

## ***Aborichthys palinensis*, a new species of river loach (Cypriniformes: Nemacheilidae) from Arunachal Pradesh, Eastern Himalaya, India**

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### **Abstract**

A new species of nemachilid loach is described based on four adult specimens (90.9-102 mm SL) from a tributary of the Palin River, in Arunachal Pradesh, northeastern India. The new species differs from all congeners by the following combination of characters: dorsal and ventral adipose crest absent, the presence of 5 rows of brown spots across dorsal fin; vent closer to the caudal-fin base (44.1-45.6% SL) than to the snout tip (52-55% SL); caudal fin broadly rounded with two concentric bars; 30-35 regular and narrow oblique stripes along the flank except anterior most part. Further can be distinguished on the following characters: pre-dorsal length (46.7-49.7% SL); pre-pectoral length (18.5-18.7% SL); pre-pelvic (length 43.1-46.2% SL); caudal fin (length 14.7-16.9% SL); dorsal to pectoral distance (30.5-33.2% SL); dorsal to caudal base distance (49.1-52.8% SL); dorsal to anal distance (28.4-33.0% SL); pectoral to anal distance (54.2-61.6% SL); anal to caudal base distance (23.6-24.9% SL); and eye diameter (8.0-11.0% HL).

**Keywords:** Cypriniformes, Palin River, Eastern Himalaya, Brahmaputra River, Western Arunachal.

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### **Introduction**

The nemachilid loaches of the genus *Aborichthys* are characterized by having an elongate and slender body almost of parallel profiles consisting of minimal 12-16 and maximum 33-35 oblique bars along flank, more or less rounded to emarginated caudal fin; horizontally placed paired fins; pelvic fins extending beyond the vent; vent closer to snout tip, caudal-fin base or almost middle of body; two black ocellus— one on upper sub-distal basicaudal bar and another at dorsal-fin origin, and all fins considerably separated (Chaudhuri 1913; Hora 1921, 1925; Kottelat 1990) and presence of dorsal and ventral adipose crest in some species (Kosygin et al. 2019; Shangningam et al. 2019). They are well-adapted in moderate to fast flowing rivers, streams and hill drainages comprises of gravelly substrate (Hora 1925).

The genus *Aborichthys* was first erected by Chaudhuri (1913) assigning *A. kemp* as type species, collected by S.W. Kemp from Sirpo and Egar streams near Rottung and Renging villages, Arunachal Pradesh on the east. The genus *Aborichthys* has since been remained monotypic until Hora (1921) described *A. elongatus* from the Riang River (Brahmaputra basin), Darjeeling (West Bengal) on the west. Subsequently Hora (1925) further described *A. garoensis* from Tura, Garo Hills, Assam (now Meghalaya) in the south, followed by Barman (1984) who added fourth species *A. tikaderi* from Namdapha Wildlife Sanctuary, Changlang District in the most southeastern part of the state Arunachal Pradesh. Moreover, over a time span of six years, six more species have been recognized from the upper Brahmaputra River basins in Arunachal Pradesh viz. *A. waikhomi* Kosygin, 2012, from Bulbulia stream near Bulbulia, a tributary of Noa-Dihing river, Namdapha, Changlang District in the east; *A. cataracta* and *A. verticauda* Arunachalam et al., 2014 from a tributary of Ranga River, *A. kailasi*, *A. pangensis* Shangningam et al., 2019 from the Pange River, Ziro, Lower Subansiri district in the west; *A. iphipaniensis* Kosygin et al., 2019 from the Iphipani River, Roing, Lower Dibang Valley District in the east; and *A. boutanensis* (Griffith and McClelland 1842) from neighboring country Bhutan originally named as *Cobitis boutanensis* Griffithi and McClelland 1842 followed by *Paracobitis boutanensis* (Griffithi and

McClelland 1842) in Eschmeyer (2020). Later, Thoni and Hart (2015) placed the *P. boutanensis* as the species of *Aborichthys* and consequently considered *A. kempi* as a junior synonym of *A. boutanensis*, based on shared morphological characters except body depth. However, Shangningam et al. (2019) has revalidated *A. kempi* based on examining type specimens housed in ZSI, Kolkata, India. Including the currently described species, there are twelve species of *Aborichthys*, whose diversity mostly confined to Brahmaputra River basin in Arunachal Pradesh in North eastern India and the distribution extends to Bhutan and upper Myanmar (Chaudhuri 1913; Chaudhuri 1919; Hora 1925; Talwar and Jhingran 1991; Shangningam et al. 2019). While conducting ichthyological surveys of Palin River at Palin in Western Arunachal Pradesh, four specimens of *Aborichthys* were collected. Further examination of those specimens revealed that it belongs to an undescribed one, which is described herein.

## Material and Methods

Samplings of fishes were carried out by using caste net with (2 m diameter and 7 mm meshes). Fishes were freshly preserved in 10% formaldehyde in the beginning and then stored in 70% ethanol. The morphometric measurements were recorded point to point with digital calipers nearest to 0.01mm. Counts and measurements were made on the left side of specimens following Kottelat (1990) and Arunachalam et al. (2014). Subunits of head are expressed as proportions of lateral head length. Fin rays, sensory pores on head and lateral line were counted under a stereo-zoom transmitted light microscope. Asterisk mark (\*) after meristic value wherever present indicates for holotype. The holotype is deposited in Zoological Survey of India (ZSI), Estuarine Biology Regional Centre (EBRC), Gopalpur, Orissa and paratypes (3) in the Museum of Dera Natung Govt. College (DNGC), Itanagar respectively for future reference.

## Results

### *Aborichthys palinensis*, sp. nov.

(Fig. 1, Table 1)

**Holotype:** EBRC/ZSI/F-12609, 102 mm SL; holotype, a tributary of Palin River (27°43'21.65"N, 93°38'47.48"E), 840 m asl, upper Brahmaputra River basin, Kra Daadi District, Arunachal Pradesh; India, G. Ako. 26 February 2017.

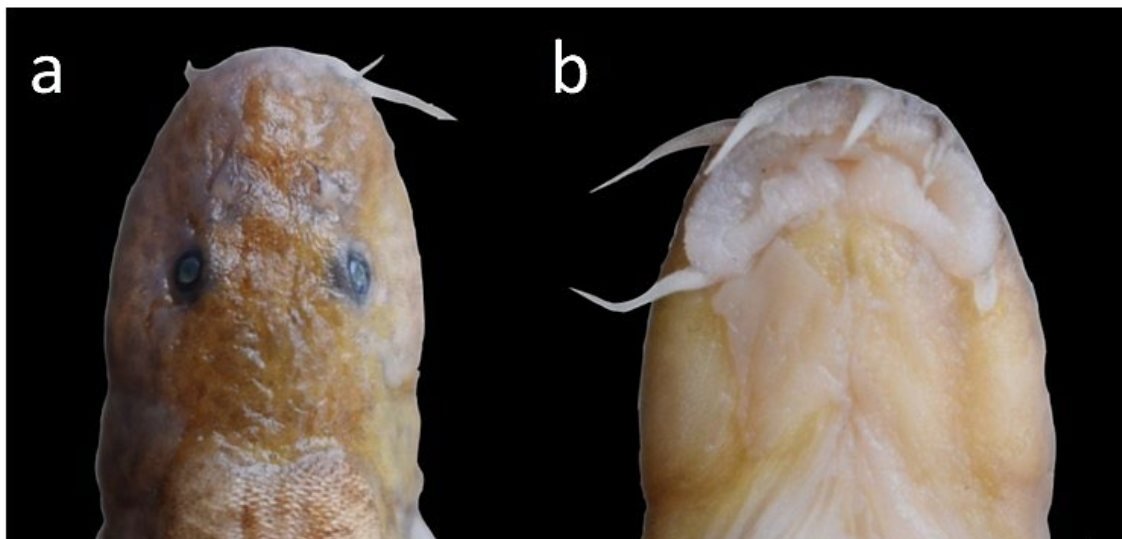
**Paratypes:** DNGC F-04, 3, 90.9-97.5 mm SL, same as holotype.

**Diagnosis:** The new species is diagnosed from its congeners by the following combination of characters: dorsal and ventral adipose crest absent, presence of 5 rows of brown spots across dorsal fin, each three rows of spots from base confluent to each other; vent closer to caudal-fin base (44.1-45.6% SL) than to snout tip (52-55% SL); caudal fin broadly rounded with two concentric bars; 30-35 regular and narrow oblique stripes along flank except anterior most part. Further can be distinguished by following characters: pre-dorsal length (46.7-49.7% SL), pre-pectoral length (18.5-18.7% SL), pre-pelvic (length 43.1-46.2% SL), caudal fin length (14.7-16.9% SL), dorsal to pectoral distance (30.5-33.2% SL), dorsal to caudal base distance (49.1-52.8% SL), dorsal to anal distance (28.4-33.0% SL), pectoral to anal distance (54.2-61.6% SL), anal to caudal base distance (23.6-24.9% SL), and eye diameter (8.0-11.0% HL).

**Description:** For general appearance see Figure 1. Morphometric data are presented in Table 1. Body elongate and slender, body between pectoral fin and posterior tip of dorsal fin cylindrical and thereafter greatly compressing to caudal-fin base, body deepest at dorsal-fin origin, little bit deeper than wide. Dorsal profile evenly rising from snout tip to occiput, thereafter almost horizontal to caudal-fin base. Ventral profile almost horizontal to anal-fin origin, then gently rising up to posterior end, thereafter very gently decreasing to caudal-fin base. Body profiles almost parallel.



**Figure 1.** *Aborichthys palinensis*, EBRC/ZSI/F-12609, holotype, 102.0 mm SL, a tributary of Palin River, Arunachal Pradesh, showing dorsal, lateral and ventral views; lateral view showing thin and regular oblique stripes; ventral view showing vent situated closer to caudal-fin base than snout tip.



**Figure 2.** *Aborichthys palinensis*, EBRC/ZSI/F-12609, holotype, 102.0 mm SL, a tributary of Palin River, Arunachal Pradesh, dorsal and ventral views of head, **a**, showing rounded snout; and **b**, cashew-nut shaped mouth.

Head moderate and depressed, longer than broad, dorsal outline very gently sloping up to occiput and ventral flattened. Snout obtusely rounded and triangular when viewed dorsally. Occipital margin W-shaped. Mouth inferior, crescentic and surrounded by soft, thick, fleshy and pleated lips, wider than long, and surrounded by a deep furrow behind (Fig. 2b). Upper lip with minute median incision. Lower lip with two large roughly triangular pads or knobs separated by an extremely narrow median interruption. Processus dentiformes prominent and situated in the middle of mouth.

Three pairs of barbels: One pair maxillary and two pairs of rostral, larger than eye. Inner rostral barbel reaching posterior margin of knob of lower lip, but not reaching base of maxillary barbel, whereas outer rostral barbel reaching maxillary barbel base, maxillary barbel at vertical almost reaching to middle of eye. Eyes moderate, situated dorsally, invisible ventrally, slightly closer to snout tip than to posterior extremity of opercle, separated by a broad interorbital space. Nostril closer to eye than to tip of snout, nares separated by triangular membrane flap dividing it into two parts, anterior nare tubular and attached with membrane flap, flaps with broad base and pointed tip, sometime twisted; posterior nare elongate. Vent situated very closer to pelvic-fin origin (27.8-31.7% of pelvic to anal-fin origin) than anal-fin origin (65.0-68.7% of pelvic to anal-fin origin), and closer to caudal-fin base (44.1-45.6% SL) than snout tip (52-55% SL).

Body embedded with minute cycloid scales, absent on ventral surface between isthmus and level of pectoral-fin origin. Lateral line incomplete, 31-40 pores extending mostly before pelvic-fin, sometime to its origin with considerably a broad interruption. Flank with 30-35 thin oblique stripes, mostly regular and equal sized except anterior bars, interspace little bit broader than bar.

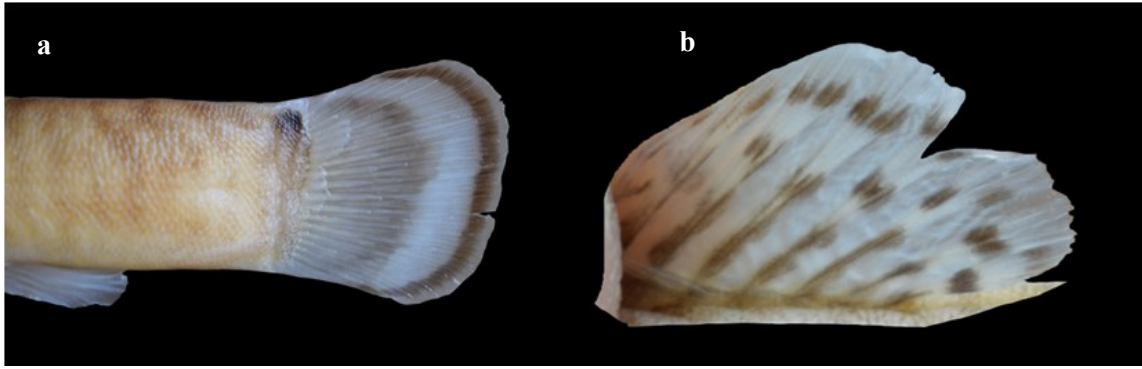
Dorsal fin with 2 simple and 8 branched rays, last ray weakly branched and originating from same pterygiophore, situated at vertical almost in between pectoral fin- and anal-fin origins, at vertical slightly posterior to pelvic-fin origin and 0.1-4.3% SL nearer to snout tip than to caudal-fin base, tip of last ray at vertical exceed anal-fin tip, anterior and posterior margins straight and distal slightly arched, second or third branched ray the longest, and length of dorsal and anal fins almost equal. Dorsal to pectoral equals occiput to pelvic distance; dorsal to anal equals pelvic to anal distance; and dorsal to pectoral almost equals dorsal to anal distance.

Pectoral fin broad leaf-shaped, with  $i11^*$ ,  $i9i$  (1),  $i10i$  (1) rays, tip obtusely pointed with three patterns of rays— first ray unbranched, second ray single branched, third ray (unbranched+ single branched i.e trifurcate), and rest double branched (tetrafurcate) except the last unbranched ray in case of paratypes; fourth or fifth branched ray the longest, anterior margin slightly convex, distal obtusely rounded; its tip extending to middle of pectoral- and pelvic-fin origins.

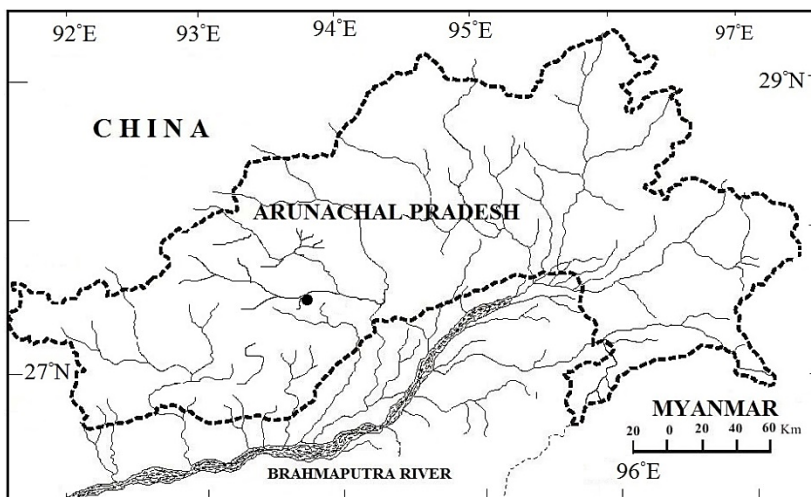
Pelvic fin broad leaf-shaped with  $i7$  rays, tip obtusely pointed with three patterns of rays— first ray unbranched, second ray single branched, third ray (unbranched + single branched i.e trifurcate), rest double branched (tetrafurcate) except last weak single branched ray, its last shortest ray slightly exceeding vent; pelvic fin situated at vertical slightly anterior to dorsal-fin origin, closer to pectoral fin (26.0-28.1% SL) than anal-fin (28.4-32.0% SL) origins. Pelvic-fin base with a small fleshy axillary lobe behind, not exceeding posterior end of base. Anal fin leaf-shaped, but narrower than pectoral and pelvic fins, with  $ii5^*$ ,  $ii5i$  (3) rays, anterior margin slightly convex and distal moderately arched; first two rays unbranched, second ray single branched, third (first unbranched+second branched, i.e. trifurcate), rest double branched (tetrafurcate) and last single branched in holotype and unbranched in paratypes. Its tip separated by a distance of 11.3-12.4%SL from caudal-fin base. Caudal fin broadly rounded with  $i16i^*(2)$ ,  $i17i$  (2) segmented rays, first upper and lower ray shortest, fin deepest at posterior end. Caudal peduncle (1.6-1.8) times longer than depth (56.5-64.1% of caudal peduncle length). Caudal peduncle length (17.5-18.7% SL) almost equals pre-pectoral length (18.5-18.7% SL) and caudal fin shorter (14.7-16.9% SL) than head length (18.4-19.2% SL).

**Table 1.** Morphometric data of *Aborichthys palinensis* (n=4). Range, mean and SD includes values of holotype

	Holotype	Range	Mean±SD
Standard length (mm)	102	90.9-102	96.7±4.6
<b>% Standard Length</b>			
Head length	18.4	18.4-19.2	18.9±0.3
Head width	11.7	11.7-12.8	12.3±0.5
Head depth	8.4	8.1-8.8	8.5±0.3
Body depth at dorsal-fin origin	11.3	11.3-12.1	11.6±0.4
Body width at dorsal-fin origin	9.9	9.9-11.5	10.5±0.7
Predorsal length	46.7	46.7-49.7	48.5±1.3
Prepectoral length	18.6	18.5-18.7	18.6±0.1
Prepelvic length	43.1	43.1-46.2	44.8±1.3
Preanal length	71.7	71.7-77.6	75.3±2.5
Preoccipital length	14.7	14.5-16.7	15.2±1.0
Pectoral-fin length	12.7	12.7-13.8	13.4±0.4
Dorsal-fin length	12.4	11.5-13.8	12.8±1.1
Dorsal-fin base length	9.0	9.0-10.9	9.9±0.9
Pelvic-fin length	10.8	10.8-12.3	11.7±0.7
Pelvic-fin base length	2.9	2.9-3.9	3.3±0.4
Anal-fin length	11.8	11.8-12.7	12.1±0.4
Anal-fin base length	5.9	5.1-5.9	5.4±0.3
Caudal-fin length	14.7	14.7-16.9	15.9±1.0
Caudal peduncle length	17.7	17.5-18.7	18.1±0.6
Caudal peduncle depth	10.0	10.0-12.0	11.0±0.8
Occiput to dorsal-fin origin	32.4	32.4-33.7	32.9±0.6
Occiput to pelvic-fin origin	30.5	30.5-33.2	31.9±1.4
Dorsal to pectoral-fin origin	30.5	30.5-33.2	32.4±1.3
Dorsal to anal-fin origin	28.4	28.4-33.0	31.2±2.2
Dorsal-fin origin to caudal-fin base	51.0	49.1-52.8	50.8±1.6
Pectoral to pelvic-fin origin	26.0	26.0-28.1	27.2±1.0
Pectoral to anal-fin origin	54.2	54.2-61.6	58.1±3.0
Pelvic origin to anal-fin origin	28.4	28.4-32.0	30.6±1.5
Pectoral-fin origin to vent	35.3	35.3-38.8	37.2±1.4
Pelvic-fin origin to vent	9.0	8.9-9.3	9.1±0.2
Vent to anal-fin origin	19.5	19.5-22.0	20.5±1.1
Snout tip to vent	52.0	52.0-55.0	54.1±1.4
Vent to caudal-fin base	44.1	44.1-45.6	45.1±0.7
Anal-fin origin to caudal-fin base	24.5	23.6-24.9	24.3±0.5
Tip of anal-fin to caudal-fin base	11.3	11.3-12.4	11.8±0.6
<b>% of Pelvic to anal-fin origin</b>			
Vent to anal-fin origin	68.6	65.0-68.7	67.2±1.8
Vent to pelvic-fin origin	31.7	27.8-31.7	29.9±1.6
<b>% of head length</b>			
Head depth	45.7	42.2-46.2	45.0±1.9
Upper jaw length	31.9	31.8-32.4	32.1±0.3
Lower jaw length	22.3	22.3-26.0	24.0±1.6
Snout length	42.6	42.6-45.9	43.9±1.5
Prenasal length	29.3	27.0-29.7	28.7±1.2
Eye diameter	8.0	8.0-11.0	9.5±1.4
Inter-orbital width	26.3	24.3-27.0	25.9±1.1
Inter-narial width	13.3	13.3-17.8	15.6±1.9
Head width	63.3	59.5-67.6	63.8±3.4
Gape width	37.2	31.8-37.2	34.1±2.3
Lower jaw to isthmus	39.9	32.4-39.9	36.4±3.2
Head depth at nostril	33.0	32.4-34.7	33.1±1.1
Head depth at pupil	37.2	37.2-43.2	39.7±2.7
Inner rostral barbel length	22.9	21.6-24.3	22.8±1.1
Outer rostral barbel length	20.2	17.3-27.0	21.6±4.1
Maxillary barbel length	17.0	16.2-18.5	17.0±1.1
<b>Ratio</b>			
Caudal peduncle length/caudal peduncle length	1.8	1.6-1.8	1.7±0.1
<b>% Caudal peduncle length</b>			
Caudal peduncle depth	56.5	56.5-64.1	60.7±3.8



**Figure 3.** *Aborichthys palinensis*, DNGC F 04, paratype, 90.9 mm SL, a tributary of Palin River, Arunachal Pradesh; **a**, showing broadly rounded caudal fin; **b**, EBRC/ZSI/F-12609, holotype, 102.0 mm SL, a tributary of Palin River, dorsal fin showing five rows of brown spots, three spots from base confluent to each other (part of thumb seen anteriorly, aided in spreading fin).



**Figure 4.** Map of Arunachal Pradesh, showing type locality of *Aborichthys palinensis* (filled circle).

**Color in preservative:** In 70% ethanol, body background beige with light brown oblique bars. Dorsum of head, scattered spots and irregular marks dark brown except light beige cheek region. Ventral region up to pelvic fin creamy, a light brown longitudinal median strip between vent and anal fin, and between anal and caudal fin base. Inter-radial membranes of dorsal, pectoral, pelvic and anal fins hyaline and radial semi hyaline. Caudal fin with two concentric bars— first subdistal bar dark brown, narrow, equal sized, and broadly rounded, second bar oval shaped, its anterior margin light brown, posterior region dusky, appears as broad patch, both bars interrupted by a broad interspace in between (Fig 3a), rest hyaline to semi-hyaline. A dark brown spot on upper margin of caudal-fin base. Dorsal fin with 5 rows of brown spots existing on each radial and one dark brown ocellus at its origin; first and second rows from the top separate, whereas third, fourth and fifth rows confluent (Fig. 3b).

**Distribution and habitat:** Till date, *Aborichthys palinensis* is only known from a small tributary of Palin River at Palin town in western Arunachal. It flows towards east about 5 km and merged with Kurung river (Fig. 4). Kurung River further moves about 30 km towards east and confluence with Kumey River from Palin town. Confluence of two Rivers is popularly known as “Kurung-Kumey”. Further it flows southeast and finally merges with Subansiri River in the lower reach, which is a major tributary of upper Brahmaputra River. River bed comprised of medium sized boulders, and mixture of pebbles, cobbles, sand and large boulders somewhere. Water was cool, clear and moderate to fast flowing. Riparian vegetation comprises of grasses, shrubs and small to medium sized trees along the banks and larger trees towards uphill. Along with the collections other species collected were; *Oreoglanis*, *Pseudecheneis*, *Schizothorax*, *Exostoma*, *Garra*, *Neolissocheilus* and *Channa*.

**Etymology:** The species name '*palinensis*' is assigned after the name of the area 'Palin' headquarter of Kra Daadi District, where the fish was obtained.

### Discussion

The genus *Aborichthys* exhibits three different positions of vent i.e. closer to snout tip, closer to the caudal-fin base, and almost in the middle of the body which is used as a generic character to differentiate other nemacheilid genera and among species as well (Hora, 1925; Kottelat 1990; Kosygin, 2019). *Aborichthys palinensis* belongs to the above second category in being the vent closer to the caudal-fin base than to the snout tip. Among the eleven known species of *Aborichthys*, the new species closely shares with *A. kailashi* in overall general appearance, shares primarily the narrow and regular oblique stripes along the flank except anterior ones, shape of head in dorsal view, maximum number of oblique bars (35 in *A. palinensis* and 36 in *A. kailashi*), dorsal-fin length (11.3-13.8 in *A. palinensis* and 11.3-13.4 in *A. kailashi* % SL), pelvic-fin length (11.5-12.3 in *A. palinensis* and 10.9-12.4 in *A. kailashi* % SL), distance between vent to anal-fin origin (20.2-22.0 in *A. palinensis* and 20.2-24.7 in *A. kailashi* % SL), inter-orbital space (24.3-27.0 in *A. palinensis* and 25.0-28.0 in *A. kailashi* % HL), eye diameter (8.6-11.0 and 8-10 in *A. kailashi* % HL). Moreover, to some extent, the type locality (Palin river), shares with, in being the same geographical area, ranging about 87 km apart from the Pange river (type locality of *A. kailashi*) in the northwest, but unconnected river system and varied altitudes (840 m vs. 1600 m asl). Pange river flows west-south direction and meet with Ranga River in lower reach, whereas Palin river moves towards eastern direction after confluence Kurung River and confluences with the Kumey River, which eventually joins with the Subansiri River in the southeast. Despite, *A. palinensis* differs from *A. kailashi* by having mouth moderately (vs. widely) arched, lacking (vs. having) dorsal and ventral adipose crest, a broadly round (vs. oval) shaped caudal fin, its distal band narrow and light brown (vs. broad and black (Fig. 2b), Shangningam et al., 2019; fig. 2). Further can be differentiated by having 5 (vs. 2) rows of spots on dorsal fin; a deeper body (11.3-12.1 vs. 7.5-9.2% SL); a greater pre-dorsal (length 46.7-49.7 vs. 40.7-46.2% SL); a shorter caudal peduncle (length 17.5-18.7 vs. 18.5-21.6% SL) and deeper caudal peduncle (56.5-64.1 vs. 46-55% of caudal peduncle length).

*Aborichthys palinensis* is distinguished from *A. iphipaniensis* by having considerably a narrower (vs. wider) interspaces between oblique bars along the flank; a higher body (11.3-12.1 vs. 8.9-9.9% SL); a longer pre-dorsal (46.7-49.7 vs. 42.4-44.4% SL) and pre-pelvic (43.1-46.2 vs. 39.4-42.0% SL); a shorter caudal peduncle (17.5-18.7 vs. 21.5-23.3% SL), vent to anal distance (19.5-22.0 vs. 24.1-27.5% SL) and to caudal base (44.1-45.6 vs. 52.0-56.2% SL) and from *A. waikhomi* in having the snout obtusely (vs. sub obtusely) blunt, a shorter pre-pelvic (43.1-46.2 vs. 46.1-50.0% SL), and a smaller eye (8.0-11.0 vs. 14.1-17.8% HL).

*Aborichthys palinensis* is distinguished from *A. pangensis* by having the snout obtusely blunt (vs. obtusely pointed), a deeper body (11.3-12.1 vs. 10.1-11.2% SL); a shorter head (18.4-19.2 vs. 20.6-21.4% SL), pre-pelvic (43.1-46.2 vs. 48.1-50.0% SL), pre-pectoral (18.5-18.7 vs. 19.6-21.4% SL), caudal fin (14.7-16.9 vs. 17.5-18.7% SL), anal fin (11.8-12.7 vs. 13.6-14.7% SL) and pelvic fin (10.8-12.3 vs. 13.1-15.6% SL); a longer caudal peduncle (17.5-18.7 vs. 16.0-17.5% SL); and a smaller eye (8.0-11.0 vs. 15-18% HL); from *A. verticauda* in having a shorter pre-pectoral (18.5-18.7 vs. 20.0-24.2% SL), pre-pelvic (43.1-46.2 vs. 48.0-53.2% SL) and snout to vent distance (52.0-55.0 vs. 56.7-61.4% SL); a longer caudal peduncle (17.5-18.7 vs. 11.0-16.6% SL); a greater dorsal to caudal base distance (49.1-52.8 vs. 36.5-41.4% SL); and a smaller eye (8.0-11.0 vs. 14.0-20.5% HL).

*Aborichthys palinensis* is further distinguished from *A. waikhomi*, *A. pangensis* and *A. verticauda* in having broadly a rounded (vs. truncate) caudal fin with two smoothly arched bars (vs. several irregular black blotches in *A. waikhomi*; several irregular clusters of black spots in *A. pangensis*; and 4-5 irregular bars in *A. verticauda*).

*Aborichthys palinensis* is distinguished from *A. elongatus* in having a shorter pre-pelvic (43.1-46.2 vs. 48.6-49.9% SL); a greater dorsal to pectoral- (30.5-33.2 vs. 23.6-24.0% SL), dorsal to anal- (28.4-33.0 vs. 19.4-21.6% SL), dorsal to caudal base- (49.1-52.8 vs. 31.6-37.2% SL) and pelvic to anal- (28.4-32.0 vs. 19.6-22.6% SL) and vent to anal distance (19.5-22.0 vs. 12.9-15.0% SL); a shorter snout to vent- (52.0-55.0 vs. 60.2-71.8% SL) and pectoral to pelvic distance (26.0-28.1 vs. 30.3-32.9% SL); and a smaller eye (8.0-11.0 vs. 15.5-22.8% HL); from *A. tikaderi* in having a greater pre-dorsal (length 46.7-49.7 vs. 42.6-44.3% SL), pre-pectoral (18.5-18.7 vs. 14.6-16.2% SL), pre-pelvic (43.1-46.2 vs. 37.8-41.4% SL), dorsal to pectoral distance (30.5-33.2 vs. 23.4-27.1% SL), and dorsal to anal distance (28.4-33.0 vs. 20.9-24.7% SL); a shorter caudal fin (14.7-16.9 vs. 20.2-21.2% SL) and anal to caudal base distance (23.6-24.9 vs. 24.9-27.4% SL); from *A. garoensis* in having a longer caudal peduncle (length 17.5-18.7 vs. 14.3-16.1% SL); a greater dorsal to pectoral- (30.5-33.2 vs. 22.6-25.9% SL), dorsal to caudal base- (49.1-52.8 vs. 40.2-41.5% SL), anal to caudal base- (23.6-24.9 vs. 14.1-14.7% SL) and snout to vent distance (52.0-55.0 vs. 48.5-50.6% SL); a longer pre-dorsal (length 46.7-49.7 vs. 41.7-43.8% SL), pre-pectoral (length 18.5-18.7 vs. 15.3-15.8% SL) and pre-pelvic (length 43.1-46.2 vs. 40.4-41% SL); and a shorter caudal fin (length 14.7-16.9 vs. 20.6-21.90% SL); from *A. kempfi* in having a shorter pre-pectoral (length 18.5-18.7 vs. 19.7-20.2% SL), caudal fin (length 14.7-16.9 vs. 19.6-22.4% SL), pectoral to anal- (54.2-61.6 vs. 51.3-54.0% SL) and anal to caudal base distance (23.6-24.9 vs. 25.2-27.0% SL); a greater dorsal to anal- (28.4-33.0 vs. 24.7-26.8% SL), dorsal to caudal base- (49.1-52.8 vs. 39.6-42.5% SL) and pelvic to anal distance (28.4-32.0 vs. 26.6-26.9% SL); and a smaller eye (8.0-11.0 vs. 14.9-17.0% HL); from *A. cataracta* in having a shorter caudal fin (14.7-16.9 vs. 19.4-21.9% SL); a greater dorsal to pectoral- (30.5-33.2 vs. 24.7-28.0% SL), dorsal to anal- (28.4-33.0 vs. 23.0-28.1% SL), and dorsal to caudal base distance (49.1-52.8 vs. 39.0-46.0% SL); a smaller eye (8.0-11.0 vs. 13.4-17.9% HL).

*Aborichthys palinensis* is further distinguished from *A. kempfi*, *A. elongatus*, *A. garoensis*, *A. tikaderi*, *A. cataracta*, *A. pangensis* and *A. verticauda* in lacking (vs. having prominent; shallow in *A. elongatus*, *A. tikaderi*, *A. cataracta*, *A. verticauda* and *A. pangensis*) dorsal and ventral adipose crest (Shangningam et al 2019). Further it differs from *A. kempfi*, *A. garoensis* and *A. tikaderi* by having the vent closer to the caudal-fin base than to the snout tip (vs. closer to the snout tip than to the caudal-fin base); in addition to *A. boutanensis*, further differs from *A. kempfi*, *A. tikaderi* and *A. waikhomi* in having more oblique stripes along flank (30-35 vs. 27 in *A. boutanensis* (counted from the figure 1b in Thoni and Hart, 2015); 20-23 in *A. kempfi*; 16 in *A. tikaderi*; and 12-16 in *A. waikhomi*); further from *A. boutanensis* in having fewer branched pectoral fin rays (9-11 vs. 12); fewer pelvic fin branched rays (7 vs. 8), a longer pectoral fin (12.7-13.8 vs. 15% SL); a shorter caudal peduncle (length 17.5-18.7 vs. 19% SL); in having more oblique bars along the flank (30-35 vs. ca 28).

**Comparative materials:** *Aborichthys waikhomi*: V/APRC/ZSI/P-519, paratypes, 2, 59.0-68.0 mm SL; Bulbulia stream near Bulbulia, Namdapha, Arunachal Pradesh, J.K. De & team, 06 November 2009.

*Aborichthys iphipaniensis*: paratypes, ZSI/V/APRC/P-1659, paratypes, 3, 107.5-120.8 mm SL; Iphipani River at Roing, Lower Dibang Valley, Brahmaputra River basin, Arunachal Pradesh, India, S. Devi and team, 04 April 2016.

*Aborichthys kailashi*: ZSI/V/APRC/P 786, paratypes, 4, 89-113 mm SL; Pange River at Arolenching, Ziro, Lower Subansiri District: Brahmaputra basin, Arunachal Pradesh, Bikramjit Sinha and team, 09 Nov 2013.

**Comparative data which could not be examined were accessed from the following literature sources:** Chaudhuri (1913), Kosygin (2012) and Arunachalam et al. (2014) for *A. kempfi*, *A. elongatus*, *A. tikaderi*, *A. garoensis*, *A. waikhomi*, *A. cataracta* and *A. verticauda*. Kosygin et al. (2019) for *A. iphipaniensis* (additional data). Shangningam et al. (2019) for *A. kailashi* (additional data) and *A. pangensis*. Thoni and Hart (2015) for *A. boutanensis*.



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