NOTES ON FISHES IN THE INDIAN MUSEUM.

VIII. On the Loaches of the Genus *Aborichthys* Chaudhuri.

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While going through the named and unnamed material of the Cobitid fishes in the collection of the Indian Museum, I have come across three very interesting specimens from the Garo Hills collected by Dr. S. W Kemp, late Superintendent of the Zoological Survey of India. These examples in my opinion represent a new species of *Aborichthys*[1]. It is a highly specialized form and throws a great deal of light on the evolution of the genus. Besides the description of the new species I have included a general account of the genus with notes on the known species. The table of measurements at the end shows differences in proportions, etc., between the three species of *Aborichthys* known so far.

The loaches, in which the suborbital is not armed, are so very similar morphologically that great difficulty has usually been experienced in separating them into distinct genera. For example the Central Asiatic species of the genus *Nemachilus* look so very different from those found in the hill-streams of India and Malaysia that they can be easily recognised at a glance. But still no definite characters have been found on which they could be separated generically. This difficulty has, therefore, led to a great confusion in the taxonomy of these fishes.

The fishes of the genus *Aborichthys*, though very similar to those of the genus *Nemachilus*, are fairly well differentiated to be readily recognised and possess certain morphological characters on which they can be easily separated. The most important of these is the position of the vent. It is situated very far forwards and the ventrals extend considerably beyond the anal-opening. This feature is, to a certain extent, shared by some of the Central Asiatic species of *Nemachilus*, but in them the colouration and the form of the tail is very different. In some Indian species, such as *Nemachilus anguilla* and *N. brunneanus*, the ventrals extend beyond the anal-opening, but the forward position of the vent is not so well marked. Another characteristic feature of *Aborichthys* is the position of the ventrals, which are situated slightly in advance of the dorsal. The short barbel-like outgrowths of the nasal membranes and the elongated narrow form are also very characteristic. For convenience of reference the genus *Aborichthys* may briefly be defined as follows :—

The genus *Aborichthys* comprises elongated loaches in which the body and especially the tail are compressed from side to side. The body and the tail are almost of uniform height throughout. The vent is situated far forwards and the ventrals extend considerably beyond the

[1] Chaudhuri, *Rec. Ind. Mus.* VIII, p. 244 (1913).

anal-opening. All the fins are greatly removed from one another. The paired fins are horizontal. The caudal is more or less perfectly rounded. The body is marked with oblique, narrow stripes. There is a black spot at the upper end of the base of the caudal and the tail fin is usually marked with concentric rings of colour.

There is no doubt that fishes of the genus *Aborichthys* are evolved from those of the genus *Nemachilus* chiefly by the change in the position of the vent. *A. elongatus* Hora[1] from the Darjiling Himalayas is the primitive form and in it the vent is slightly nearer to the tip of the caudal fin than to the tip of the snout, and the colour bands on the body are similar to those found in the Indian species of *Nemachilus*. In *A. kempi* the vent is much nearer to the tip of the snout than to the end of the caudal, but is considerably nearer to the base of the caudal than to the tip of the snout. In the new species from the Garo Hills the vent is found still further forwards and is situated at an equal distance from the tip of the snout and the base of the caudal fin. There appears to me only one explanation for this gradual shifting forwards of the position of the vent. It is to provide the fish with a longer tail for life in swift currents. Most of the species of *Nemachilus* inhabit rapid-running water, but they always seek shelter from the swift current either by hiding themselves under stones or by living at the bottom of deeper pools in the course of streams. The members of the genus *Aborichthys*, on the other hand, appear to be better suited for life in torrents. The outer rays of the paired fins are horizontal and are provided with adhesive pads on their ventral aspect. These enable the fish to fix itself to rocks and stones in rapid currents. The elongated tail and the rounded caudal fin of almost the same height form an oar-like structure, which from the nature of its form must be a powerful organ of locomotion. With its help the fish is probably able to dart from place to place in rapid-running water.

Key to the species of the genus Aborichthys.

A. Vent distinctly nearer base of caudal than tip of snout.	
1. Vent nearer tip of snout than end of caudal (barbels much longer than diameter of eye; black bands narrower than yellow interspaces)	*A. kempi* Chaudhuri.
2. Vent equidistant between tip of snout and end of caudal or nearer to latter than to former (barbels as long as or slightly longer than diameter of eye; black bands broader than yellow interspaces)	*A. elongatus* Hora.
B. Vent almost equidistant between tip of snout and base of caudal or slightly nearer to former than to latter	*A. garoensis*, sp. nov.

Aborichthys kempi Chaudhuri.

1913. *Aborichthys kempi*, Chaudhuri, *Rec. Ind. Mus.* VIII, p. 245, pl. vii, figs. 1, 1a, 1b.
1919. *Aborichthys kempi*, Chaudhuri, *Rec. Ind. Mus.* XVI, p. 278.

This species is so far known from the Abor Hills, the Garo Hills and the Putao plains in Upper Burma. The Burmese examples differ considerably from the Assamese regarding colouration and proportions,

[1] Hora, *Rec. Ind. Mus.* XXII, p. 735 (1921)

but the material available at present does not justify their specific separation. The differences in colouration have already been pointed out by Dr. Chaudhuri (*op. cit.*, 1919), while those in proportions can be readily made out by a reference to the table of measurements at the end of this paper.

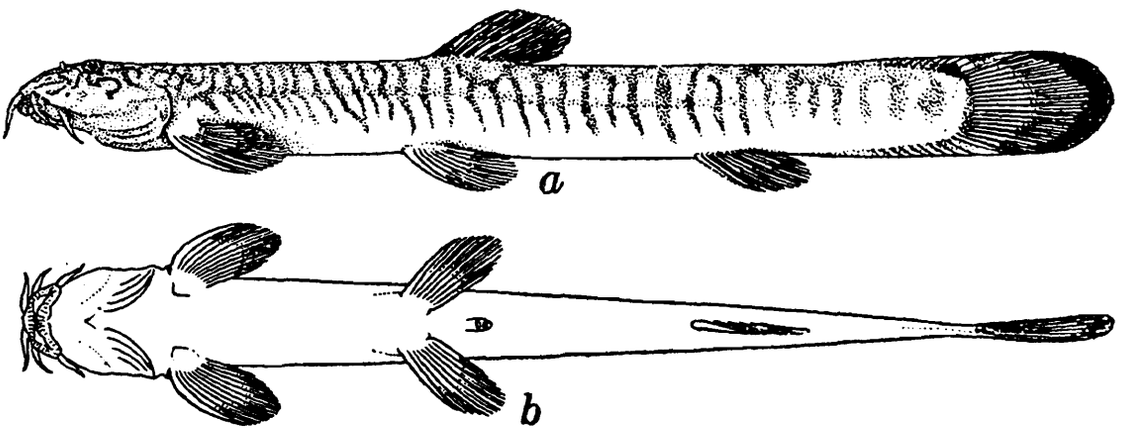
Aborichthys elongatus Hora.

1921. *Aborichthys elongatus*, Hora, *Rec. Ind. Mus.* XXII, p. 735, text-fig.

This species is only known from the base of the Darjiling Himalayas. The species was described from 2 young and 1 adult (badly preserved specimens) collected by Mr. Shaw in the Reang river. Quite recently Dr. B. Chopra obtained a specimen of this species in the Balasan river, 9 miles from Kurseong at an altitude of 1,500 feet.

Aborichthys garoensis, sp. nov.

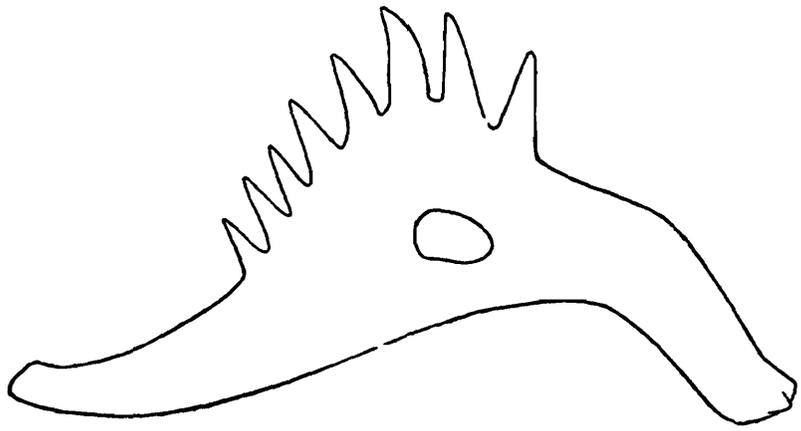
This species is greatly elongated and its body and tail are compressed from side to side. The body and the tail are of uniform height throughout so that the ventral and the dorsal profile of the fish are almost parallel and horizontal. The head is somewhat depressed so that its height at occiput is contained 1·2 times in the depth of the body or in the least height of the caudal peduncle. The length of the head is contained 6·1 to 6·5 times and the depth of the body 9·5 to 9·9 times in the total length without the caudal. The caudal is considerably longer than the head but it is almost of the same height as the rest of the fish. The eyes are small and are situated on the dorsal surface of the head; their diameter is contained 6·6 to 7·2 times in the length of the head, 3·1 to 3·3 times in the length of the snout and 1·5 to 2 times in the interorbital width. The snout is broadly rounded anteriorly and is slightly longer than the postorbital part of the head. The nostrils



TEXT-FIG. 1.—Lateral and Ventral views of the type-specimen of *Aborichthys garoensis*, sp. nov. (nat. size)
a. Lateral view ; *b*. Ventral view showing position of vent.

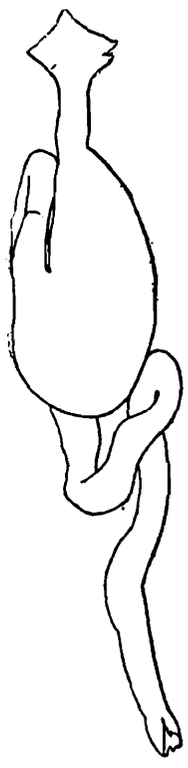
are situated close to the inner, anterior border of the orbit ; the membrane between the two nostrils is produced into a short barbel-like prolongation. The gill-opening is small and extends on the under surface for a short distance

The mouth is on the under surface slightly behind the tip of the snout; it is bordered by thick, papillated lips, which hang loosely and are continuous at the angles of the mouth. The lower lip is interrupted in the middle and on each side of the partition it is greatly thickened. The premaxillaries form a low, beak-like projection in the middle of the upper jaw; the lower jaw is naked and sharp anteriorly, probably for rasping off algal slime. There are six barbels, two pairs rostrals and one



TEXT-FIG. 2.—Pharyngeal bone and teeth of *Aborichthys garoensis*, sp. nov. × 30

pair maxillary. All of them are of almost equal length and are as long as twice the diameter of the orbit. The pharyngeal bones are broad but slender. The alimentary canal is short, about three-fourths the length of the fish without the caudal. The stomach is very large and the intestine possesses only one loop in its entire course. The vent is situated very far forwards and its position is midway between the tip of the snout and the base of the caudal or slightly nearer to the former than to the latter.



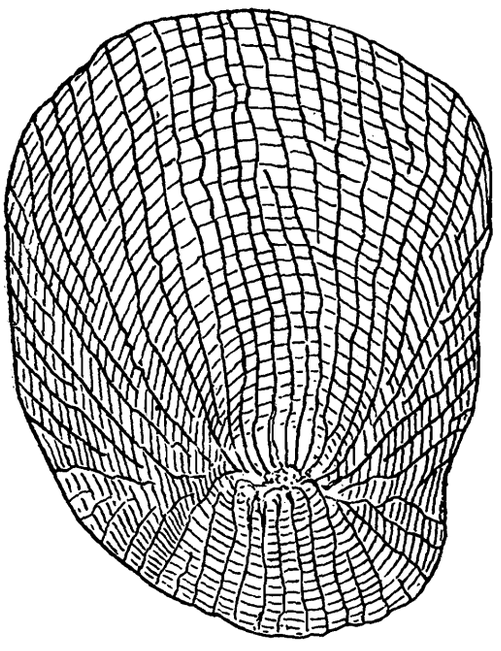
TEXT-FIG. 3.—Alimentary canal of *Aborichthys garoensis*, sp. nov. × 2.

The dorsal fin is small, its commencement is slightly behind that of the ventral and is considerably nearer to the tip of the snout than to the base of the caudal. Its longest ray is greater than the depth of the body immediately below it. The anal is similar to the dorsal and is nearer to the base of the caudal than to the commencement of the ventral. The pectorals are shorter than the head and are horizontally placed. They are removed from the ventrals by a distance equal to their length. The ventrals are slightly shorter than the pectoral and are removed from the anal by a distance equal to one and a half times their own length. The caudal is long and rounded posteriorly. It is rather asymmetrical, the rays in the upper half being longer than those in the lower half.

The outer rays of both the paired fins are provided with thick cutaneous pads of the nature of the adhesive tissue on the ventral aspect of some of their outer rays.

The entire body is covered with small, eliptical scales, those on the under surface of the body are rather inconspicuous and are probably

absent on the chest. They are more marked in the posterior region of the body. A scale from the caudal region is longitudinally oval in form and possesses the nucleus near the base. The sculpture consists of numerous fine radii and circular striae, both of which occur all round the scale. They are very similar to those found in the fishes of the genus *Nemachilus* and other allied genera.



TEXT-FIG. 4.—A lateral scale from the caudal region of *Aborichthys garoensis*, sp. nov. × 50.

The lateral line is incomplete, it runs up to a distance slightly behind the tip of the pectoral.

The caudal peduncle is well-marked, its least height is contained 2·2 to 2·4 times in its length.

In spirit the general colour of the body is pale olivaceous. The upper surface of the head is marked with short black lines which anastomose with one another. The body is marked with 30 to 35 black bands which are inclined backwards and are much narrower than the interspaces. These bands are continued up to the base of the caudal fin. In the anterior half of the body they are narrower and are closely situated together. The bands are broader above but they gradually become thinner and disappear altogether on the under surface. There is a deep, black spot at the upper end of the base of the caudal fin. The under surface of the head and body are lighter in colour. The pectorals, ventrals and the anal fins are dull white; the dorsal is banded with two or three rows of black spots and there is a grayish blotch at the base of its two or three anteriormost rays. The caudal is of a dull gray colour with a deep black margin posteriorly.

Locality:—Tura, Garo Hills, Assam. There are only three specimens in the collection, they were obtained by Dr. S. W Kemp at an altitude of 1200-1500 feet in the Garo Hills, Assam, in the rainy season of 1917.

The type-specimen (F 10669/1) is preserved in the collection of the Zoological Survey of India (*Indian Museum*).

Relationships:—*Aborichthys garoensis* is a very characteristic form and can be readily distinguished from the other two known species of the genus by the forward position of the vent, by the elongated caudal peduncle and by its colouration and general facies. The differences in proportions, etc., between the three species can best be made out by a reference to the following table of measurements.

Measurements in millimetres.

	Aborichthys garoensis, sp. nov.			*Aborichthys kempi* Chaudhuri.					*Aborichthys elongatus* Hora.	
				From type-series.		Tanja, Putao, Upper Burma.		Garo Hills.		
Total length without including length of caudal ..	89·5	89·3	85·8	74·5	53·5	81·3	79·4	54·0	74·0	60·7
Length of caudal	16·0	15·8	15·7	16·2	11·0	16·4	16·6	10·0	13·0	10·3
Length of head	14·5	13·9	13·3	15·2	11·8	15·2	15·0	11·2	13·6	11·0
Depth of body ..	9·0	9·2	9·0	9·4	8·1	11·3	9·5	8·1	9·8	8·8
Diameter of eye	2·0	2·0	2·0	2·6	2·0	2·1	2·2	2·0	1·8	2·2
Length of snout ..	6·6	6·6	6·2	6·6	5·0	7·0	6·7	4·2	6·0	5·0
Interorbital distance	3·8	4·0	3·0	4·0	3·3	3·3	2·8	2·2	3·0	2·8
Height of head at occiput	7·7	7·5	7·0	7·3	6·0	9·1	7·5	5·0	7·0	6·4
Width of head ..	10·8	10·8	10·6	10·6	8·0	11·2	9·6	7·8	7·0	7·8
Length of caudal peduncle ..	21·0	20·4	18·5	11·2	10·2	12·3	14·5	8·6	14·8	11·0
Least height of caudal peduncle ..	8·8	8·5	8·3	9·0	8·0	11·0	11·0	6·0	9·5	7·3
From tip of snout to vent ..	44·4	44·2	42·5	41·8	30·0	42·2	43·0	31·4	43·3	37·6
From vent to base of caudal . .	45·0	45·0	43·3	32·7	23·3	39·0	36·0	22·6	30·8	23·0
From tip of snout to commencement of dorsal ..	39·6	39·0	37·5	37·0	27·0	37·5	38·4	28·8	37·5	31·2
From commencement of dorsal to base of caudal	49·8	50·6	48·0	37·5	27·6	33·6	41·0	26·4	36·2	30·0
From tip of snout to commencement of ventral	35·5	36·0	34·7	34·8	24·2	34·0	37·0	26·0	42·3	30·0
Longest ray of dorsal	11·5	10·8	9·6	11·2	8·2	11·4	11·0	8·0	9·0	8·2
Longest ray of anal	10·3	8·6	8·0	9·3	8·0	10·6	10·5	7·0	6·8	7·0
Length of ventral	11·5	10·5	11·2	12·2	9·0	11·4	11·2	8·2	9·5	9·0
Length of pectoral	12·0	11·3	11·8	13·0	9·5	12·5	13·0	9·5	11·2	9·2
From commencement of pectoral to that of ventral	23·5	23·0	22·6	21·0	15·2	20·0	23·0	16·5	23·5	19·8
From commencement of ventral to that of anal	28·0	27·3	26·0	22·5	15·3	24·5	23·0	15·8	19·6	16·0
From commencement of anal to base of caudal ..	26·3	25·3	23·8	18·5	13·2	22·5	20·6	12·6	18·5	14·6

GIPC—M—X-7(23)—16.5.25—500.