

Findings of New Recorded and Indigenous Fish Species from Kachin State Together with One New Informed Species of Traditional Medicine

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Abstract

Of the 30 collected species, six new recorded species to Myanmar and three new recorded species to Kachin State were discovered. One new information was also recorded. Six new recorded species to Myanmar are *Acantopsis dialuzona* Van Hasselt, 1823, *Gatta sexualis* Tilak, 1970, *Glyptothorax conirostre poonaensis* (Day, 1877), *Glyptothorax indicus* (Fowler, 1934), *Colisa lalia* (Schneider, 1801) and *Macrognaathus guentheri* (Day, 1865). Three new recorded species to Kachin State are *Garra graveleyi* Annandale, 1919, *Garra imberbis* (Vinciguerra, 1980) and *Colisa labiosus* (Day, 1876), reported for the first time from Kachin State. One new information is that *Garra nasuta* (McClelland, 1839) is used as one of the traditional medicine in the Kachin State for curing Cerebral palsy in children. The distribution of the species *Indostomous paradoxus* Prashad and Mukerji, 1929 and *Doryichthys dunckeri* Prashad and Mukerji, 1929 are restricted to Kachin State. Indigenous species include *Indostomous paradoxus* Prashad and Mukerji, 1929, *Doryichthys dunckeri* Prashad and Mukerji, 1929 and the above six new recorded species to Myanmar. The water quality (temperature and pH) in the surveyed habitats are tabulated. The locations of the habitats are also recorded aided by GPS.

Key words: Fishes, New recorded and Indigenous species from Kachin State, Taxonomic keys and characters.

Introduction

Kachin State is situated in the northernmost part of Myanmar, bordering India and China, between latitudes 23 ° 27' – 28 ° 25' to the north and longitude 96 ° and 98 ° 44' to the east. The State covers an area of 34,379 square miles (8,904,161 hectares).

Watershed area and the major river system originate from the Kachin State, the source of famous Ayeyarwady River lies in the mountain ranges of Kachin State, which is well noted for its rich biodiversity and natural resources.

Some parts of Ayeyarwady River are rocky and sandy with rapid water flow as the river originates from the mountainous parts of Kachin State. Some fish species inhabiting parts of the river possess modified features to adapt themselves to the environment. Modifications may be in the fins, mouthparts and some parts of body. The modified mouthparts may probably be used for attachment, capturing prey or burrowing sand or mud

The fish species with modified parts of Kachin State are rare and unique species. Some species may thus be missed out in the lists of recorded fish species by previous ichthyologists.

The rare species are marketed only in certain part of the year. It was informed by the anglers that some of the fish species with modifications are rarely caught by smallest sized dredging nets. Rare fish species highly favoured by the consumers could lead to extinction of the species.

Materials and Methods

Study period

Study period lasted from June 2003 to November 2006.

Study sites

Surveyed study sites along Ayeyarwady River included Myitkyina, Waing maw and Myitson area. Nant Myin hka chaung in Waing maw Township, Nang gway chaung in Maw Phaung village of Myitkyina Township were also surveyed. Other surveyed areas included Mon Lai hka chaung of Laisa, Namti chaung of Mogaung Township, Nant Yin chaung of Hopin Township, Indawgyi Lake of Mohnhyin Township, rocky streams of Seng tong and Shadusut chaung of Hpakant Township, Tanai hka chaung and Tanwng hka chaung of Tanai Township. Some specimens were purchased from the markets in the surveyed areas.

Identification and classification of the studied fish species

Colour patterns, spots, blotches, and distinctive morphological characters (especially modified characters) of studied fish species were carefully noted and recorded soon after catch aided by scaled photographs.

The essential measurements of studied fish species, fin and scale counts were taken from fresh specimens. The specimens were then labeled, and preserved in 10 percent formalin with a few drops of glycerin for later studies.

Identification and classification were made according to Day (1967), Jayaram (1981), Talwar and Jigra (1991) and Rainboth (1996). Vernacular names mentioned for the species were obtained from verbal communication with the locals from the study sites.

Data analysis

Morphological characters and measurements were taken from 10 specimens except for rare species for identification and classification. Modified parts of each species were respectively measured and recorded.

Recording of water quality

Temperature and pH of water from the study sites were measured by waterproof pH and temperature meter (Hannainst Co. Ltd., USA).

Recording of Global positioning system (GPS)

Latitude and longitude of the study sites were recorded by GPS (GPS 12, Garmin olthane, KS, USA)

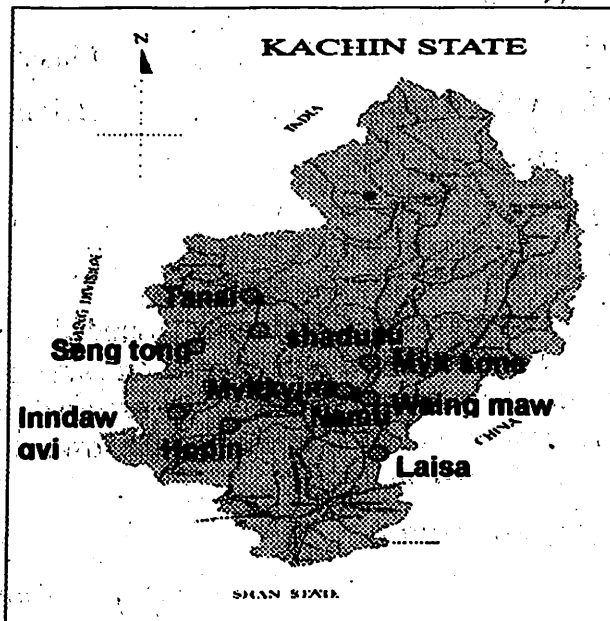


Figure 1 Map of Kachin State (Source: Survey Department, Kachin State)

Results

Taxonomic Keys of the recorded fish species

Key to the orders of Teleostomi

- | | |
|---|------------------------------|
| 1. Body elongated | 2 |
| Body not elongated, fusiform | 3 |
| 2. Body with a dermal segmental skeleton of bony | |
| scutes and forming rings round the body | |
| Gasterosteiformes | |
| Body without bony scales and rings round the body,
but covered with scales. | 5 |
| 3. Skin without scales, either smooth or covered with | |
| osseous plates | Siluriformes |
| Skin with small to large scales. | 4 |
| 4. Two dorsal fins, first spinous | |
| A single dorsal fin present | Perciformes
Cypriniformes |
| 5. Dorsal fin long preceded by 7 to 40 | |
| depressible spines | Mastacembeliformes |
| A single dorsal fin without spines | Beloniformes |

Order : Cypriniformes

Subfamily : Garrinae

Genus : *Garra* Hamilton, 1822

Body short, compressed. Abdomen rounded. Head slightly depressed anteriorly. Snout blunt. Mouth inferior, transverse, semicircular. A proboscis may or may not be present. A suctorial disc of semi-cartilaginous pad present on the chin, formed on the lower lip. One or two pairs of barbels (except *Garra imberbis*).

Key to species of the genus *Garra*

- | | |
|------------------------------------|-----------------------|
| 1. Barbels absent | <i>Garra imberbis</i> |
| Two pairs of barbels present | 2 |

2. Proboscis trilobed, sucking disc very large *Garra nasuta*
 Proboscis weakly developed *Garra gravelyi*
Garra gravelyi (Annandale, 1919)

Common name: Burmese garra ; Vernacular name : Nga-kyauk-kat

Fin formula : D.10, P.16, V.9, A.7

Length : Total length : 105 mm. ; Standard length : 83 mm.

Body elongate and subcylindrical. Head slightly depressed, barbels two pairs, shorter than eye diameter. Pectoral fin longer than head. Colour: golden purplish on back and sides, golden yellowish on belly; a few indistinct dark spots along base of dorsal fin. Snout somewhat pointed, a transverse groove at its tip, and weakly developed proboscis on snout, transverse lobe at tip of snout and tip of proboscis scarcely tuberculated, mouth: small, lower lip modified in to mental disc, 6 mm long and 9 mm wide used for attachment.

Distribution : Myanmar: Southern Shan State, Kachin State at present.

Collection site : Namti Chaung

Remark : New record for Kachin State.

Garra imberbis (Vinciguerra, 1890)

Common name : Kayin-hills garra; Vernacular name : Nga-kyauk-kat

Fin formula : D.12, P.14, V.9, A.7

Length : Total length : 84.6 mm. ; Standard length : 69 mm.

Body elongate and subcylindrical. Head flattened on under surface, barbels absent, colour: silvery grayish on back and sides, whitish on belly, snout: rounded and convex, its tip marked off by a transverse groove. Mouth: small, suctorial disc well-marked, small, 5.7 mm wide and 5 mm long, used for attachment.

Distribution : Myanmar ; Kayin Hills and Vietnam. Kachin State at present.

Collection site : Waing maw and Myitkyina.

Remark : New record for Kachin state.

***Garra nasuta* (McClelland, 1839)**

Common name : Khasi garra; stone sucker, Vernacular name:
Nga-kyauk-kat

Finformula : D.11, P.15, V.8, A.7

Length : Total length : 124mm. Standard length : 100mm.

Body strongly depressed. Head depressed, as broad as long, Barbels two pairs, shorter than eye diameter, colour: dark brown at upper surface and all fins, fading to dirty white on flanks and belly, snout with a prominent trilobed proboscis, lateral lobes small, tip of snout marked off by a transverse groove into a transverse lobe, mouth small, mental disc circular, well developed and very large. The disc is 13 mm long and 15 mm wide, used for hold fast organ.

Parasites : The presence of two parasites in the anal aperture is the unique characteristic of this species. These parasites cure cerebral palsy in children. This species is thus used as one of the traditional medicine in the Kachin State.

Distribution : India, Myanmar, South China and Vietnam.

Collection site : Nant-myin-hka Chaung of Waing maw Township.

Family : Cobitidae (Loaches)

Subfamily : Cobitinae

Genus : *Acantopsis* Van Hasselt, 1823

Body elongate, low and compressed. Head and snout greatly elongated. Eyes small, dorsally situated, suborbital spine entirely for anterior to eye. Mouth small and inferior, lower jaw with a fringed lip. Barbels three pairs. Nostrils approximate, anterior nostrils tubular. Scales very minute, head quite scales; lateral line complete.

***Acantopsis dialuzona* Van Hasselt, 1828**

Common name : Banana fish ; Vernacular name : Nga-khare,tan;

FAO name : Speckled horse face loach

Fin formula : D.10, P. 10, V.7, A.9

Length : Total length ; 218 mm.; Standard length : 186 mm

Body very elongate and slim. Head and snout greatly elongated. Eyes small, dorsally situated in posterior half of head. Three short pairs of barbels; colour: golden light brown with a dark brown with a row of dark round longitudinal blotches along lateral line and dark speckles above it. Mouth : small and inferior, lower jaw modified into a fringed lip and becoming disc shaped, the disc is 9 mm long and 9 mm wide. The lips and mouth cavity are densely covered with papillae, which aid the sense of taste.

Distribution : Thailand and Cambodia. In Myanmar : Kachin State at present

Collection site : Waing maw and Tanai.

Remark : New record for Myanmar and indigenous species of Kachin State.

Order : Siluriformes

Family : Sisoridae

Key to genera of the family Sisoridae

Adhesive thoracic apparatus present *Glyptothorax*

Adhesive thoracic apparatus absent *Gagata*

Genus : *Gagata* Bleeker, 1858

Body and head compressed; eyes large, dorsolateral in position; four pairs of barbels; dorsal spine strong; adipose fin short and prominent; caudal fin forked.

Gagata sexualis Tilak, 1970

Common name : Koeal gagata ; Vernacular name : Nga-kyar

Fin formula : $D_1.I/6, D_2.0, P.1/8, V.5, A.13$

Length : Total length : 105 mm.; Standard length : 80 mm.

Body small and slender. Head compressed, snout acuminate, mouth small, barbels four pairs. Dorsal spine strong, usually smooth on both edges. Colour: yellowish with a silvery shine laterally, four black vertical bands on dorsal surface extend to about lateral line, caudal fin with a dark band on each lobe. Males are thinner and narrower, and membranous prolongation from the tip of dorsal spine makes the height of

dorsal fin surpassing the length of head. First dorsal fin: Six rays with a strong short spine. In males, the long membranous prolongation from the tip of dorsal spine makes the height of dorsal fin 26 mm, length of dorsal spine is 17 mm.

Distribution : India

Collection site : Nant myin hka Chaung of Waing maw Township.

Remark : *Gagata sexualis* is new record for Myanmar and indigenous species of Kachin State.

Genus : *Glyptothorax*, Blyth, 1861

Glyptothorax inhabits foot hill rivers and mountain swift-running streams. They are benthic fish maintaining themselves attached to the bottom by means of a thoracic sucking disc, an adaptive feature.

Key to species of the genus *Glyptothorax*

Adhesive thoracic apparatus poorly developed ... *G. conirostre poonaensis*

Adhesive thoracic apparatus well developed, arrowhead shaped.. *G. indicus*

Glyptothorax conirostre poonaensis, (Day, 1877)

Vernacular name: Nga-kyauk-kat

Fin formula: $D_1.I/6, D_2.0, P.I/8, V.6, A.12$

Length : Total length : 95.6 mm. ; Standard length : 76.5 mm.

Body elongate. Head greatly depressed, longer than broad. Barbels four pairs, maxillary barbels extend posteriorly to middle of pectoral fin. Adhesive thoracic apparatus in the chest poorly developed, rather broad. Colour: dark brown above and sides, dirty white belly; fins yellowish with a black band on each. Adhesive thoracic apparatus in the chest poorly developed, rather broad, posteriorly a large smooth small circular space causes to be semicircular. The adhesive thoracic apparatus is 7 mm long and 6.6 mm wide.

Distribution : India and Hamalaya streams. In Myanmar found at present.

Collection site : Ayeyarwady river at Waing maw, Nant-myin-hka Chaung in Waingmaw.

Ramark : *Glyptothorax conirostre poonaensis* is a new recorded species to Myanmar and indigenous species of Kachin State.

Glyptothorax indicus (Fowler, 1934)

Fin formula : $D_1.I/6, D_2.0, P.I/8, V. 6, A.6$

Total length : 176 mm. ; **Standard length** : 145 mm.

Body elongate. Head moderately depressed. Mouth inferior. Barbels four pairs, maxillary pair extend posteriorly to beyond pectoral fin base. Dorsal fin spine serrated on its inner edge. Colour: silvery, brownish yellow at back and sides, belly whitish yellow; anal and caudal fins darker at bases and tips. Adhesive thoracic apparatus well developed, acuminate, Arrow head shaped, devoid of central pit. The thoracic apparatus is broader than long, 15 mm long and 16 mm wide. The apparatus is used as hold fast organ on stones in fast flowing streams.

Distribution : India and Nepal. In Myanmar at present.

Collection site : Mon lai hka Chaung at Laisa, Bhamo Township.

Remark : *Glyptothorax indicus* is new record for Myanmar and indigenous species of Kachin State.

Order : Gasterosteiformes

Key to families of the order Gasterosteiformes

Dorsal fins two, anterior consists of five short, sharp isolated spines Indostomidae

A single dorsal fin without spines Syngnathidae

Family : Indostomidae

Indostomus paradoxus Prashad and Mukerji, 1929

Common name : Indostomid; Pipe fish. **Vernacular name** : Mi-chaung-thwa-gyar-doh; Ye-na-yar ; **FAO name** : Armoured stickle back

Fin formula: $D_1.5, D_2.6, P.23, V.4, A.6$

Total length: 29 mm.; **Standard length** : 26 mm.

Body elongate, tubular, part of body from posterior end of dorsal fin to base of caudal considerable narrow. Head and snout moderately

compressed, head mobile. Eyes large, prominent, in the anterior half of head, visible from below ventral surface. Barbels absent. Caudal fin fan-shaped. Body enveloped by calcareous scutes, forming distinct rings round the body. Lateral line absent. Colour of body dark to dusky brown, dorsal isolated spines dusky, both dorsal fins transversely banded with black and white; pectoral and caudal fins with a central dusky band; pelvic fins blackish at bases. Mouth small, terminal, lips thin, jaws produced, beak-like, lower jaw longer, upper jaw not protrusible, both jaws without teeth. Beak is 1.5 mm long. Dorsal fins two, first dorsal fin consists of five isolated, slender, sharp spines, not connected by any membrane; second dorsal fin higher than body with six soft rays, the last branch distally.

Distribution : Upper Myanmar, Indawgyi Lake.

Collection site: Indawgyi Lake, Nang-gway Chaung.

Remark : *Indostomus paradoxus* is an indigenous species of Kachin State.

Family: Syngnathidae (Pipe fishes)

Genus: *Doryichthys* Kaup, 1853

Doryichthys dunckeri (Prashad and Mukerji, 1929)

Vernacular name : Ye-na-gar ; FAO name ; long-snouted pipefish

Fin formula : D.32, A.2-3, C.9

Total length : 97mm.; Standard length : 93mm.

Body elongated, abdomen rounded, trunk region heptagonal, tail tetragonal. Eyes prominent, in middle of head. Dorsal fin inserted opposite vent. Males with egg pouch on abdomen. Ridges of body wall developed. Superior trunk and tail ridges discontinuous, inferior trunk and tail ridges continuous. Mouth narrow, terminal, lips thin, jaws produced in the form of a tube-like beak, jaws and palate without teeth. The beak is 7mm long.

Distribution : Myanmar: Namkwag, Karmaing, Myitkyina district, Nang gway Chaung Mawphoung village, Myitkyina Township

Collection site : Nang gway Chaung

Remark : *D. dunckeri* is an indigenous species of Kachin State

Order : Perciformes

Suborder : Anabantoidei
 Family : Belontiidae
 Subfamily : Trichogasterinae
 Genus : *Colisa* Cuvier, 1831

Key to species of the genus *Colisa*.

1. Body oblong, rim of eye orange red, a blue dorso-lateral horizontal stripe from eye to caudal fin present *C. labiosus*
 Body egg shaped, rim of eye yellowish white, a blue dorso-lateral horizontal stripe from eye to caudal fin absent *C. lalia*
Colisa lalia (Hamilton and Buchanan, 1822)

Common name : Dwarf gourami ; Vernacular name : Nga-phyin-tha-lett

Fin formula : D.XV-XVII / 7-10, P.10, V.1.

Length : Total length : 63.7 mm; Standard length : 50.6 mm.

Body egg shaped and deeply compressed. Colour: body scarlet, crossed by somewhat oblique bands of pale blue; fins with scarlet spots or bars and fin with red margin. Scales large, 27 to 28 scales in longitudinal series, anal fin densely scaled; scales cover to tips of posterior spines. Pelvic fin : modified to the form of single elongate, filliform ray. The length of the ray is of 30 mm, used for sensation.

Distribution : Pakistan, India, Bangladesh. In Myanmar at present.

Collection site : Hopin

Remark : *Colisa lalia* is a new recorded fish species for Myanmar and indigenous species of Kachin State, found in only Hopin.

Order : Mastacembeliformes

Macrogathus guentheri (Day, 1865)

Common name : Malabar spiny eel; Vernacular name : Nga-mwyay-doh

Fin formula : D.XXVI / 62, P.20, A.II / 65, C.13

Total length : 180 mm. ; Standard length : 169 mm.

Body eel-like and slightly compressed. Rostrum rounded in cross section. Snout very long. Colour: olive or greenish brown, dull yellow below, a few black bands radiate from eye and cross below jaws; a light band runs along upper edge of internal line; a light band runs along upper edge of internal line; short oblique bars or marbelling on body and vertical fins. Dorsal fin: anterior part of dorsal fin modified into detached depressible spines for defense to disagreeable habit. Snout: elongated, concave fleshy and supported by a cartilaginous rod and ending in a sensitive tip, flanked by the tubular anterior nostrils which are thus remote from the posterior. Elongated snout is used for sensation.

Distribution : India. Myanmar (at present)

Collection site: Nant-yin Chaung, Hopin.

Remark : *M. guentheri* is new record for Myanmar and indigenous species of Kachin State.



Fig.2. *Garra gravelyi* (Annandale, 1919)



Fig.3. *Garra imberbis* (Vinciguerra, 1890)

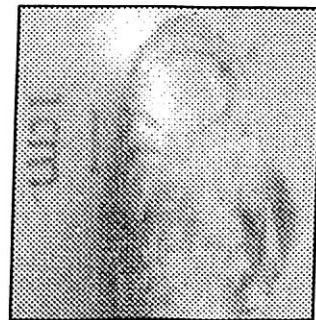
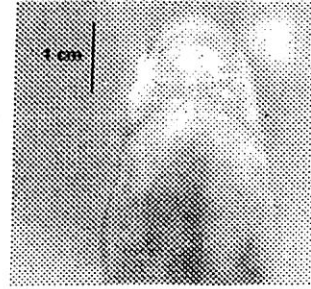
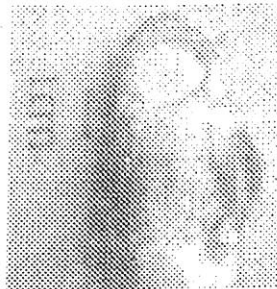
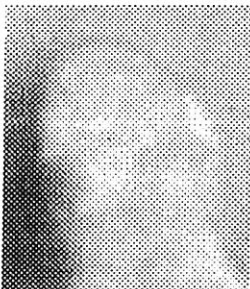


Fig. 4. *Garra nasuta* (McClelland, 1839)



Garra imberbis

Garra nasuta

Garra gravelyi

Fig. 5. Suctorial discs of *Garra* spp.

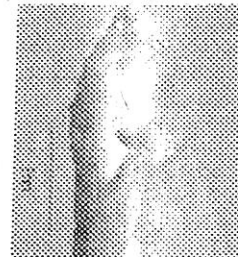
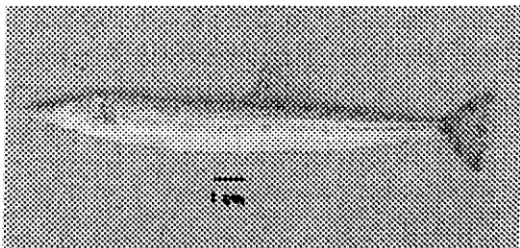


Fig. 6. *Acanthopsis dialuzona* van Hasselt, 1828

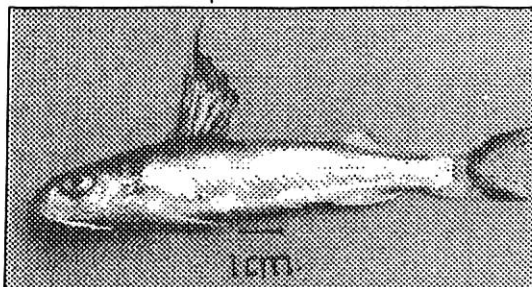


Fig. 7. *Gagata sexualis* Tilak, 1970

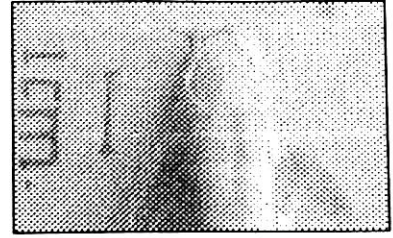
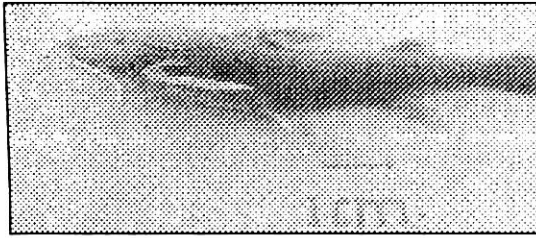


Fig. 8. *Glyptothorax conirostre poonaensis* (Day, 1877)

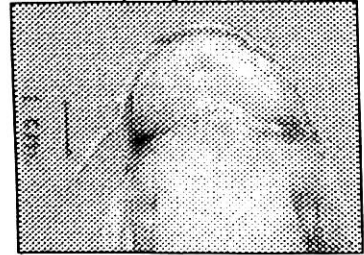
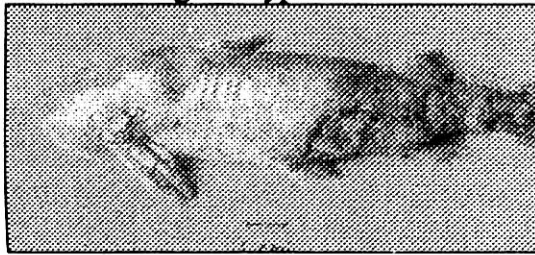


Fig. 9. *Glyptothorax indicus* (Fowler, 1934)

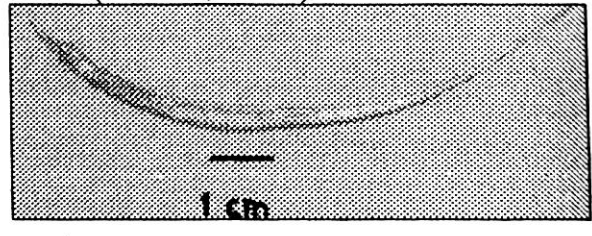
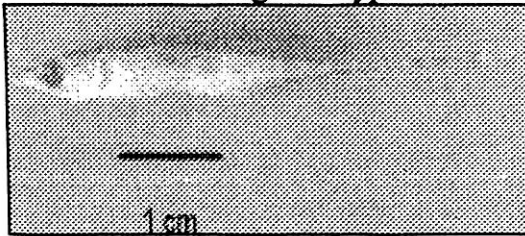


Fig. 10. *Indostomus paradoxus*

Fig. 11. *Doryichthys dunckeri*

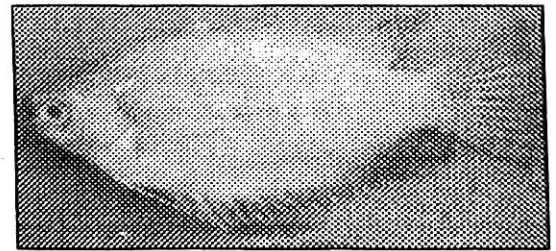
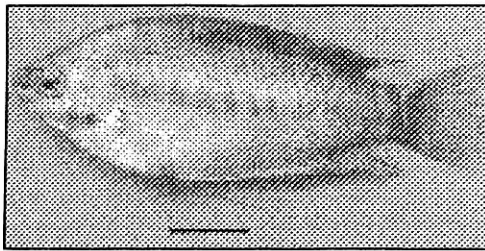


Fig. 12. *Colisa labiosus*

Fig. 13. *Colisa lalia*

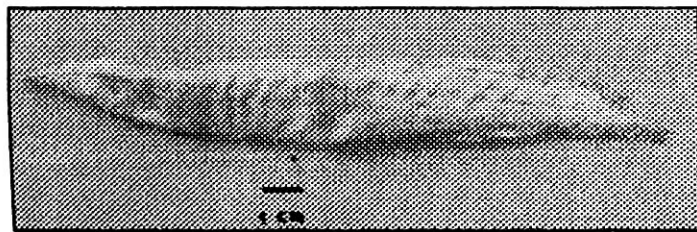


Fig. 14. *Macrornathus guentheri*

Table 1. Water quality and location of study sites

Sr. No.	Study sites	Water Quality		GPS	
		Temperature C	pH	Latitude N	Longitude S
1	Ayeyarwady River (Myitkyina)	22.5	8.1	25° 21' 0.74"	97° 25' 50"
2	Nang gway chaung (Myitkyina)	22.5	8.2	25° 20' 30.2"	97° 1' 06"
3	Ayeyarwady River (Waing maw)	26	8.3	25° 21' 0.7"	97° 25' 50.2"
4	Nant myin hka chaung (Waing maw)	21.1	8.6	25° 21' 45.5"	97° 25' 56.3"
5	Monlai hka chaung (Bhamo)	24.1	9.2	25° 31' 00"	98° 01' 00"
6	Nant yin chaung (Hopin)	26.4	8.3	25° 22' 53.3"	97° 00' 33.5"
7	Indawgyi Lake (Mohnhyin)	21.3	8.3	25° 10' 01"	96° 24' 00"
8	Seng tong (Hpakant)	28	8.8	25° 35' 01"	96° 20' 00"
9	Shadusut chaung (Hpakant)	24.7	8.7	25° 55' 36.3"	97° 39' 35.7"
10	Tanai hka chaung (Tanai)	21.7	8.2	26° 21' 49.5"	96° 42' 52"
11	Tanwng hka chaung (Tanai)	22.3	8.3	25° 55' 02"	96° 20' 02"
12	Myitsone (Myitkyina)	20	8.4	25° 40' 01"	97° 30' 01"

Discussion

Of the 30 species recorded, the species *Garra nasuta*, *Garra imberbis* (family Cyprinidae), *Gagata sexualis*, *Glyptothorax cavia*, *Glyptothorax indicus* (family Sisoridae), *Indostomus paradoxus* (family Indostomidae), *Colisa lalia* (family Belontiidae) and *Macrognathus guentheri* (family Mastacembelidae) were recorded to be rare species as

these species are marketed only once a month during the rainy season. In addition, only a single specimen was available among the fish marketed.

Among the rare species, *Gagata sexualis*, *Glyptothorax indicus*, *Colisa lalia* and *Macrornathus guentheri* are new records to Myanmar.

The rarity of the species could be one of the reasons why these species were missed by previous ichthyologists. These mentioned rare species were recorded as low as one specimen from the study sites throughout the study period. The rare species are likely to go into extinction if the nature and behavior of these species are not scientifically approach to seek the causes of their rarity.

The species *Acantopsis dialuzona* and *Glyptothorax conirostre poonaensis* though abundant in the markets during the rainy season are also new records for Myanmar. The previous ichthyologists could not have missed these species in their collections if these species were distributed during their survey period. It is thus assumed that these species must have migrated to Kachin State only in the recent period.

Two species of genus *Colisa* possess a modified filamentous pelvic fin and used for sensation. The anterior dorsal fin rays of *Macrornathus guentheri* are modified into detached depressible isolated spines serving for defence and prolongation of snout for sensation.

The species *Indostomus paradoxus* and *Doryichthys dunckeri* are the indigenous species of Kachin State. The former species is a small fish is of medicinal value. This species fetch high price in Southeast Asian markets. Therefore, live specimens are usually smuggled out of the country. This could be one of the reasons for rarity of this species. If this rate goes on, this species would surely go into extinction due to exploitation by man.

Another rare species *Garra nasuta* with two parasites in the anal aperture reported to cure "Cerebral palsy " in children are also exploited by the locals to use as a traditional medicine. The rarity of this species is also related to human impact. Here again, this species would go into extinction due to misconduct of man.

Temperature of Ayeyarwady River in rainy season ranges from 23.5 °C - 28.5 °C and it is the most suitable temperature for the survival of the fingerlings and adult fish. This could be one of the factors for the abundance of fish species in rainy season. The pH range of 7.3 – 7.6 in the

waters of Ayeyarwady River in rainy season is also the best condition for fingerlings and adults. The temperature as well as pH level in the rainy season thus serve as favorable grounds for the fish species.

In overall conclusion, this study highlighted the new records of Myanmar, indigenous species and awareness of conservation. It is thus believed that the information given in this study is of value to the country.

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