

DESCRIPTION OF A NEW SPECIES OF *MYSTUS SCOPOLI* (SILURIFORMES: BAGRIDAE) FROM VAIGAI RESERVOIR, PENINSULAR INDIA

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ABSTRACT

Recent revision of the *Mystus cavasius* species complex showed that there are two more species, *M. seengtee* from southern India and *M. falcarius* from Myanmar and based on this we examined our collections from an impounded water of Vaigai River in south India which revealed a distinct pattern and herein we describe this as new species. All the four species including the new species showed a black spot in front of the dorsal-spine but the new species is distinguished from its congeners by having no serrations on the posterior edge of the dorsal -spine.

KEY WORDS: *Mystus cavasius* species complex, *M. rubripinnis* new species, peninsular India.

INTRODUCTION

In a recent study Chakrabarty and Ng (2005), categorised the composite species of *Mystus cavasius* with a characteristic feature of long adipose fin (Roberts, 1994), and the variation in number of gill rakers in the first gill arch. Based on these diagnostic characters, *Mystus cavasius* species complex had two additional species as *Mystus seengtee* Sykes from peninsular India and *M. falcarius* Chakrabarty and NG (2005), from Myanmar. This study prompted the authors to reinvestigate all the species in the genus *Mystus* from the samples of fishes from various streams and rivers which resulted in an undescribed species. Herein, we describe this as new species from peninsular India. This study forms a doctoral research programme of the senior author (A. V.).

MATERIALS AND METHODS

Fish collections were made between 1996-2015 by earlier works led by M. Arunachalam from streams, rivers, wetlands and river sites from nearby fisherman and from fish market. Measurements were made point to point using in digital calipers. Methods used for the meristic and morphometric data are based on Hubbs and Lagler (1964). Morphometric characters of 10, 18-26, 29-31 and 34-35 (Table 1) were the additional truss measurements (Strauss and Bookstein, 1982). Body measurements are expressed as percentage of Standard Length (%SL); head measurements are expressed as percentage of Head Length (%HL). The following abbreviations were used for museum: CUKMNH- Central University of Kerala Museum of Natural History, CMA (collections of M. Arunachalam).



Figure 1. Map of the Vaigai Reservoir, Tamil Nadu, India. (Courtesy: SANDRP)

Comparison materials:***Mystus cavasius***

CMA- 375 ; 04 ex.100.9 -110.86mm SL Rohini River at Devaki pool, U.P. collected by M. Arunachalam, 09 July, 2011,

Mystus seengtee

CMA-381,4ex.118.50-130.51mmSL, N.R. Pura market, Bhadra River, Karnataka, collected by M. Arunachalam, 29 May, 2003.

RESULTS***Mystus rubripinnis* sp.nov.**

Figure 2. *Mystus rubripinnis* sp.nov., **Holotype:** CUKMNH F 1, 186.38mm SL; Vaigai Dam, impoundment of the lower reach of Vaigai River, Periyakulam, Madurai, Tamil Nadu, M. Arunachalam and team, 12 June 2002.

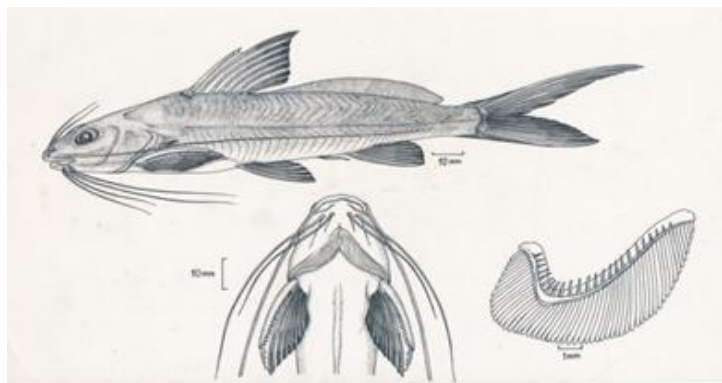


Figure 3. Drawing of *Mystus rubripinnis* sp.nov lateral view, ventral view and gill raker, (scale 10 mm).

Holotype: CUKMNH F 1, 186.38mm SL; Vaigai Dam, impoundment of the lower reach of Vaigai River, Periyakulam, Madurai, Tamil Nadu, M. Arunachalam and team, 12 June 2002.(Figures 2 and 3)

Paratype: CMA, 6, 133.25- 176.61mm SL; data as per the holotype.

Diagnosis: *Mystus rubripinnis* is distinguished from *Mystus cavasius* in having more gill-rakers in the first gill arch (23-25 vs.13-22), maxillary barbel not reaching caudal fin (vs. extending to the base of caudal fin (Table 2). Outer rostral barbel reaching the pelvic fin origin (vs. not reaching), more serrations in pectoral spine (17-22 vs.12-22). Dorsal spine posterior edge with no serrations (vs.3-4 serrations), caudal fin upper lobe longer than lower lobe (vs. both are almost same) and nasal barbel reaching opercle (vs.beyond opercle), ovoid eyes (vs.rounded). *M. rubripinnis* is distinguished from *M. seengtee* in having fewer gill rakers in the first gill arch (22-25 vs. 25-30).

Table 1. Morphometric characters of *Mystus rubripinnis* sp.nov, *M. cavasius* and *M. seengtee*. Body character measurements are represented as % standard length and head character measurements are represented as % head length.

SLNo	Measurements from point to point (identified by numbers and name)	<i>Mystus rubripinnis</i> sp.nov.		<i>M. cavasius</i> (n=4)		<i>M.seengtee</i> (n=4)		
		Holotype	Paratype (n=6)		Min.	Max.	Min.	Max.
			Min.	Max.	Min.	Max.	Min.	Max.
1	Total length (mm)	231.98	161.64	214.01	119.73	137.61	150.31	177
2	Standard length (mm)	186.38	133.25	176.61	100.9	110.86	118	130
% of Standard length								
3	Snout to urocentrum	97.84	97.32	97.86	95.14	96.58	96.93	97.
4	Pre-anal length	69.11	66.13	72.20	61.04	68.06	65.53	67.
5	Pre-dorsal length	35.04	32.11	36.01	31.24	33.09	32.29	34.
6	Pre-pelvic length	47.98	44.35	52.13	45.04	46.91	44.74	47.
7	Pre-pectoral length	21.75	20.47	22.70	18.35	19.82	18.81	20.
8	Pectoral spine length	14.18	11.72	15.18				
9	Peduncle length	12.02	10.83	13.31	13.39	14.66	10.31	12.
10	Dorsal-fin origin to pelvic-fin insertion	28.77	24.73	27.96	23.94	28.35	25.06	26.
11	Dorsal spinous height	12.94	12.07	18.88			12.34	13.
12	Anal fin height	16.25	14.33	18.67	17.00	17.63	15.73	17.
13	Peduncle depth	8.94	8.09	10.28	7.84	8.08	7.88	8.8
14	Caudal fin length	26.68	21.74	33.40	30.24	31.54	30.99	35.
15	Dorsal fin height	26.38	22.94	28.01	26.93	27.60	28.28	30.
16	Pectoral fin length	18.25	15.80	19.82	18.40	18.90	16.60	18.
17	Pelvic fin length	15.66	14.90	17.59	15.61	16.32	15.28	17.
18	Occiput to dorsal fin origin	4.60	4.18	6.54	4.52	6.04	3.49	4.8
19	Occiput to pectoral-fin insertion	17.48	15.83	19.69	16.39	18.88	16.58	17.
20	Occiput to pelvic-fin insertion	27.98	24.67	30.67	26.42	29.88	26.77	29.
21	Dorsal-fin insertion to pelvic-fin insertion	21.01	17.93	21.82	16.89	20.98	17.91	21.
22	Dorsal-fin origin to pectoral- fin insertion	20.28	18.63	21.23	16.47	20.18	17.29	18.
23	Dorsal-fin origin to anal-fin origin	43.44	40.14	43.37	38.03	43.21	39.51	41.
24	Dorsal fin to caudal fin base	54.20	53.02	55.36	51.12	59.59	53.32	57.
25	Dorsal- fin insertion to anal- fin origin	31.58	29.46	32.89	28.69	31.54	27.75	30.
26	Dorsal- fin insertion to anal-fin insertion	34.45	34.98	39.11	34.44	38.70	36.27	39.
27	Dorsal fin base length	15.28	9.37	13.43	12.28	13.59	11.79	13.
28	Anal fin base length	9.86	7.94	9.65	8.74	10.50	7.43	9.7
29	Pectoral-fin insertion pelvic-fin insertion	27.30	24.46	31.01	24.10	29.68	23.71	27.
30	Pectoral-fin insertion to anal -fin origin	48.91	43.47	52.40	37.82	50.15	42.51	45.
31	Pelvic-fin insertion to anal-fin origin	48.91	19.27	52.40	17.49	20.31	19.32	20.
32	Post-dorsal length	91.39	85.63	97.37	89.23	95.13	79.00	94.
33	Body depth	17.66	17.80	22.37	19.79	23.15	17.89	20.
34	Distance between pectoral- fin and vent	36.26	32.58	40.50	33.83	37.19	30.87	35.
35	Distance between pelvic-fin and vent	7.21	6.85	8.18	6.74	9.31	6.70	7.5
36	Pre- adipose length	51.12	49.00	55.13	48.80	51.05	46.94	48.
37	Adipose base length	41.69	37.22	41.92	38.07	42.02	39.98	45.
% of Head length								
38	Head length (mm)	47.51	34.49	43.12	24.59	25.96	30.76	33.
39	Pre-occipital length	116.25	114.21	142.03	105.61	110.75	66.78	105
40	Snout to opercle	71.71	70.43	85.38	66.26	79.77	20.47	276
41	Upper jaw length	24.86	23.50	31.72	24.32	27.16	5.18	103
42	Pre-nasal length	14.31	8.09	17.81	13.98	14.87	24.91	336
43	Orbit width	22.31	19.83	26.97	26.62	29.17	24.95	362
44	Inter-orbital width	32.46	27.20	35.94	25.17	30.22	16.24	190
45	Inter-nasal width	20.23	17.14	19.43	18.02	23.13	59.39	867
46	Head width	65.82	62.29	72.60	59.12	63.10	16.03	251
47	Head depth at nostril	20.73	17.60	21.41	17.89	21.82	38.49	652
48	Head depth at pupil	40.98	39.77	47.38	43.62	46.74	78.81	111
49	Head depth at occiput	73.63	76.58	104.56	71.64	85.80	72.99	108
50	Maxillary barbel length	374.51	297.54	406.00	366.4	389.9	374.35	549
51	Nasal barbel length	74.85	52.88	80.48	58.06	70.62	75.33	121
52	Mandibular barbel length inner	66.58	58.31	77.77	72.53	94.75	150.70	203
53	Mandibular barbel length outer	124.92	105.54	140.42	148.15	170.04	66.78	105

Maxillary barbel not reaching caudal fin base (vs. beyond caudal fin base), pectoral spine with more serrations (17-22 vs. 15-16), dorsal spine posterior edge with no serrations (vs. 3-4 serrations) and nasal barbel not reaching opercle (vs. beyond opercle). The new species is distinguished from *M. falcarius* in having fewer gill rakers in the first gill arch (23-25 vs. 22-29) and the maxillary barbel not reaching the caudal fin base (vs. reaching caudal fin base).

Description:

Body moderately compressed, dorsal profile rising evenly but not steeply from tip of mouth with the snout length. Venter slightly convex to anal fin base. Supra occipital bone elongate and extending to the anterior nuchal plate with a minute gap. Eyes ovoid, horizontal axis longest located to the dorsal half. Gill openings wide extending beyond isthmus and gill membranes free from isthmus. First gill arch with 25 gill rakers. Mouth sub terminal extending beyond upper jaw. Dorsal fin concave. First two rays longer than the others. Dorsal spine moderately long straight and slender posteriorly with no serrations.

Pectoral fin with stout spine, sharply pointed inner serration 19(2), 20(2), 22(3) vs. 8 (14), 9(12), 10(1) with the length of pelvic fin origin at vertical through posterior end of dorsal fin-base with i/5 rays and slightly convex margin and the length. Anal fin and urogenital opening located at vertical through middle of adpressed pelvic fin. Males with a short genital papilla reaching to base of first anal fin ray. Adipose fin very long spanning almost all of post dorsal distance. Caudal fin deeply forked with 7(7/8 vs. 2(7/8), 13(7/8), 15(8/9) caudal fin upper lobe longer than lower (vs. both are almost same Nasal barbel reaching opercle.

Coloration:

In formalin preserved specimens, dorsal surface of head region brownish gray even after sixteen years. Body silky silver white and all the fins have brick red color in live condition and still the color pattern remains after several years of preservation.

Table 2. Meristic characters of *Mystus rubripinnis* sp.nov., *M. cavasius* and *M. seengtee*.

Sl.no	Meristic counts	<i>Mystus rubripinnis</i> sp.nov.		<i>M. cavasius</i> (n=4)	<i>M. seengtee</i> (n=4)
		Holotype	Paratypes(n=6)		
1	Dorsal fin rays	ii,7	ii,7	ii,7	ii,7
2	Anal fin rays	iv,7	ii-iv,7-9	iii-iv,7-9	ii, 8-9
3	Pelvic fin rays	i,5	i,5	i,5	i,5
4	Pectoral fin rays	i, 9	i,8-9	i,8	i, 9
5	Caudal fin upper lobe	7	7	6-8	8
6	Caudal fin lower lobe	8	8	7-9	9
7	Pectoral fin inner teeth	22	19-22	13-16	15-16
8	Gill rakers	25	23-25	13-22	25-30

Distribution: Known only from the impoundment of Vaigai River in Western Ghats, Tamil Nadu, India.

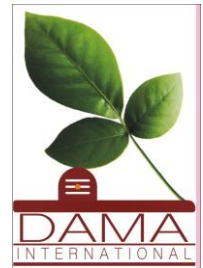
Habitat:

Mystus rubripinnis sp.nov is associated with riverine habitats where they prefer deep pools, littoral area of the reservoir of Vaigai River. All the cat fishes prefer medium to deep pools of the riverine habitats (Arunachalam *et al.*, 2005).

Etymology: Named after the brick red fins; *rubri* (Latin) = red and *pinna* (Latin) = fins. Noun in apposition.

DISCUSSION

Distribution pattern of *Mystus cavasius* group is so distinct that *M. cavasius* was recorded from north and north-eastern part of India; *M. seengtee* showed its distribution in peninsular India and *M. falcarius* showed its distribution in Myanmar (Chakrabrthi and NG, 2005). The new species *Mystus rubripinnis* can be distinguished from *M. cavasius* by having the following characters of the maxillary barbel reaching beyond anal fin and vertically at the adipose fin insertion (vs. maxillary barbel reaching the base of caudal fin; dorsal fin smooth (vs. 3-4 serrations) ; pectoral fin inner serration 20 (vs. 12 based on our collections from north and north east India) and more number of gill rakers (24-25 vs. 22). It can be distinguished from *M. seengtee* in having differences in gill rakers, pectoral fin inner teeth, and the maxillary barbel length and the dorsal fin serration. The new species is distinct from *M. falcarius* in number of gill



rakers, dorsal fin serration and the maxillary barbel length. *Mystus cavasius*, *M. seengtee*, *M. falcarius* and *M. rubripinnis* have the black spot in front of the dorsal fin origin however; ovoid humeral spot is distinct in *M. rubripinnis* as in *M. cavasius*.

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