

Some Stone Suckers (*Garra* species) from Kachin State

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Abstract

The fish specimens for this study were obtained from various habitats of Kachin State. Some were purchased from anglers and various markets of Kachin State within the study period from June 2003 to July 2007. The morphological characters together with their modifications were recorded soon after catch. Detail studies were made after preserving the specimens in 10 percent formalin. Identification and classification of the species are followed after Jayaram (1981), Talwar and Jingran (1991) and Rainboth (1996). Taxonomic keys from orders down to species level, together with descriptive accounts of recorded fish species are given supported by scaled photographs with emphasis on respective modifications. Of the 30 collected species, five species of genus *Garra* were obtained from these, *Garra graveleyi* Annandale, 1919 and *G. imberbis* (Vinciguerra, 1980) are new records to Kachin State. The water quality (temperature and pH) in the surveyed habitats are tabulated. The locations of the habitats were also recorded with the aid of GPS (Global Positioning System).

Key words: Fishes, five species of genus *Garra*, Taxonomic characters and suckers

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 sq. 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 part 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. Some species may thus be missed out in the lists of recorded fish species by previous ichthyologists. Rare fish species highly favoured by the consumers could lead to extinction.

Materials and Methods

Study period

Study period lasted from June 2003 to July 2007.

Study sites

Surveyed study sites along Ayeyarwady River included Myitkyina, Waing maw and Myitsona 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 obtained from both anglers and 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 using waterproof pH and temperature meter (Hanna instruments, produced by Hannainst Company, 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

Systematic Position and Taxonomy of Recorded Fish Species

(After Jayaram (1981), Talwar and Jingran (1991) and Rainboth (1996))

Systematic position

- | | | |
|----------|---|------------|
| Class | - | Pisces |
| Subclass | - | Teleostomi |

Order	-	Cypriniformes
Family	-	Cyprinidae
Subfamily	-	Garrinae
Genus	-	<i>Garra</i> Hamilton, 1822
Species	-	<i>Garra gotyla gotyla</i> (Gray, 1832)
		<i>Garra gravelyi</i> Annandale, 1919
		<i>Garra imberbis</i> (Vinciguerra, 1980)
		<i>Garra lamta</i> (Hamilton and Buchanan, 1822)
		<i>Garra nasuta</i> (McClelland, 1839)

Body of fishes from genus *Garra* is short and compressed. Abdomen rounded. Head and body depressed anteriorly. Snout blunt, much diversified, smooth or with pores, with or without a deep groove-like depression. Mouth inferior, transverse, semicircular. 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*). Scales moderate.

The fishes of the genus *Garra* are adapted to life in swift flowing mountain streams by means of a sucking disc that enables the fish to hold fast in a strong current. Their food is mainly algae on stones.

Sucking discs of *Garra* species are variable. Sucking disc of *Garra nasuta* is very large though others are moderate. Five species of the genus *Garra* were recorded in this study.

Key to species of the genus *Garra*

1. Barbels absent *G. imberbis*
- Two pairs of barbels present 2.
2. Proboscis absent *G. lamta*
- Proboscis present 3
3. Proboscis trilobed, sucking disc very large *G. nasuta*
- Proboscis a single median projection, without

- lateral lobes on snout, sucking disc moderate4
4. Proboscis weakly developed, without lateral
tubercular area*G. gravelyi*
- Proboscis well developed, with well defined
lateral tubercular area*G. gotyla gotyla*

Garra gotyla gotyla (Gray, 1832)

Common name : Gotyla; Vernacular name : Nga-kyauk-kat

- Fin formula - D.10, P.15, v.9, A.7
- Length - Total length 99 mm
Standard length 80 mm

Body elongate, its depth 3.9 times in standard length. Head much depressed. Barbels two pairs, shorter than eye diameter. Dorsal fin inserted nearer tip of snout than to caudal fin base. Pectoral fin considerably shorter than head length. Colour: golden brownish on back, a purplish band at sides and whitish on belly, head dark purplish blue. A row of dark spots along base of dorsal fin. Snout with a well-developed median proboscis and a transverse lobe at tip; transverse lobe and lateral sides of head in front of nostrils covered with several large spiny tubercles. Mouth arched. Lower lip modified into a suction disc on chins, mental disc well developed, 10 mm, long and 7 mm wide, used for attaching stones.

Collection site - Namti Chaung

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, its depth 3.9 times in standard length. Head slightly depressed. Barbels two pairs, shorter than eye diameter. Pectoral fin longer than head. Colour: golden purplish brown 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 into mental disc, 6 mm large and 9 mm wide, used for attachment

Geographical Distribution- Burma(Myanmar): Southern Shan States

(Talwar and Jingran, 1991)

Remark - New record for Kachin State

Collection site - Namti Chaung

Garra imberbis (Vinciguerra, 1890)

Common name : Karin-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 undersurface. Barbel absent. Colour: silvery grayish on back and sides, whitish on belly. Snout -Rounded and convex, a transverse groove at its tip of snout marked off by a transverse groove into a transverse lobe. Mouth - Small, suctorial disc well-marked, small, 5.7 mm wide and 5 mm long, used for attachment.

Geographical Distribution- Burma(Myanmar): Karin Hills; and Vietnam

(Talwar and Jingran, 1991)

Remark - New record for Kachin State

Collection site - Waing maw, and Myitkyina

Garra Lamta (Hamilton and Buchanan, 1822)

Common name:Lamta garra;Vernacular name:Kyauk-nga-lu,Nga-kyauk-kat

Fin formula - D.11, P.13, V.9, A.7

Length - Total length 111 mm

Standard length 84.4 mm

Body subcylindrical, flattened on under surface. Head short and bluntly pointed, barbels two pairs, shorter than eye diameter. Caudal fin deeply emarginated. Colour : head and back darkish brown, belly dirty white. Dorsal and caudal fins dusky; lower lobe of caudal fin with big black bar. Snout - Rounded and smooth, its tip marked off by a deep transverse groove, transverse lobe at tip and sides of snout in front of nostrils covered with horny tubercles. Proboscis absent. Mouth -Mouth wide, mental disc small but well developed, the disc is 11 mm wide and 8.5 mm long. It is used for attachment.

Collection site - Seng tong, Hpakant Township, Kachin State

Garra nasuta (McClelland, 1839)

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

Fin formula - D.11, P.15, V.8, A.7

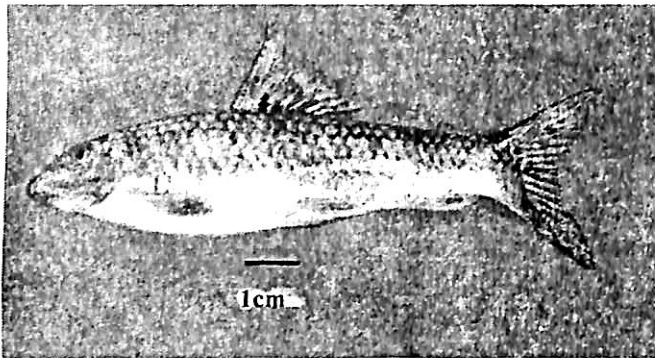
Length - Total length 124 mm
Standard length 100 mm

Body strongly depressed. Head depressed, as broad as long. Barbels two pairs, shorter than eye diameter. Caudal fin deeply emarginated. Colour: dark brown at upper surface and all fins, fading to dirty white on flanks and belly. Snout - Snout with a prominent tri lobed proboscis, the lateral lobes small, and in front of nostrils, 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.

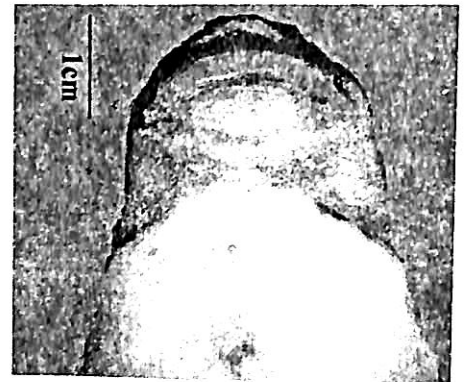
Collection site - Nant-myin-hka Chaung of Waing maw Township

Table 1. Water quality and location of study sites

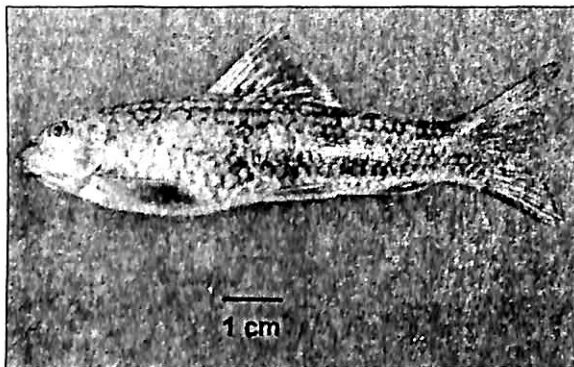
Sr. No.	Study sites	Water Quality		GPS	
		Temp. °C	pH	Latitude N	Longitude S
1	Nanti Chaung (Mogaung)	24.3	7.9	25° 22' 53.7"	97° 00' 32.8"
2	Ayeyarwady River (Waing maw)	26	8.3	25° 21' 0.7"	97° 25' 50.2"
3	Nant myin hka chaung (Waing maw)	21.1	8.6	25° 21' 45.5"	97° 25' 56.3"
4	Seng tong (Hpakant)	28	8.8	25° 35' 01"	96° 20' 00"



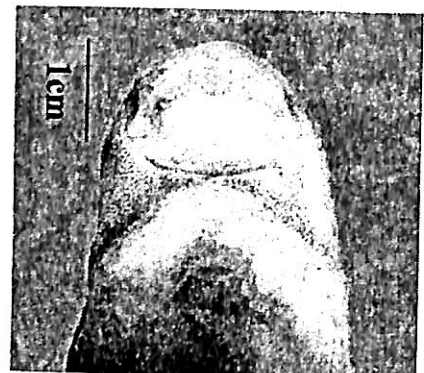
(A)



(B)

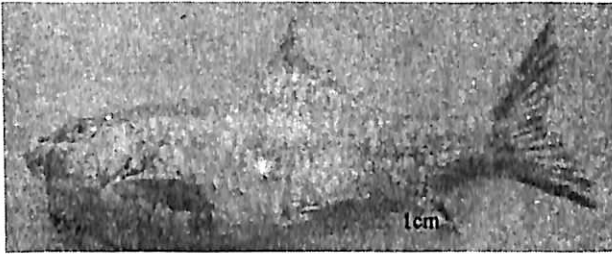
Fig.1. *Garra gotyla gotyla* (A) Lateral view; (B) Ventral view

(A)



(B)

Fig.2. *Garra gravelyi* (A) Lateral view; (B) Ventral view

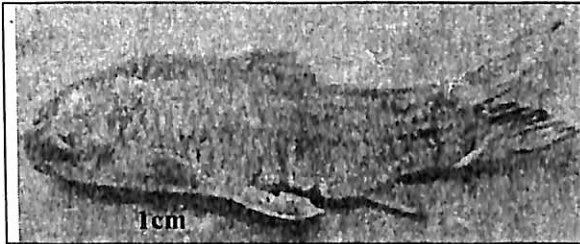


(A)

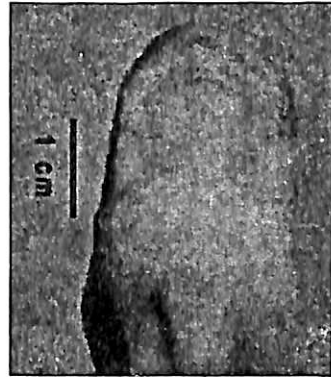


(B)

Fig.3 *Garra imberbis* (A) Lateral view; (B) Ventral view

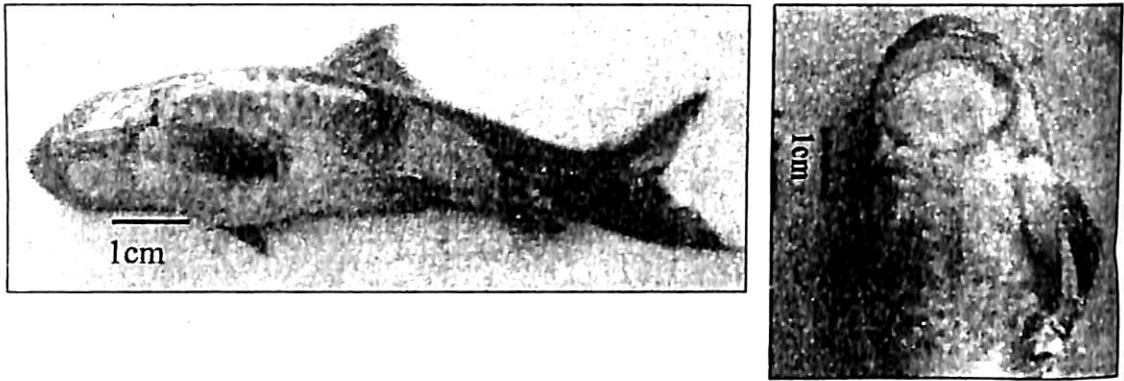


(A)



(B)

Fig.3 *Garra lamta* (A) Lateral view; (B) Ventral view



(A) (B)
 Fig.3 *Garra nasuta* (A) Lateral view; (B) Ventral view

Discussion

Of the 30 species recorded, the species *Garra gravelyi* was previously found only in Southern Shan State and *G. imberbis* was found in Karin Hills of Myanmar and Vietnam (Talwar and Jingram, 1991). Any other researchers had not recorded yet till 2007, therefore the two species, *G. gravelyi* and *G. imberbis* were new recorded species to Kachin State. *Garra* species are rare 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.

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 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.

The 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 Kachin State 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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