



Puntius madhusoodani (Teleostei: Cyprinidae), a new species of barb from Manimala River, Kerala, South India

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ABSTRACT - *Puntius madhusoodani*, a new species of barb is described from Manimala River, Kerala, South India. This species can be distinguished from all its congeners by the combination of following characters: presence of one pair of short maxillary barbels less than eye diameter and 4.39% in SL, a smaller snout forming 8.06% in SL, 25-26 lateral line scales; dorsal fin inserted nearer to tip of snout, than to caudal fin base; absence of spot at the dorsal fin base; paired fins hyaline, and the branched rays of the dorsal and anal fin tinted with black.

KEY WORDS - Cyprinidae, Manimala River, New species, Western Ghats.

Introduction

The cyprinid genus *Puntius* Hamilton (1822) comprise more than 140 species (Froese and Pauly, 2011) of small to medium sized barbs found in stagnant pools to fast flowing streams of tropical Asia (Jayaram, 1991). Due to their attractive appearance, many species within this genus are popular as aquarium pets and are extensively traded. Currently, over 60 species of *Puntius* are known from India (Froese and Pauly, 2011) mainly from the drainages of the Western and Eastern Ghats, as well as the Eastern Himalayas.

Puntius known as a 'catch-all genus' is suspected to be polyphyletic (Vishwanath and Linthoingambi 2010). Despite a revision of this genus by Jayaram (1991), the taxonomy of the genus continues to be ambiguous. There is a general consensus that when fully revised many species will be placed into new or different genera (Anon 2007-2012). According to Roberts (1989), genus *Puntius* can be distinguished by the following characters: variable number of barbels; presence of both rostral and maxillary (*Puntius sarana*

Hamilton 1822), only with maxillary barbels (*Puntius chola* Hamilton 1822), or without barbels (*Puntius narayani* Hora 1937); dorsal fin with the last simple ray serrate or entire, and branched rays usually eight in number.

In the recent past, there has been a great increase in taxonomic studies of the genus *Puntius*, leading to the description and re-validation of several species especially from the southern Western Ghats (Pethiyagoda and Kottelat 2005a & 2005b, Devi *et al.*, 2010, Knight *et al.*, 2011).

A recent survey by the authors in Manimala River in Kerala state, India, as part of the River Fish Monitoring Program, of the State Biodiversity Board resulted in the collection of four specimens that could not be readily assigned to any of the known species under the genus *Puntius*. We describe this fish as a new species, *Puntius madhusoodani* based on detailed morphometric analysis.

Materials and Methods

Measurements were made on the left side of the specimens with a dial caliper to the nearest 0.01 mm following Pethiyagoda and Kottelat (2005a) and Pethiyagoda *et al.*, (2008). Fork length was measured as the length from the tip of the snout to the end of the middle caudal fin rays; gape width was measured as the widest position of the lips, distance from the occiput to fins was measured as the distance between occiput to the respective fins and the pre-occipital length is the distance between snout and occiput. All morphometric measurements have been calculated as percentages of standard length (SL). Type specimens are deposited in the museum of the Conservation Research Group, St. Albert's College, Kochi, India.

Abbreviations: BMNH - The Natural History Museum, London; MNHN - Muséum National d'Histoire Naturelle, Paris; CRG-SAC - Conservation Research Group, St Albert's College, Kochi.

Puntius madhusoodani sp. nov. (Fig. 1)

Holotype: CRG-SAC 456; 91.43mm SL; INDIA. Manimala River, near Thirumoolapuram, Thiruvalla, Pattanamthitta District, Kerala, India, 9.3618° N, 76.5880° E, 8.5m ASL (Fig. 2); K. Krishnakumar; 17th November 2010.

Paratypes: CRG-SAC 457 - 459; 67.6 - 80.91mm SL; INDIA. Manimala River, near Thirumoolapuram, Thiruvalla, Pattanamthitta District, Kerala, 9.3618° N, 76.5880° E, 8.5m ASL (Fig. 2); K. Krishnakumar and Benno Pereira; 17th November 2010.

Diagnosis: *Puntius madhusoodani* can be distinguished from all its congeners by the combination of following characters: presence of one pair of short maxillary barbels less than eye diameter and 4.39% in SL, absence of spots on the body except at the caudal fin base (unlike *P. chola* and *P. dorsalis*), a smaller snout forming 8.06% in SL, and 25-26 lateral line scales; dorsal fin inserted nearer to tip of snout than to caudal fin base; absence of spot on the dorsal fin base; paired fins hyaline, branched rays of the dorsal and anal fin tinted with black.

Description: General body shape and appearance is shown in Fig. 1. Morphometric data of the holotype and paratypes are provided in Table 1. Body elongate, laterally compressed; profile rising up to dorsal, and then decreasing rapidly to the end of anal fin; head length less than one third of SL; eyes small, with a diameter of 8.55-11.14% SL, positioned nearer to snout than to

opercular margin; interorbital width wide, greater than eye diameter; snout length less than eye diameter (Fig. 3); mouth small and sub-terminal; a single pair of small maxillary barbels present, less than half of eye diameter; dorsal fin inserted nearer to tip of snout than to caudal-fin base, with three simple rays and seven soft branched rays. The last simple ray of the dorsal fin is fused to the second last one; pectoral fin short, with one simple and 14 branched rays; pelvic fin with two simple, and eight branched rays, its origin slightly posterior to dorsal-fin origin; both pectoral and pelvic fins short, not reaching pelvic and anal-fin origins, respectively; anal fin is situated near the hypural fold with two simple and six branched rays; caudal fin with 1+9+8+1 principal rays, deeply forked, with equal, pointed lobes; lateral line complete, with 25(1) scales on body, including one scale on the caudal-fin base; predorsal scales nine; four rows of scales present between dorsal-fin origin and lateral line, and three rows of scale between lateral line and pelvic fin.

Colouration: In life (Fig. 4), adults dusky black dorsally and silvery-white ventrally. A diffused, dark band about two scales width extends from the 22nd to the 24th lateral line scale. Fins dusky to dirty yellow. In formalin, head and body dorsally brownish olive, laterally creamy white; lower body, belly and chest pale cream-yellow. Paired fins hyaline/creamish. A faint dark-brown blotch is visible at the caudal base in all the specimens.

Etymology: The species is named after Prof. Dr. B. Madhusoodana Kurup, honoring his contribution to the taxonomy and conservation of freshwater fishes of Kerala. The species name is formed as a noun in the masculine genitive singular.

Distribution: *Puntius madhusoodani* sp. nov. is currently known only from the Manimala River. (Fig. 2) in Kerala state, India

Discussion

Puntius madhusoodani is related to *P. chola*, *P. mahecola*, *P. parrah*, *P. dorsalis*, *P. sophore* and *P. amphibius* (Fig. 5). However, the new species differs from *P. chola* in having 2 branched rays and 6 unbranched rays in the anal fin (*vs.* 2 branched ray and 5 unbranched rays), lesser predorsal scales (9 *vs.* 11-12) and lacking prominent spots in the dorsal fin base.

Puntius madhusoodani also shows similarity in body shape with *P. mahecola* (Valenciennes 1844) long misidentified or considered a junior synonym of *P. filamentosus*. Pethiyagoda and Kottelat (2005a) re-erected the species with freshly collected topotypes and



Fig 1. *Puntius madhusoodani* Holotype, CRG-SAC-456, India; Kerala; Manimala River



Fig. 2. Map showing type locality of *Puntius madhusoodani*

designated MNHN 3896 as lectotype. The data of *P. mahecola* lectotype and four paralectotypes are taken from Pethiyagoda and Kottelat (2005a). The new species can however be distinguished from the latter in having lesser number of dorsal fin rays with three branched and seven unbranched (vs. three branched and 8.5 unbranched rays), more predorsal scales - nine (vs. 8); bigger eyes (10.70 % SL vs. 8.60% SL), lesser pre-

dorsal length (34.91 % SL vs. 53.3 % SL) and having higher body width (18.95 % SL vs. 14.4% SL). The new species differs from *P. parrah* (Day, 1865) described from Karivanoor river in Kerala, by the combination of following characters: fins inserted to the tip of the snout than caudal fin base (vs. equidistant in *P. parrah*), nine predorsal scales (vs. eight predorsal scales) and short maxillary barbels, less than 2/3 of eye diameter



Fig. 3. Snout of *P. madhusoodani* Holotype, CRG-SAC-456, India; Kerala; Manimala River



Fig. 4. Fresh specimen of *P. madhusoodani* showing colouration (not preserved)

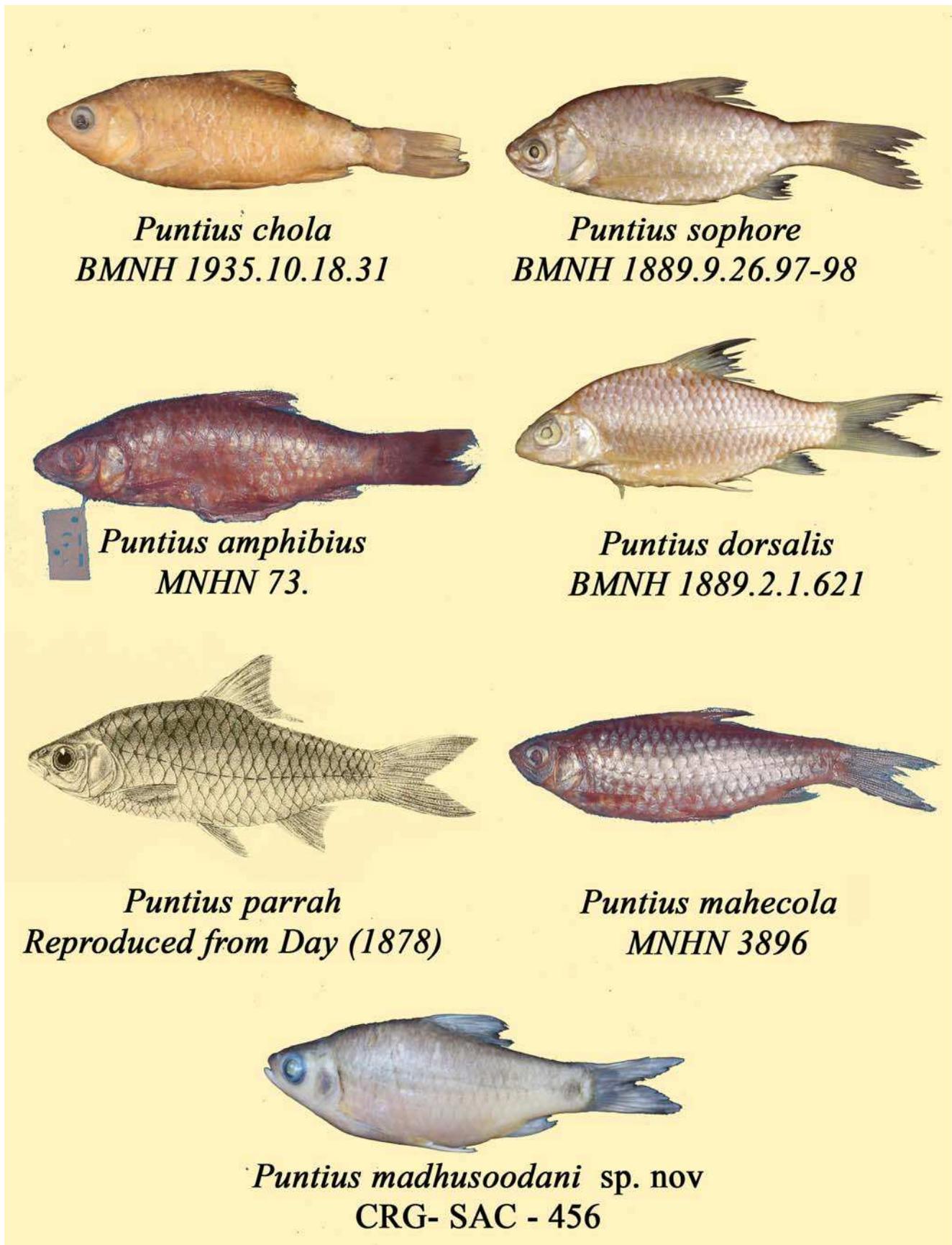


Fig. 5. General body shape and appearance of *Puntius madhusoodani* and congeners

Table 1. Morphometric data for *Puntius madhusoodani* (n=4)

Characters	Holotype	Paratypes (n = 3)	Mean (holotype+ paratypes)	Standard deviation
Standard length (in mm)	91.43	67.6-80.91		
In % SL				
Fork length	112.65	114.55-118.34	114.91	2.43
Body depth	34.87	34.47-36.21	35.02	0.82
Body width	19.09	17.61-18.97	18.53	0.67
Head length	27.05	27.48-29.51	28.01	1.07
Head depth	21.87	20.69-23.08	21.59	1.14
Head width	15.13	15.02-16.72	15.63	0.78
Eye diameter	8.53	8.55-11.54	9.45	1.42
Snout length	7.97	7.30-9.17	8.06	0.80
Inter orbital width	11.35	11.82-12.01	11.75	0.28
Pre dorsal length	50.32	49.31-50.63	51.09	2.09
Post dorsal length	58.64	50.20-55.59	54.32	3.62
Pre pelvic length	46.48	47.91-50.31	48.75	1.89
Dorsal fin depth	26.50	25.16-28.70	26.94	1.49
Length of dorsal fin base	19.91	19.02-19.52	19.45	0.37
Anal fin length	21.52	19.23-20.68	20.23	1.07
Length of anal fin base	11.90	8.91-11.53	10.88	1.35
Pectoral fin depth	19.49	17.90-20.23	18.95	1.10
Length of pectoral fin base	4.07	3.70-3.96	3.90	0.16
Pelvic fin depth	21.57	18.85-21.89	20.49	1.47
Length of pelvic fin base	6.73	5.98-7.05	6.47	0.50
Post orbital length	12.42	12.65-14.20	13.15	0.80
Inter narial distance	5.36	5.22-6.70	5.89	0.72
Maxillary barbel length	4.63	3.86-4.25	4.39	0.43
Gape width	6.51	6.60-7.50	6.83	0.45
Pre anal length	70.00	67.61-74.29	70.95	2.84
Depth of caudal peduncle	13.65	12.83-14.57	13.63	0.72
Length of caudal peduncle	16.95	12.57-17.50	15.53	2.22
Distance from dorsal fin origin to pelvic fin	33.72	31.89-32.07	33.65	2.33
Distance from the occiput to dorsal fin	30.95	28.65-31.18	30.35	1.16
Distance from the occiput to pectoral fin	22.13	20.29-21.15	20.98	0.86
Distance from the occiput to pelvic fin	38.97	34.77-38.59	37.81	2.03
Distance from the occiput to anal fin	58.93	55.47-59.10	57.71	1.69
Pre occipital length	19.25	18.98-22.93	20.16	1.86

(vs. 2/3 of eye diameter), have less lateral line transverse scale 4/3 (vs. 5/5). *Puntius madhusoodani* differs from *P. dorsalis* (Jerdon, 1848-1849) in having three unbranched and seven branched rays in dorsal fin (vs.

three unbranched and eight branched rays), lacking a black spot on the base of dorsal fin (vs. present), insertion of dorsal fin nearer to the snout than to the caudal fin base (vs. nearly midway between the end of the snout

and base of the caudal fin base. Jayaram (1991) however suggest that *P. dorsalis* has its dorsal fin inserted nearer caudal fin base than tip of the snout. The new species can further be distinguished from *P. dorsalis* by its shorter caudal fin with a length of 12.57- 17.50 % SL (vs. 18.8 - 20 % SL) and in having a smaller snout. *Puntius madhusoodani* can also be distinguished from *P. sophore* (Hamilton, 1822) by the absence of spot on the dorsal fin base and presence of only one pair of maxillary barbels (vs. absent or with two pairs) and from *P. amphibius* (Valenciennes, 1842) by having greater body depth 35.02% SL vs. 30.1% SL.

Comparitive material

Barbus amphibius BMNH 1938.2.22.65.74, 1 ex Nasik, India
Barbus chola BMNH 1935.10.18.31, 1 ex Hyderabad, India
Barbus dorsalis BMNH 1889.2.1.621, 1 ex Madras, India
Barbus sophore BMNH 1889.9.26.97-98, 2 ex Rajputana, India
Puntius sophore CRG-SAC 2004.415, 1 ex Bharathapuzha, India
Puntius amphibius CRG-SAC 2004.417, 1 ex Vembanad Lake, India
Puntius parrah CRG-SAC 2002.420, 1 ex Karivanoor River, India.

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