

FISHES OF LOWER SUBANSIRI DISTRICT, ARUNACHAL PRADESH

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Abstract

The present paper is the first comprehensive account of the fish diversity of Lower Subansiri district, Arunachal Pradesh. A total of 120 fishes belonging to 71 genera, 26 families and 7 orders have been reported. The order Cypriniformes accounts for about 53% of the total fishes and Cyprinidae is the most dominant family with 49 species. *Garra* is the most dominant genera with 8 species. Discovery of new species, record of endangered, threatened and vulnerable fishes along with some species endemic to Arunachal Pradesh only demands immediate implementation of appropriate conservation measures to conserve the rich fish diversity of the district in particular and the state as a whole.

Introduction

Fish are essential components in the functioning of aquatic ecosystems, occupies important trophic level in the food chain and are also good ecological indicators of health of the water bodies. Besides, they also have aesthetic and recreational values as in game fishery, ornamental fishery and most importantly fish constitute one of the main food items of sustenance for millions of people especially in developing countries like India. Further, fish is also spiritually linked with traditional cultures of many indigenous communities particularly inhabiting this region of the country. Around 4000 species of fishes are recorded from India which accounts for about 9.7% of the global fish diversity. Out of the Indian fishes only about 25% are recorded from the freshwater habitats of the country.

Arunachal Pradesh, being located in the Eastern Himalayas, one of the 12 mega biodiversity hotspot of the world, is rich in bioresources. The state is also endowed with rich water resources, aquatic systems (rivers/streams, lakes, beels etc.) which accounts for more than 2% of the total geographic area of the state (SAC, 2009). These vast wetland system harbours diverse aquatic fauna including freshwater fishes of which many are reported to be endemic to this landscape. The state is also regarded as the type locality of more than 30 species of freshwater fishes in the world. Ichthyological exploration of the state started probably with the work of McClelland (1839) followed by the pioneering works of Chaudhuri (1913), Hora (1921). After that several authors have explored the ichthyofauna of the state such as

Srivastava (1966), Choudhury and Sen (1977), Ghosh (1979), Ghosh & Lipton (1982), Sen (1985, 2006), Sen (1999) and Nath and Dey (1997, 2000). Recently, Bagra *et al* (2009) reported a total of 213 species of fish from the state. Since then many more new species of fishes have been reported from the state.

Though considerable progress has been made in documenting the fish fauna of the state, those from Lower Subansiri district seems to have been less explored. There is no detailed study of fish fauna of the district except for some scattered reports. Sen (1999) recorded only 8 species while Sen (2006) reported 21 species of fishes from the district. Bagra *et al.* (2009) did not provide any district-wise account of fish diversity of the state. However, the district seems to sustain much more numbers of fishes than what has been reported. This is apparent from discovery of many new species and many new records from Arunachal Pradesh including Lower Subansiri district. Thus, a sincere attempt has been made to present correct, accurate and latest ichthyofaunal diversity of the district through primary field surveys and consultation of available published literature.

Study Area: Lower Subansiri is one of the 16 administrative districts of Arunachal Pradesh. The district was created when the original Subansiri district was bifurcated into Upper & Lower Subansiri district in 1987. In 1999, Papum Pare district was carved out from the Lower Subansiri district. Again in the year 2000, Kurung Kumey district was created from Lower Subansiri district. So, the present Lower Subansiri district occupies an area of about 3460 sq. km. It is bounded on the north by the Upper Subansiri and Kurung Kumey district of Arunachal Pradesh, on the south by Papum Pare district of Arunachal Pradesh and Assam, on the east by West Siang and some part of Upper Subansiri, and on the west by East Kameng, Kurung-Kumey and Papum Pare districts of Arunachal Pradesh.

The district lies approximately between 92°40' and 94°21' E longitude and 26°55" and 28°21' N latitudes with its headquarter at Ziro (Fig. 1). The topography of the district is mostly mountainous terrain, a greater part of it falls within the higher mountain zone consisting of tangled peaks and valleys. The climatic condition of the district varies from place to place as well as season to season. In the foot hills or low high belt areas, the climatic condition is moderate in comparison to high belt areas, where during winter it is very cold and chill, and in summer it is pleasant.

The forest of the district are rich in valuable species of trees and different varieties of shrubs, cane and bamboo grow plenty, and the exquisite floral treasures of wilder species may often be found in the shadowy recesses. The district is also rich in wild fauna such as tigers, panthers, leopard, cats, bear, boars, antelopes and barking deer etc. In 1995, Lower Subansiri district became home to the Talley Valley Wildlife Sanctuary, which has an area of 337 sq. km.

The total wetland area of the district is estimated as 3607 ha accounting for about 0.36% of the total geographic area of the district and 2.32% of the total wetland area of the state. The major wetland types are River/stream and high altitude wetlands and smaller wetlands (<2.25 ha) mainly Tanks numbering 3, 31 and 34 respectively (SAC, 2009). Kurung Kumey (Kamla) and Panior (Ranga) with innumerable small tributaries are the main rivers that drain most part of the district. Apatani plateau (Ziro valley) is the highest elevation area of the district, the north eastern part of the district is drained by Kamla river and the south western part by Ranga river. The Ranga river, locally known as Paniordebru is one of the major river of Lower Subansiri district, is a sub-basin of the river Subansiri. It originates at an elevation of about 3440 m in the upper areas of Subansiri basin, flows through Lower Subansiri

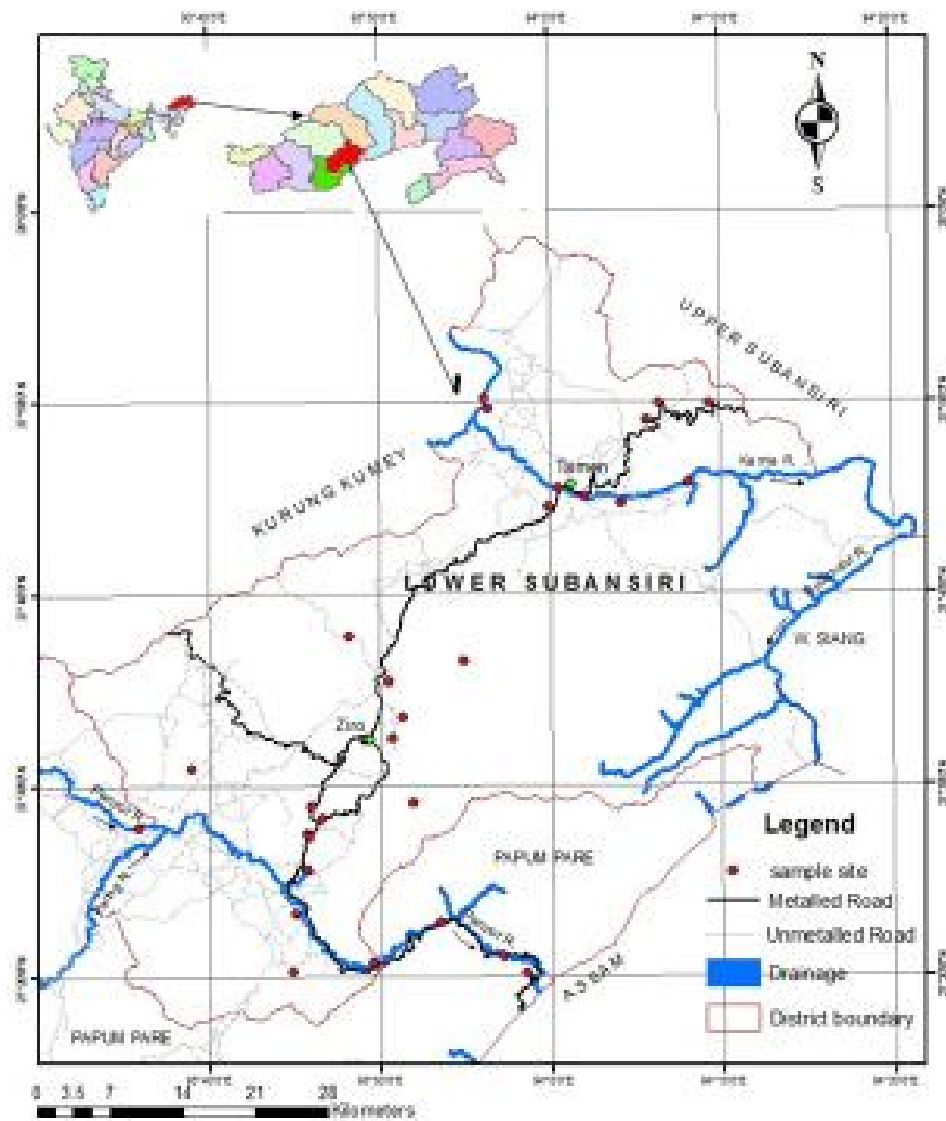


Fig. 1. Map of Lower Subansiri District, Arunachal Pradesh showing sampling sites

district and further flowing through Papum Pare district it confluences with river Subansiri.

Ziro is the headquarter town of Lower Subansiri district. The Ziro valley is famous for

its scenic beauty and the famous traditional paddy-cum-fish culture practice of the Apatani tribe, the main inhabitants of the area. Keley river and Pange river are the two main drainage systems of the

Ziro valley area. Two micro hydels, Mai hydel & Tago hydel have been installed on the Keley river. The Pange river meets Keley river just few meters down of Tago Hydel near Yazali and thereafter known as Keley-Pange river which ultimately flows into the Ranga river near the Yazali town.

Other townships of the district are Yazali and Raga. Yazali is a small township located on the bank of the Ranga river. NEEPCO has commissioned a 68 m dam on the Ranga river which is one of the main sources of power in the state. A number of small and turbulent tributaries like Piit, Pow, Piew, Keley-Pange etc. feed the Ranga river. Raga is one of the 3 sub-divisions of Lower Subansiri district. The area is drained by the Kamla river with a number of turbulent tributaries such as Pai, Pein, Pipak, Shimla, Shim, Panya and Paka stream and others. The Kurung river & Kumey river which originates in South China, after flowing separately through the entire patch of Kurung-Kumey district, unites in the Kamporijo block of Lower Subansiri district and becomes the Kamla river. It finally drains out in the Subansiri river somewhere in the Raga circle.

Methodology

Fish sampling was done in the different rivers and their tributaries and lentic bodies of the district using cat net, gill net, trap net, diverting stream waters and traditional fishing methods with the help of local fisherman. Pictorial representation of some of the traditional methods of fishing has been presented in plate 1. The details of sampling sites including locality, geographical coordinates and altitude are given in table 1. In the field fish were preserved in 10% formalin and brought to laboratory for further identification. Fishes were identified following Talwar & Jhingran (1991) and Jayaram (2013). The identified fishes are preserved in the museum of Zoological Survey of India (ZSI), Arunachal Pradesh Regional Centre (APRC), Itanagar. In addition, the old identified as well as unidentified collections from Lower Subansiri district present in the APRC museum were also studied. Further, all the available published literature was also consulted to include information of those species which could not be collected presently and reference to such species are mentioned in the appendix as material consulted. Based on primary collection and secondary information, a collated and comprehensive picture of the ichthyofauna of Lower Subansiri district is presented herewith as per the latest internationally accepted valid names available in the online fish database, 'Fishbase'.

Table 1: Details of sampling sites			
Sl. No.	River/stream Locality	Coordinates (dd mm)	Altitude (m)
1. Ranga (Panior) river	Rub village	27 20.786 N 93 49.613 E	491
2. Ranganadi dam	Pitapool	27 20.626 N 93 47.914 E	554
3. Ranga (Panior) river	Yazali	27 08.184 N 93 46.124 E	619
4. Ranga (Panior) river	Pistana	27 27.791 N 93 35.929 E	828
5. Piew stream	Pistana	27 30.943 N 93 38.972 E	938
6. Pow stream	Yazali	27 23.319 N 93 45.084 E	615
7. Keley-pein stream	Yazali	27 25.686 N 93 45.793 E	881
8. Piit stream	Pangio	27 20.340 N 93 44.897 E	955
9. Keley stream	Yachuli	27 28.363 N 93 46.664 E	1091
10. Keley stream, Tago Hydel	Yachuli	27 27.419 N 93 45.806 E	1000
11. Roadside stream	Yachuli	27 28.968 N 93 46.033 E	1141
12. Roadside pond	Yachuli	27 27.570 N 93 45.778 E	1081
13. Keley stream	Siro	27 30.897 N 93 50.394 E	1540
14. Keley stream	Hong village	27 35.485 N 93 50.523 E	1550
15. Supyo stream	Ziro	27 36.537 N 93 49.356 E	1512
16. Sikhe stream	Ziro	27 33.613 N 93 51.380 E	1594
17. Sikhe stream	Lankha Yashe	27 37.861 N 93 48.254 E	1610
18. Shia stream	Ziro	27 32.523 N 93 50.749 E	1515
19. Pange river	Aro Lencing	27 29.160 N 93 51.952 E	1600
20. Pange river	Pange IB	27 32.908 N 93 53.936 E	1804

1	2	3	4	5
21.	Paa stream	Tamen	27 45.100 N 94 02.106 E	280
22.	Pein river	Tamen	27 45.507 N 94 00.542 E	296
23.	Kamla river	Tamen	27 45.100 N 94 02.106 E	275
24.	Pai river	Pai village	27 49.645 N 93 56.436 E	344
25.	Kamla river	Pai village	27 50.226 N 93 56.181 E	325
26.	Pipak stream	Tamen	27 45.810 N 94 08.209 E	290
27.	Simla stream	Tamen	27 44.769 N 94 04.250 E	331
28.	Panya stream	Raga	27 49.938 N 94 06.425 E	1129
29.	Paka stream	Raga	27 49.076 N 94 05.704 E	1045
30.	Shim stream	Raga	27 49.930 N 94 09.390 E	1221

Results & Discussion

One hundred and twenty species of fishes under 71 genera, 26 families and 7 orders has been recorded from Lower Subansiri district of Arunachal Pradesh (Table 2). It accounts for more than 50% of the 225 fishes known from the state (Sen & Khynriam, 2014). It is to be mentioned here that Sen (1999) reported only 8 species of fishes from Lower Subansiri district while Sen (2006) reported 21 species from the district. With 63 species, the order Cypriniformes dominated (52.5%) the fish diversity of East Siang district followed by Siluriformes with 33 species and Perciformes with 16 species (Fig. 2). Of the 26 families recorded from the district, Cyprinidae is the most dominant family with 49 species followed by Sisoridae (10 species), Bagridae (9 species), Cobitidae (6 species), Nemachelidae (5 species) and other families having less representation.

In terms of nature of fauna, the ichthyofauna of Lower Subansiri district comprises of exotic elements like *Cyprinus carpio* and *Hypophthalmichthys molitrix*, oriental endemics such as *Cyprinion semplotum*, *Tor tor* etc; Indian endemics like *Garra mccllellandi*, *Aborichthys elongates*, *Glyptothorax brevipinnis* and *Batasio fasciolatus* etc. Further, there are species which are endemic to Northeast India such as *Garra gotyla*, *Garra lissorhynchus*, *Garra naganensis*, *Garra quadratiostris* etc.; and Arunachal Pradesh in general such as *Garra arunachalensis*, *Garra birostris*, *Psilorhynchus arunachalensis*, *Amblyceps apangi* etc; and Lower Subansiri district in particular such as *Garra kalpangi*, *Creteuchiloglanis arunachalensis* and *Oreoglanis pangenensis*. Furthermore, some endangered and threatened fishes have also been recorded from the district.

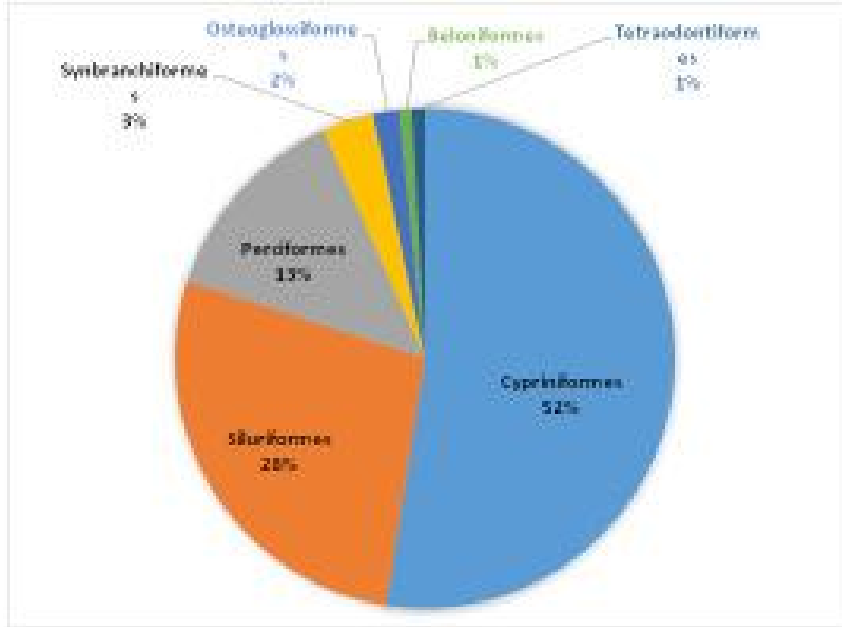


Fig. 2. Order-wise share of fishes of Lower Subansiri district

Table 2: Systematic list of fishes of Lower Subansiri district, Arunachal Pradesh

Species	Districts of Arunachal Pradesh	Status (IUCN)	Remarks
Order: OSTEOGLOSSIFORMES			
Family: NOTOPTERIDAE			
1. <i>Chitala chitala</i> Hamilton, 1822	LS, US	NT	
2. <i>Notopterus notopterus</i> Pallas, 1769	TI, CH, LO, LS, US	LC	
Order: CYPRINIFORMES			
Family: CYPRINIDAE			
3. <i>Cyprinion semiplotum</i> McClelland, 1839	LS, US, ES, WS, PP	VU	
4. <i>Osteobrama cotio</i> Hamilton, 1822	LS, PP, TI, EK	LC	
5. <i>Neolissochilus hexagonolepis</i> McClelland, 1839	LS, US, WS, EK, PP, ES, LO, TI	NT	
6. <i>Tor putitora</i> Hamilton, 1822	LS, US, EK, PP, ES, WS, LO, TI	EN	
7. <i>Tor tor</i> Hamilton, 1822	LS, US, EK, PP, ES, LO, TI	NT	
Subfamily: CYPRININAE			
8. <i>Cyprinus carpio</i> Linnaeus, 1758	LS, CH	VU	Introduced in 1989

9. <i>Megarasbora elanga</i> Hamilton, 1822	LS, TI, WK, PP, ES, LDV, LO	LC	
Subfamily: BARBINA			
10. <i>Pethia conchoni</i> Hamilton, 1822*	LS, EK, PP, ES, TI, CH	LC	
11. <i>Pethia gelius</i> Hamilton, 1822	LS, ES	LC	
12. <i>Pethia ticto</i> Hamilton, 1822	LS, US, EK, WK, PP, ES, WS, LO, TI, CH, LDV	LC	
13. <i>Puntius chola</i> Hamilton, 1822	LS, PP, ES, EK, LO	LC	
14. <i>Puntius sophore</i> Hamilton, 1822	LS, US, EK, PP, ES, WS, LO, TI	LC	
15. <i>Puntius terio</i> Hamilton, 1822	LS, ES	LC	
16. <i>Schizothorax esocinus</i> Heckel, 1838*	LS, US	NE	
17. <i>Schizothorax progastus</i> McClelland, 1839	LS, US, EK, WK, ES, WS, TI	LC	
18. <i>Schizothorax richardsoni</i> Gray, 1832*	LS, US, EK, WK, PP, ES, WS, LO, TI	VU	
19. <i>Systemus sarana</i> Hamilton, 1822	LS, ES, LO	LC	
Subfamily: LABEONINAE			
20. <i>Bangana dero</i> Hamilton, 1822*	LS, US, EK, WK, PP, ES, LO, TI, CH	LC	
21. <i>Cirrhinus mrigala</i> Hamilton, 1822	LS, ES, LDV, PP	LC	
22. <i>Cirrhinus reba</i> Hamilton, 1822	LS, ES, EK, PP, LO	LC	
23. <i>Crossocheilus latius</i> Hamilton, 1822*	LS, US, EK, PP, ES, LO, TI	LC	
24. <i>Garra annandalei</i> Hora, 1921*	LS, US, EK, PP, ES, WS, TI	LC	
25. <i>Garra arunachalensis</i> Nebeshwar & Vishwanath, 2013*	LS, EK, WS, LDV	NE	Endemic to Ar. Pradesh
26. <i>Garra birostris</i> Nebeshwar & Vishwanath, 2013*	LS, WK, PP	LC	Endemic to Ar. Pradesh
27. <i>Garra gotyla</i> Gray, 1830*	LS	NE	
28. <i>Garra kalpangi</i> Nebeshwar, Bagra & Das, 2012	LS	NE	Endemic to Ar. Pradesh
29. <i>Garra lissorhynchus</i> McClelland, 1842*	LS, PP, TI	LC	Endemic to N. E. India
30. <i>Garra naganensis</i> Hora, 1921*	LS, ES, WS, TI	LC	Endemic to N. E. India
31. <i>Garra quadratiostris</i> Nebeshwar & Vishwanath, 2013	LS, LDV, EK, WK, ES	NE	Endemic to N. E. India
32. <i>Labeo bata</i> Hamilton, 1822	LS, US	LC	
33. <i>Labeo calbasu</i> Hamilton, 1822	LS, ES, WS, EK, TI, CH, PP	LC	

34. <i>Labeo gonius</i> Hamilton, 1822	LS, ES, WS, LDV, PP, TI, CH, EK	LC	
35. <i>Labeo pangusia</i> Hamilton, 1822	LS, ES, WS, TI, CH, EK, PP	NT	
36. <i>Labeo rohita</i> Hamilton, 1822	LS, US, WS, TI, CH, LO, PP	LC	
Subfamily: XENOCYPRINAE			
37. <i>Hypophthalmichthys molitrix</i> Valenciennes, 1844*	LS	NT	
Subfamily: DANIONINAE			
38. <i>Aspidoparia jaya</i> Hamilton, 1822	LS, EK, PP, ES, LO, TI	LC	
39. <i>Amblypharyngodon mola</i> Hamilton, 1822	LS, US, TI, CH, EK, WK	LC	
40. <i>Barilius barila</i> Hamilton, 1822	LS, TI, CH, LDV,	LC	
41. <i>Barilius barna</i> Hamilton, 1807	LS, TI, CH, LO, EK, ES, LDV, PP	LC	
42. <i>Barilius barna</i> Hamilton, 1807	LS, TI, CH, LO, EK, ES, LDV, PP	LC	
43. <i>Barilius tileo</i> Hamilton, 1822	LS, EK, WK, PP, ES, LO, TI, CH	LC	
44. <i>Barilius vagra</i> Hamilton 1822*	LS, US, EK, ES, TI	LC	
45. <i>Cabdio morar</i> Hamilton, 1822	LS, EK, WK	LC	
46. <i>Danio dangila</i> Hamilton, 1822*	LS, US, EK, PP, ES, LO, TI, CH	LC	
47. <i>Danio rerio</i> Hamilton, 1822	LS, US, EK, PP, ES, WS, LO, TI, CH	LC	
48. <i>Devario aequipinnatus</i> McClelland, 1839	LS, US, EK, PP, ES, WS, LO, TI, CH	LC	
49. <i>Devario devario</i> Hamilton, 1822	LS, ES, WS, EK, LO, CH, PP	LC	
50. <i>Raiamas bola</i> Hamilton, 1822	LS, ES, ES, PP, EK, LO	LC	
51. <i>Salmostoma bacaila</i> Hamilton, 1822	LS, ES	LC	
Family: PSILORHYNCHIDAE			
52. <i>Psilorhynchus arunachalensis</i> (Nebeshwar, Bagra & Das, 2007)*	LS, WK	DD	Endemic to Ar. Pradesh
53. <i>Psilorhynchus homaloptera</i> Hora & Mukerji, 1935	LS, US, TI	LC	
Family: COBITIDAE			
Subfamily: BOTIINAE			
54. <i>Botia dario</i> (Hamilton, 1822)	ES, PP, EK, LS	LC	
55. <i>Botia rostrata</i> (Gunther, 1868)*	LS, US, PP, ES, LO, TI	VU	

56. <i>Syncrossus berdmorei</i> Blyth, 1860	TI, CH, LO, WS, LS, EK, WK, TW	NT	
Subfamily: COBITINAE			
57. <i>Lepidocephalichthys arunachalensis</i> (Datta & Barman, 1984)	LS, ES, TI, CH, LDV,	EN	
58. <i>Lepidocephalichthys guntea</i> (Hamilton, 1822)	LS, ES, WS, PP, LO, EK, WK, LDV, TI	LC	
59. <i>Pangio pangia</i> (Hamilton, 1822)*	LS	LC	
Family: BALITORIDAE			
60. <i>Balitora brucei</i> Gray, 1830	LS, TI	NT	
Family: NEMACHEILIDAE			
61. <i>Aborichthys cataracta</i> Arunachalam <i>et al.</i> , 2014	LS	NE	New species
62. <i>Aborichthys elongatus</i> Hora, 1921*	LS, TI, EK, PP, ES, LDV, LO	LC	Endemic to India
63. <i>Aborichthys kempfi</i> Chaudhuri, 1913*	LS, EK, PP, ES, LO, TI	NT	
64. <i>Acanthocobitis botia</i> (Hamilton, 1822)*	LS, EK, PP, ES, LDV, LO, TI	LC	
65. <i>Schistura rupecula</i> McClelland, 1838*	LS, EK, WS, TI	LC	
Order: SILURIFORMES			
Family: BAGRIDAE			
66. <i>Batasio batasio</i> (Hamilton, 1822)	LS, US	LC	
67. <i>Batasio fasciolatus</i> Ng, 2006	LS	LC	Endemic to India
68. <i>Batasio tengana</i> (Hamilton, 1822)	LS, TI, CH	LC	
69. <i>Hemibagrus menoda</i> (Hamilton, 1822)	LS	LC	
70. <i>Mystus bleekeri</i> (Day, 1877)	LS, ES, WS, EK, PP, LDV	LC	
71. <i>Mystus cavasius</i> (Hamilton, 1822)	LS, ES, WS, TI, EK, LO, PP	LC	
72. <i>Mystus tengara</i> (Hamilton, 1822)*	LS, PP	LC	
73. <i>Mystus vittatus</i> (Bloch, 1794)	LS, US, ES, WS, TI, CH, LO, EK, WK, TW, PP	LC	
74. <i>Sperata aor</i> (Hamilton, 1822)	LS, US	LC	
Family: SILURIDAE			
75. <i>Ompok bimaculatus</i> (Bloch 1794)	LS, ES, WS	NT	
76. <i>Ompok pabda</i> (Hamilton, 1822)	LS, ES, WS, LDV, TI, CH, EK, LO	NT	
77. <i>Pterocryptis gangelica</i> Peters, 1861*	LS, US, EK, PP, ES	DD	
78. <i>Wallago attu</i> (Bloch & Schneider, 1801)	LS, ES	NT	

Family: SCHILBEIDAE			
79. <i>Ailia colia</i> (Hamilton, 1822)	LS, US, TI	NT	
80. <i>Clupisoma garua</i> (Hamilton, 1822)	LS, ES	LC	
81. <i>Eutrophiichthys vacha</i> (Hamilton, 1822)	LS, PP	LC	
82. <i>Neotropius antherinoides</i> (Bloch, 1794)	LS, PP	LC	
Family: AMBLYCIPITIDAE			
83. <i>Amblyceps apangi</i> Nath & Dey, 1989*	LS, PP	LC	Endemic to India
84. <i>Amblyceps mangois</i> (Hamilton, 1822)*	LS, PP, ES, LDV, LO, TI, WK	LC	
Family: SISORIDAE			
Subfamily: SISORINAE			
85. <i>Bagarius bagarius</i> (Hamilton, 1822)	LS, LO, WK	NT	
86. <i>Gagata cenia</i> (Hamilton, 1822)	LS, PP	LC	
Subfamily: GLYPTOSTERNINAE			
87. <i>Creteuchiloglanis arunachalensis</i> . Sinha & Tamang, 2014	LS	NE	New species
88. <i>Exostoma labiatum</i> (McClelland, 1842)*	LS, US, EK, PP, ES, LO, TI	LC	
89. <i>Glyptothorax annandalei</i> Hora, 1923	LS, TI, CH, LO, ES, WS, WK	LC	
90. <i>Glyptothorax brevipinnis</i> Hora, 1923*	LS, ES	DD	Endemic to India
91. <i>Glyptothorax trilineatus</i> (Blyth, 1860)*	LS, TI	LC	
92. <i>Oreoglanis pangenensis</i> Sinha & Tamang, 2015	LS	NE	New species
93. <i>Parachiloglanis hodgarti</i> (Hora, 1923)	LS, WK, WS	LC	
94. <i>Pseudecheneis sulcata</i> (McClelland, 1842)	LS, WK, ES, LO, LDV	LC	
Family: ERETHISTIDAE			
95. <i>Erethistes pusillus</i> Muller & Troschel, 1849	LS, PP	LC	
Family: HETEROPNEUSTIDAE			
96. <i>Heteropneustes fossilis</i> (Bloch, 1794)	LS, EK, WK, ES	LC	
Family: CHACIDAE			
97. <i>Chaca chaca</i> (Hamilton 1822) LDV, LO, CH, TI	EK, WK, PP, LS, WS, ES,	LC	
98. <i>Parambassis ranga</i> (Hamilton, 1822)	LS, ES, LO	LC	
Family: OLYRIDAE			
99. <i>Olyra longicaudata</i> (McClelland, 1842)*	LS, US, EK, PP, ES, LO, TI	LC	

Order: BELONIFORMES			
Family: BELONIDAE			
100. <i>Xenontodon cancila</i> (Hamilton, 1822)	LS, PP, ES, WS, LDV, TI, CH, LO, EK	LC	
Order: SYNBRANCHIFORMES			
Family: SYNBRANCHIDAE			
101. <i>Monopterusuchia</i> (Hamilton, 1822)	LS, ES, PP	LC	
Family MASTACEMBELIDAE			
102. <i>Macrogathus aral</i> (Bloch & Schneider, 1801)	LS, PP, LO	LC	
103. <i>Macrogathus pancalus</i> Hamilton, 1822	LS, ES, PP, WS, LO	LC	
104. <i>Mastacembelus armatus</i> (Lacepede, 1800)	LS, ES, WS, EK, WK, PP, LO	LC	
Order: PERCIFORMES			
Suborder: PERCOIDEI			
Family: AMBASSIDAE			
105. <i>Chanda nama</i> Hamilton, 1822	LS, ES, WS, EK	LC	
Family: NANDIDAE			
106. <i>Nandus nandus</i> (Hamilton, 1822)	LS, US, EK, PP, ES, LO	LC	
Family: BADIDAE			
107. <i>Badis assamensis</i> Ahl, 2011	LS, LDV, LO	DD	Endemic to N. E. India
108. <i>Badis badis</i> Hamilton, 1822	LS, ES, LO, PP, TI	LC	
109. <i>Badis triocellus</i> Khyntiam & Sen, 2011	LS	NE	Endemic to N. E. India
Family: GOBIIDAE			
Subfamily GOBIINAE			
110. <i>Glossogobius giuris</i> Hamilton, 1822	LS, ES, WS, LO	LC	
Suborder ANABANTOIDEI			
Family ANABANTIDAE			
111. <i>Anabas testudineus</i> Bloch, 1792	LS, US, TI, CH, LO	DD	Sen, 2006
Family OSPHRONEMIDAE			
Subfamily LUCIOCEPHALINAE			
112. <i>Trichogaster chuna</i> Hamilton, 1822	LS	LC	
113. <i>Trichogaster fasciata</i> Bloch & Schneider, 1801	LS, ES, WS, PP, LDV, TI	LC	
114. <i>Trichogaster labiosa</i> Day, 1877	LS	LC	
115. <i>Trichogaster lalius</i> Hamilton, 1822	LS	LC	

Suborder CHANNOIDEI			
Family: CHANNIDAE			
116. <i>Channa gachua</i> Hamilton, 1822*	LS, WS, WK, LO, PP, LDV	LC	
117. <i>Channa punctata</i> Bloch, 1793	LS, ES, WS, EK, WK, PP, LDV, LO, TI, CH	LC	
118. <i>Channa stewartii</i> Playfair, 1867	LS, ES, TI, CH, LO, EK WK,	LC	
119. <i>Channa striata</i> Bloch, 1793	LS, ES, TI, CH, EK, PP	LC	
Order: TETRAODONTIFORMES			
Family: TETRAODONTIDAE			
120. <i>Tetraodon cutcutia</i> Hamilton, 1822	LS, ES, LO	LC	

* **New record to the district;**

Districts: LS-Lower Subansiri, US-Upper Subansiri, WK-West Kameng, TI-Tirap, WS-West Siang, EK-East Kameng, PP-Papumpare, ES-East Siang, LO-Lohit, CH-Changlang, LDV-Lower Dibang Valley, TW-Tawang.

Status: VU-Vulnerable, LC-Least Concern, NT-Near Threatened, EN-Endangered, NE-Not Evaluated, DD-Data Deficient. As per IUCN evaluation, of the recorded fishes, 19 species needs conservation initiatives. These are 4 vulnerable species, 13 near threatened species and 2 endangered species, namely *Tor putitora* (Hamilton, 1822), and *Lepidocephalichthys arunachalensis* (Datta & Barman, 1984). The present study also added 27 new records and 3 new species to the fish diversity of Lower Subansiri district. Thus, thorough exploration of the district may reveal much more conservationally important fishes.

The occurrence of such high diversity of fishes comprising of many species that are important from conservation point of view as well as occurrence of considerable number of endemic species demands implementation of suitable conservation measures in the water bodies of the district. This is especially important to preserve vulnerable fishes like the snowtrot, *Schizothorax richardsonii* which is intricately associated with the traditional culture of the Apatani community, and identification of the fisher one of the major tribe of the district and its population is reported to be declining especially in the Apatani Valley.

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Appendix : Details of Voucher specimens

Order: OSTEOGLOSSIFORMES Family: NOTOPTERIDAE 1. *Chitala chitala* (Hamilton, 1822) **Material consulted:** Das et al., 2013. **2. *Notopterus notopterus*** (Pallas, 1769) **Material consulted:** Das et al., 2013. **Order CYPRINIFORMES Family: CYPRINIDAE 3. *Cyprinion semiplotum*** (McClelland, 1839) **Material consulted:** Sen, 2006. **4. *Osteobrama cotio*** (Hamilton, 1822) **Material consulted:** Das et al., 2013. **5. *Neolissochilus hexagonolepis*** (McClelland, 1839) **Material examined:** ZSI/V/APFS/P-205, 5 exs, 102.5-114.7 mm, Subansiri River, Tale WLS, 11.iii.2003, P.T. Bhutia; ZSI/V/APFS/P-286, 3 exs, 132.5-168 mm,

Hapoli, 16.ii.1996, G Thirumalai; ZSI/V/APFS/P-330, 1 ex., 147.2, Ranga River, Yazali, 05.xi.1989, P.T. Bhutia; ZSI/V/APFS/P-527, 1 ex., 213.9 mm, Ranga River, Yazali, 19.i.2012, B. Bhutia; ZSI/V/APFS/P-553, 4 exs, 59.80-147 mm, Ranga River, Yazali, 24.vi.2012, B. Sinha; ZSI/V/APFS/P-569, 3 exs, 144.4-156.9 mm, Ranga River, Yazali, 05.ix.2012, B. Sinha; ZSI/V/APFS/P-571, 6 exs, 56.6-76.1 mm, Kelle-pein stream, Yazali, 07.ix.2012, B. Sinha; ZSI/V/APRC/P-573, 12 exs, 30.5-53.8 mm, Pein stream, Tamen, 10.ix.2012, B. Sinha; ZSI/V/APRC/P-595, 3 exs, 66.3-67.3 mm, Paa stream, Tamen-Lakhimpur new road, 08.ix.2012, B. Sinha; ZSI/V/APRC/P-621, 1 ex., 52.2 mm, Kamla river, Tamen, 10.ix.2012, B. Sinha; ZSI/V/APRC/P-626, 1 ex., 66.7, Pow river, Takam Pasa village, Yazali, 17.iii.2013, B. Sinha; ZSI/V/APRC/P-631, 1 ex., 133.9, Ranganadi dam, Yazali, 18.iii.2013, B. Sinha; ZSI/V/APRC/P-639, 2 exs, 58.0-68.8 mm, Ranga river, Rub Village, downstream of rangnadi dam, 18.iii.2013, B. Sinha; ZSI/V/APRC/P-757, 2 exs, 35.1-51.0 mm, Pai stream, Pai Village, Tamen, 13.vi.2013, B. Sinha; ZSI/V/APRC/P-768, 6 exs, 94.5-115.6 mm, Pipik stream, Tamen-Lakhimpur new road, 14.vi.2013, B. Sinha; ZSI/V/APRC/P-775, 2 exs, 36.5-44.6 mm, Pein river, Tamen, 15.vi.2013, B. Sinha. **6. *Tor putitora*** (Hamilton, 1822) **Material examined:** ZSI/V/APFS/P-586, 2 exs, 82.1-88.3 mm, Ranga River, Yazali, 5 km up from town, 05.ix.2012, B. Sinha. **7. *Tor tor*** (Hamilton, 1822) **Material examined:** ZSI/V/APFS/P-294, 1 ex., 75.7 mm, Hapoli, 16.ii.1996, G Thirumalai; ZSI/V/APFS/P-554, 12 exs, 53.1-89.6 mm, Ranga river, Yazali, 24.vi.2012, B. Sinha. **Subfamily: CYPRININAE** **8. *Cyprinus carpio*** (Linnaeus, 1758) **Material examined:** ZSI/V/APFS/P-292, 1 exs, 242.5 mm, Hapoli, 16.ii.1996, G Thirumalai; ZSI/V/APFS/P-525, 4 exs, 55.2-68.6 mm, Kelle river, Siro, 17.i.2012, B. Sinha. **9. *Megarasbora elanga*** (Hamilton, 1822) **Material consulted:** Nath & Dey, 2000. **Subfamily: BARBINAE** **10. *Pethia conchonius*** (Hamilton, 1822) **Material examined:** ZSI/V/APFS/P-540, 8 exs, 17.8-40.2 mm, Siro River, Siro village, 21.vi.2012, B. Sinha; ZSI/V/APFS/P-542, 8 exs, 31.4-35.5 mm, Paddy field, Ziro, 21.vi.2012, B. Sinha; ZSI/V/APRC/P-546, 2 exs, 36.1-42.2 mm, Sunya stream, Ziro, 21.vi.2012, B. Sinha; ZSI/V/APRC/P-550, 1 ex., 40.3 mm, Ranga (Panyor) river, Yazali, 24.vi.2012, B. Sinha; ZSI/V/APRC/P-558, 1 ex., 41.7 mm, Ranga river, Yazali, 05.ix.2012, B. Sinha. **11. *Pethia gelius*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **12. *Pethia ticto*** (Hamilton, 1822) **Material examined:** ZSI/V/APFS/P-629, 2 exs, 43.0-45.1 mm, Pow River, Takam Pasa village, Yazali, 17.iii.2013, B. Sinha; ZSI/V/APFS/P-746, 18 exs, 36.7-44.9 mm, Kelle river, Ziro, 08.vi.2013, B. Sinha; ZSI/V/APRC/P-748, 1 ex., 37.5 mm, Supyo stream, Ziro, 10.vi.2013, B. Sinha; ZSI/V/APRC/P-755, 6 exs, 33.8-46.5 mm, Sikhe stream, Ziro, 08.vi.2013, B. Sinha; ZSI/V/APRC/P-763, 8 exs, 31.6-48.4 mm, Shia stream, Hari village, 08.vi.2013, B. Sinha. **13. *Puntius chola*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **14. *Puntius sophore*** (Hamilton, 1822) **Material examined:** ZSI/V/APFS/P-295, 1 ex., 58.7 mm, Khud River, Kimin, 11.ii.2003, G Thirumalai. **15. *Puntius terio*** (Hamilton, 1822) **Material consulted:** Sen, 1999. **16. *Schizothorax esocinus*** Heckel, 1838 **Material examined:** ZSI/V/APFS/P-207, 1 ex., 100.8 mm, Subansiri River, Tale WLS, 11.ii.2003, P.T. Bhutia. **17. *Schizothorax progastus*** (McClelland, 1839) **Material examined:** ZSI/V/APFS/P-361, 2 exs, 47.0-50.6 mm, Subansiri River, Tale WLS, 09.ii.2003, P.T. Bhutia. **18. *Schizothorax richardsoni*** (Gray, 1832) **Material examined:** ZSI/V/APFS/P-563, 4 exs, 49.4-54.4 mm, Ranga River, Yazali, 24.vi.2012, B. Sinha; ZSI/V/APFS/P-568, 2 exs, 73.6-199.2 mm, Ranga River, Yazali, 05.ix.2012, B. Sinha; ZSI/V/APFS/P-582, 2 exs, 40.1-106.9 mm, Pein river, Tamen, 09.ix.2012, B. Sinha; ZSI/V/APFS/P-588, 2 exs, 64.3-110.1 mm, Panya stream, Kicho village, Raga, 23.vi.2012, B. Sinha; ZSI/V/APFS/P-635, 9 exs, 41.9-80.9 mm, Ranganadi dam, Yazali, 16.iii.2013, B. Sinha; ZSI/V/APRC/P-708, 2 exs, 137.5-149.3 mm, Ranga river, Pistana, 20.iii.2013, B. Sinha; ZSI/V/APFS/P-752, 20 exs, 34.6-79.9 mm, Sikhe stream, Hong village, Ziro, 10.vi.2013, B. Sinha; ZSI/V/APRC/P-760, 2 exs, 37.7-50.1 mm, Pai stream, Pai village, 13.vi.2013, B. Sinha; ZSI/V/APRC/P-764, 2 exs, 52.2-135.5 mm, Pange river, Aro-lencing, Ziro, 09.vi.2013, B. Sinha; ZSI/V/APRC/P-766, 15 exs, 42.0-101.3 mm, Shim stream, Godak, Raga, 12.vi.2013, B. Sinha; ZSI/V/APRC/P-767, 2 exs, 88.8-90.1 mm, Pipik stream, Tamen, 14.vi.2013, B. Sinha; ZSI/V/APRC/P-779, 4 exs, 31.0-96.9 mm, Pein river, Tamen, 15.vi.2013, B. Sinha. **19. *Systomus sarana*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **Subfamily: LABEONINAE** **20. *Bangana dero*** (Hamilton, 1822)

Material examined: ZSI/V/APFS/P-287, 5 exs, 86.8-99.4 mm, Hapoli, 16.ii.1996, G Thirumalai; ZSI/V/APRC/P-641, 2 exs, 87.8-111.6 mm, Ranga river, Rub village, Yazali, 18.iii.2013, B. Sinha. **21. *Cirrhinus mrigala*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **22. *Cirrhinus reba*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **23. *Crossocheilus latius*** (Hamilton, 1822) **Material examined:** ZSI/V/APFS/P-206, 5 exs, 101.3-123.3 mm, Subansiri River, Tale WLS, 11.iii.2003, P.T. Bhutia; ZSI/V/APFS/P-293, 2 exs, 67.9-91.9 mm, Hapoli, 16.ii.1996, G Thirumalai; ZSI/V/APRC/P-765, 2 exs, 85.9-88.5 mm, Pein stream, Tamen, 09.ix.2012, B. Sinha. **24. *Garra annandalei*** (Hora, 1921) **Material examined:** ZSI/V/APFS/P-549, 6 exs, 47.6-58.8 mm, Ranga river, Yazali, 24.vi.2012, B. Sinha; ZSI/V/APFS/P-615, 2 exs, 69.9-82.4 mm, Kelle stream, Yachuli, 07.ix.2012, B. Sinha; ZSI/V/APFS/P-618, 3 exs, 68.2-96.1 mm, Ranga (Panyor) river, Yazali, 05.ix.2012, B. Sinha; ZSI/V/APFS/P-520, 2 exs, 67.3-105.2 mm, Kamla river, Tamen, 10.ix.2012, B. Sinha; ZSI/V/APRC/P-743, 7 exs, 51.7-86.5 mm, Pein river, Tamen, 09.ix.2012, B. Sinha; ZSI/V/APRC/P-744, 5 exs, 32.8-50.0 mm, Piit stream, Pitapool-Sagalee road, 16.iii.2013, B. Sinha; ZSI/V/APRC/P-745, 14 exs, 33.7-52.0 mm, Ranganadi dam, Yazali, 18.iii.2013, B. Sinha; ZSI/V/APRC/P-758, 4 exs, 53.8-67.3 mm, Pai stream, Pai village, Tamen, 13.vi.2013, B. Sinha; ZSI/V/APRC/P-785, 9 exs, 57.0-80.9 mm, Pow river, Takam Pasa village, Yazali, 17.iii.2013, B. Sinha. **25. *Garra arunachalensis*** Nebeshwar & Vishwanath, 2013 **Material examined:** ZSI/V/APRC/P-780, 5 exs, 42.3-120.5 mm, Pai stream, Pai village, Tamen, 13.vi.2003, B. Sinha. **26. *Garra birostris*** Nebeshwar & Vishwanath, 2013 **Material examined:** ZSI/V/APRC/P-801, 2 exs, 78.61-83.79 mm, Ranga River, Yazali, 05.ix.2012, B. Sinha. **27. *Garra gotyla*** (Gray, 1830) **Material examined:** ZSI/V/APFS/P-548, 2 ex., 55.3-80.6 mm, Ranga (Panyor) River, Yazali, 24.vi.2012, B. Sinha; ZSI/V/APRC/P-644, 2 ex., 37.0-38.7 mm, Ranganadi dam, Yazali, 18.iii.2013, B. Sinha. **28. *Garra kalpangi*** Nebeshwar, Bagra & Das, 2012 **Material consulted:** Nebeshwar *et al.*, 2012. **29. *Garra lissorhynchus*** (McClelland, 1842) **Material examined:** ZSI/V/APRC/P-781, 16 exs, 39.0-60.8 mm, Pipik stream, 15 km on Tamen-Lakhimpur new road, Tamen, 14.vi.2013, B. Sinha; ZSI/V/APRC/P-799, 6 exs, 46.61-67.26 mm, Kelle river, Ziro, 08.vi.2013, B. Sinha; ZSI/V/APRC/P-805, 13 exs, 33.04-40.02 mm, Pein stream, Tamen, 09.ix.2012, B. Sinha. **30. *Garra naganensis*** Hora, 1921 **Material examined:** ZSI/V/APFS/P-201, 4 exs, 40.7-52.6 mm, Subansiri River, Tale WLS, 11.iii.2003, P. T. Bhutia. **31. *Garra quadratiostris*** Nebeshwar & Vishwanath, 2013 **Material examined:** ZSI/V/APRC/P-797, 1 ex., 86.22 mm, Pein River, Tamen, 15.vi.2013, B. Sinha. **32. *Labeo bata*** (Hamilton, 1822) **Material consulted:** Sen, 2006. **33. *Labeo calbasu*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **34. *Labeo gonius*** (Hamilton, 1822) **Material consulted:** Sen, 2006. **35. *Labeo pangusia*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **36. *Labeo rohita*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **Subfamily: XENOCYPRINAE** **37. *Hypophthalmichthys molitrix*** (Valenciennes, 1844) **Material examined:** ZSI/V/APFS/P-366, 1 ex., 226.4 mm, Ranga River, Yazali, 05.xi.1989, P.T. Bhutia. **Subfamily: DANIONINAE** **38. *Aspidoparia jaya*** (Hamilton, 1822) **Material consulted:** Sen, 2006. **39. *Amblypharyngodon mola*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **40. *Barilius barila*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **41. *Barilius barna*** (Hamilton, 1807) **Material consulted:** Das *et al.*, 2013. **42. *Barilius bendelisis*** (Hamilton, 1807) **Material examined:** ZSI/V/APFS/P-208, 4 exs, 61.6-75.5 mm, Subansiri River, Tale WLS, 11.iii.2003, P.T. Bhutia; ZSI/V/APFS/P-288, 1 ex., 66.6 mm, Hapoli, 16.ii.1996, G Thirumalai; ZSI/V/APFS/P-593, 1 ex., 77.5 mm, Pein stream, Tamen, 09.ix.2012, B. Sinha; ZSI/V/APFS/P-624, 3 exs, 101.6-111.8 mm, Ranga river, Rub village, downstream of Ranganadi dam, 18.iii.2013, B. Sinha; ZSI/V/APRC/P-756, 1 ex., 71.4, Pai river, Pai village near boundary of Lower Subansiri & Kurung Kumey district, 13.vi.2013, B. Sinha. **43. *Barilius tileo*** (Hamilton, 1822) **Material consulted:** Nath & Dey, 2000. **44. *Barilius vagra*** (Hamilton 1822) **Material examined:** ZSI/V/APFS/P-552, 9 exs, 71.5-94.6 mm, Ranga (Panyor) river, Yazali, 24.vi.2012, B. Sinha; ZSI/V/APFS/P-634, 3 exs, 84-102.2 mm, Ranga river, Rub village, downstream of Ranganadi dam, 18.iii.2013, B. Sinha. **45. *Cabdio morar*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **46. *Danio dangila*** (Hamilton, 1822) **Material examined:** ZSI/V/APFS/P-543, 2 exs, 45.3-47.5 mm, Sunya stream, Ziro, 21.vi.2012, B. Sinha;

ZSI/V/APFS/P-570, 5 exs, 38.1-54.1 mm, Ranga river, Yazali, 05.ix.2012, B. Sinha; ZSI/V/APFS/P-636, 2 exs, 45.6-47.0 mm, Ranganadi dam, Yazali, 18.iii.2013, B. Sinha; ZSI/V/APRC/P-750, 3 exs, 42.4-45.4 mm, Supyo stream, Ziro, 10.vi.2013, B. Sinha. **47. *Danio rerio*** (Hamilton, 1822) **Material examined:** ZSI/V/APFS/P-541, 5 exs, 19.7-22.9 mm, Pond, Siro village, Ziro, 21.vi.2012, B. Sinha; ZSI/V/APFS/P-551, 2 exs, 25.6-26.9 mm, Pond, Yachuli, 24.vi.2012, B. Sinha. **48. *Devario aequipinnatus*** (McClelland, 1839) **Material examined:** ZSI/V/APFS/P-539, 7 exs, 17.9-47.9 mm, Siro River, Siro village, Ziro, 21.vi.2012, B. Sinha; ZSI/V/APFS/P-544, 3 exs, 46.9-61.9 mm, Sunya stream, Old Ziro, 21.vi.2012, B. Sinha; ZSI/V/APFS/P-555, 16 exs, 31.3-56.6 mm, Ranga river, Yazali, 24.vi.2012, B. Sinha; ZSI/V/APFS/P-567, 29 exs, 26.2-65.2 mm, Ranga river, Yazali, 05.ix.2012, B. Sinha; ZSI/V/APFS/P-574, 11 exs, 44.9-77.7 mm, Kelle stream, Yachuli, 07.ix.2012, B. Sinha; ZSI/V/APFS/P-575, 8 exs, 33.4-57.5 mm, Pein river, Tamen, 09.ix.2012, B. Sinha; ZSI/V/APFS/P-581, 6 exs, 47.8-58.7 mm, Kelle-Pein stream, Yazali, 07.ix.2012, B. Sinha; ZSI/V/APFS/P-628, 5 exs, 35.6-65.1 mm, Pow river, Takam Pasa village, Yazali, 17.iii.2013, B. Sinha; ZSI/V/APFS/P-633, 3 exs, 61.5-71.7 mm, Ranga River, Rub village, Downstream of Dam, 18.iii.2013, B. Sinha; ZSI/V/APFS/P-761, 8 exs, 45.6-56.3 mm, Pai stream, Pai village, Tamen, 13.vi.2013, B. Sinha; ZSI/V/APRC/P-770, 7 exs, 69.6-76.3 mm, Sim stream, Godak, Raga, 12.vi.2013, B. Sinha. **49. *Devario devario*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **50. *Raiamas bola*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **51. *Salmostoma bacaila*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **Family: PSILORHYNCHIDAE** **52. *Psilorhynchus arunachalensis*** (Nebeshwar, Bagra & Das, 2007) **Material examined:** ZSI/V/APFS/P-547, 1 exs, 36.8, Ranga River, Yazali, 24.vi.2012, B. Sinha; ZSI/V/APFS/P-637, 12 exs, 25.4-28.9 mm, Piit stream, Pitapool-Sagalee road, 16.iii.2013, B. Sinha; ZSI/V/APFS/P-759, 22 exs, 35.3-45.6 mm, Pai stream, Pai village, Tamen, 13.vi.2013, B. Sinha; ZSI/V/APFS/P-769, 5 exs, 33.0-53.1 mm, Pipik stream, Tamen-Lakhimpur road, 14.vi.2013, B. Sinha; ZSI/V/APRC/P-774, 7 exs, 36.3-41.7 mm, Pein river, Tamen, 15.vi.2013, B. Sinha. **53. *Psilorhynchus homaloptera*** Hora & Mukerji, 1935 **Material consulted:** Bagra *et al.*, 2009. **Family: COBITIDAE Subfamily: BOTIINAE** **54. *Botia dario*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **55. *Botia rostrata*** (Gunther, 1868) **Material examined:** ZSI/V/APFS/P-632, 1 ex., 91.3 mm, Ranga (Panyor) River, Rub village, downstream of ranganadi dam, 18.iii.2013, B. Sinha. **56. *Syncrossus berdmorei*** Blyth, 1860 **Material consulted:** Das *et al.*, 2013. **Subfamily: COBITINAE** **57. *Lepidocephalichthys arunachalensis*** (Datta & Barman, 1984) **Material consulted:** Das *et al.*, 2013. **58. *Lepidocephalichthys guntea*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **59. *Pangio pangia*** (Hamilton, 1822) **Material examined:** ZSI/V/APFS/P-587, 1 ex., 52.2 mm, Pein river, Tamen, 10.ix.2012, B. Sinha. **Family: BALITORIDAE** **60. *Balitora brucei*** Gray, 1830 **Material consulted:** Bagra *et al.*, 2009. **Family: NEMACHEILIDAE** **61. *Aborichthys cataracta*** Arunachalam *et al.*, 2014 **Material examined:** ZSI/V/APRC/P-1103, 2 exs, 54.9-64.8 mm, Kelle stream, Hong village, Ziro, 08.vi.2013, B. Sinha. **62. *Aborichthys elongatus*** Hora, 1921 **Material examined:** ZSI/V/APFS/P-202, 9 exs, 56.9-84.8 mm, Subansiri River, Tale WLS, 11.iii.2003, P.T. Bhutia. **63. *Aborichthys kempfi*** Chaudhuri, 1913 **Material examined:** ZSI/V/APFS/P-203, 3 exs, 30-44.4 mm, Subansiri River, Tale WLS, 11.iii.2003, P.T. Bhutia; ZSI/V/APRC/P-800, 14 exs, 43.96-97.56 mm, Pow River, Takam Pasa village, Yazali, 17.iii.2013, B. Sinha; ZSI/V/APRC/P-824, 3 exs, 28.4-41.3 mm, Stream on road to Sagalee, 14.ii.1996, G Thirumalai. **64. *Acanthocobitis botia*** (Hamilton, 1822) **Material examined:** ZSI/V/APFS/P-383, 2 exs, 25.7-27.5 mm, Khud River, Kimin, 19.x.1989, P.T. Bhutia. **65. *Schistura rupecula*** McClelland, 1838 **Material examined:** ZSI/V/APFS/P-559, 3 exs, 57.7-73.7 mm, Ranga River, Yazali, 24.vi.2012, B. Sinha; ZSI/V/APFS/P-566, 1 ex., 64.1 mm, Ranga River, Yazali, 05.ix.2012, B. Sinha; ZSI/V/APFS/P-584, 9 exs, 30.4-41.2 mm, Pein river, Tamen, 10.ix.2012, B. Sinha; ZSI/V/APFS/P-627, 4 exs, 50.9-68.4 mm, Pow River, Takam Pasa village, Yazali, 17.iii.2013, B. Sinha; ZSI/V/APFS/P-762, 1 ex., 51.9 mm, Pai stream, Pai village, Tamen, 13.vi.2013, B. Sinha; ZSI/V/APFS/P-776, 1 ex., 61.6 mm, Pein River, Tamen, 15.vi.2013, B. Sinha. **Order: SILURIFORMES Family: BAGRIDAE** **66. *Batasio batasio*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **67. *Batasio fasciolatus*** Ng, 2006 **Material consulted:** Bagra *et al.*,

2009. **68. *Batasio tengana*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **69. *Hemibagrus menoda*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **70. *Mystus bleekeri*** (Day, 1877) **Material consulted:** Das *et al.*, 2013. **71. *Mystus cavasius*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **72. *Mystus tengara*** (Hamilton, 1822) **Material examined:** ZSI/V/APFS/P-291, 3 exs, 55.3-72.3 mm, Hapoli, 16.ii.1996, G Thirumalai. **73. *Mystus vittatus*** (Bloch, 1794) **Material consulted:** Das *et al.*, 2013. **74. *Sperata aor*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **Family: SILURIDAE** **75. *Ompok bimaculatus*** (Bloch 1794) **Material consulted:** Bagra *et al.*, 2009. **76. *Ompok pabda*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **77. *Pterocryptis gangelica*** Peters, 1861 **Material examined:** ZSI/V/APRC/P-807, 1 ex., 67.7 mm, Ranga river, Lichi village, 20.vi.2012, B. Sinha. **78. *Wallago attu*** (Bloch & Schneider, 1801) **Material consulted:** Das *et al.*, 2013. **Family: SCHILBEIDAE** **79. *Ailia colia*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **80. *Clupisoma garua*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **81. *Eutrophichthys vacha*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **82. *Neotropius antherinoides*** (Bloch, 1794) **Material consulted:** Das *et al.*, 2013. **Family: AMBLYCIPITIDAE** **83. *Amblyceps apangi*** Nath & Dey, 1989 **Material examined:** ZSI/V/APFS/P-209, 2 exs, 66.8-107.2 mm, Subansiri River, Tale WLS, 11.iii.2003, P.T. Bhutia; ZSI/V/APFS/P-630, 9 exs, 77.2-113.6 mm, Pow River, Takam Pasa village, Yazali, 17.iii.2013, B. Sinha. **84. *Amblyceps mangois*** (Hamilton, 1822) **Material examined:** ZSI/V/APFS/P-210, 2 exs, 58.6-60 mm, Subansiri River, Tale WLS, 11.iii.2003, P.T. Bhutia. **Family: SISORIDAE** **Subfamily: GLYPTOSTERNINAE** **85. *Bagarius bagarius*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **86. *Gagata cenia*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **87. *Creteuchiloglanis arunachalensis*** Sinha & Tamang, 2014 **Material examined:** ZSI/V/APRC/P-844, 1 ex., 87.1 mm, Pange River, Aro-Lencing, Ziro valley, 09.vi.2013, B. Sinha; ZSI/V/APRC/P-1112, 9 ex., 65.9-136.6, Pange River, Pange, TWS, 10.iv.2015, B. Sinha. **88. *Exostoma labiatum*** (McClelland, 1842) **Material examined:** ZSI/V/APRC/P-751, 17 exs, 35.8-53.3 mm, Sike stream, Ziro, 10.vi.2013, B. Sinha; ZSI/V/APRC/P-771, 22 exs, 26.2-48.3 mm, Shim stream, Godak, Raga, 12.vi.2013, B. Sinha. **89. *Glyptothorax annandalei*** Hora, 1923 **Material consulted:** Sen, 2006. **90. *Glyptothorax brevipinnis*** Hora, 1923 **Material examined:** ZSI/V/APFS/P-212, 1 ex., 94.0 mm, Subansiri River, Tale WLS, 11.iii.2003, P. T. Bhutia. **91. *Glyptothorax trilineatus*** (Blyth, 1860) **Material examined:** ZSI/V/APFS/P-585, 1 ex., 40.0 mm, Pein River, Tamen, 10.ix.2012, B. Sinha. **92. *Oreoglanis pangensis*** Sinha & Tamang, 2015 **Material examined:** ZSI/V/APRC/P-791, 1 ex., 76.7 mm, Pange river, Aro-Lencing, 09.vi.2013, B. Sinha; ZSI/V/APRC/P-1113, 3 exs, 49.1-71.5, Pange river, Pange, TWS, 10.vi.2015, B. Sinha. **93. *Parachiloglanis hodgarti*** (Hora, 1923) **Material consulted:** Das *et al.*, 2013. **94. *Pseudecheneis sulcata*** (McClelland, 1842) **Material consulted:** Sen, 2006. **Family: ERETHISTIDAE** **95. *Erethistes pusillus*** Muller & Troschel, 1849 **Material consulted:** Das *et al.*, 2013. **Family: HETEROPNEUSTIDAE** **96. *Heteropneustes fossilis*** (Bloch, 1794) **Material examined:** ZSI/V/APFS/P-289, 2 exs, 147.5-156.4 mm, Hapoli, 16.ii.1996, G Thirumalai. **Family: CHACIDAE** **97. *Chaca chaca*** (Hamilton 1822) **Material consulted:** Jha *et al.*, 2014. **98. *Parambassis ranga*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **Family: OLYRIDAE** **99. *Olyra longicaudata*** (McClelland, 1842) **Material examined:** ZSI/V/APRC/P-826, 1 ex., 86.6 mm, Yazali, 05.xi.1989, P. T. Bhutia. **Order: BELONIFORMES** **Family: BELONIDAE** **100. *Xenontodon cancila*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **Order: SYNBRANCHIFORMES** **Family: SYNBRANCHIDAE** **101. *Monopterus cuchia*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **Family: MASTACEMBELIDAE** **102. *Macragnathus aral*** (Bloch & Schneider, 1801) **Material consulted:** Das *et al.*, 2013. **103. *Macragnathus pancalus*** Hamilton, 1822 **Material consulted:** Das *et al.*, 2013. **104. *Mastacembelus armatus*** (Lacepede, 1800) **Material consulted:** Sen, 2006. **Order: PERCIFORMES** **Suborder: PERCOIDEI** **Family: AMBASSIDAE** **105. *Chanda nama*** Hamilton, 1822 **Material consulted:** Sen, 2006. **Family: NANDIDAE** **106. *Nandus nandus*** (Hamilton, 1822) **Material examined:** ZSI/V/APFS/P-290, 2 exs, 60.4-97.9 mm, Hapoli, 16.ii.1996, G Thirumalai. **Family: BADIDAE** **107. *Badis assamensis*** Ahl, 2011 **Material consulted:**

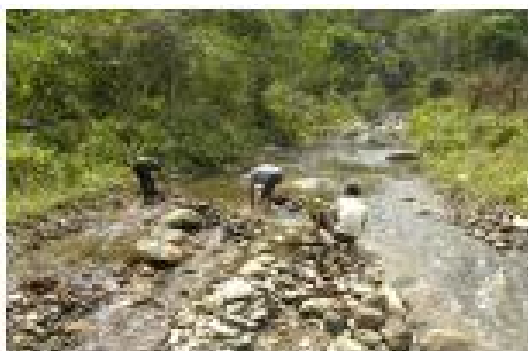
Das *et al.*, (2013) **108. *Badis badis*** (Hamilton, 1822) **Material examined:** ZSI/V/APFS/P-378, 11 exs, 18.6-21.4 mm, Ranga River, Hawa camp, 24.xi.2002, P.B. Thapa; ZSI/V/APFS/P-616, 6 exs, 10.1-29.1 mm, Pond, Siro village, Ziro, 21.vi.2012, B. Sinha. **109. *Badis triocellus*** Khyriam & Sen, 2011 **Material consulted:** Khyriam & Sen, 2011 **Family: GOBIIDAE Subfamily GOBIINAE 110. *Glossogobius giuris*** (Hamilton, 1822) **Material consulted:** Sen, 2006. Suborder ANABANTOIDEI **Family ANABANTIDAE 111. *Anabas testudineus*** (Bloch, 1792) **Material consulted:** Sen, 2006. **Family OSPHRONEMIDAE Subfamily LUCIOCEPHALINAE 112. *Trichogaster chuna*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **113. *Trichogaster fasciata*** Bloch & Schneider, 1801 **Material consulted:** Sen, 2006. **114. *Trichogaster labiosa*** Day, 1877 **Material consulted:** Das *et al.*, 2013. **115. *Trichogaster lalius*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013. **Suborder CHANNOIDEI Family: CHANNIDAE 116. *Channa gachua*** (Hamilton, 1822) **Material examined:** ZSI/V/APFS/P-211, 2 exs, 84.9-123.7 mm, Subansiri River, tale WLS, 11.iii.2003, P.T. Bhutia; ZSI/V/APFS/P-605, 1 ex., 56.1 mm, Ranga river, Yazali (5 km up from town), 05.ix.2012, B. Sinha; ZSI/V/APFS/P-606, 10 exs, 14.0-25.8 mm, Pond, Siro village, Ziro, 21.vi.2012, B. Sinha; ZSI/V/APFS/P-625, 8 exs, 59.7-132.1 mm, Pow river, Takam Pasa village, Yazali, 17.iii.2013, B. Sinha; ZSI/V/APFS/P-643, 1 ex., 101.6 mm, Ranga river, Yazali, 18.iii.2013, B. Sinha. **117. *Channa punctata*** (Bloch, 1793) **Material consulted:** Das *et al.*, 2013. **118. *Channa stewartii*** (Playfair, 1867) **Material consulted:** Das *et al.*, 2013. **119. *Channa striata*** (Bloch, 1793) **Material consulted:** Sen, 2006. **Order: TETRAODONTIFORMES Family: TETRAODONTIDAE 120. *Tetraodon cutcutia*** (Hamilton, 1822) **Material consulted:** Das *et al.*, 2013.



Fish trapping using bamboo made traps



Fish bait of floor and turmeric for catching fish



Sampling of fish by diverting stream water



Fish sampling in streams with mosquito net

Plate 1. Traditional and unconventional methods of fishing used during the study



Aborichthys kempii



Acanthocobitis botia



Amblyceps apangi



Barilius vagra



Botia rostrata



Creteuchiloglanis arunachalensis



Danio dangila



Danio rerio



Oreoglanis pangenensis



Psilorhynchus arunachalensis

Plate 2. Some important fishes of Lower Subansiri district