

## ABORICHTHYS WAIKHOMI, A NEW SPECIES OF FISH (TELEOSTEI : NEMACHEILIDAE) FROM ARUNACHAL PRADESH, INDIA

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### INTRODUCTION

The fishes of the genus *Aborichthys* Chaudhuri are small loaches generally found in torrential hill streams in the Darjeeling Himalayas, north eastern India and upper Myanmar. They are characterized in having elongated and compressed body; anus situated far forwards; pelvic fins extend considerably beyond the anal opening; dorsal fin inserted slightly behind pelvic fins; oblique narrow stripes on body; rounded caudal fin, which is usually marked with concentric black rings and a black spot at the upper corner of caudal base (Chaudhuri, 1913; Hora, 1925). While describing *Aborichthys rossamai*, Sen (2009) remarked that it is very much similar to genus *Schistura* McClelland and except for the forward position of the anus other characters of the genus are lacking in it. Menon (1987) considered *Aborichthys* as a subgenus of *Noemacheilus* van Hasselt. However, Talwar and Jhingran (1991), Jayaram (1999) and Viswanath *et al.* (2007) considered *Aborichthys* as valid genus. So far five species are described under the genus. They are *A. kempfi*, *A. elongatus*, *A. garoensis*, *A. tikaderi* and *A. rosammai*. During field survey conducted by the Zoological Survey of India in the Namdapha National Park and Tiger Reserve, Arunachal Pradesh in 2009, six specimens of an undescribed *Aborichthys* were collected from the hill streams of Noa-Dihing river (Figs. 1-2). The species is herein described as *Aborichthys waikhomi* sp. nov.

### MATERIALS AND METHODS

The specimens were preserved in 10% formalin. Measurements and counts followed Jayaram (1999). Measurements were made to the nearest 0.1 mm on the left side of specimens whenever possible. The type specimens are deposited in the Zoological Survey of India at Estuarine Biology Regional Centre, Gopalpur-on-Sea and Arunachal Pradesh Regional Centre, Itanagar. Abbreviations used are: HL, Head length; EBRC/ZSI/F, Estuarine Biology Regional Centre/Zoological Survey of India/Fish; Max, Maximum; Min, Minimum; *n*, number of specimens examined; SD, Standard deviation; SL, Standard length; V/APRC/ZSI/P, Vertebrate/Arunachal Pradesh Regional Centre/Zoological Survey of India/Pisces.

#### *Aborichthys waikhomi* sp. nov. (Figs. 3-4)

*Material Examined* : Holotype; 65.0 mm SL, India, Arunachal Pradesh, Bulbulia stream near Bulbulia, a tributary of Noa-Dihing river, Namdapha, (27°31'56.4"N; 96°27'32.2"E), 06-xi-2009, coll. J.K. De and Party (EBRC/ZSI/F-7414). *Paratypes*: 2 ex., 59.0-68.0 mm SL, same data as Holotype (V/APRC/ZSI/P-519); 3 ex., 61.0-66.5 mm SL, India, Arunachal Pradesh, a stream of Noa-Dihing river near Hornbill camp, Nampdapha, Arunachal Pradesh, India (27°32'25.48"N; 96°26'35.34"E), 05-xi-2009, coll. J.K. De and Party, (EBRC/ZSI/F-7415).

**Diagnosis :** A species of *Aborichthys* distinguished from its congeners by the combination of the following characters: 12-16 oblique black bands, narrower than interspaces at caudal peduncle; anus situated closer to caudal fin base than to tip of snout; dorsal fin insertion equidistant between snout tip and base of caudal fin; barbels much longer than eye diameter; incomplete lateral line terminating before pelvic fins; truncated caudal fin with irregular black blotches; a distinct black blotch on upper angle of caudal fin base.

**Description :** Morphometric data are given in Table 1. Body elongated and compressed. Head depressed, longer than caudal fin. Snout slightly rounded. Eye small, situated on dorsal side, not visible from ventral surface, its diameter smaller than interorbital space. Mouth inferior, semicircular; lips fleshy, upper lip continuous, lower interrupted in middle. Nostrils close to each other, closer to eye than tip of snout. Barbels three pairs; well developed, longer than eye diameter. Scale minute, embedded; lateral line incomplete, terminating before the origin of pelvic fin. Anus situated distinctly nearer to base of caudal fin than the snout tip. All fins greatly removed from one another. Dorsal fin small, with 2 simple and 7 branched rays, devoid of a spine, less than length of head; origin of dorsal fin equidistant between snout tip and caudal base. Pectoral with one simple and 9-10 branched rays, shorter than head. Pelvic fin with one simple and 6 branched ray, shorter than pectoral; its origin slightly in front of dorsal fin origin, extending considerably beyond anal opening. Anal fin base short, with 2 simple and five branched rays not reaching base of caudal, r Caudal fin with 15-16 branched rays, more or less truncated (Fig. 5f).

**Colour :** Body yellowish with 12 to 16 black oblique bands directed backwards from occiput to caudal base usually forked in front of dorsal fin, narrower than interspaces on caudal peduncle region. Upper surface and sides of head marked with irregular black blotches. Dorsal fin with 2 or 3 irregular series of spots; pectoral and pelvic fins with few black markings; anal dull white; caudal fin with irregular black blotches; upper extremity of caudal base marked with a distinct broad black spot. In life dorsal and caudal fins orange.

**Distribution :** Presently known from streams of Noa-Dihing river, upper Brahmaputra basin in the

Namdapha National Park and Tiger Reserve, Changlang district, Arunachal Pradesh, India (Figs. 1-2).

**Etymology :** Named for Prof. Waikhom Vishwanath, Manipur University in acknowledgement of his encouragement at this work.

**Discussion :** *Aborichthys waikhomi* is similar to *A. elongatus* and *A. kempi* in having vent situated distinctly nearer to caudal fin base than snout tip and a black blotch at upper end of base of caudal fin. However, it can be easily distinguished from the *A. elongatus* in having 12-16 oblique black bands on body from occiput to the caudal base alternating with broader interspaces in the caudal peduncle (vs. only posterior part of body marked with several broad bands, alternating with narrower interspaces), truncated caudal fin with irregular black blotches (vs. rounded with 2 short whitish bands in the middle), incomplete lateral line (vs. complete), barbels longer than eye diameter (vs. more or less equal), longer pectoral fins and more forward position of anus (Table 2). It is distinguished from *A. kempi* in having truncated caudal fin with irregular black blotches (vs. rounded with two broad black concentric curves), 12-16 oblique bands on body (vs. 18 to 21), more distinct bands on posterior-third of body (vs. indistinct), longer head; anus more nearer to caudal fin base than snout and more posteriorly placed pelvic and anal fins (Table 2). The new species is similar with *A. rosammai* in having a truncated caudal fin and anus situated distinctly nearer to caudal fin base than snout tip. However, it differs from the latter in having irregular black blotches on caudal fin (vs. dull white), 12-16 black bands on body (vs. 10-11), a black spot at upper end of base of caudal fin (vs. absent), smaller eye (diameter 14.1-17.8% of HL vs. 20.0-25.0), incomplete lateral line (vs. complete) and more anteriorly placed pelvic and anus (Table 2). *A. waikhomi* can be easily distinguished from *A. garoensis* and *A. tikaderi* in having anus situated distinctly nearer to caudal fin base than snout tip (vs. nearer to snout tip), dorsal fin origin equidistant between snout tip and caudal fin base (vs. nearer to snout tip) and truncate caudal fin (vs. rounded).

All the known species of *Aborichthys* are endemic in the Brahmaputra drainage except *A. kempi* which was reported from the Putao plains in upper

**Table 1** : Morphometric data of holotype (EBRC/ZSIF-7414) and 5 paratypes (V/APRC/ZSI/P-519; EBRC/ZSIF-7415) of *Aborichthys waikhomi* sp. nov.

	Range				
	Holotype	Min.	Max.	Mean	SD
Standard Length (mm)	65.0	59.0	68.0	64.1	3.4
In % of standard length					
Head length	21.5	21.0	22.0	21.4	0.39
Body depth	12.8	12.8	15.8	14.6	1.15
Caudal peduncle length	16.9	16.9	18.8	17.6	0.69
Caudal peduncle height	12.3	12.0	13.8	12.9	0.65
Predorsal length	50.8	49.2	50.8	50.1	0.72
Prepectoral length	16.9	16.9	20.3	18.5	1.29
Prepelvic length	46.1	46.1	50.0	47.9	1.45
Preanal length	75.4	75.4	77.9	76	1.05
Preanus length	53.1	53.1	57.6	55.8	1.68
Dorsal fin height	15.7	15.7	17.3	16.5	0.61
Pectoral fin length	16.9	16.9	18.0	17.4	0.47
Pelvic fin length	15.4	13.8	15.6	14.9	0.64
Anal fin height	13.8	12.8	14.6	13.6	0.74
Caudal fin length	16.1	16.1	19.1	17.0	1.12
Distance between anus to caudal fin base	43.4	39.3	43.4	41.9	1.43
In % of head length					
Head height at occiput	42.8	42.8	58.8	54.8	6.04
Head wide	65.0	65.0	71.4	69.1	2.65
Eye diameter	15.7	14.1	17.8	15.4	1.32
Snout length	32.8	32.8	42.3	37.7	3.44
Inter orbital space	17.8	16.9	25.0	20.3	2.93
Mouth width	34.3	28.6	38.7	32.9	3.44
Caudal peduncle length	78.6	78.6	84.5	82.2	3.06
In % of caudal peduncle length					
Caudal peduncle height	72.7	67.6	76.2	73.3	3.04
In % of distance between anal and pelvic fin origins					
Distance between anus and anal fin origin	75.7	68.7	77.8	72.5	3.53

Myanmar. Chaudhuri (1919) and Hora (1925) remarked that the Burmese specimens of *A. kempi* differ considerably from the Assamese regarding colouration and proportions, but the material available did not justify their specific separation. Kottelat (1990) suggested that new collections, or at least access to the existing collection, would be greatly desirable for solving the problem of specific identity of the Burmese specimens. The uplift of the Indo-Burman mountain range not only separated the Upper Brahmaputra from the Ayeyarwaddy of Myanmar led to the formation of a large number of mountains and hill streams, each of which evolved its own fish fauna (Vishwanath et al. 2010). The fishes of *Aborichthys* seem to be in the process of adaptation in the torrential hill

streams of these two drainages. Menon (1987) remarked that the gradual shifting of vent forward provides the fish with a longer tail for life in swift current. Hora (1925) opined that *A. garoensis* is a highly specialized form and throw a great deal of light on the evolution of the genus. However, the present status of these fishes and their distribution in Myanmar is yet to be studied. A detail survey and phylogenetic study of the species of *Aborichthys* in both the drainage systems would be of great interest.

*Comparative materials: Aborichthys elongatus*: Type, 1 ex., 74.0 mm SL, India, Reang River, below Darjiling, no date, coll. G.C. Shaw (ZSI F 10087/1). *Aborichthys garoensis*: Type, 2 ex., 85.0-89.5 mm SL, India, Assam, Tura, Garo Hills, Alt. 1200-1500 ft.,

no date, coll. Dr. S.W. Kemp (ZSI F 10669/1). *Aborichthys kempii*: Type 3 ex., 68.5-74.5 mm SL, India, Abor country, Egar stream between Renging and Rotung, i-1912, coll. Dr. S.W. Kemp (ZSI F 7721/1); Type, 1 ex., 53.0 mm SL, India, Abor country, Yambung, Eastern side of Dihang R., no date, coll. Dr. S.W. Kemp (ZSI F 7769/1). *Aborichthys tikaderi*: Holotype, 94.0 mm SL, India, Arunachal Pradesh, Namdapha Wildlife Sanctuary, 18-xii-1983, coll. S. Biswas and Party (ZSI FF2135); Paratype, 2 ex., 100.0-109.0 mm SL, same data as Holotype (ZSI FF 2136).

### SUMMARY

A new freshwater fish *Aborichthys waikhomi* is described here from the streams of Noa-Dihing river, Brahmaputra basin in Arunachal Pradesh, India. It is distinguished from all other known species of *Aborichthys* in having truncate caudal fin with irregular black blotches and 12-16 oblique black bands on body, which are narrower than

interspaces in caudal peduncle. The fishes of *Aborichthys* seem to be in the process of adaptation in the torrential hill streams. A detail survey on the fish fauna of the Brahmaputra and the Ayeyarwaddy drainages may provide better understanding on the status and zoogeographical distributions of these fishes.

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**Table 2 :** Comparison of morphometric characters of *Aborichthys waikhomi* sp. nov., *A. elongatus*, *A. kempi* and *A. rosammai*. (Mean values are shown in parenthesis).

	<i>A. waikhomi</i> EBRC/ZSIF2351-2352; V/APRC/2SI/P519	<i>A. elongatus</i> 2SIF10087/1, Type	<i>A. kempi</i> ZSI F 7721/1, Type; ZSI F 7769/1, Type	<i>A. rosammai</i> (after Sen, 2009)
<i>n</i>	6	1	4	5
In % of Standard length	21.0-22.0(21.4)	18.2	18.8-21.7(20.1)	22.1-22.3(22.2)
Head length	46.1-50.0(47.9)	47.6	44.3-45.9 (45.2)	51.1-55.4(53.2)
Prepelvic length	75.4-77.9 (76.0)	73.0	73.1-74.5(73.9)	73.5-79.4(77.1)
Preanal length	53.1-57.6(55.8)	59.4	54.8-57.7 (56.0)	59.4-60.1 (59.7)
Preanus length	16.9-18.0(17.4)	13.9	15.7-18.9 (17.7)	15.0-20.0(17.3)
Pectoral fin length	39.3-43.4(41.9)	39.9	43.6-45.2 (44.2)	39.6-41.6(40.6)
Distance between anus to caudal fin base				
In % of Head length				
Head wide	65.0-71.4(69.1)	52.6	64.3-70.5(67.8)	-
Eye diameter	14.1-17.8(15.4)	18.5	15.7-20.0(17.7)	20.0-25.0 (-)
Inter orbital space	16.9-25.0(20.3)	18.5	21.4-25.2(23.5)	
In % of Caudal peduncle length				
Caudal peduncle height	67.6-76.2 (73.3)	57.1	65.6-80.0(71.8)	66.7-100(-)
In % of Distance between anal and pelvic fin origins				
Distance between anus and anal fin origin	68.7-77.8 (72.5)	60.2	58.7-66.7(63.6)	-
Bands on body	12-16 bands; distinct throughout body; narrower than interspaces on caudal peduncle region	Several bands; absent in the predorsal; broader than interspaces on caudal peduncle region	18-21 bands, in distinct on caudal peduncle region	10-11 bands, coalesced on caudal peduncle region
Barbels	3 pairs; longer than eye diameter	3 pairs; almost as long as eye diameter	3 pairs; longer than eye diameter	3 pairs; longer than eye diameter
Lateral line	Incomplete	Complete	Incomplete	Complete
Bands on Caudal fin	Several irregular black blotches	2 short whitish bands	2 black broad concentric curves	Absent
Black spot at upper extremity of Caudal base	Present	Present	Present	Absent
Shape of caudal fin	Truncated	Rounded	Rounded	Truncated

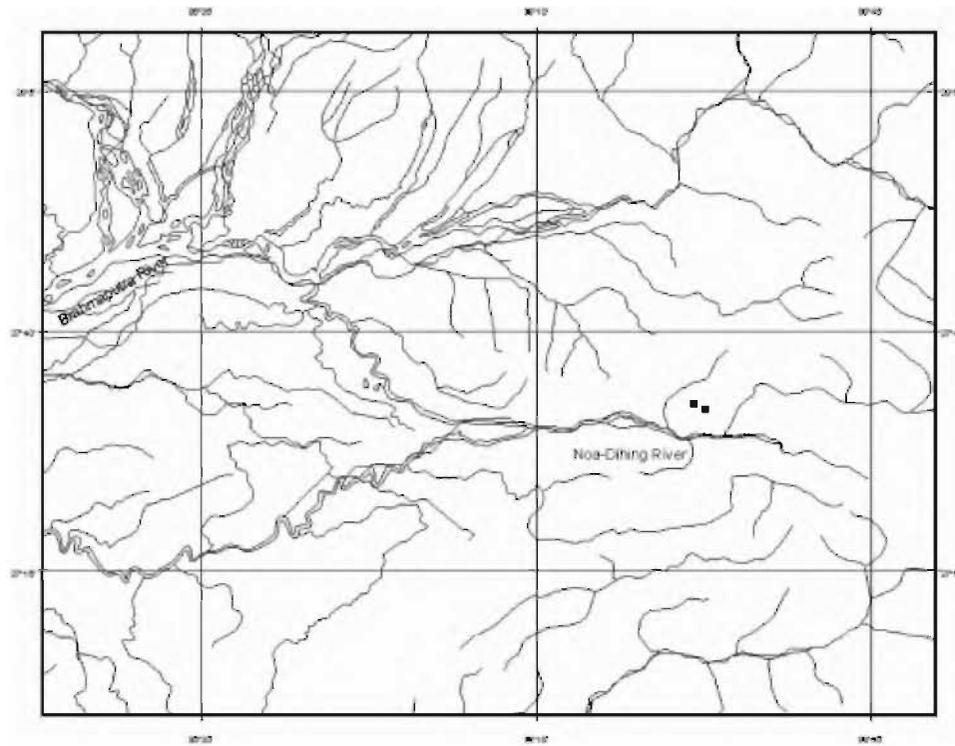


Fig. 1. Map showing type locality of *Aborichthys waikhomi* sp. nov. (■)



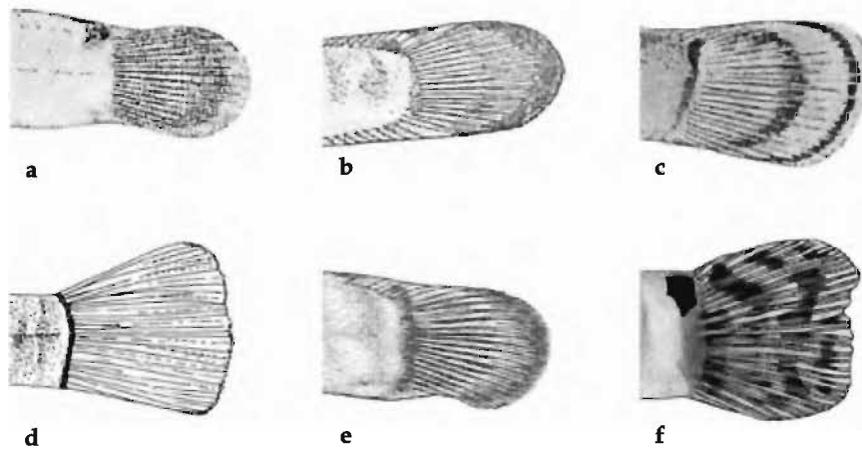
Fig. 2. A view of Bulbulia stream near Bulbulia, Namdapha, Arunachal Pradesh, India. Type locality of *Aborichthys waikhomi* sp. nov.



Fig. 3. *Aborichthys waikhomi* sp. nov. (Holotype, EBRC/ZSI/F-7414, 65.0 mm SL). a. lateral view, b. dorsal view and c. ventral view. Scale bar indicates 10 mm.



**Fig. 4.** *Aborichthys waikhomi* sp. nov. (Holotype, EBRC/ZSI/F-7414, 65.0 mm SL) close up view of head. a. ventral view; b. lateral view.



**Fig. 5.** Illustrations of caudal fin shapes of *Aborichthys* : a. *A. elongatus* (from Hora, 1921); b. *A. garoensis* (from Hora, 1925); c. *A. kempi* (from Chaudhuri, 1913); d. *A. rosammai* (from Sen, 2009); e. *A. tikaderi* (from Barman, 1984) and f. *A. waikhomi* sp. nov.