



First Record of *Garra tyriangularis* from Madhya Pradesh, India

Shibanandarath ^a, Atul Pandey ^{b++}, Asha Kiran Tudu ^a
and Rekha Rani ^{b#*}

^a Freshwater Fish Section, Zoological Survey of India, Kolkata (W.B.), India.

^b Aquatic Toxicology Lab, Zoology Department, Indira Gandhi National Tribal University,
(Central University) Amarkantak, Madhya Pradesh, 484887, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Garra triangularis Shangningam et al. [1] has been reported first from the Sakartod River at Khanvel, Dadra & Nagar Haveli (UT), Western ghats, and then from Gajapati district of Odisha, Eastern Ghat. The present study reports it for the first time from Madhya Pradesh. The present specimen agrees with all the morphometric and meristic counts of the species, including the snout shape and the structure of tubercles on the proboscis. *G. triangularis* has a new distribution record from the State of Madhya Pradesh in India.

Keywords: Freshwater fish; Lebeoninae; Madhya Pradesh.

⁺⁺ Research Scholar;

[#] Associate Professor & Head;

^{*}Corresponding author: Email: reet14@yahoo.co.in;

1. INTRODUCTION

Garra (Cyprinidae) is mainly characterized by the presence of a gular disc on the ventral side of the head. It has a worldwide distribution record, particularly in Africa and Southwest, South, Southeast, and Eastern Asia. The members of the genus in South, Southeast and Eastern Asia are found in different habitats with a strong water current, such as water falls; here, the species usually retire under rocks or among stones and boulders. Most have a poor brown to black body colour with more or less distinct darker stripes between scale rows on the posterior half of the body [2].

Garra triangularis was initially described by Shangningam, Rath, and Kosygin [1] from the Sakartod River at Khanvel, Dadra & Nagar Haveli, Western Ghats. The species is a member of the 'snout with a proboscis' species group [3] and is characteristic in having a prominent bilobed proboscis, each lobe with one large anteriorly directed unicuspid acanthoid tubercle at tip; a triangular shaped labellum consisting of eight or nine transverse ridges, a prominent conical tubercle directed laterally on each side of the transverse lobe of the snout, relatively large and elongate papillae on torus and relatively large and widely arranged papillae on labrum. A lot of collections from Madhya Pradesh contain a single specimen of *Garra* measuring 75.8 mm SL

with a proboscis on the snout. Subsequently, after a detailed study and proper examination of the species, the species is identified as *Garra triangularis*. Thus, in the present study, *Garra triangularis* is reported first time from Madhya Pradesh.

2. MATERIALS AND METHODS

Measurements were taken point to point with digital calipers on the left side of the specimens and recorded to the nearest 0.1 mm. Counts, measurements, and terminology follow Nebeshwar & Vishwanath [3]. Counts for dorsal and anal-fin rays follow Kottelat [4]; the last two rays articulating on the same pterygiophore are counted as "1^{1/2}". Fin rays and numbers of scales were counted under a Leica stereo-zoom microscope M205A.

3. RESULTS AND DISCUSSION

Garra triangularis Shangningam, Rath and Kosygin, 2021 (Figs. 1 & 2)

Material examined: ZSI FF 10106, 75.8 mm SL; India: Madhya Pradesh, Narmada River, Chandanghat, (Narmada River drainage), 22°52'52.55" N 81°18'9.35" E, coll. Sample collected and submitted by Atul Pandey & Rekha Rani for further verification on Sept. 2023 (Fig1 & 2).



Fig. 1. *Garra triangularis*, ZSI FF 10106, 75.8 mm SL; a. Dorsal, b. Lateral & c. Ventral, India: Madhya Pradesh



Fig. 2. *Garra triangularis*, a.Dorsal aspects of snout morphology b.Lateral; and c. Gular disc

Table 1. Morphometric data of *Garratriangularis* Shangningam, Rath and Kosygin,2021

	<i>Garratriangularis</i> Madhya Pradesh	<i>Garratriangularis</i> Type Ranges
Standard length	75.8	65.2-80.8
In percent of standard length		
Body depth	22.96	22.7-27.8
Head length	26.25	21.9-26.0
Head depth	14.78	13.7-15.3
Body width at anal fin origin	8.84	08.3-11.0
Body width at dorsal fin origin	16.09	14.8-19.0
Caudal peduncle length	13.46	13.2-15.2
Caudal peduncle depth	13.06	13.0-14.3
Dorsal-fin base length	16.4	14.8-19.1
Dorsal-fin length	24.53	23.4-27.8
Pectoral-fin length	21.89	20.6-24.2
Pelvic-fin length	19.66	19.4-21.7
Anal-fin base length	9.37	09.0-10.9
Anal-fin length	18.21	18.1-20.6
Predorsal length	46.44	44.5-46.9
Prepectoral length	22.29	20.1-24.3
Prepelvic length	53.82	51.7-53.9
Preanal length	77.96	76.4-80.2
Pelvic anal distance	24.80	24.4-28.8
Pre anus length	69.78	68.7-74.4
Vent to anal fin origin	7.91	05.7-08.3
In percent of head length		
Snout length	44.72	38-48
Eye diameter	22.61	22-25
Inter-orbital width	44.22	42-49
Gular disc width	36.68	40-47
Gular disc length	29.65	23-28
Pulvinus width	25.62	21-26
Pulvinus length	17.08	13-16



Fig. 3. *Garra triangularis*, present Distributional Map

3.1 Description

Biometric data of the fish and its comparison with type ranges are presented in Table.1. Body elongate, compressed laterally, more on caudal peduncle region. Dorsal profile smoothly arched to dorsal fin origin then gently sloping towards caudal peduncle. Ventral profile flattened from head to chest, then more or less round to pelvic-fin origin, straight from pelvic to caudal-fin base. Head moderately large and depressed. Eye

small, dorso-laterally located, closer to posterior margin of opercle than to snout tip (Fig.1). Snout moderately rounded with transverse lobe covered with a pair of large conical tubercles directed laterally at tip of snout. Depressed rostral surface of snout tuberculate, with 9 small to medium-sized unicuspid acanthoid tubercles. Proboscis prominent, bilobed (Fig. 2), each lobe with one large slightly outwardly directed unicuspid acanthoid tubercle at tip; one small tubercle between lobes, and 9 small to medium

unicuspid acanthoid tubercles on lateral margin. Barbels in two pairs; rostral barbel antero-ventrally located, maxillary shorter than rostral barbel. Rostral cap well developed, highly fimbriate, separated from upper jaw by deep groove and laterally continuous with labellum around corner of mouth. Upper lip bearing a thin band of weakly developed papillae, thinner at corner of mouth and connecting to labellum. Upper jaw almost covered by rostral cap. Gular disc elliptical, medially positioned, wider than long, narrower than head width through roots of maxillary barbel; labellum triangular shaped with 9 transverse ridges, last ridge longest, regular and coiled in middle. Dorsal fin with 2 simple and 8 branched rays, origin slightly nearer to snout tip than to caudal fin base. Pectoral fin with 1 simple and 14 branched rays, reaching beyond midway to pelvic-fin origin. Pelvic fin with 1 simple and 7 branched rays, reaching beyond midway to anal fin origin, surpassing anus. Anal fin short with 2 simple and 5 branched rays; first branched ray longest, almost reaching base of caudal fin. Vent posteriorly positioned, closer to anal fin origin than to pelvic-fin origin. Caudal fin forked; upper lobe slightly longer; tip of lobes pointed; 10 + 9 principal rays. Lateral line complete, scales along lateral line 32, plus 2 on base of caudal fin. Transverse scale rows above lateral-line scales $4^{1/2}$ between lateral line and pelvic-fin origin and $3^{1/2}$ between lateral line and anal-fin origin. Circum peduncular scales 16. Predorsal scales 11. Chest and belly scaled.

Garra triangularis is known to distribute in the Sakartod River at Khanvel, Dadra & Nagar Haveli Union territory, and Mahendratanya River near Andaanda, Odisha, Eastern ghats and now Narmada River, Narmada River drainage, Madhya Pradesh. The cyprinid fish *Garra triangularis* was described originally by Shangningam, Rath, and Kosygin [9] from the Sakartod River at Khanvel, Dadra & Nagar Haveli, Western Ghats. The main characteristics that quickly distinguished the species from its congeners were the presence of a bilobed proboscis on the snout, a triangular-shaped labellum consisting of eight or nine transverse ridges and a prominent conical tubercle directed laterally on each side of the transverse lobe of the snout. *Garra triangularis* reported herein agrees with the original description's size, body proportions, and meristic counts. This hypothesis suggests that the distribution of *Garra triangularis* might expand following ancestral extension (Madhya Pradesh). The present study gives

insight into the distribution of *Garra triangularis* from the Sakartod River, Dadra & Nagar Haveli, and Western Ghats to the Mahendratanya River Odisha, Eastern Ghats and then Narmada River, Narmada River drainage, Madhya Pradesh.

The specimen of the *G. triangularis* collected from Narmada River, Chandanghat, Madhya Pradesh, resembles almost the type specimens of the species collected from Dadra & Nagar Haveli. However, very few variations were observed, like the gular disc of the specimens from Madhya Pradesh, which was slightly narrower than the type series. Further, the present specimen differs from the type series in having more pectoral fin rays (14 vs. 13 in type series) and fewer branched pelvic fin rays (7 vs. 8). Proboscis prominent, bilobed (Fig.2), each lobe with one large slightly outwardly directed unicuspid acanthoid tubercle at tip vs anteriorly directed unicuspid acanthoid tubercle at tip. However, these variations may be considered a range of species inhabiting different geographical habitats. Apart from these characters, all other characters, including the triangular-shaped labellum and tuberculation patterns, match with the type series of the *G. triangularis*.

4. CONCLUSION

The specimen collected in the present study was confirmed to be *G. triangularis*, and the species is reported for the first time from the state of Madhya Pradesh.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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