

ISSN 2277-7729

Original Article

## Rediscovery and redescription of *Mystus armatus* Day

Mathews Plamoottil\*

Assistant Professor in Zoology, Government College, Chavara, Kerala

\*Corresponding Author: Phone: 9447059690; Email: [mathewsplamoottil@gmail.com](mailto:mathewsplamoottil@gmail.com)

Nelson P. Abraham

Associate Professor, Department of Zoology, St. Thomas College, Kozhencherry, Kerala

Received 12 December 2013; accepted 24 December 2013

### Abstract

*Mystus armatus* Day is now placed in synonymy with *Mystus oculatus* Valenciennes. An examination of the specimens of *Mystus armatus* and *M. oculatus* collected recently from its type localities in Kerala shows, however, that it exhibits many valid differences between each other. Day's *Mystus* is distinguished from its relative species in having long head, median longitudinal groove on head with double cephalic fontanels, elongated maxillaries which reach near to caudal base and long pelvic fin which reach anal fin origin and 19 caudal fin rays. Meristic and morphometric characters are analyzed well based on the topotypic materials.

© 2013 Universal Research Publications. All rights reserved

**Keywords:** Manimala River, Bagrid fish, *Mystus oculatus*, *M. menoni*

### 1. Introduction

*Mystus* is the most common fresh water fish genus in India, especially in Kerala. The fishes of this genus though not growing to large size, excepting a few, provide by numbers the required protein to the masses [1]. *Mystus vittatus*, *M. oculatus*, *M. montanus*, *M. malabaricus*, *M. armatus*, *M. canarensis*, *M. gulio*, *M. heoki*, *M. indicus* and *M. menoni* are the major *Mystus* species of Kerala [2, 3, 4, 5, 6, 1, 7, 8, 9, and 10].

*Mystus armatus* was described originally by Day [4] from Karuvannoor River of northern Kerala. As it shows many similarities to *Mystus oculatus*, which was also described from northern Kerala, Day's *Mystus* and *M. oculatus* are considered by Steven Grant [11, 12] and many other taxonomists as one and same species. Collections of these two species from their type localities were also lacking in the national museums to resurrect *M. armatus* from the synonymy with *M. oculatus*. The first author of this paper could collect and examine many specimens of the various *Mystus* species including *M. armatus* and *M. oculatus* from their type localities. Detailed meristic and morphometric analysis revealed that *Mystus armatus* is a distinct species with many valid differences from its congeners.

### 2. Materials and methods

Fishes were collected using cast nets and preserved in 10% formalin. Identification of various *Mystus* species and its relative species was carried out following Jerdon [3], Day [4, 13, 14], Misra [5], Talwar and Jhingran [15], Jayaram

and Sanyal [1] and Jayaram [16, 7]. Methods used are those of Jayaram [16] and measurements follow standard practices. In table, values of holotype are given first, then ranges as percentages followed by their mean values; values of holotype included in the range. Various *Mystus* species deposited in the museum of ZSI, Kolkata, ZSI/SRC Chennai, ZSI/WGRC, Calicut and KFRI, Peechi were examined and utilized for comparisons.

### 3. Results and Discussion

*Mystus armatus* (Day) (Fig. 1, 2, 4; 6.D; 7.D; Table 1)

*Hypselobagrus armatus* [4], Proceedings of Zoological Society of London: 239.

*Hypselobagrus armatus* [17], The fishes of Malabar: 187.

*Macrones armatus* [19], Proceedings of Zoological Society of London: 706.

*Macrones armatus* [13], The fishes of India.: 450.

*Macrones armatus* [14], The fauna of British India.: 161.

*Mystus oculatus* [12], The striped catfishes of the genus *Mystus* Scopeli: 5.

#### 3.1. Diagnosis

*Mystus armatus* differs from its congeners in having a comparatively long head, dorsal surface of which is rugose, median longitudinal groove with double cephalic fontanels, the posterior fontanel spindle shaped, elongated maxillaries which reach near to caudal base and long pelvic fin which reach anal fin origin; *Mystus armatus* can further differentiated from its relative species in lacking any distinct colour spots on humeral and caudal regions.

**Table 1.** Morphometric features of *Mystus armatus* and *M. oculatus*

SL No	Characters	Range	Mean	<i>M. oculatus</i>
1	Total length	84.8- 88.7	86.8	111.0- 122.0
2	Standard length	69.7- 84.8	77.3	85.0- 91.0
Percentage of standard length				
3	Head length	25.5- 26.0	25.8	23.3- 25.6
4	Head depth	16.0- 17.2	16.6	16.0- 18.2
5	Head width	18.7- 19.5	19.1	15.1- 18.3
6	Body depth at dorsal fin	20.1- 22.4	21.3	20.9- 23.0
7	Body depth at anal fin	18.7- 18.9	18.8	17.4- 19.2
8	Body width at dorsal fin	17.2- 17.7	17.5	15.5-16.7
9	Body width at anal fin	10.6- 11.5	11.1	10.0- 11.6
10	Pre dorsal length	36.0- 37.3	36.7	37.2- 37.8
11	Post dorsal length	66.0- 66.5	66.3	63.1- 66.2
12	Pre pectoral length	23.6- 23.8	23.7	22.0-26.1
13	Pre pelvic length	49.4- 49.6	49.5	47.1- 51.2
14	Pre anal length	67.8- 70.0	68.9	68.1-75.6
15	Length of rayed dorsal	22.4- 25.5	24.0	21.1- 23.6
16	Height of adipose dorsal	4.7- 5.6	5.2	5.5-6.7
17	Length of pectoral fin	20.0- 21.5	20.8	18.0-20.0
18	Length of pelvic fin	16.5- 18.3	17.4	13.9-15.6
19	Length of anal fin	17.2- 18.2	17.7	13.0-15.1
20	Length of upper caudal lobe	30.1- 33.0	31.6	29.1- 31.9
21	Length of lower caudal lobe	25.0- 28.9	27.0	24.7- 26.7
22	Length of dorsal spine	11.0- 12.7	12.0	14.4-16.5
23	Length of pectoral spine	18.4- 19.0	18.7	15.1-17.2
24	Length of base of rayed dorsal	16.5- 17.1	16.8	14.0-15.3
25	Length of base of adipose dorsal	27.0- 28.9	28.0	17.2-19.0
26	Length of base of anal	12.8- 14.3	13.6	12.8-14.0
27	Length of base of caudal	14.3- 14.5	14.4	11.8- 13.9
28	Length of caudal peduncle	18.9- 19.8	19.4	15.6-19.2
29	Depth of caudal peduncle	11.5- 11.8	11.7	10.6-11.6
30	Width of caudal peduncle	3.5- 5.7	4.6	4.7-6.1
31	Distance from pectoral to pelvic	28.3- 30.1	29.2	25.9- 30.8
32	Distance from pelvic to anal	18.2- 18.7	18.5	19.8- 22.2
33	Distance from anal to caudal	28.7- 30.7	29.7	28.3- 31.4
34	Distance from adipose dorsal to caudal	13.6- 14.2	13.9	16.1-18.0
35	Inter dorsal distance	6.9- 8.3	7.6	16.5- 18.2
36	Distance from anal to vent	5.1- 5.7	5.4	6.0- 7.6
37	Distance from ventral to vent	13.2- 14.2	13.7	14.4- 15.9
38	Head length (mm)	14.2- 17.8	16.0	20.0- 23.0
Percentage of Head length				
39	Head depth	61.4- 67.4	64.4	66.0- 71.3
40	Head width	73.0- 75.0	74	65.0- 71.7
41	Distance from occiput to snout	84.1- 85.8	85.0	86.4- 95.0
42	Distance from occiput to dorsal	52.6- 54.5	53.6	58.3- 66.5
43	Length of frontal groove	75.0- 76.3	60.0	77.8- 89.5
44	Length of occipital process	34.2- 36.4	35.3	37.5- 40.5
45	Post orbital length	40.5- 44.7	42.6	41.0- 45.6
46	Head length excluding snout	68.2- 68.4	68.3	70.5- 74.8
47	Eye diameter	23.7- 30.0	26.8	33.0- 40.0
48	Inter orbital width	28.6- 33.7	31.2	23.6- 27.5
49	Inter narial width	22.5- 22.7	22.6	16.0- 17.5
50	Snout length	31.8- 34.2	33.0	26.0- 28.3
51	Width of gape of mouth	39.5- 44.9	42.2	35.0- 41.3
52	Length of maxillary barbels	343.0- 367.0	355.0	308.7- 322.7
53	Length of nasal barbels	73.0- 77.0	75.0	66.0- 70.0
54	Length of outer mandibular barbels	132- 136.8	134.4	122.6- 145.7
55	Length of inner mandibular barbels	90- 94.7	92.4	72.7- 90.0



**Figure 1.** A freshly collected specimen of *Mystus armatus*, ZSI FF 5095, 69.7- 84.8 mm SL



**Figure 2.** A formalin preserved specimen of *Mystus armatus*, ZSI FF 5096, 69.7 mm SL



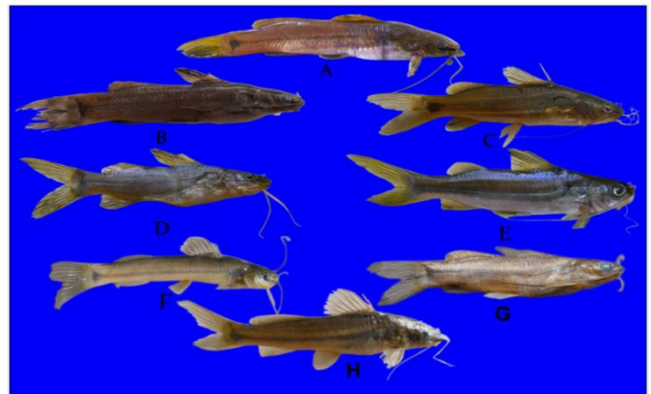
**Fig. 3.** A freshly collected specimen of *Mystus oculatus*, ZSI FF 4933, 91 mm SL.



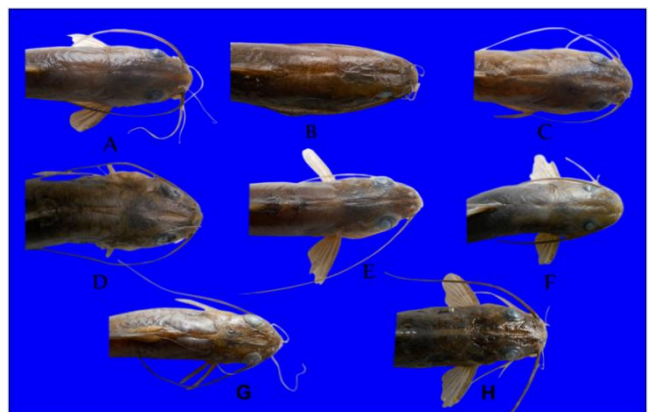
**Fig. 4.** Dorsal side of Head of *Mystus armatus*



**Figur 5.** Dorsal side of head of *M. oculatus*



**Fig. 6.** *Mystus armatus* and its relative species. A. *Mystus malabaricus*; B. *M. canarensis*; C. *M. montanus*; D. *M. armatus*; E. *M. oculatus*; F. *M. heoki*; G. *M. indicus*; H. *M. menoni*.



**Fig. 7.** Head of *Mystus armatus* and its relative species. A. *Mystus malabaricus*; B. *M. canarensis*; C. *M. montanus*; D. *M. armatus*; E. *M. oculatus*; F. *M. heoki*; G. *M. indicus*; H. *M. menoni*.

### 3.2. Description

Median longitudinal groove on head narrow and moderately deep; it starts considerably behind nasal barbels' origin extends upto a middle point in between anterior margin of orbit and occiput; but it never reach occiput; it is divided into two parts; first part is long and it extends upto a little behind outer margin of orbit; the second fontanel is spindle shaped. Occipital process reaches to basal bone of dorsal fin. Anterior nostrils located nearly at the tip of snout, at the level of maxillary

barbels; posterior nostrils located nearly in the middle of orbit and snout; mouth subterminal; it extends sideways a little behind the origin of maxillaries and outer mandibulars.

Eyes moderate, located on dorso lateral profile of head, nearly on dorsal side; nasal barbels just reach the base of occipital process; outer mandibulars reach considerably behind the middle point between pectoral and pelvic fin; near to ventral origin, one ED anterior to ventral origin; inner mandibulars extend considerably behind pectoral fin origin nearly to the middle of pectoral fin, when the latter is stretched to the body; maxillaries reach to or reach near to caudal base; outer mandibulars located outwards and backwards of inner mandibulars. Rayed dorsal fin located considerably behind pectoral fin base; its outer margin nearly round; its posterior tip reach considerably behind the outer margin of adipose dorsal fin; dorsal spine osseous and moderately strong but slender and thinner; dorsal fin long, its length nearly equal to body depth at dorsal fin origin; adipose dorsal fin located considerably behind posterior most base of rayed dorsal fin; the inter dorsal distance equals to snout length; adipose dorsal fin originates gradually and its height is medium and less (than that of *M. oculatus*); its tip reach to vertical behind posterior to anal tip. Posterior base of adipose dorsal fin considerably behind the posterior most part of base of anal fin. Considerable distance in between posterior base of adipose dorsal and caudal fin base. Pectoral fin located fairly in front of rayed dorsal fin base. Its tip reach behind the origin of rayed dorsal on vertical line; but tip of pectoral fin never reach ventral origin. Pectoral fin spine osseous and strong. Ventral fin located just below posterior base of rayed dorsal fin; its outer margin straight; its tip just reach or reach near to anal fin origin; it always reach considerably behind anal opening; tip of ventral fin reach considerably behind the origin of adipose dorsal; it reach to 1/3 of length of AD from its origin. Anal fin originates from the tip of ventral fin, 1/3 length from the origin of AD; its tip reach just in front of the tip of AD, never reach caudal base.

Tips of caudal lobes pointed; upper lobe a little longer than lower one; anal opening considerably in front of anal fin base; urino genital opening broad.

### 3.3. Color

Back and lateral sides light blackish brown; ventral side and ventro-lateral sides whitish yellow; last anal ray divided to root; dorsal spine with 6 teeth from above the middle of dorsal spine; outer mandibulars reach behind pectoral tip, one eye diameter anterior to ventral origin; inner mandibulars reach considerably behind pectoral tip, a little greater than inter orbital width, from pectoral base.

### 3.4. Comparisons

*Mystus oculatus* (Fig.3,5,6.E,7.E) described by Valenciennes [2] from Malabar, is the closely related species of *Mystus armatus*. Some scientists such as Steven Grant [11, 12] are of opinion that *M. oculatus* is a synonym of *M. armatus*. Even though Plamoottil & Abraham [9, 10] do not agree with this argument, many of the modern scientists agree with Grant. *Mystus oculatus* is similar to *M. armatus* in many characters; both these have a black spot on the front of dorsal spine, median longitudinal groove formed of

two fontanels and occipital process reaches the basal bone of dorsal fin. More over both of these bagrid fishes were described firstly from northern parts of Kerala, India. But *Mystus oculatus* shows many taxonomical differences to *M. armatus*. In *M. oculatus*, anal fin rays are iii, 9- 10 (vs. iii, 8 in *M. armatus*), caudal fin with 17 rays (vs. 19), adipose dorsal fin is higher (5.5- 6.7 % SL vs. 4.7- 5.6), length of base of adipose dorsal fin shorter (17.2- 19.0 % SL vs. 27.0- 28.9), inter dorsal distance greater (16.5- 18.2 % SL vs. 6.9- 8.3), dorsal spine longer (14.4- 16.5 vs. 11.0- 12.7), median fontanel starts from in front of nasals and it reach occipital process (vs. median fontanel starts from behind nasal barbels' origin and it never reach occipital process), second cephalic fontanel narrow and elongated (vs. spindle shaped), anterior nostrils located inwards and forwards of maxillary barbels' base (vs. located at the level of maxillary barbels), nasal barbels reach half way between posterior margin of orbit and occiput (vs. reach occipital process), maxillary barbels reach posterior most base of anal fin (vs. reach to caudal base), height of rayed dorsal fin never greater than body depth at dorsal fin origin (vs. always greater), outer margin of rayed dorsal fin straight (vs. round), tip of rayed dorsal fin never reach adipose dorsal origin (vs. tip of rayed dorsal fin reach behind the origin of adipose dorsal fin), posterior tip of adipose dorsal fin never reaches the tip of anal fin (vs. reach behind anal fin tip), posterior base of adipose dorsal is in the level of posterior base of anal fin (vs. considerably behind the posterior base of anal fin), inter dorsal distance greater than snout length (vs. inter dorsal distance equal to snout length), ventral fin tip never reach anal fin origin (vs. reach anal fin origin), tip of pectoral fin never reach anterior base of adipose dorsal (vs. reach fairly behind the adipose dorsal origin) and no spine let present before dorsal fin (vs. a spine let present before dorsal spine); moreover dorsal spine considerably stronger in *M. oculatus* than *M. armatus*.

*Mystus menoni* Plamoottil & Abraham [9], described from Elankadu of Manimala River, is a closely related species of *Mystus armatus*. In *Mystus armatus* a distinct, deep black spot present at the front base of dorsal fin (vs. absent in *M. menoni*), dorsal surface of head rugose (vs. not rugose), eyes larger, 23.7- 30.0 % HL and they are located closely, IOW 28.6- 33.7 % HL (vs. eyes comparatively smaller, 22.9- 25.0 % HL and are located comparatively away, IOW 36.0- 40.4 % HL), ventral fin longer, 16.5- 18.3 % SL and reach anal fin (vs. ventral fin comparatively shorter, 13.0- 15.8 % SL and never reach anal fin), maxillary barbels reach to caudal fin base (vs. reach only anal fin base), snout shorter (31.8- 34.2 % HL vs. 34.6- 41.7), mid lateral line thin (vs. a thick mid lateral band present), no distinct color spots on caudal and humeral regions (vs. distinct colored humeral and caudal spots present) and caudal lobes pointed (vs. rounded). In *Mystus armatus* length of rayed dorsal fin greater than body depth at dorsal fin origin (vs. length of dorsal fin shorter than body depth in *M. menoni*), width of caudal peduncle lesser, (3.5- 5.7 % SL vs. 5.4- 6.4), inter dorsal distance equal to snout length (vs. shorter than snout length) and 19 rays present in caudal fin (vs. 15- 17).

*Mystus indicus* Plamoottil & Abraham [10], described from Kuttur of Kerala, is another congener of *M. armatus*. In

*Mystus armatus*, a spine let present in front of dorsal spine (vs. spine let absent in *M. indicus*), pectoral fin with 9 branched rays (vs. 6- 8), longer anal fin (length of anal 17.2- 18.2 % SL vs. 9.3- 15.4), adipose dorsal fin shorter (4.7- 5.6 % SL vs. 5.2- 6.5), caudal fin with 19 rays (vs. 15- 17), median longitudinal groove on head narrow and moderately deep (vs. shallow and wide), maxillary barbels reach to caudal fin base (vs. maxillary barbels reach only to posterior end of anal fin base), a black spot present in front of dorsal spine (vs. black spot absent), tip of ventral fin reaches anal fin origin (vs. never reaches anal origin) and dorsal fin as high as body below it (vs. dorsal fin fairly shorter than body height at dorsal origin).

*Mystus heoki* Plamoottil & Abraham [10], described from Elankadu of Kerala, is not much related to *Mystus armatus*. *Mystus armatus* (Day) can be distinctly differentiated from the *M. heoki*. In *Mystus armatus*, head longer (25.5- 26.0 % SL vs. 18.9- 22.5 in *M. heoki*), body deep (body height at rayed dorsal fin 20.1- 22.4 % SL vs. 15.0- 16.9), median longitudinal groove on head divided into two fontanels (vs. single fontanel), occipital process reaches the basal bone of dorsal fin (vs. never reach), occipital process naked (vs. covered by a thick layer of flesh), maxillaries reach near to caudal fin base (vs. reach near to anal fin origin), outer mandibulars reach near to ventral fin origin (vs. reach near to tip of pectorals), rayed dorsal fin longer (22.4- 25.5 % SL vs. 14.3- 15.4), tip of first dorsal reach considerably behind the origin of adipose dorsal (vs. never reach adipose dorsal), length of base of adipose dorsal greater (27.0- 28.9 % SL vs. 20.0- 23.9), inter dorsal distance equals to snout length (vs. fairly greater than snout length), tips of caudal lobes pointed (vs. rounded), a black spot present on the base of dorsal spine front (vs. no color spot) and caudal fin with 19 rays (vs. 15).

*Mystus montanus* Jerdon [3], described from Mananthavady River of Wayanad, is a congener of *Mystus armatus*. In *Mystus montanus* dorsal surface of head smooth and covered with a thin skin (vs. rugose in *M. armatus*). maxillary barbels reach up to half way between ventral fin and anal fin (vs. maxillaries reach near to caudal base), cephalic fontanel single (vs. double), eye diameter less than inter orbital width (vs. greater), tip of ventral fin never reach anal fin base (vs. reach anal fin), tips of caudal lobes rounded (vs. pointed), caudal peduncle shorter (LCP 14.8 % SL vs. 18.9-19.8) and caudal fin with 15 rays (vs. 19). *Mystus malabaricus* Jerdon [3], described from Malabar of Kerala is not a close relative of *Mystus armatus*. In *Mystus malabaricus* cephalic fontanel is single (vs. double in *M. armatus*), occipital process short and it never reach dorsal fin front (vs. occipital process long and it reach dorsal front), occipital process covered by flesh (vs. not covered by flesh) and caudal fin lobes rounded (vs. pointed). *Mystus canarensis* Steven Grant (= *Hara malabarica* Day), described firstly by Day from Mundakkayam of Central Travancore, is not a close relative species of *Mystus armatus*. In *Mystus canarensis* occipital process short and it never reach dorsal fin front (vs. occipital process long and it reaches dorsal front in *Mystus armatus*), occipital process covered by flesh (vs. not covered by flesh), a dark brown humeral spot surrounded by a white ring (vs. absent)

and caudal fin lobes rounded (vs. pointed).

#### 4. Conclusion

Many species of *Mystus* such as *Mystus oculatus*, *M. armatus*, *M. montanus*, *M. malabaricus* and *M. canarensis* were described originally from Kerala. But there was confusion in the existence of many of them; it made new descriptions of *Mystus* species extremely difficult. By the analysis of all the above species collected from their type localities helped here to prove the identities of most of the south Indian *Mystus* species. Examination and analysis of *Mystus armatus* from their type locality in Malabar enabled here to resurrect it from *M. oculatus*, previously considered as a synonym of the former.

**Comparative materials examined: *Mystus malabaricus*:** ZSI FF 4931, 5 ex., 71.5-102 mm SL, Kallodi, Mananthavady River, Wayanad, Kerala, coll. Mathews Plamoottil, 20.03.2013; ZSI/SRC 313, 2 ex., Muthanga, coll. R. S. Pillai, 12.10.1976; ZSI/WGRC 9395, 1 ex., Ranipuram, Kazargod Dt, coll. M. madhavan, identified by K.C. Gopi, 07.07.1996; ZSI unreg. 7 ex., Mananthavady River at Choothakadavu near Kaniyaram, coll. K. C. Jayaram, 14.02.1985; ZSI uncat, 3 ex., Cauvery River, Kerala, coll. G. M. Natarajan, 1984.

***Mystus oculatus*:** ZSI FF 4933, 5 ex., 85- 91 mm SL, Arattupuzha, Karavannoor River, Trichur, Kerala, coll. Mathews Plamoottil, 10.01.2013; ZSI 487, 1 ex., India, purchased from Francis Day; ZSI, unreg, 4 ex., 78.0- 86.8 mm SL, Chaliyar River at Edavanna, 2 km from Manjeri, Kerala, coll. K. C. Jayaram and Anuradha, 18.02. 1985.

***Mystus armatus*:** ZSI FF 5095, 2 ex., 69.7- 84.8 mm SL, Arattupuzha, Karavannoor River, Trichur, coll. Mathews Plamoottil, 13.01. 2013; ZSI/WGRC 7886, 2 ex., Kuniyanpuzha, Kazargod, coll. Jafer Sherif, identified by K. C. Gopi, 01.07.1995; ZSI/WGRC 7425, 1 ex., Bhavani River, Wayanadu, coll. P. M. Suresh, 02.02. 1995; ZSI/WGRC/ 8470, 3 ex., Thoonacadavu dam, Parambikkulam WLS, Palakkadu, coll. P. M. Suresh, identified by K. C. Gopi, 27.10.95; ZSI uncat. 10 ex., 60- 84 mm SL, Puzhakkal, 15 km north of Trichur, Kerala, coll. K. C. Jayaram and Anuradha Sanyal, 20. 02. 1985; ZSI uncat. 6 ex., 56- 77 mm SL, Muppiniyappuzha, Kerala, coll. K.C. Jayaram & Anuradha Sanyal, 18.02. 1985; ZSI/WGRC/9397, 1 ex., Ranipuram, Kazargod, coll. M. Madhavan, identified by K.C. Gopi, 07.07.1996;

***Mystus montanus*:** ZSI FF 5096, 1 ex., 67.5 mm SL, Koodal kadavu, Mananthavady River, Wayanad, coll. Mathews Plamoottil, 16.03.2013; KFRI/88, 1 ex., Noolpuzha, coll. Shaji, C. P, 11.06.1996; ZSI uncat, 8 ex., 65- 76 mm SL, Chittoorpuzha at Thathamangalam road bridge about 17 km south of Palaghat town, coll. K. C. Jayaram & Anuradha Sanyal, 20. 02. 1985; ZSI uncat, 7 ex., 59- 78 mm SL, Malampuzha dam, Kerala, coll. K. C. Jayaram & Anuradha Sanyal, 22.02. 1985; ZSI/SRC/5217, 1 ex., 42 mm SL, Parambikkulam, coll. M. B. Reghunathan, 13.08.97.

***Mystus canarensis*:** ZSI FF 4939, 1 ex., 88.5mm SL, Manimala River at Mundakkayam, Kerala, coll. Mathews Plamoottil, 10.02.12; TC/DOZ 12, 4 ex., 87-101 mm SL, Manimala River at Mundakkayam, Kerala, coll. Mathews

Plamoottil, 10.02.12.

***Mystus indicus***: Holotype, ZSI/FF 4627, 100 mm SL, Kuttoor, Manimala River, Kerala, India; collected by Mathews Plamoottil, 17 February 2011. Paratypes, ZSI/WGRC/2418, 7 specimens, 81- 107 mm standard length, Kuttoor of Manimala River, Kerala, India; collected by Mathews Plamoottil, 07 March 2011.

***Mystus heoki***: Holotype, ZSI/FF 4626, 137 mm SL, Elankadu, Manimala River, Kerala, India; collected by Mathews Plamoottil, 10 January 2011. Paratypes, ZSI/WGRC 2419, 5 specimens, 85.5- 120 mm standard length, Elankadu, Manimala River, Kerala, India; collected by Mathews Plamoottil, 10 January 2011.

***Mystus menoni***: Holotype, ZSI/FF 4628, 101.7 mm standard length, Manimala River at Elankadu, Kerala, India; collected by Mathews Plamoottil, 10 January 2011.

Paratypes, ZSI/WGRC/IR/V 2417, 5 specimens, 96- 121 mm standard length, Manimala River at Elankadu, Kerala, India, collected by Mathews Plamoottil, 10 January 2011 and 16 October 2011.

#### Acknowledgements

First author acknowledges the University Grants Commission of India for sanctioning Faculty Development Programme to undergo research. Both authors acknowledge Principal, St. Thomas College, Kozhencherry, Kerala for providing the facilities.

#### Abbreviations

ZSI- Zoological Survey of India, Kolkata, West Bengal; ZSI/SRC- Zoological survey of India, Southern Regional Centre, Chennai, Tamil Nadu; ZSI/WGRC- Zoological survey of India, Western Ghats Regional Centre, Kozhikode, Kerala; KFRI- Kerala Forest Research Institute, Peechi; Kerala; HL- head length; SL- standard length; IOW- inter orbital width; LCP- length of caudal peduncle.

#### References

1. K. C. Jayaram, A. Sanyal, Revision of the fishes of the genus *Mystus* Scopoli. Records of Zoological Survey of India, Occasional Paper, 2003.
2. M. A. Valenciennes, Histoire naturelle Poissons, Paris, 1839.
3. T. C. Jerdon, On the fresh water fishes of Southern India, *Madras J. Lit. Sci.* 15 (1849) 302-345.
4. F. Day, On the fishes of Cochin, on the Malabar coast of India. Part I. Acanthopterygii. Proceedings of the General Meetings for Scientific Business of the Zoological Society of London, (1865a) 2- 40.
5. K. S. Misra, The fauna of India and Adjacent countries. Zoological Survey of India, Kolkata. 1976.
6. P.S. Easa, C. P. Shaji, Biodiversity documentation for Kerala. Kerala forest research Institute, Peechi, 2003.
7. K. C. Jayaram, Cat fishes of India. Narendra Publishing House, Delhi, 2006.
8. K. C. Jayaram, Fresh water fishes of the Indian region. Narendra publishing House, Delhi, 2010.
9. M. Plamoottil, N. P. Abraham, *Mystus menoni*, a new fish species from Kerala, India. International Journal of Pure and Applied Zoology, 1 (2013a) 315-325.
10. M. Plamoottil & N. P. Abraham, *Mystus indicus* and *M. heoki*, two new catfishes from Kerala, India. Biosystematica, 7 (2013b) 43-58.
11. S. Grant, A replacement name and neotype designation for *Hara malabarica* Day, 1865, with notes on related species (Siluriformes). Aqua. J. Ichtyol. & Aquatic Biol, 3 (4) (1999) 169- 174.
12. S. Grant, The striped cat fishes of the genus *Mystus* Scopeli 1777 (Siluriformes: Bagridae). J. Catfish study Group, 5(2) (2004) 5- 17.
13. F. Day, The fishes of India: being a natural history of the fishes known to inhabit the seas and fresh waters of India, Burma, and Ceylon, London, 1878.
14. F. Day, Fauna of British India including Ceylon and Burma. Taylor and Francis, London, 1889.
15. P. K. Talwar, A. Jhingran, Inland fishes of India and adjacent countries. Oxford and IBH publishing Co. Pvt. Ltd, 1991.
16. K. C. Jayaram, Fundamentals of fish taxonomy. Narendra publishing House, Delhi, 2002.
17. F. Day, The Fishes of Malabar. Bernard Quaritch., London, 1865.
18. F. Day, on the fresh water siluroids of India and Burma. Proceedings of Zoological Society of London, 1871.

Source of support: Nil; Conflict of interest: None declared