

## ORIGINAL RESEARCH ARTICLE

ICTHYOFAUNA OF GENUS: *Labeo Cuvier* 1816, RECORDED IN RIVER SIANG OF ARUNACHAL PRADESH, INDIA

Biplab Kumar Das\* and Devashish Kar

**Author affiliation:**

Department of Life  
Science and  
Bioinformatics,  
Assam University,  
Silchar, Assam –  
788011

**E-mail:**

[biplabkumar1987@gmail.com](mailto:biplabkumar1987@gmail.com)

© **Copyright:** 2018 |  
This is an open access  
article under the terms  
of the Bhumi  
Publishing, India

**ABSTRACT:**

*Labeo* is a genus of carps in the family Cyprinidae. Labeos are larger, and have a more spindle-shaped body, as they are mostly free-swimming. Their mouths look very different, too; they have a pronounced rostral cap, which covers the upper lip except when feeding. The lips are expanded into thick, sausage-shaped pads which have keratinized edges. Thus, their mouth parts are moderately apomorphic; not as little-developed as in barbels. Labeos have the two barbels on the rostrum which are common among the Cyprinidae, and also another pair of barbels at the rear edges of the lower maxilla, which has been lost in some of their relatives. They have a well-developed vomeropalatine organ. In the weberian apparatus, the posterior supraneural bone is elongated and contacts the skull at the forward end. There are five species of *Labeo* are recorded in River Siang of Arunachal Pradesh, these are *Labeo bata*, *Labeo calbasu*, *Labeo gonius*, *Labeo pangusia* and *Labeo rohita*.

**KEYWORDS:** *Labeo*, Cyprinidae, River Siang, Arunachal Prad

**INTRODUCTION:**

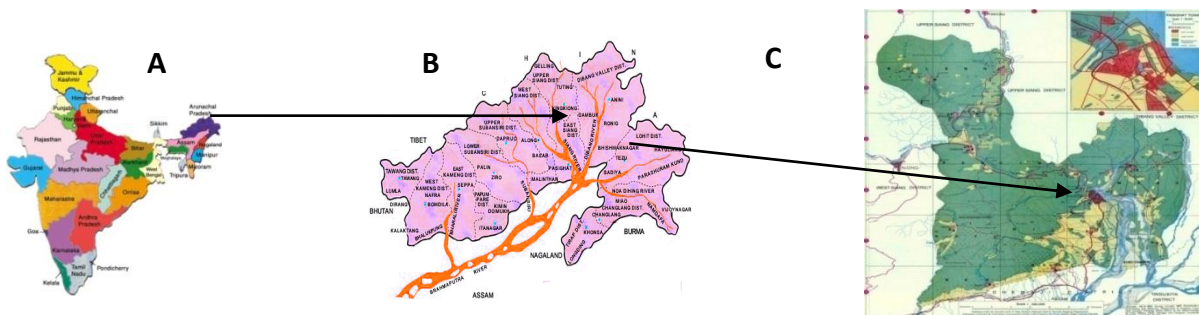
River Siang, a hill-stream of 1<sup>st</sup> order river; had colluvial valley segment and pool-riffle type of reach. Pools, riffles and runs were by and large found to command the small scale environment sort with visit event of trench pools. Waterway Siang was said to be more settled in light of V-molded valley section. The substrate sort had been observed to be ruled by rock and cobbles with much of the time happening very vast number of stones and some bed rocks. Stream Siang was the remarkable in the ichthyofaunal assorted variety. Fish examining was done with the assistance of various types of nets, for example, cast net, gill net and traps, lines and snares, and so forth. Over half of fish types of River Siang has a place with the order Cypriniformes though different fishes were spoken to by the orders viz., Siluriformes, Perciformes, Clupeiformes, Synbranchiformes,

Osteoglossiformes, Tetradontiformes and Beloniformes. In the present investigation on angle assorted variety, it was uncovered that the quantity of fishes was recorded higher in pre-rainstorm and storm seasons in all the examination years. In such manner, the present target is the quantities of various types of Labeo are accessible in River Siang of Arunachal Pradesh.

## MATERIALS AND METHODS:

### Study Site:

The River Siang, is largest river of Brahmaputra river system, originates from Chema Yungdung Glacier near Kubi at 5150 m in Tibet. In Tibet it is prevalently known as Tsang-Po, streams in West–East course. Subsequent to navigating a separation of around 1625 km waterway in Tibet and afterward it takes a hand over south bearing, enters the domain of India close Tuting in the Upper Siang region of Arunachal Pradesh and courses through North–South heading in East Siang locale towards Assam lastly it converges with Lohit and Dibang in Assam and it turns into the compelling River Brahmaputra [1], [2] (Figure 1),



**Figure 1. Map of (A) India indicating Arunachal Pradesh, (B) Arunachal Pradesh indicating to East Siang District, (C) In East Siang district highlighting River Siang (Study Area) of Arunachal Pradesh**

### Freshwater Survey:

Fish samples were collected from River Siang during January 2012 to December 2014 through experimental fishing; using cast nets (dia.3.7 m and 1.0 m), gill nets (vertical height 1.0 m-1.5 m; length 100 m -150 m), drag nets (vertical height 2.0 m), triangular scoop nets (vertical height 1.0 m) and a variety of traps and with hook and lines in certain places (where netting is not possible), River was surveyed and classified into different habitat units based on morphology [3] and finally divided in to six (6) different study sites covering upstream, mid-stream and downstream stretches of the river. General survey of the fish biodiversity was done using standard procedures [4].

**Fish Measurement:**

The morphometric study included measurement of Total length (TL), Standard length (SL), Body depth (BD) Snout length, Post orbital length, Head length (HL), Pre dorsal length, Prepelvic distance, Eye diameter (ED), length of Caudal Peduncle, and Length of caudal fin. SL was the distance from the tip of the snout to the mid base of the caudal fin and TL was the distance from the tip snout to the furthest tip of the caudal fin. BD was the greatest vertical distance across the body. The measurements were done using Vernier Calliper Scale and Digital Sartorius Electronic Balance.

**Fish Preservation and Identification:**

Fish species had been preserved, at first, in concentrated formaldehyde in the field. After that, the fishes were transferred to laboratory and preserved in 10 % formalin. The small size fishes were preserved in 5% aqueous formalin solution and big size fishes in 10% aqueous formalin solution and kept in the air-tight plastic bottles.

In the laboratory, the fishes were identified by following standard literature, notably, [5], [6], [7], [8], [9], [10], [11], [12], [13], [14], [15], [16] and [17]. All the fishes were kept in the Assam University Fish Museum (AUFM) for preservation and record. After labeling the fishes were drawn and photographed with the help of digital camera (Nikon Coolpix L-810),

**RESULTS AND DISCUSSION:**

In River Siang we had recorded *Labeo bata*, *Labeo calbasu*, *Labeo gonius*, *Labeo pangusia* and *Labeo rohita*. They are described as follows:

**Genus: *Labeo* Cuvier 1816:**

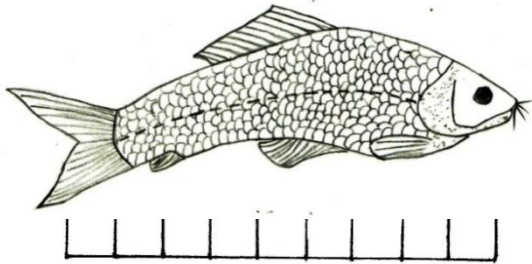
*Labeo* Cuvier, [18], *Regne Animale*, 2 (ed.1), p. 194 (type-species, *Cyprinus niloticus* Forsskal, by subsequent designation)- [19], *Occ. Papers Zool. Survey India*, (revision), *Bangana* [20], Fish Ganges, p-277, 385 (type-species, *Cyprinus dero* Hamilton-Buchanan, by subsequent designation),

**Diagnosis:**

Body moderate size, elongated, much deep with abdomen rounded. Head fairly large. Snout more or less swollen, rounded, often projecting beyond mouth, covered by a groove across and with tubercles, mostly overhanging the mouth. Eyes moderately large generally placed at the commencement of the posterior half of the head, not visible from below the ventral surface; lips thick, fleshy. Barbel two pairs, one pair maxillary and second pair was rostral. Dorsal fin inserted above anterior to origin of pelvic fins with 15 rays and without any osseous ray. Anal fin short with 7 rays. Caudal fin deeply forked. Scales moderate with numerous striae. Lateral line complete, straight or little curved, running in the center of the caudal peduncle up to the tail.

***Labeo bata* (Hamilton-Buchanan, 1822):**

Lateral line scales 40. Dorsal fins with 15 rays. 2 pairs of barbels. Pectoral fin was nearly long as head. Snout overhanging mouth. Eye diameter 4 times in head length. Lips thin, scales between lateral line to pelvic fin  $6\frac{1}{2}$  (Figure 2 and Plate 1),

Figure 2: *Labeo bata*Plate 1: *Labeo bata***Key to Species:**

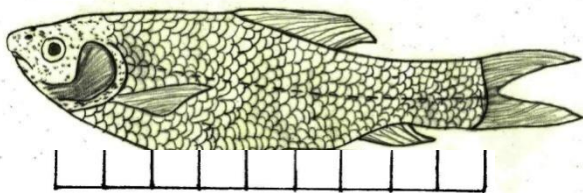
Snout length = 1.9 cm, Post orbital length = 2.8 cm, Head length = 4.9 cm, Pre-dorsal length = 8.7 cm, Pre-pelvic distance = 10.5 cm, Standard length = 19.5 cm, Total length = 23.2 cm, Eye diameter = 1.0 cm, Length of caudal peduncle = 3.5 cm, Length of caudal fin = 4.9 cm, Body depth = 5.7 cm and Weight = 143.73 g.

**Distribution:**

River Siang, Subansiri, Simen, Brahmaputra of India. Bangladesh, Nepal and Pakistan.

***Labeo calbasu* (Hamilton-Buchanan, 1822):****Key to Species:**

Lateral line with 41 scales. Dorsal fin with 15 rays. 2 pairs of barbels. Upper edge of dorsal fin concave. Pectoral fin as long as head length. Mouth distinctly inferior (Figure 3 and Plate 2),

Figure 3: *Labeo calbasu*Plate 2: *Labeo calbasu*

Snout length = 1.6 cm, Post orbital length = 2.4 cm, Head length = 4.1 cm, Pre-dorsal length = 6.4 cm, Pre-pelvic distance = 7.5 cm, Standard length = 13.7 cm, Total length = 17.1 cm, Eye diameter = 0.9 cm, Length of caudal peduncle = 2.7 cm, Length of caudal fin = 4.1 cm, Body depth = 4.2 cm and Weight = 56.21 g.

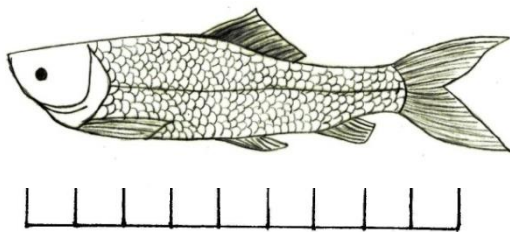
**Distribution:**

River Siang, Jia Bharali, Brahmaputra of India. Bangladesh. Myanmar. Nepal. Pakistan. Thailand.

***Labeo gonius* (Hamilton-Buchanan, 1822):**

**Key to Species:**

Lateral line with 65 scales. Dorsal fin with 15 rays. Barbels 2 pairs (Figure 4 and Plate 3),



**Figure 4: *Labeo gonius***



**Plate 3: *Labeo gonius***

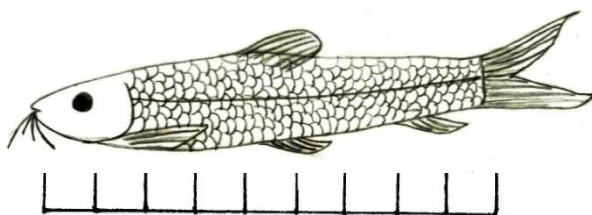
Snout length = 1.1 cm, Post orbital length = 1.8 cm, Head length = 3.3 cm, Pre-dorsal length = 5.2 cm, Pre-pelvic distance = 6.2 cm, Standard length = 11 cm, Total length = 15.3 cm, Eye diameter = 0.8 cm, Length of caudal peduncle = 1.9 cm, Length of caudal fin = 3.3 cm, Body depth = 3.2 cm and Weight = 31.77 g.

**Distribution:**

River Siang, Subansiri, Brahmaputra of India. Bangladesh, Nepal and Pakistan.

***Labeo pangusia* (Hamilton-Buchanan, 1822):**

**Key to Species:** Lateral line with 42 scales. Dorsal fin with 12 rays. Scales between lateral line and pelvic fin was 6 (Figure 5 and Plate 4),



**Figure 5: *Labeo pangusia***



**Plate 4: *Labeo pangusia***

Snout length = 0.8 cm, Post orbital length = 2.4 cm, Head length = 4.2 cm, Pre-dorsal length = 8.6 cm, Pre-pelvic distance = 8.8 cm, Standard length = 18.0 cm, Total length = 22.7 cm, Eye diameter = 0.9 cm, Length of caudal peduncle = 3.8 cm, Length of caudal fin = 4.7 cm, Body depth = 5.3 cm and Weight = 108.85 g.

**Distribution:**

River Siang, Subansiri, Brahmaputra of India. Bangladesh. Nepal. Pakistan. Thailand.

***Labeo rohita* (Hamilton-Buchanan, 1822):****Key to Species:**

Presence of 14 dorsal fin rays. Upper edge of dorsal fin concave. Presence of two pairs of barbels. Dorsal fin inserted midway between tip of snout and caudal fin base. Pectoral fins as long as head excluding snout; body oblong; mouth terminal; narrow (Figure 6 and Plate 5),

Snout length = 1.2 cm, Post orbital length = 1.9 cm, Head length = 3.5 cm, Pre-dorsal length = 5.6 cm, Pre-pelvic distance = 6.7 cm, Standard length = 11.6 cm, Total length = 12.5 cm, Eye diameter = 6.7 cm, Length of caudal peduncle = 2.1 cm, Length of caudal fin = 2.9 cm, Body depth = 3.3 cm and Weight = 54.33 g.

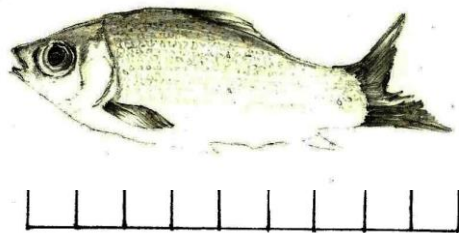


Figure 6: *Labeo rohita*



Plate 5: *Labeo rohita*

**Distribution:**

River Siang, Subansiri, Brahmaputra of India. Bangladesh. Nepal. Pakistan. Myanmar. Sri Lanka.

**ACKNOWLEDGEMENT:**

The authors are thankful to Assam University, Silchar and to the UGC, New Delhi for granting UGC-Fellowship to the First author. Most importantly, we thank the Fishermen of East Siang district of Arunachal Pradesh for their kind necessary help and co-operation for this study.

**REFERENCES:**

1. Das, B. K.; Boruah, P. and Kar, D. (2014 a), IOSR J. Enviro. Sci., 8 (2IV): 11-20.
2. Das, B. K. and Kar, D. (2015), Krishi Sanskriti Publications, New Delhi, pp. 53-56.
3. Bisson, P. A.; Nielson, J. A.; Palmason, R. A. and Grove, L. E. (1982), American Fisheries Society, Bethesda, Maryland: pp. 62-73.
4. Armontrout, N. B. (1990), Aquatic Inventory. USA, pp. 32.
5. Day, F. (1875-1878), W<sub>M</sub> Dawson and Sons Ltd. (London): pp. xx + 778.
6. Rainboth, W. J. (1996), FAO, Fishes of the Cambodian Mekong, Rome: pp. 265.
7. Sen, N. (2000), National Bureau of Fish Genetic Resources, ICAR, India: pp. 31-48.
8. Talwar, P. K. and Jhingran, A. G. (1991), Oxford and IBH Co., Pvt. Ltd. (New Delhi), India, Vol. I and II: pp. xix + 1158.
9. Jayaram, K. C. (1999), Narendra Publishing House, India : pp. xvii +551.
10. Jayaram, K. C. (2010), Narendra Publishing House, India, II<sup>nd</sup> Edn. xxxi + 616.
11. Nath, P. and Dey, S. C. (1997), Fish and Fisheries of North-East India. Arunachal Pradesh. Vol. I: pp. 140.
12. Nath, P. and Dey, S. C. (2000), National Bureau of Fish Genetic Resources, ICAR (Lucknow), India: pp. 49-67.
13. Viswanath, W. (2000), Manipur Association for Science and Society, Imphal (Manipur), India: pp.143
14. Viswanath, W. (2002), Manipur: National Agricultural Technology Project. Manipur University, India: pp. 198.
15. Kar, D. (2007), Daya Publishing House. New Delhi. India: pp. xvi + 609.
16. Kar, D. (2013), Springer Publications (London): pp. xxx + 687.
17. <http://www.fishbase.org>.
18. Cuvier, G. L. C. F. D. (1817), Le Regne animal distribu d' Apres son organization. Paris; pp. xviii + 532.
19. Jayaram, K. C. and Dhas, J. C. (1999), Rec. Zool. Surv. India. Occ. Paper 25: 35-45.
20. Hamilton-Buchanan, F. (1822), Edinburg and London: pp. viii + 405.