The first new cave fish species , *Cobitis damlae* (Teleostei: Cobitidae) from Turkey

Türkiye'den ilk yeni mağara balığı, *Cobitis damlae* (Teleostei: Cobitidae)

Research Article

Füsun Erkakan*, Filiz Özdemir
[1]Hacettepe University, Faculty of Science Department of Biology, Section of Hydrobiology, Ankara,Turkey.

ABSTRACT

The first new cave loach, *Cobitis damlae*, is caught from the Dalaman river drainage which is flowing in to the karstic plain of Western Turkey. There are caves, Keloğlan and Aslanini I and II in Dodurgalar province, connected with Dalaman river drainage c.a. 30 km. north of the catchment area. The new species probably passed through the surface water because of a heavy rain a week before we caught it. Cobitis damlae differs from its congeners by its mouth structure, fin rays formula, body without pigment, vestigial eyes.

Key Words
Cobitis, Turkey, Cave fish, New species

ÖZET

Bu çalışmada, Türkiye'nin batısındaki karstik alanda akan Dalaman Çayı'ndan yakalanan dikenli taş balığı *Cobitis damlae*, Türkiye'nin ilk yeni mağara balığı olarak tanımlanmıştır. Yakalama alanının yaklaşık 30 km. kuzeyindeki Dodurgalar bölgesinde Aslanini I, Aslanini II ve Keloğlan mağara sistemleri bulunmaktadır. Bu yeni tür, yakalanmasından bir hafta önce bölgede meydana gelen yoğun yağmurdan dolayı yüzey sularına geçmiştir. Cobitis damlae, aynı cinsin diğer türlerinden ağız yapısı, yüzgeçlerindeki ışın sayıları, pigmentsiz oluşu, körelmiş (kalıntı) gözleri ile ayrılmaktadır.

Anahtar Kelimeler
Cobitis, Türkiye, Mağara balığı, Yeni tür

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Correspondence to: F. Erkakan, Hacettepe University Faculty of Science Department of Biology, Beytepe Ankara Turkey.
Tel: +90 (312) 297 8034 Fax: +90 (312) 297 8034 E-Mail: erkakan53@gmail.com

INTRODUCTION

Up till now, there were not any cave fish records in Turkey. According to the present literature, the new species is the first Turkish cave fish. It seems probable that a complex of flooded but narrow and inaccessible passages in karst is the habitat of this species and the well is merely the surface manifestation of this complex [1-5].The specimens were collected from Gölhisar county of Burdur province and described as *Cobitis battalgili* by Bacescu [6]. Later Erkakan et al. [7] considered this new species as a synonym of *C. simplicipina* only based on Bacescu's description and proposed to study the populations from the whole range of *C. simlicipina*. We examined eleven Gölhisar specimens which were caught with this new cave species. We concluded that Cobitis battalgili is valid according to morphological and unpublished molecular data (Project code:COBT, Guelph University, The barcode of life systems, Canada).

MATERIAL AND METHODS

Only one cave fish specimen (Figure1) from Dalaman river drainage between Çavdır-Gölhisar Road (Gölhisar karstic province) was caught. There are caves, Keloğlan and Aslanini I and II in Dodurgalar province, connected with Dalaman river drainage c.a. 30 km. north of the catchment area (Fig. 10 - 11). For definition of the characters of each species, see Economidis and Nalbant [8], and Erkakan et al. [9], We compared this new species with *C. battalgili* which we caught from the same drainage.

Abbreviations:

SL: Standart length in milimeters; HUIC: Ichthyological collection of Hacettepe University.

RESULTS AND DISCUSSION

***Cobitis damlae*, new species** (Figure 1)

Type Material

Holotype: HUIC,1: 64 mm, female, Dalaman stream, Gölhisar province, 37° 08′ 55 66 N, 29° 39′ 42.57

Table 1. Comparisons of meristic characteristics between ***C. battalgili*** and ***C. damlae*** n. sp.

	Cobitis battalgili (n:11)				***Cobitis damlae*** n. sp.(n:1)
Morphometric characteristics	Min	Mak	Av.	Sd.	
Total length (mm)	71	83	76,7		73
Standart length (mm)	62	72	67,1		64
S.L.(%)					
Head length	17,5	19,8	18,5	0,6	17,0
Pre-dorsal length	49,5	53,7	51,7	1,4	50,7
Pre-pelvic length	51,5	54,7	53,8	1,0	56,3
Pre-anal length	75,1	77,5	76,4	0,8	76,4
Body width	9,6	12,6	11,1	1,0	8,8
Body depth	14,7	18,3	16,7	1,1	10,8
Caudal peduncle depth	8,9	11,0	9,9	0,6	8,5
Caudal peduncle length	14,9	17,5	16,0	0,9	15,0
Dorsal fin base length	9,7	11,8	10,8	0,7	11,5
Dorsal fin last simple length	15,3	17,3	16,3	0,5	18,4
Anal fin length	12,1	13,8	12,7	0,5	14,1
Pelvic fin length	9,6	12,0	11,0	0,7	10,0
Pectoral fin length	11,7	13,7	12,7	0,6	12,1
Head length (%)					
Head depth	68,1	71,4	69,7	1,2	63,4
Eye diameter	16,0	20,2	18,4	1,5	19,4
Snouth length	28,4	32,6	30,0	1,5	23,6
Interorbital length	14,9	17,3	16,3	0,8	12,5

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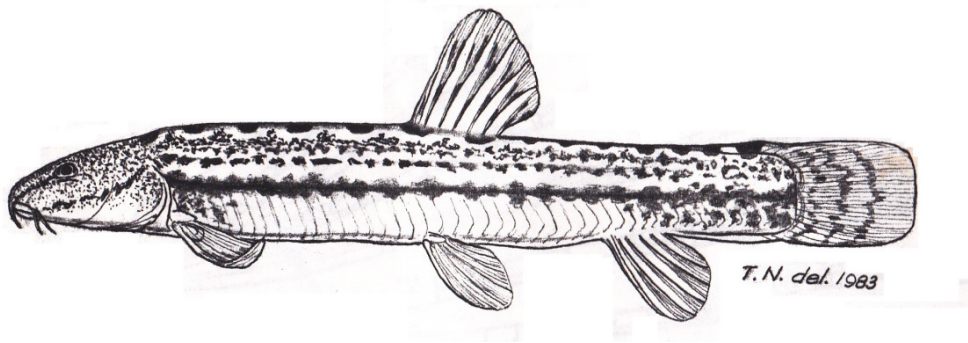

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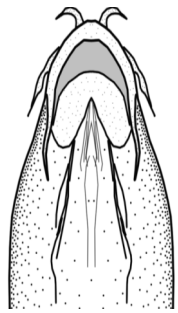

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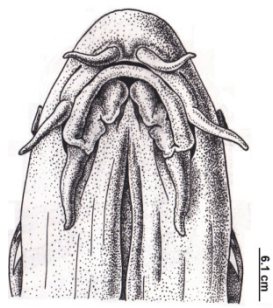

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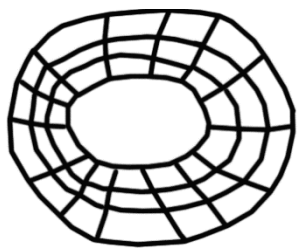

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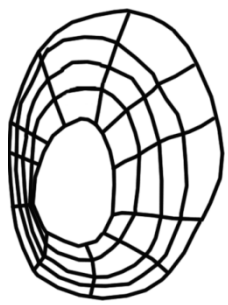

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Figures 1-9. Photographs and drawings of ***Cobitis damlae* n. sp.** (64 mm SL, adult female, holotype, Gölhisar, Turkey) and ***Cobitis battalgili*** (MINB 23, 66.3 mm SL, adult male, Gölhisar, Turkey): **1.** Lateral view of ***C. damlae* n. sp.**, **2.** Lateral view of ***C. battalgili*** (taken from T. Nalbant del. 1983) **3.** Mouth picture of ***C. damlae* n. sp.**, **4.** Mouth drawing of ***C. damlae* n. sp.**, **5.** Mouth drawing of ***C. battalgili*** (taken from T. Nalbant del. 1983), **6.** Suborbital spine drawing of ***C.damlae n. sp.* 7.** Suborbital spine drawing of ***C. battalgili*** (redrawn from T. Nalbant del. 1983), **8.** Scale drawing of ***C. damlae* n. sp. 9.** Scale drawing of ***C. battalgili*** (redrawn from T. Nalbant del. 1983).

Table 2. Comparisons of morphometric characteristics between ***C. battalgili*** and ***C. damlae*** n. sp.

Species	Dorsal fin unbranched rays	Dorsal fin branched rays	Anal fin branched rays	Ventral fin branched rays	Pectoral fin branched rays	Caudal fin rays	N
C.damlae	II	$6^{1/2}$	5	5	$6^{1/2}$	n8+8n	1
C. battalgili	III	8	5–6	5–6	7–8	n7+7n	11

E, July 24, 2013, Leg. Erkakan and Özdemir.

Diagnosis

Cobitis damlae can be distinguished from its congeners by its mouth structure (Figures 3-4); 6,5 branched dorsal fin rays, 6 branched pectoral fin rays, 5 branched pelvic fin rays, 5 branched anal fin rays, n8+8n branched caudal fin rays (Table 2); body without pigment and completely scaled body; vestigial eyes.

Description

D.II/$6^{1/2}$; A.I/5; P.I/$6^{1/2}$; V.I/5; C. n8+8n

The body depth is 10.8% of SL, the head length is 17% of SL, the length of caudal peduncle is 15% of SL, the length of pre-dorsal is 50.7% of SL, the length of pre-pelvic is 56.3% of SL, the head depth is 63.4% of the head length, the eye diameter is 19.4% of the head length, the interorbital length is 12.5% of the head length. (Tables 1-2). The body is compressed and entirely scaled. The scales are oval with relatively large eccentric focus (Figure 8). The head length is longer than the body depth. There are no auxilary lobes at the pectoral and pelvic fins bases. The pelvic fin origin is opposite the same alignment with the base of the first branched dorsal fin ray. The tip of pelvic fin does not reach to the anus. The distal margin of anal fin and caudal fin are almost straight. The head is elongated and compressed. The head length is longer than the head depth. The eye capsules are big but not functional. The nostrils are close to each other, nearer to the base of the suborbital spin than to the tip of the snout. The suborbital spine is rather straight with a relatively developed latero-median process (Figure 6). The mouth is arched with three pairs of short barbels. The upper lip is fleshy without any furrows or papillae. Each side of the lower lip was separated from the other by a mental groove and has fleshy longitudinal smooth and large mental lobes (Figure 4).

Colour pattern

The body is pale and without any pigment on skin but it looks orange because of the blood vessels (Figure 1).

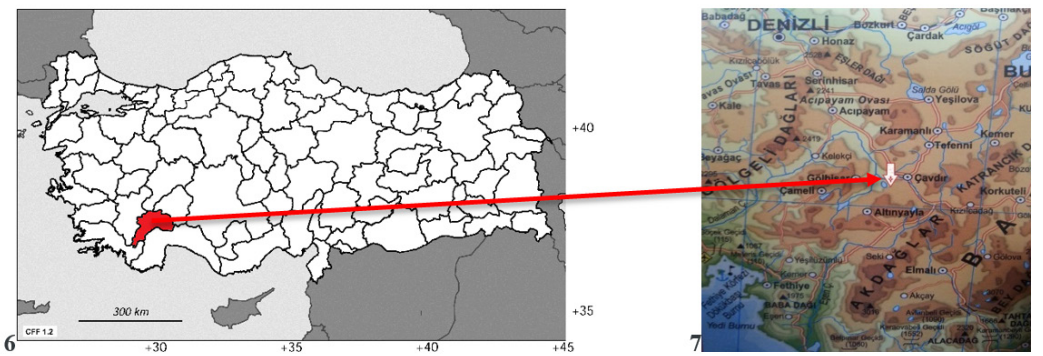
Remarks

According to morphological similarities, this cave fish species is a good evidence of the adaptive evolution of *Cobitis battalgili* living in the same river drainage.

Etymology

This cave fish species is named after Mrs. Damla Erkakan.

Comparision



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Figs. 10-11. Maps of collecting locality **10.** Collecting province in Turkey (Made in CFF [10,11], with modifications),**11.** Catchment area of *Cobitis damlae* (Dalaman stream between Gölhisar and Çavdır counties of Burdur province).

Cobitis damlae is distinguished from *Cobitis battalgili* by its mouth structure, orange colour of body (Figures 1, 3, 4; Figures 2, 5, 7, 9), more flattened head (63,4%, vs. 69,7%) and body (10,8%, vs. 16,7%), branched pectoral fin ray $6^{1/2}$ (vs, 7-8) and caudal fin ray n8+n8 (vs, n7+n7), vestigial eyes and some body proportions (Table 1).

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References

1. A.F. Bruun, E.W. Kaiser, Iranocypris typhlops n. g., n. sp., the first true cave fish from Asia. Danish Scientific Investigations in Iran, 4 (1944) 1.
2. A. Smith, The blind fishes of Persia. Nature, 271 (1978) 711.3.K. Banister, Blind cave fishes. Aqua Geõgraphia. 2 (1992) 65.
4. B.W. Coad, Freshwater Fishes of Iran. www.briancoad.com, 2008.
5. A. Mahjoorazad, B.W. Coad, A new cave fish locality for Iran. Electronic Journal of Ichthyology., 2 (2009) 30.
6. M. Bacescu, Contribution à la systématique du genre Cobitis. Description d'une espèce nouvelle, Cobitis calderoni, provenant de l'Espagne. Revue de Biologie, Académie de la République Populaire Roumaine, Bucarest v. 6 (núm. 4) [1961]: 435-448 [1-14], P l. 1., (1962).
7. F. Erkakan, F.G. Atalay-Ekmekçi, T.T. Nalbant, A review of the genus Cobitis in Turkey (Pisces: Ostariophysi: Cobitidae). Hidrobiologia 403 (1999) 13.
8. P.S. Economidis, T. Nalbant, A study of the loaches of the genera Cobitis and Sabanejewia (Pisces, Cobitidae) of Greece, with description of six new taxa. Trav. Mus Natl. Hist. Nat. 'Grigore Antipa' 36 (1996) 295.
9. F. Erkakan, F.G. Atalay-Ekmekci, T.T. Nalbant, Four new species and one new subspecies of the genus Cobitis (Pisces: Ostariophysi: Cobitidae) from Turkey. Turk. J. Zool., 22 (1998) 9.
10. Y. Barbier, P. Rasmont, Carto Fauna-Flora. Cartographie des données biologiques. Cartography of biological data. Version 1.2 et utilitaires. Version 1.2 and tools. Université de Mons-Hainaut, Mons, Belgium. 62 p. 1996.
11. Y. Barbier, P. Rasmont, Carto Fauna-Flora 2.0. Guide d'utilisation. Universite de Mons-Hainaut, Mons, Belgium, 2000.