

Taxonomic Notes on *Puntius dorsalis* {Jerdon, 1849}

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Abstract: *Puntius dorsalis*, a fish species of the family cyprinidae, was described by Jerdon (1849) from Chennai of Tamil Nadu, India. Its original description was based on a few general and morphological features; type specimens were also unavailable in animal museums. Therefore, many different *Puntius* species procured from different parts of the world are being mistaken as *Puntius dorsalis*. Taxonomic confusion still exists in its features due to unavailability of topotypical specimens. To get clarity on its taxonomic features, specimens of *P. dorsalis* was collected from its type locality and compared with its congeners from their type localities.

Key words: Taxonomy, Description, Type locality, Tamil Nadu, *Puntius cauveriensis*

Introduction

Puntius dorsalis was described by Jerdon (1849) as *Systemus dorsalis* 'from tanks and rivers in the neighborhood of Madras'. It is commonly known as long-snouted barb owing to the possession of longer snout. Many of its diagnostic characters as given by Jerdon {1849}, are general characters of the genus. The author did not give emphasis to meristic counts and other specific features. Type specimens of *P. dorsalis* are known to be lacking in most animal museums of the world. The taxonomic description was based on proportion of head length and body height in total length {excluding the tail fin, ie, standard length} and on colors of body and fins. Jerdon described "Dorsal fin with a black spot on its base behind; 4-5 inches long" may be the only feature to identify this species from its congeners.

Day (1878) gave more clear and specific description of *P. dorsalis* based on his collection from Madras. Day described its habitat as 'Kurnool, Mysore, throughout Mysore as low as Cauvery, Coleroon and Sri Lanka'. Hora (1936) presented description of 74 specimens of *P. dorsalis* based on the collections of Dr. V. N. Moorthy from Chitaldrug District of Mysore in Karnataka state. Hora argued that younger specimens of *Puntius dorsalis* have black spot on base of dorsal and caudal fin and on base of posterior anal fin rays. The author added that in adult ones color spot on anal fin disappears; besides many distinct black spots are present on base and margin of each scales and these black markings become more prominent in adult stage; dorsal spine is weak both in young and adult ones. Later in 1940, while on studying Mahanadi samples Hora had shown that these color markings are not widespread.

Jayaram (1991) had given a detailed account on morphometric characters and meristic counts of *P. dorsalis*. But his description of the species was based on collections from Cauvery River at Coorg and Shimoga, away from Chennai, the type locality. He recorded 22- 28 lateral line scales in *P. dorsalis* in contrast to 24 scales mentioned by Jerdon (1849). Even after Jayaram (1991) many researchers erroneously reported the presence of Jerdon's species from different parts of India and Sri Lanka; details and images presented by them never matching with the original description; most of the currently procured specimens of '*Puntius dorsalis*' are small sized and short snouted. It compelled the author of the present paper to collect original *P. dorsalis* from its type locality, Chennai (formerly Madras).

Materials and Methods

Fishes were collected using cast nets and preserved in 10% formalin. Methods used are those of Jayaram (2002); measurements were made point to point with dial calipers and data recorded to tenths of a millimeter. Measurements and counts were made on the left side of specimens. Length of head and other measurements of body parts are given as percentage of standard length (SL). Parts of head are presented as percentage of head length (HL). The specimen of *Puntius dorsalis* used in this study is deposited in Zoological Survey of India museum at Port Blair, Andamans in India. Congeners of the *P. dorsalis* deposited in different Zoological Survey of India museums were compared.

Result and Discussion

Diagnosis: *P. dorsalis* can be distinguished from all its congeners in having an elongated snout, 2 ½ scales between lateral line and ventral fin, in absence of a caudal colour spot and in presence of a black spot on the base of dorsal fin.

Description: Meristic and biometric data are given in Table 1 & 2 respectively. Body laterally compressed; dorsal profile convex; ventral side straight up to tip of ventral fin; then concave; snout elongated and pointed; a distinct depression present in between orbit and snout tip; nares located very close to orbit and away from snout tip; eyes located, dorso laterally, considerably above the angle of gape of mouth; upper margin of orbits reach the dorsal profile of head; eyes cannot be seen from below ventral side; mouth inferior; 1 pair of distinct maxillary barbels present which never reach to orbit or nares; operculum extends out of pectoral fin base, as a thin flap; dorsal fin inserted in advance of ventral fin; its tip extends above the origin of anal fin; outer margin of dorsal fin concave. In younger ones pectoral fin tip reach ventral fin origin; but in mature adults it reach ½ scale Infront of ventral fin origin; pectoral fin is dagger like and its margin is convex. Ventral fin tip never reaches anal fin; or vent; reach 2- 2 ½ scales in front of anal fin; outer margin of the former is convex. Anal fin tip never reaches to caudal fin base; it reach 4- 5 scales in front of caudal fin base; outer margin of anal fin roughly concave; lateral line distinct; it has a slight concavity at pectoral fin tip, then goes straight to caudal fin base; scales are comparatively larger; breast scales are of the same size to other scales; 7- 8 scales present on the base of dorsal fin; 5 scales present on the base of anal fin; axillary scales present at the base of each ventral fin; it is an orbit diameter length and little less than the length of ventral fin; caudal lobes are equal.

Table 1. Meristic counts of *Puntius dorsalis*

Sl. No	Characters	Range
1	Dorsal fin rays	ii, 8
2	Pectoral fin rays	1, 14
3	Ventral fin rays	i, 8
4	Anal fin rays	iii, 5
5	Caudal fin rays	i, 17, i
6	Lateral line scales	24
7	Pre dorsal scales	8
8	Scales between lateral line and ventral fin	2 ½
9	Scales between lateral line and dorsal fin	4 ½
10	Scales between lateral line and anal fin	3½
11	Prepelvic scales	6
12	Pre anal scales	11-12

Table 2. Morphometric characters of *P. dorsalis*

Sl. No	Characters	Range	Mean
1	Total Length (mm)	147.2- 161.5	154.4
2	Standard length (mm)	115.2- 128.0	122.0
% SL			
3	Head length	29.5- 29.7	29.6
4	Head depth	19.3- 22.0	20.6
5	Head width	15.6- 18.7	17.1
6	Body depth at dorsal fin	33.0- 34.4	33.7
7	Body depth at anal fin	21.8- 22.6	22.2
8	Body width at dorsal fin	18.2- 20.3	19.2
9	Body width at anal fin	12.5- 13.4	13.0
10	Pre dorsal distance	55.- 56.0	55.5
11	Post dorsal distance	51.2- 53.5	52.3
12	Prepectoral distance	27.0- 28.0	27.5
13	Prepelvic distance	50.0- 50.3	50.2
14	Preanal distance	74.2	74.2
15	Length of dorsal fin	25.4- 26.0	25.7
16	Length of pectoral fin	21.0-21.9	21.5
17	Length of pelvic fin	19.1	19.1
18	Length of anal fin	14.8- 17.4	16.1
19	Length of base of dorsal fin	13.4- 17.2	15.3
20	Length of base of anal fin	8.7- 9.7	9.2
21	Length of caudal peduncle	18.2- 20.3	19.3
22	Depth of caudal peduncle	13.4- 13.9	13.6
23	Distance from anal to vent	0.80- 1.3	1.05
24	Distance from ventral to vent	21.3- 23.4	22.4
25	Head Length (mm)	34.0- 38.0	36.0
% HL			
26	Head depth	65.3- 74.2	69/8
27	Head width	53.0- 63.1	58.0
28	Eye diameter	30.0- 31.3	30.6
29	Inter orbital width	30.9- 34.2	32.5
30	Internarial width	23.5- 26.3	25.0
31	Snout length	27.6- 34.0	31.6
32	Width of gape of mouth	23.7- 24.7	24.2
33	Distance from occiput to dorsal fin	118/4- 126.5	122.5
34	Distance from snout to occiput	64.5- 72.0	68.3
35	Post orbital distance	46.1- 47.0	46.5
36	Length of maxillary barbels	17.6- 18.4	18.0



Fig. 1. A fresh specimen of *P. dorsalis* collected from Madras, ZSI/ANRC/M/23595



Fig. 2. A preserved specimen of *P. dorsalis*, ZSI/ANRC/M/23595



Fig. 3. *P. dorsalis* collected by Day from Madras ZSI/F 2730

Comparisons : *P. dorsalis* is a medium sized fish with elongated body, longer snout, dorsal fin inserted in advance of ventral fin, 24 lateral line scales and 2 ½ scales present between lateral line and ventral fin. A black spot (distinct or diffuse) present on dorsal fin base but caudal colour spot may not be compulsory.

Jayaram (1991) made a detailed comparison of *P. dorsalis* and *P. amphibius* (Valenciennes, 1842; Plamoottil, 2018a). Currently the latter species is treated as *P. mahecola* (Valenciennes 1842; Pethiyagoda and Kottelat, 2005).

P. mahecola is not a close congener of the Jerdon's species. The former is a small species (vs. medium sized) with weakly or non-ossified (vs. ossified and strong) last undivided dorsal fin ray. In this character *P. dorsalis* also differs from *P. amphibius*, *P. euspilurus* Plamoottil (2016) and *P. kyphus* Plamoottil (2019). *Puntius dorsalis* differs from *P. chola* Hamilton (1822), *P. parrah* (Day, 1865), *P. viridis* Plamoottil & Abraham (2014), *P. nigronotus* Plamoottil (2014), *P. nelsoni* Plamoottil (2014), *P. dolichopterus* (Plamoottil, 2015) and *P. madhusoodani* Kumar *et al.* in having a longer (vs. shorter) body and snout and in having 2 ½ (vs. 3½) scales in between lateral line and ventral fin. *P. dorsalis* differs from *P. sophore* (Hamilton, 1822) and *P. stigma* (Valenciennes, 1844; Plamoottil, 2018) in having 2 ½ (vs. 3½) scales in between lateral line and ventral fin and in having (vs. lacking) a pair of barbels. *Systemus tristis* (Jerdon, 1849) is treated

as a synonym of *Systemus dorsalis*. Description of *Systemus tristis* is inadequate to consider it as a distinct species. It is having only 24 lateral line scales, according to Jerdon (1849), *P. dorsalis* bears 26 lateral line scales; but collection from its type locality showed that it has 24 lateral line scales and 2 scales present on caudal base. *Puntius puckelli* Day (1868) from Bangalore was previously considered as a synonym of *P. dorsalis*. Hora (1936) thought the former as a juvenile form of *P. dorsalis*. *P. puckelli* is currently treated as synonym of *P. bimaculatus* (Bleeker, 1864) now. *Puntius cauveriensis* (Hora, 1937) is a closely related species described from Coorg of Karnataka. It is a distinct *Puntius* species with deep body and longer snout; but some researchers consider it as a variety of *P. dorsalis*. The *P. cauveriensis* differs from *P. dorsalis* in having 3 ½ (vs. 2½) scales between lateral line and ventral fin, no colour spot (vs. a black spot present) on dorsal fin base and having (vs. lacking) fleshy folds of skin on cheek.

Comparative materials Examined: *Puntius chola*: ZSI/WRC/P/5537, Ganges River at Naihati, coll. Debarghya Maji & Mathews Plamoottil, 21.06.2019. *Puntius dorsalis*: ZSI/ANRC/M/23595, 2, coll. Mathews Plamoottil, 17.07.19; a water stream at Chennai; ZSI/F 2730, 1 example, Madras, coll. Francis Day, undated; *Puntius cauveriensis*: ZSI'F'12179/1, Holotype, 122 mm SL, Coorg, coll. C.R.N. Rao; *Puntius Kyphus*, Holotype: ZSI/NERC/ V/F 4546, 80.0 mm SL, a water stream at Thiruvalla, Kerala, India, coll. Mathews Plamoottil, 20.08.2017. Paratypes: ZSI/ NERC/ V/F 4547, 2, 52.0- 93.0 mm SL, other details same as HT; *Puntius dolichopterus*: 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. *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 sophore*: ZSI FF 4938, 2 examples, 58- 59 mm SL, Ganges River, Serrampore, West Bengal, Coll. Mathews Plamoottil, 10.05.2012. *Puntius stigma*, PCMP 36, 4 examples, 47.0 – 62.0 mm SL, Kollam, coll. Mathews Plamoottil, 07. 01. 2017; *Puntius mahecola*: PCMP 40, 4 ex, 63-74 mm SL, Thiruvalla, Coll. Mathews Plamoottil, 6. 3. 2011. *Systemus hamiltonii*: Account from Jerdon (1849) and Day (1865); *Puntius amphibius*: PCMP 46, 47.00 – 63.00 mm SL, collected from a water stream at Kollam, 7. 3. 2011.

Conclusion

Puntius dorsalis Jerdon (1849) is a medium sized cyprinid fish found in the water bodies of Chennai and adjacent areas. Its presence in inland bodies of other states and other countries is unacceptable. If similar specimens are procured from areas away from its type locality, they must be taxonomically analysed well and must be compared with *Puntius dorsalis* collected from Chennai. Misidentification will lead to taxonomic ambiguity. It is expected that more details of this fish will be revealed in near future.

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