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SYSTEMATIC STATUS OF *BARILIUS JAYARAMI* BARMAN AND *BARILIUS HOWESI* BARMAN (PISCES : CYPRINIDAE : RASBORINAE)

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INTRODUCTION

On a detailed study of the genus *Barilius* Hamilton-Buchanan, Husain (1987) and Jain (1987), while dealing with their projects on systematics of the fishes of Dehradun and systematics of the fishes of subfamily Rasborinae respectively, found that the two rasborine fishes, *Barilius jayarami* Barman (Barman, 1985) from Arunachal Pradesh (Namdapha Wildlife Sanctuary, Dist. Tirap) and *Barilius howesi* Barman (Barman, 1986) from West Bengal are not new taxa, but same as the widely distributed *Barilius barna* Hamilton-Buchanan and *Barilius bendilisis** Hamilton-Buchanan respectively. Most probably, Barman (1985, 1986) compared the material of his new species of the genus *Barilius* Hamilton-Buchanan from the two areas with unrelated species. According to him (Barman, 1985, 1986), *Barilius dogarsinghi* Hora and *Barilius infrafasciatus* Fowler were close allies of *Barilius jayarami*, and *Barilius barna* Hamilton-Buchanan and *Barilius barila* Hamilton-Buchanan were nearer to his *Barilius howesi*. This must have resulted in the creation of two new species i.e. *B. jayarami* and *B. howesi*.

In the present paper, a comparison of a long series of characters dealt with by Barman (1985, 1986) for his two species has been made with those of the correctly identified species. The present study clearly indicates that the two species described by Barman (1985, 1986) are invalid and belong to already known ones i.e. *Barilius barna* Hamilton-Buchanan and *B. bendilisis* Hamilton-Buchanan, respectively. The type material of both these taxa has been examined.

(i) Systematic Status of *Barilius jayarami* Barman

On examination of type material of the species *Barilius jayarami* Barmen (Regd. No. ZSI/FF 2151), the number of dorsal and pelvic fin rays, predorsal scales and rows of scales between dorsal base and lateral line were actually found to be 11/7 (instead of II-III/8 as counted by Barman, 1985), 1/7 (instead of 1/8), 16 scales (instead of 19-20 scales) and 8-8.5 rows of scales (instead of 6.5 rows), respectively.

The comparison of characters (meristic, morphometric, colouration) and distribution of *Barilius jayarami* Barman with those of *Barilius barna* Hamilton-

* Spelling followed after Hamilton, the author of the species.

TABLE showing overlapping of characters in *Barilius barna* Hamilton-Buchanan and *Barilius jayarami* Barman

Character	*Barilius barna* Hamilton				*Barilius jayarami*		
	Hamilton-Buchanan 1822	Gunther, 1868	Day, 1878, 1889	Barman, 1985, 1986	Husain, 1987	Jain, 1987	Barman, 1985
1	2	3	4	5	6	7	8
1. Dorsal fin rays	9	9	II/7	—	II-III/7	II/7	II-III/8(II/7 in paratype, Regd. No. ZSI/FF-215)
2. Pectoral fin rays	13	—	15	—	I/12-13	I/14	I/12-13
3. Pelvic fin rays	9	—	9	—	II/7	II/8	I/8 (I/7 in paratype)
4. Anal fin rays	II/10	13	III/10-11	—	III/10-11	III/10-11	III/11
5. Caudal fin rays	19	—	19	—	19	19	19
6. Cleft of mouth	—	Maxillary extends somewhat beyond vertical from front margin of orbit.	Posterior extremity of maxilla reaching to below 1/3rd of orbit.	—	Posterior extremity of maxilla reaching to below 1/3rd of orbit.	Posterior extremity of maxilla reaching to below 1/3rd of orbit.	Extending beyond anterior margin of eye.
7. Barbels	Absent	None.	Absent.	—	Minute rostral pair shorter than maxillary pair or even rudimentary, Absent or rudimentary (Barman, 1985)	Minute rostral pair of barbels.	Two pairs, anterior or rostral pair very short and posterior or maxillary pair absent, 1/5th in eye diameter (Both pairs minute in paratype).

Table (*Contd.*)

Character	*Barilius barna* Hamilton					*Barilius jayarami*
	Hamilton-Buchanan 1822	Günther, 1868	Day, 1878, 1889	Barman, 1985, 1986	Husain, 1987	Jain, 1987	Barman, 1985
1	2	3	4	5	6	7	8
8. Dorsal fin	—	—	Origin nearer caudal base than snout tip	—	Origin nearer caudal base than snout tip.	Origin nearer caudal base than snout tip	Origin nearer caudal base than snout tip
	—	Base of last 3 rays being above anal fin	—	—	Base extending over 1/3rd or middle anal base.	—	Base extending over middle of anal base in paratype
9. Pectoral fin	—	—	Extending slightly beyond pelvic base	—	Extending slightly beyond pelvic base	Extending to pelvics	Well extending pelvics
10. Pelvic fin	Origin nearer snout tip than caudal base. Fins do not reach the vent	—	Fin may or may not reach anal origin (Pl. CXLVIII, Figs. 1.2).	— —	Fin may or may not reach anal origin	Fin may or may not reach anal origin	Origin nearer snout tip than caudal base. Fin reaching anal fin
11. Head length in standard length	—	—	—	3.68–4.00	3.80–4.21	3.65–4.13	3.70–3.93
12. Body depth in standard length	—	4.00	—	3.32–3.68 3.50–4.00	3.17–4.25	3.05–3.71	3.52–3.70
13. Predorsal distance in standard length	—	—	—	—	1.77–1.88	1.74–1.87	1.81–1.85
14. Dorsal fin in standard length	—	—	—	—	5.23–6.67	—	4.84–5.90
15. Pectoral fin in standard length	—	—	—	—	4.53–5.50	—	5.36–5.72

Table (*Contd.*)

Character	*Barilius barna* Hamilton					*Barilius jayarami*
	Hamilton-Buchanan 1822	Gunther, 1868	Day, 1878, 1889	Barman, 1985, 1986	Husain, 1987	Jain, 1987	Barman, 1985
1	2	3	4	5	6	7	8
16. Prepelvic distance in standard length		–	–	–	2.11–2.33	2.12–2.52	2.25–2.36
17. Pelvic fin in standard length	–	–	–	–	4.60–5.90		4.91–5.25
18. Preanal distance in standard length	–	–	–	–	1.48–1.66	1.48–1.68	1.53–1.59
19. Anal fin in standard length	–	–	–	–	6.55–8.89	–	6.73–7.00
20. Caudal fin in standard length	–	–	–	–	3.92–4.81	3.30–4.38	4.50–4.91
21. Height of head in head length	–	–	–	–	1.09–1.27	–	1.15–1.23
22. Width of head in head length		–	–	–	1.60–2.00	1.71–2.31	1.87–2.12
23. Length of snout in head length	–	–	–	–	3.44–3.83	3.36–4.33	3.40–4.00
24. Eye diameter in head length	–	–	2.50–3.50	2.50–3.50	2.80–3.45	3.62–4.70	3.00–3.20
25. Length of snout in interorbital width	–	–	–	–	1.15–1.43	–	1.10–1.25

Table (*Contd.*)

		Barilius barna Hamilton					*Barilius jayarami*
	Character Hamilton-Buchanan 1822	Gunther, 1868	Day, 1878, 1889	Barman, 1985, 1986	Husain, 1987	Jain, 1987	Barman, 1985
1	2	3	4	5	6	7	8
27. Eye diameter in postorbital head length	—	—	—	—	1.33—1.58	—	1.20—1.60
28. Least height of caudal peduncle in its length	—	—	—	—	1.56—2.00	1.12—1.78	2.00—2.40
29. Lateral line scales	—	42	39—42	—	40	40—42	42—43
30. Scales between dorsal base and lateral line	—	9	8-9	—	7.5—8.5	8	6.5 (8.0 —8.5) in paratype)
31. Scales between lateral line and pelvic base	—	—	2.5	—	2.5—3.5	2.5	3.5
32. Predorsal scales	—	—	16	15—16	15—16	17	19-20 (16 in paratype)
33. Circum-peduncular scales	—	—	—	—	14	—	14
34. Colouration	Incomplete bars on the sides and with a golden	Body with about 8 narrow blackish vertical bands	Adult with 9-11 vertical dark bands on body;	8-9 vertical bands ; 9-10	7-10 bluish vertical bands vertical bars	7-11 bands on lateral sides	8-9 transverse dark bluish bands narrower than

Table (*Contd.*)

	Barilius barna Hamilton						*Barilius jayarami*
Character	Hamilton-Buchanan 1822	Gunther, 1868	Day, 1878, 1889	Barman, 1985, 1986	Husain, 1987	Jain, 1987	Barman, 1985
1	2	3	4	5	6	7	8
	stripe along the upper lateral line		young with 7-9 narrow deep blue vertical bands	vertical bars	of body crossing lateral line line		pale interspaces and extending from back to downwards till below lateral line, those on caudal peduncle shorter and last as dark blotch at base of caudal fin.
	A golden stripe along the upper lateral line	–	–	–	A dark horizontal line extending below between commencement of dorsal fin and caudal base	–	A dark longitudinal line extending from base of caudal fin to below commencement of dorsal fin
	Back fin stained with black especially on the edge	–	Dorsal fin edged with black	–	Upper half of dorsal fin except tip of few anterior rays dark grey	Dorsal fin edged with black	Dorsal fin provided with dark band across their rays.
	Three hinder fins of yellow colour	–	Pectoral, pelvic and anal fins yellowish	–	Pectoral, pelvic and anal fins yellowish or pale	–	Pectoral, pelvic and anal fins dull white
	Tail fin stained with balck especially on the edge	–	Caudal fin edged with black	–	Caudal fin light greyish, lower lobe more so	–	Dark longitudinal bandin lower lobe of caudal fin

Table (*Contd.*)

			Barilius barna Hamilton				*Barilius jayarami*
		Gunther, 1868	Day, 1878, 1889	Barman, 1985, 1986	Husain, 1987	Jain, 1987	Barman, 1985
		3	4	5	6	7	8
35.	Distribution	Yamuna and Brahmaputra rivers, the extreme branches of the Ganges	Ganges, Brahmaputra, Jumma, Kossye rivers	Assam, the Ganges & its branches, Bengal and Orissa.	—	Ganga and Yamuna–drainage system of Dehradun. Northern India, Orissa, Madhya Pradesh Maharashtra, Karnataka, Nepal, Bangladesh, Burma.	Namdapha Wild Life Sanctuary, Dist. Tirap, Arunachal Pradesh (Brahmaputra river system)

TABLE showing overlapping of characters in *Barilius bendilisis* Hamilton and *Barilius howesi* Barman

Character	*Barilius bendilisis* Hamilton							*howesi*
	Hamilton, 1822	Guenther, 1868	Day, 1878; 1889	Misra, 1962	Tilak at al 1984	Husain, 1987	Jain, 1987	Barman, 1986 1986
1	2	3	4	5	6	7	8	9
1. Dorsal fin rays	8-10	9	II/7	II/7	II/7	II/7	II/7	II/8 (II/7 in figure)
2. Pectoral fin rays	I/13-14	—	I/14	15	I/14	I/12	I/14	I/13
3. Pelvic fin rays	II/7	—	I/8	9	I/8	I/8	I/8	I/8
4. Anal fin	III/7 10-11	II-III/7-8	II-III/7-8	II-III/7-8	III/7	III/7-8	III/9 (last one ray counted into two)	
5. Caudal fin rays	18-19	—	18	18	18	19	18	—
6. Barbels	4.2 or none	4 very short or minute, maxillary being rather longer, rostral frequently absent	Two pairs, minute rostral shorter than maxillary pair, occassionally rudimentary or absent	Two pairs, minute, rostral, shorter than maxillary pair, occassionally rudimentary or absent	Two pairs, minute, rostral shorter than maxillary pair, occassionally rudimentary or absent	Two pairs, minute, rostral shorter than maxillary pair, occassionally rudimentary or absent	Two pairs, minute, rostral shorter than maxillary pair, occassionally rudimentary or absent	Two pairs anterior pair 2.00-2.66 and posterior pair 2.33-4.00 in eye diameter (equal in figure)
7. Cleft of mouth (Maxilla)	— scarcely ex-	Maxillary below anterior tending beyond front margin of orbit or to vertical from front margin of orbit	Extending below anterior 1/3rd of eye	Extending to below anterior 1/3rd of eye	Extending to below anterior 1/3rd of eye	Extending to below anterior 1/3rd of eye	Extending to below middle of 1/3rd of eye	Extending to eye

Table (*Contd.*)

Character	Hamilton, 1822	*Barilius bendilisis* Hamilton						*howesi*
		Guenther, 1868	Day, 1878; 1889	Misra, 1962	Tilak at al 1984	Husain, 1987	Jain, 1987	Barman, 1986 1986
1	2	3	4	5	6	7	8	9
8. Dorsal fin	—	Terminating before or in front of the origin of anal fin	Commencing nearer caudal base than snout tip and not extending to over anal fin	Commencing nearer caudal base than snout tip and not extending to over anal fin	Commencing nearer caudal base than snout tip and not extending to over anal fin	Commencing nearer caudal base than snout tip and not extending to over anal fin	Commencing nearer caudal base than snout tip and not extending to over anal fin	Origin nearer snout tip than caudal base (nearer caudal snout as shown in figure)
9. Head length in standard length	—	4.20	—	—	—	3.89—4.57	3.72—4.68	4.35—4.71
10. Depth in standard length	—	4.00—4.67	—	—	—	3.52—4.52	2.32—4.34	3.00—4.25
11. Predorsal distance in standard length	—	—	—	—	—	1.70—1.86	1.64—2.30	1.73—1.75
12. Dorsal fin in dard length	—	—	—	—	—	4.52—6.00	—	5.50—5.83
13. Pectoral fin in standard length	—	—	—	—	—	4.25—5.10	—	4.71—5.08
14. Prepelvic distance in standard length	—	—	—	—	—	1.85—2.10	1.76—2.27	1.90—2.00
15. Pelvic fin in standard length	—	—	—	—	—	5.56—7.55	—	6.94—7.62

Table (*Contd.*)

Character	*Barilius bendilisis* Hamilton							*howesi*
	Hamilton, 1822	Guenther, 1868	Day, 1878; 1889	Misra, 1962	Tilak at al 1984	Husain, 1987	Jain, 1987	Barman, 1986 1986
1	2	3	4	5	6	7	8	9
16. Preanal distance in standard length	–	–	–	–	–	1.37–1.51	1.35–1.58	1.37–1.45
17. Anal fin	–	–	–	–	–	6.78–8.92	–	6.77–7.77
18. Caudal fin in standard length	–	–	–	–	–	3.67–5.10	3.78–7.73	4.06–4.66
19. Widthofhead in head length	–	–	–	–	–	1.40–2.00	1.37–2.00	1.76–1.88
20. Height of head in head length	–	–	–	–	–	1.12–1.29	–	1.14–1.16
21. Snout length in hed length	–	–	–	–	–	2.68–3.67	2.30–4.00	4.00–4.28
22. Eye diameter inheadlength	–	–	4.25–4.67	4.20–4.60	–	3.58–4.23	3.54–6.78	4.00–4.29
23. Snout length in inter-orbital width	–	–	–	–	–	0.93–1.22	–	1.28–1.57 (defective)
24. Eye diameter in inter-orbital width	–	–	–	–	–	1.20–1.54	1.18–2.55	1.28–1.37

Table (*Contd*)

		Barilius bendilisis Hamilton						*howesi*
		Guenther, 1868	Day, 1878; 1889	Misra, 1962	Tilak at al 1984	Husain, 1987	Jain, 1987	Barman, 1986 1986
		3	4	5	6	7	8	9
25. Postorbital headlengthin snout length	—	—	—	—	—	0.52–0.72	—	Twice (i.e. 0.50)
26. Least height of caudal peduncle in its length	—	—	—	—	—	1.41–1.82	1.24–1.92	1.62–1.71
27. Lat. line scales	—	42–43	40–43	40–43	40–45	40–43	40–43	43–45
28. Scales between dorsal base and lateral line	—	8.0–8.5	7–8	7–8	7–8	7.5–8.5	7–8	8.5
29. Scales between lateral line and pelvic base	—	—	2.5–3.5	2.5–3.5	2.5–3.5	3.5–4.5	2.5–3.5	3.5
30. Predorsal scales	—	—	20	20	20	19–20	20	20–21
31. Colour bands on body	14 (Pl. 3, fig. 77)	A series of short bluish bars along the side of the back	9 (1878, pl. CXLVIII, figs. 7, 9) slaty-grey bars	—	8-12 dark bands	9-12 vertical grey bands bands	8–12 bands	14–15 vertical dark bands dark bands

Table (*Contd.*)

		Barilius bendilsis Hamilton						*howesi*
		Guenther, 1868	Day, 1878; 1889	Misra, 1962	Tilak at al 1984	Husain, 1987	Jain, 1987	Barman, 1986 1986
		3	4	5	6	7	8	9
32. Distribution	Riversof Mysore	Mysore, Ganges, East Indian Continent. Simla, Saharanpur, Calcutta, Nepal, Nilgiris.	Assam Himalayas, Continent of India as far as western ghats except from coast of Malabar or Canara or from Sind, Ceylon,	India, Assam, West Bengal, Punjab, Simla, U.P. Bihar, Coimbatore, Palghat, Mettupalayam, Nilgiris, Pakistan, East Pakistan, Ceylon.	India, Pakistan, Nepal, Bangladesh.	Ganga and Yamuna drainage systems (India), Pakistan, Nepal, Bangladesh, Sri Lanka, Burma	—	Stream near Sulkapura, Dist. jalpaiguri (North Bengal), West Bengal

Buchanan by various workers (Hamilton-Buchanan, 1822 ; Gunthur, 1868 ; Day, 1878, 1889 ; Barman, 1986; Husain, 1987 ; Jain, 1987) indicates that it falls within the range of *Barilius barna* Hamilton-Buchanan and hence in its synonymy. Barman (1985) erroneously made a comparison of his material with unrelated species like *Barilius dogarsinghi* Hora and *Barilius infrafasciatus* Fowler and on the basis of the observed differences created the new species, *Barilius jayarami* which is not valid as per the present assessment. The figure of *B. jayarami* given by Barmen (1985) closely resembles that of the male *B. barna*. This is indicated in the characters of the fins specially the dorsal, the pectorals and the pelvics which are well developed in the males of *B. barna*. Sexual dimorphism has been described in detail by Husain (1987, 1989), who observed that the mala of this species has well developed pelvic fins in addition to various other morphological features. *B. dogarsinghi* Hora is closer to *Barilius dogarsinghi* Hamilton-Buchanan.

(ii) Systematic Status of *Barilius howesi* Barman :

The figure of *Barilius howesi* given by Barman (1986) actually belongs to that of a female or an immature male in *cocsa* type of specimens of *barilius bendilisis* Hamilton-Buchanan as per the assessment made by Tilak et al. (1984) and Husain (1987). The type material of *B. howesi* has been examined. Barman (1986) has wrongly counted the last divided or branched rays of dorsal and anal fins by two in each case. The last rays of median fins are normally divided upto the base but are counted as one because, they have a single radial at the base. This fault of observation by Barman (1986) resulted in increase of one ray each in dorsal and anal fins. Further, the length of snout in the type material of *B. howesi* appears to have been also measured wrongly as it is 3.57 times in head length in figure instead of 4.00—4.28 times as given in the text. Besides, the author of the species (Barman, 1986) compared his material with unrelated species *Barilius barna* Hamilton-Buchanan and *B. barila* Hamilton-Buchanan, which resulted in the creation of a new species (*B. howesi)* and confusion among the ichthyologist. A comparison of the characters and distribution of this species mentioned by Barman (1986) with that of *B. bendilisis* Hamilton-Buchanan by various workers (Hamilton-Buchanan, 1822 ; Gunther, 1868 ; Day, 1878 ; 1889 ; Misra, 1962 ; Tilak *et al.*, 1984. Husain, 1987 ; Jain, 1987) clearly indicates that they are conspecific. Hence, *B. howesi* is a synonym of *B. bendilisis* Hamilton-Buchanan.

SUMMARY

The systematic status of two species viz., *Barilius jayarami* and *Barilius howesi* described recently by Barman (1985, 1986) has been assessed based on type and general material of the species and they are found to belong to well known species such as *Barilius barna* Hamilton-Buchanan and *ibarilius bendilisis* Hamilton-Buchanan, respectively. The observation of the meristic and morphometric characters by Barman (1985, 1986) have been found to be defective. The comparison of the material of new taxa from Arunachal Pradesh and West Bengal with unrelated species might have led to the creation of new taxa. The tables of comparison of related species are given.

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