

***Rasbora ataenia*, a new freshwater fish from Kerala, India**

Dr. Mathews Plamoottil

HOD & Asst. Professor in Zoology, Baby John Memorial Govt. College,
Chavara, Kollam, Kerala, India.

urn: lsid:zoobank.org:pub:C37FECC8-AF36-49F5-89FE-274C38DAD3DE

urn: lsid:zoobank.org:act:F3E83D0B-537E-4FEC-953F-836763E82CE8

Received Date: 8 July 2016

Accepted Date: 25 October 2016

Published Date: 29 December 2016

Abstract: Taxonomic analysis of five specimens of a cyprinid fish collected from Alappuzha, Kerala, India revealed that they present several taxonomic differences from their congeners. The new species, *Rasbora ataenia*, is diagnosed by a combination of the following characters: dorsal fin with seven branched rays, anal fin with five branched rays, body slender and without any lateral color stripe, head deeper and snout shorter.

Keywords: Taxonomy, New description, Cyprinids, *Rasbora dandia*, Alappuzha.

Abbreviations: ZSI/NERC- Zoological Survey of India, North Eastern Regional Centre, Shillong; ZSI/ SRC- Zoological Survey of India, Southern Regional Centre; Chennai; BDD- Body depth at dorsal fin origin; HD- Head depth; INW- Inter narial width;

1. INTRODUCTION

Species of genus *Rasbora* includes small freshwater fishes found in Southeast Asia and Africa. The genus includes 120 valid species [1]. Brittan [2], in his revision of *Rasbora*, considered it as a subgenus and classified it into eight 'species complexes'. Howes [3] presented an osteological treatment of the genus. Subsequent workers suggested several new genera namely *Boraras*, *Brevibora*, *Horadandia*, *Kottelatia*, *Rasboroides*, *Trigonopoma* and *Trigonostigma* for some lineages within *Rasbora* [4]; [5], [1]. Brittan's [2] classification was later revised by Kottelat & Vidthayanon [4]; they introduced the category 'species group', instead of 'species complex' which had been widely used by most of the later scientists. Siebert & Guiry [6], Kottelat [7] and Liao *et al.* [1] also conducted revisionary works on the genus.

Species of the genus *Rasbora* are aquarium fishes. Their body is elongated, abdomen rounded, lower jaw with a well developed symphysal process followed by a deep notch, well developed pectoral axial lobe attached to postcleithrum, dorsal fin inserted behind the origin of pelvic fins and lateral line fairly concave and passes through lower half of the flanks. The *Rasbora* species collected from Alappuzha possess the characters of the genus but bear many differences from its congeners; so it is described here as a new species *Rasbora ataenia*.

2. MATERIALS AND METHODS

Measurements were made point to point with dial calipers and data recorded to tenths of a millimeter. Counts and measurements were made on the left side of specimens whenever possible. Subunits of the head are presented as proportions of Head Length (HL); head length and measurements of body parts are given as proportions of Standard Length (SL). Methods used are those of Jayaram [7].

3. RESULTS

Rasbora ataenia, sp. Nov



Fig 1. A collection of *R. ataenia* from type locality; **Fig 2.** *R. ataenia*, Paratype, V/F/NERC/ 4056



Fig 3. A fresh specimen of *Rasbora ataenia*, Holotype, V/F/NERC/ 4055

Table 1. Morphometric characters of *Rasbora ataenia*

Sl. No.	Character	Holotype	Range	Mean	SD
1	Total length (mm)	99.50	87.0- 112.0	98.1	9.4
2	Standard Length (mm)	77.50	67.0- 89.0	77.1	8.1
Percentage of Standard Length					
3	Head Length	29.00	29.0- 31.3	29.5	0.9
4	Head Depth	18.10	16.4- 18.1	16.9	0.6
5	Head Width	12.90	12.9- 13.9	13.3	0.3
6	Body depth at dorsal fin origin	20.60	19.4- 21.7	20.5	0.9
7	Body depth at anal fin origin	18.10	14.9- 18.1	16.2	1.6
8	Body width at dorsal fin origin	16.10	13.4- 16.1	14.7	1.3
9	Body width at anal fin origin	10.30	9.7- 10.3	10.0	0.3
10	Pre occipital distance	19.30	17.9- 19.3	18.4	0.7
11	Distance from occiput to dorsal fin	37.40	34.3- 37.4	35.5	1.6

***Rasbora Ataenia*, A New Freshwater Fish from Kerala, India**

12	Pre dorsal distance	56.80	52.8- 56.8	54.4	2.0
13	Post dorsal distance	45.20	41.8- 48.3	45.1	3.2
14	Pre pectoral distance	25.80	25.8- 28.4	26.7	1.5
15	Pre pelvic distance	51.60	51.5- 51.7	51.6	0.1
16	Pre anal distance	74.80	74.8- 77.6	76.2	1.4
17	Height of dorsal fin	20.60	16.4- 20.8	19.2	2.4
18	Length of pectoral fin	16.80	16.8- 19.4	18.0	1.1
19	Length of pelvic fin	16.80	12.3- 17.9	15.6	2.9
20	Length of anal fin	16.80	16.4- 17.4	16.8	0.5
21	Length of caudal fin	28.40	25.8- 29.8	27.6	1.5
22	Length of base of dorsal fin	9.00	9.0- 11.9	9.9	1.6
23	Length of base of anal fin	7.10	7.1- 10.4	8.4	1.7
24	Length of base of caudal fin	14.20	12.3- 14.2	13.3	0.9
25	Length of caudal peduncle	16.80	16.7- 16.9	16.8	0
26	Depth of caudal peduncle	13.50	13.4- 13.6	13.5	0
27	Width of caudal peduncle	5.80	5.6- 5.8	5.7	0.1
28	Depth of caudal peduncle/ length of caudal peduncle	80.70	80.0- 80.7	80.3	0.4
29	Distance from pectoral to pelvic	27.10	27.1- 28.1	27.6	0.7
30	Distance from pelvic to anal fin	23.20	23.2- 25.8	24.5	1.8
31	Distance from anal to caudal fin	23.20	23.2- 27.0	25.1	2.6
32	Distance from anal to vent	2.60	2.6- 4.5	3.5	1.3
33	Distance from ventral to vent	20.6	20.6- 21.3	20.9	0.4
34	Head Length (mm)	22.5	21.0- 26.0	19.2	1.5
Percentage of Head Length					
35	Head depth	62.2	58.4- 62.2	59.9	3.1
36	Head width	44.4	44.4- 46.1	45.2	1.2
37	Eye diameter	26.7	23.1- 28.6	25.5	2.5
38	Inter orbital width	35.6	34.6- 35.6	35.1	0.7
39	Inter narial width	31.1	27.0- 31.1	29.0	2.8
40	Snout length	26.7	26.1- 28.6	27.2	0.9
41	Width of gape of mouth	26.7	26.5- 26.7	26.6	0.1
42	Pre occipital distance	66.70	61.5- 66.7	64.1	0.1
43	Distance from occiput to dorsal front	128.90	119.2- 128.9	124.0	6.8

Holotype: V/F/NERC/ 4055, 77.5 mm SL, small freshwater stream at Alappuzha, (9.4981° N, 76.3388° E) Kerala, India, coll. Mathews Plamoottil, 20.08. 2015.

Paratypes: V/F/NERC/ 4056, 4 examples, 67.0 mm SL- 89.0 mm SL, small freshwater stream at Alappuzha (9.4981° N, 76.3388° E), Kerala, India, coll. Mathews Plamoottil, 20. 08. 15.

3.1. Diagnosis

A medium sized *Rasbora* without any lateral color stripe; body is slender (depth 19.4 - 21.7 % SL), have 7 branched rays in dorsal fin, 5 branched rays in anal fin, shorter (26.1- 28.6 % HL) snout and deeper head (HD 58.4- 62.2 % HL).

3.2. Description

General body shape and appearance is shown in Figure 1. Morphometric data as shown in Table 1. Body elongated; dorsal profile nearly straight; ventral profile convex; Eyes situated, on the upper lateral side, considerably behind and above the angle of jaws, protruding above the surface of head and distinctly visible from below the ventral side; lower border of orbit just touch the level of angle of jaws. Inter orbital region nearly straight. Nostrils inserted on the middle of orbit and snout tip. Snout distinctly pointed. Mouth superior and upturned. Jaws unequal, lower jaw longer than upper jaw; width of gape of mouth equals to inter narial width. Lower jaw symphyseal knob present; it is not prominent. Operculum rigid and moderately hard. Dorsal fin inserted, behind the insertion of pelvic fin, nearer to caudal base than snout tip. Its outer margin slightly convex; dorsal fin with 2 undivided and 7 branched rays; last dorsal ray branched to root and articulating on same pterygiophore. Dorsal fin shorter than head and longer than all other fins. Pectoral tip never reach ventral fin origin; its outer margin slightly concave; pectoral fin shorter than head and dorsal fin. Ventral fin originates just in front of dorsal origin; tip of it never reach vent. Upper margin of ventral fin convex. Ventral fin with 1

undivided 7- 8 branched rays; Auxiliary scale present on the side of pelvic fin; it is delicate, feeble and shorter than orbit diameter. Anal fin originates below the tip of dorsal fin; with 2 undivided and 5 branched rays; its tip never reach caudal base; considerable distance in between anal fin origin and vent; length of base of anal fin shorter than that of dorsal fin; lateral line passes through lowest part of flanks; caudal fin equally lobed and with 19 principal rays.

Lateral line scales 31 to 32; 1 scale on the base of caudal fin; pre dorsal scales 13; scales between lateral line and ventral fin 1½; scales between lateral line and dorsal fin ½ 4½; pre pelvic scales 7- 8; pre anal scales 16.

3.3. Coloration

Lateral and ventral sides silvery; dorsal side blackish green; dorsal fin orange; pectoral and pelvic fin hyaline; anal fin yellowish; caudal fin greenish yellow. A faint black dotted line present on the head from tip of snout to operculum;

3.4. Etymology

Feminine Latin noun '*taenia*' meaning ribbon or band; prefix 'a' means 'without'; the name '*ataenia*' used here in reference to the absence of a mid lateral color band on the body of the new fish.

3.5. Distribution

Currently known to occur only at its type locality in Kerala, India.

4. DISCUSSION

According to Vishwanath & Laisram [8] five species of *Rasbora* are known from India, namely, *R. caverii* (Jerdon), *R. daniconius* (Hamilton), *R. labiosa* Mukerji, *R. rasbora* (Hamilton) and *R. ornatus*. Silva et al [9] revised the *Rasbora* of Sri Lanka based on osteological observations and opined that 4 species of *Rasbora* are residing in the water bodies of India namely, *Rasbora daniconius* (Hamilton), *Rasbora rasbora* (Hamilton), *Rasbora dandia* Valenciennes and *R. microcephalus* (Jerdon). They also showed that *Leuciscus flavus* Jerdon, *L. caverii* Jerdon, *L. xanthogramme* Jerdon, *L. malabaricus*, *Rasbora neilgherriensis* Day and *R. woolaree* Day as junior synonyms of *R. dandia*. By a careful examination, it was found that, *Rasbora dandia*, *R. daniconius*, *R. rasbora* and *R. microcephalus* are the close congeners of *Rasbora ataenia*. *Rasbora ataenia* differs from *R. dandia* (Valenciennes) described from Sri Lanka in having a slender body (Body height 19.4- 21.7 % SL vs. 23.4- 29.5), shorter (26.1- 28.6 % HL vs. 31.1- 36.4) snout, deeper head (Head height 58.4- 62.2 % HL vs. 50.6- 57.9) and lesser (7 vs. 8) branched rays in dorsal fin, pectoral fin (11 vs. 12- 14) and anal fin (5 vs. 6). The new species can further be distinguished from *Rasbora dandia* in lacking (vs. having a deep color stripe in *R. dandia*) any lateral color band on body. The new species differs from *Rasbora daniconius* [10] of Ganges River in having a complete (vs. incomplete) lateral line, superior (vs. terminal) mouth and in lacking (vs. having) any lateral color band. *Rasbora ataenia* can be distinguished from *R. rasbora* in having a slender body (BDD 19.4- 21.7 % SL vs. 26.0- 30.0 in *R. rasbora*), longer head (HL 29.0- 31.3 % SL vs. 22.0- 26.0) and a fewer (13 vs. 15) pre dorsal scales. The new species can be distinguished from *Rasbora microcephalus* [11], in having lesser lateral line scales (31- 32 vs. 30), fewer (13 vs. 15- 16) pre dorsal scales, higher (HD 58.4- 62.2 % HL vs. 47.0- 53.5) head, widely (INW 27.0- 31.1 % HL vs. 18.0- 23.8) set nares and slender (19.4- 21.7 % SL vs. 22.5- 26.6) body. Unlike the new species, *Rasbora microcephalus* have a silvery lateral stripe. The new species differs from *Rasbora labiosa* Mukerji in having lesser lateral line scales (31- 32 vs. 33- 35) and pre dorsal scales (13 vs. 15) and also in lacking (vs. having) a lateral color stripe. The new species differs from *Leuciscus xanthogramme* Jerdon in having larger eyes (ED 23.1- 28.6 % HL vs. 20), 31- 32 (vs. 30) lateral line scales, 9 (vs. 8) dorsal fin rays, 7 (vs. 6) anal fin rays and both caudal lobes equal (vs. lower lobe longer). The new species can be demarcated from *Leuciscus malabaricus* Jerdon in having 9 (vs. 10) rays in dorsal fin and in lacking (vs. having a blue color band) a mid lateral color band. *Rasbora ataenia* can be distinguished from *Leuciscus cauverii* Jerdon and *L. flavus* Jerdon (1849) in having 31- 32 (vs. 30) lateral line scales, 7 (vs. 6) rays in anal fin and in lacking (vs. having) a mid lateral color band.

5. CONCLUSION

Rasboras are common freshwater fishes of Kerala. They are beautiful aquarium fishes. Even though many surveys and certain biological studies were conducted on these fishes, systematic studies were

found to be rare. For a long time, *Rasbora* species of the Kerala were considered as *Rasbora daniconius*, which was originally described from West Bengal. Silva et al [9], in their revision of *Rasbora*, showed that majority of *Rasbora* species of Kerala are *Rasbora dandia*. Now a new *Rasbora* is being discovered and named from Kerala, especially without a lateral color band on it. It is interesting to state that it is after one and half century a new species of this genus reaching to scientific world from Kerala. It is expected that many new *Rasboras* will be discovered in the coming days from the state.

6. COMPARATIVE MATERIALS EXAMINED

Rasbora rasbora (Hamilton-Buchanan): F. 2107/2 ZSI, Dharikati, 31,12 miles R. Bharati near Lokra (Balipara F. track, Assam). Dr. S.L. Hora; ***Rasbora caverii*** (Jerdon): ZSI/ SRC F 5672, 1 ex, 83.0 mm SL, Thoovanam, coll. M. S. Ravichandran, 24.02. 1998; ***Rasbora dandia***: PCM 21, 30 cm, coll. Mathews Plamoottil; ***Rasbora microcephalus***: From original description by Jerdon (1849) and from review of Sri Lankan *Rasbora* by Silva et al. (2010). ***Rasbora labiosa*** Mukerji: ZSI/ SRC/ F7455, 30.0 mm SL. ***Leuciscus xanthogramme***, ***Leuciscus malabaricus*** and ***Leuciscus flavus***: From original description by Jerdon (1849).

ACKNOWLEDGMENTS

The author acknowledges Principal, Baby John Memorial Government College, Chavara, Kerala for providing the facilities. I am grateful to anonymous reviewers for comments that helped to improve the manuscript. The author is greatly indebted to Dr. Richard Pyle, database coordinator and associate zoologist in ichthyology, Department of Natural Sciences, Bishop Museum, Hawaii.

REFERENCES

- [1] Liao, T.Y., Kullander, S.O. & Fang, F. Phylogenetic analysis of the genus *Rasbora* (Teleostei: Cyprinidae). *Zoologica Scripta*, 2010, 39, 155–176.
- [2] Brittan, M. A revision of the Indo-Malayan freshwater fish genus *Rasbora*. *Monographs of the Institute of Science and Technology, Manila*, 1954, 3: 1- 224.
- [3] Howes, G. J. The anatomy and phylogeny and classification of the bariline cyprinid fishes. *Bull. Br. Mus. Nat. Hist. (Zool)*. 1980, 37 (3): 129- 198.
- [4] Kottelat, M. & Vidthayanon, C. *Boraras micros*, a new genus and species of minute freshwater fish from Thailand (Teleostei: Cyprinidae). *Ichthyological Exploration of Freshwaters*, 1993, 4, 161–176.
- [5] Kottelat, M. and Whitten, A. *Freshwater fishes of western Indonesia and Sulaasi*. Hong Kong, Periplus, 1993, xxxviii+ 221
- [6] Siebert, D.J. & Guiry, S. *Rasbora johanna*e (Teleostei: Cyprinidae), a new species of the *R. trifasciata*-complex from Kalimantan, Indonesia. *Cybium*, 1996, 20, 395–404.
- [7] Jayaram, K.C. *Fundamentals of fish taxonomy*. Narendra publishing House, Delhi, 2002, 53-65.
- [8] Vishwanath, W. and Laisram, J. A new species of *Rasbora* Bleeker (Cypriniformes: Cyprinidae) from Manipur, India. *Journal of Bombay natural History Society*. 2004, 101 (3): 429- 432.
- [9] Silva, A, Maduwage, K. and Pethiyagoda, R. A review of the genus *Rasbora* in Sri Lanka with description of two new species (Teleostei: Cyprinidae). *Ichthyological Exploration of Freshwaters*. 2010, 21 (1): 27- 50.
- [10] Hamilton F. *An account of fishes found in the River Ganges and its branches*. Edinburgh Hurst, Robinson & Co, London, 1822, 312-389.
- [11] Jerdon, T. C, *On the freshwater fishes of southern India*. *Madras Journal of Literature and Science*, . 1849, 15: 302- 346.