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***HORABAGRUS MELANOSOMA*, A NEW FISH SPECIES
(ACTINOPTERYGII: SILURIFORMES) FROM KERALA, INDIA**

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ABSTRACT

Taxonomic analysis of ten catfishes collected from low level regions of Manimala River reveals that they present several morphological differences from their relatives. The new species is diagnosed by a combination of the following characters: body and fins deep black to grayish black in live condition. Rayed dorsal fin inserted above $\frac{3}{4}$ of the length of pectoral fin, inner margin of dorsal spine serrated $\frac{3}{4}$ from the base with 12- 24 teeth, pectoral fin with 22- 30 antrorse teeth along inner edge of its spine, pelvic fin not reaching anal fin; Dorsal fin and its spine, pectoral fin and its spine shorter than its relative species. The fish is described and compared with its related species.

Key words: Manimala river, West Venpala, catfish, *Pseudobagrus brachysoma*, *Macrones chryseus*, new species.

INTRODUCTION

Horabagrus is an interesting genus created by Jayaram (1952, 1955, 1966) to accommodate *Macrones chryseus* Day (= *Pseudobagrus brachysoma* Guenther (1864)). Jayaram (1955) doubted the validity of *Macrones chryseus* Day and also suspected the reference of the species under *Pseudobagrus* by Day (1865a) in his 'Fishes of the Malabar'. After its description as *Pseudobagrus brachysoma* by Guenther confusion continued for a long time regarding the type locality of the species; later information was obtained by Jayaram (1955) from Natural History Museum, London on the type locality as "cochin" and not "Cochin- china". After his studies on the entire family of Bagridae, Jayaram (1955) found the Japanese genera *Pseudobagrus* and *Pelteobagrus* were different. On the basis of the specific features exhibited by the south Indian forms, he established the genus *Horabagrus*.

Mo (1991) suggested the *Horabagrus* to be placed under schilbidae and excluded it from Bagridae. This genus was included in the family Schilbidae and sub family Horabagrinae by

Jayaram (2006); but recent molecular studies with rag1 and rag2 nuclear gene sequences suggest that it can be included in a separate family Horabagridae. At present Horabagridae bears only two species namely *Horabagrus brachysoma* (Guenther) known from Kerala (Pillai, 1929; John, 1936; Talwar & Jhingran, 1991; De pinna, 1993; Jayaram, 1999; Menon, 1999; Gopi, 2000; Easa & Shaji, 2003) and Karnataka (Ali & Raghavan, 2012) and *H. nigricollaris* (Pethiyagoda and Kottelat, 1994), an endemic species of Kerala (Ferraris, 2007; Menon, 1999).

The ten specimens of *Horabagrus* collected recently from Kadalimangalam distributary of Manimala River at West Venpala, Kerala could not be readily assigned to any of the known species of the genus. Therefore it is described here as a new species *Horabagrus melanosoma* based on detailed morphometric analysis.

MATERIALS AND METHODS

Fishes were collected using gill nets and preserved in 10% formalin. Identification of the species was carried out following Guenther

(1864), Day (1865a, 1865b, 1878, 1889), Misra (1976) and Jayaram (2002, 2006, 2010). In the table values of holotype are given first, then ranges as percentages followed by their mean values. Methods used are those of Jayaram (2002) and measurements follow standard practices. Type materials examined in this study were deposited in the museum of Zoological survey of India, Western Ghats regional centre, Kozhikode, Kerala.

Abbreviations: Ad- adipose dorsal fin; Rd- rayed dorsal fin; LCP-length of caudal peduncle; DCP-depth of caudal peduncle; IR- identified register; KFRI- Kerala Forest Research Institute, Peechi, Kerala; ZSI/WGRC- Zoological survey of India, Western Ghats Regional Centre, Kozhikode, Kerala; UOK/AQB- Department of Aquatic Biology and Fisheries, University of Kerala, Kariavattom, Thiruvananthapuram, Kerala.

Horabagrus melanosoma, sp. Nov.

(Figures 1-3, 6.a, 6.c, 6.e & Table 1)

Type materials examined

Holotype

ZSI/WGRC/IR/2384, 195 mm SL, West Venpala, Manimala River, Kerala, India, 3 kms from Thiruvalla town of Pathanamthitta district, coll. Mathews Plamoottil, 11.07. 2011.

Paratypes

ZSI/WGRC/IR/2385, 9 exs, 96-235 mm SL, same location and same collector as the holotype, 10.01. 2012.

RESULTS AND DISCUSSION

Diagnosis

Unlike *Horabagrus brachysoma*, in present species color black to grayish black (vs. greenish yellow to golden in *H. brachysoma*), fins grey to black (vs. yellowish orange), pelvic fin does not reach anal fin (vs. pelvic fin reach anal fin) and anal fin with iii, 28- 30 rays (vs. iii, 23-28). Lengths of head, dorsal fin, dorsal spine and pectoral spine are shorter in the new species. In *H. melanosoma* head length 21.9- 27.6 % SL (vs. 27.8- 36.6), rayed dorsal fin length 16.2- 19.5 % SL (vs. 20.4- 27.4), dorsal spine length 12.3- 14.5% SL (vs. 15.1- 20.5), pectoral spine length 16.8- 17.4 % SL (vs. 18.0- 20.1) and length of base of rayed dorsal fin are 7.7- 8.4 % SL (vs. 8.6- 10.8). Unlike *Horabagrus nigricollaris*, in

the new species a thick nearly round shoulder spot present (vs. a black saddle shaped band extends from humeral region over the back in *H. nigricollaris*), rayed dorsal fin with 12- 24 teeth (vs. 12- 16 teeth), pectoral spine with 22- 30 teeth on inner edge (vs. 13- 17 teeth) and pelvic fin does not reach anal fin (vs. pelvic fin reaching anal fin).

Description

General body shape and appearance are shown in Figures 1-3, 6.a, 6.c and 6.e. Morphometric data for holotype and 9 paratypes of *Horabagrus melanosoma*, and 10 exs. of *H. brachysoma* are given in Table 1. Head slightly granulated and depressed; its length 21.9-27.6 in percent of standard length. Mouth nearly terminal, transverse, jaws sub equal, upper jaw slightly the longer, cleft of mouth wide, not extending to anterior margin of orbit; gape of mouth 46.3-57.8 in percent of head length. Median longitudinal groove on head distinct, short and narrow as a single fontanel, not extending posteriorly beyond orbit; occipital process reaching basal bone of dorsal fin. Teeth villiform, in bands on jaws and palate. Four pairs of barbels; maxillaries reach pectoral fin base, nasals extend to anterior edge of opercle, outer mandibulars reach opercle and inner mandibulars are shorter.

Rayed dorsal fin inserted above $\frac{3}{4}$ of the length of pectoral fin, origin near to snout tip than to adipose dorsal origin; base, 12 in standard length, 1.7 in anal base; spine, 1.8 in head length; rayed dorsal fin bears two unbranched and six branched rays. Dorsal spine comparatively strong, shorter than head length, ending in a soft prolongation, inner margin serrated $\frac{3}{4}$ from the base with 12- 24 serrae; outer margin occasionally possesses 2 or 3 teeth at the posterior tip. Adipose dorsal fin and its base short well separated from the caudal fin. Pectoral fin bears one unbranched and seven to eight branched rays, not reaching pelvic fin; pectoral spine strong with 22- 30 antrorse teeth along inner edge. Pelvic fin bears one unbranched and five branched rays, much nearer to anal fin than to pectoral fin, but not reaching anal origin. Anal fin bears 3 unbranched and 28- 30 branched rays, located nearer to pelvic origin than to caudal base, nearly reaching caudal base; caudal fin bears seventeen rays; it is lunate, lobes mostly unequal, upper lobe longer than the lower one.

Table 1. Morphometric characters of *Horabagrus melanosoma* and *H. brachysoma*.

Sl No.	Characters	No. of fishes	<i>Horabagrus melanosoma</i>			<i>H. brachysoma</i>	
			Holotype	Range	Mean	Range	Mean
1	Total length (mm)	10	240.0	124-282	216.00	141-280	213.5
2.	Standard length	10	195.0	96-235	175.1	117-230	174.7
	Percentage of SL						
3	Head length	10	27.6	21.9- 27.6	24.8	27.8-36.6	28.4
4	Body depth at dorsal origin	10	22.6	18.8- 24.0	21.8	20.7-26.3	22.7
5	Body depth at anal origin	10	22.6	22.1- 23.5	22.5	19.6-20.8	20.4
6	Pre dorsal length	10	34.3	32.7-37.0	35.20	37.2-42.1	37.2
7	Post dorsal length	10	63.6	60.7- 71.4	70.3	55.0-65.2	60.5
8	Pre pectoral length	10	24.1	21.9- 24.1	23.0	20.7-25.9	23.5
9	Pre pelvic length	10	48.7	45.2- 51.1	48.1	48.9-57.7	52.0
10	Pre anal length	10	64.1	60.2-64.7	62.9	61.3-67.6	63.1
11	Length of rayed dorsal fin	9	19.5	16.2-19.5	18.4	20.4-27.4	20.7
12	Length of dorsal spine	9	14.4	12.3- 14.5	13.8	15.1-20.5	16.0
13	Height of adipose dorsal fin	10	7.7	7.5- 8.0	7.8	5.9-8.1	7.4
14	Length of pectoral fin	10	18.9	15.7- 20.1	18.8	18.4-23.2	20.0
15	Length of pectoral spine	4	17.4	16.8- 17.4	17.2	18.0-20.1	19.1
16	Length of anal fin	10	10.3	8.9- 11.0	10.8	11.2-14.3	12.6
17	Length of base of rayed dorsal fin	10	7.7	7.7- 8.4	8.2	8.6-10.8	9.5
18	Length of base of adipose dorsal fin	10	4.1	3.8- 4.5	4.2	4.9-7.6	4.4
19	Length of base of anal fin	10	24.1	23.1- 25.6	24.2	23.0-25.7	24.6
20	Length of base of pectoral fin	10	4.1	2.8- 4.3	3.6	4.5- 5.4	4.8
21	Distance from Rd to Ad	10	34.4	34.6- 37.5	36.06	31.9-34.2	33.4
22	Distance from pectoral fin to pelvic fin	10	26.8	25.5- 27.0	26.4	28.3-30.1	29.5
23	Distance from pelvic fin to anal fin	10	13.3	11.4- 14.0	12.4	9.2-11.1	10.0
24	Length of caudal peduncle	10	8.7	8.7- 13.0	11.4	11.6-14.0	12.5
25	Depth of caudal peduncle	10	10.3	9.8- 10.6	10.2	9.8-15.1	12.0
26	Upper caudal lobe	10	23.1	18.7-23.1	20.8	23.0-27.2	25.7
27	Lower caudal lobe	10	20.5	17.5-20.8	19.4	21.6-25.0	23.6
28	Distance from anal to vent	10	2.6	2.6- 2.8	2.7	3.8- 4.7	4.2
29	DCP/ LCP	10	117.6	80.8- 117.6	91.1	67.7-92.3	83.1
30	Head length (mm)	10	54.0	30.0-62.0	49.7	32.0-66.0	47.6
	Percentage of Head length						
31	Head depth	10	59.3	59.2- 80.0	69.2	59.5-65.9	61.4
32	Head width	10	74.1	75.0- 102	85.1	70.6-75.0	73.6
33	Distance from occiput to dorsal origin	10	44.0	43.8- 44.9	44.2	45.2- 46.3	45.8
34	Head length excluding snout	10	68.0	67.8- 68.8	68.2	69.1- 71.9	70.0
35	Eye diameter	10	16.7	16.7-22.2	18.9	13.2-21.6	18.7
36	Inter orbital width	10	53.7	53.0- 66.7	59.9	50.0-56.8	53.9
37	Snout length	10	37.0	35.2- 45.6	40.6	32.4-43.2	40.2
38	Width of gape of mouth	10	48.2	46.3- 57.8	51.8	47.1-51.8	48.8
39	Length of maxillary barbels	10	51.8	51.8- 77.8	65.4	64.7-82.4	70.5
40	Length of nasal barbels	10	50.0	46.6- 55.6	52.0	42.6-67.6	59.3
41	Length of outer mandibular barbels	8	64.9	62.1- 77.8	68.6	54.4-73.5	65.2
42	Length of inner mandibular barbels	10	43.5	41.4- 53.4	46.6	43.2-52.9	47.6
43	Vertical diameter of humeral blotch	10	29.6	27.8-36.9	31.8	22.1-27.0	27.2
44	Horizontal diameter humeral blotch	10	24.1	24.1-41.3	32.4	21.3-27.0	25.6



Figure 1. Lateral view of a fresh specimen of *Horabagrus melanosoma* sp. nov., Paratype, 200 mm SL, ZSI/WGRC/IR/2385.



Figure 2. Dorsal view of a fresh specimen of *Horabagrus melanosoma*, Paratype, ZSI/WGRC/IR/2385.



Figure 3. Lateral view of a preserved specimen of *Horabagrus melanosoma* sp. nov, holotype, 95 mm SL, ZSI/WGRC/IR/2384.



Figure 4. Lateral view of a fresh specimen of *Horabagrus brachysoma*, 140 mm SL, ZSI/WGRC/IR/2388.



Figure 5. A specimen of *Horabagrus nigricollaris*, 95 mm SL, KFRI/FF/116, Athirappally, Kerala, India.

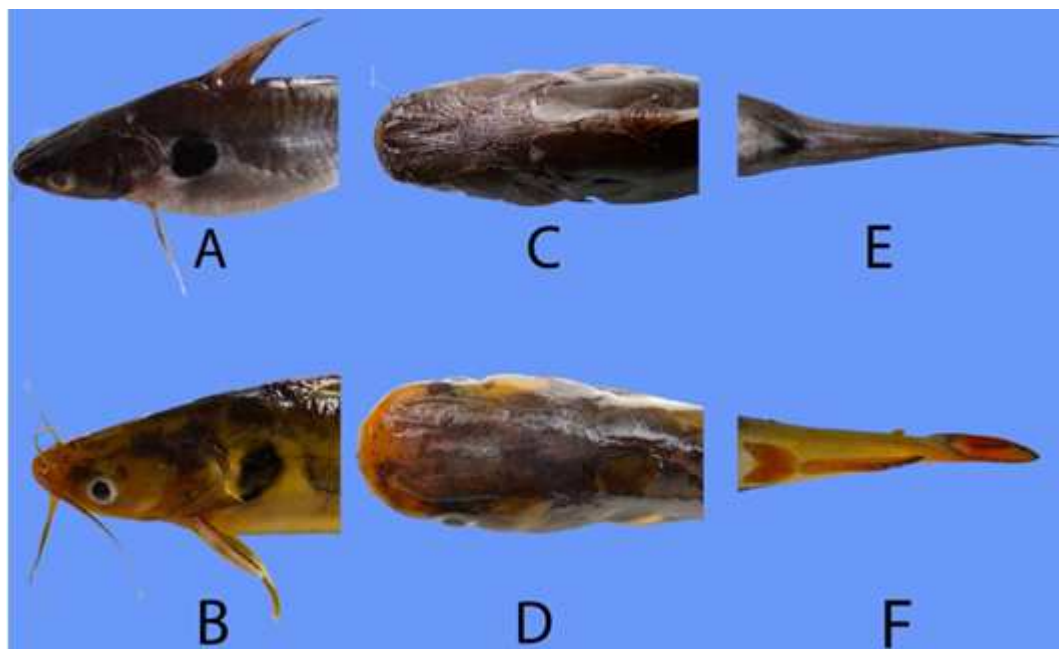


Figure 6. A & B- Lateral view of head of *Horabagrus melanosoma* (A) & *H. brachysoma* (B); A & B shows difference in colour, head length and head length excluding snout length in both these species; C & D- Dorsal view of head of *H. melanosoma* (C) & *H. brachysoma*.(D); C&D shows difference in color and nature of dorsal surface of head; E & F- Ventral view of posterior region of *H. melanosoma* (E) & *H. brachysoma* (F); E & F- shows the extent of pelvic fin; in *H. melanosoma* pelvic fin never reaches anal fin origin; in *H. brachysoma* pelvic fin reaches anal fin origin.



Figure 7. Kadalimangalamaar, a distributary of Manimala River at West Venpala, Kerala, India, the type locality of *Horabagrus melanosoma*.

Colouration

Live specimens: Dorsal side and upper lateral side black; lower lateral side black to greyish black; ventral side clear white. Dorsal fin black. Upper and lower marginal ray of caudal deep black; all the fin rays in between them grey. Pectoral light grey. Pelvic hyaline. Anal grey with its extreme tip black. A thick black shoulder spot ringed with white and a semi lunar indistinct black ring at caudal base present. Eyes hyaline to white.

Preserved specimens: Dorsal and lateral sides grayish black; fins except pelvic fins black to grayish black; pelvic fins hyaline; eyes greyish black.

Distribution: Currently known to occur at West Venpala of Manimala River, Kerala, India.

Habitat: West Venpala the type locality of *Horabagrus melanosoma*, is a part of Kavumbhagam distributary (Kadalimangalamaar) (Figure. 7)) of Manimala River at its low level regions. This stretch of river has width of 40- 50 m, depth <1 to 5 m, and bank height of 1 m in summer season. The

sediments in this stretch are generally silty clays with occasional patches of sand. This area is covered by moderately dense riparian vegetation. The flora include *Bambusa bambos*, *B. vulgaris*, *H. tiliaceus*, *Ochreinauclea missionis* etc as the major species, *Artocarpus heterophullus*, *Thespesia populnea*, *Anacardium occidentale*, *Artocarpus hirsutus* etc as the minor species and *Cymbopogon flexuosus*, *Cynodon dactylon* etc as grasses. *Catla catla*, *Cyprinus carpio communis*, *Labeo rohita*, *Labeo dussumeiri*, *Cirrhina mrigala*, *Puntius mahecola*, *P. amphibus*, *Pethia ticto*, *Haludaria fasciata*, *Drawkinsia filamentosa*, *Systemus subnasutus*, *Wallago attu*, *Heteropneustes fossilis*, *Clarias dussumeiri*, *Ompok malabaricus* etc are the co- occurring fish species.

Etymology: Specific name ‘*melanosoma*’ refers to the black colour on the body of new fish; Greek words ‘*melanos*’ means ‘black’ and ‘*some*’ means ‘body’.

Comparisons

The present species differs greatly from *Horabagrus brachysoma* (Guenther) (Figures 4,

6. b, 6. d & 6.f). 10 specimens of *H. brachysoma* were collected from the same locality of the new species and examined well. It unveiled a number of taxonomic differences from the new species. In Guenther's cat fish, unlike the new species, dorsal spine serrated behind with 14-16 teeth (vs. dorsal spine serrated behind with 12-24 teeth in new species), pectoral spine with 16-24 antrorse teeth along inner edge (vs. pectoral spine with 22-30 antrorse teeth on inner edge), pelvic fin reaching anal fin (vs. pelvic fin not reaching anal fin) and anal fin not reaching caudal base (vs. anal fin nearly reach or reach very near to caudal base).

In *Horabagrus brachysoma* color greenish yellow above, lateral sides golden (vs. dorsal side and upper lateral side black, lower lateral side grey to light black in the new species), pale yellow beneath (vs. clear white), with a large round black humeral spot ringed with light yellow (vs. black shoulder spot with white ring), dorsal, anal and caudal fins yellowish orange (vs. dorsal fin black, upper and lower marginal rays of caudal deep black, all the fin rays in between them grey, pectoral very light grey, pelvic fin hyaline and anal fin grey with its extreme tip black) and dorsal side of head soft and covered with a thin layer of skin (vs. dorsal side of head commonly rough and not covered with skin layer).

The new species is distinguished from *Horabagrus brachysoma* in having shorter head (21.9- 27.6 % SL vs. 27.8- 36.6 in *H. brachysoma*), shorter pre dorsal length (32.7- 37.0 % SL vs. 37.2- 42.1), shorter rayed dorsal fin (16.2- 19.5 % SL vs. 20.4- 27.4), shorter dorsal spine (12.3- 14.5 % SL vs. 15.1- 20.5), shorter pectoral spine (16.8 - 17.4% SL vs. 18.0- 20.1), shorter upper caudal fin lobe (18.7- 23.1% SL vs. 23.0- 27.2) and shorter lower caudal fin lobe (17.5- 20.8% SL vs. 21.6- 25.0). In the new species, base of pectoral fin (2.8- 4.3% SL vs. 4.5- 5.4 in *H. brachysoma*), base of rayed dorsal fin (7.7- 8.4% SL vs. 8.6- 10.8), base of adipose dorsal fin (3.8- 4.5 vs. 4.9- 7.6) and distance from pectoral fin to pelvic fin (25.5- 27.0 % SL vs. 28.3- 30.1) all are shorter than the Guenther's cat fish. In *H. melanosoma* body depth at anal origin (22.1- 23.5 % SL vs. 19.6- 20.8 in *H. brachysoma*), distance from rayed dorsal to adipose dorsal (34.6 - 37.5% SL vs. 31.9- 34.2) and distance from pelvic fin to anal fin (11.4- 14.0 % SL vs. 9.2- 11.1) all are longer than *H. brachysoma*. In the new species dorsal

fin rays are II, 6 (Vs. I, 5-7 in *Horabagrus brachysoma*), pectoral rays I, 7- 8 (vs. I, 7) and anal rays iii, 28- 30 (vs. iii, 23- 28).

Pseudobagrus chryseus (Day, 1865a, 1865b, 1878; Hora and Law, 1941) is an objective synonym of *H. brachysoma* of Guenther (Jayaram, 1955, 1966, 2006). Pethiyagoda & Kottelat (1994) examined the type specimens of *Pseudobagrus chryseus* Day and concluded that the latter is a synonym of Gunther's catfish. The first author of this paper collected many specimens of *Horabagrus brachysoma* from Karavannoor River of Thrichur district of Kerala, the type locality of *Pseudobagrus chryseus* and examined well for meristic and morphometric features. The analysis revealed that no taxonomic difference exists between *H. brachysoma* and the Day's species in meristic, morphometric and in other relevant taxonomic features.

Horabagrus nigricollaris Pethiyagoda and Kottelat (1994) can be distinctly separated from the present species in a number of features. In *Horabagrus nigricollaris* (Figure. 5) head and body grey brown (vs. black to grayish black in the new species), a black saddle shaped band edged in white extends from the humeral region of each side over the back (vs. around black spot ringed in white), caudal fin light yellow (vs. grey), pectoral spine with 13-17 serrations along inner edge (vs. 22- 30) and pelvic fin reaching anal fin origin (vs. pelvic fin does not reach anal fin origin). In *H. nigricollaris* eyes are larger (orbit diameter 24.2- 28.0 % HL vs. 16.7- 22.2), orbits located closely (inter orbital width 39.5- 47.1 % HL vs. 53.0- 66.7), rayed dorsal fin longer (dorsal fin length 21.6- 25.5 % SL vs. 16.2- 19.5) and base of adipose dorsal fin longer (5.1- 12.1% SL vs. 3.8- 4.5).

CONCLUSIONS

Systematic studies conducted on the genus *Horabagrus* are very less compared to other genera; after the description of *P. brachysoma* by Guenther (1864), no other species were found out for more than a century; *H. nigricollaris* was discovered in 1994; after about twenty years another new species reaches to the genus *Horabagrus*. According to the fishermen associated with the fishery of *Horabagrus*, this black species is available in minor quantities in the Vembanad Lake during monsoon season. It was told that *H. melanosoma* is sold along with *H. brachysoma*, but the former is not much

valued as compared to the nominal species. The flesh of the black *Horabagrus* is grayish or dirty white (vs. yellowish white in *H. brachysoma*) and it is not much palatable. Further research works are required to trace out more biological aspects of this new species.

Comparative Material

***Horabagrus nigricollaris*:** KFRI/FF/116, 1 example, 95 mm SL, Athirappally, Kerala, coll. C. P. Shaji, 05.06.99; ***Horabagrus brachysoma*:** ZSI/WGRC/IR/2388, 10 examples, 110- 222 mm SL, West Venpala, Manimala River, Kerala, coll. Mathews Plamoottil, 20. 01. 12; ZSI/WGRC/IR/1977, 2 examples, Kuppam, Kannur dt, Kerala, coll. K.C. Gopi, 15.02.2007; UOK/AQB/F/105, 1 example, 118 mm SL, Meenachil River, coll. Bijukumar, 10.02.2000.

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CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest associated with this article.

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