

First record of *Cobitis puncticulata* from Europe with comments on its conservation status (Teleostei: Cobitidae)

Jörg FREYHOF¹, Björn STELBRINK¹, Müfit ÖZULUG² and Panos S. ECONOMIDIS³

¹ Leibniz-Institute of Freshwater Ecology and Inland Fisheries, Department of Biology and Ecology of Fishes, Müggelseedamm 310, 12587 Berlin, Germany; e-mail: Freyhof@igb-berlin.de

² Istanbul University, Faculty of Science, Department of Biology, 34459-Vezneciler, Istanbul, Turkey

³ Karakasi str. 79, 54453 Thessaloniki, Greece

Received 20 November 2006; Accepted 21 March 2008

Abstract. *Cobitis puncticulata* is first recorded from Anatolian Lake Ulubat and from Greek lower River Evros drainage.

Key words: occurrence, *C. puncticulata*, Greek Thrace

Cobitis puncticulata (Fig. 1) was recently described from the Lake Manyas (Kuş) drainage in northwestern Anatolia, Turkey (E r k ' a k a n et al. 1998). It is unusual among the species of *Cobitis* in Europe and Asia Minor as it has one lamina circularis in males, but its colour pattern lacks the lateral row of large dark blotches typical for a monogonistricine *Cobitis*, and is instead composed of very tiny dots which ventrally almost reach the origins of the pectoral fins. This pigmentation pattern is more similar to the pigmentation pattern of *Cobitis* species with two laminae circularis (such as *Cobitis turcica* or *C. punctilineata*) (E r k ' a k a n et al. 1998). *Cobitis puncticulata* was only known from the stream Karadere, the outlet of Lake Manyas and was recently listed as Critically Endangered by S m i t h & D a r w a l l (2006), due to the small geographic range (a single locality) and the presumed declining habitat quality.

During field surveys in Greek Thrace in 2005 and Western Anatolia in 2006, *C. puncticulata* was found at two additional localities, one far outside its known distribution range. The species was identified by characters given by E r k ' a k a n et al. (1998) and K o t t e l a t & F r e y h o f (2007). *Cobitis puncticulata* was recorded at the village Lira in a small stream running to the lower River Evros (Greek Thrace, 41°04.348'N; 26°16.034'E) and in the River Ulubat at the road from Bursa to Ulubat (Western Anatolia, the outlet of Lake Apolyont, 40°12.325'N; 28°25.968'E). Also, one individual male paratype from the Department of Biology, Hacettepe University (Ankara) (HUIC) and 10 additional specimens

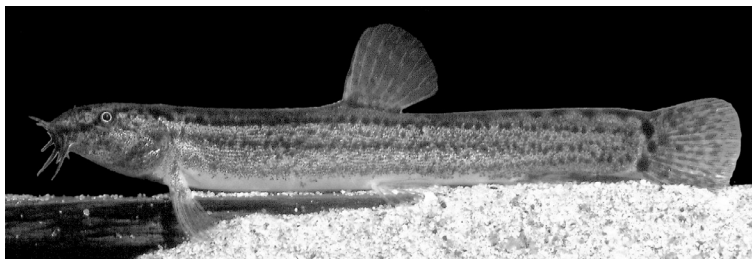


Fig. 1. *Cobitis puncticulata*, Stream at Lira, River Evros drainage, Greece.

from the type locality (stream Karadere, 40°13'36.79''N 28°19'59.45''E) in the fish collection of the University Science Faculty Hydrobiology Museum Istanbul (IUSHM) were examined. Fig. 2 shows the known localities of *C. punctulata*.

The finding of this species in the lower River Evros drainage also suggests the interesting connection of this river to the Marmara Sea basin. The history of communication between the Black Sea, fed by central and northern European drainage systems, the Marmara Sea and the Mediterranean Sea is of fundamental importance in understanding the genesis of the ichthyofauna in this region. The Marmara Sea was first isolated from the more saline Mediterranean water inflow in the Pleistocene and afterwards, temporarily becoming a brackish-water lake at the end of glaciations (Yaltrak et al. 2002). The reconnection of the Marmara and Black Seas to the Mediterranean following the last glaciation (about 16–8,500 BP) has become an issue of intensive study during recent years. Aksu et al. (2004) and Kerey et al. (2004) follow the hypothesis that massive amounts of glacial meltwater from arctic and northern Europe come through the large rivers into the Black and Caspian Seas, while sea levels remained lower worldwide (known as Tschepalyga's flood 16–8,500 BP; Yaltrak et al. 2002). They suggest that during Tschepalyga's flood,

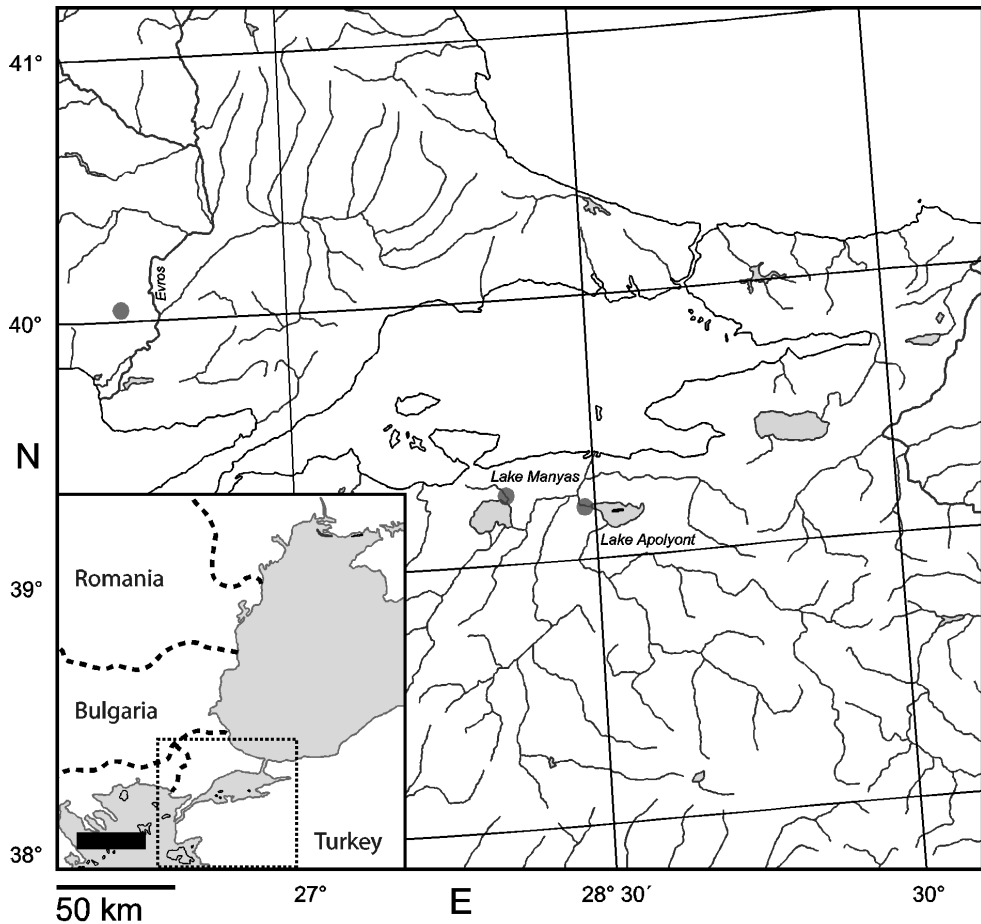


Fig. 2. Findings of *Cobitis punctulata* in Greece and Turkey.

freshwater was discharged from the Black Sea across the Bosphorus to the Marmara and Aegean Seas leading to a freshened area in the northern Aegean Sea during this time (Aksu et al. 2004). The biogeographic connection between the Evros and the Marmara fauna should have its basis with this temporal outflow of Black Sea water to the Aegean during the Pleistocene, already postulated as the so-called River Aegeopotamos by Kossig & Battalgi (1943).

The three locations from which *C. puncticulata* is known can be characterised as slowly flowing streams and rivers. The outlet of Lake Manyas is a medium sized (3–4 m wide), slow flowing (estimated at less than 10 cm/s) and up to 1.1 m deep stream with muddy shores. This habitat was already described by Erk'akan & Ekmeççi (2000). The stream in the River Evros drainage is about 1–2 m wide and almost standing, with dense underwater vegetation and reed stands. The River Ulubat, about 60 m wide, is quite regulated with a slow current and a mud-sand substrate at the place *C. puncticulata* was recorded. At this place, sheep and perhaps other animals come to drink and therefore, the terrestrial part of the shore was without vegetation. In the water, dense stands of *Potamogeton pectinatus* were present. All habitats are subjectively somewhat untypical for *Cobitis* species, being too muddy and too densely vegetated, more resembling the habitats of *Misgurnus fossilis*. It seems that *C. puncticulata* is not restricted to the typical *Cobitis* habitat of fine sand in moderately flowing streams, but rather is associated with muddy and densely vegetated, slow flowing streams or rivers.

It should be mentioned that in *C. puncticulata*, the barbels are held out straight forward, like in a fish that sneaks through a maze and like in *Misgurnus*, but not like a *Cobitis*, which lies on the sand from which it feeds. This parallel between *C. puncticulata* and *Misgurnus* and could indicate a well-developed specialisation in *C. puncticulata*. Interestingly, *C. puncticulata* occurs in sympatry with *C. fahirae* in Lake Manyas (Erk'akan et al. 1999) and the River Ulubat, and with *C. strumicae* in Evros. A co-occurrence of different species of *Cobitis* is rare (Bohlen & Ráb 2001) and indicates niche separation between the species. Because of the two new findings of *C. puncticulata*, the classification of this species as Critically Endangered is no longer needed using the criteria of the IUCN Red List of Threatened Species™. Since the habitat situation in Anatolia is really difficult (e.g. due to the fact that the water level of lakes Manyas and Apolyont are decreasing and both lakes are polluted), a decline of the habitat quality and the loss of habitats might still be suspected.

On the other hand, the habitat situation in the lower River Evros seems not to be critical and a much wider distribution of the species within this drainage could be expected. Small, densely vegetated and deep streams are most likely poorly explored and more findings of *C. puncticulata* may occur in the future. Therefore, we do suggest listing the species as endangered (EN) following the criteria of the IUCN (http://www.iucnredlist.org/info/categories_criteria2001.html#categories), due to suspicions that it occurs at more than five places with independent risk of extinction. *Cobitis puncticulata* should be transferred to a vulnerable conservation status based on the few, small ranges and the declining habitat quality, at least in Turkey (VU B1ab (i,ii,iii,iv) 2ab (i,ii,iii,iv)).

Acknowledgements

The authors are grateful to Füsün Erk'akan (Ankara) for the loan of individual of the type series of *Cobitis puncticulata*.

LITERATURE

- Aksu A.E., Hiscott R.N., Kaminski M.A., Mudie P.J., Gillespie H., Abrajano T. & Yasar D. 2004: Last glacial–Holocene paleoceanography of the Black Sea and Marmara Sea: stable isotopic, foraminiferal and coccolith evidence. *Marine Geology* 190(1/2): 119–149.
- Bohlen J. & Ráb P. 2001: Species and hybrid richness in spined loaches of the genus *Cobitis* L. (Teleostei: Cobitidae.), with a checklist of European forms and suggestions for their conservation. *J. Fish Biol.* 59: 75–89.
- Erk'akan F. & Ekmekçi F.G. 2000: Habitats of *Cobitis fahireae*, *C. puncticulata* and *C. levantina* (Teleostei: Cobitidae) in Turkey. *Folia Zool.* 49 (Suppl. 1): 193–198.
- Erk'akan F., Atalay-Ekmekçi F.G. & Nalbant T.T. 1998: Four new species and one new subspecies of the genus *Cobitis* (Pisces: Ostariophysi: Cobitidae) from Turkey. *Turk. J. Zool.* 22: 9–15.
- Kerey I., Meric E.E., Tunoglu C., Kelling G., Brenner R.L. & Dogan A.U. 2004: Black Sea-Marmara Sea Quaternary connections: new data from the Bosphorus, Istanbul, Turkey. *Palaeogeography, Palaeoclimatology, Palaeoecology* 204: 277–295.
- Kosswig C. & Battalgil F. 1943: Zoogeographie der türkischen Süßwasserfische. *Rev. Fac. Sc. Univ. İstanbul, Série B* 7:145–165.
- Kottelat M. & Freyhof J. 2007: Handbook of European freshwater fishes. *Kottelat (Cornol) and Freyhof (Berlin)*, 640 pp.
- Smith K.G. & Darwall W.R.T. 2006: The Status and Distribution of Freshwater Fish Endemic to the Mediterranean Basin. In: *IUCN Red List of Threatened Species™*.
- Yaltırak C., Sakıncı M., Aksu A.E., Galleb B., Hiscott R.N. & Ülgen U.G. 2002: Late Pleistocene uplift history along the southwestern Marmara Sea determined from raised coastal deposits and global sea-level variations. *Marine Geology* 190 (1): 238–305.