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***PUNTIUS DOLICHOPTERUS*, A NEW FISH SPECIES
(CYPRINIFORMES: CYPRINIDAE), FROM KERALA, INDIA**

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ABSTRACT

Puntius dolichopterus, a new species of the family cyprinidae, is described from a freshwater stream at Kayamkulam of Kerala, India. It is distinguished from its congeners by the following combination of characters: Dorsal fin short and located a little behind the ventral fin origin; third dorsal ray osseous, rigid and strong, its spinous portion longer, 51.2- 52.2 % HL; pectoral fin long and reaches pelvic fin origin; pelvic fin extends to vent; lateral line scales 23- 24 + 1- 2; pre dorsal scales 8; 3- 4 longitudinal lines present below lateral line; a narrow and short depression present on occiput. The new species is compared with its closely related species.

Keywords: Taxonomy, New species, Cyprinids, *Puntius viridis*, *Puntius nigronotus*.

INTRODUCTION

The Asian cyprinid genus *Puntius* was created by Hamilton (1822) based on his collections from River Ganges; but it was without any type designation; moreover Hamilton placed some species under *Cyprinus* and some others under *Puntius*. His *Cyprinus sophore* is now considered as the type species of the genus *Puntius*. There had been great inconsistency and confusion in adopting the names *Barbus* Cuvier or *Puntius* Hamilton. Jayaram (1991) in his revision of genus *Puntius*, considered *Barbus* Cuvier, *Cyprinus* Hamilton, *Capoeta* Valenciennes, *Hypseobarbus*, *Gonoproktopterus*, *Hemibarbus*, *Barbodes* and *Cyclocheilichthys* of Bleeker and *Systomus* McClelland as synonyms of *Puntius*. Pethiyagoda et al. (2012) and Pethiyagoda (2013) recognized *Puntius* and *Systomus* as separate genera; they also created three more new genera *Dawkinsia*, *Haludaria* and *Pethia* from the genus *Puntius*.

The present species described from Kayamkulam of Kerala, India has been assigned to *Puntius* and herein described as *Puntius dolichopterus*, new species.

MATERIALS AND METHODS

Measurements were made point to point with dial calipers and data recorded to tenths of a millimeter. Counts and measurements were made on the left side of specimens. 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). Methods used are those of Jayaram (2002). Distance between two fins or between fin and vent is taken from the origin of the fin.

Abbreviations used: ZSI/ANRC- Zoological Survey of India, Andaman and Nicobar Regional Centre at Port Blair; ZSI- Zoological Survey of India, Kolkata; ZSI/ WGRC- Zoological Survey of India, Western Ghats Regional Centre, Calicut; ZSI/ SRC- Zoological Survey of India, Southern Regional Centre, Tamil Nadu; CRG-SAC- Conservation Research Group, St. Albert's College, Cochin; DAV- Distance from anal to vent; HD- Head depth; DCP- Depth of caudal peduncle; LCP- Length of caudal peduncle.

PUNTIUS DOLICHOPTERUS, SP. NOV.

(Figures 1 & 2 and Table 1)

Type materials examined

Holotype: ZSI/ANRC-12226, 68 mm SL, Kayamkulam, Kerala, India, coll. Mathews Plamoottil, 21.08. 2014. **Paratypes:** ZSI/ANRC-12227, 5 specimens, 57.0 - 63.5 mm SL, Kayamkulam,, Kerala, India, coll. Mathews Plamoottil, 21.08. 2014.

RESULTS AND DISCUSSION

Diagnosis: *Puntius dolichopterus* can be distinguished from its congeners in having longer head, 30.0- 34.6 % SL, operculum extends out beyond pectoral fin base as a soft membranous flap, 8 pre dorsal scales, 23- 24 + 1- 2 lateral line scales, short dorsal fin located behind ventral fin origin, third dorsal ray osseous, rigid and strong, its spinous portion longer, 51.2- 52.2 % HL; an elongated pectoral fin reaches pelvic fin and pelvic fin reaches vent, 3- 4 longitudinal lines present below lateral line and a narrow and short depression present on occiput.

Description: General body shape and appearance shown in Figures 1 & 2. Morphometric data as in Table 1. Body laterally compressed; dorsal profile more convex than ventral profile; region from pre dorsum to occiput convex, after sinking down very slightly goes straight to snout tip; post dorsal region slightly concave. Eyes situated considerably behind and above the angle of jaws and not seen from below ventral side; upper margin of orbit reaches dorsal profile of head; nostrils situated nearer to eyes than to snout tip and enclosed in a short but prominent tube; a short and distinct depression present on occiput. Jaws unequal, upper jaw longer and broader than lower jaw; barbels one pair maxillary only, shorter than orbit, feeble and reaches lower border of eyes, never reach nostrils; mouth sub terminal, slightly upturned and protruding; gape greater than inter narial distance; operculum rigid and moderately hard, extends beyond pectoral fin base out as a soft membranous flap. Dorsal fin originates considerably behind the pectoral tip and a little behind the ventral origin, upper margin fairly

concave; dorsal fin with three simple and 8 branched rays; first ray very minute, soft and seemingly absent, commonly fused to second ray which is slightly osseous; third ray osseous, rigid and strong, its spinous portion longer, 51.2- 52.2 % of head length; tip filamentous; filamentous portion as long as eye diameter; inner and outer margins of the spine smooth; base of third dorsal ray wide and forms 23.4- 25.0 % ED; last dorsal ray branched to root and so considered as one. Pectoral fin with one simple and 14 branched rays; pectoral tip reaches ventral fin origin; ventral fin originates just in front of dorsal, with one simple and 8 branched rays; its tip never reaches anal fin origin, but reaching the vent; two auxiliary scales present on either side of base of ventral, one above the other, of this the upper one soft and delicate, lower one more fleshy. Anal fin originates a little behind the end of ventral fin, with three simple and 5 branched rays; it is roughly rectangular, outer margin fairly concave, tip not reaches caudal base; no prominent ridge on the base of anal; no considerable distance in between anal fin origin and vent; first anal ray small; last anal ray divided to root. Caudal fin with 19 rays; its lobes equal. Lateral line complete with 23- 24 scales, 1- 2 scales at the base of caudal fin; scales relatively large, easily deciduous and clearly countable; scales on the breast region with same size to other scales. Pre dorsal scales 8; pre pelvic scales 6- 7; pre anal scales 13- 14; circum peduncular scales 10; scales between lateral line and dorsal fin $\frac{1}{2}$ 4 $\frac{1}{2}$; scales between lateral line and ventral fin 3 $\frac{1}{2}$; scales between lateral line and anal fin 3 $\frac{1}{2}$ - 4 $\frac{1}{2}$.

Coloration: Body silvery; dorsal fin light orange red; pectoral and anal fin greenish yellow; ventral fin yellow; caudal fin dusky; minute black spots present on operculum; a diffuse, inconspicuous dusky spot present on 21 and 22 scales.

Distribution: Currently known only from the type locality in Kerala.

Etymology: The specific epithet '*dolichopterus*' was taken from two Greek words '*dolikhos*' meaning elongated and '*pteron*' meaning wing or fin refers to elongated pectoral fin.

Table 1. Morphometric characters of *Puntius dolichopterus* (n= 6).

Measurement	Holotype (HT)	Range (HT included)	Mean	SD
Total Length (mm)	87	73.0- 87.0	81.2	4.6
Standard Length (mm)	68	57. 0- 68.0	62.9	3.5
Head length (mm)	20.5	19.0 – 21.8	19.8	1.1
Percent of standard length				
Head length	30.1	30.0- 34.6	31.7	1.9
Head depth	22.8	22.2– 25.4	23.7	1.3
Head width	16.9	14.3– 16.9	15.6	0.9
Body depth at dorsal origin	32.4	31.7– 35.7	32.9	1.5
Body depth at anal origin	22.9	21.7– 24.6	23.4	1.1
Body width at dorsal origin	16.2	14.2– 17.5	15.8	1.3
Body width at anal origin	11.9	10.6– 13.2	11.7	0.9
Pre occipital distance	22.1	19.8– 22.3	21.4	1.0
Distance from occiput to dorsal front	29.4	27.0– 31.7	29.9	1.6
Pre-dorsal length	51.5	50.4– 53.9	51.8	1.3
Post-dorsal length	51.5	50.4–53.9	51.8	1.3
Pre-pectoral length	31.6	30.1– 31.7	30.8	0.7
Pre-pelvic length	48.5	48.5– 51.6	49.8	1.2
Pre-anal length	72.1	71.9– 74.9	73.2	1.3
Length of dorsal fin	22.0	19.2– 22.0	20.7	0.8
Length of pectoral fin	21.3	20.2– 22.2	20.9	0.7
Length of pelvic fin	20.6	20.5– 22.8	21.2	0.9
Length of anal fin	16.5	16.5– 20.5	18.1	1.6
Length of base of dorsal fin	19.8	18.7– 20.6	19.6	0.8
Length of base of anal	10.3	8.7– 11.1	10.3	0.8
Length of caudal peduncle	20.6	2.8– 4.4	19.1	1.2
Depth of caudal peduncle	13.2	11.9– 13.7	13.1	0.7
DCP/ LCP	64.3	68.2– 79.1	74.3	4.5
Width of caudal peduncle	8.8	6.3– 8.8	7.5	0.9
Distance from pectoral to pelvic	19.6	19.0 – 21.9	20.3	0.9
Distance from pelvic to anal	24.6.	23.6– 26.2	25.0	0.9
Distance from anal to caudal	30.1	26.9– 31.7	28.6	1.9
Distance from anal to vent	1.5	1.3– 1.8	22.2	1.3
Distance from ventral to vent	20.6	20.6– 23.9	1.6	0.2
Percent of head length				
Head depth	75.6	67.9– 80.0	73.1	5.1
Head width	56.1	41.3– 52.6	48.3	4.7
Eye diameter	24.4	24.4– 32.1	27.8	3.2
Inter orbital width	40.5	26.3–32.6	28.3	2.9
Inter narial width	20.0	20.0– 22.1	20.9	0.9
Snout length	29.3	22.1– 29.3	26.9	3.3
Gape width	24.4	21.0 –24.4	22.0	1.5
Length of maxillary barbel	12.5	10.0 – 14.6	12.6	1.9
Pre occipital distance	73..2	64.2– 73.2	67.7	3.6
Distance from occiput to dorsal	97.6	92.1–105.3	98.5	4.8
Head length excluding snout	70.0	68.4– 78.9	72.7	4.6



Figure 1. A fresh specimen of *Puntius dolichopterus*, Holotype, ZSI/ANRC-12226



Figure 2. A preserved specimen of *Puntius dolichopterus*, Paratype, ZSI/ANRC-12227

Comparisons: *Puntius dolichopterus* shows similarity to *Puntius nigronotus*, *P. viridis*, *P. nelsoni*, *P. parrah* and *P. madhusoodani* described from rivers of Kerala, *Puntius dorsalis* described from tanks and rivers in the neighborhood of Chennai and *Puntius chola* and *P. sophore* described from Ganges River. *Puntius dolichopterus* differs from *P. nigronotus* Plamoottil (2014) in having 8 pre dorsal scales (vs. 11 in *P. nigronotus*), 23- 24 + 1-2 lateral line scales (vs. 25+2), 8 branched rays in dorsal fin (vs. 9) and 5 branched rays in anal fin (vs. 6). The new species differs from *Puntius viridis* Plamoottil & Abraham (2014) in having 8 pre dorsal scales (vs. 9 in *P. viridis*), dorsal fin devoid of distinct black spots (vs. a row of elongated black spots present), a diffuse spot (vs. deep black blotch) present on caudal base, third

undivided dorsal ray strong (vs. not much strong) and vent located nearer to anal fin DAV 1.3- 1.8 (vs. vent located away from anal front, DAV 2.6- 4.1 % SL). *Puntius dolichopterus* can be distinguished from *Puntius nelsoni* Plamoottil (2014) in having 8 pre dorsal scales (vs. 9), elongated pectoral fin (20.2- 22.2 % SL vs. 17.3- 18.4) reaches ventral fin (vs. not reaches), ventral fin with 8 branched rays (vs. 7) and 3- 4 longitudinal lines present below lateral line (vs. absent) and a longer (30.0- 34.6 % SL vs. 25.7- 26.7) and flatter (HD 67.9 - 80.0 % HL vs. 89.3- 96.2) head. *Puntius dolichopterus* differs from *Puntius parrah* (Day, 1865, 1878, 1889) in having an elongated pectoral fin (20.2- 22.2 % SL vs. 17.6- 19.8 in *P. parrah*) reaches ventral fin (vs. not reaching), ventral fin tip reaches vent (vs. not reaching), a distinct depression present at

the occiput (vs. absent), 3- 4 longitudinal lines present below lateral line (vs. absent) and a short space present between anal fin origin and vent (vs. lacking). *Puntius dolichopterus* is distinguished from *P. dorsalis* (Jerdon, 1849) in having 3½ scales present between lateral line and ventral fin (vs. 2½ scales in *Puntius dorsalis*), shorter snout (22.1- 29.3 % HL vs. 31.8- 37.1), 8 pre dorsal scales (vs. 9) and in lacking (vs. bearing) any color spot on dorsal fin base. *Puntius dolichopterus* differs from *P. madhusoodani* Kumar et al., (2011) in having 8 pre dorsal scales (vs. 9 in *P. madhusoodani*), 8 branched rays in dorsal fin (vs. 7), 5 branched rays in anal fin (vs. 6) and shorter dorsal fin (19.2- 22.0 % SL vs. 25.2- 28.7). The new species differs from *Puntius chola* (Hamilton, 1822) in the presence of 3- 4 longitudinal lines below lateral line (vs. absent in *P. chola*), long pectoral fin reaches (vs. not reaching) ventral fin, inconspicuous caudal spot (vs. conspicuous), 8 pre dorsal scales (vs. 9) and 10 circumpeduncular scales (vs. 11- 12). Unlike to the present fish, a black spot present (vs. absent) at the base of dorsal fin in *P. chola*. *Puntius dolichopterus* differs from *Puntius sophore* (Hamilton, 1822) and *P. stigma* (Valenciennes, 1844) in lacking black spot on the base of dorsal fin (vs. deep black spot present) and in possessing (vs. lacking) barbels. *Puntius dolichopterus* differs from *P. mahecola* ((Valenciennes, 1844) in having 23-24 (vs. 22) lateral line scales, 3½ (vs. 2½) scales between lateral line and ventral fin and last undivided dorsal fin ray osseous, rigid and strong (vs. feebly ossified and flexible).

Conclusions: *Puntius dolichopterus* is an edible fish consumed by the local people living nearby. As it is beautiful, it can also be utilized as an ornamental fish. As it was collected from a polluted water channel flowing through the heart of the Kayamkulam city, it is considered to survive in some extent to contaminated water bodies also.

Comparative materials examined: *Puntius nelsoni*: Holotype: ZSI/WGRC/IR/2353, 91 mm SL, Kallumkal, Manimala River, Kerala, India, 9°20'0''N, 76°30'0''E, coll. Mathews Plamoottil, 21.08.2011; paratypes: ZSI/ WGRC/ IR/ 2354, 3 examples, 81- 84 mm SL, Kallumkal,

Manimala River, Kerala, India, 9°20'0''N, 76°30'0''E, coll. Mathews Plamoottil, 21.08.2011. *Puntius nigronotus*: Holotype: ZSI FF 5285, 82.3 mm SL, India: Kerala, Mananthavady River, Wayanad, coll. Mathews Plamoottil, 01. 01. 2012. *Puntius viridis*: Holotype, ZSI/ WGRC/IR/2382, 81 mm SL, Kallumkal, Manimala River, Kerala, India, 9°20'0''N, 76°30'0''E, coll. Mathews Plamoottil, 21.08.2011; paratypes, ZSI/ WGRC/ IR/2383, 5 examples, 72- 76 mm SL, Kallumkal, Manimala River, Kerala, India, 9°20'0''N, 76°30'0''E, coll. Mathews Plamoottil, 21.08.2011; ZSI FF 4932, 2 examples, 63- 74 mm SL, Manimala River at Kallumkal, Kerala, coll. Mathews Plamoottil, 10. 10. 2012. *Puntius madhusoodani*: Holotype, CRG-SAC 456, 91.4 mm SL, Manimala River, near Thirumoolapuram, Thiruvalla, Kerala, , coll. K. Krishnakumar; 17.11.2010; paratypes, CRG-SAC 457 – 459, 3 examples, 67.6 - 80.9 mm SL, Manimala River, near Thirumoolapuram, Thiruvalla, Pattanamthitta District, coll. K. Krishnakumar and Benno Pereira, 17.11.2010. *Puntius parrah*: ZSI/F 2718, Syntype, 1 example, Kariavannoor River, Kerala, coll. Francis Day, undated; ZSI FF 4934, Topotypes, 4 examples, 65.5- 78.0 mm SL, Arattupuzha, Karavannoor River, Iringalakuda, Kerala, coll. Mathews Plamoottil, 10.01. 2012. *Puntius chola*: ZSI/F 2203, 1 example, 41.5 mm SL, Soni Gaon Bheel, Lokpa, Batipara, Assam, coll. S.L. Hora; 08.11.1939; ZSI/F/2804/2, 2 examples, 32.5- 55 mm SL, Raxanal, Bihar, coll. Keval Singh, 18.03.1958. *Puntius dorsalis*: ZSI/F 2730, 1 example, Madras, coll. Francis Day, undated; ZSI/F 2801, 1 example, 53 mm SL, Usteri tank, 7 miles north west of Pondicherry, coll. A.G.K. Menon; 11.02. 58; ZSI/SRC/F 4954, 2 examples, 52- 53 mm SL, Sethumadai canal, Indira Gandhi Wild Life sanctuary, Tamil nadu, coll. M.B. Reghunathan, 16.02. 1996. *Puntius sophore*: ZSI FF 4938, 2 examples, 58- 59 mm SL, Ganges River, Serrampore, West Bengal, Coll. Mathews Plamoottil, 10.05.2012. *Puntius stigma*: PCMP 35, 5 examples, 72- 86 mm SL, Trichur, coll. Mathews Plamoottil, 10. 02.2010. *Puntius mahecola*: PCMP 40, 7 examples, 70- 87 mm SL, Thiruvalla, coll. Mathews Plamoottil. 20.01.2011.

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