



***Channa amari*, a new species of Snakehead (Teleostei: Channidae) from North Bengal, India**

Arpita Dey^{1*}, Basudhara Roy Chowdhury², Ruksa Nur¹, Debapriya Sarkar³, Laishram Kosygin⁴ and Sudip Barat¹

¹Aquaculture and Limnology Research Unit, Department of Zoology, University of North Bengal, Darjeeling, Siliguri - 734013, West Bengal, India.

²Paribesh Unnayan Parishad, Sagar Island, South 24 Parganas, West Bengal, India.

³Fishery Unit, Uttar Banga Krishi Viswavidyalaya, Cooch Behar - 736165, West Bengal, India.

⁴Freshwater Fish Section, Zoological Survey of India, 27 J.L. Nehru Road, Kolkata - 700016, West Bengal, India.

Received: 15 Jan 2019 / Accepted: 13 Mar 2019 / Published online: 1 Apr 2019

Corresponding Author Email: arpitadeycob@gmail.com

Abstract

Channa amari, a new ornamental species is described from Bhalka forest, West Bengal, India. It differs from congeners in having the following combination characters: absence of pelvic fins; 37 dorsal fin rays; 12-13 pectoral fin rays with 4-5 black bands; 23 – 25 anal fin rays; 10-11 caudal fin rays; 44- 45 lateral line pored scales; 40- 41 total vertebrae; 11-13 transverse scales rows; head length 29.4 % SL; inter-orbital space 32.6 % HL. This species is very colourful and may be considered as ornamental fish.

Keywords

Taxonomy, West Bengal, *Channa*, new species.

INTRODUCTION

Fishes of the family Channidae is commonly known as "Snakehead fish" and distributed in tropical Africa, parts of the Middle East and Asia ¹. They inhabit in a wide range of freshwater habitats such as hill streams, lakes, ponds, estuaries, swamps etc. They are characterised by having single long dorsal and anal fins, rounded caudal fin and curved lateral line. Fishes under genus *Channa* are currently reported as having 43 species ^{2,3,4,5,6,7} and many of them are popular as aquarium fish because of their beautiful colouration. A total of 15 *Channa* species namely *C.*

amphibeus, *C. andrao*, *C. aurantimaculata*, *C. barca*, *C. bipuli*, *C. bleheri*, *C. gachua*, *C. marulius*, *C. melanostigma*, *C. pardalis*, *C. pomanensis*, *C. punctata*, *C. quinquefasciata*, *C. stewartii* and *C. striata* were reported from North-East India in the Brahmaputra drainage. While conducting ichthyofauna surveys in the Dooars region of West Bengal of Brahmaputra basin, an undescribed species of *Channa* was obtained, which is herein described as *Channa amari* sp. nov.

MATERIALS AND METHODS

Measurements were made point to point with digital callipers and data recorded to the nearest 0.1 mm. Counts and measurements were made on the left side of specimens whenever possible, following Vishwanath and Geetakumari⁸ and Britz⁹. Fin rays were counted under a stereo zoom light microscope. Vertebral counts follow Roberts¹⁰. Subunits of the head are presented as proportions of head length (HL). Head length and measurements of body parts are given as proportions of standard length (SL). Numbers in parentheses after a meristic value indicate the frequency of that value. Radiographs were taken using Fujifilm (C.R-IR-392) in x-ray machine and used for counting the total vertebrae in examined specimens¹¹. The type specimens were deposited in Zoological Survey of India (ZSI), Kolkata, India.

RESULTS

***Channa amari* sp. nov.** (Fig.1, 2)

New English name: Chocolate bleheri

Local name: Lal cheng

Holotype: ZSIF7926, 111.5 mm SL; India: West Bengal, Alipurduar district, Bhalka forest, 26° 53' 34" N, 89° 32' 52 " E, 22nd September 2018, collected by Amar Dey.

Paratypes: ZSIF7927, 9ex, 72.1 -120 0 mm SL. Collected with the holotype. One paratype, 104 mm SL, dissected for counting different types of teeth and osteology.

Etymology: The specific epithet '*amari*' is named to honour Amar Dey who collects this new species and donating of the live specimens.

Diagnosis: *Channa amari* sp. nov. is distinguished from all other species of *Channa* except *C. bleheri*, *C. andrao*, *C. asiatica*, *C. burmanica*, *C. hoaluensis*, *C. ninhbinhensis*, *C. nox* and *C. orientalis* by the absence of pelvic fins. It is further distinguishing from its congeners in having the following combination characters: absence of pelvic fins; 37 dorsal fin rays; 12-13 pectoral fin rays with 4-5 black bands; 23 – 25 anal fin rays; 10-11 caudal fin rays; 44- 45 lateral line pored scales; 40- 41 total vertebrae; 11-13 transverse scales rows; head length 29.4 % SL; inter-orbital space 32.6 % HL.

Description: Morphometric data of holotype and 9 paratypes in Table 1. General appearance given in Fig.1 and 2. Body elongated and fairly rounded in cross section. Anterior portion of body blunt and bulky, dorso-ventrally depressed, body depth more in pectoral fin region, caudal peduncle region laterally compressed. Head large 30% of standard length with plate-like scales. Mouth large, lips thick,

angle of gape vertical through beyond posterior margin of eye. Lower jaw projecting slightly beyond upper jaw. Eyes small and located at anterior portion of head and situated laterally.

Cephalic sensory pores single; three sensory pores present under eye area and fifteen sensory pores in lower jaw. Upper jaw with almost same small sharp villi-form teeth arrange in a band; vomer with 4 pairs middle sized conical teeth; palatine with small size conical teeth; a pair of ovoid pharyngeal pads with two groups of needle like teeth; larger teeth in anterior half and smaller teeth in posterior half of the pharyngeal pads and pharyngeal pad also cover with similar type of needle like teeth arrange semi-circular shape in anterior half. Ceratobranchial with five rows of teeth and outer row with 12 large conical teeth. Lower jaw in a single row of villi form teeth; anterior mandibulars smaller than posterior mandibular teeth; pharyngeal bones form a triangular structure present on below the upper pharyngeal tooth pads. Lateral line complete with 44(7)* or 45(3) pored scales, extending straight from shoulder girdle almost in a straight line and dropping down one scale row at 14(7)* or 15(3) and then continuing medially to caudal-fin base. Transverse lateral line scales 4½ (1) or 5½(9)* scale rows above lateral line and 6½* (9) or 7½ (1) scale rows below lateral line at anal-fin origin. Pre-dorsal scales: 7(6)* or 8 (4). One large scale on ventral surface of lower jaw. Dorsal fin rays 37(10)*; pectoral fin rays 12 (2) or 13 (8)*; anal fin rays 23(3) or 24 (4)* or 25(3), and caudal fin rays i10i (9)* or i11i (1). Total vertebrae: 40(3) or 41(3)*. Abdominal vertebrae 12(3) * or 13(3) and caudal vertebrae 28(6) *

Colouration: Live specimens: Body creamy white with light brown. Dorsal and caudal fins light blue with broad orange border and 4 -7 orange round marking on caudal fin. In adult fish, the orange round marking arranged in a semi-circular shape in caudal fin. Anal fin light blue with a dark blue border in colour. Pectoral fin orange with 4(9)*– 5(1) dark black semi-circular bands. Forehead light brown with deep orange spots. Pectoral fin base, under eye area, the middle portion of lower jaw or isthmus and branchiostegal membranes deep bluish in colour. Eyes pupil black with deep orange ring. Ventral side yellowish brown (Fig. 1).

In alcohol: Dorsal side greyish than ventral region creamy but deep blue in the middle portion of the isthmus to anal fin origin. Side view of body deep creamy in colour. Pectoral fin yellowish with prominent black bands. Dorsal fin deep bluish with

light yellow border. Anal fin and caudal fin bluish but caudal fin with yellowish marking (Fig.2).

Distribution: *Channa amari* sp. nov. is distributed in small streams or water bodies in Dooars area of Alipurduar district, West Bengal, India (Fig. 3 & 4).

Table 1. Morphometric characters of holotype (ZSIF7926) and 9 Paratypes (ZSIF7927/9) of *Channa amari*

Characters	Holotype	Range (includes Holotype) N=10	Mean±SD
Total length (mm)	131.5	107.5 -122.7	116.5 ± 5.4
Standard length (mm)	111.5	72.6 -120.5	101.9 ± 17.8
In % of standard length (SL)			
Body Depth	17.48	13.8 -22.2	17.5 ± 2.8
Head Length	30.31	26.3 – 32	29.4 ± 1.8
Head depth at nape (snout)	17.3	9.1 – 17.3	12.5 ± 2.6
Head depth at eye	13.45	9.1 – 13.5	10.9 ± 1.5
Head width (Max)	20.07	16.5 – 21.4	20.1 ± 1.5
Head width (Eye)	15.69	12.9-17	15.6 ± 1.3
Snout length	6.63	6.1 -8.3	6.8 ± 0.7
Eye diameter	4.48	4.3 – 5.8	4.9 ± 0.6
Inter-orbital space	9.86	8.3 -11.1	9.6 ± 0.9
Inter-orbital width	9.29	8.34 -11.13	9.63± 0.81
Dorsal fin base length	61.25	53.2 - 61.5	58.2 ± 3.1
Pectoral fin base length	8.4	6.6 – 8.9	7.7 ± 0.8
Anal fin base length	38.47	32.2 – 40	37.7 ± 2.4
Pre-pectoral length	31.65	27.58 – 33.30	31.05 ± 1.82
Pre-dorsal length	35.87	32.73 – 36.69	34.97 ± 1.58
Pre-anal length	56.50	51.03 – 57.59	54.13 ± 2.26
Upper Jaw length	12.28	9.5 – 38.5	13.9 ± 9.2
Lower Jaw length	12.55	10.8 -13.4	12.2 ± 1
Caudal peduncle Length	5.84	5.8 -11.3	7.7 ± 1.5
Caudal peduncle depth	10.69	8.4 – 13.2	10.5 ± 1.3
In % of head length (HL)			
Snout length	21.89	19.7 – 25.9	23.0 ± 1.8
Eye diameter	14.79	14.7 -18.9	16.6 ± 1.4
Head depth at nape (snout)	57.10	34.7 -57.1	42.5 ± 7.4
Head depth at eye	44.37	33.3 – 44.4	37.1 ± 3.4
Head Width (Max)	69.52	61.4 -75.7	68.3 ± 3.9
Head width (Eye)	51.77	48.2 -56.5	53 ± 2.5
Inter-orbital space	32.54	30.2 -36.8	32.6 ± 2.2
Pre-orbital depth	19.58	15.46- 23.11	17.84± 2.4
Post –orbital depth	34.2	31.51- 38.84	34.04±2.76
Upper Jaw length	40.53	34.5 -40.53	37.4 ± 2.2



Fig. 1 *Channa amari* ZSIF7926, 111.5 mm SL; India: West Bengal, Alipurduar district, Bhalka forest, A. dorsal, B. lateral and C.ventral views of live specimen



Fig. 2 *Channa amari*, ZSIF7926, 111.5 mm SL; India: West Bengal, Alipurduar district, Bhalka forest, A. dorsal, B. lateral and C.ventral views of alcohol preserve specimen



Fig. 3. Distribution of *Channa amari* (red circle) in the Bhalka forest, Alipurduar district, West Bengal, India (Source: Google map)



Fig. 4: Type locality of *Channa amari*, at Bhalka forest, Alipurduar district, West Bengal, India

DISCUSSION

Channa amari is distinguished from all known species of *Channa* except *C. andrao*, *C. asiatica*, *C. bleheri*, *C. burmanica*, *C. hoaluensis*, *C. ninhbinhensis*, *C. nox* and *C. orientalis* by the absence of pelvic fins. However, it is distinguished from *C. andrao* in having shorter dorsal fin base (53.2-61.5 vs. 64.6-68.8% SL), shorter anal fin base (32.2-40 vs. 40.8-44.5), pectoral fin with more bands (4-5 vs. 2), more dorsal fin rays (37 vs. 35-36) and presence of orange blotches (whitish-cream) on caudal fin; and from *C. bleheri* in having fewer pectoral fin black bands (4-5 vs. 7-8), fewer pectoral fin rays (12-13 vs. 14), fewer caudal fin rays (10-11 vs. 14), fewer vertebrae (40-41 vs. 43), more transverse scales row (11-13 vs. 11½), dorsal fin rays number fixed (37 vs. 35-37), more head length (26.3-32 vs. 25.2-25.9 % SL), lesser head depth at nape (34.7-57.1 vs. 61.1-62.4), more eye diameters (14.7-18.9 vs. 13.2-13.5 % SL), shorter dorsal fin base (53.2-61.2 vs. 63.4-64.4 % SL), pectoral fin base (6.6-8.9 vs. 17.3-17.4 % SL), lesser upper jaw length (34.5-40.53 vs. 46.2-47.4 % HL) and smaller inter-orbital space (30.2-36.8 vs. 38.3-39.4 % HL).

Channa amari differs from *Channa orientalis* in having fewer pectoral fins rays (12-13 vs. 13-15); more dorsal fin rays (37 vs. 30-34); more anal fin rays (23-25 vs. 20-22) and more lateral line scales (44-45 vs. 36-42). It is distinguished from *C. asiatica*, *C. burmanica*, *C. hoaluensis*, *C. ninhbinhensis* and *C. nox* in having fewer vertebrae (40-41 vs. 45-57), fewer dorsal fin rays (37 vs. 46-49), anal fin rays (23-25 vs. 28-32) and fewer lateral line scales (44-45 vs. 55-64).

Channa amari is very colourful and may be considered as ornamental fish. It is very hardy fish and dominates other fishes while keeping together in the same aquarium.

Comparative materials

Channa amphibeus: ZSIF11435/1 (Neotype), 183.7 mm SL; India: West Bengal, North Bengal.

Channa aurantimaculata: ZSIF4053 (Paratype), 130 mm SL; India: Assam, Dibrugarh, Medela reserve forest.

Channa aurantipectoralis: ZSIF5634 (Holotype), 165.1 mm SL; India: Mizoram, Keisalam River, Dampa Tiger Reserve.

Channa barca: ZSICat378, 219 SL mm; India: Assam, Cuchar.

Channa bipuli: ZSI FF 7650 (Holotype), 127.0 mm SL; India: Assam, small stream outskirts Garbhanga forest.

Channa burmanica: ZSIF9755/1 (Holotype), 106 mm SL; N.E. Burma: Putao Plains, Sen-Bin-Ti.

Channa bleheri: ZSIF7920, 65.5 mm SL, 65.21mm SL; Assam, Guwahati.

Channa stiktos: ZSIF7727 (Holotype), 188.3 SL; India: Mizoram, Champhai district, Tiau river.

Channa gachua: ZSIF7877, 81.1 mm SL; India: Bhubaneswar.

Channa marulius: ZSI1382, 220 mm SL; Indian: Assam, Guwahati.

Channa striata: ZSIF10994/1, 157 mm SL; U Barma.

Channa punctata: ZSIF2206/2, 101 mm SL; India: Assam, Balipara frontier Tract, Soni Gaon Bhil (Lake).

Channa quinquefasciata: ZSI FF 7905 (Holotype), 101.2 mm SL; India: North Bengal, Near Bhutan foothills, Howlong bridge, Torsa River.

Published information used for comparison: Geetakumari K. & Vishwanath³ for *Channa melanostigma*, Britz¹² for *Channa andrao*, Gurumayum & L. Tamang¹³ for *Channa pomanensis*.

ACKNOWLEDGEMENTS

We are thankful to Kailash Chandra (ZSI, Kolkata) for permission to examine specimens and providing laboratory facilities. The first author is grateful Vivekananda Gope for providing necessary suggestions during survey of Ichthyofauna diversity study in different rivers and tributaries of Dooars region of Eastern Himalaya, West Bengal, India.

REFERENCES

1. Berra T.M., Freshwater fish distribution. Academic Press, San Diego, California, 604, 2001.
2. Musikasinthorn P., *Channa aurantimaculata*, a new channid fish from Assam (Brahmaputra River basin), India, with designation of a neotype for *C. amphibeus* (McClelland, 1845). *Ichthyological Research*, 47: 27–37, 2000.
3. Geetakumari K., Vishwanath W., *Channa melanostigma*, a new species of freshwater snakehead from north-east India (Teleostei: Channidae). *Journal of the Bombay Natural History Society*, 107 (3): 231–235, 2011.
4. Lalhlimpuia D.V., Lalronunga S. L., *Channa aurantipectoralis*, a new species of snakehead from Mizoram, north-eastern India (Teleostei: Channidae). *Zootaxa* 4147(3): 343–350, 2016.
5. Knight J.D.M., *Channa pardalis*, a new species of snakehead (Teleostei: Channidae) from Meghalaya, north-eastern India. *Journal of Threatened Taxa*, 8(3): 8583–8589, 2016.
6. Praveenraj J., Uma A., Moulitharan N., Bleher H., *Channa bipuli*, a new species of snakehead (Teleostei: Channidae) from Assam, northeast India. *Aqua, International Journal of Ichthyology*, 24:153-166, 2018b.
7. Praveenraj J., Uma A., Moulitharan N., Knight J. D. M., Moulitharan N., Balasubramanian S., Bineesh K., Bleher H. *Channa quinquefasciata*, a new species of snakehead (Teleostei: Channidae) from Torsa River, North Bengal, India. *Aqua, International Journal of Ichthyology*, 24:141-152, 2018a.
8. Vishwanath W., Geetakumari K., Diagnosis and interrelationships of fishes of the genus *Channa scopoli* (Teleostei: Channidae) of northeastern India. *Journal of Threatened Taxa*, 1(2): 97–105, 2009.
9. Britz R, *Channa ornatipinnis* and *C. pulchra*, two new species of dwarf snakeheads from Myanmar (Teleostei: Channidae). *Ichthyological Exploration of Freshwaters* 18(4): 335–344, 2008.
10. Roberts T. R. Systematic revision of Asian bagrid catfishes of the genus *Mystus* sensu stricto, with a new species from Thailand and Cambodia. *Ichthyological Exploration of Freshwaters*, 5(3): 241-256, 1994.
11. Aguirre W. E., Walker K., Gideon S., Tinkering with the axial skeleton: vertebral number variation in ecologically divergent three spine Stickleback populations. *Biological Journal of the Linnean Society*, 113: 204–219, 2014.
12. Britz R., *Channa andrao*, a new species of dwarf snakehead from West Bengal, India (Teleostei: Channidae). *Zootaxa*, 3731(2): 287–294, 2013.
13. Gurumayum S.D., Tamang L., *Channa pomanensis*, a new species of snakehead (Teleostei: Channidae) from Arunachal Pradesh, North Eastern India. *Species*, 17(57): 175-186, 2016.