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## Original Article

# *Paraschistura ilamensis*, a new species of loach from the Tigris River drainage (Teleostei: Nemacheilidae)

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**Abstract:** *Paraschistura ilamensis*, new species, is described from the Tigris River drainage, Iran. It is distinguished from other species of *Paraschistura* in Iran by a combination of the following characters: emarginate caudal fin, stout, deep and scaled body, deep caudal peduncle, 7-10 irregular and interrupted vertical pale brown bars on flanks, two obvious dark spots on the upper and lower caudal fin unbranched rays, and moveable protuberance at the antero-ventral corner of the eye in males.

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## Introduction

Nemacheilid loaches with about 72 genera and about 793 species are found across Eurasia with one species in northeast Africa (Eschmeyer and Fong, 2011). This family has a great diversity in Iranian interior waters (Coad, 2014). Among the members of Nemacheilids, *Paraschistura* Prokofiev, 2009 is a newly described genus, therefore, not all of its species fully examined and ascribed to it or related genera (Coad, 2014). These small Nemacheilid loaches, with a dark black spot or strip at the base of the anterior dorsal fin rays, are distributed from the upper Tigris River basin, interior water bodies of Turkmenistan and from Iranian Baluchistan east to the upper reaches of the Indus River in Afghanistan and Pakistan (Prokofiev, 2009; Coad, 2014). Many species of this genus were formerly included in the genus *Schistura* McClelland, 1838 (Coad, 2014). Hence, it can be concluded that the genus *Paraschistura* remains poorly studied, and a comprehensive taxonomic revision is still not available.

According to Kottelat (2012), fourteen valid species

are belong to the genus, including *P. alepidota*, *P. bampurensis*, *P. chrysicristinae*, *P. kessleri*, *P. lepidocaulis*, *P. lindbergi*, *P. microlabra*, *P. naseeri*, *P. nielsenii*, *P. pakistanica*, *P. prashari*, *P. punjabensis*, *P. sargadensis*, and *P. turcomanus*. In addition, *P. turkmenicus* described from Turkmenistan suggested a synonym of *P. sargadensis* (Berg 1948-1949) but Bănărescu and Nalbant (1966) consider it to be a valid subspecies, and *P. baluchiorum* described from Pakistan is treated as synonym of *P. bampurensis* according to Nalbant and Bianco (1998).

During the year 2014, we collected and examined materials of all known Iranian species throughout Iran. Comparing the collected loach from the middle part of the Tigris River drainage with nominal species by morphological characters, as well as colour patterns, it became clear that it represents an unnamed species which is described here.

## Material and methods

**Sampling and measurements:** Specimens were collected by electrofishing in 2014. They were fixed

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Figure 1. *Paraschistura ilamensis*, VMFC PSI3-H, holotype, 43 mm SL; Iran: spring Siahgav.

in 5% buffered formaldehyde after anaesthesia, and stored in 72% ethanol. Morphometric characters were measured by a dial caliper to the nearest 0.1 mm. All measurements are made point to point, never by projections. Methods for counts and morphometric measurements were performed based on 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 last two branched rays articulating on a single pterygiophore in the dorsal and anal fins are noted as "1½".

**Abbreviations used:** SL, standard length. HL, lateral head length. VMFC, Vatandoust and Mousavi-Sabet Fish Collection, Tehran. ZMMU, Zoological Museum, Moscow State University, Moscow.

## Results

### *Paraschistura ilamensis*, new species

(Figs. 1-5)

**Holotype:** VMFC PSI3-H, 43 mm SL. Iran, Ilam prov.: spring Siahgav, the Tigris River drainage, 32°51'54"N 47°42'2"E. S. Vatandoust, H. Mousavi-Sabet, H. Bagherpour, M. Cheraghpour, M. Nourmohammadi and A. Jouladeh.

**Paratypes:** VMFC PSI3-P, 30 specimens, 26 - 42 mm SL, same data as holotype.

**Diagnosis:** *Paraschistura ilamensis* is distinguished from the congeners in Iran by a combination of none unique characters including emarginate caudal fin, stout and deep body, scaled body, deep caudal peduncle, 7-10 irregular and interrupted vertical pale brown bars on flanks, two obvious small dark spots on the upper and lower caudal fin unbranched rays, and moveable protuberance at the antero-ventral corner of the eye in males.

**Description:** For general appearance see Figs. 1-5. Measurements of holotype and paratypes are given in Table 1. Body stout (body depth at dorsal fin origin 14.1-18.5% SL,  $16.4 \pm 1.6$ ). Lateral line incomplete, extending to the mid of the dorsal fin base. Mouth arched, upper jaw with developed processus dentiformis. Maxillary barbel long, reaching to the end of the eye and passes it. Outer mandibular barbel extending mid of the eye. Inner mandibular barbel reaching to the maxillary barbel origin. Nostrils proximate to the eyes, with a relatively long tube on the anterior nares opening. Anterior dorsal fin origin located mid dorsum, or slightly posterior. Ventral fin insertion below a vertical of the dorsal fin spines. Developed axillary lobe at the base of pelvic fin, attached to the body.



Figure 2. *Paraschistura ilamensis*, VMFC PSI3-P, paratype; Iran: spring Siahgav; a, 42 mm SL; b, 42 mm SL; c, 41 mm SL; and d, 34 mm SL.

Caudal fin emarginate with round lobes. Very-small scales scattered on all over body. Moveable protuberance at the antero-ventral corner of the eye in males.

Dorsal fin with  $7\frac{1}{2}$  branched rays (simple rays cannot be counted). Anal fin with  $5\frac{1}{2}$  branched rays (simple rays cannot be counted). Pectoral fin with 9 branched rays. Pelvic fin with 7 branched rays. Caudal fin with 8+8 branched rays.

**Colouration:** Body and head pale cream to yellow. 7-10 vertical dark cross bars on flanks, sometimes irregular and interrupted. A pale dark bar at the caudal fin base. Two obvious small dark spots on the

upper and lower caudal fin unbranched rays. 2-3 rows of small dark speckle on caudal fin. An obvious dark blotch present at anterior dorsal fin origin, not appear in life, only a short dark bar is appear on the first spine of the dorsal fin in live specimens. Some specimens have de-pigmented body in life, with no any obvious dark pigmentation (Fig. 5).

**Remarks:** *Paraschistura ilamensis* is distributed in the middle part of the Tigris River drainage, which is geographically separated and morphologically distinct from the congeners. *Paraschistura ilamensis* is the second confirmed species of this genus in the Tigris River drainage, where is the westernmost



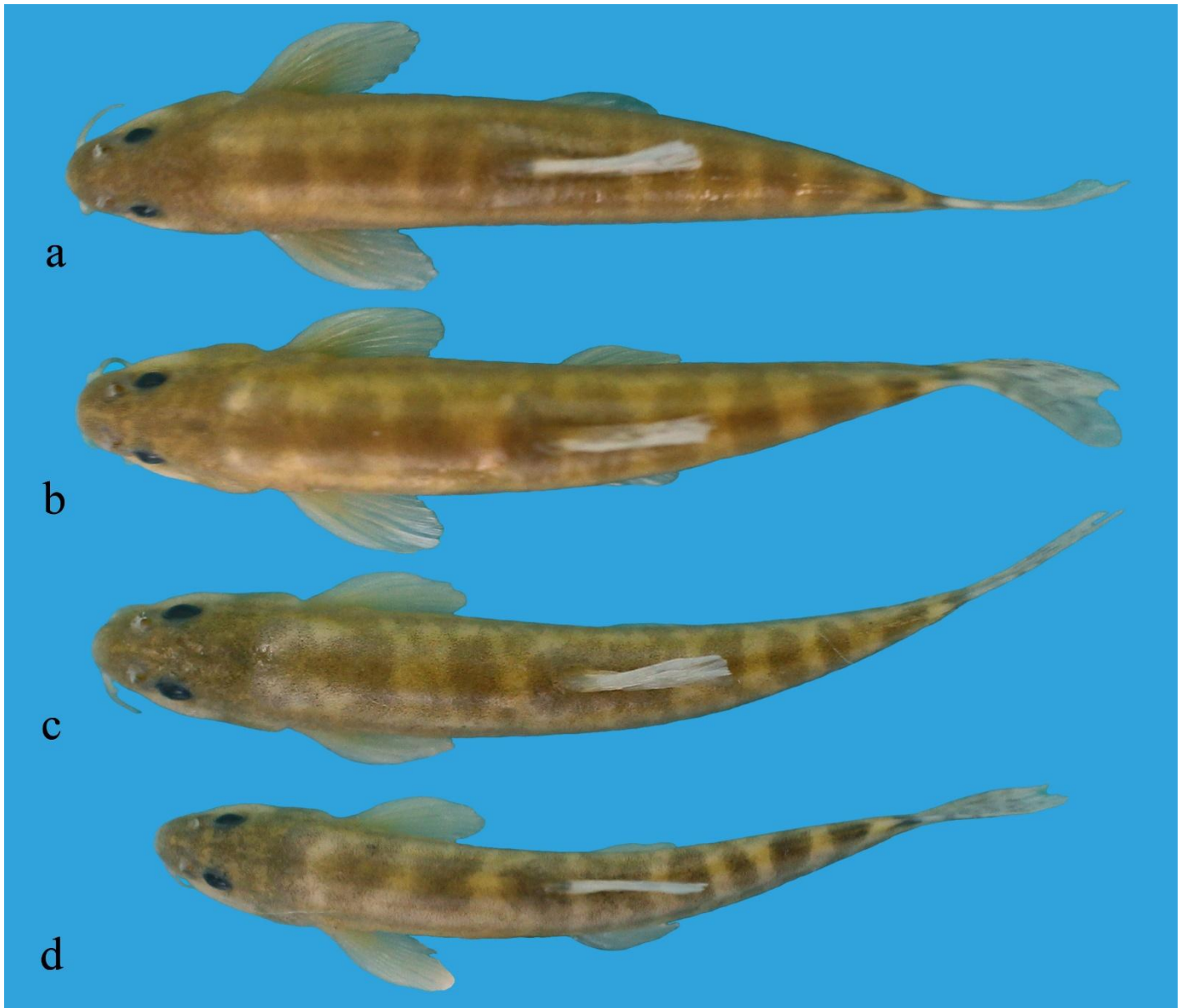


Figure 3. *Paraschistura ilamensis*, VMFC PSI3-P, paratype; Iran: spring Siahgav; a, 42 mm SL; b, 42 mm SL; c, 41 mm SL; and d, 34 mm SL.



Figure 4. *Paraschistura ilamensis*, VMFC PSI3-P, paratype; 41 mm SL; Iran: spring Siahgav.



Figure 5. *Paraschistura ilamensis*, VMFC PSI3-P, paratype; 39 mm SL; Iran: spring Siahgav.

Table 1. Morphometric data of *Paraschistura ilamensis* (n = 17).

	Holotype	Paratypes			
		Min	Max	Mean	SD
Standard length (mm)	43.3	25.6	49.5		
<b>In percent of standard length</b>					
Head length	23.1	23.5	26.8	25.1	1.5
Body depth at dorsal-fin origin	16.9	14.1	18.5	16.4	1.6
Prepectoral length	27.3	27.1	30.1	28.6	1.2
Predorsal length	52.4	52.6	58.2	54.9	2.1
Postdorsal length	35.6	35.5	39.5	37.9	1.6
Preanal length	79.0	76.7	81.0	78.6	1.7
Prepelvic length	53.3	53.5	57.4	55.5	1.7
Distance between pectoral and pelvic-fin origins	30.0	30.2	32.7	31.5	1.0
Distance between pelvic and anal-fin origins	24.9	25.3	29.7	26.9	2.1
Distance between vent and anal-fin origin	3.0	2.6	3.3	3.1	0.3
Depth of caudal peduncle	13.2	10.5	13.3	12.6	1.2
Length of caudal peduncle	18.0	14.6	18.8	16.9	1.6
Dorsal-fin depth	18.9	19.0	22.6	20.7	1.5
Anal-fin base length	6.9	6.8	8.6	7.7	0.6
Pectoral-fin length	21.9	19.0	21.7	20.6	1.2
Pelvic-fin length	17.8	14.8	17.5	16.4	1.1
<b>In percent of head length</b>					
Head depth at eye	49.0	37.3	48.8	43.7	4.3
Snout length	39.0	37.4	40.0	38.9	1.0
Eye diameter	19.0	19.3	25.8	21.4	2.8
Postorbital distance	50.0	45.9	56.5	46.0	4.1
Maximum head width	61.0	48.1	58.0	51.2	4.2
Interorbital width	33.0	23.3	33.0	28.1	4.4

distribution of this genus. *Paraschistura chrysicristinae* (Nalbant, 1998) is the only nominal species from this basin, which is described from eastern Anatolia, Turkey (the upper Tigris basin). Both of these species are characterized by incomplete lateral line, but lateral line in *P. ilamensis* not reaching to the posterior origin of the dorsal fin vs. lateral line in *P. chrysicristinae* passes the dorsal fin and reaching till above the anal fin. *Paraschistura ilamensis* is further distinguished from *P.*

*chrysicristinae* by stout body (vs. elongate), 7-10 vertical dark cross bars on flanks (vs. 13-14), caudal fin with 8+8 branched rays (vs. 8+7), eyes placed in the mid of the head (vs. in the first half of head), and suborbital flap in front of the eye in males (vs. apparently no sexual dimorphism) (Nalbant, 1998). The second closest geographical species with *P. ilamensis* is *P. nielsenii* from the Persian Gulf basin. *Paraschistura ilamensis* is distinguished from *P. nielsenii* by having a deeper body (body depth

14.1-18.5% SL,  $16.4 \pm 1.6$  vs. 13.8-15.5% SL,  $14.6 \pm 1.3$ ), 7-10 vertical dark cross bars on flanks (vs. 7-17), dorsal fin located in the posterior half of the body (vs. dorsal fin placed in the mid dorsal), relatively longer barbels, emarginate caudal fin (vs. deeply emarginate), bigger head (head length 23.5-26.8% SL,  $25.1 \pm 1.5$  vs. 21.0-24.2% SL,  $22.8 \pm 1.1$ ), and caudal fin with 2 rows of dark spots (vs. 3 rows). *Paraschistura ilamensis* is further distinguished from *P. sargadensis* by having a scaled body (vs. scaleless), and a dorsal-fin origin in front a vertical of the pelvic fin origin (vs. slightly behind the pelvic fin origin).

*Paraschistura ilamensis* is further distinguished from the other species of *Paraschistura* in Iran by a combination of characters, none of them unique. In *P. ilamensis* the body has small scales (vs. scales absent in *P. kessleri*), and obvious vertical dark bars are presented on flanks (vs. not regular cross bars in *P. bampurensis*).

**Distribution:** *Paraschistura ilamensis* is found in Siahgav spring near Abdanan, in Ilam province, in the Tigris River basin, west of Iran.

**Etymology:** The species name *ilamensis* comes from the Ilam province, the region where it was found.

**Comparative material:** *Metaschistura cristata*: VMFC MSC, 10 specimens, 59-68 mm SL, Iran, Khorasan prov.: a stream near Mashhad, Hari River basin, H. Mousavi-Sabet A. Jouladeh & B. Ganjbakhsh. *Paraschistura bampurensis*: VMFC PSB-B, 12 specimens, 39-43 mm SL, Iran, Sistan-and-Baluchistan prov.: a qanat near Bampur, S. Eagderi and M. Nasri. *Paraschistura kessleri*: VMFC PSK, 9 specimens, 33-42 mm SL, Iran, Sistan-and-Baluchistan prov.: Mashkid River, near Sarbaz Town, S. Eagderi. *Paraschistura nielsenii*: VMFC PSN, 21 specimens, 31-49 mm SL, Iran, Bushehr prov.: Shapur River, S. Eagderi and H. Mousavi-Sabet. *Paraschistura sargadensis*: VMFC PSS, 18 specimens, 29-41 mm SL, Iran, Sistan-& Baluchistan prov.: a stream, near Zaboli Town (not Zabol), in Mashkid basin, S. Eagderi and M. Nasri. *Paraschistura turcomanus*: ZMMU P-57353, 1 specimen; ZMMU P.5734, 3 specimens; Syntypes.

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