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Article

Taxonomic review of the genus *Capoeta* Valenciennes, 1842 (Actinopterygii, Cyprinidae) from central Iran with the description of a new species

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Abstract

The genus *Capoeta* in Iran is highly diversified with 14 species and is one of the most important freshwater fauna components of the country. Central Iran is a region with high number of endemism in other freshwater fish species, though the present species was recognized as *C. aculeata* (Valenciennes, 1844), widely distributed within Kavir and Namak basins. However previous phylogenetic and phylogeographic studies found that populations of Nam River, a tributary of the Hableh River in central Iran are different from the other species. In this study, the mentioned population is described as a new species based on morphologic and genetic characters.

Keywords: Inland freshwater of Iran, Nam River, Algae-scraping cyprinid, *Capoeta.*
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Introduction

There are 257 fish species in Iranian inland waters under 106 genera, 29 families and Cyprinidae with 111 species (43.19%) is the most diverse family in the country (Jouladeh-Roudbar et al. 2015a, b). Within the family Cyprinidae, the genus *Capoeta* Valenciennes, 1842 with 14 of the approximately 27 described species, is widely distributed in Iranian freshwaters. These species are: *Capoeta aculeata* (Valenciennes, 1844); *C. anamisensis* Zareian, Esmaeili & Freyhof, 2016; *C. barroisi* Lortet 1894 *C. buhsei* Kessler, 1877, *C. capoeta* (Güldenstaedt, 1773); *C. coadi* Alwan, Zareian, & Esmaeili, 2016; *C. damascina* (Valenciennes, 1842); *C. fusca* Nikolskii, 1897; *C. gracilis* (Keyserling, 1861); *C. heratensis* (Keyserling, 1861); *C. mandica* Bianco and Bănărescu, 1982; *C. saadii* (Heckel, 1847); *C. trutta* (Heckel 1843) and *C. umbla* (Heckel, 1843) (Jouladeh-Roudbar et al. 2015b; Alwan et al. 2016; Zareian et al. 2016).

The genus *Capoeta* is distributed through western Asia from Anatolia to the Levant, Transcaucasia, the Tigris and Euphrates basins, Turkmenistan, and northern Afghanistan, occurring in practically all Iranian freshwater bodies (Bănărescu 1999; Levin et al. 2012). They inhabit mainly in fast flowing streams and rivers and are also found in lakes and springs (Turan et al. 2006). The genus *Capoeta* is composed by medium-large species characterized morphologically by a fusiform body with small to moderately large scales and an inferior mouth (Coad 2016). Their lower lip bears a keratinized edge (Howes 1982), and lower one restricted to the corner of mouth allowing them to scrape algae and periphyton on stones in riffles and rapid streams (Turan et al. 2006; Coad 2016). Their dorsal fin is short with the last unbranched ray thickened and having serration (serrations sometimes reduced to absent) (Coad 2016). All species are hexaploid with 2n=150 (Coad 2016) as consequence of hybridization between *Luciobarbus* and *Cyprinion* (Yang et al. 2015).

Previous phylogenetic and phylogeographic studies based on molecular mitochondrial data recognized three main clades within the genus, Mesopotamian clade, Aralo-Caspian Clade and Anatolian-Iranian Clade (Levin et al. 2012; Zareian et al. 2016 a, b; Ghanavi et al. 2016). The Aralo-caspian clade is composed by three valid species distributed within the rivers flowing to the Aral, Orumieh, and Caspian seas, and several rivers in central Iran (Levin et al. 2012; Ghanavi et al. 2016). However, one detailed study of the populations of this clade in Iran,

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found some populations which were not identified as any described species (Ghanavi et al. 2016). Among them, some populations distributed in Nam River from central Kavir basin, traditionally identified as *C. aculeata* (Abdoli 2000). *Capoeta aculeata* (Valenciennes, 1844) was probably described from the Kor River basin, Iran (Cuvier and Valenciennes 1844). *Varicorhinus bergi* Derzhavin, 1929 was described from the Karaj River near Tehran, northern Iran but latter was considered as synonym of *C. aculeate* (Coad and Krupp 1994). Types of *Varicorhinus* (*Capoeta*) *bergi* are unknown (Eschmeyer et al. 1996; Coad 2016). Also, we done intensive field works in the Karaj River (type locality of *Varicorhinus* (*Capoeta*) *bergi*) during past five years, but no individual of this species has been found. Furthermore, the provided data for this species was not enough to distinguish our samples from Nam River, therefore we discard this description for comparison. Hence, the main goal of this work is to study morphologically populations of Nam River, previously assigned as *C. aculeata*, and compare them with the remaining species of this species, consequently and based on differences found, we describe as a new species the populations of the genus *Capoeta* in Kavir basin.

Material and Methods

Thirty-one adult samples of *Capoeta* belonging to the Aralo-caspian clade were collected from the Nam River at Tehran Province (Kavir basin, Iran) by electrofishing device. After an overdose with anaesthesia, samples were fixed in 10% buffered formaldehyde and then kept in 70% ethanol. Fin clips were fixed in 96% ethanol for molecular studies. Samples were deposited in Ichtyological Museum of Natural Resources Faculty - University of Tehran collection.

Morphological examinations: Measurements were performed using digital calipers to the nearest 0.1 mm based on (Kottelat and Freyhof 2007). Standard length (SL) was measured from the tip of the upper jaw to the end of the hypural complex; total length (TL) was measured from the tip of the upper jaw to the end of the longest caudal-fin lobe. Head length and interorbital width were measured to their bony margins. Fin ray counts separate unbranched and branched rays. The last two branched rays articulated on a single pterygiophore in the dorsal and anal-fins are noted as "1½". Mean and standard deviation were calculated without the "½". Lateral-line scales count includes pierced scales, from the first one just behind the supracleithrum to the posteriormost one at the base of the caudal-fin rays (i.e. posterior margin of the hypurals) excluding 1 or 2 scales located on the bases of the caudal-fin rays.

DNA extraction and PCR: DNA was extracted from fin clips using a Genomic DNA Purification Kit (#K0512; Thermo Scientific Corporation, Lithuania) following the manufacturer's protocol. The primers used to amplify the cytochrome *b* gene were GluF (5′ -AACCACCGTTGTATTCAACTACAA-3′) and ThrR (5′ -ACCTCCGAT CTTCGGATTACAAGACCG-3′) (Machordom and Doadrio 2001). Polymerase chain reaction (PCR) conditions were as follows: a 50 µl final reaction volume containing 5 µl of 10X Taq polymerase buffer, 1 µl of (50 mM) $MgCl_2$,1 µl of (10 mM) deoxynucleotide triphosphate (dNTP), 1 µl (10 µm) of each primer, 1 µl of Taq polymerase (5 $U\mu l^{-1}$), 7 µl of total DNA and 33 µl of H_2O. Amplification cycles were as follows: denaturation for 5 min at 94°C; 35 cycles at 94°C for 1 min, 50°C for 1:15 min, 72°C for 1:30 min and a final extension for 10 min at 72°C. PCR products were purified using purification Kit (Expin Combo GP – mini; Macrogen incorporation, Korea). The PCR products were sequenced using Sanger method by a robotic ABI-3130xl sequencer using manufacturer's protocol.

Molecular data analysis: Newly obtained sequences were aligned together with GenBank sequences (Table 1) with CLUSTAL W using default parameters (Larkin et al. 2007), or with Geneious software (Geneious v. 10.0.2, Biomatters, http://www.geneious.com/), and visually verified to maximize positional homology. Sequences of *Luciobarbus capito* (Güldenstädt, 1773) and *Barbus barbus* (L., 1758) species were retrieved from GenBank to be used as outgroup because of their phylogenetic relationship to *Capoeta* (Levin et al. 2012; Yang et al. 2015;

Table 1. Samples used for molecular analysis. GB stands for GenBank accession number.

GB	Organism	GB	Organism
JF798266 JF798267 KM459637 KM459638 KM459640	*Capoeta aculeata*	JF798285 KM459633 KM459634	*Capoeta coadi*
KM459687 KM459688 KM459695 KM459696 KY365752 KY365753 KY365754	*Capoeta alborzensis*	KU167952 KU167953 KU167954	*Capoeta damascina*
KU312380 KU312381	*Capoeta anamisensis*	KU312371 KU312372	*Capoeta fusca*
JF798279	*Capoeta barroisi*	JF798316 JF798317 JF798318 JF798319 KU167893 KU167894	*Capoeta heratensis*
JF798283 KM459623 KM459624	*Capoeta buhsei*	KM459649 KM459650 KM459651	*Capoeta mandica*
KU167936 KU167937 KU167938	*Capoeta capoeta*	KM459631 KM459639 KM459641	*Capoeta saadii*
KC465926	*Barbus barbus*	AF145949 JF798332 KM459673	*Capoeta trutta*
KP712171	*Luciobarbus capito*		

Ghanavi et al. 2016). Uncorrected-p pairwise distances between and within species (Table 2) were calculated with Mega 6 (Tamura et al. 2013). A bootstrapping process was implemented with 1000 repetitions. As multiple tests, P-values were further adjusted by Bonferroni's correction (Rice, 1989). Jmodeltest 2.1.4 (Darriba et al. 2012) selected F81+I+G as the best evolutionary model. RAxML (Stamatakis 2006) implemented in Geneious software was used to estimate the maximum- likelihood (ML) tree. Bayesian inference was conducted with MrBAYES v. 3.2.2 (Ronquist et al. 2012). Two simultaneous analyses were run on $2*10^7$ generations, each with four MCMC chains sampling every 2000 generations. Convergence was checked on Tracer 1.6 (Rambaut and Drummond 2013). After discarding the first 10% of generations as burn-in, we obtained the 50% majority rule consensus tree and the posterior probabilities. To delimit species, a Bayesian Poisson tree process (bPTP) model were used which is based on a distance-based tree (Zhang et al. 2013). bPTP were accessed at Exelixis Labs (http://sco.h-its.org/exelixis/web/software/PTP/index.html).

Abbreviations used: SL, standard length; HL, lateral head length; IMNRFI-UT, Ichtyological Museum of Natural Resources Faculty - University of Tehran.

Results

According to the results, out of 956 bp of partial cytochrome *b*, 786 bp were conserved and 154 bp parsimony informative. Genetic distances between species are listed in Table 2. The Bayesian and ML analyses yielded similar topologies with well-supported taxa (Fig. 1). The reconstructed topology was also in agreement with previously published higher level phylogenies that included *Capoeta* (Levin et al. 2012; Ghanavi et al. 2016). The results revealed the presence of three well-supported clades, Aralo-Caspian, Anatolian-Iranian and Mesopotamian.

Aralo-Caspian Clade: This clade comprises *C. capoeta, C. fusca*, *Capoeta* sp. (from Nam River), C*. aculeata*, and *C. heratensis* from the Orumieh, Hari, Namak, Dasht-e Kavir basins of Iran and *C. ekmekciae* and *C. capoeta* from the Coruh River basin of Turkey, respectively. The members of this clade are found in rivers of the north-

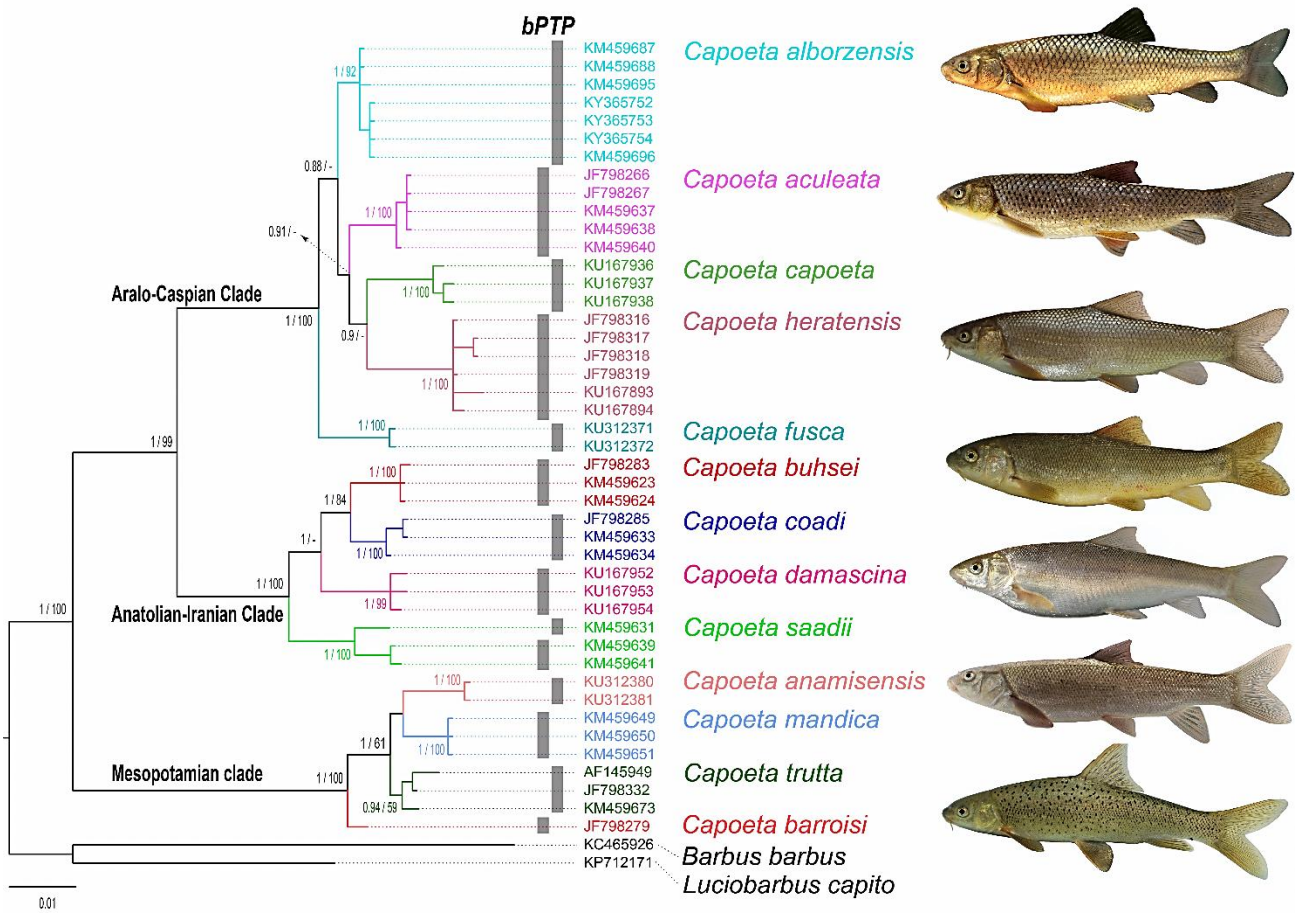

Figure 1. *Capoeta* genus. Values at nodes correspond to BI posterior probability/ML bootstrap. Grey bars represent species delimitated with bPTP method. Pictures corresponds respectively from top to down to *C. alborzensis*, *C. aculeata*, *C. heratensis*, *C. coadi*, *C. damascina*, *C. mandica* and *C. trutta*.

eastern, north and north-western of Iran. The mean genetic distances within this clade was 1.6 % (Table 2).

Anatolian-Iranian Clade: This clade is comprised of *C. saadii*, *C. coadi*, *C. buhsei* and *C. damascina* from the Persis, Tigris and Dasht-e Kavir basins of Iran. The members of this clade are found in middle, west and southwestern Iran. The mean genetic distances within this clade was 2.1% (Table 2).

Mesopotamian Clade: This clade comprises *C. barroisi*, *C. mandica*, *C. trutta* and *C. anamisensis* from the Persis, Orontes, Tigris and Makran basins of Iran. The members of this clade are found in the rivers of the middle, west, south and southwestern Iran. The mean genetic distances within this clade was 1.1% (Table 2).

Capoeta alborzensis, sp. nov.
(Figs. 2-3, Tables 3-8)

Holotype: Figure 2, Table 3, IMNRF-UT-1063-115, 108.5 mm SL; Iran: Tehran prov.: Nam River, tributary of Hableh River, near Harandeh village, 35°42'41.1"N, 52°40'19.7"E, S. Eagderi & A. Jouladeh-Roudbar, September 2014.

Paratypes: IMNRF-UT-1063, 7, 48-136 mm SL; data same as holotype. - IMNRF-UT-2063, 23, 40-163 mm SL; Iran: Tehran prov.: Nam River, tributary of Hableh River, near Arjomand village, 35°48'00.1"N, 52°30'57.8"E, S. Eagderi & A. Jouladeh-Roudbar, September 2014.

Diagnosis: *Capoeta alborzensis* sp. nov. is distinguished from the other species of *Capoeta* in Iran by a combination of characters, none of them unique. One pairs of barbels; snout rounded; 39-44 lateral line scales; 6-8 scales rows between lateral line and dorsal-fin origin, 5-8 between lateral line and anal-fin origin; 19-22 gill

Table 2. Estimates of the average evolutionary divergence between Iranian *Capoeta* species. *within the clade.

Species		1	2	3	4	5	6	7	8	9	10	11	12
C. alborzensis	**1**												
C. aculeata	**2**	1.2											
C. anamisensis	**3**	8.3	8.8										
C. barroisi	**4**	8.0	8.4	1.6									
C. buhsei	**5**	5.5	6.1	8.7	8.3								
C. capoeta	**6**	1.8	2.0	8.0	8.0	6.1							
C. heratensis	**7**	2.1	2.3	9.0	9.1	5.9	2.4						
C. coadi	**8**	5.7	6.2	8.8	7.9	1.6	6.2	6.7					
C. damascina	**9**	5.5	6.1	8.4	7.8	2.4	5.9	6.1	2.2				
C. saadii	**10**	5.8	6.3	8.2	7.8	2.8	6.1	6.4	2.9	3.0			
C. fusca	**11**	1.6	2.2	8.9	8.6	5.7	2.3	2.5	6.3	6.5	6.6		
C. mandica	**12**	8.5	8.9	1.5	1.3	8.5	8.5	9.5	8.1	8.0	8.1	9.1	
C. trutta	**13**	8.3	8.7	1.4	1.0	8.6	8.4	9.2	8.2	8.1	8.1	8.9	1.1

Clades		1	2
Anatolian-Iranian Clade	**1**	*2.1**	
Aralo-Caspian Clade	**2**	*1.6**	6.0
Mesopotamian Clade	**3**	*1.1**	8.2	8.7

Figure 2. *Capoeta alborzensis*, IMNRF-UT- 115, holotype, 108.5 mm SL; Iran: Nam River, Dasht-e Kavir basin.

Figure 3. Live specimen of *Capoeta alborzensis*, IMNRF-UT-111, 106.7 mm SL. Iran: Nam River, Dasht-e Kavir basin.

rakers on the first gill arch; Mouth small and transverse; prepelvic length 53-56 %SL; snout length 31-39 %SL and short barbel 10-12%HL.

Table 3. Morphometric data of *Capoeta alborzensis* (holotype, IMNRF-UT-1063-111; paratypes, IMNRF-1063, 7 specimens and IMNRF-UT-2063, 23 specimens) and *Capoeta aculeata* (IMNRF-UT-1058, 9 specimens).

		Capoeta alborzensis				*Capoeta aculeata*			
	Holotype	**Min**	**Max**	**Mean**	**SD**	**Min**	**Max**	**Mean**	**SD**
Standard length (mm)	108.5	40.5	163.5			53.7	116.7		
In percent of standard length (SL)									
Body depth maximal	25.3	21.8	30.2	26.7	2.0	25.4	29.4	28.1	1.4
Caudal peduncle depth	12.7	11.0	14.3	12.3	0.8	11.2	12.8	11.9	0.5
Predorsal length	53.6	50.1	57.8	54.3	2.0	52.8	57.8	54.9	1.5
Postdorsal length	49.1	47.1	51.3	49.0	1.4	48.1	51.6	49.5	1.1
Prepelvic length	53.8	53.4	56.4	55.4	1.1	56.2	61.6	59.4	1.7
Preanal length	76.2	76.1	80.7	78.2	1.3	77.5	80.9	78.8	1.1
Caudal peduncle length	16.6	14.0	20.0	16.8	1.4	14.9	18.0	16.5	1.0
Dorsal-fin base length	13.6	12.1	21.5	15.3	2.0	12.6	16.0	14.2	1.1
Dorsal-fin depth	18.6	16.1	29.8	21.1	3.3	19.1	23.0	20.9	1.6
Anal-fin base length	8.5	7.5	9.6	8.5	0.7	6.3	7.4	6.9	0.4
Anal-fin depth	14.9	15.1	21.4	18.2	1.8	13.3	17.3	16.1	1.2
Pectoral fin length	18.0	15.9	20.2	18.6	1.1	17.5	22.6	20.3	1.6
Pelvic fin length	15.1	14.0	18.6	16.0	1.2	14.1	17.1	15.8	0.9
Pectoral - pelvic-fin origin distance	33.8	22.2	34.3	31.4	2.4	31.2	38.4	34.4	2.4
Pelvic - anal-fin origin distance	23.2	20.8	26.6	23.9	1.3	19.1	21.8	20.5	0.8
Pectoral - anal-fin origin distance	56.1	47.4	63.9	55.2	3.0	51.0	58.0	54.3	2.2
Caudal-fin length	20.0	18.5	27.7	22.7	2.2	20.7	29.5	25.5	2.9
Body width	17.7	15.7	17.1	16.6	0.5	16.8	18.8	17.9	0.7
Caudal peduncle width	3.3	2.3	3.4	2.9	0.4	2.6	3.4	3.0	0.3
Head length (HL)	20.7	22.4	30.7	25.0	1.9	21.4	29.3	25.0	2.3
In percent of Head length (HL)									
Snout length	27.2	31.0	39.1	34.4	2.0	23.6	29.2	26.7	1.8
Eye horizontal diameter	17.9	15.5	25.8	19.1	2.2	17.9	26.8	22.2	3.5
Postorbital distance	53.0	45.4	52.6	48.6	2.1	46.2	62.4	54.6	5.1
Head depth at nape	82.4	59.8	81.5	70.2	4.8	69.6	88.4	82.5	5.9
Head depth at eye	49.4	49.4	60.0	54.8	3.2	48.5	62.3	54.0	4.1
Head length at nape	93.7	77.0	92.8	85.0	4.3	80.7	96.5	90.0	4.5
Head width	68.9	53.1	71.2	63.0	5.0	55.0	74.0	66.5	5.6
Inter-orbital	43.0	31.9	45.5	39.3	2.6	35.7	50.0	43.0	4.2
Inter-nasal	24.7	22.7	29.9	27.4	2.2	19.9	27.4	25.0	2.5
Mouth width	30.1	16.0	30.2	25.5	2.7	25.8	36.7	30.1	3.1
Barbel length	12.5	10.5	12.1	11.5	1.5	18.4	22.0	20.7	1.8

Description: See Figures 2-3 for general appearance and Tables 4-8 for morphometric and meristic data. A medium-large species with the body moderately elongated and compressed laterally. Dorsal head profile slightly convex. Snout rounded, blunt, triangular in ventral view. Predorsal profile convex, ventral profile straight or slightly convex, a weak keel found in front of dorsal-fin origin. Mouth small and transverse. Upper and lower lips adnate to jaws, Lower jaw almost with a thick horny layer, rostral cap well-developed, partly overlapping upper lip (Fig. 4). One set of thin and short maxillary barble almost reaching to vertical of anterior margin of eye. Pelvic axillary scale triangular and pointed. Dorsal fin with 3-4 simple and 8½-9½ branched rays, outer margin of dorsal fin slightly emarginated. Pelvic fins inserted under anterior third of dorsal-fin base. Last unbranched ray thick, ossified, proximal two thirds rigid with 18-24 serrae on its posterior margin (Fig. 5). Last unbranched ray slightly shorter than first branched dorsal-fin ray, tip soft, serrated along 60-80% of its posterior margin. Caudal fin deeply forked. Pectoral fin with 18-20 branched rays. Pelvic fin with 1 simple and 9 branched rays. Anal fin with 3 simple and 6 branched rays, outer margin convex. Gill rakers19-22, on outer side of first arch. Circum-peduncular scales 16-17. Lateral line complete, totally with 39-44 scales, 6-8 between dorsal-fin origin and lateral line and 5-8 between anal-fin origin and lateral line.

Figure 4. The ventral view of head. *Capoeta aculeata* (left, IMNRF-UT- 1058-120, 100 mm SL) and *Capoeta alborzensis* (right, IMNRF-UT- 115, 108 mm SL).

Figure 5. Last simple of dorsal-fin rays, *Capoeta aculeata* (Above) and *Capoeta alborzensis* (Below) (both samples have same size ≈100 mm).

Figure 6. Nam River, at Harandeh village, Dasht-e Kavir basin, type locality of *Capoeta alborzensis*.

Coloration: In life specimens; dorsal profile is almost entirely black to dark-brown or olive-green, upper side is brownish, belly yellow up to the lateral line, being yellow and sometimes white, and flanks are generally brown. The sides of the head are dark-brown but in ventral view is yellowish. Fins are often light-brown, pelvic and anal fins may be yellowish to hyaline. The dorsal and caudal fins are darker than the lower fins. The peritoneum is black. In preserved specimens: dark brown on back and flanks, yellowish white on belly.

Table 4. Range of meristic features of Iranian *Capoeta* species.

No.	Species	L.L	A.L.L	B.L.L	C.P.S	G.R	Reference
1	*C. aculeata*	39-43	7-8	5-7	16-20	19-23	This study
2	*C. anamisensis*	56-67	11-12	6-8	-	21-25	Zareian et al. (2016)
3	*C. barroisi*	76-84	14-16	10-13	-	26-29	Turan et al. (2006)
4	*C. buhsei*	72-89	13-16	9-13	26-33	12-14	Alwan et al. (2016)
5	*C. capoeta*	51-58	9-11	7-8	19-23	17-29	This study
6	*C. coadi*	70-84	12-17	9-11	26-32	14-18	Alwan et al. (2016)
7	*C. damascina*	64-82	12-17	8-12	23-30	17-25	Alwan (2010)
8	*C. fusca*	46-54	8-10	8-9	19-26	16-20	This study
9	*C. heratensis*	52-61	9-12	7-9	22-25	21-24	This study
10	*C. mandica*	58-68	12-13	8-10	27-33	23-27	Alwan et al. (2016)
11	*C. saadii*	61-78	9-14	6-10	-	12-17	Alwan (2010)
12	*C. trutta*	61-84	8-15	8-11	-	21-31	Alwan et al. (2016)
13	*C. umbla*	86-104	18-24	11-15	32-39	17-20	Esmaeili et al. (2016)
14	*C. alborzensis*	39-44	6-8	5-8	16-17	19-22	This study

Table 5. Number of the lateral-line scales in *Capoeta alborzensis* and *Capoeta aculeate*.

	39	**40**	**41**	**42**	**43**	**44**
C. alborzensis	1	1	5	15	3	5
C. aculeata	3	3	-	2	1	-

Table 6. Number of the scales above the lateral line (A.L.L) and below the lateral line (B.L.L) in *Capoeta alborzensis* and *Capoeta aculeate*.

	A.L.L			
	5	**6**	**7**	**8**
C. alborzensis		6	17	7
C. aculeata			5	4
	B.L.L			
C. alborzensis	4	18	7	2
C. aculeata	4	4	1	

Table 7. Number of the pectoral, pelvic and caudal-fin rays in *Capoeta alborzensis* and *Capoeta aculeate*.

Pectoral fin					**Pelvic fin**					**Caudal fin**		
	16	**17**	**18**	**19**		**8**	**9**	**10**		**19**	**20**
C. alborzensis	3	10	12	5	*C. alborzensis*	1	23	6	*C. alborzensis*	28	2
C. aculeata	1	3	4	1	*C. aculeata*		9		*C. aculeata*	8	1

Table 8. Number of the gill rackers (G.R) and circum-pendicular (C.P.S) scales in *Capoeta alborzensis* and *Capoeta aculeate*.

	G.R							
	16	**17**	**18**	**19**	**20**	**21**	**22**	**23**
C. alborzensis				10	5	10	4	1
C. aculeata				1	1	2	3	2
	C.P.S							
C. alborzensis	2	24	4					
C. aculeata	6	1		1	1			

Habitat. *Capoeta alborzensis* inhabits large streams and is more frequent in the main flow of large rivers. At the Nam River (Type locality, Fig. 6), temperature, pH and conductivity were 24°C, 7.1, 0.675 µS, respectively. In addition, the current was medium to fast, river width about 2-17 m, maximum depth up to 1.5 m, shore grassy, and stream-bed gravel. *Capoeta buhsei*, *Alburnoides coadi*, *Barbus miliaris*, *Squalius namak*, *Oncorhynchus mykiss*, *Paracobitis malapterura* co-exists with *C. alborzensis* in type locality.

Etymology: The species name refers to the Alborz Mountains (Tehran Province, Iran), where the Nam River is originated.

Remarks: *Capoeta alborzensis* is distinguished from *C. aculeata* by shorter prepelvic length (53-56 vs. 56-61 %SL), longer snout (31-39 vs. 24-29 %HL), shorter barbel (10-12 vs. 18-22 %HL), transverse mouth (vs. straight), last unbranched ray weakly ossified and short serrae (more ossified and larger serrated), origin of scales with dark spot (vs. absence of spot on scales) and 13 parsimony-informative position in Cyt *b* gene and 1.2 % uncorrected-p genetic distances (see Tables 2, 3).

Capoeta alborzensis is distinguished from *C. anamisensis*, *C. barroisi*, *C. buhsei*, *C. capoeta*, *C. coadi*, *C. damascina*, *C. fusca*, *C. umbla* and *C. heratensis* by larger scale size and fewer number of scales between dorsal-fin origin and lateral line, number of scales between anal-fin origin and lateral line, circum-peduncular scales, and 1.6 to 8.5% uncorrected-p distance (see Table 2, 3).

Comparative Material: *Capoeta aculeata*: IMNRF-UT-1058, 9, 53-116 mm SL, Iran: Fars prov.: Tange Boragh village, Kor River, Kor river basin, 37°14'46.7"N, 58°08'01.3"E, S. Eagderi & H. Mossavi-Sabet, Aug 2014.

Capoeta capoeta: IMNRF-UT-1067, 15, 66-157 mm SL, Iran: Ardebil prov.: Near Borjloo, Balekhlo River, Caspian Sea basin, 38°00'48.9"N 47°58'27.1"E, S. Eagderi & A. Jouladeh-Roudbar, Jun 2016.

Capoeta fusca: IMNRF-UT-1065, 8, 47-124 mm SL, Iran: North Khorasan prov.: Near Farooj town, at segonbadan village, Qanat-e Segonbadan, 37°14'46.7"N 58°08'01.3"E, S. Eagderi & A. Jouladeh-Roudbar, Jun 2016.

Capoeta heratensis: IMNRF-UT-1064, 15, 116-161 mm SL, Iran: Khorasan-e Razavi prov.: Near Sarakhs, at Pole-e Khaton, Hari River, Hari River basin, 35°56'51.4"N, 61°08'51.0"E, S. Eagderi & A. Jouladeh-Roudbar, Jun 2016.

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