

TAXONOMIC STUDIES ON THE ICHTHYOFAUNA OF NONGKHYLLEM WILDLIFE SANCTUARY AND ITS ADJACENT AREAS, RI-BHOI DISTRICT, MEGHALAYA

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ABSTRACT

The present study inventorised the ichthyofaunal diversity of Nongkhyllem wildlife sanctuary and its adjacent areas in Ri-bhoi district of Meghalaya. A total of 39 species belonging to 25 genera, 14 families and 5 orders were documented. The aquatic bodies in the sanctuary and its adjacent areas served as an ideal habitat for the conservation of endangered species of fish (*Tor putitora*, *Schistura sijuensis*, *Clarias magur* and *Pillaia indica*).

INTRODUCTION

Meghalaya lies in between 25° and 26° 10' latitudes and 89° 47' and 92° 47' longitude in north east of India, bounded on the north by Goalpara, Kamrup and Nowgong districts, on the east by north Cachar and Karbi Anglong districts, all of Assam and on the west and south by Bangladesh. It became an Autonomous Hill State on 2nd April, 1970 and later, it was accorded full Statehood on 21st January, 1972. The State extends over an area of 22429 Km² and comprising of 11 districts – East Khasi Hills, West Khasi Hills, South-west Khasi Hills, East Jaintia Hills, West Jaintia Hills, Ri-Bhoi, East Garo Hills, South Garo Hills, West Garo Hills, North Garo Hills and South-west Garo Hills.

Meghalaya is rich in natural vegetation which consists of different types of forests ranging from coniferous pines in the upper hills regions to temperate forest and sub-tropical forests in the middle and lower hills and tropical forests in the plains. The total recorded forest areas of Meghalaya as per the India State of Forest Report, 2013 published by Forest Survey of India is 9496 Km² classified as Reserved forests (1113 Km²),

Protected forests (12 Km²) and unclassified forests (8371 Km²). Meghalaya has two National parks – Balpakram National park (220 Km²) and Nokrek National Park (47.48 Km²) and three wildlife sanctuaries – Nongkhyllem wildlife sanctuary (29 Km²), Siju wildlife sanctuary (5.18 Km²) and Baghmara Pitcher plant wildlife sanctuary (0.02 Km²).

The government of Meghalaya in exercising the power conferred by sub-section (1) of section 18 of the wildlife (Protection) Act, 1972 (Central Act 53 of 1972) consider a portion of the Nongkhyllem Reserve Forest under the Meghalaya Forest Regulation (Assam Regulation 7 of 1891 as adopted by Meghalaya) to be of adequate ecological, faunal, floral, geomorphological and natural significance for the purpose of protection, propagation and development of wildlife and declared an area of 29 Km² approximate as wildlife sanctuary in the year 1981 vide Government notification No. FOR.25/81/5(A) dated 25th March, 1981.

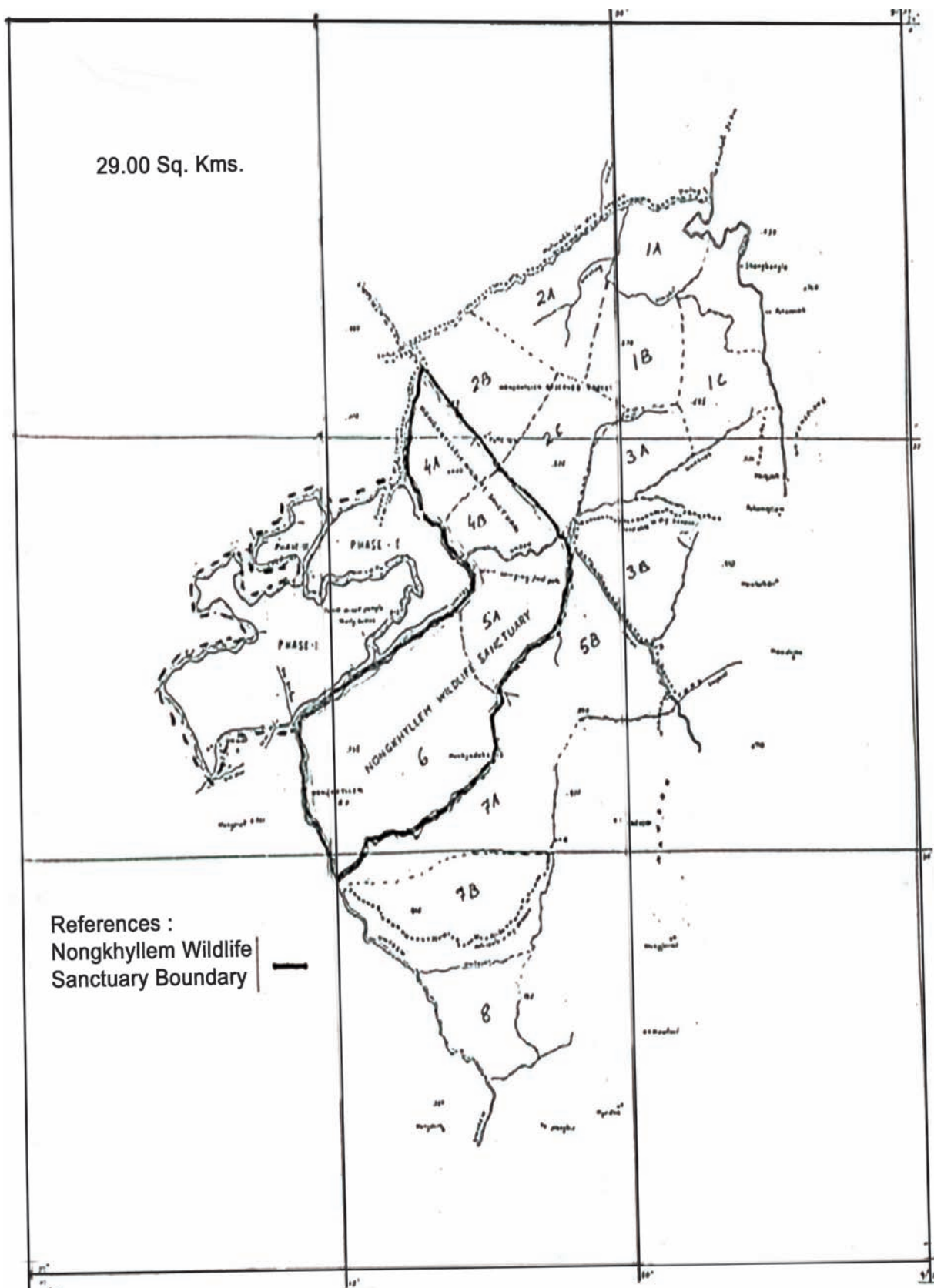
The Nongkhyllem wildlife sanctuary (NWLS) is located in Ri-Bhoi district of Meghalaya about 80 km from Shillong and accessible through

the forests beat offices at Adit point, Umtasor and Lailad under the Range office at Nongpoh and Headquarter at Shillong. The sanctuary can be approached from Umling on the Guwahati-Shillong Highway (NH-40) and then 17 km along Umling-Patharkmah road up to Lailad village. The co-ordinates of the sanctuary recorded during the study periods ranges from 91°44'17.0" and 91°48'46.7" Longitude to 25°50'17.1" and 25° 56' 00.1" Latitude with altitude ranging from 193-965m. It is being surrounded by Nongkhylllem Reserve Forest, private and community forests and the forests under the Autonomous district council, which together provide a buffer zone of about 319.25 Km². The state government acquired a portion of the community forest (23 Km²) located to the west of the Umtrew River in 2002 for future extension of the sanctuary. The sanctuary has a tropical monsoon climate with temperature ranging from 6°C to 32°C and average annual rainfall about 2000-3000mm. The major part of the habitat is Tropical Moist Deciduous forest with patches of Tropical Semi-Evergreen forest, Montane grassy land and large stretches of bamboos. Plantations of the Forest Department are mostly Sal (*Shorea robusta*) and Teak (*Tectona grandis*). Two perennial rivers drain the Nongkhylllem wildlife sanctuary. The Umtrew River runs west and north along the boundary of the sanctuary and Nongkhylllem Reserve forest. The Umran River runs along the east, cut through the centre of the sanctuary and finally drains into the Umtrew River in the west. The tributaries of the Umtrew River include the Umling River in the north-eastern part of the sanctuary, the Umtasor stream along the south and east and Ummluh River in the west. The Umlammar stream, Ummar River and Umjaphing stream are the tributaries of the Umtrew River from the proposed extension area of the Nongkhylllem wildlife sanctuary. The natural lake called 'Birbah' is in the southern part of the sanctuary. The open area of the lake is being reduced by grass and reeds.

There are human settlements surrounding the sanctuary and protected reserve forests of Nongkhylllem. These are Umtasor, Kynjoin

Umran, Umksih, Myrdon, Mawtari, Nongmahir, Nongkseh, Sohjirang, Nongkynrih, Nongbirlum, Tasku, Umsohma, Lailad Rim, Umling, Mawdiangum, Saiden, Shangbangla, Umladoh, Umdu and others. The Hydroelectric power project of Meghalaya Energy Corporation Limited is also located close to Nongkhylllem protected area. Farmers residing in these nearby villages are still practicing slash-and-burn shifting cultivation (jhums) and their common plantations are rice, beetle nut, beetle leaf, pineapple, oranges, jackfruit, banana, rubber, broom stick etc. As some of these settlements and plantations are close to the boundaries of the protected area, man-animal conflict is a frequent case during the recent past especially with wild elephants. The other wildlife in Nongkhylllem protected area is under constant threat from poachers from nearby villages who often indulge in illegal hunting.

According to the published information, the sanctuary is rich in wildlife fauna and harbour some of the rare and endangered species. The Nongkhylllem wildlife sanctuary is one of the important bird areas (IBA) in India, code IN-ML-04. About 50 species of mammals, 25 species of reptiles and over 300 species of avifauna have been reported (Choudhury, 1998 & 1999; Gupta and Sharma, 2005; Dohling and Sathyakumar, 2011). The key fauna recorded includes a high density of large mammals such as wild Asian Elephants *Elephas maximus*, Tiger *Panthera tigris*, Leopard *Panthera pardus*, Clouded Leopard *Neofelis nebulosa*, Leopard Cat *Prionailurus bengalensis*, Jungle Cat *Felis chaus*, Fishing Cat *Felis viverrinus*, Wild dog *Cuon alpinus*, Himalayan Black Bear *Ursus thibetanus*, Sloth Bear *Merursus ursinus*, Hoolock Gibbon *Hylobates hoolock*, Slow Loris *Nycticebus coucang*, Capped Langur *Trachypithecus pileata*, Rhesus macaque *Macaca multta*, Sambar *Cervus unicolor*, Barking Deer *Muntiacus muntjak*, Gaur *Bos frontalis*, Binturong *Arctictis binturong* and Malayan Giant Squirrel *Ratufa bicolor*. Besides, the notable mammals, wild boar, civets and mongoose are also present in the sanctuary. Among the reptiles, Asian Leaf Turtle *Cyclemis dentata*, Common Monitor



Nongkhylllem Wildlife Sanctuary Boundary map

Lizard *Varanus bengalensis* and Water Monitor Lizard *Varanus salvator* were recorded. The snakes includes the Indian Rock Python *Python molurus*, King Cobra *Ophiophagus hannah*, Banded Krait *Bungarus fasciatus*, Common Krait *Bungarus caeruleus*, Buffstriped Keelback *Amphiesma stolata* and Vipers such as Green or Bamboo Pit Viper *Trimeresurus gramineus*. Among the insect fauna 52 species of Hymenoptera have been documented by Mathew (2003). Sen (1995) reported 152 species of fishes from Meghalaya including about 19 species from adjacent areas (Lailad, Umran and Nongkhylllem Reserve) of Nongkhylllem wildlife sanctuary. Literature on the fish fauna of Nongkhylllem wildlife sanctuary in particular is scanty. The present study therefore attempts to inventorise and document the fish fauna in Nongkhylllem wildlife sanctuary and its adjacent areas.

MATERIALS AND METHODS

Samplings of fishes were carried out from April, 2012 to March, 2014 and a total of 8 quarterly surveys of 5 days duration each were conducted. The fishes were collected from Umtrew River and its tributaries (Umran, Umling, Ummluh and Ummar rivers), perennial hill streams (Umtasor, Umnongpha, Umjaphing, Umdu, Umski, Umsyei), seasonally unnamed streamlets and ponds, lake (Birbah) and rice fields. Hand nets, scoop nets, cast nets, hooks and traps were used for catching fishes. Fish specimens caught by local fishermen were also used for the study. The collected fish specimens were preserved in formalin solution (8-10%) with proper field labels. Each sampling sites were substantiated with GPS co-ordinates (Oregon 550 Garmin). Live photographs of specimens, habitats and topography of the area were captured with canon digital camera. Taxonomic identification of fish specimens was done following Day (1889), Talwar and Jhingran (1991), Jayaram (1999), Kottelat (2012), Sen and Khyrnriam (2014), Khyrnriam and Sen (2014) and FishBase (<http://www.fishbase.org>). For conservation status of species, the IUCN's website www.iucnredlist.org. Version 2015.2 was used.

SYSTEMATIC LIST

Phylum CHORDATA

Class ACTINOPTERYGII

Order ANGUILLIFORMES

Family ANGUILLIDAE

1. *Anguilla bengalensis* (Gray, 1831)

Order CYPRINIFORMES

Family CYPRINIDAE

2. *Barilius bendelisis* (Hamilton, 1807)
3. *Cyprinus carpio* Linnaeus, 1758
4. *Danio rerio* (Hamilton, 1822)
5. *Devario aequipinnatus* (McClelland, 1839)
6. *Esomus danrica* (Hamilton, 1822)
7. *Garra annandalei* Hora, 1921
8. *Garra gotyla* (Gray, 1832)
9. *Garra lamta* (Hamilton, 1822)
10. *Labeo calbasu* (Hamilton, 1822)
11. *Labeo bata* (Hamilton, 1822)
12. *Neolissochilus hexagonolepis* (McClelland, 1839)
13. *Neolissochilus hexastichus* (McClelland, 1839)
14. *Tor putitora* (Hamilton, 1822)
15. *Tor tor* (Hamilton, 1822)
16. *Pethia shalynius* (Yazdani & Talukdar, 1975)
17. *Puntius chola* (Hamilton, 1822)
18. *Puntius sophore* (Hamilton, 1822)

Family NEMACHEILIDAE

19. *Schistura devdevi* (Hora, 1935)
20. *Schistura multifasciata* (Day, 1878)
21. *Schistura reticulofasciata* (Singh & Banarescu, 1981)
22. *Schistura sijuensis* (Menon, 1987)

Family COBITIDAE

23. *Lepidocephalichthys berdmorei* (Blyth, 1861)
24. *Lepidocephalichthys guntea* (Hamilton, 1822)

Order SILURIFORMES

Family ERETHISTIDAE

25. *Pseudolaguvia ribeiroi* Hora, 1921

26. *Pseudolaguvia shawi* (Hora, 1921)
Family SISORIDAE
27. *Glyptothorax striatus* (McClelland, 1842)
Family CLARIIDAE
28. *Clarias magur* (Hamilton, 1822)
Family HETEROPNEUSTIDAE
29. *Heteropneustes fossilis* (Bloch, 1794)
Family OLYRIDAE
30. *Olyra horae* (Prashad & Mukherji, 1929)
31. *Olyra longicaudata* McClelland, 1842
Order SYNBRANCHIFORMES
Family SYNBRANCHIDAE
32. *Monopterus cuchia* (Hamilton, 1822)
Family CHAUDHURIIDAE
33. *Pillaia indica* Yazdani, 1972
Order PERCIFORMES
Family BADIDAE
34. *Badis assamensis* Ahl, 1937
35. *Badis badis* (Hamilton, 1822)
Family CICHLIDAE
36. *Oreochromis mossambicus* (Peters, 1852)
Family CHANNIDAE
37. *Channa gachua* (Hamilton, 1822)
38. *Channa punctata* (Bloch, 1793)
39. *Channa stewartii* (Playfair, 1867)

SYSTEMATIC ACCOUNTS

Order ANGUILLIFORMES
Family ANGUILLIDAE

1. *Anguilla bengalensis* (Gray, 1831)
Indian mottled eel (PLATE-1)

1831. *Muraena bengalensis* Gray, *Illust. Indian Zool.*:
pl. 95, fig. 5 (Type locality: Ganges River).

Material examined: Identification was based on digital images captured by wildlife officials from a specimen caught by local fishermen near Nongkhylllem wildlife sanctuary.

Diagnostic Characters: Body elongate, head conical and flattened dorsally. Mouth terminal, cleft of mouth extending to some distance behind

orbits and lips well developed. Dorsal and anal fins continuous around tail. Pelvic fin absent. No spines in fins. Dorsal fin with 250-305, Anal fin 220-250 and Pectoral fin with 18 rays.

Distribution: Nongkhylllem wildlife sanctuary: Ummar River. India: Arunachal Pradesh, Assam, Manipur, Meghalaya, Tripura, Sikkim, East coast of India, Andaman Islands and Maharashtra. *Elsewhere*: Bangladesh; East Indies; Myanmar; Pakistan; Sri Lanka and Nepal.

IUCN Status: Near Threatened (NT).

Order CYPRINIFORMES
Family CYPRINIDAE

2. *Barilius bendelisis* (Hamilton, 1807)
Hamilton's Barila (PLATE-1)

1807. *Cyprinus bendelisis* Hamilton, *Journey in Mysore*,
3: 345, Pl. 32 (Type locality: Vedwati stream,
headwaters of Krishna River near Heriuru, Mysore).

Material examined: Umsong River, 1 ex.,
11.ix.2013, Regn. No. V/F/NERC/ZSI/3680, 2
exs., 29.x.2013, Regn. No. V/F/NERC/ZSI/3712,
Coll. D. Khyntiam & Party.

Diagnostic Characters: Body shallow, mouth moderate and jaws long. The maxilla extends to below anterior third of orbit. Barbels two short pairs, the rostral pairs often reduced or absent. Each scale in adults with a black spot at its base and two in each scale forming the lateral line. Lateral line with 40-45 scales. Body silvery with 8-12 bars on sides descending towards the lateral line, most distinct in immature specimens. In adults these bars become indistinct as spots and sometimes lost. Dorsal fin with 2/7, Anal fin with 2-3/7-8, Pectoral fin with 1/14 and Pelvic fin with 1/8 rays.

Distribution: Nongkhylllem wildlife sanctuary: Umsong River (adjacent area). India: Throughout India. *Elsewhere*: Bangladesh; Bhutan; Myanmar; Nepal; Pakistan; Sri Lanka.

IUCN Status: Least concern (LC).

3. *Cyprinus carpio* Linnaeus, 1758
Common carp (PLATE-1)

1758. *Cyprinus carpio* Linnaeus, *Systema Naturae*, ed. 10,
1: 320 (Type locality: Europe).

Material examined: Umran village, River Umran-Umsaw confluence area, 1 ex., 13.vi.2013, Regn. No. V/F/NERC/ZSI/3649, Coll. D. Khyntiam & Party.

Diagnostic Characters: Body stout, slightly compressed and fully covered with regularly arranged rows of large and thick scales. In variety *specularis* scales are irregularly arranged and almost absent in variety *nudus*. Barbels 2 pairs. Lateral line with 33-35 scales. Body usually olivaceous, with silvery or golden sides. Fins yellowish, reddish or golden. Dorsal fin with 3-4/17-23, Anal fin with 2-3/5-6, Pectoral fin with 1/15 and Pelvic fin with 1/8 rays.

Distribution: Nongkhylllem wildlife sanctuary: Umran and Umsaw rivers. India: Introduced throughout India. *Elsewhere:* Western Europe throughout Eurasia to China and South-East Asia; Siberia.

IUCN Status: Vulnerable (VU).

4. *Danio rerio* (Hamilton, 1822)

Zebra danio (PLATE-1)

1822. *Cyprinus rerio* Hamilton, *Fishes of Ganges*: 323, 390 (Type locality: Kosi River, Uttar Pradesh).

Material examined: Nongkhylllem Wildlife sanctuary, pond, 15 exs., 19.vi.2012, Regn. No. V/F/NERC/ZSI/3324, 6 exs., 03.xii.2012, Regn. No. V/F/NERC/ZSI/3485, stream, 2 exs., 19.vi.2012, Regn. No. V/F/NERC/ZSI/3328, 4 exs., 21.vi.2012, Regn. No. V/F/NERC/ZSI/3341, 2 exs., 19.ix.2012, Regn. No. V/F/NERC/ZSI/3384, 1 ex., 21.ix.2012, Regn. No. V/F/NERC/ZSI/3372, 1 ex., 12.iii.2013, Regn. No. V/F/NERC/ZSI/3539, Birbah lake, 10 exs., 05.xii.2012, Regn. No. V/F/NERC/ZSI/3505, 27 exs., 13.iii.2013, Regn. No. V/F/NERC/ZSI/3550, 19 exs., 11.vi.2013, Regn. No. V/F/NERC/ZSI/3630, 7 exs., 12.iii.2014, Regn. No. V/F/NERC/ZSI/3809, Umran River, 1 ex., 05.xii.2012, Regn. No. V/F/NERC/ZSI/3502, Ummluh River, 4 exs., 12.vi.2013, Regn. No. V/F/NERC/ZSI/3633, Umtrew River, 1 ex., 10.iii.2014, Regn. No. V/F/NERC/ZSI/3770, Umling River, 1 ex., 10.iii.2014, Regn. No. V/F/NERC/ZSI/3771, Quinine village,

Umran River, 2 exs., 20.vi.2012, Regn. No. V/F/NERC/ZSI/3322, Nongkhylllem Reserve Forests, Umtasor stream, 5 exs., 20.vi.2012, Regn. No. V/F/NERC/ZSI/3347, 1 ex., 10.vi.2013, Regn. No. V/F/NERC/ZSI/3622, Umlangtara stream, 3 exs., 20.vi.2012, Regn. No. V/F/NERC/ZSI/3317, Umling stream, 3 exs., 06.xii.2012, Regn. No. V/F/NERC/ZSI/3518, 4 exs., 30.x.2013, Regn. No. V/F/NERC/ZSI/3713, Umdu village, Umdu stream, 5 exs., 17.ix.2012, Regn. No. V/F/NERC/ZSI/3409, 35 exs., 06.xii.2012, Regn. No. V/F/NERC/ZSI/3521, 1 ex., 12.vi.2013, Regn. No. V/F/NERC/ZSI/3642, Lailad village, stream, 1 ex., 20.ix.2012, Regn. No. V/F/NERC/ZSI/3405, Umsyei River, 7 exs., 07.xii.2012, Regn. No. V/F/NERC/ZSI/3528, 4 exs., 11.iii.2014, Regn. No. V/F/NERC/ZSI/3776, Umran village, River Umran-Umsaw confluence area, 8 exs., 13.vi.2013, Regn. No. V/F/NERC/ZSI/3645, paddy field, 7 exs., 31.x.2013, Regn. No. V/F/NERC/ZSI/3729, Umsaw River, 1 ex., 31.x.2013, Regn. No. V/F/NERC/ZSI/3734, 4 exs., 12.iii.2014, Regn. No. V/F/NERC/ZSI/3789, Sohkhwai village, Umlammar stream, 6 exs., 10.ix.2013, Regn. No. V/F/NERC/ZSI/3670, Nongladew village, stream, 6 exs., 11.ix.2013, Regn. No. V/F/NERC/ZSI/3667, Umtasor village, Umtasor stream, 16 exs., 12.ix.2013, Regn. No. V/F/NERC/ZSI/3687, 9 exs., 31.x.2013, Regn. No. V/F/NERC/ZSI/3748, 5 exs., 12.iii.2014, Regn. No. V/F/NERC/ZSI/3801, Lamrang village, Umling stream, 6 exs., 30.x.2013, Regn. No. V/F/NERC/ZSI/3723, Ummar village, Ummar River, 5 exs., 11.iii.2014, Regn. No. V/F/NERC/ZSI/3786, Coll. D. Khyntiam & Party.

Diagnostic Characters: Body elongate and slightly compressed. Mouth obliquely directed upwards. Barbels two pairs. Scales moderate size, lateral line usually absent, often rudimentary or incomplete with 28-30 scales. Caudal fin forked. Body silvery grey on the back, yellowish white on belly and flanks with four metallic blue stripes. Anal fin with three longitudinal blue bands. Dorsal fin with 2/6-7, Anal fin with 2-3/12-13, Pectoral fin with 1/11-12 and Pelvic fin with 1/6 rays.

Distribution: Nongkhylllem wildlife sanctuary: Umtrew, Umran, Umling and Ummluh rivers, Birbah lake, ponds and streams. India: Throughout India. *Elsewhere:* Bangladesh; Bhutan; Myanmar; Nepal; Pakistan; Sri Lanka.

IUCN Status: Least concern (LC).

5. *Devario aequipinnatus* (McClelland, 1839)
Gaint danio (PLATE-I)

1839. *Perilampus aequipinnatus* McClelland, *Asiat. Res.*, **19** (2) pp. 393, Pl. 60, fig. 1 (Type locality: Assam).

Material examined: Nongkhylllem Wildlife sanctuary, stream, 1 ex., 19.vi.2012, Regn. No. V/F/NERC/ZSI/3319, 2 exs., 19.vi.2012, Regn. No. V/F/NERC/ZSI/3320, 5 exs., 21.vi.2012, Regn. No. V/F/NERC/ZSI/3338, 2 exs., 19.ix.2012, Regn. No. V/F/NERC/ZSI/3383, 2 exs., 20.ix.2012, Regn. No. V/F/NERC/ZSI/3410, 1 ex., 21.ix.2012, Regn. No. V/F/NERC/ZSI/3373, 9 exs., 12.iii.2012, Regn. No. V/F/NERC/ZSI/3540, 1 ex., 12.iii.2013, Regn. No. V/F/NERC/ZSI/3543, 14 exs., 12.iii.2013, Regn. No. V/F/NERC/ZSI/3547, 2 exs., 18.vi.2012, Regn. No. V/F/NERC/ZSI/3335, 7 exs., 13.iii.2014, Regn. No. V/F/NERC/ZSI/3817, Umjaphing stream, 3 exs., 14.iii.2013, Regn. No. V/F/NERC/ZSI/3554, 6 exs., 14.iii.2013, Regn. No. V/F/NERC/ZSI/3557. Umling River, 1 ex., 17.ix.2012, Regn. No. V/F/NERC/ZSI/3393, 1 ex., 04.xii.2012, Regn. No. V/F/NERC/ZSI/3500, 7 exs., 04.xii.2012, Regn. No. V/F/NERC/ZSI/3496, 1 ex., 03.xii.2012, Regn. No. V/F/NERC/ZSI/3486, 2 exs., 09.ix.2013, Regn. No. V/F/NERC/ZSI/3663, Ummluh River, 2 exs., 19.ix.2012, Regn. No. V/F/NERC/ZSI/3396, 6 exs., 19.ix.2012, Regn. No. V/F/NERC/ZSI/3407, 5 exs., 04.xii.2012, Regn. No. V/F/NERC/ZSI/3487, 2 exs., 15.iii.2013, Regn. No. V/F/NERC/ZSI/3562, 4 exs., 12.vi.2013, Regn. No. V/F/NERC/ZSI/3634, 1 ex., 13.ix.2013, Regn. No. V/F/NERC/ZSI/3700, 2 exs., 13.iii.2014, Regn. No. V/F/NERC/ZSI/3811, 1 ex., 14.iii.2014, Regn. No. V/F/NERC/ZSI/3818, Umran River, 1 ex., 05.xii.2012, Regn. No. V/F/NERC/ZSI/3504, 3 exs., 12.iii.2013, Regn. No. V/F/NERC/ZSI/3537, Umrahuleng River, 2 exs., 05.xii.2012, Regn. No. V/F/NERC/ZSI/3501, 4 exs., 13.iii.2013, Regn. No. V/F/NERC/ZSI/3548, Umtrew River, 1 ex.,

12.ix.2013, Regn. No. V/F/NERC/ZSI/3683, 1 ex., 10.iii.2014, Regn. No. V/F/NERC/ZSI/3764, Nongkhylllem Reserve Forests, Umlangtara stream, 1 ex., 20.vi.2012, Regn. No. V/F/NERC/ZSI/3318, Umsaw River, 1 ex., 22.vi.2012, Regn. No. V/F/NERC/ZSI/3331, Umnongpha stream, 1 ex., 22.vi.2012, Regn. No. V/F/NERC/ZSI/3332, Umtasor stream, 12 exs., 22.vi.2012, Regn. No. V/F/NERC/ZSI/3344, 6 exs., 10.vi.2013, Regn. No. V/F/NERC/ZSI/3621, 2 exs., 12.ix.2013, Regn. No. V/F/NERC/ZSI/3694, Umling River, 9 exs., 06.xii.2012, Regn. No. V/F/NERC/ZSI/3513, Umdu stream, 4 exs., 30.x.2013, Regn. No. V/F/NERC/ZSI/3718, Quinine village, Umran River, 6 exs., 20.vi.2012, Regn. No. V/F/NERC/ZSI/3321, Umsaw River, 3 exs., 20.vi.2012, Regn. No. V/F/NERC/ZSI/3326, Umran village, River Umran-Umsaw confluence area, 20 exs., 13.vi.2013, Regn. No. V/F/NERC/ZSI/3646, Umsaw River, 3 exs., 31.x.2013, Regn. No. V/F/NERC/ZSI/3736, 1 ex., 12.iii.2014, Regn. No. V/F/NERC/ZSI/3791, Umran River, 2 exs., 31.x.2013, Regn. No. V/F/NERC/ZSI/3743, 2 exs., 12.iii.2014, Regn. No. V/F/NERC/ZSI/3797, Umtasor village, Umtasor stream, 1 ex., 31.x.2013, Regn. No. V/F/NERC/ZSI/3749, 1 ex., 12.iii.2014, Regn. No. V/F/NERC/ZSI/3803, Coll. D. Khyriam & Party.

Diagnostic Characters: Body elongate and compressed. A pre-orbital spine, backwardly directed from lachrymal bone. Barbels two short pairs, rostral and maxillary. Lateral line complete with 34-37 scales. A well marked lateral band of dark blue along sides of the body with thinner golden bands above and below it. A well defined black blotch near upper angle of gill opening generally present. Caudal fin forked. Dorsal fin with 2-3/9-12, Anal fin with 2-3/14-16, Pectoral fin with 1/11-12 and Pelvic fin with 1/ 6 rays.

Distribution: Nongkhylllem wildlife sanctuary: Umling, Ummluh, Umran, Umrahuleng and Umtrew rivers and Umjaphing stream. India: Throughout India. *Elsewhere:* Bangladesh; Bhutan; Indo-China; Myanmar; Nepal; Pakistan; Sri Lanka; Thailand.

IUCN Status: Least concern (LC).

6. *Esomus danrica* (Hamilton, 1822)

Flying barb (PLATE-2)

1822. *Cyprinus danrica* Hamilton, *Fishes of Ganges*, pp. 325, 390, Pl. 16, fig. 88 (Type locality: Ponds and ditches of Bengal)

Material examined: Quinine village, Umran River, 1 ex., 20.vi.2012, Regn. No. V/F/NERC/ZSI/3323, Nongkhylllem Reserve Forests, Umtasor stream, 1 ex., 20.vi.2012, Regn. No. V/F/NERC/ZSI/3348, 1 ex., 12.ix.2013, Regn. No. V/F/NERC/ZSI/3695, Umdu stream, 1 ex., 30.x.2013, Regn. No. V/F/NERC/ZSI/3717, Umdu village, Umdu stream, 2 exs., 06.xii.2012, Regn. No. V/F/NERC/ZSI/3523, Sohkhwai village, Umlammar stream, 2 exs., 10.ix.2013, Regn. No. V/F/NERC/ZSI/3669, Umtasor village, Umtasor stream, 1 ex., 12.ix.2013, Regn. No. V/F/NERC/ZSI/3688, 2exs., 31.x.2013, Regn. No. V/F/NERC/ZSI/3747, 1 ex., 12.iii.2014, Regn. No. V/F/NERC/ZSI/3802, Umsong village, Umsong River, 1 ex., 29.x.2013, Regn. No. V/F/NERC/ZSI/3707, Coll. D. Khyrnriam & Party.

Diagnostic Characters: Body elongate, slim and compressed. Body olive-green to grey-green with a broad lateral dark band (sometimes absent) from mouth to base of caudal fin. Head small and mouth projected obliquely upwards. Barbels two pairs, maxillary pair long and reaches to the base of pelvic or sometimes up to caudal fin base. Dorsal fin inserted opposite between anal and pelvic fin. Lateral line incomplete or absent with 27-30 scales in lateral series. Dorsal fin with 2/6, Anal fin with 3/5, Pectoral fin with 1/14-15 and Pelvic fin with 1/6-7 rays.

Distribution: Nongkhylllem wildlife sanctuary: Umran River. India: Throughout India. *Elsewhere:* Afghanistan; Bangladesh; Malaya; Myanmar; Nepal; Pakistan; Sri Lanka; Thailand; South Vietnam (Mekong Basin).

IUCN Status: Least concern (LC).

7. *Garra annandalei* Hora, 1921

Annandale garra (PLATE-2)

1921. *Garra annandalei* Hora, *Rec. Indian Mus.*, 22(5): 657 (Type locality: Mahananda River, below Darjeeling).

Material examined: Nongkhylllem wildlife

sanctuary, Ummluh River, 1ex., 13.iii.2014, Regn. No. V/F/NERC/ZSI/3812, Nongkhylllem Reserve Forests, Umnonghpa stream, 1 ex., 22.vi.2012, Regn. No. V/F/NERC/ZSI/3334, Umtasor stream, 5exs., 22.vi.2012, Regn. No. V/F/NERC/ZSI/3346, Umtasor village, Umtasor stream, 1 ex., 12.iii.2014, Regn. No. V/F/NERC/ZSI/3805, Coll. D. Khyrnriam & Party.

Diagnostic Characters: Body almost subcylindrical and head slightly depressed. Mouth semicircular and suction disc well developed. Barbels two pairs. Snout without proboscis. Tip of snout not marked off by a deep transverse groove. Dorsal fin inserted nearer tip of snout than caudal fin base. Lateral line with 33-34 scales. Body dark grey on dorsum and paler below. A black spot on upper angle of gill openings. A dark mid-lateral band in young specimens. Dorsal fin with 3/7-8, Anal fin with 2/5, Pectoral fin with 1/12-14 and Pelvic fin with 1/7 rays.

Distribution: Nongkhylllem wildlife sanctuary: Ummluh River. India: All the North Eastern States (Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura), Bihar, Himalayas, West Bengal (Darjeeling, Including North Bengal Plain). *Elsewhere:* Bangladesh; Bhutan; Nepal.

IUCN Status: Least concern (LC).

8. *Garra gotyla* (Gray, 1832)

Sucker head (PLATE-2)

1832. *Cyprinus gotyla* Gray, *Illustr. Indian Zool.*, 1: pl. 88, figs. 3, 3a (Type locality: Northern India).

Material examined: Umtasor village, Umtasor stream, 10 exs., 12.ix.2013, Regn. No. V/F/NERC/ZSI/3693, Coll. D. Khyrnriam & Party.

Diagnostic Characters: Body elongate, head depressed and mouth semicircular. Barbels two pairs and suction disc well developed. Snout covered with pores or conical tubercles with a deep groove across it forming a proboscis. Lateral line scales 32-35. Body dark brown on back and lighter on flanks. Caudal fin deeply forked. Dorsal fin with 3/7-8, Anal fin with 2/5, Pectoral fin with 1/14 and Pelvic fin with 1/8 rays.

Distribution: Nongkhylllem wildlife sanctuary: Umtrew River. India: All the North Eastern States (Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura) and along the Himalayas, Chotanagpur plateau and the Vindhya-Satpura Mountains of the Indian peninsula. *Elsewhere:* Afghanistan; Bangladesh; Bhutan; Myanmar; Nepal; Pakistan.

IUCN Status: Least concern (LC).

9. ***Garra lamta*** (Hamilton, 1822)

Lamta garra (PLATE-1)

1822. *Cyprinus (Garra) lamta* Hamilton (*patrim*), *Fishes of Ganges*: 343, 393 (Type locality: Rapti River, Gorakhpur, U.P.).

Material examined: Nongkhylllem wildlife sanctuary, stream, 1 ex., 19.ix.2012, Regn. No. V/F/NERC/ZSI/3379, Ummluh River, 2 exs., 01.11.2013, Regn. No. V/F/NERC/ZSI/3761, Umtrew River, 1 ex., 10.iii.2014, Regn. No. V/F/NERC/ZSI/3765, Coll. D. Khyntiam & Party.

Diagnostic Characters: Body subcylindrical and somewhat flattened on undersurface. Head short, snout rounded and smooth in females, its tip marked off by a deep transverse groove. In males, transverse lobe at tip and sides of snout in front of nostrils covered with horny tubercles. Lateral line with 31-34 scales. Upper surface of body dark, belly yellowish white. Dorsal fin with 3/7-8, Anal fin with 2/5, Pectoral fin with 1/12 and Pelvic fin with 1/7-8 rays.

Distribution: Nongkhylllem wildlife sanctuary: Ummluh and Umtrew rivers and also in streams. India: All the North Eastern States (Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura), Eastern Himalayas, Western Ghats. *Elsewhere:* Myanmar; Nepal.

IUCN Status: Least concern (LC).

10. ***Labeo calbasu*** (Hamilton, 1822)

Black rohu, Kalbasu, Orange-fin labeo (PLATE-1)

1822. *Cyprinus calbasu* Hamilton, *Fishes of Ganges*: 297, 387, pl. 2, Fig. 33 (Type locality: Rivers and ponds of Bengal and in the Western provinces).

Material examined: A specimen caught by local fishermen.

Diagnostic Characters: A deep robust fish with ventral and dorsal profiles equally convex. Mouth narrow, inferior and conspicuously fringed. Barbels two pairs, rostral and maxillary. Snout depressed and fairly pointed, devoid of lateral lobe and studded with pores. Lateral line with 40-44 scales. Body charcoal black in color. Dorsal fin with 3-4/13-16, Anal fin with 2-3/ 5, Pectoral fin with 1/16-18 and Pelvic fin with 1/8 rays.

Distribution: Nongkhylllem wildlife sanctuary: Umtrew River. India: Throughout India. *Elsewhere:* Bangladesh; Myanmar; Nepal; Pakistan; South China; Thailand.

IUCN Status: Least concern (LC).

11. ***Labeo bata*** (Hamilton, 1822)

Bata labeo (PLATE-1)

1822. *Cyprinus bata* Hamilton, *Fishes of Ganges*: 283, 386 (Type locality: Rivers and ponds of Bengal).

Material examined: Specimens caught by local fishermen.

Diagnostic Characters: Body elongate. Snout slightly projecting beyond mouth, often studded with pores. Mouth inferior and lips thin. Barbels, a pair of minute maxillary only. Lateral line with 37-40 scales. Body golden yellow above and silvery on lower half of flanks and belly. Dorsal fin with 2-4/9-10, Anal fin with 2-3/5, Pectoral fin with 1/15-17 and Pelvic fin with 1/8 rays.

Distribution: Nongkhylllem wildlife sanctuary: Umtrew River. India: Throughout India except Kerala. *Elsewhere:* Bangladesh; Myanmar; Nepal; Pakistan.

IUCN Status: Least concern (LC).

12. ***Neolissochilus hexagonolepis***

(McClelland, 1839)

Chocolate mahseer (PLATE-1)

1839. *Barbus hexagonolepis* McClelland, *Asiat. Res.*, **19**(2): 270, 340, pl. 41, fig. 3. (Type locality: Upper Assam).

Material Examined: Nongkhylllem wildlife sanctuary, Umtrew River, 1 ex., 19.vi.2012, Regn. No. V/F/NERC/ZSI/3362, 3 exs., 17.ix.2012, Regn. No. V/F/NERC/ZSI/3392, 8

exs., 21.ix.2012, Regn. No. V/F/NERC/ZSI/3386, Nongkhylllem Reserve Forests, Umtasor stream, 1 ex., 20.vi.2012, Regn. No. V/F/NERC/ZSI/3363, 1 ex., 14.vi.2013, Regn. No. V/F/NERC/ZSI/3655, Coll. D. Khyntiam & Party.

Diagnostic Characters: Body moderately elongate. Mouth nearly truncated, lower labial fold interrupted and lower jaw edge sharp. Barbels two pairs. Lateral line complete with 28-30 scales. Body olive-green on back, coppery coloured on sides above the lateral line and fading to pure white on belly. Dorsal fin with 4/9, Anal fin with 3/5, Pectoral fin with 1/16 and Pelvic fin with 1/8 rays.

Distribution: Nongkhylllem wildlife sanctuary: Umtrew River. India: All the North Eastern States (Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura), throughout Northern India, Darjeeling and Eastern Himalayas. *Elsewhere:* Bangladesh; Bhutan; China; Indonesia; Malaysia; Myanmar; Nepal; Pakistan; Sumatra; Thailand; Vietnam.

IUCN Status: Near threatened (NT).

13. *Neolissochilus hexastichus*
(McClelland, 1839)

McClelland's bokar, Labura (PLATE-1)

1839. *Barbus hexastichus* McClelland, *Asiat. Res.*, **19**(2): 269, 333, pl. 39, fig. 2 (Type locality : Great Rivers in the plains of India).

Material examined: Nongkhylllem wildlife sanctuary, Umtrew River, 9exs., 21.ix.2012, Regn. No. V/F/NERC/ZSI/3387, 1ex., 07.xii.2012, Regn. No. V/F/NERC/ZSI/3527, 1 ex., 11.iii.2013, Regn. No. V/F/NERC/ZSI/3535, stream, 1ex., 12.iii.2013, Regn. No. V/F/NERC/ZSI/3545, 2exs., 12.ix.2013, Regn. No. V/F/NERC/ZSI/3685, 1ex., 10.ix.2013, Regn. No. V/F/NERC/ZSI/3664, 2exs., 13.ix.2013, Regn. No. V/F/NERC/ZSI/3698, Umjaphing stream, 1ex., 14.iii.2013, Regn. No. V/F/NERC/ZSI/3552, 1ex., 14.iii.2013, Regn. No. V/F/NERC/ZSI/3555, 1ex., 14.iii.2013, Regn. No. V/F/NERC/ZSI/3559, Nongkhylllem Reserve Forests, stream, 1ex., 18.vi.2012, Regn. No. V/F/NERC/ZSI/3336, Umsaw River, 5exs., 22.vi.2012, Regn. No. V/F/NERC/ZSI/3330, Umtasor stream,

5exs., 22.vi.2012, Regn. No. V/F/NERC/ZSI/3345, 2exs., 13.vi.2013, Regn. No. V/F/NERC/ZSI/3653, 1ex., 14.vi.2013, Regn. No. V/F/NERC/ZSI/3655, Umran village, River Umran-Umsaw confluence area, 1ex., 13.vi.2013, Regn. No. V/F/NERC/ZSI/3648, Umran River, 1ex., 31.x.2013, Regn. No. V/F/NERC/ZSI/3744, Coll. D. Khyntiam & Party.

Diagnostic Characters: Body elongate. Mouth rounded smoothly, edge of lower jaw blunt. Lower labial fold continuous. Barbels two pairs. Lateral line scales 25-26. Body brownish, tinged with green along the back, becoming dull white with yellow on the sides and below. The fry have a black spot at caudal base. Dorsal fin with 4/9, Anal fin with 3/5, Pectoral fin with 1/16 and Pelvic fin with 1/8 rays.

Distribution: Nongkhylllem wildlife sanctuary: Umtrew River and Umjaphing stream. India: Arunachal Pradesh, Assam, Meghalaya, Mizoram, Nagaland, Rivers from Kashmir to Sikkim along the Himalayan Foot hills. *Elsewhere:* Myanmar.

IUCN Status: Near threatened (NT).

14. *Tor putitora* (Hamilton, 1822)
Golden mahseer (PLATE-2)

1822. *Cyprinus putitora* Hamilton, *Fishes of Ganges*: 303, 388 (Type locality: Eastern parts of Bengal).

Material examined: Nongkhylllem wildlife sanctuary, Umtrew River, 1 ex., 13.ix.2013, Regn. No. V/F/NERC/ZSI/3705, Coll. D. Khyntiam & Party.

Diagnostic Characters: Body streamlined and somewhat compressed with both dorsal and ventral profiles equally arched. Head broadly pointed and considerably greater than depth of body in length. Mouth small and lips thick with uninterrupted lower labial groove. Barbels two pairs. Scales large and lateral line complete with 25-29 scales. Dorsal fin with 4/8, Anal fin with 2/5, Pectoral fin with 1/16-17 and Pelvic fin with 1/8 rays.

Distribution: Nongkhylllem wildlife sanctuary: Umtrew River. India: All the North Eastern States (Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura) and also along the Himalayas including Kashmir

and Maharashtra. *Elsewhere*: Afghanistan; Bangladesh; Bhutan; Myanmar; Nepal; Pakistan.

IUCN Status: Endangered (EN).

15. ***Tor tor*** (Hamilton, 1822)

Tor mahseer (PLATE-2)

1822. *Cyprinus tor* Hamilton, *Fishes of Ganges*: 305, 388 (Type locality: Mahananda River, West Bengal).

Material examined: Nongkhylllem Wildlife Sanctuary, Umtrew River, 1 ex., 13.ix.2013, Regn. No. V/F/NERC/ZSI/3705, Coll. D. Khyntiam & Party.

Diagnostic Characters: Body fairly deep. Head relatively smaller than body depth. Mouth small and lips fleshy. Barbels 2 pairs, snout and cheeks smooth and devoid of tubercles. Lateral line with 22-27 scales. Dorsal fin with 4/8, Anal fin with 3/5, Pectoral fin with 1/14-17 and Pelvic fin with 1/8 rays.

Distribution: Nongkhylllem wildlife sanctuary: Umtrew River. India: All the North Eastern States (Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura), West Bengal (Including North Bengal Plain), Bihar, Uttar Pradesh, Madhya Pradesh, all along the Himalayas, Ganga and Narmada River system. *Elsewhere*: Bangladesh; Bhutan; China; Myanmar; Nepal; Pakistan.

IUCN Status: Near threatened (NT).

16. ***Pethia shalynius*** (Yazdani &

Talukdar, 1975)

Shalyni barb (Plate-2)

1975. *Puntius shalynius* Yazdani and Talukdar, *J. Bombay nat. Hist. Soc.*, **72**(1): 218 (Type locality: Barapani lake near Shillong, Meghalaya).

Material examined: Nongkhylllem Reserve Forests, Umnonpha stream, 1 ex., 22.vi.2012, Regn. No. V/F/NERC/ZSI/3333, Coll. D. Khyntiam & Party.

Diagnostic Characters: Body fairly deep, mouth small and barbels absent. A thin blue horizontal line along middle of the body and two spots on side of caudal peduncle. Dorsal fin spine strong and serrated. Lateral line incomplete with 20-23 scales. Dorsal fin with 3/7, Anal fin with 2/5, Pectoral fin with 1/12-13 and Pelvic fin with 1/7 rays.

Distribution: Nongkhylllem wildlife sanctuary: Umtrew River. India: Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland. *Elsewhere*: So far not recorded from other places.

IUCN Status: Vulnerable (VU)

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

Swamp barb, Chola barb (PLATE-2)

1822. *Cyprinus chola* Hamilton, *Fishes of Ganges*, 312, 289 (Type locality: North Eastern part of Bengal).

Material examined: Umdu village, Umdu stream, 2 exs., 06.xii.2012, Regn. No. V/F/NERC/ZSI/3525, Umran village, River Umran-Umsaw confluence area, 3 exs., 13.vi.2013, Regn. No. V/F/NERC/ZSI/3647, Nongkhylllem Reserve Forests, Umtasor stream, 1 ex., 13.vi.2013, Regn. No. V/F/NERC/ZSI/3654, Umtasor village, Umtasor stream, 4 exs., 12.ix.2013, Regn. No. V/F/NERC/ZSI/3689, 5 exs., 31.x.2013, Regn. No. V/F/NERC/ZSI/3752, 5 exs., 12.iii.2014, Regn. No. V/F/NERC/ZSI/3804, Umran village, Umsaw River, 2 exs., 31.x.2013, Regn. No. V/F/NERC/ZSI/3740, Coll. D. Khyntiam & Party.

Diagnostic Characters: Body deep and compressed. Barbels a single short maxillary pair. Last unbranched ray of dorsal fin osseous, fairly strong and smooth. Lateral line complete with 26-28 scales. A deep black blotch present near base of caudal fin. A few rays of dorsal fin spotted. Dorsal fin with 3/8, Anal fin with 2/5, Pectoral fin with 1/14 and Pelvic fin with 1/8 rays.

Distribution: Nongkhylllem wildlife sanctuary: Umran River. India: Throughout India. *Elsewhere*: Bangladesh; Bhutan; Myanmar, Nepal; Pakistan; Sri Lanka.

IUCN Status: Least concern (LC)

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

Pool barb, Spotfin swamp barb, Stigma barb (PLATE-2)

1822. *Cyprinus sophore* Hamilton, *Fishes of Ganges*: 310, 389, pl. 19, fig. 86 (Type locality: Ponds and Rivers in the Gangetic provinces)

Material examined: Umran village, paddy field, 7 exs., 31.x.2013, Regn. No. V/F/NERC/ZSI/3733, Umsaw River, 2 exs., 31.x.2013, Regn. No. V/F/

NERC/ZSI/3738, 2 exs., 12.iii.2014, Regn. No. V/F/NERC/ZSI/3790, Coll. D. Khyntiam & Party.

Diagnostic Characters: Body relatively deep, dorsal profile more convex than ventral. Barbels absent. Dorsal spine weak and smooth. Lateral line complete with 22-27 scales. A dark blotch at base of caudal fin and another on central part of dorsal fin. Dorsal fin with 3-4/8-9, Anal fin with 3/5, Pectoral fin with 1/14-16 and Pelvic fin with 1/8 rays.

Distribution: Nongkhylllem wildlife sanctuary: Umran River. India: Throughout India. *Elsewhere:* Afghanistan; Bangladesh; Bhutan; China; Myanmar; Nepal; Pakistan; Sri Lanka; Yunan.

IUCN Status: Least concern (LC).

Family NEMACHEILIDAE

19. *Schistura devdevi* (Hora, 1935)

River loach (PLATE-3)

1935. *Noemacheilus devdevi* Hora, *Rec. Indian Mus.*, **37**(1): 54, pl. 3, figs. 5 & 6 (Type locality: Small streams below Darjeeling and in Sikkim, Eastern Himalaya).

Material examined: Umsong village, Umsong River, 1 ex., 29.x.2013, Regn. No. V/F/NERC/ZSI/3708, Coll. D. Khyntiam & Party.

Diagnostic Characters: Body slender with 4-6 broad saddle-shaped bands extending from back to sides of body. Lateral line incomplete, terminating above pelvic fin. Dorsal fin inserted nearer base of caudal fin than to snout tip. Caudal fin lunate with a black spot at base. Dorsal fin with 3/8, Anal fin with 2/5, Pectoral fin with 1/18 and Pelvic fin with 1/6 rays.

Distribution: Nongkhylllem wildlife sanctuary: Umsong River (adjacent area). India: Arunachal Pradesh, Meghalaya, Sikkim. *Elsewhere:* Not recorded from other places.

IUCN Status: Near threatened (NT).

20. *Schistura multifasciata* (Day, 1878)

Multifasciated loach (PLATE-3)

1878. *Nemacheilus multifasciatus* Day (*patrim*), *Fishes of India*: 617, pl. 153, fig. 7 (Type locality: Darjeeling and Assam).

Material examined: Nongkhylllem wildlife sanctuary, Umtrew River, 2 exs., 03.xii.2012,

Regn. No. V/F/NERC/ZSI/3656, 1ex., 07.xii.2012, Regn. No. V/F/NERC/ZSI/3657, 1 ex., 11.iii.2013, Regn. No. V/F/NERC/ZSI/3660, 1 ex., 12.ix.2013, Regn. No. V/F/NERC/ZSI/3697, Umling River, 1ex., 10.ix.2013, Regn. No. V/F/NERC/ZSI/3675, Umjaphing stream, 1ex., 14.iii.2013, Regn. No. V/F/NERC/ZSI/3658, 5exs., 14.iii.2013, Regn. No. V/F/NERC/ZSI/3661, stream, 1ex., 12.iii.2013, Regn. No. V/F/NERC/ZSI/3659, Coll. D. Khyntiam & Party.

Diagnostic Characters: Body robust and slender with dorsal profile slightly arched. Body marked with 14 -16 vertical bands which often split up particularly in front of dorsal fin into several narrower bands. Dorsal fin inserted slightly nearer base of caudal fin than to snout tip. A black spot at base of anterior dorsal fin rays. Lateral line complete. Caudal fin truncate or slightly emarginated. Dorsal fin with 2/8, Anal fin with 2/5, Pectoral fin with 1/10-11 and Pelvic fin with 1/7-8 rays.

Distribution: Nongkhylllem wildlife sanctuary: Umtrew and Umling rivers and Umjaphing stream. India: All the North Eastern States (Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura) and Eastern Himalayas. *Elsewhere:* Myanmar; Nepal; Thailand.

IUCN Status: Least concern (LC).

21. *Schistura reticulofasciata*

(Singh & Banarescu, 1981)

North eastern loach (PLATE-3)

1981. *Mesonoemacheilus reticulofasciatus* Singh, Sen, Banarescu and Nalbant. *Trav. Mus. Hist. nat. Grigore Antipa*, **23**: 206 (Type locality: Barapani near Shillong, Meghalaya).

Material examined: Nongkhylllem wildlife sanctuary, Ummluh River, 1ex., 04.xii.2012, Regn. No. V/F/NERC/ZSI/3495, 2exs., 12.vi.2013, Regn. No. V/F/NERC/ZSI/3636, 5exs., 13.ix.2013, Regn. No. V/F/NERC/ZSI/3704, 1ex., 01.xi.2013, Regn. No. V/F/NERC/ZSI/3756, 5exs., 14.iii.2014, Regn. No. V/F/NERC/ZSI/3819, Umtrew River, 1ex., 02.xii.2012, Regn. No. V/F/NERC/ZSI/3483, 1ex., 12.ix.2013, Regn. No.

V/F/NERC/ZSI/3684, 8exs., 14.iii.2014, Regn. No. V/F/NERC/ZSI/3825, Umling River, 1ex., 01.xi.2013, Regn. No. V/F/NERC/ZSI/3762, stream, 1ex., 12.iii.2013, Regn. No. V/F/NERC/ZSI/3662, Nongkhyllem Reserve Forests, Umtasor stream, 1ex., 20.vi.2012, Regn. No. V/F/NERC/ZSI/3356, 10exs., 22.vi.2012, Regn. No. V/F/NERC/ZSI/3355, 6exs., 10.vi.2013, Regn. No. V/F/NERC/ZSI/3628, Umsaw River, 2exs., 20.vi.2012, Regn. No. V/F/NERC/ZSI/3353, 3exs., 22.vi.2012, Regn. No. V/F/NERC/ZSI/3354, Umdu stream, 4 exs., 30.x.2013, Regn. No. V/F/NERC/ZSI/3716, Umtasor village, Umtasor stream, 1ex., 12.ix.2013, Regn. No. V/F/NERC/ZSI/3691, 7exs., 31.x.2013, Regn. No. V/F/NERC/ZSI/3751, Lailad village, Umsyei River, 6exs., 11.iii.2014, Regn. No. V/F/NERC/ZSI/3779, Ummar village, Ummar River, 3exs., 11.iii.2014, Regn. No. V/F/NERC/ZSI/3787, Umran village, Umran River, 1ex., 12.iii.2014, Regn. No. V/F/NERC/ZSI/3798, Coll. D. Khyntiam & Party.

Diagnostic Characters: Body with a network of irregular crossbars, the anterior bars reticulated. Dorsal fin inserted almost equidistant between tip of snout and caudal fin base. Lateral line short, ending below anterior part of dorsal fin or slightly in front of it. Caudal fin forked with two or three rows of spots. Dorsal fin with 3/8, Anal fin with 2-3/5, Pectoral fin with 1/9 and Pelvic fin with 1/6-7 rays.

Distribution: Nongkhyllem wildlife sanctuary: Ummluh, Umtrew and Umling rivers. India: Assam, Meghalaya. *Elsewhere:* Not recorded from other places.

IUCN Status: Vulnerable (VU)

22. *Schistura sijuensis* (Menon, 1987)
Meghalaya loach (PLATE-3)

1987. *Noemacheilus sijuensis* Menon, *Fauna of India*, Pisces, 4: 175, pl. 6, fig. 2 (Type locality: Siju cave, Garo Hills, Meghalaya).

Material examined: Nongkhyllem wildlife sanctuary, Umtrew River, 1ex., 10.iii.2014, Regn. No. V/F/NERC/ZSI/3766, Coll. D. Khyntiam & Party.

Diagnostic Characters: Body marked with

8-10 short light grey bands across back which break up into secondary bands below lateral line. Dorsal fin inserted slightly nearer base of caudal fin than to snout tip. Lateral line complete. Caudal fin forked with two V-shaped bands. Dorsal fin with 2/8, Anal fin with 2/5, Pectoral fin with 1/10 and Pelvic fin with 1/7 rays.

Distribution: Nongkhyllem wildlife sanctuary: Umtrew River. India: Meghalaya. *Elsewhere:* Not recorded from other places.

IUCN Status: Endangered (EN).

Family COBITIDAE

23. *Lepidocephalichthys berdmorei*

(Blyth, 1861)

Burmese loach (PLATE-3)

1861. *Acanthopsis berdmorei* Blyth, *J. Asiat. Soc. Bengal*, 29: 163 (Type locality: Tenasserim Province, Burma).

Material examined: Nongkhyllem wildlife sanctuary, stream, 1 ex., 19.ix.2012, Regn. No. V/F/NERC/ZSI/3380, 1 ex., 12.iii.2013, Regn. No. V/F/NERC/ZSI/3542, Ummluh River, 1 ex., 04.xii.2012, Regn. No. V/F/NERC/ZSI/3490, 1 ex., 15.iii.2013, Regn. No. V/F/NERC/ZSI/3565, 1 ex., 12.vi.2013, Regn. No. V/F/NERC/ZSI/3635, Umran River, 1 ex., 12.iii.2013, Regn. No. V/F/NERC/ZSI/3536, Umtrew River, 1 ex., 10.iii.2014, Regn. No. V/F/NERC/ZSI/3767, Nongkhyllem Reserve Forests, Umtasor stream, 1 ex., 22.vi.2012, Regn. No. V/F/NERC/ZSI/3360, 2 exs., 10.vi.2013, Regn. No. V/F/NERC/ZSI/3626, stream, 1 ex., 06.xii.2012, Regn. No. V/F/NERC/ZSI/3519, Umdu stream, 8 exs., 30.x.2013, Regn. No. V/F/NERC/ZSI/3722, Umling River, 1 ex., 06.xii.2012, Regn. No. V/F/NERC/ZSI/3515, Lailad village, Umsyei River, 2 exs., 20.ix.2012, Regn. No. V/F/NERC/ZSI/3401, 2 exs., 20.ix.2012, Regn. No. V/F/NERC/ZSI/3406, 1 ex., 07.xii.2012, Regn. No. V/F/NERC/ZSI/3531, 1 ex., 11.iii.2014, Regn. No. V/F/NERC/ZSI/3778, Umdu village, Umdu stream, 5 exs., 06.xii.2012, Regn. No. V/F/NERC/ZSI/3524, 2 exs., 12.vi.2013, Regn. No. V/F/NERC/ZSI/3643, Umran village, River Umran-Umsaw confluence area, 1 ex., 13.vi.2013, paddy field, 1 ex., 31.x.2013, Regn. No. V/F/NERC/

ZSI/3732, Umsaw River, 2 exs., 31.x.2013, Regn. No. V/F/NERC/ZSI/3741, Sohkhwai village, Umlammar stream, 11 exs., 10.ix.2013, Regn. No. V/F/NERC/ZSI/3672, Umsong village, Umsong River, 5 exs., 29.x.2013, Regn. No. V/F/NERC/ZSI/3709, Umtasor village, Umtasor stream, 5 exs., 31.x.2013, Regn. No. V/F/NERC/ZSI/3754, 2 exs., 12.iii.2014, Regn. No. V/F/NERC/ZSI/3808, Coll. D. Khyntiam & Party.

Diagnostic Characters: Body profile almost parallel from head to caudal base. Body pale to yellowish brown, thickly speckled over with blackish markings except on the belly. A dark longitudinal line along the flanks composed of spots and a black spot above middle of caudal fin base. Barbels 3 pairs. Mental lobe produced posteriorly into 3 or more short barbel like projections. Caudal fin emarginated. Dorsal fin with 2-3/6, Anal fin with 2/5-6, Pectoral fin with 1/7-9 and Pelvic fin with 1/6-7 rays.

Distribution: Nongkhylllem wildlife sanctuary: Ummluh, Umran and Umtrew rivers and also in streams. India: Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura. *Elsewhere:* Bangladesh; China; Malaysia; Myanmar; Thailand.

IUCN Status: Least concern (LC).

24. *Lepidocephalichthys guntea*

(Hamilton, 1822)

Guntea loach (PLATE-2)

1822. *Cobitis guntea* Hamilton, *Fishes of Ganges*: 353, 394 (Type locality: Ponds and Freshwaters of Bengal).

Material examined: Nongkhylllem wildlife sanctuary, Umling River, 1 ex., 10.iii.2014, Regn. No. V/F/NERC/ZSI/3773, Umtrew River, 1 ex., 14.iii.2014, Regn. No. V/F/NERC/ZSI/3826, Nongkhylllem Reserve Forests, Umtasor stream, 30 exs., 20.vi.2012, Regn. No. V/F/NERC/ZSI/3361, 5 exs., 10.vi.2013, Regn. No. V/F/NERC/ZSI/3627, 1 ex., 12.ix.2013, Regn. No. V/F/NERC/ZSI/3696, Umdu stream, 1 ex., 30.x.2013, Regn. No. V/F/NERC/ZSI/3721, Sohkhwai village, Umlammar stream, 3 exs., 10.ix.2013, Regn. No. V/F/NERC/ZSI/3673, Nongladew village, stream, 1 ex., 11.ix.2013,

Regn. No. V/F/NERC/ZSI/3678, Umsong village, Umsong River, 14 exs., 11.ix.2013, Regn. No. V/F/NERC/ZSI/3681, 1 ex., 29.x.2013, Regn. No. V/F/NERC/ZSI/3710, Umtasor village, Umtasor stream, 14 exs., 12.ix.2013, Regn. No. V/F/NERC/ZSI/3692, 6 exs., 31.x.2013, Regn. No. V/F/NERC/ZSI/3755, 4 exs., 12.iii.2014, Regn. No. V/F/NERC/ZSI/3806, Umran village, Umsaw River, 2 exs., 31.x.2013, Regn. No. V/F/NERC/ZSI/3739, 1 ex., 12.iii.2014, Regn. No. V/F/NERC/ZSI/3792, Umran River 1 ex., 31.x.2013, Regn. No. V/F/NERC/ZSI/3746, Lailad village, Umsyei River, 4 exs., 11.iii.2014, Regn. No. V/F/NERC/ZSI/3777, Coll. D. Khyntiam & Party.

Diagnostic Characters: Body profile parallel posteriorly but depressed in front of dorsal fin. A dark longitudinal band along the flanks composed of black dots. A dark spot above the caudal fin base. Mental lobe well developed and produced into one or two projections. Caudal fin convex or truncate. Dorsal and caudal fins with rows of dark spots. Body colour highly variable with age and sex. Dorsal fin with 2-3/6-7, Anal fin with 2-3/5, Pectoral fin with 1/6-7 and Pelvic fin with 1/6-7 rays.

Distribution: Nongkhylllem wildlife sanctuary: Umling, Umran and Umtrew rivers. India: Throughout India except Karnataka, Kerala and South of Krishna River. *Elsewhere:* Bangladesh; Myanmar; Nepal; Pakistan; Salween basin; Thailand.

IUCN Status: Least concern (LC).

Order SILURIFORMES

Family ERETHISTIDAE

25. *Pseudolaguvia ribeiroi* Hora, 1921

Hora's painted laguvia (PLATE-2)

1921. *Laguvia ribeiroi* Hora, *Rec. Indian Mus.*, 22(5): 741, pl. 29, fig. 3 (Type locality: Khoila River, a tributary of Tista River at Jaipalguri, North Bengal).

Material examined: Nongkhylllem wildlife sanctuary, Ummluh River, 1 ex., 18.ix.2012, Regn. No. V/F/NERC/ZSI/3398, 3 exs., 04.xii.2012, Regn. No. V/F/NERC/ZSI/3494, 1 ex., 15.iii.2013, Regn. No. V/F/NERC/ZSI/3564, 1 ex., 12.vi.2013, Regn. No. V/F/NERC/ZSI/3639, 1 ex., 14.iii.2014,

Regn. No. V/F/NERC/ZSI/3822, stream, 1 ex., 19.ix.2012, Regn. No. V/F/NERC/ZSI/3378, 2 exs., 21.ix.2012, Regn. No. V/F/NERC/ZSI/3376, Nongkhylllem Reserve Forest, Umling River, 1 ex., 06.xii.2012, Regn. No. V/F/NERC/ZSI/3514, Lailad village, Umsyei River, 3 exs., 07.xii.2012, Regn. No. V/F/NERC/ZSI/3530, 1 ex., 11.iii.2014, Regn. No. V/F/NERC/ZSI/3780, Lamrang village, Umling stream, 1 ex., 30.x.2013, Regn. No. V/F/NERC/ZSI/3727, Coll. D. Khyriam & Party.

Diagnostic Characters: Body subcylindrical, dark grey above and becoming dull white below. A broad yellowish transverse band between rayed and adipose dorsal fin and another below posterior half of adipose dorsal fin base. Eyes small and placed in middle of head. Barbels 4 pairs. Thoracic adhesive disc faintly developed. Dorsal spine strong and finely serrated on both edges. Skin tuberculated, adipose dorsal fin dusky and other fins banded. Dorsal fin with 1/6, Anal fin with 3/6-9, Pectoral fin with 1/6-8 and Pelvic fin with 1/5 rays.

Distribution: Nongkhylllem wildlife sanctuary: Ummluh River and stream. India: Arunachal Pradesh, Assam, Meghalaya, Tripura, Sikkim, Himalayas: From West Bengal (Including North Bengal Plain) to as far as Saharanpur along the Himalayan base and Rihand River along the Vindhyan range. *Elsewhere:* Bangladesh; Nepal.

IUCN Status: Least concern (LC).

26. *Pseudolaguvia shawi* (Hora, 1921)

Hora's painted laguvia (PLATE-3)

1921. *Laguvia shawi* Hora, *Rec. Indian Mus.*, 22(5): 740, pl. 29, fig. 2. (Type locality: Mahananda and Sivoke Rivers, Darjeeling Himalaya)

Material examined: Lailad village, Umling River, 1 ex., 26.02.2012, Regn. No. V/F/NERC/ZSI/3288, Coll. J. Lyngdoh & Party.

Diagnostic Characters: Body more or less elongate, dark greyish yellow above and dull whitish below with two broad crossbands formed of black dots. Eyes small, barbels 4 pairs and thoracic adhesive apparatus faintly developed. Dorsal spine strong and smooth. Skin tuberculated and fins indistinctly marked with black transverse

bands. Dorsal fin with 1/5-6, Anal fin with 1/8, Pectoral fin with 1/7 and Pelvic fin with 1/5 rays.

Distribution: Nongkhylllem wildlife sanctuary: Umling River. India: Assam, Meghalaya, Mizoram, Nagaland, Darjeeling Himalayas, Northern India. *Elsewhere:* Bangladesh.

IUCN Status: Least concern (LC).

Family SISORIDAE

27. *Glyptothorax striatus* (McClelland, 1842)

North eastern sisorid (PLATE-3)

1842. *Glyptosternon striatus* McClelland, *Culcutta J. nat. Hist.*, 2: 587, pl. 6, fig. 1 (Type locality: Khasi Hills, Meghalaya).

Material examined: Nongkhylllem wildlife sanctuary, Umjaphing stream, 2 exs., 14.iii.2013, Regn. No. V/F/NERC/ZSI/3556, Ummluh River 2 exs., 12.vi.2013, Regn. No. V/F/NERC/ZSI/3637, 1 ex., 13.ix.2013, Regn. No. V/F/NERC/ZSI/3702, 7 exs., 01.xi.2013, Regn. No. V/F/NERC/ZSI/3758, Umtrew River, 4 exs., 14.iii.2014, Regn. No. V/F/NERC/ZSI/3828, Nongkhylllem Reserve Forests, stream, 2 exs., 18.vi.2012, Regn. No. V/F/NERC/ZSI/3358, Umnongha stream, 2 exs., 22.vi.2012, Regn. No. V/F/NERC/ZSI/3357, 4 exs., 10.vi.2013, Regn. No. V/F/NERC/ZSI/3629, Umtasor stream, 1 ex., 10.vi.2013, Regn. No. V/F/NERC/ZSI/3624, Umtasor village, Umtasor stream, 5 exs., 12.ix.2013, Regn. No. V/F/NERC/ZSI/3690, 11 exs., 31.x.2013, Regn. No. V/F/NERC/ZSI/3753, Umran village, Umsaw River, 4 exs., 31.x.2013, Regn. No. V/F/NERC/ZSI/3737, 2 exs., 12.iii.2014, Regn. No. V/F/NERC/ZSI/3793, Umran River, 3 exs., 31.x.2013, Regn. No. V/F/NERC/ZSI/3745, 11 exs., 12.iii.2014, Regn. No. V/F/NERC/ZSI/3800, Coll. D. Khyriam & Party.

Diagnostic Characters: Body uniformly dark brown and paler on ventral. Skin on head and body tuberculated. Head depressed, occipital process not reaching basal bone of dorsal fin. Adhesive thoracic apparatus well developed, as long as broad and devoid of a central pit. Pectoral spine much stronger than that of the dorsal and plaited ventrally. Dorsal fin with 1/6, Anal fin with 2/9, Pectoral fin with 1/11 and Pelvic fin with 1/5 rays.

Distribution: Nongkhylllem wildlife sanctuary:

Ummluh and Umtrew rivers and Umjaphing stream. India: Arunachal Pradesh, Assam, Meghalaya, Mizoram, Sikkim. *Elsewhere*: Not recorded from other places.

IUCN Status: Near threatened (NT).

Family CLARIIDAE

28. *Clarias magur* (Hamilton, 1822)

Magur (PLATE-3)

1822. *Macropteronotus jagur* Hamilton, *An account of the fishes found in the River Ganges*: 146, 374, Pl. 26, fig. 45 (Type locality: Ganges River).

Material examined: Sohkhwai village, Umlammar stream, 1 ex., 10.ix.2013, Regn. No. V/F/NERC/ZSI/3674, Coll. D. Khyntiam & Party.

Diagnostic Characters: Body elongate, brownish superiorly and becoming lighter beneath. Head depressed, snout broad and mouth terminal. Barbels four pairs, the nasal extend to gill opening, the maxillary extend beyond base of pectoral fin, the outer and inner mandibular are shorter. Dorsal fin inserted at a considerable distance from end of head. Pectoral spine strong and finely serrated on both edges. Dorsal fin with 70-76, Anal fin with 45-58, Pectoral fin with 1/8-11 and Pelvic fin with 1/5 rays.

Distribution: Nongkhylllem wildlife sanctuary: Umlammar stream (adjacent area). India: Throughout India. *Elsewhere*: Bangladesh; Borneo; Indonesia; Java; Malay Peninsula; Myanmar; Nepal; Pakistan; Philippines; Singapore; Srilanka; Sumatra; Thailand.

IUCN Status: Endangered (EN).

Family HETEROPNEUSTIDAE

29. *Heteropneustes fossilis* (Bloch, 1794)

Stinging catfish, Singee (PLATE-3)

1794. *Silurus fossilis* Bloch, *Naturgesch. Ausl. Fische*, 8: 46, pl. 370, fig. 2 (Type locality: Tranquebar, Tamil Nadu).

Material examined: Nongkhylllem wildlife sanctuary, Birbah lake, 2 exs., 05.xii.2012, Regn. No. V/F/NERC/ZSI/3507, 2 exs., 13.iii.2013, Regn. No. V/F/NERC/ZSI/3549, 10 exs., 11.vi.2013, Regn. No. V/F/NERC/ZSI/3631, 1 ex., 12.iii.2014, Regn. No. V/F/NERC/ZSI/3810, Coll. D. Khyntiam & Party.

Diagnostic Characters: Body elongate with dark purplish brown above and lighter below, usually with two lateral yellowish bands in juveniles. Head flat and greatly depressed. Mouth small and terminal. Barbels 4 pairs. Dorsal fin with spine, nearer to snout end than to caudal base. Pectoral fin with a strong serrated spine. Anal fin long-based and separated from round caudal fin. Dorsal fin with 6-7, Anal fin with 60-70, Pectoral fin with 1/7 and Pelvic fin with 1/5 rays.

Distribution: Nongkhylllem wildlife sanctuary: Birbah lake. India: Throughout India. *Elsewhere*: Bangladesh; Indo-China; Laos; Myanmar; Nepal; Pakistan; Sri Lanka; Thailand.

IUCN Status: Least concern (LC).

Family OLYRIDAE

30. *Olyra horae* (Prashad & Mukerji, 1929)

Hora olyra (PLATE-4)

1929. *Amblyceps horae* Prashad and Mukerji, *Rec. Indian Mus.*, 31: 173, fig. 1 and pl. 7, (Type locality: Indawgyi lake, Upper Burma).

Material examined: Nongkhylllem wildlife sanctuary, stream, 1 ex., 19.ix.2012, Regn. No. V/F/NERC/ZSI/3381, 1 ex., 21.ix.2012, Regn. No. V/F/NERC/ZSI/3375, 1 ex., 04.xii.2012, Regn. No. V/F/NERC/ZSI/3497, Coll. D. Khyntiam & Party.

Diagnostic Characters: Body long and slender, brownish above and paler beneath. Head small and depressed. Barbels 4 pairs, maxillary pair barely reach pectoral fins. Pectoral spine serrated on both edges. Caudal fin deeply forked its upper lobe slightly longer than lower. Dorsal fin with 1/7, Anal fin with 3/18, Pectoral fin with 1/7 and Pelvic fin with 1/5 rays.

Distribution: Nongkhylllem wildlife sanctuary: Streams. India: Arunachal Pradesh, Assam, Meghalaya, Nagaland. *Elsewhere*: Myanmar.

IUCN Status: Data deficient (DD).

31. *Olyra longicaudata* McClelland, 1842

Himalayan olyra (PLATE-4)

1842. *Olyra longicaudata* McClelland, *Calcutta Jour. Nat. Hist.*, 2: 588, pl. 21, fig. 1 (Type locality: Khasi Hills, Meghalaya).

Material examined: Nongkhyllem wildlife sanctuary, Ummluh River, 1 ex., 04.xii.2012, Regn. No. V/F/NERC/ZSI/3493, 7 exs., 15.iii.2013, Regn. No. V/F/NERC/ZSI/3566, 1 ex., 13.ix.2013, Regn. No. V/F/NERC/ZSI/3703, 1 ex., 01.xi.2013, Regn. No. V/F/NERC/ZSI/3760, 1 ex., 14.iii.2014, Regn. No. V/F/NERC/ZSI/3821, Umling River, 1 ex., 10.iii.2014, Regn. No. V/F/NERC/ZSI/3774, Ummyrten stream, 1 ex., 14.iii.2013, Regn. No. V/F/NERC/ZSI/3560, Nongkhyllem Reserve Forests, Umtasor stream, 2 exs., 22.vi.2012, Regn. No. V/F/NERC/ZSI/3343, Lailad village, Umsyei River, 5 exs., 11.iii.2014, Regn. No. V/F/NERC/ZSI/3781, Coll. D. Khyriam & Party.

Diagnostic Characters: Body long and slender, brownish above and paler beneath. Head small and depressed. Barbels 4 pairs, maxillary pair extends to base of pectoral fins. Pectoral spine strong, serrated on both edges. Caudal fin forked. Upper lobe of caudal fin almost twice as long as lower. Dorsal fin with 1/6-7, Anal fin with 3/15-20, Pectoral fin with 1/4-6 and Pelvic fin with 1/5 rays.

Distribution: Nongkhyllem wildlife sanctuary: Ummluh and Umling rivers. India: Arunachal Pradesh, Assam, Meghalaya, Mizoram, Nagaland, Tripura, West Bengal (Darjeeling Himalayas). *Elsewhere:* Myanmar.

IUCN Status: Least concern (LC).

Order SYNBRANCHIFORMES

Family SYNBRANCHIDAE

32. *Monopterus cuchia* (Hamilton, 1822)

Cuchia (PLATE-4)

1822. *Unibranchapertura cuchia* Hamilton, *Fishes of Ganges*: 16, 363, pl. 16, fig. 4 (Type locality: Rivers and ponds of southeast parts of Bengal).

Material examined: Specimens caught by local fishermen.

Diagnostic Characters: Body eel like and robust. Head not conspicuous, eyes small covered by skin. Gill opening divided into a pair of pore like lateral aperture. Skin of branchial region on ventral side of head drawn into deep longitudinal folds. Body with numerous black spots, greenish or chestnut brown on dorsal and sides and becoming

lighter on abdomen. Dorsal and anal finfolds or ridges rudimentary.

Distribution: Nongkhyllem wildlife sanctuary: Umtrew River. India: Arunachal Pradesh, Assam, Manipur, Meghalaya, Nagaland, Tripura, Northern India, Orissa. *Elsewhere:* Bangladesh; Myanmar; Nepal; Pakistan.

IUCN Status: Least concern (LC).

Family CHAUDHURIIDAE

33. *Pillaia indica* Yazdani, 1972

Hillstream spineless eel (PLATE-4)

1972. *Pillaia indica* Yazdani, *J. Bombay nat. Hist. Soc.*, 69 (1): 134 fig. 1 (Type locality: Sumer stream, about 22 km North of Shillong, Khasi and Jaintia Hills, Meghalaya).

Material examined: Nongkhyllem wildlife sanctuary, stream, 1 ex., 19.vi.2012, Regn. No. V/F/NERC/ZSI/3327, 3 exs., 21.vi.2012, Regn. No. V/F/NERC/ZSI/3339, 6 exs., 19.ix.2012, Regn. No. V/F/NERC/ZSI/3382, 3 exs., 21.ix.2012, Regn. No. V/F/NERC/ZSI/3374, 2 exs., 04.xii.2012, Regn. No. V/F/NERC/ZSI/3499, 1 ex., 13.iii.2014, Regn. No. V/F/NERC/ZSI/3815, Umjaphing stream, 3 exs., 14.iii.2013, Regn. No. V/F/NERC/ZSI/3553, 1 ex., 11.iii.2014, Regn. No. V/F/NERC/ZSI/3785, Ummluh River, 1 ex., 18.ix.2012, Regn. No. V/F/NERC/ZSI/3397, 1 ex., 04.xii.2012, Regn. No. V/F/NERC/ZSI/3489, 2exs., 15.iii.2013, Regn. No. V/F/NERC/ZSI/3563, 3exs., 12.vi.2013, Regn. No. V/F/NERC/ZSI/3638, 1 ex., 14.iii.2014, Regn. No. V/F/NERC/ZSI/3820, Birbah lake, 1 ex., 05.xii.2012, Regn. No. V/F/NERC/ZSI/3506, 10 exs., 13.iii.2013, Regn. No. V/F/NERC/ZSI/3551, Umtrew River, 1 ex., 10.iii.2014, Regn. No. V/F/NERC/ZSI/3768, 2 exs., 14.iii.2014, Regn. No. V/F/NERC/ZSI/3827, Umling River, 1 ex., 10.iii.2014, Regn. No. V/F/NERC/ZSI/3772, Nongkhyllem Reserve Forests, Umkhatwei stream, 4 exs., 20.vi.2012, Regn. No. V/F/NERC/ZSI/3325, Umtasor stream, 1 ex., 22.vi.2012, Regn. No. V/F/NERC/ZSI/3342, Umling River, 2 exs., 18.ix.2012, Regn. No. V/F/NERC/ZSI/3391, 1 ex., 06.xii.2012, Regn. No. V/F/NERC/ZSI/3512, stream, 1 ex., 06.xii.2012, Regn. No. V/F/NERC/ZSI/3517, Umdu stream, 6 exs., 30.x.2013, Regn. No. V/F/NERC/ZSI/3714,

Umling village, stream, 18 exs., 18.ix.2012, Regn. No. V/F/NERC/ZSI/3368, 4 exs., 10.ix.2013, Regn. No. V/F/NERC/ZSI/3665, Tasku village, Umsharhei stream, 3 exs., 20.ix.2012, Regn. No. V/F/NERC/ZSI/3394, 2 exs., 11.ix.2013, Regn. No. V/F/NERC/ZSI/3676, Lailad village, stream, 1 ex., 20.ix.2012, Regn. No. V/F/NERC/ZSI/3404, Umsyei River, 2 exs., 07.xii.2012, Regn. No. V/F/NERC/ZSI/3533, 12 exs., 11.iii.2014, Regn. No. V/F/NERC/ZSI/3782, Lamrang village, Umling stream, 3 exs., 30.x.2013, Regn. No. V/F/NERC/ZSI/3724, Umran village, Umsaw River, 1 ex., 31.x.2013, Regn. No. V/F/NERC/ZSI/3735, 1 ex., 12.iii.2014, Regn. No. V/F/NERC/ZSI/3794, Umran River, 4 exs., 12.iii.2014, Regn. No. V/F/NERC/ZSI/3799, Ummar village, Ummar River, 1 ex., 11.iii.2014, Regn. No. V/F/NERC/ZSI/3788, Coll. D. Khyntiam & Party.

Diagnostic Characters: Body eel-like and naked. Head long and depressed anteriorly. Mouth wide and horizontal. Dorsal and anal fins well developed and confluent with caudal fin. Upper part of body light to dark purplish-brown, ventral surface lighter. Dorsal fin with 34-36, Anal fin with 34-36, Pectoral fin with 7-9 and Caudal fins with 8-10 rays.

Distribution: Nongkhylllem wildlife sanctuary: Ummluh, Umling and Umtrew rivers, Umjaphing stream and Birbah lake. India: Arunachal Pradesh, Assam, Meghalaya. *Elsewhere:* Not recorded from other places.

IUCN Status: Endangered (EN).

Order PERCIFORMES

Family BADIDAE

34. *Badis assamensis* Ahl, 1937

Assam badis (PLATE-4)

1936. *Badis badis assamensis* Ahl, *Zool. Anz.*, **117**: 118 (Type locality: Assam, India).

Material examined: Nongkhylllem wildlife sanctuary, Umtrew River, 1 ex., 11.iii.2013, Regn. No. V/F/NERC/ZSI/3534, Coll. D. Khyntiam & Party.

Diagnostic Characters: Body moderately elongated and slightly compressed. Possess a

prominent dark blotch posterodorsally on opercle, two rows of irregular blackish blotches alongside and one prominent blotch at caudal peduncle. Lateral line with 28-30 scales. Dorsal fin with 16-17/9-11, Anal fin with 3/7-8, Pectoral fin with 12-14 and Pelvic fin with 1/5 rays.

Distribution: Nongkhylllem wildlife sanctuary: Umtrew River. India: Assam, Meghalaya, Nagaland. *Elsewhere:* Not recorded from other places.

IUCN Status: Data deficient (DD)

35. *Badis badis* (Hamilton, 1822)

Common badis (PLATE-4)

1822. *Labrus badis* Hamilton-Buchanan, *Fishes of Ganges*: 70, 368, pl. 25, fig. 23 (Type locality: Gangetic provinces).

Material examined: Nongkhylllem wildlife sanctuary, stream, 15 exs., 21.vi.2012, Regn. No. V/F/NERC/ZSI/3352, 15 exs., 19.ix.2012, Regn. No. V/F/NERC/ZSI/3385, 7 exs., 21.ix.2012, Regn. No. V/F/NERC/ZSI/3370, 3 exs., 04.xii.2012, Regn. No. V/F/NERC/ZSI/3498, 6 exs., 12.iii.2013, Regn. No. V/F/NERC/ZSI/3541, 1 ex., 12.iii.2013, Regn. No. V/F/NERC/ZSI/3544, 8 exs., 13.iii.2014, Regn. No. V/F/NERC/ZSI/3814, Ummluh River, 7 exs., 18.ix.2012, Regn. No. V/F/NERC/ZSI/3395, 10 exs., 04.xii.2012, Regn. No. V/F/NERC/ZSI/3488, 6 exs., 15.iii.2013, Regn. No. V/F/NERC/ZSI/3561, 18 exs., 12.vi.2013, Regn. No. V/F/NERC/ZSI/3640, 8 exs., 13.ix.2013, Regn. No. V/F/NERC/ZSI/3701, 5 exs., 01.xi.2013, Regn. No. V/F/NERC/ZSI/3757, 6 exs., 14.iii.2014, Regn. No. V/F/NERC/ZSI/3824, Umtrew River, 1 ex., 21.ix.2012, Regn. No. V/F/NERC/ZSI/3389, 1 ex., 12.ix.2013, Regn. No. V/F/NERC/ZSI/3682, 2 exs., 13.ix.2013, Regn. No. V/F/NERC/ZSI/3699, 4 exs., 10.iii.2014, Regn. No. V/F/NERC/ZSI/3769, 2 exs., 14.iii.2014, Regn. No. V/F/NERC/ZSI/3829, Umran River, 6 exs., 05.xii.2012, Regn. No. V/F/NERC/ZSI/3503, 3 exs., 12.iii.2013, Regn. No. V/F/NERC/ZSI/3538, 1 ex., 13.iii.2014, Regn. No. V/F/NERC/ZSI/3817, pond, 30 exs., 03.xii.2012, Regn. No. V/F/NERC/ZSI/3484, Umling River, 4 exs., 01.xi.2013, Regn.

No. V/F/NERC/ZSI/3763, 34 exs., 10.iii.2014, Regn. No. V/F/NERC/ZSI/3775, Nongkhylllem Reserve Forests, Umran River, 4 exs., 20.vi.2012, Regn. No. V/F/NERC/ZSI/3349, Umsaw River, 1 ex., 20.vi.2012, Regn. No. V/F/NERC/ZSI/3350, 1 ex., 22.vi.2012, Regn. No. V/F/NERC/ZSI/3351, 4 exs., 06.xii.2012, Regn. No. V/F/NERC/ZSI/3516, Umling River, 10 exs., 18.ix.2012, Regn. No. V/F/NERC/ZSI/3390, 8 exs., 06.xii.2012, Regn. No. V/F/NERC/ZSI/3511, Umski River, 4 exs., 06.xii.2012, Regn. No. V/F/NERC/ZSI/3508, Umtasor stream, 1 ex., 10.vi.2013, Regn. No. V/F/NERC/ZSI/3623, Umdu stream, 6 exs., 30.x.2013, Regn. No. V/F/NERC/ZSI/3715, Umdu village, Umdu stream, 2 exs., 17.ix.2012, Regn. No. V/F/NERC/ZSI/3408, 4 exs., 06.xii.2012, Regn. No. V/F/NERC/ZSI/3520, 10 exs., 12.vi.2013, Regn. No. V/F/NERC/ZSI/3644, Lailad village, Umsyei River, 4 exs., 20.ix.2012, Regn. No. V/F/NERC/ZSI/3400, 17 exs., 07.xii.2012, Regn. No. V/F/NERC/ZSI/3529, 10 exs., 11.iii.2014, Regn. No. V/F/NERC/ZSI/3783, stream, 2 exs., 20.ix.2012, Regn. No. V/F/NERC/ZSI/3402, Umran village, River Umran-Umsaw confluence area, 16 exs., 13.vi.2013, Regn. No. V/F/NERC/ZSI/3651, paddy field, 7 exs., 31.x.2013, Regn. No. V/F/NERC/ZSI/3728, Umran River, 1 ex., 31.x.2013, Regn. No. V/F/NERC/ZSI/3742, Umsaw River, 3 exs., 12.iii.2014, Regn. No. V/F/NERC/ZSI/3795, Sohkhwai village, Umlammar stream, 9 exs., 10.ix.2013, Regn. No. V/F/NERC/ZSI/3668, Umsong village, Umsong River, 1 ex., 11.ix.2013, Regn. No. V/F/NERC/ZSI/3679, 1 ex., 29.x.2013, Regn. No. V/F/NERC/ZSI/3706, Lamrang village, Umling stream, 12 exs., 30.x.2013, Regn. No. V/F/NERC/ZSI/3725, Coll. D. Khyriam & Party.

Diagnostic Characters: Body moderately elongate, slightly compressed and oval shaped. Body variegated with alternate belts of black and green, a bluish black spot behind gill opening and a row of dark spots along base of dorsal fin. Lateral line placed high on the body, interrupted or absent with 26-28 scales in lateral series. Dorsal fin with 15-17/7-10, Anal fin with 3/6-8, Pectoral fin with 12 and Pelvic fin with 1/5 rays.

Distribution: Nongkhylllem wildlife sanctuary:

Umran, Umtrew, Umling and Ummluh rivers, streams and ponds. India: Throughout India. *Elsewhere:* Bangladesh; Bhutan; Myanmar; Nepal; Pakistan; Thailand.

IUCN Status: Least concern (LC).

Family CICHLIDAE

36. *Oreochromis mossambicus* (Peters, 1852) Mozambique tilapia (PLATE-4)

1852. *Chromis (tilapia) mossambicus* Peters, *Montab. Akad. Wiss., Berlin:* 681 (Type locality: Mozambique).

Material examined: Nongkhylllem Wildlife sanctuary, Birbah lake, 4 exs., 11.vi.2013, Regn. No. V/F/NERC/ZSI/3632, Coll. D. Khyriam & Party.

Diagnostic Characters: Body fairly deep, laterally compressed and grey to yellowish in colour with 3 or 4 dark blotches or bands along flanks. Scales cycloid with 30-32 in lateral series. Mouth large. Dorsal fin inserted above base of pectoral fins. Caudal fin truncate. Dorsal fin with 15-18/10-13, Anal fin with 3/7-12, Pectoral fin with 14-15 and Pelvic fin with 1/5 rays.

Distribution: Nongkhylllem wildlife sanctuary: Birbah lake. India: Introduced throughout India. *Elsewhere:* Bangladesh; East Africa; Malaysia; Myanmar; Nepal; Pakistan; Singapore; Sri Lanka; Thailand.

IUCN Status: Near threatened (NT).

Family CHANNIDAE

37. *Channa gachua* (Hamilton, 1822) Great snakehead (PLATE-4)

1822. *Ophicephalus gachua* Hamilton, *Fishes of Ganges:* 68, 367, pl. 21, fig. 21 (Type locality: Bengal).

Material examined: Nongkhylllem wildlife sanctuary, Ummluh River, 1 ex., 04.xii.2012, Regn. No. V/F/NERC/ZSI/3491, Umtrew River, 1 ex., 21.ix.2012, Regn. No. V/F/NERC/ZSI/3388, stream, 1 ex., 19.ix.2012, Regn. No. V/F/NERC/ZSI/3377, 2 exs., 21.ix.2012, Regn. No. V/F/NERC/ZSI/3371, Umling village, stream, 1 ex., 18.ix.2012, Regn. No. V/F/NERC/ZSI/3369, Lailad village, Umsyei River, 1 ex., 11.iii.2014, Regn. No. V/F/NERC/ZSI/3784, 3 exs., 07.xii.2012, Regn. No. V/F/NERC/

ZSI/3532, stream, 2 exs., 20.ix.2012, Regn. No. V/F/NERC/ZSI/3411, 1 ex., 20.ix.2012, Regn. No. V/F/NERC/ZSI/3403, Nongkhylllem Reserve Forest, Umski River, 1 ex., 06.xii.2012, Regn. No. V/F/NERC/ZSI/3510, 1 ex., 06.xii.2012, Regn. No. V/F/NERC/ZSI/3509, Umtasor stream, 1 ex., 10.vi.2013, Regn. No. V/F/NERC/ZSI/3625, Sohkhwai village, Umlammar stream, 1 ex., 10.ix.2013, Regn. No. V/F/NERC/ZSI/3671, Umtasor village, Umtasor stream, 1 ex., 12.ix.2013, Regn. No. V/F/NERC/ZSI/3686, 4 exs., 31.x.2013, Regn. No. V/F/NERC/ZSI/3750, 5 exs., 12.iii.2014, Regn. No. V/F/NERC/ZSI/3807, Umsong village, Umsong River, 3 exs., 29.x.2013, Regn. No. V/F/NERC/ZSI/3711, Lamrang village, Umling stream, 3 exs., 30.x.2013, Regn. No. V/F/NERC/ZSI/3726, Umran village, paddy field, 8 exs., 31.x.2013, Regn. No. V/F/NERC/ZSI/3730, Umsaw River, 1 ex., 12.iii.2014, Regn. No. V/F/NERC/ZSI/3796, Umdu village, Umdu stream, 2 exs., 30.x.2013, Regn. No. V/F/NERC/ZSI/3719, 1 ex., 06.xii.2012, Regn. No. V/F/NERC/ZSI/3522, Coll. D. Khyrnriam & Party.

Diagnostic Characters: Body elongate, greenish dorsally and becoming lighter on the ventral. Head large, maxilla of the mouth reaches to below the hind edge of the orbit. 4-5 scales between orbit and angle of preopercle. Lateral line with 39-50 scales. Pectoral fin base with transverse black bands. Pelvic fin shorter than half the pectoral fin length. In young specimen often a large ocellus with a light edge on few last dorsal rays. Dorsal fin with 32-37, Anal fin with 20-23, Pectoral fin with 14-15 and Pelvic fin with 6 rays.

Distribution: Nongkhylllem wildlife sanctuary: Ummluh and Umtrew rivers. India: Arunachal Pradesh, Assam, Manipur, Nagaland, Maharashtra, West Bengal. *Elsewhere:* Afghanistan in the West to Indonesia through South and Central Asia.

IUCN Status: Least concern (LC).

38. *Channa punctata* (Bloch, 1793)

Spotted snakehead (PLATE-4)

1793. *Ophiocephalus punctatus* Bloch, *Naturges. ausland. Fische*, (7): 139, pl. 358 (Type locality: Rivers and Lakes of Coromandel Coast).

Material examined: Nongkhylllem Reserve Forests, Umdu stream, 1 ex., 30.x.2013, Regn. No. V/F/NERC/ZSI/3720, Umdu village, Umdu stream, 1 ex., 06.xii.2012, Regn. No. V/F/NERC/ZSI/3526, Umran village, River Umran-Umsaw confluence area, 1 ex., 13.vi.2013, Regn. No. V/F/NERC/ZSI/3652, paddy field, 20 exs., 31.x.2013, Regn. No. V/F/NERC/ZSI/3731, Coll. D. Khyrnriam & Party.

Diagnostic Characters: Body elongate, generally greenish grey on dorsal and yellowish white on ventral. A dark stripe along the side of head and several short cross-bands on flanks. Pelvic fin more than half of pectoral fin length. 4-5 scales between orbit and angle of preopercle. Pectoral fin plain. Lateral line scales 37-40. Dorsal fin with 28-33, Anal fin with 20-23, Pectoral fin with 15-18 and Pelvic fin with 6 rays.

Distribution: Nongkhylllem wildlife sanctuary: Umran River. India: Throughout India. *Elsewhere:* Afghanistan; Bangladesh; China; Malaysia; Myanmar; Nepal; Pakistan; Polynesia; Srilanka; Thailand.

IUCN Status: Least concern (LC).

39. *Channa stewartii* (Playfair, 1867)

Assamese snakehead (PLATE-4)

1867. *Ophiocephalus stewartii* Playfair, *Proc. Zool. Soc. Lond.*: 14, fig. 3 (Type locality: Cachar, Assam).

Material examined: Nongkhylllem wildlife sanctuary, stream, 1 ex., 19.vi.2012, Regn. No. V/F/NERC/ZSI/3329, 10 exs., 21.vi.2012, Regn. No. V/F/NERC/ZSI/3340, 1 ex., 12.iii.2013, Regn. No. V/F/NERC/ZSI/3546, Umjaphing stream, 1 ex., 14.iii.2013, Regn. No. V/F/NERC/ZSI/3558, Ummluh River, 1 ex., 12.vi.2013, Regn. No. V/F/NERC/ZSI/3641, Nongkhylllem Reserve Forests, stream, 1 ex., 18.vi.2012, Umling village, stream, 1 ex., 10.ix.2013, Regn. No. V/F/NERC/ZSI/3666, Coll. D. Khyrnriam & Party.

Diagnostic Characters: Body elongate, dark brown on back and lighter on flanks and belly. Scales scattered with small circular black spots, more numerous above lateral line. 4 or 5 scales

between preopercular angle and hind border of orbit. Lateral line scales 47 to 50. Pelvic fin less than half of pectoral fin length. Pectoral fin yellow with a blue basal spot in young. Dorsal fin with 39-40, Anal fin with 27, Pectoral fin with 17 and Pelvic fin with 6 rays.

Distribution: Nongkhylllem wildlife sanctuary: Ummluh River and Umjaphing stream. India: Arunachal Pradesh, Assam, Meghalaya, Mizoram, Tripura, Bihar, West Bengal. *Elsewhere:* Nepal.

IUCN Status: Least concern (LC).

RESULTS AND DISCUSSION

Earlier studies on the ichthyofauna of Meghalaya were initiated by Hora (1924), Yazdani (1977), Yazdani and Talukdar (1975), Pillai and Yazdani (1974; 1977) and Sen (1995) made an elaborate attempt to study the ichthyofauna of the state and reported 152 species including about 19 species from adjacent areas (Lailad, Umran and Nongkhylllem Reserve Forests) of Nongkhylllem wildlife sanctuary. Sen (2003) while reporting on the fish fauna of North east India, listed 167 species from Meghalaya and recent compilation by Sen and Khyrnriam (2014) raised the number of species to 176.

During the present investigation, 39 species (including 2 introduced species) of fishes belonging to 25 genera, 14 families and 5 orders were recorded. The family Cyprinidae has maximum diversity comprising 17 species followed by Nemacheilidae with 4 species and Channidae with 3 species. The families Cobitidae, Erethistidae, Olyridae and Badidae are represented by 2 species each and families Anguillidae, Clariidae, Sisoridae, Heteropneustidae, Synbranchidae, Chaudhuridae and Cichlidae are represented by single species.

The Cyprinidae is a very large and most dominant group of freshwater fishes. In Meghalaya, this family is represented by 66 species Sen and Khyrnriam (2014) of which 17 species were recorded in the present study viz., 3 species of *Garra* (*G. annandalei*, *G. gotyla*, *G. lamta*), 2 species each of *Labeo* (*L. bata*, *L. calbasu*), *Neolissochilus* (*N. hexagonolepis*, *N.*

hexastichus), *Tor* (*T. putitora*, *T. tor*), *Puntius* (*P. chola*, *P. sophore*) and 1 species each of *Barilius* (*B. bendelisis*), *Cyprinus* (*C. carpio*), *Danio* (*D. rerio*), *Devario* (*D. aequipinnatus*), *Esomus* (*E. danricus*) and *Pethia* (*P. shalynius*). *Pethia shalynius* was placed in genus *Puntius* before it was segregated into a distinct genus *Pethia* by Pethiyagoda *et. al.* (2012).

The Nemacheilines are semi-torrential forms and prefer moderate to swift flowing streams and rivers with rocky bottom in the foothills and mountainous habitats. Sen and Khyrnriam (2014) listed 18 species of Nemacheilidae in Meghalaya of which 4 species belonging to genus *Schistura* (*S. devdevi*, *S. multifasciata*, *S. reticulofasciata* and *S. sijuensis*) were recorded in the present study. *S. devdevi* (*Nemachilus devdevi* Hora, 1935) and *S. multifasciata* (*Nemacheilus multifasciatus* Day, 1878) were described from the Eastern Himalayas and placed under the single genus *Schistura* by Banarescu and Nalbant (1995). *S. reticulofasciata* (*Mesonoemacheilus reticulofasciatus* Singh *et. al.*, 1981) was described from Barapani near Shillong (Brahmaputra basin) and placed under *Schistura* by Kottelat *et. al.* (2007). *S. sijuensis* (*Noemacheilus sijuensis* Menon, 1987) was described from siju cave in Garo hills of Meghalaya. However, according to Kottelat *et. al.* (2007) *S. sijuensis* is morphologically indistinguishable from the epigeal populations. Khyrnriam and Sen (2014) recorded the species from west Khasi hills district of Meghalaya.

In Meghalaya, as listed in Sen and Khyrnriam (2014), the Cobitidae are represented by 5 species under the genus *Lepidocephalichthys* (*L. annandalei*, *L. berdmorei*, *L. goalparensis*, *L. guntea* and *L. irrorata*) of which 2 species *L. guntea* and *L. berdmorei* were recorded in the present study and also known to occur in the Brahmaputra drainage Sen (1995; 1999). The Erethistidae under the genus *Pseudolaguvia* are represented by *P. ribeiroi* and *P. shawi* and the Olyridae are represented by *Olyra horae* and *Olyra longicaudata*. The representative species of both families were recorded in present study. The Sisoridae under the genus *Glyptothorax* are

represented by *G. cavia*, *G. conirostris*, *G. striatus* and *G. telchitta*. In the present study *G. striatus* and one *Glyptothorax* sp. (PLATE-3) were recorded. The Badidae is so far represented by *Badis badis*. Khyntiam and Sen (2011) described *Badis triocellus* (considered as junior synonym of *Badis singenensis*) from Subansiri River in Arunachal Pradesh and include few paratypes from Meghalaya. Sen and Khyntiam (2013) recorded *Badis assamensis* from Garo hills of Meghalaya. Britz and Kullander (2013) described *Dario kajal*, a new species of badid fish from Jaintia hills of Meghalaya. In the present study *B. badis* and *B. assamensis* were recorded.

The other species included in the present study are *Anguilla bengalensis*, *Clarias magur*, *Heteropneustes fossilis*, *Monopterus cuchia*, *Pillaia indica* and *Oreochromis mossambicus*. These were reported from different regions of Meghalaya as well Sen (1995; 2003).

The Channidae are represented by 6 species in Meghalaya viz., *Channa barca*, *C. gachua*, *C. marulius*, *C. punctata*, *C. stewartii* and *C. striata*. Sen (1985; 1995) also recorded *C. orientalis* from the Brahmaputra drainages. However, Vishwanath and Geetakumari (2009) is of the view that *C. orientalis* is endemic to Sri Lanka and records of the species from the Brahmaputra drainage refer to *C. gachua*. Three species: *C. gachua*, *C. punctata* and *C. stewartii* were recorded in the present study.

Meghalaya exhibits twin drainage system, the Brahmaputra in the north and Barak in the south. The western boundary of Nongkhylllem wildlife sanctuary is drained by the Umtrew River which flows down to Assam plains and merges with the mighty Brahmaputra. As per the IUCN Red list version 2015.2, the present investigation revealed 4 endangered species (*Tor putitora*, *Schistura sijuensis*, *Clarias magur* and *Pillaia indica*), 3 vulnerable species (*Pethia shalynius*, *Cyprinus carpio*, and *Schistura reticulofasciata*,) and 6 Near Threatened species (*Tor tor*, *Neolissochilus hexastichus*, *Neolissochilus hexagonolepis*, *Schistura devdevi*, *Glyptothorax striatus* and *Oreochromis mossambicus*). *Cyprinus carpio* and

Oreochromis mossambicus are introduced species. *Cyprinus carpio* is the third most frequently introduced species in the world and is also a popular angling and ornamental fish. *Oreochromis mossambicus* has spread worldwide through introductions for aquaculture. The population of these species got established in the wild through intentional release or escapes from fish farms. These introduced fish species are known to compete with and have negative impact on the indigenous fish species.

Nongkhylllem wildlife sanctuary is pristine and an ideal habitat for wildlife conservation. Though the Meghalaya wildlife division is sincere in protecting the area, the species inside the sanctuary are subjected to anthropogenic interference as there are many settlements surrounding the protected area. Man-animal conflict and illegal hunting cases are frequent during the recent past. Besides stringent laws, community participation and awareness on endangered species are essential for better and effective conservation. Establishment of Biodiversity Management Committee (BMC) under the Meghalaya Biological Diversity Rules, 2010 would be more relevant to deal with conservation of species at the grassroot level.

SUMMARY

The study on Ichthyofauna of Nongkhylllem wildlife sanctuary and its adjacent areas in Ri-Bhoi district of Meghalaya was initiated in April, 2012 and completed in March, 2015. The objective of the study is to inventorise and document the ichthyofaunal diversity of the area. A total of 8 quarterly surveys of 5 days duration each were conducted in between 2012 and 2014. The fish specimens were sampled from different aquatic habitats inside the sanctuary and its adjacent areas including rivers, streams, lakes, ponds and paddy fields. The fish specimens caught by local fishermen and photographs taken by wildlife officials at Lailad Beat were also used for the study. Altogether 1428 specimens of fishes were collected and identified into 39 species belonging to 25 genera, 14 families and 5 orders out of which 4 species are endangered.

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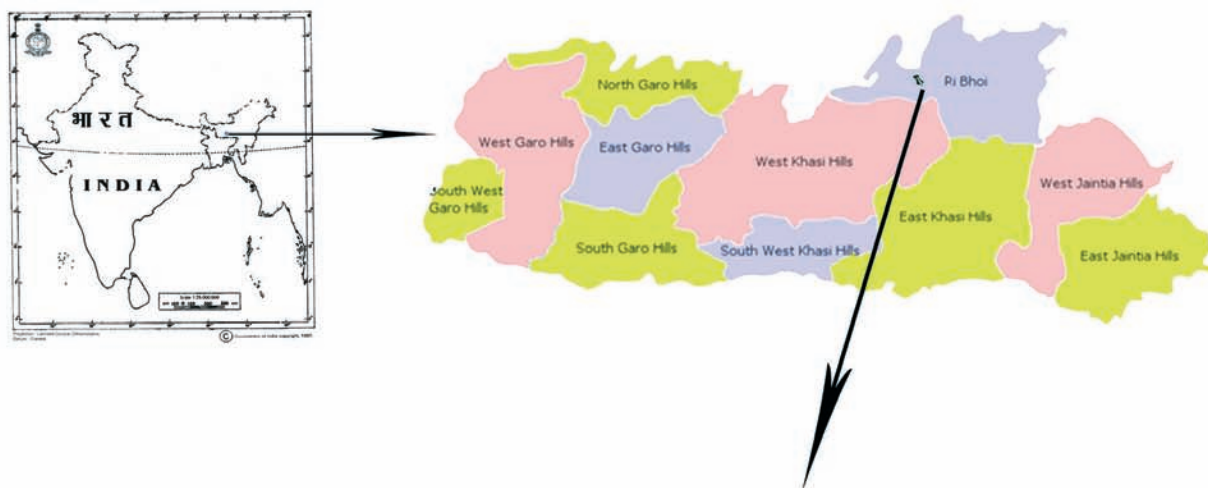
The field assistance rendered by Mr. S. Swell, Collection Tender, Mr. M. Soonar, Laboratory attendant and Mr. G. Japang, motor River of North Eastern Regional Centre, Shillong are thankfully acknowledged.

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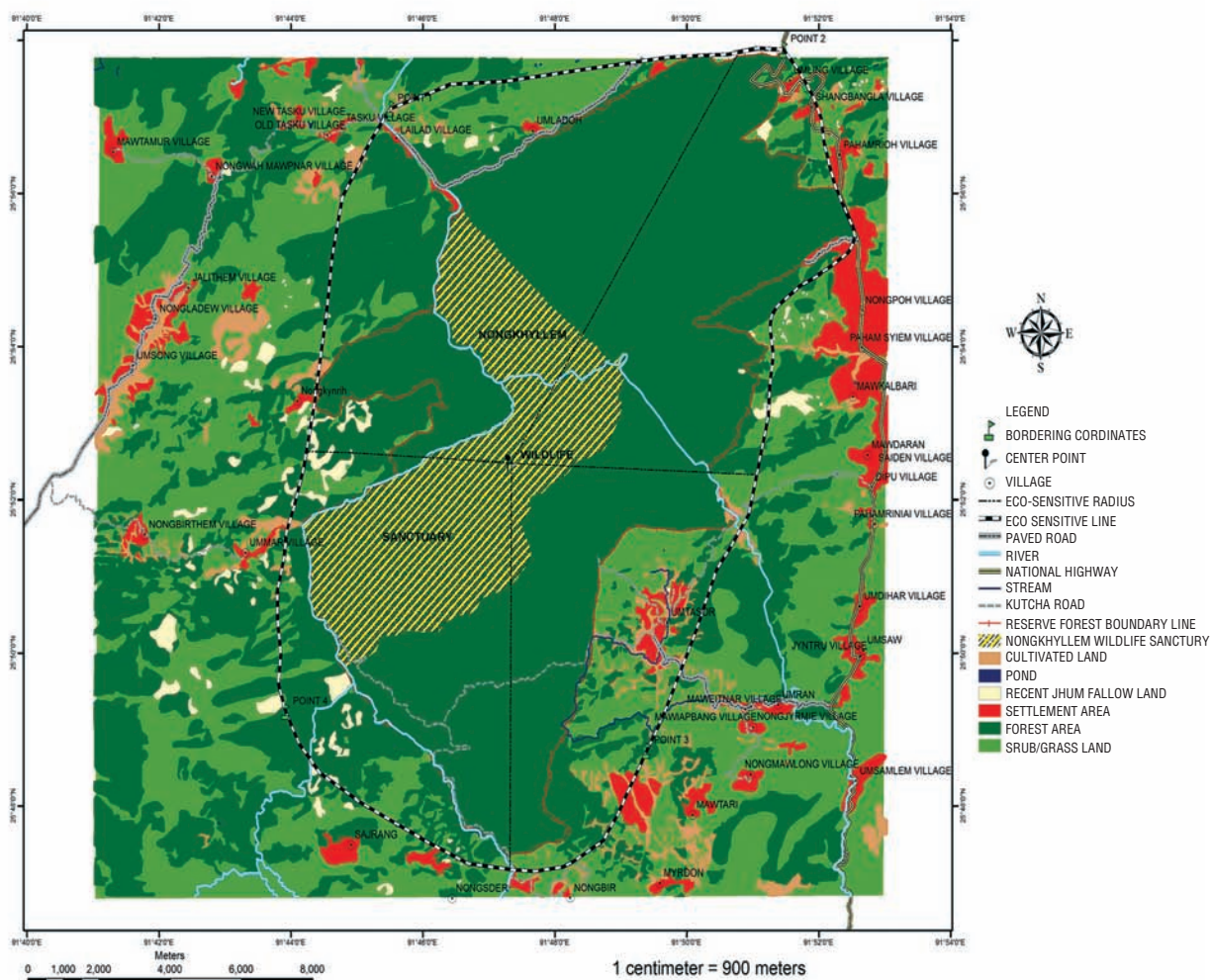
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FIGURE-I



NONGKHYLLEM WILDLIFE SANCTUARY



Nongkhylllem Wildlife Sanctuary location map

FIGURE-II



Umdu Stream



Birbah lake



Umling River



Umtrew River



Umongpha stream



Ummar River



Umran River



Umtasor stream



Umsaw River



Umsong River

Collection sites

FIGURE-III



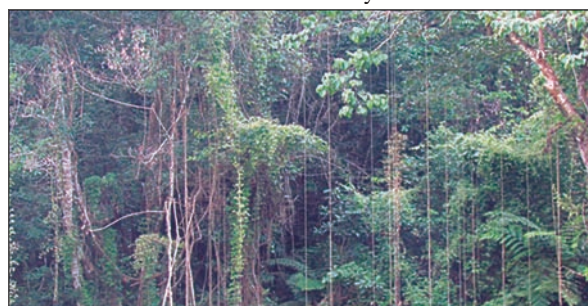
Hills in Nongkhyllem wildlife sanctuary



Entrance into the sanctuary from Lailad



Semi-Evergreen Forest



A mixed vegetation



A grassland area



A salt lick of wild animals



Patrolling path



A Patrolling bridge over the river Umran



Patrolling camp



Portion of an extension area of the Sanctuary

Inside the Nongkhyllem Wildlife Sanctuary

FIGURE-IV



Settlement



Burning of hills for Jhumming



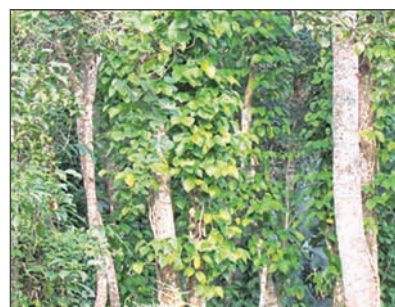
Jhum cultivation on hills



Preparation of Rice fields



Betle nut plantation



Betle leaf plantation



Plantain cultivation



Orchard



Broomstick plantation



Rubber plantation



Extraction of River sand



Fishing

Land use and activity around the Sanctuary

PLATE-1



Anguilla bengalensis



Garra lamta



Barilius bendelisis



Labeo calbasu



Cyprinus carpio



Labeo bata



Danio rerio



Neolissochilus hexagonolepis



Devario aequipinnatus



Neolissochilus hexastichus

PLATE-2

*Esomus danricus**Tor putitora**Garra annandalei**Tor tor**Garra gotyla**Pethia shalynius**Puntius chola**Lepidocephalichthys guntea**Puntius sophore**Pseudolaguvia ribeiroi*

PLATE-3



Schistura devdevi



Pseudolaguvia shawi



Schistura sijuensis



Glyptothorax striatus



Schistura reticulofasciata



Glyptothorax sp.



Schistura multifasciatus



Clarias magur



Lepidocephalichthys berdmorei



Heteropneustes fossilis

PLATE-4

*Olyra horae**Badis badis**Olyra longicaudata**Oreochromis mossambicus**Monopterus cuchia**Channa gachua**Pillaia indica**Channa punctata**Badis assamensis**Channa stewartii*