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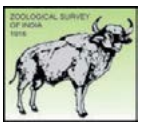

Garra lungongza, a new species of cyprinid fish (Teleostei: Cyprinidae) from Nagaland, India

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Abstract

Garra lungongza sp. nov., is described from the Dei-thung Shumang River, Nagaland. It belongs to the member of "smooth snout" group. It differs from its congeners in having the following characteristics: head strongly depressed; snout tip with 23-34 rounded hollow pits; Gular disc elliptical; torus crescentic; labellum covered by lateral distal margin of rostral cap; pre-dorsal scales irregularly arranged with 12-14 scale rows; lateral line with 37+ 2(1)-3(5) scales.

Keywords: Brahmaputra drainage, Tuensang district, Nagaland, new species.

Introduction

Members of the genus *Garra* Hamilton,1822 are bottom-dwelling rheophilic cyprinids which are distributed in Africa and Southwest, South, Southeast, and East Asia (Zhang and Chen, 2002). The genus is highly diversified, accounting for 261 valid species (Fricke *et al.*, 2023), of which 79 species were distributed in different river basins and regions of South and South East Asia (Nebeshwar and Vishwanath,2017).

Nagaland is drained by three drainage systems: Brahmaputra, Barak, and Chindwin drainages. Ezung *et al.* (2020a) in their checklist recorded 11 *Garra* species from Nagaland viz. *G. annandalei* Hora, 1921, *G. gotyla* (Gray 1832), *G. gravelyi* Annandale 1919, *G. kempi* Hora 1921, *G. lamta* (Hamilton, 1822), *G. lissorhynchus* (McClelland, 1842), *G. mcClellandi* (Jerdon, 1849), *G. naganensis* Hora,1921, *G. nasuta* (McClelland, 1838), *G. notata* (Blyth, 1860), *G. rupecula* (M'Clelland, 1839). Later two species of *Garra* were described from Brahmaputra drainage of the state i.e. *G. chathensis* Ezung *et al.*, 2020b and *G. langlungensis* Ezung *et al.*, 2021. Ezung *et al.* (2022) reported *G. birostris* Nebeshwar &Vishwanath 2013 from Dikhu River Nagaland. Thus, the present account of *Garra* species in Nagaland is 14. The ichthyofaunal diversity of these drainages and their tributaries in Nagaland are yet to be properly explored.

A collection of fishes in the Dei-thung Shumang River near Sangsangyu village, Tuensang district, Nagaland, India, included undescribed species of *Garra* belonging to the proboscis species group, which is described herein as *Garra lungongza* sp. nov.

Material and Methods

Specimens were collected using drag nets and assigned with a specific ID. It is stored in 10% formalin for morphological studies. All measurements were made using a digital calliper, point to point on the left side of the specimen closet to 0.1 mm. Meristic counts, scale counts, and measurements follow Nebeshwar and Vishwanath (2013) and Kottelat (2001). Fin rays and the number of scales were counted using a Stereoscopic zoom microscope. Predorsal scales are counted at the immediate regularly arranged scale row alongside the irregularly arranged scales. Head length and other measurements are given in percent standard length. Sub-units of the head are given in percent head length. Terminology for lips and associated structures follows Kottelat (2020). The holotype (ZSI F9798, Calcutta) and the paratypes (DMUMF-CN011-DMUMF-CN015) are deposited in Freshwater Fish Section, Zoological Survey of India, Kolkata and Museum of Fishes, Dhanamanjuri University respectively.

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Taxonomy

***Garra lungongza* sp. nov.** (Figures 3, 4)
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Holotype: *Garra lungongza*: male: 108.0 mm SL; Dei-thung Shumang River, Sangsangyu village, Tuensang district, Nagaland, India. coll. Idohangbe, 13th April, 2022 (ZSI F9798, Calcutta).

Paratype: 5 specimens; 64.1mm-125.0mm SL, (DMUMF-CN011-DMUMF-CN015); same data as holotype.

Diagnosis: Among the five groups of *Garra* species categorized by Nebeshwar and Vishwanath, 2017, *G. lungongza* sp. nov., belongs to a member of the "smooth snout" group. It differs from its members of smooth snout group in having more lateral line scales 39-40 i.e., 37 + 2(1)-3(5), except *G. chakpiensis* and *G. compressus*. It further differs from *G. chakpiensis* in the absence (vs. presence) of one faint midlateral stripe on the body, anus closer to pelvic fin origin (vs. closer to anal fin origin); and from *G. compressus* in having rounded (vs. pentagonal) gular disc, snout broadly rounded (vs. slightly conical). It is distinguished from *G. abhoyai, G. naganensis, G. nambulica* and *G. rupecula* in absence (vs. presence) of W- shaped band on caudal fin; from *G. annandalei* in having irregular pre dorsal scales (vs. regular); from *G. chaudhurii* and *G. chivaensis* in having scales well-developed (vs. poorly developed) on abdomen; from *G. ukhrulensis* in having fewer scales between lateral line and anal fin origin (3 or 3½ vs. 4½ or 5).

Description: General body shape as in Figure 3. Morphometric data and meristic counts are presented in Table 1 and Table 2 respectively. Body elongated; gently compressed anteriorly, strongly compressed at caudal peduncle region, dorsal profile straight along the length of the body, depressed at supra-occipital, then gently slopes towards snout tip. Ventral profile from snout till pelvic fin origin flat, between pelvic fin origin and anal fin origin slightly rounded, beyond anal fin origin till caudal fin base straight. Body depth at dorsal-fin origin less than head length.

Head short, its length 19.6-20.9% SL; strongly depressed, its depth 10.5-12.8% SL; broadest at pre-opercular region, its width 16.2-17.8% SL. Eye small and dorsolaterally placed, its diameter 14.4-19.6% HL; inter orbital space almost flat and wide i.e., 49.9-50.5% HL. Snout broadly rounded, smooth without transverse lobe, transverse groove, and proboscis. Round hollow pits on snout tip and each lateral surfaces in holotype with 23 and 10, and in paratype with 23-34 i.e., 23 (1), 24(3), 34(1) and 8-12 i.e., 8(1), 9(3), 10(1) respectively. Rostral flaps and rostral lobes are absent. Sublachrymal groove deep continuous with rostral groove.

Barbels two pair: rostral barbel present anterolaterally, lesser or equal to eye diameter, longer than maxillary barbel. Rostral cap well-developed, less fimbriate, completely cover the upper jaw. Gular disc slightly elliptical, wider than its length (62.1-66.5% HL vs 50.0- 52.2% HL), posteriorly positioned. Torus well-developed, crescentic, lateral distal margin reaching at the level of posterior margin of labellum, moderately papillated, not covered by rostral cap, toral groove deep. Labellum with moderate papillation, covered by rostral cap. Pulvinus wider than long (43.6-47.1 vs 34.5-38.2% HL); anterior part thicker than posterior without any papillation. Labrum with minute papillation, posterior part extending beyond level of eye, not reaching level of pectoral fin origin and lower inclination of gill opening.

Dorsal fin with two simple and 7½ branched fin rays; inserted closer to snout tip than caudal fin base (pre-dorsal length 46.8-50.6% SL), distal margin straight. Pectoral fin with one simple and 13 branched fin rays, slightly longer than head length (19.1-23.3% SL vs 19.6-20.9% SL), when adpressed longest fin ray reaching midway between pectoral fin origin and pelvic fin origin, distal margin slightly rounded. Pelvic fin with one simple and 8 branched fin rays, inserted slightly posterior to dorsal fin insertion, when adpressed its length shorter than pelvic fin length (16.5-18.9% SL vs 19.1-23.3% SL) and surpassing anus, distal margin subacuminate. Anal fin with two simple and 5½ branched fin rays, longest fin ray reaching mid-way of caudal peduncle, its margin straight. Caudal fin with 10+9 fin rays, distal margin emarginate, lobe tips slightly pointed. Anus closer to pelvic fin origin than anal fin origin, i.e., Distance between pelvic fin origin to anus 46.4-49.9% pelvic fin origin to anal fin origin.

Lateral line scales complete with 39-40 i.e., 37 + 2(1) - 3(5) scales. Scales in transverse row above lateral line 3½; between lateral line and pelvic fin origin 2; between lateral and anal fin origin 3 (3) or 3½ (3). Circumpeduncular scales 16. Pre-dorsal scales irregularly arranged with 12 (1), 13 (3) or 14 (2) scales. Pre-anal scales 6 (2) or 7 (4). Chest and belly scaled, those on chest smaller than in belly, visible to naked eye. Dorsal fin base scale 5 (5)- 6(1), all connected to its base. Anal fin base scale 4(6), all connected to its base. An axillary scale at the base of pelvic fin reaching its base.

Colour in preservation: Dorsum, head dark brown; ventral

surface of head, chest, and abdomen yellowish. A small black spot present at the upper angle of gill opening. Distal rim of dorsal fin with short dark grey bands along the fin rays. First four branched fin rays of anal fin with dark grey bands. Caudal fin with dark grey stripes in the middle, occupying 9th – 14th fin rays and distal rims of lower lobe.

Etymology: The species is named after its local name Lungongza: *Garra lungongza.*

Habitat type: The river is a clear "pool-riffle" type as shown in Figure 2(b). The flow of water fluctuates in speed so that below dammed pools, the speed increases, and decreases. River substrate is composed of gravel, cobbles, boulders, sand, and clay particles. The species in the study are collected from the dammed pool areas. The riverbank is mostly covered by bushes and shrubs and trees.

Distribution: *Garra lungongza* is presently only known from its type locality, Dei-thung Shumang River (26°20'32.1"N 94°53'37.6"E), Sangsangyu village, Tuensang district, Nagaland, India [Figure 1 and 2(b)].

Results and Discussion

The Labeoninae group of the genus *Garra* is a highly diversified cyprinid with various morphological modifications on the snout region, varying shapes, and distribution patterns of tubercles which aid in species distinction (Nebeshwar and Vishwanath, 2013). Nebeshwar and Vishwanath (2017) categorized this genus into five groups on the basis of snout morphology, viz., a) smooth snout, b) a transverse lobe, c) a proboscis with transverse lobe, d) a pair of rostral flaps with or without a transverse lobe, and e) with a pair of rostral lobes. *G. lungongza* belongs to the member of smooth snout group. Among the eleven *Garra* species with smooth snout group, three are from the Brahmaputra drainage, viz. *G. annandalei*, *G. chaudhurii* (Hora, 1921) and *G. rupecula* (McClelland,1839); one from the Barak-Meghna drainage, viz., *G. naganensis*; and seven from the Chindwin drainage, viz., *G. abhoyai* (Hora, 1921), *G. chakpiensis* (Nebeshwar and Viswanath, 2015), *G. chivaensis* (Moyon and Arunkumar, 2020), *G. compressus* (Kosygin and Vishwanath, 1998), *G. nambulica* (Vishwanath and Joyshree, 2005), *G. ukhrulensis* (Nebeshwar and Viswanath, 2015) and *G. ngatangkha* Arunkumar & Moyon 2019. Menon (1964) grouped the species of these genus with broad W-shaped band on caudal fin in the "*G. lissorhynchus*" complex. Hence, *G. abhoyai, G. dampaensis* (Lalronunga *et al.,* 2013), *G. lissorhynchus*, *G. matensis* (Nebeshwar and Vishwanath, 2017), *G. ngatangkha* Arunkumar and Moyon, 2019, *G. nambulica*, *G. namyaensis* (Shangningam and Vishwanath, 2012), *G. paralissorhynchus* (Vishwanath and Shanta Devi, 2005), *G. rupecula*, *G. tyao* (Arunachalam *et al.,* 2014) belong to this complex. This distinctive character is absent in *Garra lungongza*.

Garra lungongza differs from *G. abhoyai* in having more lateral line scales (37+2-3 vs. 30-33 + 1-3), predorsal scales well-developed (vs. much reduced), present (vs. absent) of scales on chest and abdomen, lesser scale rows between dorsal fin base and lateral line (3½ vs. 4½), and that between lateral line and pelvic fin base (2 vs. 4½); *G. annandalei* in having more lateral line scales (39-40 vs. 34-35), more pre-dorsal scales irregularly arranged (12-13 vs. 9-10 regularly arranged), anus closer to pelvic fin (vs. closer to anal fin), caudal fin emarginate (vs deeply forked); from *G. chakpiensis* in having a deep distinct sublachrymal groove (vs. two shallow grooves), rostral barbel shorter or equal to (vs. shorter) eye diameter, toral groove deep (vs. shallow), lesser branched dorsal fin rays (7½ vs. 8½ or 9½ fin rays) and its distal margin straight (vs. slightly concave), anus closer to pelvic fin origin (vs. closer to anal fin origin); from *G. chaudhurii* in having head broadly rounded (vs. conical), dorsal fin height greater than body depth at its origin (vs. equal to body depth), scales well-developed (vs. poorly developed) on abdomen, more lateral line scales (39-40 vs. 32-33); from *G. chivaensis* in having more lateral line scales (39-40 vs. 34-36), lesser pre dorsal scales (13 vs. 16), well-developed scales on chest and belly present (vs. absent on chest and poorly developed on belly), dorsal fin insertion closer to snout tip (vs. closer to caudal fin base), anus closer to pelvic fin (vs. closer to anal fin), presence (vs. absence) of dark grey stripes on 9th –14th fin rays and distal rims of ventral lobe of caudal fin, short dark grey bands along distal rim of dorsal fin rays present (vs. absent); from *G. compressus* in having snout broadly rounded (vs. slightly conical), gular disc rounded (vs. pentagonal), more pectoral branched fin rays (13 vs. 11), and caudal fin emarginate (vs. deeply forked); from *G. naganensis* in having well-developed scales on chest and belly (vs. greatly reduced), and fewer caudal peduncle scales (16 vs. 19); from *G. nambulica* in having more lateral line (39-40 vs. 34-35), lesser pre dorsal scales (12-14 vs. 19-26), lesser scale rows between dorsal fin base and lateral line (3½ vs. 4), and that between lateral line and pelvic fin base (2 vs. 3); from *G. ngatankha* in having more lateral line scales (39-40 vs. 33-35) and more caudal peduncle scales (16 vs. 14) and from *G. rupecula* in having more lateral line scales (39-40 vs.

35 scales), lesser rows of scales between dorsal and pelvic fins (6½ vs. 9), more pectoral fin rays including simple ray (14 vs. 10), more dorsal branched fin ray including simple rays (9½ vs. 8), more pelvic fin rays including simple rays (7½ vs. 6); from *G. ukhrulensis* in having one sublachrymal groove deep (vs. two shallow), longer gular disc (50.0- 52.2% HL vs. 24-27% HL), toral groove deep (vs. shallow), posterior part of labrum extending beyond vertical to eye (vs. extending vertically to anterior margin of eye), anus closer to pelvic fin origin (vs. closer to anal fin origin), caudal fin emarginate (vs. forked), well-developed scales on chest and belly present (vs. absent), and fewer transverse scale rows above lateral line (3½ vs. 4 or 5), fewer scales between lateral line and anal fin origin (3 or 3½ vs. 4½ or 5).

From the above mentioned drainages and Koladyne drainage, twelve of the *Garra* species have smooth snout but possess either a pair of rostral flaps or rostral lobes. Among the "*G. lissorhynchus*" complex, *Garra lungongza* further differs from *G. lissorhynchus, G. namyaensis, G. matensis* and *G. paralissorhynchus* in absence (vs. presence) of rostral flaps; in having more lateral line scales (39-40 vs. 32-35 vs. 31 vs. 30-31 vs. 30-31). It differs from *G. matensis* in having anus closer to pelvic fin (vs. closer to anal fin); further differs from the former in having lesser scale rows between lateral line and anal fin base (3-3½ vs. 4-4½). In the original description of *G. ngatangkha* Arunkumar & Moyon 2019, in the abstract presence of rostral lobe is mentioned however in description (page 286) and discussion (page 289) it is mentioned rostral lobe absent and compared with *G. namyaensis*. Image is also not clear. However it should be noted here that rostral lobe and rostral fold are two distinct structures (See Nebeshwar and Viswanath 2017). The rostral lobe of *G. namyaensis* mentioned in Arunkumar & Moyon 2019 should be rostral fold. On examination of the specimen deposited in museum the species is found to not have rostral lobe. Also during our study of *Garra* from Manipur, we have noticed rostral lobe only in *G. manipurensis*. It also differs from *G. dampaensis* and *G. tyao* in absence (vs. presence) of rostral lobes; more lateral line scales (39-40 vs. 27-29 vs. 31); more pre dorsal scales (12-14 vs. 10-11 vs. 9-10); anus closer to pelvic fin (vs. closer to anal fin).

Garra lungongza further differs from *G. khawbungi* (Arunachalam *et al.*, 2014) in having Absent (vs. present) of rostral lobe, more lateral line scales (39-40 vs. 36-37), more pre anal scales (6-7 vs. 2-3), more predorsal scales (12-14 vs. 9-10), anus closer to pelvic fin (vs. closer to anal fin); from *G. manipurensis* (Vishwanath and Sarojnalini, 1986) in having more lateral line (39-40 vs. 34), more pre dorsal scales (12-14 vs. 10-11), present (vs. absent) of scales on chest; from *G. mini* (Rahman *et al.,* 2016) in having absence (vs. presence) of transverse groove, absence (vs. presence) of lateral lobe, scales present (vs. absent) on abdomen, more lateral line scales (39-40 vs. 31-33), and absence (vs. presence) of contrasting dark bands from head to caudal fin base. Arunachalam, 2013 described four species from Arunachal Pradesh, among which *G. alticaptus, G. minimus* and *G. nigricauda* are similar to *Garra lungongza* in having smooth snout, but differs in having rostral lobe, however, Nebeshwar and Vishwanath (2017) commented that original descriptions of these species are ambiguous and are closely similar to *G. birostris*, *G. quadratirostris* and *G. kimini*, and *G. arunachalensis* and respectively.

Garra lungongza differs from *G. arupi* (Nebeshwar *et al.,* 2009), *G. kempi* and *G.lamta* in having transverse lobe absent (vs. present). It differs from *G. arupi* and *G.lamta* in more lateral line scales (39-40 vs. 35-36 vs. 30-31); it further differs from the former in having more pre-dorsal scaels (12-14 vs. 11-12), while the latter differs in having absent (vs. present) of a faint spot at caudal fin base and gular disc posteriorly positioned (vs. medially positioned). It further differs from *G. kempi* in having more caudal peduncle scales (16 vs. 12), anus closer to pelvic fin origin (vs. midway between pelvic fin and anal fin origin). It differs from *G. jenkinsonianum* (Hora,1921) in having absent (vs. present) of transverse groove, more lateral line scales (33-34), more predorsal scales (12-14 vs. 10-11), anus closer to pelvic fin (vs. closer to anal fin). It differs from *G. gravelyi, G. langlungensis,* and *G. nasuta* in having absence of proboscis (vs. presence of incipient proboscis), more lateral line scales (39-40 vs. 32-34 vs. 34 vs. 34); from *G. gravelyi* in having well-developed scales on chest (vs. almost naked); from *G. langlungensis* in having gular disc posteriorly positioned (vs. medially positioned), more pre dorsal scales (13 vs. 8-9), more Circumpeduncular scales (16 vs. 13-15), anus closer to pelvic fin origin (vs. closer to anal fin origin). It also differs from *G. birostris, G. chathensis*, and *G. gotyla* in having absence of proboscis (vs. presence of bilobed proboscis in *G. birostris* and *G. chathensis*, and quadrate proboscis with or without a depression appearing to be bilobed in *G. gotyla*), anus closer to pelvic fin origin (vs. anal fin origin), more pre dorsal scales (13 vs. 10-11 vs. 9-10 vs. 10-12), more lateral line scales (39-40 vs. 33-34 vs. 32-33 vs. 33-34), more pre anal scales (6-7 vs. 3-4 vs. 3 vs. 3-4), from *G. mcclellandi* and *G. notata* in having more lateral line scales (39-40 vs. 36 vs.

33-34), lesser scales between dorsal fin origin and pelvic fin origin (6½ vs. 9 vs. 8).

Garra lungongza is similar to *G. magnacavus* Shangningam *et al.*, 2019 and *G. magnidiscus* Tamang, 2013 in morphological appearance. However, it differs from the former in having more rounded hollow pits on snout (23-34 vs 15-19), absence of proboscis (vs. presence of incipient proboscis), absence of transverse groove (vs. presence of thinly demarcated transverse groove), rostral cap less fimbriate (vs. highly fimbriate), labellum well-developed and covered by rostral cap (vs. reduced and not covered), toral groove deep and narrow (vs. deep and wide), pulvinus slightly elliptical (vs. rhomboid), distal margin of dorsal fin straight (vs. concave), pectoral fin reaching midway to pelvic fin (vs. beyond), anus closer to pelvic fin origin (vs. midway between pelvic and anal fin origin), caudal fin emarginate (vs. forked), lesser lateral line scales (39-40 vs 42), predorsal scales irregularly arranged (vs. regularly arranged). It also differs from the latter in having a shallow dorsal furrow extending obliquely from just above rostral barbels to lateral extremities of rostral fold absent (vs. present), posterior margin of labrum not reaching to the level of pectoral fin origin (vs. reaching to or very close to), labellum covered by rostral cap (vs. not covered), anus closer to pelvic fin origin (vs. closer to anal fin origin), more circumpeduncular scales (16 vs. 12-14), scales on chest visible (vs deeply embedded making it invisible to naked eye), caudal fin emarginate (vs. deeply forked), absence of a faint black blotch on caudal fin base (vs. presence).

After a thorough comparison among species closely similar to or members of same group, *G. lungongza* is described as a new species, whose habitat is only known from its type locality Dei-thung Shumang River, Brahmaputra drainage, Nagaland, India.

Comparative materials

Garra abhoyai - MUMF 6296-6305, 10, 49.3- 54.90 mm SL, Iril R. at Phungdhar, Manipur, 17.i.2003, K. Nebeshwar, M. Shantakumar and I. Linthoingambi

Garra annandalei (Hora) Holotype: ZSI Calcutta, F 6082/2-1; 60.17 mm SL; Kokha nallah, Koshi river, District: Barabakshetra. India. Date of collection: 30.01.1946.

Garra chakpiensis: Holotype. MUMF 4308, 83.0mm SL; India: Manipur: Chandel district: Chakpi River at Tangpol (Chindwin River basin); B. D Sangningam, 30-31, December 2010.

Garra chathensis - ZSI FF 8037, 65.6 mm SL, India, Nagaland, Chathe River, Brahmaputra Basin (25 47'50.1918"N, 93 47'57.4213"E) collected on October, 2016.

Garra chaudhurii - ZSI F 8146-8148, 3 (holotype and 2 paratypes), 49.5-53.0 mm SL; India: West Bengal: Darjeeling district.

Garra compressus - MUMF 2316, holotype, 68.1 mm SL; MUMF 2314-2315, 2, paratypes, 78.6-83.2 mm SL; India: Manipur: Ukhrul district: Wanze stream at Khamson

Garra gotyla - ZSI Calcutta, F 198/2; 121.92 mm SL; (Kumaon Hills survey – May to June 1948). Location: Kosi River (Kosi Village – Almorah). Date of collection: 07.06.1948.

Garra gravelyi - ZSI F 11586/1, 107.5–112.4 mm SL; Myanmar, S. Shan States, Lawksawk Canal at Lwaksawk (Chindwin basin).

Garra jenkinsonianum - ZSI F 5736/1, holotype, 55.5 mm SL; India: West Bengal: Sita Nullah, Paresnath hills. Collectors-Jenkins and Annandalei.

Garra kempi (Hora) Holotype: ZSI Calcutta, F 7716/1; 87.0 mm SL; Location: Siyom River, below Damda, the Abor hills, Arunachal Pradesh, India. Date of collection: 25.07.2000. collector - Dr. S. W. Kemp.

Garra khawbungi - ZSI/SRS F8625, male. 89.84 mm SL, Tuipui River, Khawbung Village - Champhai District, Mizoram, India (N 22 38'14.8" E 94 07' 44.0"), Collectors: M. Arunachalam, M. Raja, C. Vijayakumar and S. Nandagopal. 11 May 2012.

Garra langlungensis - ZSI FF7152, 13.i.2017, 54.9mm SL, India, Nagaland, Langlung River near Zutovi Village, Dimapur District, Brahmaputra Basin; collected by Ezung *et al.*

Garra lissorhynchus (McClelland) Topotype: ZSI Calcutta, FF 8098/1; 73.05 mm SL; (Location: Museum Collection, Assam, India). Collected by: L. Kosygin.

Garra magnacavus - ZSI FF 6010, 68.0 mm SL; India: Arunachal Pradesh: Lower Subansiri District, Ranga River, Brahmaputra River Basin, 27°20' N 93°48' E, 547 m above sea level, Bikramjit Sinha, 16 March 2013.

Garra magnidiscus – ZSI/V/APFS/P-622, 83.8 mm SL; India: Arunachal Pradesh: Upper Siang district: a fast-flowing tributary to Siang River, about 3 km from Bomdo village on main road to Tuting, 28°44.04' N 94°51.97' E, 429 m asl; L. Tamang, 26 Oct 2011.

Garra naganensis (Hora) ZSI Calcutta, F 9970/1; 89.93 mm SL; (Location: Senapathi Stream, Naga Hills, Assam, India). Collected by: L. Kosygin.

Garra nambulica (Viswanath) Paratype: ZSI Calcutta, 4139; 50.41 mm SL; Location: Irengloic (Stream flowing to Nambul River) Shingala Village, Imphal West District, Manipur, India. Date of collection: 03.02.2004.

Garra ngatangkha - 110/NH/MUM: 33.5 mm SL; India, Manipur, Chandel district, Purum Chumbang village, Tumit River, Chindwin basin; Wanglar Alphonsa Moyon & party18 December 2018.

*Garra paralissorhynchus (*Viswanath & Santadevi) Paratype: ZSI Calcutta, 4158; 52.35mm SL; Location: Khuga River, Churachandrapur district, Manipur, India. Date of collection: 25.07.2000.

Garra *tyao* - ZSI/SRS F8626, 1 ex. male. 64.31mm SL, Tyao River, Tyao Village, Champhai District, Mizoram, India (N 23 27' 25.5" E 93 4' 35.6"), Collectors: M. Arunachalam, M. Raja, C. Vijayakumar and S. Nandagopal. 10 May 2012.

Garra ukhrulensis: Holotype. MUMF 4311, 119.0mm SL; India: Manipur: Ukhrul district: Challou River at Khamson (Chindwin River basin); L. Kosygin, 17 march 1998.

Tamenglong district: Iyei River at Noney.

From the published literature for the following species:

For *G. arupi*: Data from Nebeshwar *et al,* 2009: *G. mcclellandi, G. nasuta, G. notata, G. lamta:* Data from Hora 1921; *G. alticaptus, G. minimus* and *G. nigricauda:* Data from Arunachalam, 2013; *G. birostris*: Data from Nebeshwar and Viswanath,2013; *G. chivaensis:* Data from Nebeshwar and Viswanath, 2015; *G. matensis:* Data from Nebeshwar and Viswanath, 2017; *G. mini:* Data from Rahman *et al.*, 2013; *G. dampaensis*: Data from Lalronunga *et al.,* 2013. Overall systematic data of the genus Garra: Data from Viswanath, 2021

Table 1: Morphometric data of *Garra lungongza*, Holotype: ZSI F9798 and paratypes (n=5).

Morphometric data	Holotype	Range		Mean	SD
		Min	Max		
Standard length (SL) in mm	**108.0**	**64.06**	**125.0**		
In % SL					
Body depth at dorsal fin origin	15.2	15.2	19.0	17.0	1.9
Head length (HL)	19.6	19.6	20.9	20.4	0.6
Head depth at occiput	10.5	10.5	12.8	11.9	1.1
Body width at anal fin	7.4	7.4	8.6	8.0	0.5
Body width at dorsal fin	12.6	12.6	15.3	13.9	1.2
Caudal peduncle length	16.8	14.5	18.7	16.9	1.8
Caudal peduncle height	11.4	11.4	13.2	12.4	0.8
Dorsal fin base length	13.2	12.8	14.1	13.5	0.6
Dorsal fin height	18.8	17.4	20.7	19.0	1.4
Pectoral fin length	20.8	19.1	23.3	21.1	1.7
Pelvic fin length	18.9	16.5	18.9	18.2	1.1
Anal fin base length	6.5	5.8	7.1	6.5	0.5
Ana fin length	15.7	15.2	18.8	16.8	1.6
Pre dorsal length	46.8	46.8	50.6	48.2	1.7
Pre pectoral length	17.3	17.3	19.7	18.5	1.0
Pre pelvic length	49.2	47.1	51.1	48.9	1.7
Pre anal length	76.9	73.9	77.2	75.5	1.8
Pre anus length	62.6	61.5	64.9	62.7	1.6
Distance between pelvic and anus	12.4	11.5	14.0	12.8	1.1
Distance between pelvic and anal fin	26.6	24.2	28.9	26.6	1.9

Morphometric data	Holotype	Range		Mean	SD
		Min	Max		
Snout length	7.3	6.8	7.3	7.0	0.2
Eye diameter	3.3	3.0	4.1	3.5	0.5
Interorbital width	10.0	10.0	10.7	10.4	0.3
Gular disc width	13.0	13.0	13.8	13.2	0.4
Gular disc length	10.2	10.2	10.8	10.4	0.2
Pulvinus width	9.2	9.1	9.5	9.3	0.2
Pulvinus length	6.9	6.9	7.8	7.3	0.4
Head width at occiput	16.7	16.2	17.8	16.8	0.7
Head depth at nape	7.5	7.5	8.6	8.2	0.5
In % HL					
Snout length	37.5	32.5	37.5	34.2	2.3
Eye diameter	17.0	14.4	19.6	17.1	2.2
Interorbital width	51.1	49.9	52.5	50.9	1.3
Gular disc width	66.5	62.1	66.5	64.8	2.0
Gular disc length	52.2	50.0	52.2	51.2	1.0
Pulvinus width	47.1	43.6	47.1	45.5	1.5
Pulvinus length	35.1	34.5	38.2	35.7	1.7
Head depth at occiput	53.5	53.5	62.8	58.4	4.4
Head width at occiput	85.2	77.4	87.6	82.5	4.8
Head depth at nape	38.5	38.5	42.4	40.1	1.7
In % pelvic fin - anal fin distance					
Pelvic fin origin to anus distance	46.4	46.4	49.9	48.1	1.5

Table 2: Meristic counts of *Garra lungongza,* Holotype: ZSI F9798 and paratypes (n=5). .

Meristic counts	**Holotype**	**Paratype (n=5)**
Lateral line scales	37+3	37+ 2(1)-3(4)
Lateral transverse scale rows	3½/1/2	3½/1/2
Scales between lateral line and anal fin base	3½	3(3)-3½(2)
Pre-anal scales	6	6(1)-7(4)
Predorsal scales	12	13(3)-14(2)
Circumpeduncle scales	16	16
Dorsal fin base scales	5	5(4)-6(1)
Anal fin base scales	4	4
Dorsal fin ray	ii,7½	ii,7½
Pectoral fin ray	i,13	i,13
Pelvic fin ray	i,8	i,8
Anal fin ray	ii,5½	ii,5½
Caudal fin ray	10+9	10+9

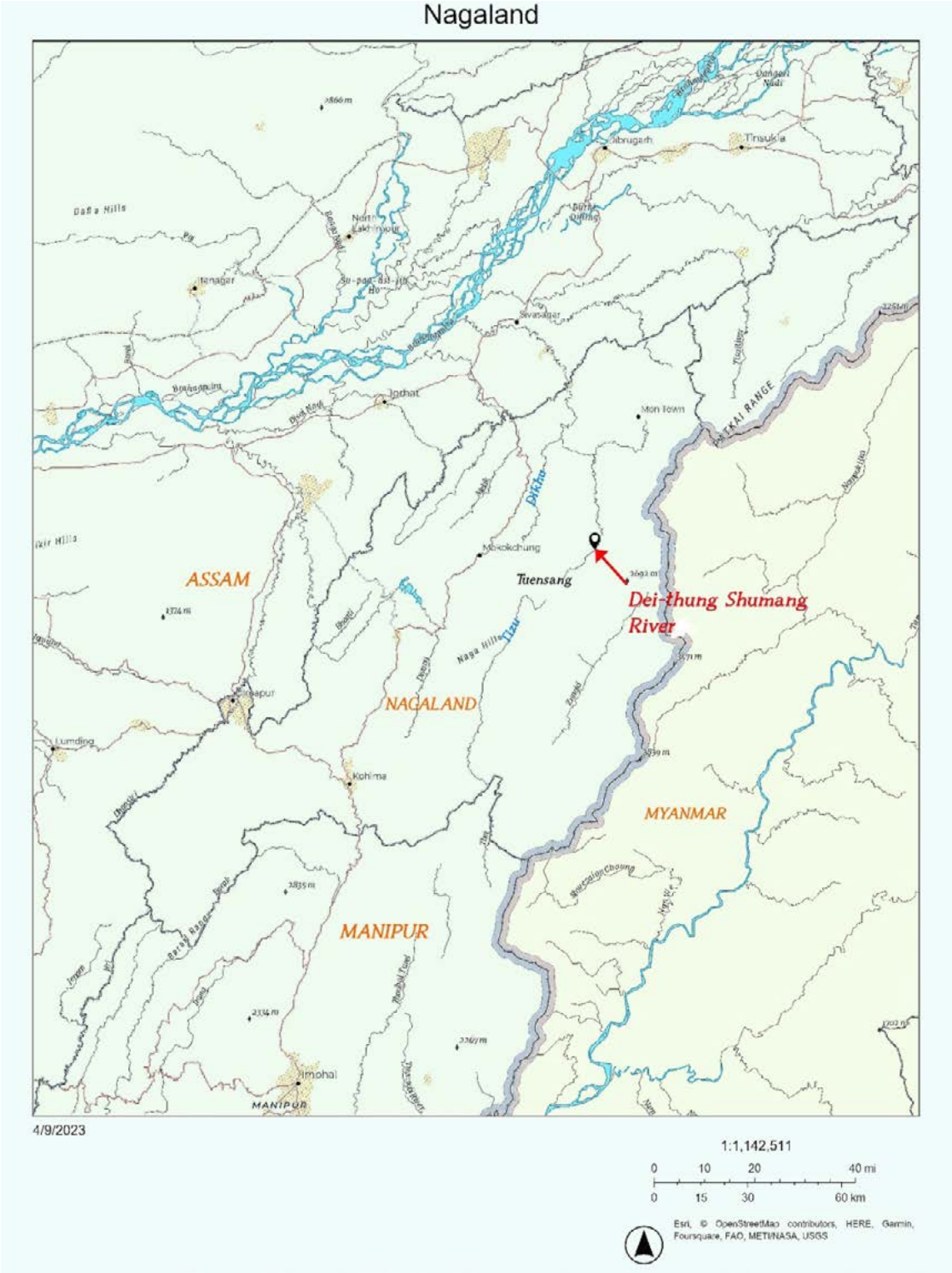

Figure 1: Map of Nagaland; Dei-thung Shumang River, tributary of Dikhu River, Brahmaputra drainage indicated by a black drop-pin in the map.

Map source: https://www.arcgis.com

Figure 2: (a) Habitat (map source: https://www.arcgis.com);

(b) Specimen collection site; Dei-thung Shumang River, tributary of Dikhu River, Brahmaputra drainage.

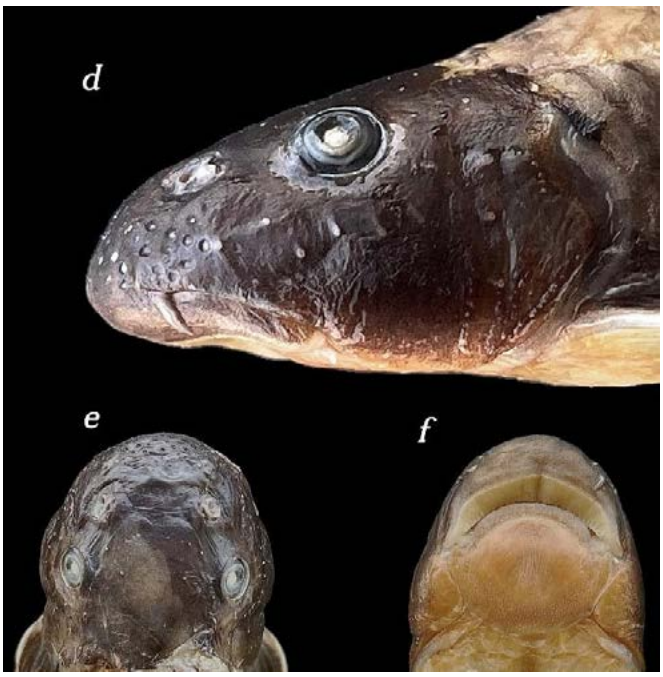

Figure 3: *Garra lungongza*, Holotype: ZSI F9798, Calcutta, SL-108.0mm; India: Nagaland: Tuensang District: Dei-thung Shumang River, tributary of Dikhu River, Brahmaputra drainage: a) dorsal view, b) lateral view, c) ventral view of the body.

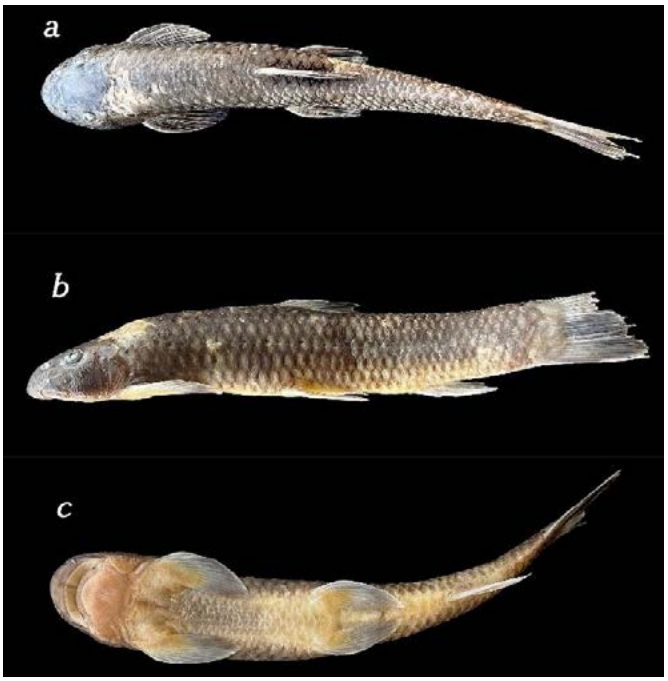

Figure 4: *Garra lungongza*, Holotype: ZSI F9798, Calcutta, SL-108.0mm; India: Nagaland: Tuensang District: Dei-thung Shumang River, tributary of Dikhu River, Brahmaputra drainage: d) lateral view of the head, e) smooth snout without transverse lobe and proboscis, f) Gular disc.

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