



Status of *Lepidocephalichthys caudofurcatus* (Tilak & Husain, 1978) in relation to *L. goalparensis* Pillai & Yazdani, 1976 (Cobitidae : Cypriniformes)

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ABSTRACT: The status of *Lepidocephalichthys caudofurcatus* (Tilak & Husain, 1978) in relation to *L. goalparensis* Pillai & Yazdani, 1976 has been clarified and upheld and the two species are found.

Keywords: *Lepidocephalichthys caudofurcatus* (Tilak & Husain, 1978).

INTRODUCTION

Tilak and Husain (1978) described *Lepidocephalus caudofurcatus* from Kalapani nala, Rishikesh, District Dehra Dun; Sailani river, Beharigrah, District Saharanpur and Gagan river near Moradabad, District Moradabad (North-west India) which is recognised by Talwar & Jhingran (1991) and Jayaram (1999). The status of *Lepidocephalus caudofurcatus* has been in confusion since Jayaram (1999: 216) mentioned in the footnote 'Menon (1992, p. 69) synonymised this species with *L. menoni*. It will be seen that *L. caudofurcatus* is a species of northern India whereas *L. menoni* is confined to Eastern India. Moreover, the two can well be separated as in the key'. Menon (1999) synonymised *Lepidocephalichthys goalparensis* Pillai & Yazdani, 1976 from Goalpara, Assam and *Lepidocephalus caudofurcatus* Tilak & Husain, 1978 from Uttarakhand and Uttar Pradesh with *Lepidocephalichthy menoni* Pillai & Yazdani, 1976 from Garo hills, Meghalaya without assigning any reasons.

Tilak & Husain (1981) studied the type material (2 paratype specimens, Regd. No. ERS / ZSI-553 at Eastern Regional Centre, Zoological Survey of India, Shillong (Meghalaya) of *L. menoni* in detail and found it clearly belonging to *L. annandalei*

Chaudhuri, 1912 in all its meristic, morphometric and other characters including the colouration which is very characteristic, particularly the presence of a white-edged black spot near end of caudal fin just before the notch. Kottelat (2012) probably following this treatment also considered it a synonym of *Lepidocephalichthys annandalei*. Kottelat & Lim (1992) opined that a critical examination of the species described as *L. annandalei* Chaudhuri, 1912, *L. menoni* Pillai & Yazdani, 1976, *L. goalparensis* Pillai & Yazdani, 1976 and *L. caudofurcatus* Tilak & Husain, 1978 should done because some of them might possibly be synonyms of *L. micropogon*. But in 2012 (Kottelat, 2012) did not provide as stated in 1992 (Kottelat, 1992).

Bhattacharya *et al.* (2000), while dealing with threatened fishes of Assam, mentioned *L. goalparensis* is rare in the area. Das *et al.* (2012) studied the sexual dimorphism of *L. goalparensis* on the material (32 specimens, males and females) collected from Kamrup and Jorhat districts, Assam extending its range of distribution by 371 km further east in Assam from the type-locality of the species, a locality 6 km west of Dudhna Inspection Bungalow, Goalpara in Assam. Havird and Page (2010) revised and diagnosed the genus *Lepidocephalichthys* as having the seventh and eighth pectoral rays modified in the

mature male as other cobitids have different pectoral rays modified (second ray in *Cobitis*). They described two new species from Thailand, Laos, Vietnam, and Myanmar, viz. *Lepidocephalichthys kranos* and *L. alkaia* and including these, studied 17 'valid' species of *Lepidocephalichthys* and out of which redescribed 15, viz. *L. annandalei*, *L. arunachalensis*, *L. berdmorei*, *L. coromandelensis*, *L. furcatus*, *L. goalparensis*, *L. guntea*, *L. hasselti*, *L. irrorata*, *L. jonklaasi*, *L. lorentzi*, *L. manipurensis*, *L. micropogon*, *L. thermalis*, and *L. tomaculum*. They also discussed sexual dimorphism in the genus, *Lepidocephalichthys*. These authors have mentioned that the validity of *L. micropogon*, *L. annadalei*, *L. menoni*, *L. goalparensis* and *L. caudofurcatus* was disputed by Kottelat & Lim (1992) and Arunkumar (2000).

Havird & Page (2010) placed *Lepidocephalus caudofurcatus* under *Lepidocephalichthys goalparensis* Pillai & Yazdani, 1976, described from a locality 6 km west of Dudhna Inspection Bungalow, Goalpara, Assam (Eastern India) without considering the two geographic regions, far off localities, about 2000 km apart.

These authors compared and distinguished *goalparensis* with *Lepidocephalichthys furcatus*, *L. manipurensis* and *L. micropogon* but not with *L. caudofurcatus*. Kottelat (2012) probably followed these authors without going into the details.

OBSERVATIONS

The present authors have restudied *Lepidocephalichthys caudofurcatus* (Tilak & Husain, 1978) and *L. goalparensis* Pillai & Yazdani, 1976 the characters in detail which are clearly mentioned in the Table below:

Table 1: Showing differences between *Lepidocephalichthys caudofurcatus* (Tilak & Husain, 1978) and *L. goalparensis* Pillai & Yazdani, 1976.

Sl. No.	Character	<i>L. caudofurcatus</i> (Tilak & Husain, 1978) (Data after Tilak & Husain, 1978, 1981)	<i>L. goalparensis</i> Pillai & Yazdani, 1976
1.	Fin rays	D. II / 6, P. I / 7, V. I / 6, A. III / 5, C. 16	D. III / 6, P. 7, V. I / 6, A. II / 6. C. 18 (Pillai & Yazdani, 1976), versus D. III / 7, P. I / 7, V. I / 6, A. II / 6, C. 16 (Tilak & Husain, 1981; Das et al., 2010)
2.	Dorsal fin origin	Almost equidistant between snout tip and caudal base and ahead of pelvics (Tilak & Husain, 1978), may be nearer snout tip or caudal base; opposite or slightly ahead of pelvics (Tilak & Husain, 1981)	Much nearer snout tip than to caudal base and slightly in advance of pelvics (Pillai & Yazdani, 1976); usually anterior to pelvic fin origin (Havird & Page, 2010), much nearer snout tip than caudal base (Tilak & Husain, 1981; Talwar & Jhingran, 1991)
3.	Pectoral fin	A few inner rays in males fuse to form a vertical plate-like, shovel-shaped bony structure.	Pectoral fin in male longer with fewer rays and ossified than in female (Arunkumar, 2000), lamina circularis composed of fused seventh and eighth pectoral rays sometimes forming small dorsally projecting flange (but never large flange with serrations) (Havird & Page, 2010).
4.	Caudal fin	Forked or deeply emarginate	Emarginate (Pillai & Yazdani, op. cit.; Talwar & Jhingran, 1991), strongly forked (Havird & Page, 2010; Das et al., 2012) (but not so in their figures)
5.	Shape and focal area of subdorsal scales	Oval with very small and eccentric focal	Oval with comparatively large and eccentric focal area (Tilak & Husain, 1981)
6.	Scales on head	Lateral and ventral sides of head	Sides of head (Tilak & Husain, 1981; Talwar & Jhingran, 1991)
7.	Scales between back of body and base of anal fin	25 scales	16 scales (Tilak & Husain, 1981)
8.	Body scales	Extend much anterior, beyond	extend up to a point opposite the pectoral fin

	on ventral side	the Isthmus	bases (Tilak & Husain, 1981)
9.	Colouration	Back marked with 7-10 saddle-shaped dark bands; extending downwards from lateral band, 7-14 large vertical rectangular blotches along sides of body; dorsal and caudal fins with 4-5 vertical bands; a black spot on upper part of caudal base	Back darkish with some extremely faded colour patches along lateral side of body; three faded bands on caudal fin; a black spot on upper half of caudal base (as observed from the holotype) (Tilak & Husain, 1981), caudal fin usually with 4-5, dark, broad, regularly spaced V-shaped bars; male with dark stripe and female with dark spots along the sides of body (Havird & Page, 2010)
10.	Size of the body	36.0-49.5 mm in total length	39.0 mm in total length of holotype (vide Das et al., 2012), moderate / large (to 44 mm SL) (Havird & Page (2010), males 57.4-63.0, females 56.3-61.9 mm (Das et al., 2012)
11.	Distribution	Northern India (Dehra Dun, Saharanpur and Moradabad)	Goalpara, Assam (Pillai & Yazdani, 1976), Sidli and Seksekia beels, Goalpara, Assam (Saha & Bordoloi (2009), Ganges, Brahmaputra and Irrawaddy (Havird & Page, 2010), Kamrup and Jorhat districts., Assam (Das et al., 2012).

Tilak & Husain (1981) examined the only specimen, Holotype of *L. goalparensis* (Regd. No. ERS/ZSI-519) from Eastern Regional Centre, Zoological Survey of India, Shillong, Meghalaya (India) and found that it was devoid of the colouration described by Pillai & Yazdani (1976) and observed the differences in meristic and morphometric characters of the specimen from that given by them. The colouration shown of the specimen as shown by these authors in text-figures (2a and 2b) is not consistent because they have shown two dark spots on the back before the dorsal fin in fig. 2a (lateral view) while there are three such spots in fig. 2b in the same area. The caudal fin, both in the text as well as in text-fig. 2a, is shown as bifurcated into lobes but in the actual specimen (holotype), the caudal fin is slightly emarginate. Havird & Page (2010) studied the material from Ganges (16 exs., 24.6-43.1), Brahmaputra (18 exs., 24.9-37.6) and Irrawaddy (5 exs., 44.2-48.7) and mentioned under the description of *L. goalparensis* '...strongly forked caudal fin; caudal fin usually with four to five, dark, broad, regularly spaced V-shaped bars; dorsal-fin origin usually anterior to pelvic fin origin; moderate / large size (to 44 mm SL); lamina circularis (Fig. 1H) composed of fused seventh and eighth pectoral rays sometimes forming small dorsally projecting flange (but never large flange with serrations)'. These authors (Havird & Page, 2010) mentioned that 'Tilak and Husain (1981) found several differences in meristic counts from those in original description and noted that the lateral colour pattern described for *L. caudofurcatus* (Tilak & Husain, 1978) but placed *L. caudofurcatus* in the synonymy of *L. goalparensis* without giving reasoning. The present authors note that the two species differ in many important features (fin rays in dorsal and anal fins, scales on head, subdorsal scales count and size of focal area, extent of

scales on ventral side and colouration as mentioned in the Table 1). In this context, it must be stated that Tilak & Husain (1981) nowhere mentioned the likely lateral colour pattern in live *L. goalparensis*'.

CONCLUSION

On comparing colour pattern of the two species, viz. *L. caudofurcatus* (Tilak & Husain, 1978, fig. 1; 1981, figs. 16,17) and *L. goalparensis* Pillai & Yazdani, 1976, Fig., Havird & Page, 2010, Fig. 6D; Das et al., 2012, Figs. IIIa,b & IVa,b), it is found that the lateral colouration is quite different in two species i.e. 7-14 large vertically rectangular blotches separated from each other by a distance almost equal to their own width in *caudofurcatus* and 8 (as counted, including the one at caudal base) roundish spots, widely separated from each other by large gap, along fine lateral band in *goalparensis*. The caudal fin in figures by Havird & Page (2010) and Das et al. (2010) is also not 'strongly forked' as mentioned but it is shallowly so (1/4th) or emarginate. Further, dorsal and anal fin rays D. II / 6, A. III / 5 in *caudofurcatus* v/s D. III / 7, A. II / 6 in *goalparensis*, number of scales between back of body and base of anal fin and size of their focal area differ in both the species i.e. 25 scales in *caudofurcatus* v/s 16 in *goalparensis* and comparatively smaller focal area in *caudofurcatus* v/s larger in *goalparensis* and the extent of scales on ventral side i.e. extending anteriorly much beyond Isthmus in *caudofurcatus* and not extending anteriorly beyond pectoral fin bases in *goalparensis*. In view these important difference between the two it species, it can safely be concluded that *L. caudofurcatus* is a valid species and not a synonym of *L. goalparensis*. The colour pattern of the material of *L. goalparensis*, on which Havird & Page (2010, Fig 6D) based their studies agree with that of Das et

al. (2012, Figs. III a,b and IV a,b) and not of *L. caudofurcatus* (Tilak & Husain, 1978, Fig. 1; 1981, Fig. 16) which clearly shows that the two species are different.

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REFERENCES

Arunkumar, L. 2000. Loaches of the genus *Lepidocephalichthys* from Manipur, with description of a new species. *J. Fish Biol.*, **57**: 1093-1104.

Bhattacharjya, B. K., Sugunan V. V. and Choudhury, M. 2000. *Threatened fishes of Assam*. In: *Fish Biodiversity of North-East India*. Ponniah, A. G. and Sarker, U. K. (eds.): 75-79, NBFGR, NATP Publ. **2**: 228 pp.

Das, M. K., Baishya, A., Sarkar, U. K., Lakra, W. S. and Bordoloi, S. 2012. Standard measurement and sexual dimorphism of a cobitid loach, *Lepidocephalichthys goalparensis* Pillai and Yazdani, 1976. *Internat. J. Sci. & Nat.*, **3**(4): 763-767.

Havird, J. C. and Page, L. M. 2010. A revision of *Lepidocephalichthys* (Teleostei: Cobitidae) with descriptions of two new species from Thailand, Laos, Vietnam and Myanmar. *Copeia*, **1**: 137-159.

Jayaram, K. C. 1999. *The Fresh Water Fishes of the Indian Region*: 216. Narendra Publishing House, Delhi-110 006 (India).

Kottelat, M. 2012. *Conspectus Cobitidum*: An inventory of the loaches of the world (Teleostei:

Cypriniformes: Cobitoidei). *Raffles Bull. Zool., Supplement No. 26*: 1-199.

Kottelat, M. and Lim, K. K. P. 1992. A synopsis of the Malayan species of *Lepidocephalichthys*, with descriptions of two new species (Teleostei: Cobitidae). *Raffles Bull. Zool.*, **40**(2): 201-220.

Menon, A. G. K. 1992. *The fauna of India and adjacent countries. Pisces. Vol. IV. Teleostei-Cobitoidea. Part 2. Cobitidae*: 69-72 (113 pp.). Zoological Survey of India Publication.

Menon, A. G. K. 1999. Checklist - Freshwater Fishes of India. *Rec. zool. Surv. India, Occ. Pap. No. 175*: 1-366.

Pillai, R. S. and Yazdani, G. M. 1976. Two new species and two new records of *Lepidocephalichthys* Bleeker (Pisces: Cobitidae) from Assam and Meghalaya, India, with a key to the known species. *J. Zool. Soc. India*, **26**(1-2): 11-17.

Saha, S. and Bordoloi, S. 2009. Ichthyofaunal diversity of two beels of Goalpara district, Assam, India. *J. Threatened Taxa*, **1**(4): 240-242.

Talwar, P. K. and Jhingran, A. G. 1991. *Inland Fishes of India and adjacent countries. Oxford & IBH Pub. Co., New Delhi*: 1: 523-525.

Tilak, R. and Husain, A. 1978. Description of a new species of the genus *Lepidocephalus* Bleeker from Uttar Pradesh (Cobitidae: Cypriniformes). *Matsya*, **3**: 60-63, figs. 1-3.

Tilak, R. and Husain, A. 1981. On the systematic of the Indian fishes of the genus *Lepidocephalus* Bleeker with keys to the species of the genus and genera of the subfamilies Botiinae and Cobitinae (Cobitidae: Cypriniformes). *Rec. zool. Surv. India, Occ. Paper No. 32*: 1-42.