species:(2): Tor putitora (Hamilton, 1822)

Order(I): Cypriniformes

Family(B): Cyprinidae

Sub-family (b): Torinae

Genus (iii): Neolissochilus Rainboth, 1985

Species (3): Neolissochilus hexagonolepis (McClelland, 1839)

Order(I): Cypriniformes

Family(B): Cyprinidae

Sub-family (c): Smiliogastrinae

Genus: (iv): Puntius Hamilton, 1822

Species (4): Puntius chola (Hamilton, 1822)

Order(I): Cypriniformes

Family(C): Psilorhynchidae

Genus (v): Psilorhynchus McClelland, 1839

Species (5): Psilorhynchus balitora (Hamilton, 1822)

Order(I): Cypriniformes

Family(D): Nemacheilidae

Genus (vi): Acanthocobitis (Paracanthocobitis) Peters, 1861

Species (6): Acanthocobitis (Paracanthocobitis) botia (Hamilton, 1822)

Order (II): Siluriformes

Family (E): Ailiidae

Genus (vii): Ailia Gray, 1830

Species (7): Ailia coila (Hamilton, 1822)

Order (II): Siluriformes

Family: (F): Sisoridae

Sub-family (d): Sisorinae

Genus: (viii): Bagarius Bleeker, 1853

Species: (8): Bagarius bagarius (Hamilton, 1822)

Order: (II): Siluriformes

Family: (F): Sisoridae

Sub-family:(d): Sisorinae

Genus: (ix): Glyptothorax Blyth, 1860

Species: (9): Glyptothorax telchitta (Hamilton, 1822)

Gist: R Tuivai in Mizoram: Total No. of:

Order: 2

Family: 6

Sub-Family: 4

Genus: 9

Species: 9

Gist of Species Record

Species composition of the ichthyospecies collected from River Tuichong from different sites on different dates have been presented in the following running table:

Collectns. From River Tuichong	20 10 2002, Lot No.1	20 10 2002, Lot No 2
Species	6	2
Genus	6	2
Sub-family	3	1
Family	6	2
Order	3	2

Concomitantly, species composition of the ichthyospecies collected from River Tuivai from different sites on different dates have been presented in the following running table:

Collectns.	SI 106: R Tuivai: Coll: 4	SI 107: R Tuivai: Coll:	SI 111: R Tuivai: Coll:
From River	6 2007	24 4 2008	25 4 2008
Tuivai			
Species	2	2	2
Genus	2	5	3
Sub-family	2	3	2
Family	2	6	3
Order	2	6	3

2. Method

Fish samples were collected by 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, at the beginning, in concentrated formaldehyde in the field itself and then in 10% formalin in the Laboratory. Fishes were identified through standard literature (Day, 1873, 1885, 1878, 1889; Shaw and Shebbeare, 1937; Misra, 1959; Menon, 1974, 1999; Talwar and Jhingran, 1991; Jayaram, 1981, 1999, 2010) and fishbase.org. The arrangement of classification,

followed here, is that of Greenwood *et al.* (1966) and Jayaram (1981, 1999, 2003, 2010); Kar and Khynriam, 2022, 2024, Kar, 2025 a, b, c).

3. Result

Systematic account of the Fishes of River Tuichong

Genus: Salmostoma Swainson, 1839

Salmophasia Swainson, 1839, *Nat. Hist.Fish.*, 2: 184 (Type species, *Cyprinus oblonga* Swainson=*Cyprinus bacaila* Hamilton-Buchanan, by subsequent designation); Banarescu, 1968, *Rev.Roum.Biol. Zool.*, 13: 13-14; Howes, 1979, *Bull.Br.Mus. nat.Hist.*, (Zool.) 36(3):190-191; Talwar and Jhingran, 1999, *Inland Fishes* 1; Jayaram, 1999, 2010, *FW Fishes of the Indian Region*: 65; Menon, 1999, *Rec.Zool. Surv. India Occ. Paper* No. 175: 24.

Generic characters: Body elongated, compressed. Abdomen keeled from below pectoral fins to anus; keel not hardened. Head moderate to long, compressed. Snout blunt. Mouth oblique to body axis; cleft reaching anterior margin of orbit or slightly ahead. Lower jaw longer with a knob (generally present) at the symphysis of the 2 bones. Dorsal fin short; inserted mostly opposite to anal fin (or may be little ahead in some cases) with usually 7 to 10 rays. Pectoral fins long and presence of an elongated axillary scale. Anal fin short with 14-20 rays. Caudal fin deeply forked. Ll complete with usually 39 to 112 scales.

Material examined:

(a) River Tuichong in Mizoram; Collection date: 20 10 2002 (Lot 2); 56 Ex.; *Museum No. 101 / 2* (i) to 2 (Lvi); Collection and First Report by: Professor D. Kar and Party.

Key to species: Lateral Line scales 99 to 112.

Salmostoma phulo phulo (Hamilton, 1822)

Distribution: In water bodies in India (including Rivers Karnafuli, Tuichong in Mizoram: First Report by Professor D. Kar and Party); also, in the Ganges river system, Bangladesh, etc.

IUCN status: Least Concern (LC).

Genus: Opsarius McClelland, 1838

Opsarius McClelland, 1838. *Journal of the Asiatic Society of Bengal* 7: 944.

Generic characters: Body long, mouth widely cleft and horizontal with symphysial knob received into a corresponding depression in the apex of the upper jaw. Back straight, dorsal fin placed opposite to anal fin, both fins situated near the caudal extremity.

Material examined:

(a) River Tuichong in Mizoram; Collection date: 20 10 2002 (Lot 1); 6 Ex.; *Museum No. 100 / 2* (i) to 2 (vi); Collection and First Report by: Professor D. Kar and Party.

Key to species: Coloured bands usually present on the upper part of Lateral line and generally does not extend below the Lateral line. No barbels.

Opsarius barna McClelland, 1839

Distribution: In many water bodies in India (including River Barak between Patpuihmun and Sartuinek, River Barak at Karnifai; River Barak at Taithu in North-East India: In all these collections: First reports by Prof. D. Kar and Party; Rivers Tuirial, Tlawng, Mat, Kolodyne, Tuichong in Mizoram: In all these collections, First reports by Prof D Kar and Party); also in Bihar, Delhi, Jammu and Kashmir, Madhya Pradesh, Mysore, Orrisa, Rajasthan, Uttar Pradesh, West Bengal. Bangladesh, Myanmar, Nepal, etc.

IUCN Status: Least Concern (LC).

Genus: Pethia Pethiyagoda, 2012

Pethia, 2012, Pethiyagoda, Meegaskumbura and Maduwage: 80 (Type species: *Barbus nigrofasciatus* Gunther, 1868. Type by original designation). Pethiyagoda, Meegaskumbura and Maduwage, 2012.

Generic characters: Body short to moderately long, deep, and compressed. Abdomen rounded. Head short. Snout obtuse, conical, or pointed; sometimes, it may have tubercles. Mouth arched, anterior or inferior. The upper jaw may be protractile. Eyes moderate to large, dorso-lateral; they are not visible from below the ventral surface. Lips thin, cover the jaws, without any horny covering. Jaws simple without any tubercle at the symphysis. Barbels 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:

(a) River Tuichong in Mizoram; Collection date: 20 10 2002 (Lot 1); 1 Ex.; *Museum No. 100 / 3 (i)*; Collection and First Report by: Professor D. Kar and Party.

Key to species: Barbel absent, lateral line incomplete, and caudal peduncle with a black blotch.

Pethia conchonius (Hamilton, 1822)

Distribution: In many water bodies in India (including River Vomvadung and River Khuolzangvadung in Dima Hasa District, Assam: First reports by Professor. D. Kar and Party; River Kopili: **at Panimur:** First report by Professor. D. Kar and Party ; River Monu in Tripura: First report by Professor. D. Kar and Party; Rivers Tuirial , Tlawng, Mat, Kolodyne, Karnafuli , Tuichong in Mizoram: First reports by Professor. D. Kar and Party); also in Bihar, Uttar Pradesh, Punjab, Maharashtra, Orissa, Eastern, and western Himalaya, Deccan, Afghanistan, Bangladesh, Myanmar, Nepal, Pakistan, and Sri Lanka, etc.

IUCN Status: Least Concern (LC).

Psilorhynchus McClelland, 1839, Asiatic Researches, 19: 300, 428 (Type species: *Cyprinus sucatio* Hamilton, by subsequent designation).

Generic characters: Body spindle-shaped, arched dorsally and flattened ventrally; anteriorly depressed. Ventral surface markedly flattened. Snout flat obtusely pointed anteriorly. A shallow depression may be present on the cheek. Mouth small, inferior, transverse. Eyes large, dorso-lateral in the posterior half

of the head; not visible from below ventral surface. Lips entire, fleshy, continuous at the angle of mouth; reflected off from both the jaws; and, with glands and folds. Presence of a distinct lateral groove on either side passing along the sides of the snout. The upper jaw overhangs the mouth. Absence of barbels. Dorsal fins inserted ahead of pelvic fins with 10-12 rays. Pectoral fins simple with four-six rays. Anal fin short with seven rays. Caudal fin forked; upper lobe longer. Scales relatively large along the lateral line. Lateral line complete with 32-34 scales.

Material examined:

(a) River Tuichong in Mizoram; Collection date: 20 10 2002 (Lot 1); 1 Ex.; *Museum No. 100 / 5 (ii)*; Collection and First Report by: Professor D. Kar and Party.

Key to species: Pectoral fin with 6-7 simple rays. Lateral line scales 30-34.

Psilorhynchus balitora (Hamilton, 1822)

Distribution: In many water bodies in India, particularly, in the hill streams (including upstream rheophilic stretch of River Barak at Phulpui in North-East India: First report by Professor D. Kar and Party; in the upstream hilly stretch of River Tuivai at 20 km upstream from Barak Dam site: First report by Professor D. Kar and Party; in Rivers Tuirial, Tlawng, Mat, Kolodyne in Mizoram: First reports by Professor D. Kar and Party; in **River Gomati in Tripura**: First report by Professor D. Kar and Party); also, in the Ganga-Brahmaputra basin. Bangladesh, Bhutan, Nepal, etc.,

IUCN Status: Least Concern (LC).

Genus: *Schistura* McClelland, 1839

Schistura McClelland, 1839, *Asiat. Res.*, 19: 306, 439 (Type species: *Cobitis (Schistura) rupecula* McClelland by subsequent designation).

Generic characters: Body elongate of almost uniform depth; compressed posteriorly. Head either depressed or compressed. Snout usually blunt. The posterior nostril may be prolonged as a tube in some species. Lips with a few furrows; medially interrupted. Upper lip slightly furrowed; continuous or with a narrow median interruption. Lower lip interrupted in the middle; moderately furrowed. Processus dentiform of upper jaw present with a corresponding incision on the lower jaw in many species. Dorsal fin short; inserted ahead or opposite to pelvic fins; with seven-eight rays; rarely 10. An auxiliary pelvic lobe may be present. Caudal fin slightly emarginated, forked, or truncate (never rounded); with a black bar. A general absence of adipose crest. If present, mostly in the posterior part of the body. Lateral line complete or incomplete. Presence of scales on the body generally. Usually, presence of a characteristic color pattern.

Material examined:

(a) River Tuichong in Mizoram; Collection date: 20 10 2002 (Lot 1); 4 Ex.; *Museum No. 100 / 5 (i), 5 (iii) to 5 (v)*; Collection and First Report by: Professor D. Kar and Party.

Key to species: Total Length may reach upto 10 cm. Usually lives in the streams with gravelly bottom. Tail could be said to be an allusion to forked caudal fin.

Schistura scaturigina McClelland, 1839

Distribution: In water bodies in India (particularly, in the hill streams with gravelly bottom; notably, in River Tuichong in Mizoram: First Report by Professor D. Kar and Party); also in Darjeeling in the Himalayas, Nepal, Bhutan, Bangladesh, etc.

IUCN status: Least Concern (LC)

Genus: *Eutropiichthys* Bleeker, 1862

Eutropiichthys Bleeker, 1862, *versl. Akad. Amsterdam*, 14: 398 (Type species: *Pimelodus vacha* Hamilton-Buchanan, by original description); Hora, 1937, *J. Bombay nat. Hist. Soc.*, 39: 431-446 (review); Jayaram, 2006, *Catfishes of India*: 132; Ferraris, 2007, *Zootaxa* 1418: 358.

Generic characters: Body elongate, compressed. Abdomen rounded. Head of moderate size, conical, snout pointed or blunt. Cleft of mouth reaching below orbit or slightly beyond. Eyes moderately large, lateral. Presence of 4 pairs of barbels; one pair each of maxillary, nasal and two pairs of mandibular. Rayed dorsal fin inserted above half of pectoral fins with 7 rays and a spine. Adipose dorsal fin short, posteriorly free. Pectoral fins with 10 to 16 rays and a spine. Pelvic fins with six rays. Anal fin long with 38 to 54 rays. Caudal fin deeply forked

Material examined:

(a) River Tuichong in Mizoram; Collection date: 20 10 2002 (Lot 2); 11 Ex.; *Museum No. 101 / 1 (i) to 1 (xi)*; Collection and First Report by: Professor D. Kar and Party.

Key to species: Nasal barbels reach hind border of head or slightly beyond.

Eutropiichthys vacha (Hamilton, 1822)

Distribution: In many water bodies in India (including Sone Beel, in Assam: First Report by Professor D. Kar and Party; River Barak at Fulertal in Assam: First Report by Professor D. Kar and Party; Rivers Mat, Kolodyne, Karnafuli, Tuichong in Mizoram: First Reports by Professor D. Kar and Party); also, in Bangladesh, Myanmar, Thailand, etc.

IUCN status: Least Concern (LC)

Genus: *Gagata* Bleeker, 1858

Gagata Bleeker, 1858. *Ichthyol. Archipel Indici Prodr.*, 1: 204 (type species: *Pemelodus gagata* Hamilton-Buchanan, by absolute tautonymy);- Hora and Law 1941, *Rec. Indian Mus.* 43 (10): 9 (revision);- Roberts and Ferraris, 1998. *Proc. Calif. Acad. Sci.* 50 (14): 317;- Jayaram, 2006, *Catfishes of India*: 187; Thompson ad Page, 2006, *Zootaxa*, 1345: 29 (Check list);- Ferraris, 2007, *Zootaxa*, 1418: 385 (Check list).

Generic characters: Dorsal profile rising not very sharply upto dorsal fin base; thereafter, slopes very gently; nearly straight. Head and body compressed. Head short. Snout obtusely rounded. Mouth inferior, small and narrow. Median longitudinal groove on head distinct. Eyes large, dorso-lateral. Maxillary barbels with an osseous base and lying in a groove anteriorly. Nasal pair of barbels with broad flaps, separating the 2 nostrils. Mandibular barbels inserted in a transverse row but at the same level. Rayed dorsal fin inserted above middle of pectoral fins. Caudal fin deeply forked. Lateral line complete with pores on anterior half.

Material examined:

(a) River Tuichong in Mizoram; Collection date: 20 10 2002 (Lot 1); 1 Ex.; *Museum No. 100 / 1 (i)*; Collection and First Report by: Professor D. Kar and Party.

Key to species: Tip of snout acutely pointed in lateral profile with a distinct notch anteriorly. Maxillary barbels shorter than head length.

Gagata cenia (Hamilton, 1822):

Distribution: In many water bodies in India, usually, in the hill streams (including River Barak at Khangbor in NE India: First Report by Professor D. Kar and Party; **River Gomati in Tripura**: First Report by Professor D. Kar and Party; Rivers Tlawng, Karnafuli and Tuichong in Mizoram: First Reports by Professor D. Kar and Party); also, in Nepal, Myanmar, Bangladesh, Thailand, Sumatra, etc.

IUCN status: Least Concern (LC)

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:

(a) River Tuichong in Mizoram; Collection date: 20 10 2002 (Lot 1); 1 Ex.; *Museum No. 100 / 4 (i)*; Collection and First Report by: Professor D. Kar and Party.

Key to species: Presence of generally 80 Lateral line scales and 22 anal fin rays.

Channa gachua (Hamilton, 1822)

Distribution: In many water bodies in India (including wetlands in Assam like Salchapra Anua, Baskandi Anua in Cachar, Assam: First reports by Professor D Kar and party; Rivers Tuirial, Mat and Tuichong in Mizoram: First reports by Professor D Kar and party); also, in Bangladesh, China, Malaya, Myanmar, etc.

IUCN Status: Least Concern (LC)

Systematic account of the Fishes of River Tuivai

Genus *Barilius* Hamilton, 1822

Barilius Hamilton, 1822, Fish Ganges, 266, 384 (Type species: *Cyprinus barila* Hamilton).

Generic characters: Body moderately elongate and compressed. Abdomen rounded. Head sharply pointed; might have “peral organs” and tubercles. Mouth anterior or obliquely directed upwards. Eyes large and superior in the anterior half of the head, not visible from below the ventral surface. Upper jaw longer than lower. Characteristic muscular pads present in front of the bases of the pectoral fins. Dorsal fin inserted opposite the inter-space between pelvic and anal fins, nearer to caudal-fin base than to the tip of the snout. Caudal fin forked. Scales moderate. Lateral line concave. The body usually covered with vertical bands.

Material examined:

(a) River Tuivai in Mizoram; Collection: 24 4 2008; 22 Ex.; *Museum No.*, 107 / 5 (i) to 5 (xxii); Coll. and First Report by Professor D. Kar and Party.

(b) River Tuivai in Mizoram; Collection: 25 4 2008; 10 Ex.; *Museum No.*, 111 / 2 (i) to 2 (x); Coll. and First Report by Professor D. Kar and Party.

Key to species: Body with 14 or 15 short vertical bars extending from back to lateral line.

***Barilius barila* (Hamilton, 1822)**

Distribution: In many water bodies in India, generally in the hill streams (including River Barak at Thingkal, NE India: First report by Prof. D. Kar and Party; Rivers Tuirial, Tlawng, Kolodyne, Tuivai in Mizoram: In all these collections: First reports by Prof. D. Kar and Party); also in Bihar, Delhi, Jammu and Kashmir, Madhya Pradesh, Mysore, Odisha, Rajasthan, Uttar Pradesh, West Bengal. Bangladesh, Myanmar, Nepal, etc.

IUCN Status: Least Concern (LC).

Genus: *Tor* Gray, 1834

Tor Gray, 1834, Illustrations of Indian Zoology, 2, Pl. 96 (type-species, *Cyprinus tor* Hamilton, by monotypy).

Generic characters: Body elongate, moderately compressed. Abdomen rounded. Head small, broadly pointed. Snout angularly rounded, often with tubercles. Mouth inferior, usually arched. Eyes large; not

visible from below ventral surface. Lips fleshy, continuous at angles of the mouth. Posterior lip with a median lobe and the post-labial groove continuous. Four barbels; one pair each of maxillary and rostral. Dorsal fin inserted above pelvic fins, with 12 to 13 rays and a strong, stout, smooth spine. Anal fin with seven or eight rays. The caudal fin deeply forked. Scales large. Lateral line complete with 22 to 37 scales.

Material examined:

(a) River Tuivai in Mizoram; Collection: 4 6 2007; 5 Ex.; *Museum No.*, 106 / 2 (i) to 2 (v); Coll. and First Report by Professor D. Kar and Party.

Key to species: Head length almost equal to or may be little more than body depth. Dorsal fin inserted midway between tip of snout and caudal fin base.

Tor putitora (Hamilton, 1822)

Distribution: In water bodies in India, particularly, in the hill streams (including River Barak at Thingkal, Tuolbung in NE India First report by Prof. D. Kar and Party; River Tuivai in Mizoram: First report by Prof. D. Kar and Party); also, in the Ganges, Brahmaputra and Barak river systems, Bangladesh, Nepal, etc.

IUCN Status: Endangered (EN)

Genus: *Neolissochilus* Rainboth, 1985

Neolissochilus Rainboth, 1985, *Beaufortia* 35 (3): 26 (Type species: *Barbus stracheyi* Day, 1871, by original designation).

Generic characters: Body deep anteriorly. Trunk and peduncle are smoothly tapering from anterior end to posterior end. Abdomen rounded. Head broad. Snout blunt. Mouth oblique, terminal to horizontal or inferior. Species with horizontal mouth often have the lobe of the snout overhanging the upper lip. Mouth smoothly rounded when the lower jaw is blunt. Eyes in the upper half of head; visible both from dorsal and ventral surfaces. Lips thick. Cheeks with many tubercles. Labial fold interrupted. Scales large and heavy.

Material examined:

(a) River Tuivai in Mizoram; Collection: 24 4 2008; 1 Ex.; *Museum No.*, 107 / 4 (i); Coll. and First Report by Professor D. Kar and Party.

Key to species: Mouth nearly truncate. Edge of lower jaw sharp.

Neolissochilus hexagonolepis (McClelland, 1839)

Distribution: In many water bodies in India, particularly, in the rheophilic hill streams (including River Barak at Karong (Nagaland-Manipur Border): First Report by Professor D.Kar and Party; River Gomati in Tripura: First Report by Professor D.Kar and Party; Rivers Tuirial, Mat, Kolodyne, Tuivai in Mizoram: In all these collectons: First Reports by Professor D.Kar and Party); also, in Darjeeling and Eastern Himalayas; South and South-Eastern Asia; etc.

IUCN Status: Near Threatened (NT).

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 and Jhingran, 1991, *Inland Fishes* 1: 250; Jayaram, 1999, *FW Fishes of the Indian Region*: 108; Menon, 1999, *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 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, dorso-lateral; 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. Barbels 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:

(a)River Tuivai in Mizoram; Collection: 24 4 2008; 1 Ex.; *Museum No.*, 107 / 4 (ii); Coll. and First Report by Professor D. Kar and Party.

Key to species: Pre-dorsal scales 8-10. Presence of 2 conspicuous dark blotches on the body black spot on dorsal fin and on caudal peduncle. Presence of one pair of barbels.

Puntius chola (Hamilton, 1822)

Distribution: In many water bodies in India (including Fulbari Anua and Salchapra Anua in Assam: In all these collectons: First Reports by Professor D. Kar and Party; Sone Beel, Sat Beel, Javda Beel, Rani Meghna Beel in Assam: In all these collections: First Reports by Professor D. Kar and Party; Chatla Haor in Assam: First Report by Professor D. Kar and Party; Rivers Tlawng, Kolodyne and Tuivai in Mizoram: In all these collections: First Reports by Professor D. Kar and Party); also in Bangladesh, Myanmar, Nepal, Pakistan, Sri Lanka, etc.

IUCN status: Least Concern (LC).

Genus: **Psilorhynchus** McClelland, 1839

Psilorhynchus McClelland, 1839, *Asiatic Researches*, 19: 300, 428 (Type species: *Cyprinus sucatio* Hamilton, by subsequent designation).

Generic characters: Body spindle-shaped, arched dorsally and flattened ventrally; anteriorly depressed. Ventral surface markedly flattened. Snout flat obtusely pointed anteriorly. A shallow depression may be present on the cheek. Mouth small, inferior, transverse. Eyes large, dorso-lateral in the posterior half of the head; not visible from below ventral surface. Lips entire, fleshy, continuous at the angle of mouth; reflected off from both the jaws; and, with glands and folds. Presence of a distinct lateral groove on either side passing along the sides of the snout. The upper jaw overhangs the mouth. Absence of barbels. Dorsal fins inserted ahead of pelvic fins with 10-12 rays. Pectoral fins simple with four-six rays. Anal fin short with seven rays. Caudal fin forked; upper lobe longer. Scales relatively large along the lateral line. Lateral line complete with 32-34 scales.

Material examined:

(a) River Tuivai in Mizoram; Collection: 24 4 2008; 2 Ex.; *Museum No.*, 107 / 2 (i) , 2 (ii) ; Coll. and First Report by Professor D. Kar and Party.

Key to species: Pectoral fin with 6-7 simple rays. Lateral line scales 30-34.

Psilorhynchus balitora (Hamilton, 1822)

Distribution: In many water bodies in India, particularly, in the hill streams (including upstream rheophilic stretch of River Barak at Phulpui in North-East India: First report by Professor D. Kar and Party; in the upstream hilly stretch of River Tuivai at 20 km upstream from Barak Damsite: First report by Professor D. Kar and Party; in Rivers Tuirial, Tlawng, Mat, Kolodyne, Tuichong, Tuivai in Mizoram: In all these collections: First reports by Professor D. Kar and Party; in **River Gomati in Tripura**: First report by Professor D. Kar and Party); also, in the Ganga-Brahmaputra basin. Bangladesh, Bhutan, Nepal, etc.,

IUCN Status: Least Concern (LC).

Genus: ***Paracanthocobitis*** Peters, 1861

Paracanthocobitis Peters, 1861, *Monats. Akad. Wiss. Berlin* for 1861: 712 (Type species: *Acanthocobitis longipinnis* Peters = *Cobitis pavonaceus* McClelland, by monotypy); Menon, 1987, *Fauna India*, 4 (1): 140; Kottelat, 1990, *Verlag Dr. Friedrich Pfeil*, Munchen: 18 (as a valid genus); Banarescu and Nalbant, 1995, *Trav. Mus. Hist. nat. "Grigore Antipa"*, 35: 430 (as a valid genus); Jayaram, 1999, *FW Fishes of the Indian Region*: 173.

Generic characters: Body deep and strongly compressed posteriorly. Head slightly compressed. Nostrils close together. Presence of a slight indication of an adipose keel. Upper lip covered by 2 or 3 rows of papillae. Lower lip interrupted in the middle and with numerous papillae. Dorsal fin usually with 10 to 18 branched rays. Caudal fin slightly emarginated. Presence of conspicuous black spot at upper extremity of caudal fin.

Material examined:

(a) River Tuivai in Mizoram; Collection: 24 4 2008; 7 Ex.; *Museum No.*, 107 / 3 (i) to 3 (vii); Coll. and First Report by Professor D. Kar and Party.

(a) River Tuivai in Mizoram; Collection: 25 4 2008; 1 Ex.; *Museum No.*, 111 / 3 (i); Coll. and First Report by Professor D. Kar and Party.

Key to species: Dorsal fin with 9-11 branched rays. Body depth about 20.00 to 23.63 % SL.

Paracanthocobitis botia (Hamilton, 1822)

Distribution: In many water bodies in India, particularly, in the hill streams (notably, in Rivers Tuirial, Tlawng, Tuivai in Mizoram: In all these collections: First reports by Prof. D. Kar and Party; Rivers Monu and Gomati in Tripura: In all these collections: First reports by Prof. D. Kar and Party; also in wetlands in Barak valley like Baskandi Anua in Cachar, Assam: First report by Prof. D. Kar and Party); also, said to occur in Manipur, Myanmar, etc.

IUCN Status: Least Concern (LC).

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 barbels: 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:

(a) River Tuivai in Mizoram; Collection: 24 4 2008; 3 Ex.; *Museum No.*, 107 / 1 (i) to 1 (iii).; Coll. and First Report by Professor D. Kar and Party.

Key to species: Pelvic fins absent. Rayed dorsal fin also absent. Anal fin long with 48 to 90 rays. ***Ailia coila*** (Hamilton, 1822)

Distribution: In many water bodies in India (including Sone Beel, Rani Meghna Beel, etc., in Assam: In all these collections: First Reports by Professor D. Kar and Party; Rivers Tlawng, Karnafuli, Tuivai in Mizoram: In all these collections: First Reports by Professor D. Kar and Party); also, in Bangladesh, Nepal, Pakistan, etc.

IUCN Status: Near threatened.

Bagarius Bleeker, 1853

Bagarius Bleeker, 1853, *Verh. Bat. Gen.*, 25, p. 121 (Type species: *Pimelodus bagarius* Hamilton-Buchanan); Hora, 1939, *J. Bombay nat. Hist. Soc.*, 40 (4): pp. 585-593 (review); Roberts, 1983, *Copeia* (2): pp. 435-445 (Revision); Jayaram, 2006, *Catfishes of India*: 201; Thompson and Page,

2006, *Zootaxa* 1345: 26 (Check list); Ferraris, 2007, *Zootaxa*, 1418: 383 (Check list).

Generic characters: Body and abdomen elongate, flattened upto pelvics. Head broad. Body fully or almost fully covered by heavily keratinised skin, superficially differentiated into unculiferous plaques or tubercles. Snout not pointed; sharply conical. Mouth wide, terminal, slightly inferior. Eyes small, sub-cutaneous. Eyes dorsally placed at the posterior half of the head. Presence of 4 pairs of barbels: 1 pair of large maxillary, 1 pair of nasal and 2 pairs of mandibular. Rayed dorsal fin inserted above the base of pectoral fins with 7 rays and a smooth spine; and, with an elongated soft termination of varying length. Adipose dorsal fin moderately long, posteriorly free. Presence of 9 to 14 (or 12) rays in the pectoral fins and a spine serrated along the inner edge; and, also, with a soft prolongation. Pelvic fins have 6 rays. Anal fin short with 13 (or 12) to 17 rays. Caudal fin deeply forked. Upper lobe of caudal fin longer; and, both the lobes of caudal fin, sometimes, produced into soft, filamentous prolongations. Lateral line complete.

Material examined:

(a) River Tuivai in Mizoram (MZ); Collection: 25 4 2008; 1 Ex.; *Museum No.*, 111 / 1 (i); Coll. and First Report by Professor D. Kar and Party.

Key to species: Pelvic origin anterior to a vertical line through base of last dorsal fin ray. Pectoral fin rays 9 to 12.

Bagarius bagarius (Hamilton, 1822)

Distribution: In water bodies in India (including Rivers Tlawng, Tuivai in Mizoram: In all these collections: First Reports by Professor D. Kar and Party); also in the Ganga river system, etc.

IUCN status: Vulnerable (VU)

Genus: *Glyptothorax* Blyth, 1860

Glyptothorax Blyth, 1860, *J.Asiat.Soc., Bengal*, 29: 154 (Type species: *Glyptothorax trilineatus* Blyth); Hora, 1923, *Rec. Indian Mus.*, 25: 8 (revision); Prasad and Mukerji, 1929, *Rec. Indian Mus.*, 31: 164, 183, 185; Burmese species; Hora and Gupta, 1941, *Bull. Raffles Mus.*, 17: 33, Pl. 3 (Malayan species); Menon, M.A.S., 1954, *Rec. Indian Mus.*, 62: 30 (revision); Li, 1986, *Indo-Pacific Fish Biology*: 521-528; Nath and Dey, 2000, *Fish and Fisheries of NE India*: 111; Jayaram, 2006, *Catfishes of India*: 256; Thompson and Page, 2006, *Zootaxa*, 1345: 40 (Check list); Ferraris, 2007, *Zootaxa*, 1418: 387 (Check list).

Generic characters: Body of small to moderate size. Dorsal profile not much arched. Head small, depressed, covered with thick skin. Mouth conical but not pointed. Upper jaw longer. Mouth inferior, transverse, narrow. Presence of an adhesive organ on the ventral surface of thorax; which is confined to the abdomen immediately between the pectoral fins; and, further, it may be of varying lengths and may be with or without a pit or depression. Barbels: 4 pairs; 1 pair each of maxillary and nasal; and, 2 pairs of mandibular. Rayed dorsal fin with 5 to 7 rays and a spine. Adipose dorsal fin short and posteriorly

free. Pectoral fins inserted laterally with 6 to 11 rays and a flat strong spine. Pelvic fins with 6 rays. Anal fin short with 7 to 14 rays. Caudal fin deeply forked. Lateral line simple and complete.

Material examined:

(a) River Tuivai in Mizoram (MZ); Collection: 4 6 2007; 1 Ex.; *Museum No.*, 106 / 1 (i); Coll. and First Report by Professor D. Kar and Party.

Key to species: Thoracic adhesive apparatus with narrow folds of skin, incomplete posteriorly. Nostrils separated from the snout by a distance equal to eye diameter.

Glyptothorax telchitta (Hamilton, 1822)

Distribution: In many water bodies in India, particularly, in the hill streams. Also, found in the plain water mid-stream and downstream stretches of Rivers, like River Barak at Lakhimpur and Katigora: First Reports by Professor D. Kar and Party; in Rivers Tuivai, Tlawng, Mat, Kolodyne, Tuivai in Mizoram: First Reports by Professor D. Kar and Party); also, found in Bangladesh, Nepal, etc.

IUCN status: Least Concern (LC)

4. Discussion

An overall review of the habitat inventory parameters of the River **Tuichong** portrayed that, the sufficiently long range of microhabitat of the River Tuichong consists mainly of four types of microhabitats, viz., Fall, Cascade, Riffle-pool and Run-sheet. However, Run-sheet type of microhabitat is not much found; because the river flows through a long range of mountains in this remote corner of Mizoram in India. Out of the four categories of microhabitats, the quite common and frequently-observed microhabitat is the riffle-pool type followed by run-sheet type. Falls are rarely seen in this not too big a river. Cascades are generally found in the mid-reach stretch of the river; and, are not usually seen elsewhere. Riffle-pools generally occur in different stretches of the entire length of the river, depending on the kind of the base or substratum. Nevertheless, run-sheet type of micro-habitat do sometimes occur, particularly during the dry season, mainly from the stretch around Dighlibak (near Demagiri) where the River Tuichong joins the River Karnafuli.

Concomitant to above, four distinct types of substrata are usually seen in the entire length of the River Tuichong. These are: (i) Bedrocks, (ii) Boulders, (iii) Cobbles and Gravels and (iv) Fines (silt, sand and clay); In River Tuichong, bedrocks are not always abundant. Boulders are usually found in the upper mid-reach stretch of the river; generally having cascade type of microhabitat; while cobbles and gravels are usually seen in the lower mid-reach of the river with riffle-pool type of microhabitat. Fines type of substratum (consisting mainly of silt, sand and clay) are, sometimes, found (particularly during the dry season), in the stretch extending from around Tuichong village to Demagiri Town,

Concomitant to above, the status of the ichthyospecies based on locally estimated information (but, corroborating with IUCN criteria) has been determined for adopting locally suitable species-specific conservation strategies.

A gross review of the habitat parameters of the River **Tuivai** depicted that, the long range of microhabitat of the River Tuivai consists mainly of four types of microhabitats, viz., Fall, Cascade, Riffle-pool and Run-sheet. However, Run-sheet type of microhabitat is not much found; because the river flows through a long range of mountains in this remote corner of Mizoram in NE India. Out of the four categories of microhabitats, the quite common and frequently-observed microhabitat is the riffle-pool type followed by cascade type. Falls are rarely seen in this not too big a river. Run-sheet type of microhabitat are generally found in the short downstream stretch of the river near its confluence with the River Barak at Tuivaimukh (Tipaimukh). Riffle-pools usually occur in different stretches of the entire length of the river, depending on the kind of the base or substratum.

Concomitant to above, four distinct types of substrata are usually seen in the entire length of the River Tuivai. These are: (i) Bedrocks, (ii) Boulders, (iii) Cobbles, Gravels and (iv) Fines. (silt, sand clay); although Fines are generally not much found; as the river does not show very long plainwater stretch. In River Tuivai, bedrocks are not always abundant. Boulders are usually found in the upper mid-reach stretch of the river; generally having cascade type of microhabitat; while cobbles and gravels are usually seen in the lower mid-reach stretch of the river with riffle-pool type of microhabitat. Fines type of substratum (consisting mainly of silt, sand and clay) are, sometimes, found (particularly during the dry season), usually in the stretch around the confluence point of River Tuivai with River Barak at Tuivaimukh (Tipaimukh).

Concomitant to above, the status of the ichthyospecies based on locally estimated information (but, corroborating with IUCN criteria) has been determined for adopting locally suitable species-specific conservation strategies.

Notwithstanding the above, various workers, notably, Bailey, R.G. (1994, 1996) and Bailey and Hickley (1986) had worked on the water bodies and fish species in Africa. Further, Didem *et al* (2012) dealt with the fishes of Western Black Sea Coast of Turkey; while, Kullander and Britz (2008) and Conway and Kottelat (2007) had dealt with the fishes of Myanmar.

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Table 1. Species composition, Seasonal distribution and Conservation status of Fishes of River Tuichong in Mizoram

Fish name	Collection date: 20 10 2002 (L 1)& River Coll No. 100, +(No.of Fishes),River No/Fish No. =Museum No.	Collection date: 20 10 2002 (L 2) & River Coll No. 101 +(No.of Fishes),River No/Fish No. =Museum No.	Total No. of Fish collected	Conservation Status (Global) Conservation Status (Global) Conservation Status (Global) Conservation Status (Global) IUCN Conservationstatus (Global) LC=Least Concern VU= Vulnerable EN= Endangered NT=NearThreatened NE=Not Evaluated DD-Data Deficient	Conservation Status (Local) Conservation Status (Local) Conservation Status (Local) Conservation status (Local) (based on occurrence of Fish species in 1 or >1 locations 1 Location: of Concern(C) 2
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						Locations:Less Concern(LC) >2Locations:N o Concern(NC)
1	<i>Salmostoma phulo</i>		+(56),101 / 2 (i) to 2 (Lvi)	56	LC	C
2	<i>Opsarius barna</i>	+(6),100 / 2 (i) to 2 (vi)		6	LC	C
3	<i>Pethia conchoni</i>	+(1),100 / 3 (i)		1	LC	C
4	<i>Psilorhynchus balitora</i>	+(1),100 / 5 (ii)		1	LC	C
5	<i>Schistura scaturigena</i>	+(4),100 / 5 (i), 5 (iii) to 5 (v)		4	LC	C
6	<i>Eutropiichthys vacha</i>		+(11),101 / 1 (i) to 1 (xi)	11	LC	C
7	<i>Gagata cenia</i>	+(1),100 / 1 (i)		1	LC	C
8	<i>Channa gachua</i>	+(1),100 / 4 (i)		1	LC	C

Table 2. Species diversity, seasonal distribution and conservation status of the Fishes of River Tuivai in Mizoram

<i>Fish name</i>	<i>Collection date: 4 6 2007 & River Coll No. 106, +(No.of Fishes),River ver No./Fish No. =Museum No.</i>	<i>Collection date: 24 4 2008 & River Coll No. 107, +(No.of Fishes),River ver No./Fish No. =Museum No.</i>	<i>Collection date: 25 4 2008, River Coll No. 111, +(No.of Fishes),River ver No./Fish No. =Museum No.</i>	<i>Total No. of Fish collected</i>	<i>Conservation Status (Global) Conservation Status (Global) Conservation Status (Global) Conservation Status (Global) IUCN Conservation status (Global) LC=Least Concern VU= Vulnerable EN= Endangered NT=NearThreatened NE=Not Evaluated DD=Data Deficient</i>	<i>Conservation Status (Local) Conservation Status (Local) Conservation Status (Local) Conservation status (Local) (based on occurrence of Fish species in 1 or >1 locations 1 Location: of Concern(C) 2 Locations:L</i>
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							ess Concern(LC) >2Locations :No Concern(NC)
1	<i>Barilius barila</i>		+(22),107 / 5 (i) to 5 (xxii)	+(10),111 / 2 (i) to 2 (x)	32	LC	LC
2	<i>Tor putitora</i>	+(5),106 / 2 (i) to 2 (v)			5	EN	C
3	<i>Neolissochilus hexagonolepis</i>		+(1),107 / 4 (i)		1	NT	C
4	<i>Puntius chola</i>		+(1),107 / 4 (ii)		1	LC	C
5	<i>Psilorhynchus balitora</i>		+(2),107 / 2 (i) , 2 (ii)		2	LC	C
6	<i>Paracanthoco bitis botia</i>		+(7),107 / 3 (i) to 3 (vii)	+(1),111 / 3 (i)	8	LC	LC
7	<i>Ailia coila</i>		+(3),107 / 1 (i) to 1 (iii)		3	NT	C
8	<i>Bagarius bagarius</i>			+(1),111 / 1 (i)	1	VU	C

9	<i>Glyptothorax telchitta</i>	+(1),106 / 1 (i)			<i>I</i>	<i>LC</i>	<i>C</i>
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