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L Arunkumar

Department of Zoology,
Mayai Lambi College, Yumnam
Huidrom, Manipur, India

Wanglar Alphonsa Moyon

Department of Zoology,
South East Manipur College,
Komlathabi, Manipur, India

Garra ngatangkha a new labeonin species of *Lissorhynchus* complex (Teleostei: Cyprinidae) from Manipur, north eastern India

L Arunkumar and Wanglar Alphonsa Moyon

Abstract

Garra ngatangkha, a new labeonin species is described from the Tunit River of the Chindwin River basin in Manipur. It can be distinguished from its congeners of north-eastern India in having a unique combination of the following characteristics: dorsal-fin rays with ii,4,i or ii,5; lateral line scales 33 to 35; lateral transverse scales 3.5/3.5; predorsal scales 15-16; caudal fin forked, absence of tubercles on snout, oval shaped adhesive disc, wider than long; chest, belly and post-pelvic-fin naked, rostral lobe present, a horizontal row of small cluster of tiny tubercles present in three separate patches below the eye which originated just above the maxillary barbel to the opercular opening and formed by 2 to 3, 4 to 5, and 3 to 4 respectively. Total number of vertebrae 29 to 30. A key to the species of *Garra* in the *lissorhynchus* complex of north-eastern India is provided. This is the fifth and ninth species of *Garra* belonging to the *lissorhynchus* complex which reported from the Chindwin basin of Manipur and north-eastern part of India respectively.

Keywords: labeoninae, *Garra*, new species, chindwin basin, Manipur

1. Introduction

Labeonin fishes of the genus *Garra* Hamilton, 1822 are adopted to high gradient and fast flowing water and harbours about 200 recognised species (Yu *et al.*, 2016 and Roni & Vishwanath, 2018) [17, 12]. Menon (1964) [8] revised the genus *Garra* with description of 37 species of which 8 species were from Africa, divided 4 groups and 9 complexes. Presence of a dark streak near the free margin of the dorsal-fin, a broad black W-shaped band on the anterior half of the caudal-fin and the chest and belly being naked are distinguishing characters of the *lissorhynchus* complex (Menon, 1964) [8].

Talwar & Jhingran (1991) [15], Jayaram, (1999) [4], Kottelat (2013) [5], Nandagopal & Arunachalam (2015) [10], Sinha & Tamang (2015) [14] and Moyon & Arunkumar (2018) [9] reported 19, 23 (24 in the key), 46, 39, 7 species of *Garra* and shown the distributional pattern of *Garra* species in the different drainages of north-eastern India with 49 species respectively. In addition to *Garra rangaensis* Tamang *et al.* 2019 [16]; the total number of labeonin species distributed in the drainages of north eastern India raised to 38 and 19 species are known to occur in the upper Brahmaputra basin in Arunachal Pradesh (Tamang *et al.* 2019) [16] Hora (1921) [3] firstly described two new labeonin species viz., *Garra abhoyai* and *G. naganensis* from the State Manipur and also recorded *G. nasuta*.

Eight (8) species of labeonin species belonging to *lissorhynchus* complex are reported from the north-eastern India viz., *Garra abhoyai* Hora, 1921 [3]; *G. dampensis* Lalronunga *et al.*, 2013 [7]; *G. lissorhynchus* (McClelland, 1842); *G. nambulica* Vishwanath & Joyshree, 2005 [19]; *G. nanyaensis* Shangningam & Vishwanath, 2012 [13]; *G. paralissorhynchus* Vishwanath & Devi, 2005 [18]; *G. rupecula* (McClelland, 1839) and *G. tyao* Arunachalam *et al.*, 2014 [1] respectively. During a survey of fishes in the Tunit River, a tributary of the Chindwin River basin of Manipur by the second author, specimens of a morphologically unique species of *Garra* were collected. These were found to represent an undescribed species which we describe herein as *Garra ngatangkha* sp. nov.

2. Material and Methods

All descriptions are based on fresh and formalin preserved specimen. Measurement was made

Correspondence

Wanglar Alphonsa Moyon

Department of Zoology,
South East Manipur College,
Komlathabi, Manipur, India

on left hand side of the specimens with digital callipers to the nearest 0.1mm. Measurements and counts follow Kullander & Fang (2004)^[6]. Subunits of head are presented as percentages of head length (% HL). Head length itself and measurements of body parts are given percentages of standard length (% SL). Head width, body depth at dorsal and anal-fin origins in the percentage of head depth, width of disc in the percentage of head width, length of disc in the percentage of width of disc, caudal peduncle depth and length in the percentage of caudal peduncle length and depth, distance from anus to anal-fin in the percentage of pelvic-anal distance and distance from pelvic to anal-fin origin in the percentage of pelvic to base of caudal-fin were also taken. Lateral line scales were counted from anterior most scale in contact with the shoulder girdle to the last scale on the caudal-fin. All specimens were preserved in 10% buffered formalin and deposited in the Manipur University Central Museum with Accession no. 110/NH/MUM.

3. Results

3.1 *Garra ngatangkha* sp. nov. (Fig. 1-3)

3.2 Material examined

Holotype: 110/NH/MUM: 33.5 mm SL; India, Manipur, Chandel district, Purum Chumbang village, Tumit River, Chindwin basin. 24°15'-24°30' N. 94°0'-94°15'E. 18 December 2018, Wanglar Alphonsa Moyon & party.

3.3 Paratypes

111-119/NH/MUM, 9 specimens, 30.0-33.1 mm SL; same data as holotype. Two specimens (116 and 117 /NH/MUM) 31.2 -32.5mm SL) were dissected for osteology.

3.4 Diagnosis

Garra ngatangkha sp. nov. is distinguished from the congeners of north eastern India in having a unique combination of the following characters: absence of proboscis, lateral line 33-35, predorsal scales 15-16, w-shaped black band across the middle of caudal-fin, breast and belly naked, origin of dorsal-fin nearer to tip of snout than base of caudal-fin, eye diameter 47.6-71.4%, snout length, head length 15.1-16.4% total length, 3 patches of tiny tubercles in infraorbital regions, base of the dorsal procurrent ray of caudal-fin is dull-white and caudal-fin is orange or light crimson red with blue black w-band shaped at the middle.

3.5 Description



Fig 1: Dorsal, lateral and ventral views of *Garra ngatangkha* sp. Nov. 110/NH/MUM, holotype, 35.5 mm SL, India: Manipur: Chandel District: Purum Chumbang Village: Tumit River.

Morphometric data are presented in Table 1. General appearance as in Fig. 1. Body small, short, more or less cylindrically elongated. Dorsal profile slightly rising from the tip of snout to origin of dorsal-fin then sloping gently towards caudal peduncle, body depth greatest at dorsal-fin origin. Ventral surface flattened form head to anal-fin base. Eye ovoid, not visible form ventral, located in the middle of head length, eye diameter is 1.4 -2.1 times in the length of snout. Snout rounded without transverse groove and proboscis. Head slightly wider than deep. Head height less than its length. The length of head is longer than the depth of body and contained 6.6 - 6.1 times in total length of body. Anterior barbel short not reaching the margin of rostral cap. Rostral lobe absent. Central adhesive pad oval shaped, wider than long. Interorbital region slightly convex. A horizontal row of clusters of tiny tubercles present in three patches below the eye which originated just above the maxillary barbel to the opercular opening and formed by 2 to 3, 4 to 5 and 3 to 4 respectively. Two pairs of barbels i.e. one rostral and one maxillary are present and shorter than eye diameter. Scales absent on chest and belly. Post pelvic-fin to origin of vent scaleless or naked but ill defined or margins of scales like structures are present. 14 scale less are present from the last branched dorsal-fin to the origin of dorsal procurrent caudal-fin ray.

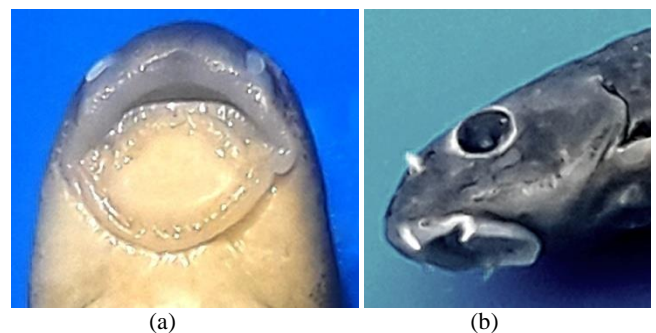


Fig 2(a): *Garra ngatangkha* sp. Nov., 110 NH/MUM, holotype 33.5 mm SL, showing oromandibular structures. **(b):** *Garra ngatangkha* sp. Nov., showing three separate patches of tubercles in the infraorbital region of head.

Dorsal-fin with ii, 5, i (or ii, 4, i or 5) branched rays, closed to the tip of snout. Posterior margin of dorsal-fin straight and highest point of the body is at the dorsal-fin origin. Pectoral-fin with i, 12, i (or i, 12.5) rays, origin close to gill opening with slightly obtuse posterior margin, not reaching the pelvic-fin origin and more or less same length with head. Pelvic-fin with i, 6 to 8 rays and originated at the vertical line of the origin of the second branched dorsal-fin rays, reaching the

vent and posterior margin is truncated. Anal-fin with ii, 5 rays, distal margin straight and not reaching caudal-fin base. Distance of anal-fin origin to caudal-fin base not equal to that of anal-fin origin to pelvic-fin origin i.e., anal-fin origin is closed to the base of caudal-fin origin. Vent closer to anal-fin origin than to pelvic-fin origin. Caudal fin with 18 rays, its

lobes are equal in length and forked type.

Lateral line complete with 33-35 perforated scales. Transverse scales rows above lateral line and origin of dorsal-fin 3.5; between lateral line and pelvic-fin origin 3.5. Circumpeduncular scale rows 14. Predorsal scales 14-15. Total number of vertebrae 29-30.

Table 1: Morphometric data of Holotype (110/NH/MUM) and eleven paratypes ((111-121/NH/MUM) of *Garra ngatangka* sp.nov. “** indicates data of holotype included in range. SD=Standard deviation, mm=millimetres

Morphometric Character	Holotype	Paratypes	Mean	SD	
		Range*			
Standard length (mm)	33.5	30.0-33.5			
In % of Standard length (SL)	Body depth (at dorsal-fin origin)	19.4	18.8-19.5	19.1	1.4
	Body depth (at anal-fin origin)	16.5	14.3-16.5	15.4	1.3
	Body width (at dorsal-fin origin)	17.7	12.1-17.7	15.0	1.3
	Body width (at anal-fin origin)	8.9	7.2 - 9.0	8.0	0.9
	Head width	17.1	17.1-17.2	17.1	1.4
	Head depth	16.4	13.0-16.4	14.7	1.3
	Head length	25.1	25.1-26.9	26.0	1.7
	Caudal peduncle length	18.8	15.1-18.8	16.9	1.3
	Caudal peduncle depth	12.9	11.5-13.0	12.2	1.2
	Dorsal-fin length	22.7	18.7-22.7	20.7	1.5
	Pectoral-fin length	20.3	19.6-21.5	20.5	1.5
	Pelvic-fin length	17.0	15.7-17.0	16.3	1.3
	Anal-fin length	17.0	16.1-17.0	16.3	1.3
	Predorsal length	57.6	55.0-57.6	56.3	2.5
	Prepelvic length	52.8	52.8-59.0	55.9	2.5
	Preanal length	77.6	77.6-81.1	79.3	3.0
	Prepectoral length	25.1	25.1-27.0	26.0	1.7
	Interorbital length	13.5	13.3-13.5	13.4	1.2
	Snout length	10.8	10.1-10.8	10.4	1.1
	In % of head length (HL)	Disc length	7.5	7.5-7.7	7.6
Disc width		8.9	8.9-9.4	9.1	1.0
Preanus length		67.8	67.8-69.5	68.6	2.8
Head width at nares		53.1	53.1-54.5	53.8	2.4
Head width at occiput		65.5	65.5-70.1	67.8	2.7
Head length at occiput		93.2	84.0-93.2	88.6	3.1
Head depth at eye		57.3	51.6-57.3	54.4	2.4
Head depth at occiput		63.1	52.9-63.1	58.0	2.5
Eye diameter		19.6	19.6-22.6	21.1	1.5
Interorbital width		51.8	51.8-54.0	53.0	2.4
In % of head depth	Snout length	41.7	41.0-41.7	41.3	2.1
	Disc length	28.9	28.9-31.2	30.0	1.8
	Pectoral-fin length	78.00	79.8-82.7	81.2	3.0
In % of width of disc	Caudal peduncle length	72.2	61.4-72.2	66.8	2.7
	Head width at occiput	103.8	103.8-132.5	118.1	3.6
	Body depth at dorsal-fin origin	118.0	118.0-144.1	131.0	3.8
In % of caudal peduncle length	Body depth at anal-fin origin	100.2	100.2-110.0	105.1	3.4
	Width of disc	52.4	52.4-54.6	53.5	2.4
In % of caudal peduncle depth	Length of disc	84.0	81.4-84.0	82.7	3.0
	Caudal peduncle depth	68.6	68.6-76.2	72.4	2.8
In % pelvic-anal distance	Caudal peduncle length	145.8	131.2-145.8	138.5	3.9
In % pelvic-base of caudal	Distance from anus to anal-fin	39.3	39.3-46.6	45.9	2.2
	Distance from pelvic to anal-fin origin	53.1	53.1-53.8	53.4	2.4

3.6 Colouration

In fresh, body is greyish or pale light yellowish. Base of the dorsal procurrent ray of caudal-fin is dull white. Ventral surface is dull white to light yellowish upto the origin of anal-fin. A black spot at the upper angle of gill opening is present. 1-2 wide black vertical bands at the base of caudal-fin. 1 black band or streak at the middle of branched dorsal-fin ray. Caudal-fin is orange or light crimson red with blue black W-band shaped at the middle. W-shaped band of caudal-fin is not distinct in some fresh specimens but distinct after preservation in formaldehyde solution (Fig. 3).

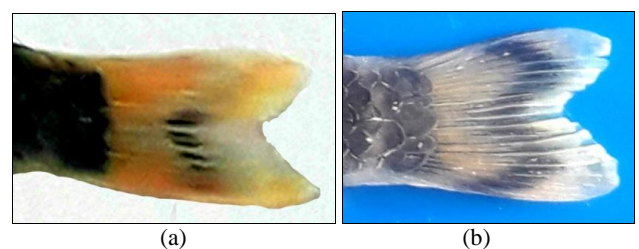


Fig 3: *Garra ngatangka* sp. nov., showing W-shaped band at the caudal-fin (a) before preservation and (b) after preservation

3.7 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.



Fig 4: Type locality of *Garra ngatangkha* sp. nov., Tumit River, Purum Chumbang village, Chandel district, Manipur, India

3.8 Distribution

Garra ngatangkha 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.

3.9 Local name

Ngatangkha

3.10 Etymology

Named after the local name of the fish (Moyon dialect), 'ngatangkha', noun in apposition.

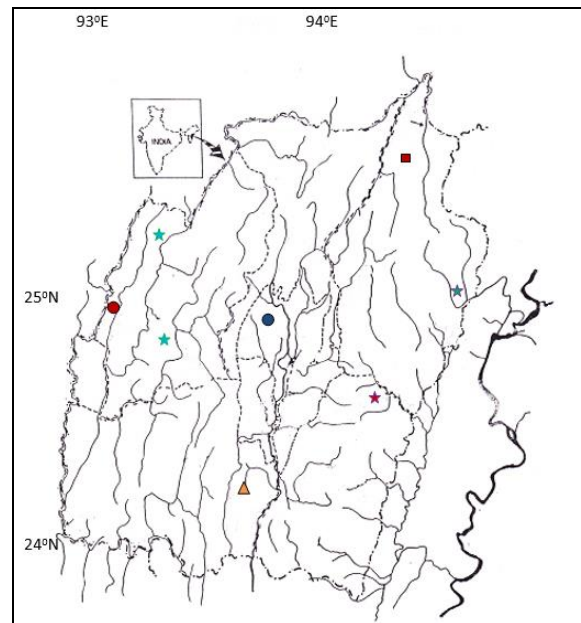


Fig 5: Map showing the type locality of *Garra ngatangkha* sp. nov. indicated by symbol and distribution of its congeners in Manipur = *G. abhoyai*, = *G. lissorhynchus*, = *G. namyaensis*, = *G. nambulica*, = *G. paralissorhynchus*, = *G. rupecula*

Table 2: Distribution pattern of *lissorhynchus* complex of Genus *Garra* in the north-eastern India.

S. No.	Scientific Name	State	River Basin
1.	<i>G. abhoyai</i> Hora, 1921 ^[3]	Manipur	Chindwin basin
2.	<i>G. dampensis</i> Lalronunga <i>et al.</i> , 2013 ^[7]	Mizoram	Karnaphuli basin
3.	<i>G. lissorhynchus</i> (Mc Clelland, 1842)	Assam	Brahmaputra basin
4.	<i>G. nambulica</i> Vishwanath & Joyshree, 2005 ^[19]	Manipur	Chindwin basin
5.	<i>G. namyaensis</i> Shangningam & Vishwanath, 2012 ^[13]	Manipur	Chindwin basin
6.	<i>G. paralissorhynchus</i> Vishwanath & Devi, 2005 ^[18]	Manipur	Chindwin basin
7.	<i>G. rupecula</i> (Mc Clelland, 1839)	Arunachal Pradesh	Brahmaputra basin
8.	<i>G. tyao</i> Arunachalam <i>et al.</i> , 2014 ^[1]	Mizoram	Kaladan basin
9.	<i>G. ngatangkha</i> sp. nov.	Manipur	Chindwin basin

4. Discussion

Garra ngatangkha sp. nov. can be easily distinguished for, *G. abhoyai* in having less branched dorsal-fin rays (4, i or 5 Vs. 6-7), less branched pectoral-fin rays (12 vs. 13), less branched ventral-fin rays (7,i vs.6-8), length of head longer than the depth of body in front of the base of dorsal vs. almost equal and is contained 6.1-6.6 vs. 4.3-4.6 times in the length of the fish. The commencement of dorsal-fin close to the tip of snout vs. almost in the middle distance between the tip of snout and the base of caudal-fin. Caudal-fin is forked vs. deeply emarginated. It is smaller size than *G. abhoyai* viz., 33.1 -35.0 mm vs. 61-65 and has orange or light crimson red colour on caudal-fin rays. A black spot at upper extremity gill opening (present vs. absent). Hora (1921)^[3] did not mention this colouration for *Garra abhoyai*. Caudal peduncle longer than its depth vs. almost as deep as long, deeper body at dorsal-fin origin (18.8-19.5%SL vs. 17.6-18.7), longer head (25.1-26.9% SL vs. 22.0-23.5), wider head (17.1-17.2%SL vs. 13.8-15.9), longer anal-fin (16.1-17.0% SL vs. 06.3-08.1), longer

dorsal-fin (18.7-22.7%SL vs. 17.0-18.8), narrower head at occiput (65.5-70.1%HL vs. 78.0-83.0), longer predorsal (55.0-57.6%SL vs. 51.5-55.1), larger eye (19.6-22.6% HL vs. 17.3-20.4), shorter snout (41.0-41.7%HL vs. 44.0-48.0) and (10.1-10.8%SL vs. 10.8-11.3), shorter disc (28.9-31.2%HL vs. 33.0-38.1), narrow disc (8.9-9.4%SL vs. 12.5-13.2), longer disc (81.4-84.0% its width vs. 70.5-76.2), lesser predorsal scale (14-15vs. 18-29) and less number of lateral transverse scales (3.5/3.5 vs. 4½-5½/ 4½-5½) respectively.

Garra ngatangkha sp. nov. can be distinguished from *G. dampensis* in having more lateral line scales (33-35 Vs. 27-29), more predorsal scales (14-15 vs. 10-11), absence vs. presence of scales on breast and belly, less branched dorsal-fin rays (4,i or 5 vs. 6), more branched rays of anal-fin (5 vs. 4), caudal-fin forked vs. deeply emarginated, less circumpeduncular scale rows (14 vs. 16), lesser body depth (18.8 -19.4% SL vs. 20.1-22%), lesser head width (17.1-17.2%SL vs. 20.0 21.4), lesser body width at dorsal-fin origin (12.1-17.7%SL vs. 16.5-18.1) and at anal-fin origin (7.2-8.9%

vs. 8.8-10.5), slender caudal peduncle (11.5-12.9%SL vs.12.7-14.2), shorter dorsal-fin (18.7-22.7%SL vs. 22.8-26.5), shorter pectoral-fin (19.6-21.5%SL vs. 22.9-27.1), shorter pelvic-fin (15.7-17.0%SL vs. 20.6-23.2), shorter anal-fin (16.1-17.0%SL vs.18.5-21.0), longer pre-anal (77.6-81.1%SL vs. 75.1-79.0) shorter preanus (67.8-69.5%SL vs. 70.6-74.4), longer predorsal (55.0-57.6%SL vs. 51.5-54.7), shorter snout (41.0-41.7%HL vs. 48.7-54.4), wider interorbital (51.8-54%HL vs. 45.9-50.3), shorter disc 28.9-31.2%HL vs. 34.2-37.2), longer distance between anus to anal-fin 39.3-46.6% pelvic to anal distance vs. 15.9-19.6 and more vertebrae 29-30 vs. 26-27 respectively.

Garra ngatangkha sp. nov. can be further distinguished from *G. lissorhynchus* in having less branched dorsal-fin rays (4,i or 5 vs. 6-6½), less lateral line transverse scales (3.5/3.5 vs. 3-4/1/2-3), less circumpeduncular scales (14 vs. 16), greater head height (84.0-93.2%HL vs. 51.8-73.1), snout length (41.0-41.7%HL vs. 34.2-35.1 and 48.0- 58.4, smaller disc width (52.4-54.6% head width vs. 78.8-86.0 and 52.0 -80.0), more predorsal scales (14-15 vs. 11-14), wider interorbital (13.3-13.5%SL vs. 11.5-12.7), smaller disc width (8.9-9.4%SL vs. 13.4-14.0), shorter disc length (7.5-7.7%SL vs. 10.0-10.7), longer anus to anal distance (39.3-46.6% pelvic to anal distance vs. 37.3-40.2), absence vs. presence of scales behind pelvic-fin origin, absence vs. presence of an indistinct black blotch near the base of caudal and a black spot behind the upper angle of the gill openings respectively.

The new species can be distinguished from *G. nambulica* in having less branched dorsal-fin rays (4,i or 5 vs. 6), more branched pelvic-fin rays (8 vs. 6), less transverse scale 3.5/3.5 vs. 4/1/3 or 4½/4½, less predorsal scales (14-15 vs. 16-29), more branched anal-fin rays (5 vs. 4), longer head (25.1-26.9% SL vs. 20.5-24.8), narrower body width at anal fin origin (7.2-8.9%SL vs. 10.5-12.2), more head height at occiput (84.0-93.2%HL vs. 55.7-75.8), longer snout (41.0-41.7%HL vs. 28.6-32.9), shorter disc (28.9-31.2%HL vs. 57.2-64.5), more disc width (103.8 -132.5% head width vs. 74.6-83.3), shorter disc (81.4-84.0% disc width vs. 89.2-105.5), less circumpeduncular scales (14 vs.16), absence vs. presence of tubercles on snout and interorbital space, absence vs. presence of post pelvic scales and fins are not orange in colourations except caudal-fin vs. fins are orange respectively.

Garra nagtangkha sp. nov. differ from *G. namyaensis* in having less branched dorsal-fin rays (4,i or 5 vs. 6.5), more predorsal scale (14-15 vs. 13), less number of vertebrae (29-30 vs. 32), more lateral line scales (33-35 vs.31), absence of scaled on chest and abdomen vs. presence, rostral lobe absent vs. present, snout without tubercles vs. with tubercles, caudal-fin forked vs. emarginated, longer head (25.1-26.9%SL vs. 20.0-25.0), shorter pectoral-fin (19.6-21.5%SL vs. 23.0-25.0), shorter pelvic-fin (15.7-17.0%SL vs.18.3-20.0), shorter anal-fin (16.1-17.0%SL vs.17.4-21.0), longer caudal peduncle (18.7-18.8%SL vs. 13.0-15.2), longer predorsal (55.0-57.6%SL vs. 50.0-53.0), longer prepectoral (25.1-26.9%SL vs.19.3-21.4), shorter snout (41.0-41.7%HL vs. 46.0-61.0), shorter disc (28.9-31.2%HL vs. 34.0-44.0), longer anus to anal-fin distance 39.3-46.6% of pelvic to anal distance vs. 28.0-33.3, longer caudal peduncle (131.2-145.8% its depth vs. 93.0-115.2) and absence vs. presnece of the prominent triangular-shaped rostral lobe with 10-11 strong conical tubercles respectively.

Garra ngatangkha sp. nov. differs from *G. paralissorhynchus* in having less branched dorsal-fin rays (4,i or 5- vs. 6), more branched anal-fin rays (5 vs. 4), more predorsal scales (14-15

vs. 11-12), more lateral line scales (34-35 vs. 30-31), slender body depth (18.8-19.4%SL vs. 19.3-25.0), slender caudal peduncle width (68.6-76.2% of its length vs. 103.1-131.4), absence vs. presence of few tubercles on snout, caudal-fin forked vs. slightly emarginated, longer predorsal (55.0-57.6%SL vs. 43.9-55.3), narrower head (65.5-70.1%HL vs. 75.8-87.7), greater height of head (84.0-93.2%HL vs. 64.8-71.9), shorter snout (41.0-41.7%HL vs. 46.8-57.7), shorter pectoral-fin (78.0-82.7%HL vs. 88.2-101.7), shorter disc (28.9-31.2%HL vs. 33.3-41.9) longer caudal peduncle (61.4-72.2%HL vs. 46.9-62.6), narrower disc (52.4-54.6% of head width vs. 54.2-59.8), longer disc (81.4-84.0% of disc width vs. 67.1-77.1), slender caudal peduncle (68.6-76.2% of its length vs. 103.1-131.4), longer space of anus to anal-fin origin (39.3-46.6% of pelvic to anal distance vs. 25.0-30.8), shorter space of pelvic to anal-fin origin (53.1-53.8% of space between pelvic-fin to base of caudal-fin vs. 56.5-60.4) and scales on sides of body no orange vs. orange colour respectively.

G. ngatangkha sp. nov. differs from *G. rupecula* in having less number of branched dorsal-fin rays (4,i or 5 vs. 6-7), presence of 14-15 vs. absence of predorsal scales, longer height of head (84.0-93.2%HL vs. 50.0-69.9), narrower disc width (52.4-54.6% of head width vs. 55.5-80.0), shorter disc length (81.4-84.0% of disc width vs. 95.6-100), less circumpeduncular scales (14 vs.16), absence vs. presence of row of open pores on interorbital and on internarial regions i.e., row of open pores on dorsum of head, longer snout (41.0-41.7%HL vs. 26.0-29.8) and absence vs. presence of an indistinct blotch near the base of caudal-fin and a black spot behind the upper angle of the gill openings respectively.

G. ngatangkha sp. nov. differs from *G. tyao* in having slender body depth (18.8-19.4%SL vs. 21.2-29.6), less branched dorsal-fin rays (4,i or 5 vs. 7), less branched pectoral-fin rays (10-11 vs. 14-15), more branched anal-fin rays (5 vs. 3-4), more predorsal scales (14-15 vs. 8-10), more lateral line scales (34-35 vs. 31), absence vs. presence of minute tubercles on snout, caudal-fin forked vs. emarginated, w-shaped band on the middle of caudal-fin vs. posterior end of caudal-fin, less number of circumpeduncular scales (14 vs. 15-16) and absence vs. presence of scales on chest and belly respectively.

5. Key to *Garra* species belonging to *lissorhynchus* complex from north-eastern India.

1. Predorsal scales absent *G. rupecula*
Predorsal scales present2.
2. Origin of dorsal-fin equidistant from tip of snout and base of caudal-fin.....3.
Origin of dorsal-fin nearer to base of caudal-fin than tip of snout.....6.
Origin of dorsal-fin nearer to tip of snout than base of caudal-fin.....7.
3. Chest and belly scaled*G. namyaensis*
Chest and belly naked4.
4. Lateral line scales 30-31*G. paralissorhynchus*
Lateral line scales 32-36.....5.
5. Predorsal scales 18-29*G. abhoyai*
Predorsal scales 11-14*G. lissorhynchus*
6. Lateral line scales 34-35, Predorsal scales 16-29.....*G. nambulica*
7. Breast and belly scaled8.
Breast and belly naked9.
8. Lateral line scales 27-29, predorsal scales 10-11, W-

- shaped black band along across the middle of caudal-fin.....*G. dampensis*
Lateral line scales 31, predorsal scales 8-10, W-shaped dark band along posterior margin of caudal-fin.....*G. tyao*
9. Lateral line scales 33-35, predorsal scales 15-16, W-shaped black band across the middle of caudal-fin.....*G. ngatangkha* sp.nov.

6. Comparative material

Garra abhoyai: MUMF 6296-6305, 10 exs; 49.3-54-90 mm SL, Iril river at Phungdhar, Manipur (Chindwin River basin). Data from Hora (1921) [3], Vishwanath & Linthoingambi (2008) [20], Nebeshwar *et al.* (2012) [11] and Deng *et al.* (2018) [2].

Garra dampensis: PUCMF 12001, Holotype, 45.6mm SL., India: Mizoram: Seling River, a tributary of Khawthlang Tuipul (Karnaphuli River basin). Data from Lalronunga *et al.* (2013) [7].

Garra lissorhynchus: Data from Hora (1921) [3], Menon (1964) [8], Vishwanath & Devi (2005) [18], Vishwanath & Joyshree (2005) [19], Nebeshwar *et al.* (2012) [11] and Deng *et al.* (2018) [2].

Garra nambulica: MUMF 8003, Holotype, 85.5mm SL., India: Manipur: Ireng Lok (Stream of Nambol River), Singda village (Chindwin River basin); Data from Vishwanath & Joyshree (2005) [19] and Nebeshwar *et al.* (2012) [11].

Garra namyaensis: MUMF 12042, 72.5mm SL., holotype, India: Manipur: Namya River, close to Indo-Myanmar border. Shangningam *et al.*; 18. iv. 2011. (Chindwin River basin). Data from Shangningam & Vishwanath (2012) [13].

Garra paralissorhynchus: MUMF 5054, 67.3mm SL., holotype, India: Manipur Khuga River, Churachandpur district, K. Shanta Devi; 25. VII. 2000. (Chindwin River basin). Data from Vishwanath & Devi (2005) [18].

Garra rupecula: Data from Hora (1921) [3], Menon (1964) [8], Vishwanath & Devi (2005) [18], Vishwanath & Joyshree (2005) [19], Nebeshwar *et al.* (2012) [11] and Lalronunga *et al.* (2013) [7].

Garra tyao: Data from Arunachalam *et al.* (2014) [1].

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