

Original Research

Puntius viridis (Cypriniformes, Cyprinidae),
a new fish species from Kerala, India

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ABSTRACT:

Taxonomic analysis of eight specimens of a cyprinid fish collected from Manimala River, Kerala, India revealed that they present several morphological differences from their congeners. The new species, *Puntius viridis*, is diagnosed by a combination of the following characters: eyes clearly visible from below ventral side; head depth lesser; one row of prominent elongated black spots on the middle of dorsal fin; a black band formed of dark spots present outer to operculum. 25-26 lateral line scales; 4½- 5½ scales between lateral line and dorsal fin; moderate scales on the breast region

Keywords:

Fish, New species, *Puntius parrah*, Manimala River, Kallumkal.

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INTRODUCTION

The tropical Asian cyprinid genus *Puntius* contains 120 valid species (Pethiyagoda *et al.*, 2012). The genus as currently known (Pethiyagoda *et al.*, 2012) is characterized by the absence of rostral barbels, last unbranched dorsal fin ray smooth, dorsal fin with 3-4 unbranched and eight branched rays, anal fin with three unbranched and five branched rays, lateral line complete with 22- 28 pored scales, presence of free uroneural, simple and acuminate gill rakers and presence of a post-epiphysial fontanelle.

Jayaram (1991) revised the fishes of the genus *Puntius* from the Indian region. He classified different species of *Puntius* into 10 groups with 14 complexes. But it is now understood that five lineages are present within South Asian genus *Puntius*, which are recognized as distinct genera namely *Puntius*, *Systomus*, *Dawkinsia*, *Haludaria* and *Pethia*. (Pethiyagoda *et al.*, 2012; Pethiyagoda, 2013); of these *Puntius* and *Dawkinsia* are the common cyprinid fishes of the country. In Kerala different species of *Puntius* preponderate in number than any other scaled fresh water fishes.

Since the presently described specimens from Manimala River did not have rostral barbels, possession of smooth last unbranched dorsal ray and was similar in morphology to the genus *Puntius* (*sensu stricto*), the authors compared the specimens with comparative materials of the currently known species in that genus and found that the new species differs in enough characters to distinguish it from other similar fishes of the genus. So it is described here as a new species *Puntius viridis*. The descriptions are based on eight specimens collected from main stream of Manimala River at Kallumkal.

MATERIALS AND METHODS

Fishes were collected using cast nets and preserved in 10% formalin. Methods used are those of Jayaram (2002) and measurements follow standard

practices. In the table values of holotype as percentages are given first, then ranges (holotype + paratypes) as percentages followed by their mean values. Body depth and body width were measured both at dorsal-fin origin and anus, vertically from dorsal-fin origin to belly, and from anus to dorsum, respectively.

Abbreviations

ZSI/WGRC/IR-Identified Register, Zoological Survey of India, Western Ghats Regional Centre, Kozhikode; ZSI/SRC-Zoological Survey of India, Southern Regional Centre, Chennai; ZSI- Zoological Survey of India, Kolkata; UOK/AQB- University of Kerala, Department of Aquatic Biology, Kariavattom, Thiruvananthapuram; CRG-SAC- Conservation Research Group, St. Albert's College, Kochi; STC/DOZ- St. Thomas College, Kozhencherry, Department of Zoology; BDD- Body Depth at Dorsal origin; BDA- Body Depth at Anal origin; BWD- Body Width at Dorsal origin; BWA- Body Width at Anal origin; PROD-Pre Occipital Distance; D-OD- Distance from Occiput to Dorsal fin origin; LCP- Length of Caudal Peduncle; DCP - Depth of Caudal Peduncle; DP-PL- Distance from Pectoral fin to Pelvic fin; DPL-A- Distance from Pelvic fin to Anal fin; DA-C- Distance from Anal fin to Caudal fin; DAV- Distance from Anal to Vent; DVV- Distance from Ventral to Vent; LMB- Length of Maxillary Barbels; LLS- Lateral Line Scales; PDS- Pre Dorsal Scales; PRPLS- Pre Pelvic Scales; PRAS- Pre Anal Scales; CPS- Circum Peduncular Scales; LL/D- Scales Between Lateral Line and Dorsal fin; LL/V- Scales between Lateral Line and Ventral fin; LL/A- Scales between Lateral Line and Anal fin; L/TR- Lateral Transverse Scales; D- Dorsal fin; P- Pectoral fin; V- Ventral fin; A- Anal fin; C- Caudal fin; HT- Holotype; PT- Paratype.

Puntius viridis, sp. nov.,

<http://zoobank.org/urn:lsid:zoobank.org:act:7569C0D4-1236-473F-AE67-541C6A4C9A10>

(Figures 1-4, 5. F & Tables 1 & 2)

Type materials examined

Holotype

ZSI/ WGRC/IR/2382, 81 mm SL, Kallumkal, Manimala River, Kerala, India, 9°20'0"N, 76°30'0"E, collected by Mathews Plamoottil, 21.08.2011.

Paratypes

ZSI FF 4932, 2 examples, 63- 74 mm SL, Manimala River at Kallumkal, Kerala, India, collected by Mathews Plamoottil, 10. 10. 2012.

ZSI/ WGRC/ IR/2383, 5 examples, 72- 76 mm SL, Kallumkal, Manimala River, Kerala, India, coll. Mathews Plamoottil, 21.08.2011.

RESULTS AND DISCUSSION

Diagnosis:

Puntius viridis can be differentiated from *P. dorsalis* in having a terminal mouth (vs. sub terminal mouth), a comparatively short snout (22.7- 31.8 vs. 31.8 - 37.1 in % of HL), LL/V 3½ (vs. 2½) and caudal fin with 18- 19 rays (vs.17). The new species differs from *Puntius sophore* in having 10- 12 pre anal scales (vs. 13 pre anal scales in *P. sophore*), 3½ scales between lateral line and anal fin (vs. 4½), a black band present outer to operculum (vs. black band absent), a black blotch present in front of occiput (vs. black blotch absent) and absence of spot on the base of dorsal fin (vs. black spot present at the base of dorsal fin), body depth at dorsal origin 31.5-



Figure 1: *Puntius viridis*, sp. nov, (fresh specimen), Paratype, 76 mm SL, ZSI/WGRC/IR/2383.



Figure 2: *Puntius viridis*, sp. nov, (preserved in formalin), Holotype, 81 mm SL, ZSI/ WGRC/IR/2382.



Figure 3: Dorsal fin of *Puntius viridis*



Figure 4: Head region of *Puntius viridis*

33.8 in % of SL (vs. 36.2- 37.3), eye diameter 26.1- 31.6 in % of HL (vs. 34.7- 36.0) and head depth 68.2- 80.0 in % of HL (vs. 80.3- 86.7). The new species differs from *Puntius parrah* in having nine pre dorsal scales (vs. 8 in *P. parrah*), a deep black caudal spot (vs. diffused caudal spot), green dorsal and caudal fin (vs. dusky dorsal and caudal fin), longer head, 26.4- 31.1 % of SL (vs. 25.6- 26.0), shorter caudal peduncle, 16.3- 17.8 % of SL (vs. 19.1- 21.2) and shorter head depth (68.2-80.0 vs. 84.2- 89.5 % of HL); the new species differs from *Puntius madhusoodani* in having 4½- 5½ scales between lateral line and dorsal fin (vs. 4 scales), 8 branched rays in dorsal fin (vs. 7), 5 branched rays in anal fin (vs. 6), a deep black caudal spot (vs. diffused caudal spot) and lesser body depth at dorsal fin origin (31.5- 33.8 vs. 34.5 - 36.2); the new species can be differentiated from *Puntius chola* in having 8 anal fin rays (vs. 7 in *P. chola*), 10-12 pre anal scales (vs. 12-13), 9- 10 circumpeduncular scales (vs. 11- 12), protrusible mouth (vs. non- protrusible mouth) and a row of black spots present in the middle of dorsal fin (vs. absent).

Description:

General body shape and appearance is shown in Figures 1- 4. Morphometric data as in Table 1 and meristic counts as in Table 2. Body laterally compressed; dorsal and ventral profiles convex; region from dorsal front to occiput a little bent, 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, protruding above the surface of head and distinctly visible from below the ventral side; inter orbital region slightly convex; nostrils situated nearer to eyes than to snout tip and covered by a flap originating from the anterior end; jaws equal, upper jaw broader than lower jaw; tip of upper jaw a little bulging and so can be easily demarcated from the rest of it; barbels one pair maxillaries only, shorter than orbit, feeble and never reach the eyes or nostrils; mouth terminal, slightly upturned and protruding; width of gape of mouth shorter than inter narial distance; operculum rigid and moderately hard.

Dorsal fin originates considerably behind the pectoral tip and a little behind the ventral origin, upper margin fairly concave, first ray very minute, soft and seemingly absent, commonly fused to second ray which is slightly osseous, soft, tip a little filamentous, form a little less than ½ and above 1/3 of the third ray; third ray osseous but not much strong, tip filamentous, inner margin slightly roughened but not serrated. Last dorsal ray branched to root and so considered as one. Pectoral tip just reaches or reach nearer to ventral origin; its upper margin convex. Ventral originates just in front of dorsal origin and a little behind pectoral tip; its tip never reaching anal origin, but only reaching the vent; upper

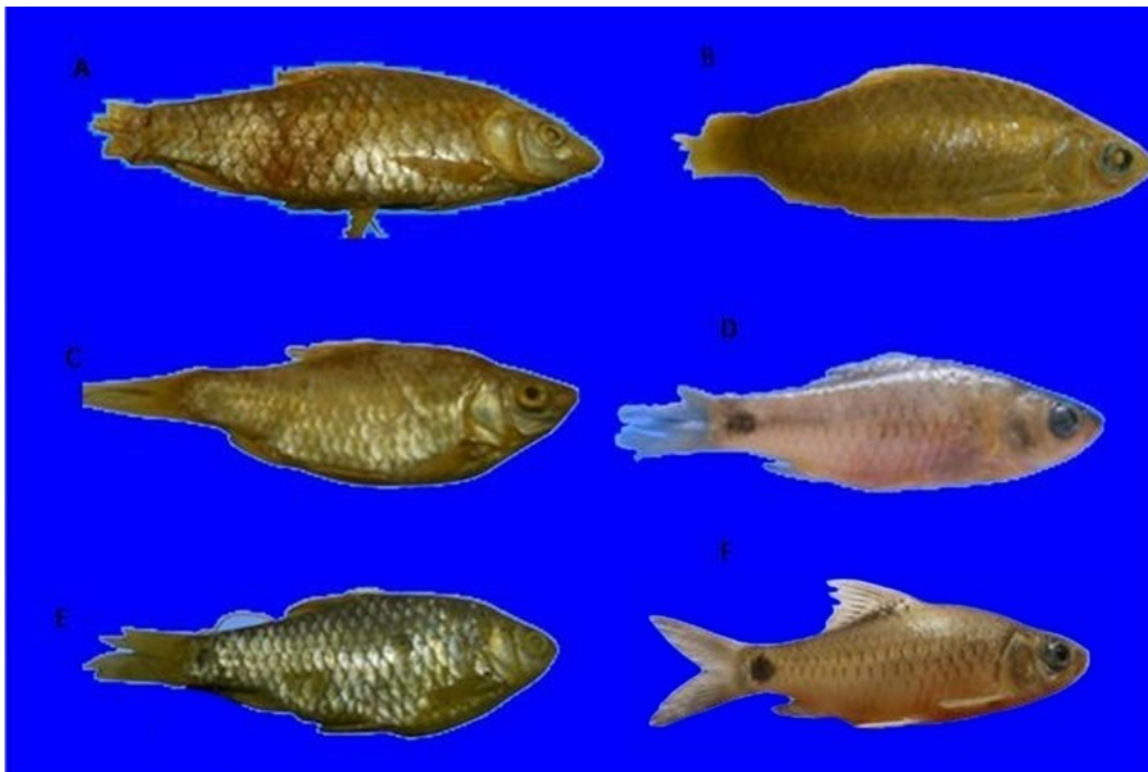


Figure 5: General body shape and appearance of *Puntius viridis* and relative species.
A. *Puntius dorsalis* ZSI/F 2730 (coll. Francis Day) B. *P. parrah* ZSI/F 2718 (coll. Francis Day) C. *P. chola* ZSI/F 2804 D. *P. madhusoodani* Paratype CRG-SAC 457 E. *Puntius sophore* ZSI/F 13827 F. *P. viridis* Holotype, SL, ZSI/ WGRC/IR/2382.

margin of ventral fin convex; two 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, form $2\frac{1}{2}$ of the length of ventral. Anal roughly rectangular, upper margin fairly concave, originates a little in front of dorsal tip, considerably behind the ventral tip and a little behind anal opening; its tip never reach caudal base; no prominent ridge on the base of anal; considerable distance in between anal fin origin and vent; first anal ray small; unbranched rays are slightly osseous; last anal ray not divided to root. Caudal lobes equal.

Scales relatively large, not easily deciduous and clearly countable; scales on the breast region moderate. Lateral line passes through lower half of the body and fairly distinct throughout.

Coloration:

Fresh specimens:

Dorsal and dorso lateral sides green to silvery green; ventro lateral sides silvery green; eyes greenish blue; a prominent yellowish green rectangular spot on opercle; a black band formed of dark spots present outer to operculum; a black blotch present just in front of occiput, in the middle of it present a small elongated depression; dorsal and caudal fins light green, pectoral and anal light green to hyaline, distal end of anal black; ventral hyaline to white. A row of distinct black spots present on the middle of dorsal fin; a deep black caudal blotch present well behind anal tip on 20-22 or 21-23 or 23-25 scales; 2- 3 rows of mid lateral scales have dark spots at its base, so appear to have 2-3 broken lines on mid lateral side.

Table 1: Morphometric characters of *Puntius viridis* and its relative species from Kerala

SL.No.	Characters	<i>Puntius viridis</i> sp. ov.		Mean	SD	<i>P. parrah</i> ZSI/F2718,4934 (n=5)	<i>P. madhusoodani</i> CRG/SAC 456- 459 (n=4)
		HT	Range HT+PT (n=8)				
1	Total length (mm)	103.0	91.2 -103.0	96.5	4.04	86.5 - 102.0	90.5 - 118.3
2	Standard Length (mm)	81.0	72.0 - 81.0	74.9	3.26	65.5 - 78.0	67.6 - 91.4
% SL							
3	Head length	28.4	26.4 - 31.1	28.7	1.75	25.6 - 26.0	27.5 - 29.5
4	Head depth	22.2	19.7 - 22.9	21.6	1.13	21.6 - 24.0	20.7- 23.1
5	Head width	16.7	15.8 - 17.8	17.1	0.45	15.4 - 17.6	15.0 - 16.7
6	BDD	33.3	31.5 - 33.8	32.9	0.94	32.1 - 33.1	34.5 - 36.2
7	BDA	22.2	21.1 - 23.9	22.6	0.98	23.7 - 24.4	22.1 - 23.7
8	BWD	18.5	16.2 - 19.1	17.7	1.16	17.3 - 19.7	17.6 - 19.1
9	BWA	12.3	10.8 - 13.2	12.2	0.88	13.4 - 15.2	11.7 - 14.5
10	PROD	19.1	18.9 - 23.0	20.9	1.22	20.5 - 24.3	18.9 - 22.9
11	D-OD	30.6	30.4 - 31.7	30.9	0.31	24.3 - 29.8	29.0 - 32.9
12	Pre-dorsal length	50.6	48.2 - 54.8	52.2	1.61	50.0 - 52.1	49.3 - 50.6
13	Post-dorsal length	50.6	48.2 - 54.8	52.2	1.61	48.7 - 53.5	50.2 - 58.6
14	Pre-pectoral length	27.2	25.8 - 29.7	28.3	0.92	27.0 - 28.2	26.2 - 28.9
15	Pre-pelvic length	49.4	47.9 - 50.0	49.0	0.73	47.2 - 51.3	46.5 - 50.3
16	Pre-anal length	72.2	72.2 - 76.6	73.3	1.68	70.3 - 74.4	67.6 - 74.3
17	Length of dorsal fin	23.5	22.4 - 26.5	24.2	1.58	22.1 - 24.4	25.2 - 28.7
18	Length of pectoral fin	17.3	16.7 - 19.7	18.5	1.19	17.6 - 19.8	17.7 - 19.1
19	Length of pelvic fin	17.3	17.3 - 20.3	19.0	1.13	20.3 - 21.4	20.7 - 21.1
20	Length of anal fin	14.8	14.8 - 18.9	17.4	1.58	13.3 - 16.8	19.2 - 21.5
21	Length of caudal fin	29.5	29.3 - 30.0	29.6	0.20	28.4 - 32.1	24.8 - 27.0
22	Length of base of dorsal fin	18.5	17.6 - 19.2	18.5	0.60	18.0 - 21.0	19.0 - 20.0
23	Length of base of anal fin	9.8	9.8 - 11.1	10.7	0.43	12.0 - 15.4	9.0 - 12.0
24	Length of base of pectoral fin	4.3	4.1 - 5.3	4.5	0.48	3.3 - 4.2	3.7 - 4.1
25	Length of base of pelvic fin	5.2	5.0 - 6.9	5.9	0.77	4.2 - 5.4	6.0 - 7.1

26	Length of base of caudal	13.6	13.5 - 14.2	13.8	0.34	12.2 - 14.1	12.4 - 13.8
27	Length of caudal peduncle	17.3	16.3 - 17.8	17.0	0.62	19.1 - 21.2	12.6 - 17.5
28	Depth of caudal peduncle	13.6	13.5 - 14.5	13.8	0.37	12.9 - 13.5	12.8 - 14.6
29	LCP/DCP	78.6	77.0 - 88.0	81.2	3.20	63.6 - 74.3	73.1 - 84.6
30	Width of caudal peduncle	7.4	5.5 - 7.4	6.5	0.77	4.1 - 5.4	6.2 - 6.6
31	DP- PL	21.0	21.0 - 21.6	21.4	0.20	20.4 - 20.9	22.8 - 25.0
32	DPL-A	24.2	23.8 - 25.0	24.3	0.60	24.3 - 26.8	25.0 - 28.9
33	DA-C	26.0	25.9 - 27.5	26.6	0.51	27.7 - 29.6	25.5 - 27.0
34	DAV	3.7	2.6 - 4.1	3.2	0.61	—	4.8 - 6.6
35	DVV	22.8	19.1 - 22.8	21.2	1.29	23.0 - 25.6	22.4 - 23.4
% HL							
36	Head depth	78.3	68.2 - 80.0	74.3	4.26	84.2 - 89.5	95.0 - 100.0
37	Head width	58.7	56.5 - 63.2	59.8	2.52	60.0 - 68.4	55.0 - 61.9
38	Eye diameter	30.4	26.1 - 31.6	29.6	2.07	32.5 - 36.8	27.5 - 33.3
39	Inter orbital width	39.1	31.6 - 40.9	37.5	3.37	42.1 - 42.5	37.5 - 41.9
40	Inter narial width	28.3	23.9 - 28.9	26.8	1.95	23.5 - 30.0	25.0 - 28.6
41	Snout length	30.4	22.7 - 31.8	29.1	3.39	26.3 - 30.0	28.6 - 30.0
42	Width of gape of mouth	26.1	23.0 - 27.3	25.5	1.53	28.9 - 30.0	25.0 - 27.6
43	LMB	17.4	13.0 - 21.1	17.8	3.69	15.0 - 17.6	14.3 - 15.0

Preserved specimens:

Dorsal and upper lateral sides blackish green, lower lateral and ventral sides whitish yellow; spot on the operculum becomes brownish black colored; a greenish line present above the ventral origin to caudal spot which is distinct in some specimens in preserved condition; pectoral, pelvic and anal becomes hyaline, dorsal and caudal become dirty black, base of caudal turns to black.

Distribution:

Puntius viridis sp. nov is presently known only from Manimala River, Kerala, India.

Habitat:

Manimala River at Kallumkal the type locality of *P. viridis* is blanketed by mud dominant sediments. Sand occurs as discrete patches within the mud dominant

deposits. The depth and width of the channel at Kallumkal ranges from 1 to 10 and 30 to 85 m respectively. The reach has a bank height of 1 to 2 m from the general water level. Riparian vegetation is moderate. Dominant flora include *Bambusa bambos*, *B. vulgaris*, *Hibiscus tiliaceus* and *Ochreinauclea missionis*. The other species include *Thespesia populnea*, *Artocarpus heterophyllus*, *Areca catechu*, *Anacardium occidentale*, *Aporosa lindleyana* and *Ficus exasperata*. *Cynodon dactylon* and *Cymbopogon flexuosus* are major grass species in this area. *Rasbora daniconius*, *Osteobrama bakeri*, *Amblypharyngodon microlepis*, *Dawkinsia filamentosa*, *Haludaria fasciatus*, *Puntius parrah*, *Systemus subnasutus*, *Pethia ticto*, *Gonoproktopterus kurali*, *Catla catla*, *Labeo rohita*, *Labeo dussumieri*, *Cirrhinus mrigala*, *C. cirrhosus*,

Table 2: Meristic Counts of *Puntius viridis* sp.nov and its relative species

SL No	Counts	<i>Puntius viridis</i> (n=8)		<i>P.parrah</i> ZSI/ F2718, STC/ DOZ 20 (n=5)	<i>P. madhusoodani</i> CRG/SAC 456- 459 STC/DOZ 21(n=6)	<i>P. chola</i> ZSI/F2203, 4009(n=2)	<i>P. dorsalis</i> ZSI/ F2730,ZSI/ SRC4954 (n=3)	<i>P. sophore</i> ZSI/ F13827, STC/ DOZ 22 (n=3)
		Holotype	Range					
Scale Counts								
1	LLS	25	25 - 26	25	25 - 26	26 - 28	25 - 26	25
2	PDS	9	9	8	9	9	9	9
3	PRPLS	5	5	6	6	5 - 6	5 - 6	5
4	PRAS	11	10 - 12	14	14	12 - 13	11 - 13	13
5	CPS	10	9 - 10	10	10	11 - 12	9 - 10	10
6	LL/D	4½	4½ - 5½	5½	4	4½ - 5	4 ½ - 5 ½	5½
7	LL/V	3½	3½	3½	3	3 - 3½	2 ½	3½
8	LL/A	3½	3½	3½	3½	3½	3 ½	4½
9	L/TR	5 ½ / 3½	5 - 5½ / 3½	5/4	5 / 3½	5½ / 4½	5 ½ / 2½	5½ / 4½
Fin Ray Counts								
10	D	iii , 8	iii , 8	iii , 8	iii , 7	iii , 8	iii , 8	iii , 8
11	P	i , 14	i , 14	i , 14	i , 14	i , 13-16	i , 14-15	i , 13-14
12	V	i , 8	i , 8	i , 8	ii , 8	i , 8	i , 7	i , 8
13	A	iii , 5	iii , 5	ii , 5	ii , 6	iii , 5	iii , 5	iii , 5
14	C	18	18 - 19	19	19	19	17	18

Horabagrus brachysoma, *H. melanosoma* *Mystus indicus*, *Wallago attu* etc are some of the co- occurring species.

Etymology:

Species name comes from the Latin word *viridis* meaning green, an adjective, given here in reference to greenish colored body and fins of the new species.

Comparisons:

Puntius viridis is related to *Puntius parrah*, *P. madhusoodani*, *P. dorsalis*, *P. chola* and *P. sophore* (Figure 5). *Puntius dorsalis* (Jerdon, 1849) [Figure.5 A] was described from the fresh water bodies of Madras (Jayaram, 1991; Talwar & Jhingran, 1991; Pethiyagoda *et al.*, 2008). It differs from the new species in many meristic and morphometric characters (Table 2). In *Puntius dorsalis* a black spot present at the posterior portion of the base of dorsal fin (vs. no black spot in the

present species), mouth sub terminal (vs. mouth terminal), dorsal fin inserted nearer to caudal fin base than tip of snout (vs. dorsal fin inserted in the middle between snout tip and caudal base), 2½ scales present in between lateral line and pelvic fin (vs. 3½ scales), caudal fin with 17 rays (vs. 18 or 19 caudal rays) and snout length 31.8-37.1 (vs. 22.7- 31.8) in percent of head length, dorsal fin inserted in front of ventral (vs. dorsal originates a little behind ventral fin) and black spots absent in the middle of dorsal fin (vs. one row of prominent elongated black spots present on the middle of dorsal fin).

Puntius parrah Day (1865, 1878 and 1889) [Figure. 5. B] of Karavannoor River of Kerala shows distinct differences to the new species. In *P. parrah*, a dark bluish line present along mid lateral line, which is more distinct in preserved state (vs. dark bluish line

absent in fresh or preserved condition in the new species), eyes golden (vs. greenish blue), pectoral, ventral and anal tinged with yellow (vs. pectoral and anal light green to hyaline, ventral hyaline to white), dorsal and caudal are dusky (vs. dorsal and caudal are green), 8 pre dorsal scales (vs. 9), 6 pre pelvic scales (vs. 5), 14 pre anal scales (vs. 10-12), dorsal fin originate just over ventral fin (vs. dorsal fin originate a little behind ventral origin), caudal spot diffused (vs. caudal spot deep black), smaller head (25.6- 26.0 % of SL vs. 26.4- 31.1 % of SL), greater head depth at occiput, 84.2- 89.5 % of HL (vs. 68.2- 80.0 % of HL), longer anal fin base (12.0- 15.4 % of SL vs. 8.8- 11.1), longer caudal peduncle (19.1- 21.2 % of SL vs. 16.3- 17.8) and greater distance between ventral to vent (23.0- 25.6 % of SL vs. 19.1- 22.8). Above all, in the present species, just in front of occiput a black blotch present, in the middle of which is a small elongated depression, a black band present outer to operculum, 2-3 broken lines on mid lateral side, a row of elongated green dots on dorsal fin and a row of distinct black spots present in the middle of the anal which are all absent in *P. parrah*.

Puntius viridis sp. nov resembles *Puntius chola* (Hamilton) [Figure. 5. C] of Gangetic plains in having a blotch on caudal base, possession of a single pair of maxillary barbels and in the number of ventral fin rays (Hamilton, 1822; McClelland, 1839; Nath & Dey, 2000); however, the new species shows differences to *P. chola* in a number of characters. In *P. chola* anal fin has seven rays (vs. eight rays in new species), no scale like appendants above ventral fins (vs. an axillary ventral scale present), a slight ridge present along the middle of lower jaw (vs. no ridge along the middle of lower jaw), arch of the back rising abruptly from the nape to the base of the dorsal (vs. arch of back rising gradually from the nape to the base of dorsal), a dark mark present along the base of anterior dorsal ray (vs. dark mark absent), lateral line scales are 26- 28 (vs. 25- 26), pre anal scales 12- 13 (vs. 10-12), circum peduncular scales 11- 12 (vs. 9-10),

width of gape of mouth 19.0- 23.0 (vs. 23.0- 27.3), eyes not visible from below the ventral side (vs. eyes protruding above the surface of head and distinctly seen from below ventral side), mouth not protrusible (vs. mouth fairly protruding), no black band present outer to operculum (vs. a black band present outer to operculum), no black blotch in front of occiput (vs. a black blotch present in front of occiput) and no black spots present in the middle of dorsal fin (vs. a row of distinct black spots present in the middle of dorsal fin).

The new species can also be easily distinguished from *Puntius madhusoodani* [Figure.5. D] described by Kumar *et al.*, (2011) from Manimala River. In *P. madhusoodani*, 4 scales present between dorsal fin and lateral line (vs. 4½- 5½ scales in the new species), dorsal side dusky black (vs. dorsal side greenish), dorsal fin with seven branched rays (vs. dorsal fin with eight branched rays), ventral fin with two unbranched and eight branched rays (vs. ventral fin with one unbranched and eight branched rays), anal with two unbranched and six branched rays (vs. anal fin with three unbranched and five branched rays), branched rays of dorsal and anal rays black (vs. branched rays of dorsal and anal not black), absence of spots except at caudal base (vs. presence of spots other than on caudal base such as a black blotch just in front of occiput, a thin dark band present outer to operculum and a row of green dots present in the middle of dorsal fin), mouth sub terminal (vs. mouth terminal), pelvic fin slightly posterior to dorsal origin (vs. pelvic origin just in front of dorsal origin), body depth at dorsal origin 34.5- 36.2 (vs. 31.5- 33.8) and length of anal 19.2- 21.5 (vs. 14.8- 18.9) in percent of standard length.

Puntius sophore (Hamilton), [Figure. 5. E] described from Gangetic provinces shows many similarities to present species in meristic and morphometric features (Misra, 1962; Rema devi, 1992; Datta & Srivastava, 1988; Talwar and Jhingran, 1991; Jayaram, 2010). In *P. sophore*, a black spot present at

the root of the dorsal fin (vs. black spot absent at the root of dorsal fin in the new species), barbels absent (vs. one pair of maxillaries present), a faint band present on the lateral side (vs. lateral band absent), no black band present outer to operculum (vs. a black band present outer to operculum), no black blotch in front of occiput (vs. a black blotch present in front of occiput, in the middle of which a small elongated depression), no black spots present in the middle of dorsal fin (vs. a row of distinct black spots present in the middle of dorsal fin), body depth at dorsal origin 36.2- 37.3 (vs. 31.5- 33.8), pre anal length 71.2- 72.2 (vs. 72.3- 76.6), length of pelvic fin 20.7- 22.0 (vs. 17.3- 20.3) and distance from pelvic to anal fin 25.8- 27.6 (vs. 23.8- 25.0) all in percent of SL; head depth at occiput 80.3- 86.7 in % of HL (vs. 68.2- 80.0) and eye diameter 34.7- 36.0 in % of HL (vs. 26.1- 31.6).

CONCLUSION

Puntius viridis is a barb usually caught along with *Puntius mahecola* and *Dawkinsia filamentosa*. It is an edible fish can usually be collected by small- meshed gill nets. They show similarities with *Puntius parrah* and *P. madhusoodani* of Kerala, *P. dorsalis* of Madras and *Puntius chola* of northern parts of India. They can be easily identified from their congeners in having a black band formed of dark spots present outer to operculum and a row of distinct black spots present on the middle of dorsal fin. They have also a less deep head. It is expected that further research works may unveil its more biological aspects.

Comparative material

Puntius dorsalis: 27.10.95, 1 example, 62 mm SL, Thunakadavu dam, Parambikulam wild life sanctuary, Kerala, ZSI/WGRC/IR 8466, coll. P.M. Sureshan, identified by K. C. Gopi; 23.2.2000, 2 examples, 56- 63 mm SL, Pampa River at Parumala, Kerala, ZSI/WGRC/IR/10379, coll. K. C. Gopi; 11.02. 58; 1 example, 53 mm SL, Usteri tank, 7 miles north

west of Pondicherry, ZSI/F 2801, coll. A.G.K. Menon; 16.02. 1996, 2 examples, 52- 53 mm SL, Sethumadai canal, Indira Gandhi Wild Life sanctuary, Tamil nadu, ZSI/SRC/F 4954, coll. M.B. Reghunathan; undated, 1 example, Madras, ZSI/F 2730, coll. Francis Day; undated, 1 example, 53 mm SL, Tunga River at Shimoga, ZSI/F 12320/1, coll. H.S. Rao; undated, 5 examples, 55- 62 mm SL, Cauvery River, Coorg, Karnataka, ZSI/F 12319/1, coll. C.R. Narayan Rao;

Puntius parrah: 10.01. 2012, 4 examples, 65.5- 78.0 mm SL, Arattupuzha, Karavannoor River, Iringalakuda, Kerala, ZSI FF 4934, coll. Mathews Plamoottil; 15.12.1994; 1 example, 60 mm SL, Kuruva Island, Wayanad, ZSI/WGRC/IR/742, coll. C. Radhakrishnan; 24.03.1997, 1 example, 44 mm SL, Parambikulam WLS, ZSI/WGRC/IR/10696, coll. K. C. Gopi; 10.8.2001, 2 examples, 100.0- 103.0 mm SL, Achankoil River, UOK/AQB/F/ 102, coll. Bijukumar; undated, 1 example, Kariavannoor River, Kerala, ZSI/F 2718 Syntype, coll. Francis Day; 08.05. 1977, 6 examples, 71 mm- 94 mm SL, Cauvery River at Chunchinagatte, ZSI/SRC Uncat, coll. K. C. Jayaram.

Puntius chola: 08.11.1939, 1 example, 41.5 mm SL, Soni Gaon Bheel, Lokpa, Batipara, Assam, ZSI/F 2203, coll. S.L. Hora; 1963, 1 example, 54 mm SL, Sukla Talai, Jhalwar, Rajasthan, ZSI/F 4009/2, coll. N. Majumdar & R.N. Bhargava; 18.03.1958, 2 examples, 32.5- 55 mm SL, Raxanal, Bihar, ZSI/F/2804/2, coll. Keval Singh; 3 examples, 50- 62 mm SL, Rajasthan, ZSI/F/4379/2, coll. Birla college, Pilani; 1 example, 71 mm SL, Mahanadi Irrigation Canal, Rudri, Orissa, ZSI/F 13082/1, coll. H.S. Rao.

Puntius madhusoodani: 17.11.2010, Holotype, 91.43mm SL, Manimala River, near Thirumoolapuram, Thiruvalla, Kerala, CRG-SAC 456, coll. K. Krishnakumar; 17. 11. 2010, 3 examples, 67.6 - 80.91mm SL, Manimala River, near Thirumoolapuram, Thiruvalla, Pattanamthitta District, CRG-SAC 457 – 459 paratypes, coll. K. Krishnakumar and Benno Pereira.

Puntius sophore: 10.05.2012, 2 examples, 58- 59 mm SL, Serrampore, River Ganges, Kolkata, ZSI FF 4938, Coll. Mathews Plamoottil; 20.06. 1963, 4 examples, 62.5- 70.0 mm SL, Sukla Talai, Jhalawar, Rajasthan, ZSI/F 4008/2, coll. N. Majumdar & R. N. Bhargava; 24.10.1939, 1 example, 40 mm SL, Siwane River, east of Hazaribagh Barthi Road, ZSI/F 13827, H.S. Rao; 22.06.1963, 4 examples, 66- 102 mm SL, Gadhuli Talai, Shergarh, Rajasthan, ZSI/F 4023, SE Rajasthan Survey of ZSI; 30.06.1983, 4 examples, 58.0- 67.5 mm SL, Talbi, N. of Bimmal Railway station, ZSI/F 4029/2, S. E. Rajasthan Survey of ZSI.

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