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Original Article

Barbus urmianus a new species from Urmia Lake basin, Iran (Teleostei: Cyprinidae)

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Abstract: *Barbus urmianus* from the Mahabad-Chai River in Urmia Lake basin, is distinguished from its congeners in the *B. lacerta* group by a well-developed middle pad of the lower lip, a shorter postdorsal length (25.2–42.0 vs. 46.4–60.7% SL), long anal fin (11.0–23.0 vs. 6.0–10.4% SL), short dorsal-fin base (9.2–15.6 vs. 16.1–22.6% SL), less scales in the caudal peduncle (14–23 vs. 25–35), and 64–85 scales on the lateral line (vs. 52–70).

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Introduction

The *Barbus* populations of the southern Caspian Sea, Lake Namak, and Urmia (Orumiyeh) Lake Basins, Euphrates and Tigris drainages, and the Qweik endorheic basin in Syria have been previously considered as *B. lacerta* Heckel, 1843 (Berg, 1949; Coad, 1995; Khaefi et al., 2017a; Çiçek et al., 2018). Naseka and Bogutskaya (2009) recognized *B. cyri* De Filippi, 1865 as a valid species in the Caspian Sea basin. Two other species, viz. *B. miliaris* De Filippi, 1863, a nominal species found in the Lake Namak basin and *B. karunensis*, Khaefi, Esmaili, Geiger & Eagderi, 2017 from the Karun River drainage are found in the Iranian inland waters (Radkhah and Eagderi, 2015; Jalili et al., 2015; Ghasemi et al., 2015; Khaefi et al., 2017a, b; Esmaili et al., 2018).

Barbus cyri is also known from the Urmia Lake basin (Khaefi et al., 2017b). A recent study on the ichthyofauna of the Urmia Lake basin revealed that the *Barbus* population from the Mahabad-Chai River represents an undescribed species. Hence herein, we describe it as *Barbus urmianus* sp. nov.

Materials and Methods

After anesthesia, the collected fishes were fixed in 10% buffered formaldehyde. Measurements were made with a dial caliper and recorded to the nearest 0.1 mm. All measurements were made point to point never by projections. Methods for counts and measurements follow Kottelat and Freyhof (2007). Standard length (SL) is measured from the tip of the snout to the end of the hypural complex. The length of the caudal peduncle is measured from behind the base of the last anal-fin ray to the end of the hypural complex, at mid-height of the caudal-fin base. The width of the upper lip is measured ventrally at the anterior tip of the lip. The scales in the lateral line are counted as total scales from the first scale on flank to the last scale on the caudal-fin base. The last two branched rays articulating on a single pterygiophore in the dorsal and anal fins are counted as "1½".

Abbreviations used: SL, standard length; HL, lateral head length; IMNRF-UT, Ichthyological Museum of Natural Resources Faculty, University of Tehran; ZM-CBSU, Zoological Museum of Shiraz University,

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Figure 1. Live specimen of *Barbus urmianus* sp. nov., VMFC B1388, paratype, 130.1 mm SL, Iran: Western Azerbaijan prov.: Mahabad-Chai River at Miriseh village, Beytas Town, Urmia lake Basin.



Figure 2. *Barbus urmianus* sp. nov., IMNRF-UT-1079-8, holotype, 117.7 mm SL, Iran: Western Azerbaijan prov.: Mahabad-Chai River at Miriseh village, Beytas Town, Urmia lake Basin.

Collection of Biology Department, Shiraz; VMFC, Vatandoust and Mousavi-Sabet Fish collection, Tehran.

Results

Barbus urmianus, new species

(Figs. 1-4, Table 1)

Holotype: IMNRF-UT-1079-8, 117.7 mm SL; Iran: Western Azerbaijan prov.: Mahabad-Chai River at Miriseh Village, Beytas City, 36°29'55.14"N 45°33'54.26"E.

Paratypes: IMNRF-UT-1079-1-15, 14, 101.1–187.6

mm SL; same data as holotype. VMFC B1388, 30, 95.0–184.2 mm SL; same data as holotype.

Diagnosis: *Barbus urmianus* sp. nov. is distinguished from the other species of the *B. lacerta* group in Iran by having short postdorsal length (25.2–42.0% SL vs. 50.5–53.2% SL in *B. karunensis*; 52.3–58.7% SL in *B. miliaris*; 46.4–59.1% SL in *B. lacerta*; and 47.8–60.7% SL in *B. cyri*), short dorsal-fin base (9.2–15.6% SL vs. 16.8–21.8% SL in *B. karunensis*; 18.4–22.6% SL in *B. miliaris*; 16.2–21.8% SL in *B. lacerta*; and 16.1–21.2% SL in *B. cyri*), long anal fin (11.0–23.0% SL vs. 7.1–8.6% SL in *B. karunensis*; 6.8–9.1% SL

Table 1. Morphometric and meristic data of *Barbus urmianus* sp. nov. (IMNRF-UT-1079-8, holotype; IMNRF-UT-1079-1-15, 15 paratypes, Iran: Western Azerbaijan prov.: Miriseh village at Beytas Town, Mahabad-Chai River, Urmia Lake Basin).

	<i>Barbus urmianus</i> sp. nov.				
	Holotype	Paratypes			
		min	max	mean	SD
Total length (mm)	121.7	101.3	187.6	135.5	23.9
In percent of standard length					
Head length	22.0	16.9	27.6	24.5	2.4
Pre orbital distance	8.8	6.7	12.8	10.6	1.4
Post orbital distance	9.7	7.5	12.7	11.3	1.2
Inter orbital distance	3.5	2.7	5.8	3.9	0.7
Predorsal length	46.0	35.4	57.4	51.0	4.9
Postdorsal length	32.8	25.2	42.0	35.6	4.7
Base of dorsal-fin length	11.9	9.2	15.6	13.3	1.6
Dorsal-fin length	18.2	14.0	21.8	18.0	2.2
Base of anal-fin length	6.7	5.2	12.1	8.3	1.6
Anal-fin length	14.4	11.0	23.0	17.7	3.2
Preanal length	64.1	49.3	76.1	69.5	8.6
Pectoral-fin length	15.2	11.7	19.7	17.1	2.0
Pelvic-fin length	14.5	11.2	17.7	14.9	1.4
Minimum body depth	8.8	6.8	20.5	10.7	3.0
Maximum body depth	16.9	13.0	22.2	18.9	2.1
Distance between pectoral and Anal-fin	42.3	32.5	54.6	49.3	5.1
Distance between pectoral and pelvic-fin	23.9	18.4	30.3	26.9	2.9
Distance between pelvic and anal-fin	22.3	17.1	26.9	23.4	2.4
Rostral barbel	3.1	2.4	5.8	4.1	0.8
Maxillary barbel	5.3	4.1	7.6	6.0	0.9
In percent of head length					
Head depth	58.3	51.5	63.7	57.0	3.4
Pre orbital distance	43.6	38.5	49.4	43.9	2.8
Post orbital distance	48.6	41.8	49.6	45.2	2.2
Inter orbital width	40.5	34.2	65.9	42.1	7.2
Eye diameter	13.5	11.4	17.1	13.8	1.5
Maximum body depth	76.8	59.4	87.3	77.3	6.1
Length of caudal fin	74.1	71.1	100.9	80.8	8.6
Mouth width	51.7	27.2	51.7	32.1	7.2
Meristic data					
Dorsal fin unbranched rays	3	2	4	2.9	0.6
Dorsal fin branched rays	7	7½	10½	7.8	0.9
Pectoral fin rays	15	12	16	14.9	1.0
Pelvic fin rays	9	6	10	8.3	1.2
Anal fin unbranched rays	2	2	3	2.1	0.3
Anal fin branched rays	7	5½	7½	5.5	0.8
Lateral line scales	79	64	85	79.6	6.3
Caudal peduncle scales	19	14	23	19.5	2.4
Scales above lateral line	15	15	18	16.1	1.0
Scales below lateral line	12	12	15	13.2	1.2
Predorsal scales	26	25	31	27.5	1.9
Gill rakers	7	6	9	7.2	0.9

in *B. miliaris*; 6.0–9.1% SL in *B. lacerta*; and 6.1–10.4% SL in *B. cyri*), and less scale in caudal peduncle (14–23 vs. 26–29 in *B. karunensis*; 28–35 in *B. miliaris*; 25–32 in *B. lacerta*; and 28–33 in *B. cyri*). It is also discriminated from the other species of the *B. lacerta* group except *B. karunensis* by having a

well-developed middle pad of lower lip (vs. poorly developed or absent). Furthermore, *B. urmianus* is distinguished from *B. karunensis* by having 64–85 (mean 79.6) scales in lateral line (vs. 60–70 (63.1)), more scales below lateral line (12–15 vs. 9–11), less scales of predorsal (25–31 vs. 33–42), maxillary



Figure 3. *Barbus urmianus* sp. nov., IMNRF-UT-1079-3, 5, 11, paratypes, a. 124.0 mm SL, b. 138.2 mm SL, c. 113.4 mm SL. Iran: Western Azerbaijan prov.: Mahabad-Chai at Miriseh village, Beytas Town, Urmia lake Basin.

barbels reaching beyond middle of eye (vs. not reaching), tip of anal fin reaching beyond middle of distance between base of last anal-fin ray and lower caudal-fin origin when pressed to body (vs. not reaching).

Barbus urmianus sp. nov. is also distinguished from *B. cyri* by having 64–85 (mean 79.6) scales in lateral line (vs. 52–69 (59.4)) and more scales below lateral line (12–15 vs. 9–13). In addition, *B. urmianus* sp. nov. is distinguished from *B. lacerta* by having 64–85 (mean 79.6) scales on lateral line (vs. 56–7 (62.9)) and less scales of predorsal (25–31 vs. 35–48). *Barbus urmianus* sp. nov. is also distinguished from *B. miliaris* by having less scales of predorsal (25–31 vs. 37–45) and having wider mouth (17.2–51.7 vs. 12.9–27.2% HL).

Description: For general appearance see Figures 1–3;



Figure 4. Ventral side of head of *Barbus urmianus* sp. nov.

mouth structure Figure 4 and morphometric and meristic data are provided in Table 1. Body elongate and cylindrical, greatest body depth somewhat before dorsal-fin origin decreasing towards middle of caudal



Figure 5. Mahabad-Chai River at Miriseh village, Urmia lake Basin, type locality of *Barbus urmianus* sp. nov..

peduncle, predorsal body profile convex, ventral profile slightly convex. Head deep tapering towards rounded, blunt snout. Dorsal profile of head slightly convex, with no marked hump between head and body. Caudal peduncle 1.7–2.9 times longer than deep. Triangular and pointed axillary scale at pelvic-fin base. Pelvic-fin origin below vertical of last unbranched dorsal-fin ray. Caudal fin forked. Posterior dorsal- and anal-fin margins straight or slightly concave. Tip of anal fin, when pressed to body, passing middle of caudal peduncle. Pectoral fin reaching approximately 55–75% distance from pectoral-fin origin to pelvic-fin origin. Pelvic fin not reaching anus. Snout 48–72% of body depth at dorsal-fin origin. Width of upper lip 4.5–7.5% HL. Lower lip thicker than upper lip, with a well-developed median pad (Fig. 4). Rostral barbel short, not reaching nostril; maxillary barbel 27–45% HL, reaching beyond the middle of the eye. Largest known individual 187 mm SL.

Dorsal fin with 2–4 (mode 3) unbranched rays and $7\frac{1}{2}$ – $10\frac{1}{2}$ branched rays, 50–65% of posterior margin of last unbranched dorsal-fin ray covered with denticles. Anal fin with 2–3 (mode 2) unbranched and $5\frac{1}{2}$ – $7\frac{1}{2}$ branched rays. Pectoral fin with 12–16 (mode

15) rays. Pelvic fin with 6–10 (mode 9) rays. Lateral line with 64–85 (mean 79.6) scales. Scale rows between dorsal-fin origin and lateral line 15–18 (mode 16). Scale rows between pelvic-fin origin and lateral line 12–15 (mode 12). Caudal peduncle scale 15–23 (mode 21). Predorsal scales 25–31 (mode 28) and 6–9 (mode 7) gill rakers on first gill arch. Pharyngeal teeth 1,4-4,1.

Coloration: In live specimens: Body and head yellow to brown, flanks brown, lighter below lateral line; numerous small, irregular dark-brown spots and small blotches on dorsum and flanks, lower number of irregular dark-brown spots in fins; dorsal, pectoral and ventral fins brownish with fade orange colour anteriorly, caudal and anal fins brownish; belly yellowish white; barbell yellowish.

In preservation: Body and head brown with flanks darker above lateral line; belly light brown without spots; dark brown irregular spots and small blotches scattered on entire body; fins cream to yellowish; barbels light brown.

Distribution: *Barbus urmianus* is known from the Mahabad-Chai River, Urmia Lake Basin, Iran (Fig. 5).

Etymology: The species is named for the Urmia Lake basin where the type materials were collected.

Material examined: All from Iran. *Barbus miliaris*: IMNRF-UT-1082, 2, 110.8–119.7 mm SL; Iran: Tehran prov.: Nem River at Harandeh village, Dasht-e Kavir Basin, 35°43'20.9"N 52°39'18.4"E. — ZM-CBSU G1101, 24, 70–97 mm SL; Markazi prov.: Qara Chai (Gharehchai) River, at Jalayer, 34°53'13.9"N 50°02'10.9"E.

Barbus karunensis: ZM-CBSU G1038, 12, 47.0–121.0 mm SL; Iran: Kohgiluyeh and Boyer-Ahmad prov.: Bashar River at Taleghah village 10 km north of Yasuj City, 30°47'27.5"N 51°25'13.3"E.

Barbus lacerta: IMNRF-UT-1080, 10, 67.7–97.8 mm SL; Iran: Kurdistan prov.: Sefidbarg (Leyleh) River Sefid-Barg village, Tigris River drainage, 34°51'75.7"N 46°20'17.6"E. — ZM-CBSU D111, 8, 57–139 mm SL; Iran: Lorestan prov.: Karkheh River at Kashkanrud 25 km west of Khoramabad, 33°35'14"N 47°52'55"E. — ZM-CBSU G964, 4, 104–136 mm SL. Iran: Kermanshah prov.: Leyleh River at Shervineh west of Javanrud, 34°52'29"N 46°21'06"E.

Barbus cyri: MNRF-UT-1081, 15, 44.0–94.5 mm SL; Iran: Guilan prov.: Sefid River at, Rostam-Abad, Caspian Sea Basin. — ZM-CBSU G1125, 24, 69–127 mm SL. Iran: Mazandaran prov.: Tajan River at Sari, 36°12'13.8"N 53°05'10.7"E.

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