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REDESCRIPTION OF *BARILUS HOWESI* BARMAN, 1986, A VALID CYPRINID SPECIES (PISCES : CYPRINIFORMES : CYPRINIDAE) FROM NORTH BENGAL, INDIA

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INTRODUCTION

The cyprinid fishes of the genus *Barilius* Hamilton are known to inhabit freshwater systems and occurring throughout Southeast Asia. It is known to comprise 29 species (Froese and Pauly, 2010) in Asia and Menon (1999) recognized only 15 species from India. During the studies on the Cyprinid fishes belonging to the genus *Barilius* from India, three specimens of *Barilius* were found lying unidentified in the National Zoological Collections in the Fish Division of Zoological Survey of India, Kolkata. On critical examination it was found that these specimens represent a distinct species and was described as a new species of bariline fishes *Barilius howesi* by Barman (1986). Subsequently, Talwar and Jhingran (1991), Husain *et al.* (1992), Menon (1999) and Jayaram (1999) considered *B. howesi* as conspecific with *B. bendelisis* (Hamilton, 1807). Although, the species was diagnosed as being allied to *Barilus bendelisis* (Hamilton), the later species can easily be separated by presence of black spots on all body scales at their bases and two spots on either side of lateral line in all lateral line scales.

Recently, the first author collected a number of specimens belonging to the genus *Barilius* from North Bengal (West Bengal). The specimens were identified as *B. bendelisis* and during the course of determination it was strongly felt that *B. bendelisis* and *B. howesi* are two distinct species represented in North Bengal. The present communication serves to resurrect *Barilus howesi* as valid species with its re-description to set aside errors committed in the original description and

discusses the differences between *B. howesi* and *B. bendelisis*.

Barilus howesi Barman, 1986

1986. *Barilius howesi* Barman, *J. Bombay nat. Hist. Soc.*, **83**(1) : 171-173 (type locality : Stream near Sulka para, Jalpaiguri district, North Bengal in West Bengal).

Material examined : Holotype : ZSI FF 2235, 70 mm SL, Locality : stream near Sulka para, Jalpaiguri district, North Bengal, Collector : Dr. H.K. Bhowmick, Date of Collection : 27.08.1975; Paratypes : 2 ex., 61-66 mm SL. Reg. No. ZSI FF 2236. Locality, Collector and date of collection same as in holotype.

Description : Body moderately elongate, compressed. Abdomen rounded with vent placed in posterior half of body. Snout pointed, devoid of tubercles; mouth terminal, oblique, large but not protractile. Maxilla extends to below middle of eye. Symphyseal process of lower jaw poorly developed. Barbels two pairs, distinctly smaller than eye diameter. Suborbital bones are wide, the third one not covering cheek. Head length 4.32 to 4.62, body depth 3.15 to 3.33, predorsal distance 1.72 to 1.74 and preanal distance 1.29 to 1.41 in standard length. Depth of head 1.12 to 1.16, eye diameter 3.98 to 4.18, snout length 2.99 to 3.31 in head length. Ratio of interorbital width and eye diameter is 1.36 to 1.59. Gill rakers are 8 or 9 on lower arm of first arch.

Dorsal fin rays ii, 7; anal fin rays ii-iii, 7-8; pectoral fin rays i, 13; pelvic fin rays i, 8; caudal fin rays 19. Height of dorsal fin is 5.79 to 6.01, height of anal fin 6.91 to 7.21, pectoral fin length 4.89 to 5.21 and pelvic

fin length 7.45 to 7.92 in standard length. Origin of dorsal fin is nearer to base of caudal fin than to tip of snout. Caudal fin deeply forked with lower lobe slightly longer than upper.

Lateral line complete with 42 or 43 scales. Lateral transverse scales 12; 8½ scales between origin of dorsal fin and lateral line, 3½ scales between origin of anal fin and lateral line. Predorsal scales 17 or 18 and circumpeduncular scales 12 to 14. Axillary scales, elongate with a fleshy border, present at base of pectoral and pelvic fins.

Colour : Dorsal surface brown, sides and ventral surface silvery white. Upper sides of body with 14 or 15 vertical dark bands, that does not reach lateral line. Fins are hyaline.

DISCUSSIONS

Menon (1999) recognized 15 species from India but considered *B. howesi* Barman as conspecific with *B. bendelisis* (Hamilton). Talwar and Jhingran (1991) have relegated *B. howesi* to the synonymy of *B. bendelisis* without assigning any reason. Husain *et al.* (1992) compared several characters given in original description with that of *B. bendelisis* as described by other authors to conclude that both the species are conspecific. Menon (1999) and Jayaram (1999) followed the same to retain *B. howesi* under the synonymy of *B. bendelisis*. But, Kar (2002) studied the *Barilius* species of India and could compare all species belonging to this genus to distinguish *B. howesi* from *B. bendelisis*.

In the original description (Barman, 1986), *B. howesi* was compared with *B. barna* (Hamilton) and *B. barila* (Hamilton), which were stated to be unrelated (Husain *et al.*, 1992). Among the *Barilius* species known from India, *B. dimorphicus* Tilak and Husain, *B. nelsoni* Barman, *B. radiolatus* Gunther, *B. shacra* (Hamilton) and *B. telio* (Hamilton) are having higher lateral line scale count (55 to 75 vs. 35 to 50 in others). Body is uniform in colour with no vertical bars or spots in *B. everzadi* Day and *B. modestus* Day. *B. bakeri* Day and *B. canarensis* (Jerdon) are characterized in having one or more rows of large spots on sides. In having bars on sides, the described species closely resemble but differs from *B. barila* (Hamilton), *B. barna* (Hamilton), *B. gatensis* (Valenciennes) and *B. vagra* (Hamilton),

which have higher anal fin elements (13 to 17 rays). *B. dogarsinghi* Hora is known to have lower lateral line scale count (less than 40). A comparative chart of meristic and morphometric characters based on the materials examined are given (table 1) hereunder to distinguish *B. howesi* from *B. bendelisis*, both similar in having lower anal fin rays (7 or 8 branched rays), 40 to 43 lateral line scales and bars on sides of body.

Further, in terms of posterior extension of maxilla these fishes can be placed under three distinct groups (Kar, 2002). In *B. everzadi*, *B. radiolatus* and *B. shacra*, maxilla reaches at most to anterior margin of eye. Posterior extension of maxilla reaches to below anterior one-third of eye in *B. barila*, *B. barna*, *B. bendelisis*, *B. canarensis* and *B. nelsoni*. In case of rest of the *Barilius* species including *B. howesi*, maxilla extends to below middle of eye. At this point, *B. howesi* is unrelated not only to *B. barila* and *B. barna*, but also to *B. bendelisis*. It is rather closely allied to *B. modestus* in having lower jaw with a poorly developed symphyseal process but differs in having vertical dark bands (no band or spot in *B. modestus*). In *Barilius* species, number of barbels seems to differ within the species itself and size of the barbels is not a constant character (e.g., *B. bendelisis*, in Day, 1878). Hence, presence or absence or rudimentary nature of barbels (as used in Talwar and Jhingran, 1991; Jayaram, 1999) can not be considered as a differentiating structure to distinguish various species of the genus.

Four species, *viz.*, *Cyprinus bendelisis*, *C. cocsa*, *C. chedra* and *C. tita*, described in Hamilton (1822) as from northern rivers of Bengal are clubbed together under the name *Barilius bendelisis* (Hamilton) (Day, 1878; Menon, 1999). All these species are distinct in having a spot on each scale but last two are said to devoid of barbels and *C. cocsa* with four barbels. The *Cocsa* type specimens are also known to bear a spot on the middle of each scale and a row of small oblong spots on each side of lateral line (Hamilton, 1822; Day, 1878; Shaw and Shebbeare, 1937). The argument in Husain *et al.* (1992) for *B. howesi* being 'a female or immature male of *Cocsa* type specimens of *B. bendelisis* Hamilton' does not hold good as the characteristic black spots on each scale at bases are absent. *B. bendelisis* can easily be distinguished from all other congener in



Outline drawing of *Barilius howesi* Barman



Barilius howesi Barman (Holotype)



Barilius bendelisis (Hamilton) Lataguri, Jalpaiguri Dist. North Bengal



Barilius bendelisis (Hamilton) Rajabhatkhawa, Alipurduar Jn., North Bengal

Table-1. Comparison of meristic and morphometric characters of *B. bendelisis* and *B. howesi*.

Characters	<i>B. bendelisis</i>	<i>B. howesi</i>
Head length in SL	3.87-4.00	4.32-4.62
Body depth in SL	3.36-3.84	3.15-3.33
Pre-dorsal length in SL	1.60-1.66	1.72-1.74
Pre-anal length in SL	1.43-1.49	1.29-1.41
Dorsal fin height in SL	4.93-5.47	5.79-6.01
Pelvic fin length in SL	6.85-7.35	7.45-7.92
Head depth in HL	1.33-1.35	1.12-1.16
Eye diameter in HL	4.75-4.80	3.98-4.18
Snout length in HL	2.66-2.71	2.99-3.31
Lateral line scales	40-41	42-43
Pre-dorsal scales	19-21	17-18
Posterior extension of maxilla	To below anterior 1/3 of eye	To below middle of eye

(Source : Kar, 2002)

having all the body scales with black spots at their bases and two spots on either side of lateral line in all the lateral line scales. Presence of black dots in each scale of even younger specimens of *B. bendelisis* is also observed (Tilak, 1967; Jayaram and Singh, 1977; Talwar and Jhingran, 1991), which is not present in *B. howesi* specimens.

In view of the objections raised in Husain *et al.* (1992) meticulous examination of type materials (no other material collected since then) were made and compared with a number of examples of *B. bendelisis* including that of North Bengal. The specimens of *B. howesi* in fact bear dorsal fin rays 8 (not 9), anal fin rays 10 (not 12) and predorsal scales 17-18 (not 20-21). Considering the differences in characters (table-1), especially smaller head, deeper body, shorter pre-dorsal length, longer pre-anal distance, larger eye, shorter snout and absence of black spots on each scale, it is concluded that *B. howesi* is a distinct species and can not be considered conspecific with *B. bendelisis*.

COMPARATIVE MATERIALS

Barilus bendelisis : ZSI F 2437, 1 ex., 95 mm SL, Almorah, no date, purchased from F. Day; ZSI F 2438, 1 ex., 88 mm SL, Orissa, no date, purchased from F. Day; ZSI F 2448-49, 2 exs., 78-85 mm SL, Assam, no date, purchased from F. Day; ZSI F 1629-30/1, 2 exs.,

81-83 mm SL, Purulia, no date, Bengal Fisheries; ZSI F 1856/1, 5 exs., 95-105 mm SL, Maldhum, Uttar Pradesh, no date, Museum Collection; ZSI F 10844/1, 3 exs., 77-82 mm SL, Subarnarekha R., Ranchi, Jharkhand, Dec. 1927, I. Mukherjee; ZSI F 2443/2, 1 ex., 110 mm SL, Belairi R. at foothills, Kameng Frontier Division, 27.11.1961, K.C. Jayaram (Indo-Swiss Expd.); ZSI F 9712/1, 2 exs., 94-98 mm SL, Medha, Satara Dist., Yenna Valley, Bombay Presidency, no date, N. Annandale; ZSI F 9950/1, 4 exs., 65-77 mm SL, Senapati Stream, Kairong, Nagahills, no date, S.L. Hora; ZSI F 10292/1, 2 exs., 48-55 mm SL, Siju Cave, Garo hills, Assam, no date, S.W. Kemp & B.N. Chopra; ZSI F 7078/1, 2 exs., 85-88 mm SL, Rowta river, Assam-Bhutan Frontier, 13.12.1910, S.W. Kemp; ZSI F 1243/1, 4 exs., 44-49 mm SL, Tunga River at Shimago, 20.05.1937, B.S. Bhimachar; ZSI F 11191/1, 10 exs., 92-108 mm SL, Tributaries of Sutlej River, no date, Acad. Nat. Sci. Phil. (exch.); ZSI F 11192/1, 2 exs., 55-58 mm SL, Branch of Sutlej River, no date, Acad. Nat. Sci. Phil. (exch.); ZSI F 11193/1, 5 exs., 88-91 mm SL, northern India, no date, Acad. Nat. Sci. Phil. (exch.); ZSI F 11194/1, 2 exs., 77-79 mm SL, Sutlej river, no date, Acad. Nat. Sci. Phil. (exch.); ZSI F 11195/1, 1 ex., 105 mm SL, Gugger river, no date, Acad. Nat. Sci. Phil. (exch.); ZSI F 11421/1, 28 exs., 83-90 mm SL, R. of Terai and Duars, no date, G.E. Shaw & E.O. Shebbeare; ZSI F 11953/1, 25 exs., 88-92 mm SL, Lachhiwala, Dehra

Dun, no date, S.L. Hora; ZSI F 12117/1, 1 ex., 78 mm SL, Moola Mutha R., Poona, no date, Dept. of Fisheries, Bombay; ZSI F 12159/1, 1 ex., 86 mm SL, Nandhaser river, Nainital, U.P., no date, Bhola & Shebbeare; ZSI F 12217/1, 6 exs., 38-46 mm SL, Tribeni, Nepal, 05.12.1935, F.M. Baily; ZSI F 12499/1, 2 exs., 113-117 mm SL, Waldi river, Pimpalgaon, 17.08.1935, A.G.L. Fraser; ZSI F 12502/1, 25 exs., 97-120 mm SL, Waldi river, villages of Deolali and Edgaon, 14.11.1935, A.G.L. Fraser; ZSI F 2592/1, 7 exs., 50-91 mm SL, Rajputna, 06.03.1961, M.L. Bhatia; Unregistered, 1 ex., 86 mm SL, Chinnar river, 13 km east of Mariyoor, Iduki Dist., Kerala, 09.10.1990, A.G.K. Menon & party; ZSI FF 4269, 1 ex., 120 mm SL, Torsa

River, Coochbehar, North Bengal, 22.08.2008, R.P. Barman and party; ZSI FF 4270, 6 exs., 37-80 mm. SL, Lataguri, Jalpaiguri district, North Bengal, 27.01.2010, R.P. Barman and party; ZSI FF 4271, 3 exs., 45-63 mm SL, Rajabhatkhawa, Alipurduar Jn., North Bengal, 24.01.2010, R.P. Barman and party.

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REFERENCES

- Barman, R.P., 1986. A new freshwater fish of the genus *Barilius* Hamilton (Pisces: Cyprinidae) from West Bengal, *J. Bombay nat., Hist. Soc.*, **83**(1) : 171-173.
- Day, F., 1878. *The fishes of India, being a natural history of the fishes known to inhabit the seas and freshwaters of Indian, Burma and Ceylon*. William Dawson & Sons, London, Part 4 : i-xx, 553-778, pls. 134-195.
- Hamilton, F., 1822. *An account of the fishes found in the river Ganges and its branches*. Edinburgh : 405 pp.
- Froese, R. and Pauly, D., (Eds.), 2010. Fish Base. World Wide Web electronic publication. www.fishbase.org, version (03/2010).
- Husain, A., Tilak, R. and Jain, S., 1992. Systematic status of *Barilius jayarami* Barman and *Barilus howesi* Barman (Pisces : Cyprinidae : Rasborinae). *Rec. zool. Surv. India*, **90** (1-4) : 91-104.
- Jayaram, K.C., 1999. *The freshwater fishes of the Indian region*. Narendra Publishing House, Delhi, India. 551 pp.
- Jayaram, K.C. and Singh, K.P., 1977. On a collection of fish from North Bengal. *Rec. zool. Surv. India*, **72** : 243-27.
- Kar, S., 2002. *A revision of the cyprinid genus Barilius Hamilton from India*. Ph.D. thesis submitted to the University of Calcutta : 1-134, pls.
- Menon, A.G. K., 1999. A check list—Freshwater fishes of India. *Rec. zool. Surv. India Occ. Paper*, No. **175** : 366 pp.
- Shaw, G.E. and Shebbeare, E.O., 1937. From the fishes of Northern Bengal. *J. Roy. Asiat. Soc. Bengal*, **3** : 1-317.
- Talwar, P.K. and Jhingran, A.G., 1991. *Inland fishes of India and adjacent countries*. Oxford & IBH publishing, New Delhi, 1158 pp.
- Tilak, R., 1967. The fishes of the river Tawi and its tributaries (J & K) with notes on eacology. *Rec. zool. Surv. India*, **65** : 183-231.