

A New Geographical Distribution of *Garra jaldhakaensis* in Kumaon Himalayas

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ABSTRACT: The occurrence of *Garra jaldhakaensis* is recorded first in Uttarakhand, Northern India. The fish has been reported earlier only from the type locality Jaldhaka River near Jhalong, Kalimpong district, West Bengal, Brahmaputra River Drainage, India. The meristic counts, body measurements and descriptions are presented. The specimens have been compared with the type specimens and found out that the fish has a new distributional record from the Uttarakhand, Kumaon Himalayas, India.

Keywords: Freshwater fish, Lebeoninae, Kumaon Himalayas.

INTRODUCTION

The genus *Garra*, a cyprinid fish with gular disc, has a dull brown to black body with more or less distinct darker stripes between scale rows on the posterior half of the body (Kottelat, 2020). They are distributed in Africa, and Southwest, South, Southeast and East Asia. The members of the genus in South, Southeast and East Asia are found in habitats with strong current, such as rapids, torrents and waterfalls, usually solitary under rocks or among stones and boulders.

Garra jaldhakaensis was described by Kosygin *et al.* (2021) from the Jaldhaka River near Jhalong, Kalimpong district, West Bengal, Brahmaputra River Drainage, India. The species belongs to the snout with a proboscis species group of Nebeshwar and Vishwanath (2017) and is characteristic in having a snout with a conspicuously tuberculated unilobed proboscis protruding downward with 16–25 medium-to large-sized multicuspoid tubercles on the transverse lobe; 10–11 scales on the predorsal region, 33 scales on the lateral line series, scaled chest and belly.

A fish lot collection from the Kosi River, Almora district, Uttarakhand, contains three specimens measuring 116.4–123.8 mm SL of *Garra*. Subsequently, after a detailed study and proper examination, the species is identified as *Garra jaldhakaensis*. Thus, in the present study, *G. jaldhakaensis* is reported first from Kosi River, Almora district, Uttarakhand, Northern India.

MATERIALS AND METHODS

All the measurements of the specimens were taken by digital callipers point to point on the left side. Counts, measurements, and terminology follow Nebeshwar and

Vishwanath (2013). Dorsal and anal-fin rays count followed Kottelat *et al.* (2001), which indicates that the last two rays which are articulating on the same pterygiophore are considered as “1½”. The authors used the Leica stereo-zoom microscope M205A for counting the scales and rays.

RESULTS

Garra jaldhakaensis Kosygin, Shangningam, Singh and Das, 2021 (Fig. 1 & 2)

Material examined. ZSI F 198/2, 116.4–123.8 mm SL; India: Kosi River, Kosi village, District- Almora, Uttarakhand, 19°01'54.9"N84°23'15.9"E, coll. Kumaon Hills Survey Party, 7 June 1948.



Fig. 1. *Garra jaldhakaensis* ZSI F 198/2, 123.8mm SL; India: Uttarakhand, A, dorsal; B, lateral; C, ventral views.

Description. In Table 1, the morphometric data are given. The specimen observed having elongated body which is compressed laterally as well as more compressed towards caudal peduncle. The dorsal surface of the specimen is smoothly arched to dorsal-fin

origin, after which it slopes down to caudal peduncle. The ventral surface of the specimen is flattened from head to breast, which is more or less rounded up to the origin of the pelvic-fin and eventually almost straight towards caudal-fin base.

Table 1: Morphometric data of *Garra jaldhakaensis*.

Comparison	<i>Garra jaldhakaensis</i> ZSIF 198/2,	<i>Garra jaldhakaensis</i> (after Kosygin <i>et al.</i> , 2021)
Standard Length (mm SL)	116.4–123.8	95.3–84.3
Body depth	22.4–22.9	21.7–24.1
Head length	22.5–23.8	23.3–24.1
Head depth	16.4–17.2	16.1–17.3
Body width at anal fin origin	9.0–9.5	7.7–9.8
Body width at dorsal fin origin	12.6–19.2	15.4–17.3
Caudal peduncle length	13.9–16.5	15.2–17.0
Caudal peduncle depth	13.3–13.4	11.9–12.7
Dorsal-fin base length	15.5–19.8	17.5–18.4
Dorsal-fin length	25.23	22.2–24.7
Pectoral-fin length	18.4–20.8	20.2–21.1
Pelvic-fin length	18.0–19.0	19.6–20.2
Anal-fin base length	7.2–9.8	7.2–9.2
Anal-fin length	18.9–19.1	16.8–20.2
Predorsal length	42.1–47.1	45.5–47.3
Prepectoral length	20.9–22.5	21.1–21.9
Prepelvic length	43.7–50.2	49.0–52.2
Preanal length	73.1–77.5	72.4–76.1
Pelvic anal distance	23.9–27.2	24.7–26.7
Snout length	51.0–56.8	55.0–58.1
Eye diameter	15.7–17.1	16.0–18.8
Inter orbital width	43.5–46.8	40.4–44.2
Gular disc width	48.3–50.7	45.8–55.3
Gular disc length	33.9–36.3	34.6–37.2
Pulvinus width	33.7–36.0	27.1–30.4
Pulvinus length	19.7–25.5	20.0–21.3

The specimen is having a large depressed head with moderately convex interorbital region. The depth of head is less than its length. Small eyes, dorso-laterally located, nearer to posterior end of opercle than to the tip of the snout. Snout slightly pointed, 16–17 medium-to large-sized ulcuspid tubercles on its transverse lobe, which is defined posteriorly by a deep transverse groove; 9–11 unicuspid tubercles on slightly elevated lateral surface, 1–2 minute unicuspid tubercles on posterior region of nostrils. Proboscis prominent, short, thick, protruding downward above the transverse groove, with 5–6 uni- to bi-cuspid tubercles on anterolateral margin, 8–9 uni- bicuspid tubercles on antero-ventral margin, separated from depressed rostral surface by a specific transverse groove; width smaller than internarial space. Depressed rostral surface soft, with 2–3 thin ridges. Sub-lachrymal groove deep, horizontally curved. Rostral lobe absent.

There are two pairs of barbels, rostral and maxillary. Rostral barbels situated anterolaterally, equal to diameter of eye, and the maxillary barbels positioned at the corner of mouth. The maxillary barbel is much shorter than rostral barbels. The jaw on upper is wholly roofed by prominent rostral cap. The rostral cap is well-developed, extended, highly fimbriate, detached from upper jaw by deep groove, which is laterally incessant with lower lip. The rostral cap covers the upper jaw.

The gular disc is elliptical, wide, slenderer than width of head. The lower lip consists of a weakly developed labellum, roofed fully with papillae; the torus is prominent with papillae, not covered by rostral cap; the toral groove deep, papillated; the papillae on inner half of whole length of labrum are coarsely organized; posterior most margin of labrum extending to vertical margin of eye.

The dorsal fin is having two unbranched and 8½ branched rays, the last unbranched rays equal to head length, origin much closer to tip of the snout than caudal-fin base. The pectoral fin has one unbranched and 14–15 branched rays, the fin length is shorter than the head. The pelvic fin has one unbranched and 7–8 branched rays, the length of the second branched ray is longest, reaching anus; not extending to base of anal fin, its origin closer to anal fin than to the pectoral fin, inserted steeply below the base of third branched dorsal-fin ray. The anal fin is having two unbranched and 5 branched rays, anus opening much nearer to the origin of the anal fin than to pelvic fin. The caudal fin is forked with 9+8 branched rays, the lower lobe slightly longer than the upper.

A long axillary scale present at the base of pelvic fin, extending to end of pelvic-fin origin. Seven scales present on the dorsal-fin of which last 6–7 is attached to dorsal fin base. Four scales present on the base of anal

fin, of which last 2–3 connected to its base. Three scales between anus and anal-fin origin present. The lateral line is complete with 33 scales. Transverse scale rows between the origin of dorsal fin and lateral line is 4½; between lateral line and pelvic-fin origin is 3, and between lateral and anal-fin origin is 3. 10–11 scales are present in the predorsal region. 16 scales are present

around the caudal peduncle. The chest and breast are covered with scales.

Distribution. *Garra jaldhakaensis* is known to distribute in the Jaldhaka River near Jhalong, Kalimpong district, West Bengal, Brahmaputra River Drainage, India, and Kosi River, Almora district, Uttarakhand India.



Fig. 2. *Garra jaldhakaensis*, ZSI F198/2, 123.8mm SL; India: Uttarakhand, A, dorsal aspects of snout morphology and B, gular disc.



Fig. 3. Map showing the distributional locations of *Garra jaldhakaensis* indicates the type locality.

DISCUSSION

The cyprinid fish *Garra jaldhakaensis* was described by Kosygin *et al.* (2021) from the Jaldhaka River near Jhalong, Kalimpong district, West Bengal, Brahmaputra River Drainage, India. The main characteristics that easily distinguished the reported species from congeners are the existence of aprotuberant thick unilobed proboscis, protruding downward above the transverse groove; 10–11 predorsal scales, 33 lateral line scales, and 16 circumpeduncular scales.

Garra jaldhakaensis reported herein is in agreement with the size, body proportions and meristic counts with the original description. A species of *Garra*, registered in the Zoological Survey of India as ZSI F 198/2, 116.4–123.8 with a prominent proboscis, was previously identified as *Garra gotyla* (Gray). Gray (1830) published *G. gotyla* from the drawings of General Harwicke. Menon (1964) identified members of *Garra* with a discrete transverse lobe, prominent proboscis, and row of dark spots along dorsal fin from

the Himalayan foothills from Pakistan in the west to upper Myanmar in the east. Since then, *Garra* specimens with spots on dorsal fin base and with various shapes of proboscis, different shapes and distribution of tubercles, varying oral morphology and meristic in different river systems have often been identified as *G. gotyla*. However, Nebeshwar and Vishwanath (2013) redescribed and designated a neotype for *Garra Gotyla* from the Tista River, Ganga drainage in Sikkim, India.

The previously identified *Garra* (ZSI F 198/2, 116.4–123.4) collected from the Kosi River, Kosi village, Almorah District, Uttarakhand, India entirely agrees with the original description of *Garra jaldhakaensis*. The present specimens have slightly wider pulvinus 33.7–36.0 vs. 27.1–30.4 in percent of its head length. This is the first record in the Kumaon Himalayas India. This hypothesis suggests the distribution of *Garra jaldhakaensis* might expand following a northward extension. Thus, the present study gives insight into the distributional range of *Garra jaldhakaensis* from the

Jaldhaka River, west Bengal to the Kosi River, Almora district, Uttarakhand, India.

CONCLUSION AND FUTURE SCOPE

The present study reports the first report of *Garra jaldhakaensis* from the Kosi River, Almorah District, Uttarakhand, India. It discussed the distributional status of the species from the Jaldhaka River to the Kosi River in Uttarakhand. The current study will assist the freshwater fish specialist group to apprise the status of different freshwater taxa. The study demand further biological study for conserving the genetic resources of the fish and establishing its fishery potential for socioeconomic development.

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Conflict of Interest. None.

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