



Paracanthocobitis tumitensis, a new species of zipper loach from Manipur, north-eastern India (Cypriniformes: Nemacheilidae)

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ABSTRACT

Paracanthocobitis tumitensis sp. nov. is described from a stream Tumit in the northern part of Chandel district of Manipur State, India, which forms a part of the Chindwin basin. The fish is characterised by the absence of axillary pelvic lobe, 11-12.5 pectoral-fin rays, 9 pelvic-fin rays, 7 anal-fin rays, lateral line incomplete, reaching at the middle of predorsal-fin insertion, with 6-8 pores and 28-33 scales, 2 black spots at upper and lower base margins of caudal-fin, 15-16 greyish dark black blotches along the lateral side of body, 15-17 dorsal saddle like bands which not extending to lateral line, and 5 dark bands on caudal-fin.

Key words: *Paracanthocobitis*, Manipur, New Species.

1. INTRODUCTION

Hamilton (1822) described *Cobitis botia* from northeastern parts of Bengal. Kuhl & van Hasselt (1823) used the generic name *Noemacheilus* for type species *N. fasciatus*. Bleeker (1863) used the generic name *Nemacheilus* for the type species *Cobitis fasciata*. Peters (1861) described the genus *Acanthocobitis* and designated *A. longipinnis*, a new species from the Ganges River basin in India. Menon (1987) recognised *A. longipinnis* as a junior synonym of *Cobitis botia* Hamilton, 1822. Banarescu & Nalbant (1968) treated *Acanthocobitis* as a sub-genus of *Noemacheilus* Kuhl and van Hasselt, 1823. Kottelat (1989, 1990, 2013) recognized *Acanthocobitis* as a genus and included *A. botia*, *A. mandalayensis*, *A. pictilis*, *A. rubidipinnis* and *A. zonalternans*. Talwar & Jhingran (1991) reported *Nemacheilus botia*, *N. mooreh*, *N. pavonaceus*, *N. rubidipinnis*, *N. urophthalmus* and *N. zonalternans* from the Inland fishes of India and adjacent countries. Jayaram (1999) reported six species of *Acanthocobitis* viz., *A. botia*, *A. mooreh*, *A. pavonaceus*, *A. rubidipinnis*, *A. urophthalmus* and *A. zonalternans* from north east India.

Hora (1921) described *Nemacheilus kangjupkhulensis*, *N. prashadi* and *N. sikmaiensis* (now, *N. kangjupkhulensis* and *N. sikmaiensis* are belong to the Genus *Schitura*, *N. prashadi* belongs to the genus *Physoschistura*), while reporting on the fish and fisheries of Manipur. His report from the state, Manipur also included *N. botia* (now, *Paracanthocobitis botia*), but the place of collection was Ghaspani, Nagaland. Subsequent reports on the fishes of the state by Hora (1936). Menon (1953) and Menon (1954) did not add any more *nemacheilines* to the list. Only two species viz., *Acanthocobitis botia* and *A. zonalternans* (now, *Paracanthocobitis*) are reported from Manipur (Vishwanath & Laishram, 2001).

The genus *Paracanthocobitis* was created by Grant (2007) and recognised 18 species viz., *P. abutwebi* Singer & Page, 2015; *P. adelaideae* Singer & Page, 2015; *P. aurea* (Day, 1872); *P. botia* (Hamilton, 1822); *P. canicula* Singer & Page, 2015; *P. linypha* Singer & Page, 2015; *P. mackenziei* (Chaudhuri, 1910); *P. maekhlungensis* Singer & Page 2015; *P. mandalayensis* (Rendahl, 1948); *P. marmorata* Singer et al., 2017; *P. mooreh* (Sykes, 1839); *P. nigrolineata* Singer et al., 2017; *P. phuketensis* (Klausewitz, 1957); *P. pictilis* (Kottelat, 2012); *P. rubidipinnis* (Blyth, 1860); *P. triangula* Singer et al., 2017; *P. urophthalama* (Gunther, 1868) and *P. zonalternans* (Blyth, 1860) respectively. They are a geographically widespread and species rich group of fishes in Southeast Asia. They range from Pakistan in the Indus basin to the Salween drainages, the Malay Peninsula, Cambodia and Laos in the Mekong basin (Menon, 1987; Kottelat 1990 and Pethiyagoda, 1991).

Zipper loach fishes of the genus *Paracanthocobitis* Grant, 2007 are characterised by the combination of lower lip with large papillated pad on either side of a medial interruption; upper lip with 2-5 rows of papillae and continuous with lower lip i.e., strongly papillated lips; conspicuous black spot with white outline (an ocellus) on upper half of caudal-fin base; emarginated or truncate caudal-fin, 9½- 15½ branched dorsal-fin rays, rounded head in lateral view, horizontally oriented suborbital flap or groove etc. (Kottelat, 2012 and Singer & Page, 2015).

During our studies on the fish diversity of Chandel district, Manipur (Chindwin basin) we found 9 specimens of *Paracanthobitis* which resembles species of *zonalternans* complex. However, it does not fit into any known species of the genus. Thus, the fish is described here as a new species, *Paracanthocobitis tumitensis*.

2. MATERIAL AND METHOD

Measurements and counts follow Kottelat (1984 and 1990). Measurements were made to the nearest 0.1mm using dial callipers. In lists of material examined, the catalogue number is followed by the number of specimens, size range in mm SL, locality, collector, and date. Specimens were preserved in 10% formalin. The examined materials (type series) were deposited in the Manipur University Museum of Natural History (MUNH), Canchipur, Manipur.

3. NEW SPECIES

***Paracanthocobitis tumitensis* sp. nov.**

Types-Holotype: 135/NH/MUM (30.1mm SL; India, Manipur, Tumit River at Chumbang village of Chandel district, Chindwin basin, collectors: W. Alphonsa Moyon and her party, 12 February 2019.

Paratypes: 135/NH/MUM, 24.2-30.0 SS mm SL, same data as holotype.

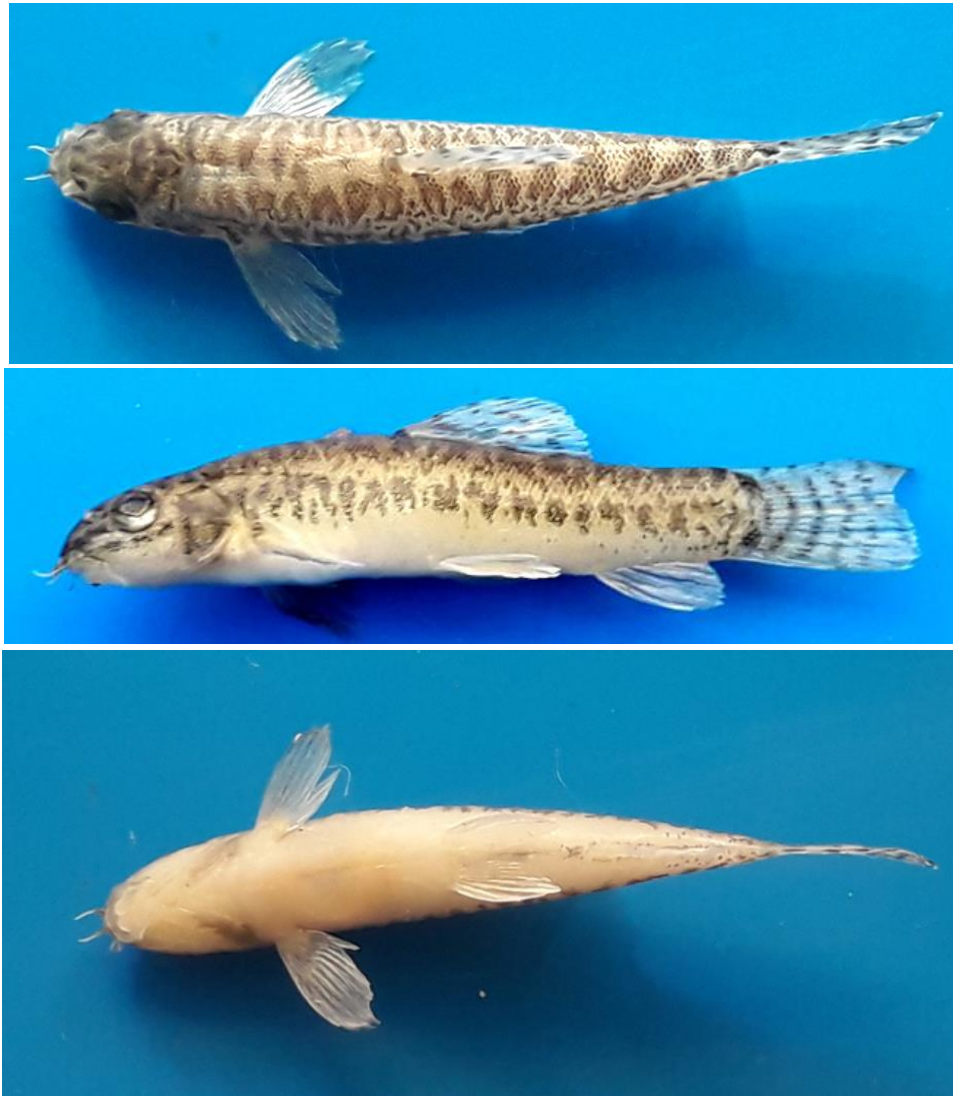


Figure 1 Dorsal, lateral, and ventral views of *Paracanthocobitis tumitensis* sp. nov., 135/ NH/ MUM, 30.1 mm SL; India: Manipur: Tमित River at the Purum Chumbang Village of Chandel District, Chindwin Basin.

Diagnosis

Paracanthocobitis tumitensis sp. nov., differs from all other species of *Paracanthocobitis* by the combination of incomplete lateral line, axillary pelvic lobe absent, suborbital flap on male; $10\frac{1}{2}$ dorsal-fin rays; dark dorsal saddle not well connected to lateral blotches; two black spots at upper and lower base margins of caudal-fin; head length 21.9-27.8%SL, body depth 13.6-19.2%SL, pectoral-fin length 20.3-33.1%SL; pelvic-fin length 15.2-19.6%SL; interorbital wide 34.4-37.5%HL. Colour pattern consists of 15-16 greyish dark blotches along lateral side of body; dorsal saddle bands with 15-17 which narrower than or equal interspaces, not extending to lateral line, 5-6, usually 5 dark bands on caudal-fin.

Description

Morphometric data are in Table -1. General body shaped as in Fig. 1. Body deepest at in insertion of anterior dorsal-fin origin, cylindrical before dorsal-fin, compressed postdorsally. Head underpressed, snout gently rounded to slightly pointed when view dorsally or laterally. Dorsal-fin origin close to the tip of snout; distal margin straight. Pectoral-fin 20.3-33.1%SL, not reaching the origin of pelvic-fin. Pelvic-fin 15.2-19.6%SL, not reaching the origin of anal-fin and just reaching the anal opening, caudal-fin emarginated.



Figure 2 Oromandibular structure of *Paracanthocobitis tumitensis* sp. nov.

Lateral line incomplete, reaching at most to dorsal-fin insertion, 28-33 pores. Axillary pelvic lobe absent. Mouth arched with papillated lips; upper lips with 2-3 minute rows of papillae, discontinuous with large pads on lower lip. Three pairs of barbels, inner rostral barbel extends to or slightly past base of maxillary barbel, maxillary barbel and outer rostral barbel extend to or slightly past orbit or eye. Body covered with scales, 10½ branched dorsal-fin rays; 11-12½ pectoral-fin rays and pointed or acuminate, 9 pelvic-fin rays and rounded to subacuminate, 7 branched anal-fin rays; 18 branched caudal-fin rays.

Table 1 Morphometric data of *Paracanthocobitis tumitensis*. Ranges include values of holotype. No. of specimen =9.

	<i>Paracanthocobitis tumitensis</i> sp. nov.			
	Holotype	Range	Mean	SD
Standard length (mm)	30.1	24.2-30.1		
In % of Standard length (SL)				
Body depth	19.2	13.6-19.2	16.2	1.3
Head depth at occiput	14.6	12.8-14.6	13.7	1.2
Head depth at eye	12.2	10.7-12.2	11.4	1.1
Head length at occiput	19.3	19.3-21.4	20.4	1.5
Head length	27.8	21.9-27.8	24.8	1.7
Predorsal length	47.4	47.4-54.6	51.0	2.4
Prepelvic length	59.8	59.6-59.8	59.7	2.6
Preanus length	71.3	71.3-79.5	75.4	2.9
Preanal length	75.7	75.7-83.5	79.6	3.0
Width of head at nares	3.3	3.3-10.3	6.8	0.9
Width of head at neck	14.2	12.8-14.2	13.5	1.2
Width of body at dorsal-fin origin	14.2	13.2-14.2	13.7	1.2
Width of body at anal-fin origin	8.3	7.5-8.3	7.9	0.9
Snout length	9.3	9.3-9.9	9.6	1.0
Eye diameter	7.3	5.0-7.3	6.2	0.8
Inter orbital width	9.3	8.2-9.3	8.7	1.0
Caudal peduncle length	11.6	8.8-11.6	10.2	1.1
Caudal peduncle height or depth	11.9	8.8-11.9	10.3	1.1
Pectoral-fin length	33.1	20.3-33.1	26.7	1.7
Pelvic-fin length	19.6	15.2-19.6	17.4	1.4
Dorsal-fin length	24.8	21.5-24.8	23.1	1.6
Caudal-fin length	23.8	21.9-23.8	22.6	1.6
In % of head length				
Depth of head at eye	45.0	45.0-48.8	47.0	2.3
Depth of head at occiput	53.5	53.5-58.6	56.1	2.5
Height of head at occiput	70.8	70.8-97.7	84.3	3.1
Width of head at nares	36.4	36.4-46.9	41.7	2.1
Width of head at neck	52.3	52.3-58.2	55.3	2.5
Eye diameter	26.8	22.9-26.8	24.9	1.7
Interorbital width	34.4	34.4-37.5	36.0	2.0
Snout length	34.4	34.4-45.1	39.8	2.1

Colouration

Body brown to greyish with 15-16 dark brown to black scattered blotches along lateral line and not extending onto lower side of body, 15-17 dark brown scattered dorsal saddles. Dark spots and blotches on head; 1 uninterrupted black bar from anterior eye to tip of snout, and 1 interrupted black bar from the tip of snout to the posterior end of eye which lower surface of eye i.e., in infraorbital region. 2 black ocellus like spots at the upper and lower portions or bases of the caudal-fin origin. Dorsal-fin with 3-4 black dotted rows of bands.



Figure 3 Colour pattern on side of body in *Paracanthocobitis tumitensis* sp. nov.

Biology

The species inhabits flowing clear water with gravel bottom and lush green algal bloom (Fig. 4). They were found adhering to rocks at the time of collection and associated with *Devario*, *Schistura*, *Mastacembelus*, *Pethia* and *Opsarius* species.



Figure 4 Type locality of *Paracanthocobitis tumitensis* sp. nov., Tumit River, Purum Chumbang Village, Chandel district, Manipur, India.

Distribution

Paracanthocobitis tumitensis sp. nov. is presently known from the Tumit River, Chindwin basin in Chandel district, Manipur State, India (Fig.5). This river is originated from the region between Khunjai and Lamkaang Khunou villages of Chandel district. It meanders along the southern fringe from east to west and joins the Maha River near Purum Chumbang village, about 1 km from the Kapaam Village.

Etymology

The species is named after the type locality, Tumit River. An adjective.

Local Name: Ngachicharou in Moyon language, Ngakrijou macha or Ngakrijou- manbi (in Meteilon or Manipuri language).

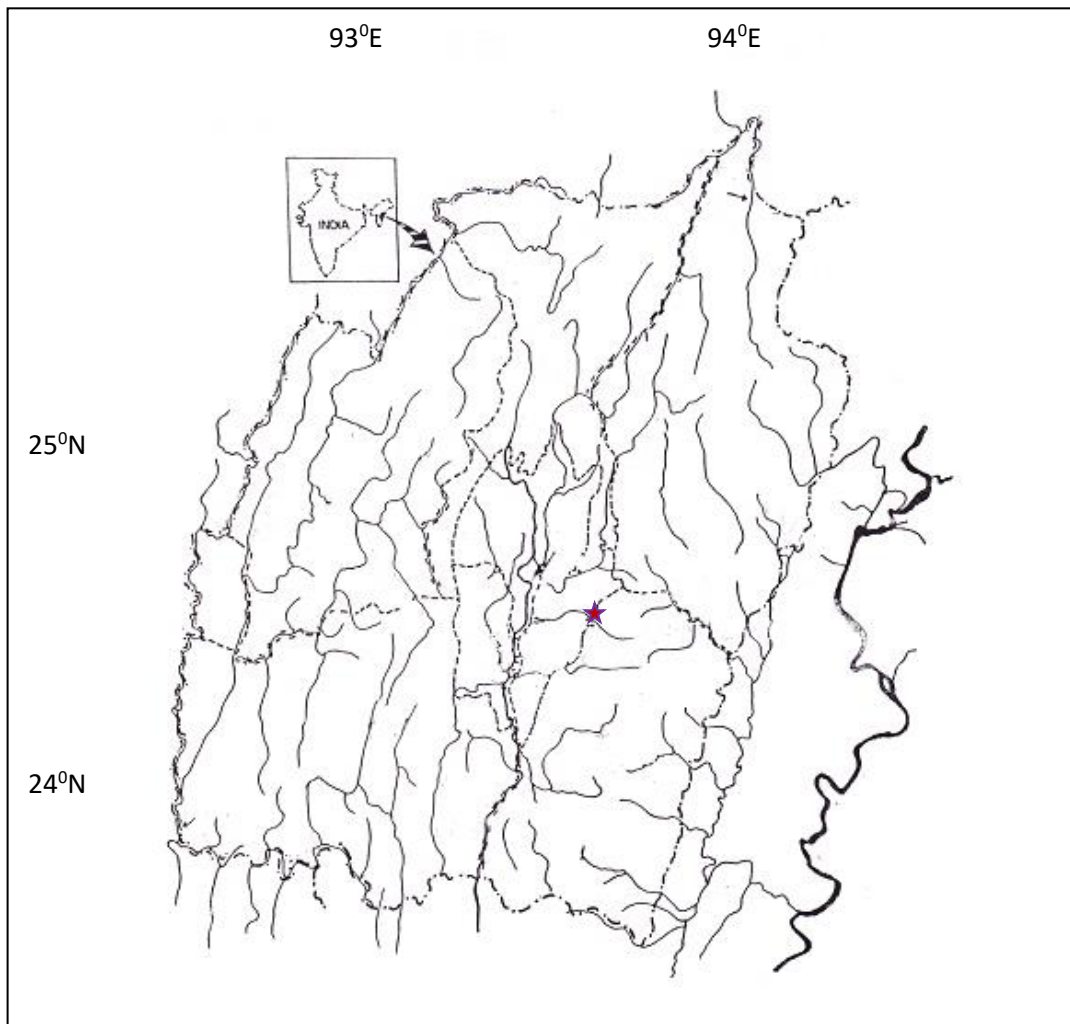


Figure 5 Map showing the type locality of *Paracanthocobitis tumitensis* sp. nov. indicated by symbol - ★

4. DISCUSSION

Paracanthocobitis tumitensis sp. nov. differs from *P. adelaideae*, *P. canticula*, *P. mackenziei*, *P. maekhlengensis*, *P. mandalayensis*, *P. nigrolineata*, *P. rubidipinnis*, *P. triangula* and *P. zonalternans* in lacking vs. having axillary pelvic lobe. It differs from *P. abutwebi* in having less number of branched dorsal-fin rays (10 vs. 12-13), longer head length (21.9-27.8%SL vs. 17.5-22.1), longer prepelvic (53.8-59.6%SL vs. 45.5-50.9), longer pectoral-fin (20.3-33.1%SL vs. 17.1-24.4), lateral line (incomplete vs. complete), more number of dorsal black patches or saddles (15-17 vs. 10-13). It is known from the Chindwin basin of Manipur vs. the Karnaphuli, Meghna, and lower Brahmaputra and Ganges river drainages of Bangladesh.

Paracanthocobitis tumitensis sp. nov. differs from *P. aurea* in lacking having dark saddles continuous with dark bars on the side of body and bars extending below lateral line; 2 black spots at the upper and lower portions of the bases of caudal-fin origin vs. 1 round black spot near dorsal margin of caudal peduncle, lateral line scales (incomplete with 28-33 vs. complete with 102), longer predorsal (47.4-54.6%SL vs. 44.2), longer head (21.9-27.8%SL vs. 20.7), longer snout (9.3-9.9%SL vs. 8.8), longer prepelvic (53.8-59.6%SL vs. 49.8) longer preanal (75.7-83.5%SL vs. 73.4), smaller eye (22.9-26.8%HL vs. 28), wider interorbital (34.4-37.5%HL vs. 24.2). It is known from the Chindwin basin of Manipur vs. Narmada basin of Madhya Pradesh, India.

Paracanthocobitis tumitensis sp. nov., differs from *P. botia* in having more blotches (15-16 vs. 8-10), lateral line (incomplete vs. complete), smaller eye (22.9-26.8%HL vs. 28.1-35.3), wider interorbital (34.4-37.5%HL vs. 23.2-31.1), longer head (21.9-27.8%SL vs. 18.7-21.0), lateral blotches or X-mark short, interrupted and along the lateral line at the vertical of dorsal-fin base vs. more or less rounded blotches along and just below lateral line at the vertical of dorsal-fin base. It is known from the Chindwin basin of Manipur vs. Brahmaputra basin of Assam, India.

Paracanthocobitis tumitensis sp. nov. differs from *P. linypha* in having more dark saddles (15-17 vs. 10-14), absence vs. presence of thin vertical dark bars on lateral sides of body that extend from upper to lower side, less number dark bands on caudal-fin (4-5 vs. 5-7), lateral line (ending in front of dorsal-fin origin vs. ending near pelvic-fin origin), longer head (21.9-27.8%SL vs. 18.8-22.9), longer pectoral-fin (20.3-33.1%SL vs. 17.5-21.8), It is known from the Chindwin basin of Manipur vs. Irrawaddy & Sittang basins of Myanmar.

Paracanthocobitis tumitensis sp. nov. differs from *P. marmorata* in having less number of concentric rows of dark spots in dorsal-fin (3-4 vs. 3-6), longer predorsal (47.4-54.6%SL vs. 0.43-0.49), longer head (21.9-27.8%SL vs. 0.20-0.22), longer snout (9.3-9.9%SL vs. 0.07-0.10), longer pre-pelvic (53.8-59.6%SL vs. 0.51-0.55), longer preanal (75.7-83.5%SL vs. 0.76-0.78), deeper body (13.6-19.2%SL vs. 0.17-0.18), deeper caudal peduncle (8.8-11.9%SL vs. 0.11-0.12), longer pectoral-fin (20.3-33.1%SL vs. 0.19-0.22), longer pelvic-fin (15.2-19.6%SL vs. 0.15-0.17), larger eye (5.04-7.3%SL vs. 0.28-0.32), wider interorbital (8.26-9.39%SL vs. 0.32-0.40), lateral line pores ending in front of dorsal-fin insertion vs. ending just beyond dorsal-fin insertion, more pectoral-fin rays (11-12½ vs. 9-10), more pelvic-fin rays (9 vs. 5-6), more branched anal-fin rays (7 vs. 5½) and absence vs. presence of 2-3 rows of dark spots in anal-fins. It is known from the Chindwin basin of Manipur vs. Barak drainage of Assam, India.

Paracanthocobitis tumitensis sp. nov. differs from *P. mooreh* in having longer head (21.9-27.8%SL vs. 19.6-22.3), longer pectoral-fin (20.3-33.1%SL vs. 17.8-21.6), wider interorbital (34.4-37.5%HL vs. 18.2-30.3), lateral line ending before the insertion of dorsal-fin vs. ending near the pelvic-fin origin. It is known from the Chindwin basin of Manipur vs. Krishna, Godavari and Kaveri river basins of India.

Paracanthocobitis tumitensis sp. nov. differs from *P. phuketensis* in having more black blotches along lateral line (15-16 vs. 10-12), more dorsal saddles (15-17 vs. 12-15), less concentric rows of dark spots in dorsal-fin (3-4 vs. 3-6), less number of lateral line pores (28-33 vs. 20-48), more pectoral-fin rays (11-12½ vs. 9-10), more pelvic-fin rays (9 vs. 6), more anal-fin rays (7 vs. 5½). It is known from the Chindwin basin of Manipur vs. Panag Tak drainage system of Thailand and Malaysia.

Paracanthocobitis tumitensis sp. nov. differs from *P. urophthalma* in lacking vs. having large dark bars on side of body extending from dorsum to venter, lesser dark bands on caudal-fin (5 vs. 5-7), longer head (21.9-27.8 %SL vs. 19.9-22.5), wider interorbital (34.4-37.5%HL vs. 23.8-28.1), lateral line ending before the insertion of dorsal-fin vs. ending at or posterior to anal-fin origin, less lateral line scales (28-33 vs. 59-71), less branched dorsal-fin rays (10 vs. 11½). It is known from the Chindwin basin of Manipur vs. a species of Sri Lanka.

Singer & Page (2015) divided 3 species of groups of the genus *Paracanthocobitis* viz., (1) *P. botia* group, (2) *P. zonalternans* group and (3) *P. mandalayensis*.

- (1) *P. botia* group are distributed in India, Sri Lanka, Bangladesh and Myanmar. Species of *P. botia* group are: *P. abutwebi*, *P. adelaideae*, *P. aurea*, *P. botia*, *P. linypha*, *P. mackenziei*, *P. mooreh*, *P. rubidipinnis* and *P. urophthalma*.
- (2) *P. mandalayensis* group are restricted to Myanmar, Cambodia and Thailand. Species of *P. mandalayensis* group are: *P. canicula*, *P. maekhlongensis*, *P. mandalayensis* and *P. pictitis*.
- (3) *P. zonalternans* group are highly variable, ranges across several drainages. *P. zonalternans* is the only recognised species of this group. They are small size (<40-45mm SL), having 10½ or fewer dorsal-fin rays and a suborbital flap.

Singer *et al* (2017) reported that *Paracanthocobitis zonalternans* are diminutive less than 45mm SL and described three new species viz., *P. marmorata*, *P. nigrolineata* and *P. trinagula* which included under the *P. zonalternans* group. The new species, *Paracanthocobitis tumitensis* belongs to *P. zonalternans* groups as it has less than 40-45 mm SL i.e. 30.13mm SL.

Paracanthocobitis tumitensis sp. nov. differs from *P. botia* in having incomplete vs. complete lateral line, less branched dorsal-fin rays (10 vs. 12½), pelvic-fin origin under 2nd-3rd vs. 3rd-4th branched dorsal-fin ray, more dark patches on dorsal (i.e., saddles) 15-17 vs. 10-11, not vs. extending towards lateral line alternate with the blotches, lesser caudal-fin bands (5 vs. 7-8), slender body (13.6-19.2%SL vs. 18.0-24.4), wider inter orbital (8.2-9.3%SL vs. 5.9-7.2), shorter caudal peduncle (8.8-11.6%SL vs. 11.5-14.4), slender caudal peduncle (8.8-11.9%SL vs. 12.2-13.4), narrower wide at anal-fin origin (7.5-8.3%SL vs. 8.3-10.2), longer predorsal (47.4-54.6%SL vs. 42.2-46.8) and longer prepelvic (53.8-59.6%SL vs. 51.9-54.7) respectively (based on Vishwanath & Laisram, 2001).

It can be distinguished from *P. zonalternans* in having incomplete lateral line ending in front of dorsal-fin origin vs. extends upto middle of dorsal-fin base, pelvic-fin origin under 2nd -3rd vs. 4th -5th branched dorsal-fin ray, more dark patches on dorsal (i.e., saddles) 15-17 vs. 10-13, more blotches 15-16 vs. 12-13 vertical bars of variable shape, extending from back to middle of body, slender body (13.6-19.2%SL vs. 17.9-22.0), slender head at nape (12.8-14.6%SL vs. 14.2-17.3), slender head at eye (10.7-12.2%SL vs. 12.2-13.9), larger eye (5.0-7.3%SL vs. 4.4-5.8), wider interorbital (8.2-9.3%SL vs. 6.7-8.5), shorter caudal peduncle (8.8-11.6%SL vs. 11.4-16.4), slender caudal peduncle (8.8-11.9%SL vs. 12.0-14.4), narrower body width at anal-fin origin (7.5-8.3%SL vs. 8.5-10.8) and shorter caudal-fin (21.9-23.8%SL vs. 24.4-28.2) respectively (based on Vishwanath & Laisram, 2001).

5. COMPARATIVE MATERIALS

Paracanthocobitis abutwebi: Data from Singer & Page (2015)

P. adelaideae: Data from Singer & Page (2015)

P. aurea: Data from Singer & Page (2015)

P. botia: Data from Singer & Page (2015) and Vishwanath & Laishram (2001)

P. canicula: Data from Singer & Page (2015)

P. linypha: Data from Singer & Page (2015)

P. maekenziei: Data from Singer & Page (2015)

P. maekhlongensis: Data from Singer & Page (2015)

P. mandalayensis: Data from Singer & Page (2015)

P. marmorata: Data from Singer & Page (2017)

P. mooreh: Data from Singer & Page (2015)

P. nigrolineata: Data from Singer *et al.*, (2017)

P. phuketensis: Data from Singer *et al.*, (2017)

P. pictilis: Data from Kottelat (2012) and Singer & Page (2015)

P. rubidipinnis: Data from Singer & Page (2015)

P. triangluta: Data from Singer *et al.*, (2017)

P. urophthalma: Data from Singer & Page (2015)

P. zonalternans: Data from Singer & Page (2015), Singer *et al.*, (2017) and Vishwanath & Laishram (2001)

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Conflict of Interest: The authors declare that there are no conflicts of interests.

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