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Journal of Threatened Taxa

Building evidence for conservation globally

www.threatenedtaxa.org

ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

SHORT COMMUNICATION

A NEW FISH SPECIES OF GENUS *GARRA* (TELEOSTEI: CYPRINIDAE) FROM NAGALAND, INDIA

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26 May 2021 | Vol. 13 | No. 6 | Pages: 18618–18623

DOI: [10.11609/jott.6029.13.6.18618-18623](https://doi.org/10.11609/jott.6029.13.6.18618-18623)



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A new fish species of genus *Garra* (Teleostei: Cyprinidae) from Nagaland, India

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Abstract: A species of the genus *Garra* is described from the Langlung River, Brahmaputra basin, Nagaland, India. The new species is distinguished from its congeners in having weakly-developed unilobed proboscis, a distinct transverse lobe with 8–12 small sized unicuspid acanthoid tubercles, 30–32 lateral line scales, and 13–15 circumpeduncular scales.

Keywords: *Garra langlungensis* sp. nov., new species, northeastern India.

The members of the labeonine genus *Garra* Hamilton, 1822 are elongated fish that live in torrential rivers and streams. They are widely distributed from Sub-Saharan Africa to Borneo through the Arabian Peninsula, southern Asia, and southern China (Zhang & Chen 2002). The species of *Garra* are diagnosed by the presence of a labial fold forming a gular disc that displays variations in the snout (Kottelat 2020). Nebeshwar & Vishwanath (2017) divided the genus found in southern and southeastern Asia into five groups based on snout morphology: smooth, transverse lobe, proboscis, rostral flap, and the rostral lobe.

The Langlung River, also known as Atu Ghoki (meaning-stone River) is an important tributary of Dhansiri River in

Nagaland. It originates near New Jalukie, Peren District and flows through Zutovi Village, Dimapur, and joins with Dhansiri River and finally confluences into the Brahmaputra. The river forms an ideal habitat for *Garra*. There are no prior reports of ichthyological explorations of this river.

A field survey in the Langlung River, a tributary of Brahmaputra drainage in Nagaland, India included the collection of seven undescribed *Garra* with a weakly-developed proboscis and a transverse lobe on the snout. The present paper deals with the formal description of this species as *Garra langlungensis* sp. nov.

MATERIAL AND METHODS

Samples were fixed in 10% formaldehyde and then kept in 70% ethanol. All measurements were made using digital callipers, point to point on the left side of the specimen closest to 0.1mm. Counts, measurements and terminology follow Nebeshwar & Vishwanath (2013). Gular disc terminology follows (Kottelat 2020). Dorsal and anal fin rays follow Kottelat (2001). Lateral line scales were counted from the anterior-most scale in contact with the shoulder girdle to the posterior-most scale on the caudal

ZooBank: urn:lsid:zoobank.org:pub:418DD67B-7207-4A2E-ADFF-CECB218FAF64

Editor: Anonymity requested.

Date of publication: 26 May 2021 (online & print)

Citation: Ezung, S., B. Shangningam & P.P. Pankaj (2021). A new fish species of genus *Garra* (Teleostei: Cyprinidae) from Nagaland, India. *Journal of Threatened Taxa* 13(6): 18618–18623. https://doi.org/10.11609/jott.6029.13.6.18618-18623

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Funding: (a) University Grants Commission, New Delhi; (b) Zoological Survey of India, Ministry of Environment Forest and Climate Change, Government of India.

Competing interests: The authors declare no competing interests.

Acknowledgements: We are grateful to Kailash Chandra (ZSI) for permission to undertake the present study and to Waikhom Vishwanath, Manipur University for permission to examine type specimens under his care. We thanked Laishram Kosygin (ZSI) for support and encouragement. The first author (SE) is grateful to the University Grants Commission, New Delhi for financial assistance for the award of UGC Non-NET fellowship, Nagaland University. The second author (BS) is thankful to Zoological Survey of India, Ministry of Environment Forest and Climate Change, Government of India for the Post-Doctoral Fellowship.





fin. Fin rays and number of scales were counted using Huvitz stereo zoom microscope. Numbers in parentheses following meristic data indicate the number of specimens with that count. Head length and measurements of body are expressed in percentage of standard length (%SL); pelvic-anal distance in the percentage of vent-anal distance; subunits of the head in the percentage of head length (%HL); caudal peduncle depth in the percent of caudal peduncle length. Examined specimens are deposited in the Zoological Survey of India (ZSI), Kolkata.

RESULTS

Garra langlungensis sp. nov. (Images 1 & 2)

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Holotype: ZSI FF7152, 13.i.2017, 54.9mm SL, India, Nagaland, Langlung River near Zutovi Village, Dimapur District, Brahmaputra Basin; 25.716°N, 93.650°E, collected by Ezung et al.

Paratypes: ZSI FF 8859, 6 exs, 54.8–70.2 mm SL, same data as holotype.

Diagnosis

Garra langlungensis sp. nov., a member of the snout with proboscis species group, can be distinguished from other members of this group in having the following combination of characters: weakly-developed unilobed proboscis, a distinct transverse lobe with 8–12 small sized unicuspid acanthoid tubercles, 8–9 pre-dorsal scales, 30–32 lateral line scales and 13–15 circumpeduncular scales. Vent closed to the anal-fin origin than pelvic-fin origin.

Description

Table 1 depicts morphometric and meristic data. Body elongate, laterally compressed, more towards the caudal peduncle. Dorsal head profile rising gently over the snout, slightly convex, more or less continuous with dorsal body profile to dorsal-fin origin, then gently sloping towards caudal peduncle. Ventral profile from head to chest straight and profile from chest to anal-fin origin more or less convex. Head moderately large, depressed with slightly convex inter-orbital area; height less than length; width greater than height. Eyes dorso-laterally located, closer to posterior margin of opercle than to snout tip.

Snout rounded, with a distinct transverse lobe covered with 8–12 small-sized unicuspid acanthoid tubercles, demarcated posteriorly by a narrow moderately deep transverse groove. Proboscis weakly developed, unilobed with small tubercles on its margin (Image 2). Barbels two

pairs; rostral barbel anteroventrally located, shorter than eye diameter; maxillary barbel at the corner of the mouth, shorter than rostral barbel. Rostral cap well-developed, its distal margin highly fimbriate, papillate ventral surface moderately wide; separated from upper jaw by deep groove and laterally continuous with the lower lip. Upper jaw entirely covered by the rostral cap. Disc elliptical, shorter than wide and narrower than head width through roots of maxillary barbel; labellum of lower lip distinct; torus well developed with papillae, not covered by the rostral cap; toral groove between the posterior torus and pulvinus deep; papillae on inner half of the whole length of labrum larger and coarsely arranged; anterior marginal surface of pulvinus with coarsely arranged fleshy papillae; posterior most margin of labrum extending vertical to eye.

Dorsal fin with two simple and 8½ branched rays; distal margin concave; origin nearer to snout tip than to caudal-fin base, inserted anterior to vertical through pelvic-fin origin. Pectoral fin with 1 simple and 11 (4) or 12 (3) branched rays, reaching beyond midway to pelvic-fin origin; margin subacuminate. Pelvic fin with 1 simple and 7½ branched rays; second branched ray longest, reaching beyond midway to anal-fin origin, surpassing anus; origin closer to anal-fin origin than to pectoral-fin origin. Anal fin with 2 simple and 5½ branched rays; first branched ray longest, not reaching base of caudal fin; distal posterior margin slightly concave, origin closer to caudal-fin base than to pelvic-fin origin. Vent closer to the anal-fin origin than to pelvic-fin origin. Caudal fin forked with 10+9 principal caudal rays; upper lobe slightly longer; tip of lobes pointed.

Lateral line complete, scales along lateral line 28 (3), 29 (2) or 30 (2) + 2 (7) on caudal-fin base. Transverse scale rows above lateral line scale 3½ (7); between lateral line and pelvic-fin origin 3 (7); between the lateral line to anal-fin origin 3½ (7). Circumpeduncular scales 13 (3), 14 (2) or 15 (2). Pre-dorsal scales 8 (4) or 9 (3); scales regularly arranged. Chest and belly with well-developed scales. One long axillary scale at the base of the pelvic fin, its tip reaching the posterior end of pelvic-fin origin. Dorsal-fin base scales 7 of which last three to four connected to the base of the dorsal fin. Anal-fin base scales 4 of which last three to four connected to the base of the anal fin. Scales between the vent and anal-fin origin 2 (3) or 3 (4).

Coloration: In fresh specimens, head and body greenish-brown dorsally and laterally. Mouth, chest and abdomen white. Dorsal, pectoral, pelvic, anal and caudal fins orange yellowish, fin rays moderately spotted. In preservative, head, dorsal and lateral side dark grey. Mouth, chest and abdomen yellowish white. A black spot at upper angle of gill opening. Dorsal, pectoral, and

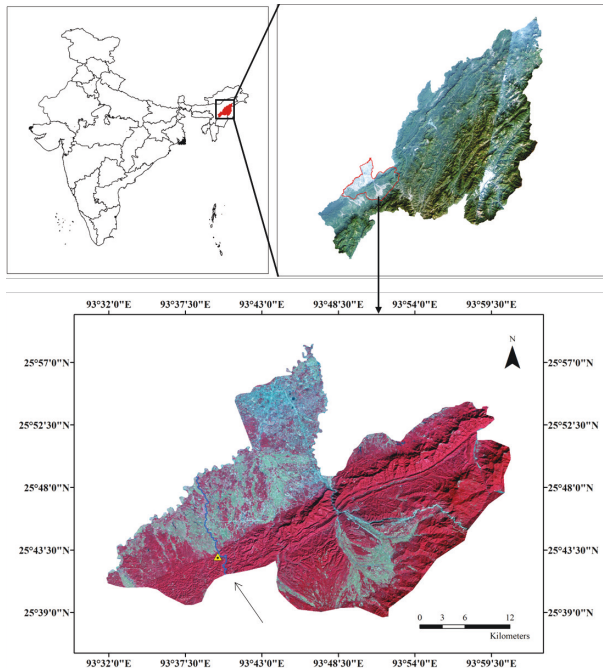


Figure 1. Type locality of *Garra langlungensis* sp. nov.



Image 1. *Garra langlungensis* sp. nov. holotype. ZSI FF7152: A—dorsal view | B—ventral view | C—lateral view. © Sophiya Ezung.

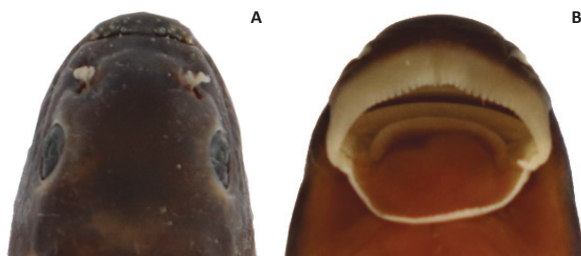


Image 2. *Garra langlungensis* sp. nov. holotype. ZSI FF7152: A—Dorsal view of head | B—Ventral view of oromandibular structures. © Sophiya Ezung.

pelvic fins with thin melanophores. Anal and caudal fins greyish-yellow. Six narrow black stripes on lateral side more prominent towards caudal peduncle. Median rays and tips of upper and lower lobe of caudal fin dark brown.

Etymology: Named after its type locality, Langlung River.

Distribution: *Garra langlungensis* is known only from the type locality, Langlung River near Zutovi Village, Dimapur District, Nagaland, India (Image 3, Figure 1).

DISCUSSION

There are currently 32 valid species of *Garra* belonging to the members of snout with proboscis species group of Nebeshwar & Vishwanath (2017). *Garra langlungensis* belongs to the proboscis species group, and is compared with its congeners of the group, viz., *Garra dengba* Deng et al., 2018, *G. kalpangi* Nebeshwar et al., 2012, *G. gravelyi* Annandale, 1919, *G. bimaculacauda* Thoni et al., 2016, *G. clavirostris* Roni et al., 2017, *G. kangrae* Prashad, 1919, *G. montisalsi* Hora, 1921, *G. parastenorhynchus* Thoni et al., 2016, *G. simbalbaraensis* Rath et al., 2019, *G. stenorhynchus* Jerdon, 1849, *G. substrictorostri* Roni & Vishwanath, 2018, *G. arunachalensis* Nebeshwar & Vishwanath, 2013, *G. biloborostris* Roni & Vishwanath, 2017, *G. birostris* Nebeshwar & Vishwanath, 2013, *G. bispinosa* Zhang, 2005, *G. chindwinensis* Premananda et al., 2017, *G. cornigera* Shangningam & Vishwanath, 2015, *G. gotyla* Gray, 1830, *G. litanansis* Vishwanath, 1993, *G. motuoensis* Gong et al., 2018, *G. quadratirostris* Nebeshwar & Vishwanath, 2013, *G. qiaojiensis* Wu, 1977, *G. rotundinasus* Zhang, 2006, *G. yajiangensis* Gong et al., 2018, *G. bicornuta* Rao, 1920, *G. koladynensis* Nebeshwar & Vishwanath, 2017, *G. nasuta* McClelland, 1838, *G. paratrilobata* Roni et al., 2019, *G. surgifrons* Sun et al., 2018, *G. tamangi* Gurumayum & Kosygin, 2016, and *G. trilobata* Shangningam & Vishwanath, 2015.

Garra langlungensis is distinguished from *G. dengba* in having fewer pre-dorsal scales (8–9 vs. 14–16), fewer lateral-line scales (30–32 vs. 42–44), more branched anal-fin rays (5½ vs. 4), branched dorsal-fin rays (8½ vs. 6), more circumpeduncular scales (13–15 vs. 12) and shorter disc width (46–54 vs. 57–73%HL). It differs from *Garra kalpangi* in the absence (vs. presence) of black spot at the base of branched dorsal-fin rays, fewer pre-dorsal scales (8–9 vs. 10–11), fewer transverse row below lateral line (3 vs. 3½–4), fewer circumpeduncular scales (13–15 vs. 16), longer pulvinus length (5.7–6.6 vs. 4.8–5.5 %SL) and greater pulvinus width (8.6–9.5 vs. 7.3–8.1 %SL). It differs from *Garra gravelyi* in the absence (vs. presence) of black spots along dorsal-fin base, more branched dorsal-fin rays (8½ vs. 7), fewer branched pectoral-fin rays (11–12 vs.



Table 1. Morphometric data of *Garra langlungensis* sp. nov. range includes value of holotype. n= number of specimens; SD= standard deviation.

| | <i>Garra langlungensis</i> - (n=7 including holotype) | | | |
|--|---|-----------|------|-----|
| | holotype | range | mean | SD |
| Standard length (mm) | 54.9 | 54.8–70.2 | | |
| Percent of standard length (% SL) | | | | |
| Head length | 26.2 | 24.9–27.9 | 26.4 | 1 |
| Body depth at dorsal-fin origin | 23.5 | 20.9–25.9 | 23.5 | 1.6 |
| Predorsal length | 48.7 | 47.1–49.8 | 48.7 | 0.9 |
| Preanus length | 67.9 | 66.6–69.6 | 67.7 | 1 |
| Preanal length | 74.1 | 74.1–77.4 | 75.5 | 1.1 |
| Prepectoral length | 22.4 | 21.4–22.6 | 22.1 | 0.5 |
| Prepelvic length | 50.9 | 50.9–53.9 | 52 | 1 |
| Dorsal-fin base length | 16.4 | 16.3–19.0 | 17.3 | 0.9 |
| Dorsalfin length | 25.1 | 23.2–25.4 | 24.1 | 0.9 |
| Pectoral fin length | 23.2 | 18.4–23.9 | 22.3 | 1.8 |
| Pelvic fin length | 19.7 | 18.5–20.3 | 19.6 | 0.6 |
| Anal-fin base length | 7.1 | 6.4–7.6 | 7 | 0.4 |
| Analfin length | 19.5 | 16.9–20.1 | 19.1 | 1.1 |
| Distance from vent to anal fin | 5.5 | 4.8–7.8 | 6.4 | 1.2 |
| Caudal peduncle length | 16.3 | 16.3–19.8 | 18 | 1.2 |
| Caudal peduncle depth | 15.2 | 14.2–15.7 | 14.8 | 0.6 |
| Disc length | 8.5 | 8.5–9.8 | 9.4 | 0.5 |
| Disc width | 13 | 12.5–13.7 | 13 | 0.4 |
| Pulvinus length | 5.7 | 5.7–6.6 | 6.1 | 0.3 |
| Pulvinus width | 9.5 | 8.6–9.5 | 9.1 | 0.3 |
| Percent of pelvic-anal distance (% pelvic-anal distance) | | | | |
| Distance from vent to anal fin | 23 | 19–31 | 25 | 4 |
| Percent of head length (% HL) | | | | |
| Head depth at occiput | 75 | 68–77 | 72 | 3 |
| Snout length | 55 | 50–56 | 53 | 1 |
| Interorbital distance | 45 | 43–49 | 46 | 2 |
| Eye diameter | 26 | 20–26 | 23 | 2 |
| Disc length | 32 | 32–38 | 35 | 2 |
| Disc width | 49 | 46–54 | 49 | 2 |
| Pulvinus length | 21 | 21–25 | 23 | 1 |
| Pulvinus width | 36 | 33–36 | 34 | 1 |
| Percent of caudal peduncle length (%caudal peduncle length) | | | | |
| Caudal peduncle depth | 93 | 77–93 | 82 | 5 |
| Meristic count | | | | |
| Dorsal fin rays | ii8½ | ii8½ | | |
| Pectoral fin rays | i11 | i11–12 | | |
| Pelvic fin rays | i7½ | i7½ | | |
| Anal fin rays | ii5½ | ii5½ | | |
| Caudal fin rays | 10+9 | 10+9 | | |
| Pre-dorsal scales | 9 | 8–9 | | |
| Lateral line scales | 28+2 | 28–30+2 | | |
| Transverse scales | 3½/1/3 | 3½/1/3 | | |
| Circumpeduncular scale rows | 15 | 13–15 | | |

14–15), fewer predorsal scales (8–9 vs. 10–11) and more circumpeduncular scales (13–15 vs. 12).

Garra langlungensis is distinguished from *G. bimaculacauda* in the absence (vs. presence) of two distinct black spot in the caudal fin, lesser branched pectoral-fin rays (11–12 vs. 14), fewer pre-dorsal scales (8–9 vs. 11–12), transverse scale rows from dorsal-fin origin to lateral line ($3\frac{1}{2}$ vs. 6), more circumpeduncular scales (13–15 vs. 12), shorter disc length (32–38 vs. 40–44 %HL). It differs from *G. clavirostris* in having weakly-developed proboscis (vs. clubbed proboscis), lesser branched pectoral fin rays (11–12 vs. 14–15), transverse scale rows from dorsal origin to lateral line ($3\frac{1}{2}$ vs. $5\frac{1}{2}$) and smaller disc length (32–38 vs. 50–65 % HL); from *G. kangrae* in having weakly-developed proboscis (vs. prominent quadrate proboscis), fewer branched pectoral-fin rays (11–12 vs. 15) and fewer lateral line scales (30–32 vs. 34). It differs from *G. montisalsi* in having weakly-developed proboscis (vs. prominent unilobed proboscis projecting upward above the transverse lobe), longer disc length (32–38 vs. 28 %HL), pulvinus length (21–25 vs. 18 %HL) and pulvinus width (33–36 vs. 22 %HL).

Garra langlungensis is distinguished from *G. parastenorhynchus* in having weakly-developed proboscis (vs. club-shaped overhanging proboscis), fewer pre-dorsal scales (8–9 vs. 10–11), circumpeduncular scales (13–15 vs. 16), more head length (24.9–27.9 vs. 28.5–30.7 %SL), lesser pre-anus length (66.6–69.6 vs. 70.1–74.2 %SL) and more interorbital width (43–49 vs. 34–39 %HL). It differs from *G. simbalbaraensis* in having weakly-developed proboscis (vs. prominent unilobed rounded proboscis), fewer circumpeduncular (13–15 vs. 16) and more pulvinus width (33–36 vs. 26–29 %HL). It differs from *G. stenorhynchus* in having weakly-developed proboscis (vs. prominent quadrate proboscis) and fewer lateral line scales (30–32 vs. 34). It differs from *G. substrictorostris* in having weakly-developed proboscis (vs. narrow antrorse unilobed proboscis), fewer branched pectoral-fin rays (11–12 vs. 15), fewer pre-dorsal scales (8–9 vs. 10), transverse scale rows from dorsal origin to lateral line ($3\frac{1}{2}$ vs. $5\frac{1}{2}$), circumpeduncular (13–15 vs. 16), shorter pre-anus length (66.6–69.6 vs. 70.3–77.7 %SL), disc length (32–38 vs. 44–55 %HL) and disc width (46–54 vs. 53–66 %HL).

Garra langlungensis can be differentiated from *G. arunachalensis*, *G. biloborostris*, *G. birostris*, *G. bispinosa*, *G. chindwinensis*, *G. cornigera*, *G. gotyla*, *G. litanensis*, *G. motuoensis*, *G. quadratiostris*, *G. qiaojiensis*, *G. rotundinasus*, *G. yajiangensis* in having weakly-developed unilobed proboscis (vs. prominent bilobed or slightly bilobed) proboscis on the snout. It can be differentiated from *G. bicornuta*, *G. koladynensis*, *G. nasuta*, *G.*



Image 3. Langlung River, Nagaland, India; type locality of *Garra langlungensis* sp. nov. © Sophiya Ezung.

paratrilobata, *G. surgifrons*, *G. tamangi*, and *G. trilobata* in having weakly-developed unilobed (vs. prominent trilobed) proboscis on the snout.

Comparative material and sources

Garra arunachalensis: Data from Nebeshwar & Vishwanath (2013)

Garra bicornuta: Data from Rao (1920)

Garra biloborostris: ZSI FF 7928, 2 paratypes, 69.1–75.6 mm; India, Assam, Chirang District, Kanamakra River, Brahmaputra basin, Sewali and Paraty.

Garra bimaculacauda: Data from Thoni et al. (2016)

Garra birostris: Data from Nebeshwar & Vishwanath (2013)

Garra bispinosa: Zhang (2005)

Garra chindwinensis: ZSI FF 5906, holotype, 120mm SL, India, Manipur, Senapati District, Laniye River nearLaii, Premananda.

Garra clavirostris: ZSI FF 6062, 2 paratypes, 71.2–83.0 mm SL; India, Assam, Dima Hasao District, DilaimaRiver at Boro Chenam village below the confluence of Dilaima and Dihandi Brahmaputra drainage.

Garra cornigera: ZSI FF 5995, 2 paratypes, 72.19–46.82 mm SL; India, Manipur, Ukhrul District, Sanalok River, Chindwin basin.

Garra dengba: Data from Deng et al. (2018)

Garra gotyla: Data from Gray (1830)

Garra gravelyi: ZSI F 9694/1, type, 60.9mm SL; Myanmar, S. Shan States, he-ho stream, Annandale (1919)

Garra kalpangi: Data from Nebeshwar et al. (2012)

Garra kangrae: Data from Prashad (1919)

Garra koladynensis: Data from Nebeshwar & Vishwanath (2017)

Garra litanensis: Data from Vishwanath (1993)

Garra magnacavus: Data from Shangningam et al.



(2019)

Garra montisalsi: ZSI F 9953/1, type, 100.8mm. SL; India, Punjab, Nilwan ravine near the Shapur salt ranges.

Garra mutuoensis: Data from Gong et al. (2018)

Garra nasuta: Data from Menon (1964)

Garra parastenorhynchus: Data from Thoni et al.

(2016)

Garra paratrilobata: Data from Roni et al. (2019)

Garra qiaojiensis: Data from Gong et al. (2018)

Garra quadratirostris: Data from Nebeshwar & Vishwanath (2013)

Garra rotundinasus: Data from Zhang (2006)

Garra simbalbaraensis: ZSI FF 8003, 60.8mm SL; India: Himachal Pradesh, Sirmaur District, Simbalbara River, Yamuna River Basin.

Garra stenorhynchus: ZSI F 9957, 64.5mm SL; India, Mysore, hillstream, Coorg,

Garra substrictorostris: Data from Roni & Vishwanath (2018)

Garra surgifrons: Data from Gong et al. (2018)

Garra tamangi: ZSI FF 5423, paratypes, 102.4mm SL; India, Arunachal Pradesh, Dikrong River at Hoj, Brahmaputra drainage.

Garratrilobata: ZSI FF 5994, 2 paratypes, 95.78–119.14 mm SL; India, Manipur, Ukhrul District, Sanalok River.

Garra yajiangensis: Data from Gong et al. (2018)

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ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

May 2021 | Vol. 13 | No. 6 | Pages: 18411–18678

Date of Publication: 26 May 2021 (Online & Print)

DOI: 10.11609/jott.2021.13.6.18411-18678

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