Volume : 4 | Issue : 8 | Aug 2015 • ISSN No 2277 - 8179

Research Paper

Morphological Identification of a Near Threatened Ornamental Fish, *Ctenops nobilis*

Zoology

KEYWORDS : Ornamental fish, near Near Threatened , morphology, identification.

Shreya Bhattacharya — Aquaculture Management and Technology Department, Vidyasagar University, Midnapore

Bijay Kali Mahapatra — ICAR-Central Institute of Fisheries Education, Salt Lake City, Kolkata

Joydev Maity — Department of Aquaculture Management & Technology, Vidyasagar University, Midnapore

ABSTRACT

Among the indigenous ornamental fish, Ctenops nobilis McClelland, 1845 is one of the most high demanding fish in both local and export market. The fish is assessed as Near Threatened by IUCN Red List, 2010 due to habitat loss as there is insufficient information to determine its population declines in the wild. The morphological (morphometric and meristic) characters are helpful to proper identification of the fish and also distinguish from other species. C. nobilis is small, brown to black colour, striped streamline body fish. Head length of the fish is near about one fourth of total body length. Fish possess protruding eyes with subterminal mouth. Fins contain both hard spines and soft rays.The pectoral fin of the fish contains a large fin ray. Body covered with small ctenoid scales. The fish is carnivorous in nature. The present paper focus on the details morphology of the species.

INTRODUCTION

Ctenops nobilis is one of the important native ornamental fish under Perciformes order and family Osphronemidae. This species is the only known member of its genus. Due to their small size, they can be reared in aquarium throughout their life span and thereby this species can be regarded as a 'classified ornamental fish'. The fish is commonly known as Noble gourami. *C. nobilis* is described by McClelland in the year 1845 from the rivers at the foot of Bhutan and also described from Sikkim state, north-eastern India and also known from West Bengal, Bihar and Assam states plus northern Bangladesh and, more recently, Nepal. Studies leading to domestication of the fish and breeding will help in sustained fisheries and preserve germplasm. Indiscriminate capture of the fish from natural habitat has led to decline in population of these fishes. *C. nobilis* is now in Near Threatened condition as per IUCN, 2010 report. For captive domestication, breeding and culture of the species detailed eco-biological information is utmost important but unfortunately studies in this direction is very lacking. Morphometric and meristic characters are helpful in easy & correct identification of fish species in laboratory as well as at natural places (Jayaram 1999). Morphometric characters are important for identifying fish species and their habitat as well as ecological criteria in any stream, lake or sea. It is common to use morphometric measurements to identify and classify fishes (Begenal and Tesch 1978). Little data is available of the fish as studied by several workers (Rahman 1989 and 2005; IUCN Bangladesh 2000; Shafi and Quddus 2001; Ruber et al. 2006; Britz et al. 1995; Talwar and Jhingran 1991). But the data is not sufficient for fish identification. In the present study relationships between the various body measurements to the total length and head length have been calculated. The range of total length, mean and standard deviation were calculated for characters under study. The present study is envisaged to know the detailed morphometric and morphomeristics biology of *C. nobilis* which is one of the essential pre-requisite for captive breeding and rearing under controlled conditions.

MATERIAL AND METHODS

Samples collection:

A total of 50 samples of *C. nobilis* were collected from the landings sites on Brahmaputra river basin at Assam during the period from December, 2014 to April 2015. After transporting to the laboratory, where they were measured (**Figure 1**) and was identified to species level. Then fishes were immediately preserved in 5% formalin solution for detail examination.

Morphometric and meristic data:

Studies of morphometric and meristic characters followed the methods given by Jayaram, 1999. Morphometric measurements were made using digital callipers and simple steel scale. Morphomeristic characters were taken using magnifying glass and microscope. In Laboratory, about 23 morphometric and 9 meristic characters of each fish sample were made in the present study as shown in **Tables 1 & 2**. All morphometric measurements were taken in millimetres.

Statistical analysis of data:

All data were analysed by using internationally reputed Software Statistical Package for Social Sciences (SPSS-16.0) and MS Excel.

RESELUT AND DISCUSSION

C. nobilis have streamline sagittiform body covered with small ctenoid sclaes. Colouration of the fish varies between grey, black and brown with several black and brown strips present at the belly portion of the fish. A black spot present at the caudal portion of the fish and fins with brown to black colour and redish edge.

Lateral line is not prominent or distinguishable every time and it is continuous and curved. The scales over the lateral line are mainly white in colour. The fish possessing sub-terminal mouth with slightly upturned lower lip. The fish is carnivorous in nature. Apart from gill labyrinthine organ present for extra air consumption. Somewhat aggressive in nature but would like to stay in sole.

The total length of the fish varies between 37-72 mm. The average total length of the fish is near about 55 mm. The relationship of various morphometric measurements compared with total length (**Table 3**) and head length (**Table 4**) in *C. nobilis* is calculated to identify the fish. Head length is 26.75$\pm$5% of total length of the fish. Head length is 3.71 part of the total body length. Eyes are highly protruding. The eye diameter of the fish 3-6 millimetre which is 28.55$\pm$5% of head length of the fish. The pectoral fin of the fish contains a large fin ray. Dorsal fin grows near the end of anus. Dorsal fin spines are short and rays are long. 2 nostrum present at the upper side of the eyes. Caudal fin is round shaped.

CONCLUSION

From the present study it is suggested that for conservation of the fish biological study of the fish is very important. The details morphological analysis of *C. nobilis* is help to identify the fish proper and distinguished from other gourami species. The study is also helpful for further study on the feeding habits and reproductive biology of the fish for captive breeding and rearing.

Volume : 4 | Issue : 8 | Aug 2015 • ISSN No 2277 - 8179

Table 1. Morphological characters of *Ctenops nobilis*

SL. NO.	CHARACTERS	MAX	MIN	AVE	STDV
1.	TL	72	37	54.96	9.938505
2.	SL	64	33	45.06	8.926937
3.	BD	24	7	13.74	4.711298
4.	HL	23	10	14.78	3.339864
5.	PCL	10	4	6.82	1.320019
6.	PVL	13	5	7.28	1.773271
7.	AFL	28	13	17.44	4.190173
8.	CFL	17	4	10.94	2.427815
9.	DFL	20	6	10.02	3.52536
10.	DBL	12	5	7.94	1.777524
11.	ABL	31	12	22.38	5.536115
12.	CBL	5	3	4.1	0.580288
13.	PCBL	4	2	3.52	0.579937
14.	PVBL	5	3	3.9	0.580288
15.	PDL	44	18	27.26	7.381195
16.	PPCL	27	10	16.38	4.356042
17.	PAL	38	12	19.76	7.032171
18.	PPVL	26	11	17.08333	4.889355
19.	DFH	7	4	5.3	1.035098
20.	AFH	6	4	4.98	0.769044
21.	CPL	8	4	5.98	1.186489
22.	SNL	7	3	4.52	1.474131
23.	ED	6	3	4.22	1.130107

Table 2. Morphomeristic characters of *Ctenops nobilis*

SL. NO.	CHARACTERS	MAX	MIN
1.	AFR	V/28	IV/23
2.	CFR	16	14
3.	DFR	VII/8	IV/4
4.	PCFR	12	8
5.	PVFR	I/5	I/5
6.	LLS	32	28
7.	TS	16	12
8.	CPS	8	5
9.	CT	U-16, L-14	U-13, L-12

Table 3. Relationship between total length and different morphometric characters of the fish:

SL. NO.	CHARACTERS	% OF TL
1.	SL	81.55±5
2.	BD	24.86±5
3.	HL	26.75±5
4.	PCL	12.34±5
5.	PVL	13.17±5
6.	AFL	31.56±5
7.	CFL	19.80±5
8.	DFL	18.13±5
9.	DBL	14.37±5
10.	ABL	40.50±5
11.	CBL	7.42±5
12.	PCBL	6.37±5
13.	PVBL	7.05±5
14.	PDL	49.34±5
15.	PPCL	29.64±5
16.	PAL	35.76±5
17.	PPVL	30.91±5
18.	DFH	9.59±5
19.	AFH	9.01±5
20.	CPL	10.82±5

Table 4. Relationship between head length and SNL: Snout length and ED: Eye diameter of the fish:

SL. NO.	CHARACTERS	% OF HL
1.	SNL	30.58±5
2.	ED	28.55±5

Figure 1. Identification of *Ctenops nobilis*

Acknowledgement
The authors are greatly thankful to the Dr. W. S. Lakra, Director, ICAR-CIFE, Mumbai for providing facilities to carry out the research work.

REFERENCE

Bagenal TB and TeschFW(1978) Age and growth. In:T. Begenal (Ed.), Methods for assessment of fishproduction in fresh waters, 3rd Edn. IBP HandbookNo. 3, Blackwell Science Publications, Oxford: 101-136. | Britz R (1995)ZurphylogenetischenSystematik der Anabantoidei (Teleostei, Percomorpha) unterBerucksichtigung der Stellung des Genus Luciocephalus. Morphologische und ethologischeUntersuchungen. PhD Thesis, Universitat Tubingen, Tubingen, Germany. | IUCN, Bangladesh (2000) Red book of threatened fishes of Bangladesh, IUCN The world conservation union. xii+116 pp. | Jayaram KC (1999) The Freshwater Fishes of the Indian Region, Narendra Publishing House, Delhi. p. 551 + pls. 154 XVIII. | McClelland J (1845) Description of four species of fishes from the rivers at the foot of the Boutan Mountains. Calcutta J. of Natural History5 (no. 18): 274-282. [Issue for July 1844, possibly published in 1844.] | Rahman AKA(1989) Freshwater Fishes of Bangladesh, 1st edition, Zoological Society of Bangladesh, Department of Zoology, University of Dhaka, Dhaka 1000, pp. 282-283. | Rahman AKA (2005) Freshwater Fishes of Bangladesh, 2nd edition, Zoological Society of Bangladesh, Department of Zoology, University of Dhaka, Dhaka 1000, pp. 307-308. | Rüber L,BritzR and ZardoyaR (2006). Molecular phylogenetics and evolutionary diversification of labyrinth fishes (Perciformes: Anabantoidei).J. Systematic Bio.55(3): 374-397. | Shafi M and Quddus MMA (2001) BangladesherMatshoShampad (Fisheries of Bangladesh) (in Bengali), Kabir publication. Dhaka, Bangladesh. pp. 301-302. | Talwar PK and Jhingran AG(1991) Inland Fishes of India and Adjacent Countries, Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi, Calcutta, 2: 1001-1002. | **Abbreviation used in the paper** | TL: Total length; SL: Standard length; BD: Body depth; HL: Head length; PCL: Pectoral fin length; PVL: Pelvic fin length; AFL: Anal fin length; CFL: Caudal fin length; DFL: Dorsal fin length; DBL: Dorsal fin base length; ABL: Anal fin base length; CBL: Caudal fin base length; PCBL: Pectoral fin base length; PVBL: Pelvic fin base length; PDL: Pre dorsal length; PPCL: Pre pectoral length; PAL: Pre anal length; PPVL: Pre pelvic length; DFH: Dorsal fin height; AFH: Anal fin height; CPL: Caudal peduncle length; SNL: Snout length; ED: Eye diameter; AFR: Anal fin ray; CFR: Caudal fin ray; DFR: Dorsal fin ray; PCFR: Pectoral fin ray; PVFR: Pelvic fin ray; LLS: Lateral line scale; TS: Transverse scale; CPS: Caudal peduncle scale; CT: Cranial teeth.