Indian J. Applied & Pure Bio. Vol. 36(1), 45-52 (2021). **ISSN: 0970-2091**
A web of Science Journal

Systematic Notes on *Hypselobarbus carnaticus* (Cypriniformes: Cyprinidae) Collected From Bhavani River in Attappady Reserve Forests

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Abstract

Carnatic carp is a freshwater fish distributed in the freshwater bodies of upper reaches of Bhavani and Cauvery Rivers. Eventhough it is not uncommon in its type locality; many taxonomic ambiguities still prevail in the identity of the original Carnatic Carp; confusions exists in many of its meristic counts and morphometric features. Jerdon[12] originally described this fish in so brief that an ordinary fish taxonomist cannot easily get to confirmation on its identity. Consequently, many taxonomists described this fish differently. It is an endeavour to trace out the taxonomic details of this cyprinid fish based on the fresh specimens of this fish from its type locality. It is taxonomically analysed and compared with its close congeners.

H*ypselobarbus carnaticus*, also known as the Carnatic carp, is an edible cyprinid fish found in the freshwater bodies of Western Ghats in India. It is commercially important and also cultivated in different parts of India. Jerdon[12] described *H. carnaticus* (as *Barbus carnaticus*) briefly: 'Head small, being rather more than one fifth of whole body; obtuse; body not much compressed; eye about one fourth the length, it has about 32 scales, along the sides in 8 rows, cirri of moderate length, profile of back ascending to dorsal, dark glassy olive green above, silvery beneath, fins yellowish dusky; D. 4, 8; A.7; spine stout simple.' The description is brief but somewhat distinct compared to many of his other descriptions.

Jerdon's[12] description of Carnatic Carp may be applicable to many species of fishes. Day[5] redescribed *H. carnaticus* as *Puntius (Barbodes) carnaticus* and he was not certain whether it is Jerdon's fish. Day's description was in some detail; but he wrote: Dorsal fin 'commences midway between snout and base of caudal'. Gunther[9] gave a description of this fish based on his collections received from Bhavani River and Cauvery River which had presented to him by Day and Mitchell respectively. But his description created some confusions in the identity of the fish. He wrote its lateral line scales as 25- 29 (vs. 32 of original description) and scales between lateral line and ventral fin as 2 ½ (vs. 3 ½); many features of Gunther[9] also gave emphasis to proportion of

one part of body to other, which may be common to several other fishes too. In contrast to Day's[5] description, Gunther[9] wrote: dorsal fin 'conspicuously near to the end of snout than to the root of caudal fin'. Menon[14] included this fish along with *Barbodes*. Menon[15] treated it as a threatened fish and retained it along with *Barbodes*. According to him, lateral line scale count in this fish is 38 (vs. 32 in original description). Carnatic Carp was placed in *Hypselobarbus* by Arunachalam *et al.*[4]. Many confusions still exist in the features of *Carnaticus* nevertheless it is not an uncommon fish. It is an endeavour to get clear cut taxonomic details of *Hypselobarbus carnaticus* based on its collection from Bhavani River at the base of Nilgiris Hills.

Fishes were collected using cast net and gill net from water bodies of Attappady Reserve Forests of Palakkad district. Measurements were taken using dial calipers and data recorded to tenths of a millimeter. Parts of head are measured as percentage of head length (HL); other body parts are shown as percentage of standard length (SL). Taxonomic methods used are those of Jayaram[10]. Fishes used for taxonomic studies in this article are now deposited in museum of Zoology Department, Government College Chavara (GCC/DOZ), Kerala.

Diagnosis: *Hypselobarbus carnaticus* can be distinguished from all its congeners in having 2 pairs of barbels, 9-11 predorsal scales, 30- 32 lateral line scales, 8 branched rays in dorsal fin and 5 branched rays in anal fin, body depth at dorsal fin origin 28.7- 32.8 % SL, dorsal fin inserted nearer to snout tip than caudal fin base, last simple dorsal fin ray strong, osseous and smooth, pelvic fins placed behind to dorsal fin origin and body without any caudal colour spot.

Description: General body shape and appearance is shown in Fig. 1 & 2; morphometric data and meristic counts are enlisted in Table 1 & 2. Body elongate, laterally compressed; both dorsal and ventral profiles are equally convex; head small, 23.4-27.0 in % of standard length; body moderately deep, its height at dorsal fin origin 28.7-32.8 in % of SL; Pharyngeal teeth curved and pointed; 5, 3, 2/2,3, 5. 2; two pairs of barbels; they are thin and usually shorter than orbit; dorsal fin commences above a little infront of ventral fin insertion, midway between snout tip and base of caudal fin in adult and a little nearer to snout tip than caudal fin base in young ones; its upper edge is concave; last undivided dorsal ray is broad, strong, rigid and its inner edge smooth. Pectoral fin long but its tip never reach to pelvic fin base; the former is shorter than head length in young adults but equal to head in large adults. Pelvic fin is with nearly same length of pectoral fin and never reach to anal fin insertion. Anal fin never reaches to caudal fin in young ones and fairly reach to caudal fin in adults. Lateral line distinct, complete and concave. 3 ½ scales occur between lateral line and ventral fin. Colour: Flanks white to light brownish white; greenish brown along the back; fins hyaline to greyish; dorsal, anal and caudal fin dusky in some; anal fin and ventral fin pale red in some large specimens. Eyes golden.

Fig. 1. A fresh specimen of *H. carnaticus* from Attappady

Fig. 2, A large specimen of *H. carnaticus* collected from the base of Nilgiri Hills

Fig. 3. Collection area of Bhavani River at Attappady Reserve Forests

Fig. 4. Catching of *H. carnaticus* from Attappady

Comparisons: *Hypselobarbus carnaticus* is a large freshwater fish growing to large size (10-12 kg) and can be distinguished from all its congeners in having 2 pairs of barbels, 9-11 predorsal scales, 30- 32 lateral line scales, 8 branched rays in dorsal fin and 5 branched rays in anal fin, body depth at dorsal fin 28.7- 32.8 % SL, last simple dorsal fin ray strong, osseous and smooth, pelvic fin placed behind to dorsal fin origin and body without any caudal colour spot. *Hypselobarbus carnaticus* differs from *H. jerdoni*[6], collected from Manglore in Karnataka, in having 30-32 (vs. 28-29) lateral line scales, 8 (vs. 9) branched rays in dorsal fin and 3 ½ (vs. 4 ½) scales between lateral line and ventral fin. Moreover dorsal, ventral, anal and caudal fins of *H. jerdoni* are light reddish and distal half of dorsal fin and upper caudal lobe are deep black in colour. *Hypselobarbus carnaticus* shows similarities with *Barbodes bovanicus*, collected by Day[8] from Bhavani River at the base of Nilghiri Hills, in many features. Jayaram[11] and Talwar and Jhingran[18] treated this species as *Puntius bovanicus*; but Menon[14] regarded it as a *Barbodes* species. Type locality of both are also same- Bhavani River. *H. carnaticus* differs from *bovanicus* in having 30- 32 (24- 26) lateral line scales, 3 ½ (2 ½) scales between lateral line and ventral fin and 8 (vs. 9) branched rays in dorsal fin.

Hypselobarbus carnaticus can be distinguished from *H. basavarajai*[3] in having 30- 32 (vs. 32-34) lateral line scales and 3½ (vs. 4½) scales between lateral line and ventral fin. *Hypselobarbus*. *carnaticus* differs from *H. pulchellus*, described by Day[6] from south Canara, in having 8 (vs. 9) branched dorsal fin rays and longer (23.4- 27.0 % SL vs. 20.6-21.3) head. *H. carnaticus* differs from *H. dobsoni*, described by Day[7] from Deccan, in having 3 ½ (vs. 2 ½) scales between lateral line and ventral fin, 8 (vs. 9) branched dorsal fin rays and 7-8 (vs. 9- 10) branched ventral fin rays, *Hypselobarbus carnaticus* can be distinguished from *H. maciveri* [1] in having 8 (vs. 9) branched dorsal fin rays and lesser (3½ vs. 4½) scales between lateral line and ventral fin.

Kumar and Kurup[13] reported the occurrence of *Hypselobarbus carnarticus* from Chalakkudy River. Sanal *et al.*[16] reported its occurrence (as *P. carnaticus*) from Achankovil River; but they could not deposit its specimens in recognised museums; it may most probably be misidentification. Arun Kumar *et al.*[2] reported Carnatic carp from Chalakudy and Moyar River systems; it must also be confirmed. This author holds that Carnatic carp is a freshwater fish restricted in its distribution only in the water bodies of Bhavani and Cauvery Rivers at Kerala and Karnataka.

Hypselobarbus carnaticus is an accepted species and is not uncommon in its type localities- at the base of Nilgiris (Fig. 3) and Cauvery River at Karnataka. At Attappady region Hill Tribe people trap these fishes using cut branches of riparian vegetation spread in the water bodies during nighttime. The fishes are attracted to the site and feed on the leaves and they are caught using cast net during this occasion. So these fishes are locally known

Table-1. Morphometric features of *H. carnaticus* (GCC/DOZ 55) from Bhavani River (7 Nos)

Sl. No	Characters	Range	Mean
1	Total length (mm)	81.0- 168.0	125.3
2	Standard Length (mm)	64-132	97.0
3	Head Length(mm)	16-31	23.5
	% SL		
4	Head length	23.4-27.0	25.0
5	Head depth	18.9-20.3-	19.6
6	Head width	13.6- 17.0	15.3
7	Body depth at dorsal origin	28.7-32.8	30.7
8	Body Depth at anal fin	19.6-23.6	21.5
9	Body width at dorsal origin	15.3-18.0	16.6
10	Body width at anal origin	9.7-11.8	10.8
11	Pre-dorsal length	47.5-51.5	49.5
12	Post-dorsal length	52-59.1	55.6
13	Pre-pelvic length	49.2- 51.4	50.0
14	Pre- anal length	73.4-80	76.0
15	Length of dorsal fin	25.8-31	28.4
16	Length of pectoral fin	20.4-24.2	22.3
17	Length of pelvic fin	19.3-24	21.7
18	Length of anal fin	18.2-22	20.1
19	Length of caudal fin	30.3-34.4	32.0
20	Length of base of dorsal fin	16.6-18.7	17.0
21	Length of base of anal fin	8.6-10.7	9.6
22	Length of caudal peduncle	16.1-18.4	17.0
23	Depth of caudal peduncle	12.1-14	13.0
24	Width of caudal peduncle	4.5-6.2	5.4
25	Distance between pectoral fin and pelvic fin	26.0- 27.8	27.0

26	Distance between pelvic fin and anal fin	25- 30	27.5
27	Distance between anal fin and caudal fin	18.3-26.5	22.4
28	Distance from ventral to vent	24.7-27.0	25.8
29	Distance from anal to vent	2.2- 3.3	2.8
	% HL		
30	Head depth	74- 81.2	77.5
31	Head width	58-65.2	61.5
32	Eye diameter	36-43.7	40.0
33	Pre-orbital distance	62.9- 68.7	65.8
34	Post-orbital distance	39.1-45.1	42.1
35	Pre-occipital distance	77.0- 87.5	82.2
36	Post-occipital distance	118.5- 131.2	124.7
37	Inter orbital width	39.1-44	41.4
38	Inter narial width	25-31.2	28.1
39	Snout length	29- 32	30.5
40	Width of gape of mouth	25.9-31.2	28.5

Table 2. Meristic Counts of *H. carnaticus* (GCC/DOZ 55) (7 Nos)

Sl.No.	**Characters**	**Counts**
1	Lateral line scales	30-31+1
2	Pre-dorsal scales	9-12
3	Dorsal fin origin to lateral line	5.5-6.5
4	Ventral fin origin to lateral line	3.5
5	Anal fin origin to lateral line	4.5
6	Circumpeduncular scales	7-8
7	Dorsal fin rays	iii.8
8	Pectoral fin rays	i.13-14,
9	Pelvic fin rays	i.7-8,
10	Anal fin rays	ii.5
11	Caudal fin rays	iii.17.iii
12	Number of barbells	4

as 'Pachilavetti' in regional language-Malayalam. Carnatic carps are also entangled using gill net (Fig. 4) and cast net. A good population of this fish inhabits in riffles and larger pools in rapidly flowing mountain streams of Bhavani River at Palakkad district of Kerala at about 1200 meters above sea level. It is also cultivated in ponds and other impoundments in various parts of India. Menon[14] considered *Puntius cauveriensis* and *Hypselobarbus carnatticus* as same, which is erroneous. In color and length of fins *Carnaticus* collected from different parts of south India shows distinct differences. This species can reach a length of 60 centimetres and has reported to attain a maximum weight of 12 kilograms. Molecular level studies are essential to ascertain the identity of *H. carnaticus* of Bangalore.

Comparative materials examined: *H. carnaticus*: GCC/DOZ 55, 7, 64-132 mm SL, Bhavani River at Palakkad, coll. Mathews Plamoottil, 20/01/2020; *Hypselobarbus jerdoni:*GCC/DOZ 54, 2,93- 101, a water stream at Chikamagalure, Coll. Mathews Plamoottil & Vineeth. K, 22/02/2020; *H. dobsoni*: ZSI/SRC F8738, 1, 145.05mm SL; India: Thunga River, Karnataka, A. Rai, 12 May 2013; *H. maciveri*: ZSI/F9576, 2, Holotype and Paratype, 121.17-123.55 mm SL; Krishna River near Mahuli, 3 km from Satara, N. Annandale.

The author is grateful to DST- SERB for sanctioning Core Research Grant for funding this research work. I am also thankful to anonymous reviewers for the comments that helped improve the manuscript.

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