

Taxonomic Status of the Genus *Paraschistura* (Teleostei: Nemacheilidae) in the Hari River Basin, with Re-validation of *P. turcomana*

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Received: July 12, 2015

Accepted: August 23, 2015

Abstract

The genus *Paraschistura* in the Hari River basin is reviewed, and diagnoses are presented for all the three recognized species. *Paraschistura cristata* and *P. turemenica* are considered valid; and *P. turcomana* is revalidated. *Paraschistura turcomana* is a poorly known species from the Kushk River in the Murghab drainage at the border of Afghanistan and Turkmenistan, its validity has been questioned and a synonymy with *P. turemenica* has been suggested. In this study, we compare *P. turemenica* with the syntypes of *P. turcomana*. A comparison with the related taxa *P. cristata* and *P. turemenica* reveals that *P. turcomana* can be separated from them by 7½ branched rays in dorsal fin, scaleless body, elongated and shallow body, shallow caudal peduncle, and colour pattern including obvious dark cross bars. The presence of two additional undescribed species is suggested from the basin.

Keywords: Freshwater Fishes, Loach, Afghanistan, Iran, Turkmenistan.

INTRODUCTION

Nemacheilid loaches with about 72 genera and more than 800 species are found across Eurasia with one species in northeast Africa [7]. Classification of this taxon is complex, and many researchers are trying to determine their taxonomic status [14, 15]. This family has a great diversity in Iranian interior waters [1, 6]. Among the member of Nemacheilids, *Paraschistura* Prokofiev, 2009 is a newly described genus, which is recently reviewed by Freyhof et al. [8] in Iran. The species of this genus 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 [4, 6, 14].

According to Kottelat [10], fourteen valid species were belonged to the genus *Paraschistura*, which are described from Afghanistan (*P. lindbergi*), Pakistan (*P. alepidota*, *P. kessleri*, *P. lepidocaulis*, *P. microlabra*, *P. naseeri*, *P. pakistanica*, *P. prashari*, *P. punjabensis*), Turkey (*P. chrysicristinae*), and Turkmenistan (*P. turcomana*), and the three remain species are endemic to Iran, including *P. bampurensis*, *P. nielseni* and *P. sargadensis*. Vatandoust and Eagderi [16] added one more species by description of *Paraschistura ilamensis* from the Tigris River basin. Freyhof et al. [8] reviewed the genus in Iran and described six new species including; *P. abdoli*, *P. aredvii*, *P. hormuzensis*, *P. naumanni*, *P. pasatigris* and *P. susiani*. Also they suggested that *P. sargadensis* is a synonym of *P. kessleri*, and *P. turcomana* is a synonym of *P. turemenica* [8]. Based on the recent studies on the genus *Paraschistura*, it can be suggested that *P. pasatigris* is a synonym of *P. ilamensis* [16]. In addition, *P. alta* described

from Afghanistan is retained in the genus *Schistura* by Kottelat [10]. Also, *P. baluchiorum* described from Pakistan is treated as the synonym of *P. bampurensis* according to Nalbant and Bianco [12].

The Hari River (called Tedzhen in Turkmenistan and Iran), is an endorheic basin which originates in Afghanistan, passes from northeastern Iran and ends in the Karakum desert in Turkmenistan (Figure 1).

The aim of this study is to investigate; (1) the current taxonomic status of the genus *Paraschistura* in the Hari River basin, and (2) validity of *Paraschistura turcomana* (Nikolskii, 1947; as *Nemacheilus kessleri turcomanus*), which has been suggested as a synonym of *P. turemenica*.

MATERIAL AND METHODS

Sampling

Fish samples were fixed in 5% buffered formalin after anesthesia and then stored in 70% ethanol. Morphometric characters were measured by a dial caliper to the nearest 0.1 mm. All measurements are made point to point based on Kottelat and Freyhof [9]. 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. GUIC, The Collection of the Ichthyology Museum, Department of Fisheries Sciences, Faculty of Natural Resources, the University of Guilan, Guilan Province, Iran. VMFC, Vatandoust and Mousavi-Sabet Fish Collection, Tehran. ZMMU, Zoological Museum, Moscow State University, Moscow.

Comparative material

Paraschistura cristata: VMFC MSC, 10 specimens, 39-68 mm SL, Iran, Khorasan prov.: a stream near Mashhad, Hari River basin, H. Mousavi-Sabet A. Jouladeh & B. Ganjbakhsh. *Paraschistura turcomana*: ZMMU P.5734, ZMMU P.5735, syntypes. *Paraschistura turemenica*: VMFC PST, 11 specimens, 41-58 mm SL, Iran, Khorasan prov.: a stream near Dargaz, Hari River basin, at the border of Turkmenistan, H. Mousavi-Sabet A. Jouladeh & B. Ganjbakhsh.

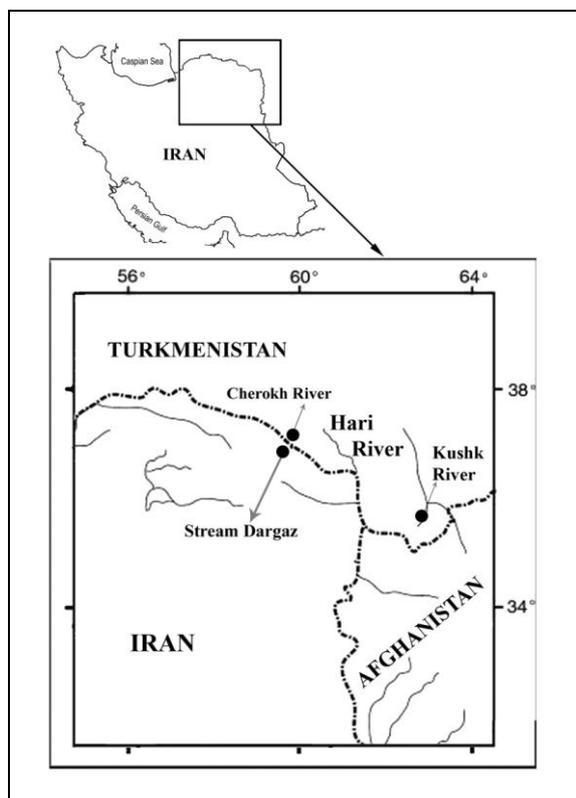


Figure 1. Map of the Hari River basin in northeast of Iran, at the border of Afghanistan and Turkmenistan; showing stream Dargaz in Iran, Cherokh River (the type locality of *Paraschistura turcomana*) and Kushk River (the type locality of *Paraschistura turcomana*) in Turkmenistan.

RESULTS

Paraschistura cristata (Berg, 1898) (Figure 2)
Nemachilus cristatus Berg, 1898: 18

Diagnosis

According to Freyhof et al [8], Azimi et al [2] and examined materials, *Paraschistura cristata* is distinguished from the congeners in the Hari River basin by having a prominent dorsal adipose crest supported by 22-25 procurrent rays of the caudal fin (vs. adipose crest absent, if present, not supported by procurrent rays) and a complete lateral line (vs. incomplete). Other characters useful to identify *P. cristata* are: 9-13 brown bars usually faded or absent on flank in front of dorsal fin origin, regularly shaped and wider than interspaces or dissociated into blotches and irregularly shaped bars; no suborbital groove or flap in males; usually 8½ branched dorsal-fin rays; spot at base of first dorsal-fin rays bold; pelvic fin reaching to or slightly in front of anus.

Distribution

Paraschistura cristata is known from the Hari River basin in Afghanistan, Iran and Turkmenistan.

Remarks

Nemachilus cristatus was described from the Ashgabat River that flows from the northern slope of the Kopetdag to the Karakum desert in Turkmenistan. *Paraschistura cristata* is recognized by a prominent dorsal adipose crest. A dorsal adipose crest is also present in some individuals of *P. turcomana* and *P. turmenica*. *Paraschistura cristata* occurs sympatrically with *P. turmenica* in the Hari River. It is distinguished from this species by a long dorsal adipose crest supported by 22-25 procurrent rays of the caudal fin (vs. adipose crest absent in most individuals, if present, not supported by procurrent rays), a complete lateral line (vs. incomplete), scales on caudal peduncle (vs. absent) and usually 8½, rarely 7½ branched dorsal-fin rays (vs. always 7½).



Figure 2. *Paraschistura cristata*, VMFC MSC, 59 mm SL; Iran: Hari River basin, stream near Mashhad city.

Paraschistura turcomana (Figure 3)

Nemacheilus kessleri turcomanus Nikolskii, 1947: 32, Figure 3.

Diagnosis

Paraschistura turcomana is distinguished from the congeners in the Hari River basin by the colour pattern consisting of obvious dark cross bars along the flanks (vs. vague dark brown spots on flank, or bars usually faded or absent on flank in front of dorsal fin origin), shallow and slender body and caudal peduncle (vs. deep), $7\frac{1}{2}$ branched rays in dorsal fin (vs. $8\frac{1}{2}$ in *P. cristata*), adipose crest absent, if present, not supported by procurrent rays (vs. dorsal adipose crest supported by procurrent rays of the caudal fin in *P. cristata*), and incomplete lateral line (complete in *P. cristata*).

Distribution

Found in the eastern Hari River basin, Murghab drainage, in Afghanistan and Turkmenistan. No record from Iran.

Remarks

Nemacheilus kessleri turcomanus Nikolskii, 1947 was described from the Kushka (Kushk) River in the Murgab (Murghab) drainage in Turkmenistan. Nikolskii [13] and Berg [5] treated *P. turcomana* as a subspecies of *P.*

kessleri, while Bănărescu and Nalbant [3] treated it as a synonym of *P. kessleri*. Kottelat [10] stated that given the remote localities of *P. turcomana* and *P. kessleri* they are unlikely to be synonyms and listed *P. turcomana* as a valid species. Berg [5] distinguished *P. turcomana* from *P. turcmunica* by the position of the dorsal-fin origin, which is reported as situated at the middle between the tip of the snout and the caudal-fin origin in *P. turcomana* vs. behind the middle between the tip of the snout and the caudal-fin origin in *P. turcmunica*, also by the colour pattern of *P. turcomana* which is organized in bars (vs. partly set irregular and dissociated into blotches as in *P. turcmunica*). Freyhof et al [8] by examination of the syntypes of *P. turcomana*, stated that the dorsal-fin position cannot be used to distinguish *P. turcomana* from *P. turcmunica*. They also could not find any differences between *P. turcomana* and *P. turcmunica* in the shape of the snout, their general appearance, the length of the lateral line, the shape of the lips and the position of the fins and the anus, etc., so they treat *P. turcomana* as a synonym of *P. turcmunica*. However, it seems Freyhof et al [8] compared wrong materials of *P. turcmunica*, as; (1) they recognized and illustrated some *Paraschistura* specimens from Kavir basin (different basin from the type locality of the fish), (2) they examined and illustrated small specimens of *P. turcmunica* (which as they stated small specimens has different colour pattern in compare with large specimens).



Figure 3. *Paraschistura turcmunica*, ZMMU P-5734, syntypes of *Nemacheilus turcomanus*; Afghanistan: Kushka River; from above to below: 40 mm SL, 33 mm SL, 30 mm SL.

We examined three syntypes of *P. turcomana* (ZMMU P-5734; Figure 3) and fresh materials of *P. turcomenica* for this study. Based on the examined materials collected from the Hari River basin near the Turkmenistan border (close to the type locality), we suggest that the *Nemacheilus kessleri turcomanus* is a valid and distinct species as *Paraschistura turcomana*. According to the original description and our obtained results, *Paraschistura turcomana* can be easily distinguished from the congeners in the Hari River basin by its colour pattern consisting of obvious dark cross bars along the flanks (vs. vague dark brown spots on flank, tending posteriorly to form transverse bars in *P. turcomenica* and obvious dark cross bars only in posterior flanks in *P. cristata*), 7½ branched rays in dorsal fin (vs. 8½ in *P. cristata*), elongated and shallow body (vs. stout and deep in *P. cristata*), absence of caudal crest or shallow if presented (vs. well-developed deep caudal peduncle crest in *P. cristata*), incomplete lateral line (complete in *P. cristata*), and shallow and elongated caudal peduncle (vs. short and deep in *P. turcomenica*).

***Paraschistura turcomenica* (Berg, 1932)** (Figures 4-5)
Nemacheilus turcomenicus Berg, 1932: 149, Figure 1.

Diagnosis

Paraschistura turcomenica is distinguished from the congeners in the Hari River basin by a colour pattern consisting of vague dark brown spots on flank, tending posteriorly to form transverse bars in both small and large specimens in life and preserved (vs. obvious dark cross bars, at least posteriorly), deeper body and caudal peduncle (vs. shallow and slender in *P. turcomana*), 7½ branched rays in dorsal fin (vs. 8½ in *P. cristata*), and incomplete lateral line (complete in *P. cristata*).

Distribution

Found in the western Hari River basin in Turkmenistan and Iran, and probably in Afghanistan (needs confirmation).



Figure 4. *Paraschistura turcomenica*, VMFC PST, 49 mm SL; Iran: Hari River basin.



Figure 5. *Paraschistura turcomenica*, VMFC PST, 51 mm SL; Iran: Hari River basin.

Remarks

Nemachilus sargadensis turcmenicus Berg, 1932 was described from "einem Bache unweit von der Eisenbahnstation Gjaurs in Turkmenistan (Transkaspien)" near the Iranian border and alternatively from the Kelte-chinar River (Cherokh River) near Gyaurs (37°47'N, 58°44'E), Turkmenistan [6]. Berg [5] synonymises *turcmenicus* with *sargadensis* but Bănărescu and Nalbant [5] consider it to be a valid subspecies, adding a third, *paludani*, from the Kabul River drainage of Afghanistan. Later Mirza et al. [11] separate *paludani* as a distinct species in a different species group from *P. sargadensis*, since *P. sargadensis* has scales, an almost forked caudal fin, a feeble dentiform process and irregular bars on the flank, all in contrast to *P. paludani*. In addition, Kottelat [10] stated that given the remote localities of *turcmenicus* and *sargadensis*; they are unlikely to be synonyms. Freyhof et al [8] considered *P. turcmenicus* as distinct species. However, based on the mentioned history and examined material collected from the Hari River basin near the Turkmenistan border (close to the type locality), we recognized *P. turcmenicus* as a valid and distinct species. According to Berg [5] and our obtained results, *P. turcmenicus* is distinguished from the congeners in the Hari River basin by a colour pattern in both live and preserved specimens consisting of vague dark brown spots on flank, tending posteriorly to form transverse bars, 7½ branched rays in dorsal fin, elongated and shallow body and caudal peduncle.

DISCUSSION

Taxonomic status the genus *Paraschistura* in the Hari River basin is reviewed. *Paraschistura cristata* and *P. turcmenicus* are recognized valid and *P. turcomana* is revalidated. Freyhof et al [8] reviewed this genus and suggested *P. turcomana* as a synonym of *P. turcmenicus*, which revalidated here. In addition morphological comparison between the correct materials of *P. cristata* and the other species of this genus, also osteological examination by Azimi et al [2] suggest that synonymy of the genus *Metaschistura* with *Paraschistura* [8] is questioned and needs further studies. Our examined materials showed there are at least two undescribed *Paraschistura* species in the basin. It is concluded that further study needed to clarify the current taxonomic status of the genus *Paraschistura*, and the validity of the genus *Metaschistura*.

Acknowledgments

We are pleased to thank B. Miran and B. Ganjbakhsh for helping with fish collection and University of Guilan for financial support. Also, we would like to thank Prof. Dr. E. D. Vasil'eva (Zoological Museum, Moscow State University) for providing museum specimens.

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