

NEW DATA ON THE DISTRIBUTION OF *COBITIS ELONGATOIDES* BĂCESCU & MAIER, 1969 IN CENTRAL CROATIA WITH ACCOMPANYING ICHTHYOFAUNA

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Presented data brings data on ichthyofauna of four localities on Kupa, Orlijava, Lonja and Glina Rivers of the Sava River basin (Danube drainage) in central Croatia. We have recorded one lamprey and 30 fish species, three of them not native for European fauna and eight threatened in Croatian fauna. We have found three species from the Cobitidae family, *C. elongatoides*, *Misgurnus fossilis* and *Sabanajewia balcanica*. Ecological characteristics of *C. elongatoides* distribution are discussed.

Key words: freshwater fishes, loaches, distribution, Croatia

Delić, A., Bučar, M., Jugović, D., Mihoci, I. & Kučinić, M.: Novi podaci o rasprostranjenosti *Cobitis elongatoides* Băcescu & Maier, 1969 u središnjoj Hrvatskoj i pratećoj ihtiofauni. *Nat. Croat.*, Vol. 18, No. 2., 255–262, 2009, Zagreb.

U radu su prikazani rezultati istraživanja ihtiofaune na četiri lokaliteta na rijekama središnje Hrvatske: Kupe, Orljave, Lonje i Gline (dunavski sliv). Ovim istraživanjima utvrđena je jedna vrsta paklare te 30 vrsta riba, od kojih su tri alohtone u europskoj fauni, a osam je ugroženih u fauni riba Hrvatske. Iz porodice Cobitidae utvrđene su tri vrste: *C. elongatoides*, *Misgurnus fossilis* i *Sabanajewia balcanica*. Raspravlja se o ekološkim osobitostima vezanim za rasprostranjenje vrste *Cobitis elongatoides*.

Ključne riječi: slatkovodne ribe, vijuni, rasprostranjenje, Hrvatska

INTRODUCTION

Data on distribution and ecology of majority of commercially uninteresting fishes in Croatia are relatively poor and inadequate. This is also the case for species from the Cobitidae family, regardless of the numerosity of recent studies (on distribution, taxonomy and ecology) (e.g. MRAKOVČIĆ *et al.*, 2000; SCHNEIDER *et al.*, 2000; DELIĆ *et al.*, 2003a, 2003b, MUSTAFIĆ *et al.*, 2003; BUJ *et al.*, 2008a, 2008b; MIČETIĆ *et al.*, 2008; ZANELLA *et al.*, 2008; JELIĆ *et al.*, 2009). According to MRAKOVČIĆ *et al.* (2008) in Croatia 9 species from the family Cobitidae can be found. One out of four Cobitidae species recorded in the Danube drainage in Croatia is *Cobitis elongatoides* Băcescu & Maier, 1969. This species was mentioned by VUKOVIĆ & IVANOVIĆ (1971), HABEKOVIĆ *et al.* (1986, 1990, 1991, 1997), DELIĆ (1993) and BAKOTA *et al.* (2003) under the name of *Cobitis taenia* Linnaeus, 1758 for waterways of the Danube River basin in Yugoslavia, i.e. Croatia. Under the name of *Cobitis taenia danubialis* it was

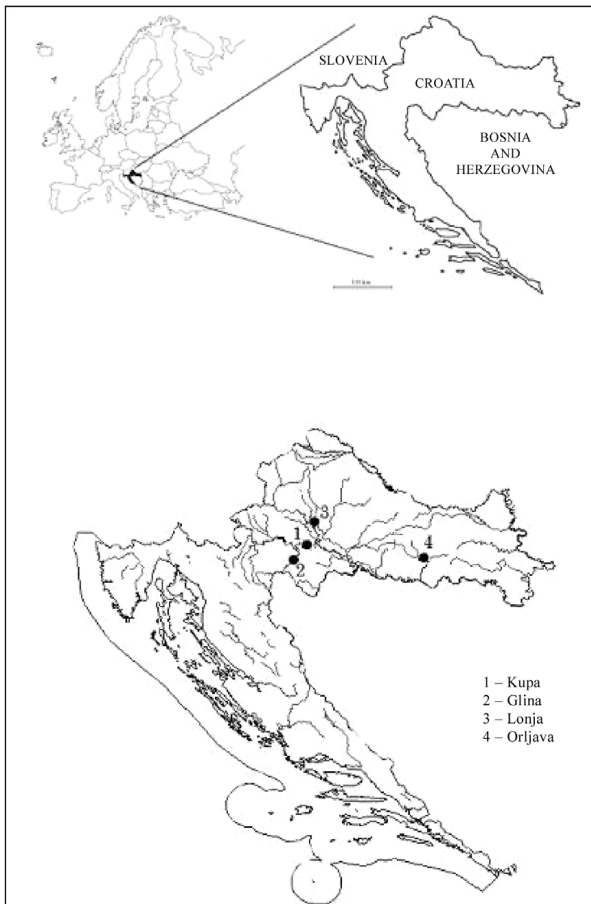


Fig. 1. Researched locations of *Cobitis elongatoides* in Croatia.

mentioned for Croatia (the Danube drainage) by MRAKOVČIĆ *et al.* (2000) and SCHNEIDER *et al.* (2000). Under the name of *C. elongatoides* Băcescu & Maier, 1969 it was detected in streams and rivers in the Sava and Drava River basins (Danube drainage) (DELIĆ *et al.*, 2003; MUSTAFIĆ *et al.*, 2003; MRAKOVČIĆ *et al.*, 2008).

In this study we present only our findings about ichthyofauna on selected sampling sites on four investigated rivers in central Croatia. We focused especially on *Cobitis elongatoides* as well as other species from the Cobitidae family.

MATERIAL AND METHODS

Samples were collected using the 2.5 kW electrofisher, in the period between June and September from 2003 to 2006, at one sampling site on four rivers (Fig. 1): Kupa (locality Brest, lower part of the River Kupa), Orjava (locality Pasikovci, middle part of the Orjava River), Glina (locality Hrvatsko Selo, lower part of the Glina River) and Lonja (locality Stružec, lower part of the Lonja River) in central Croatia (Sava river basin) (Fig. 1).

Substrate type composition on sampling sites of the studied streams was identified visually according to substrate types given in ŠKORIĆ (1965). For indication of water quality the saprobe index (Tab. 1) was estimated according to the standard Pantle-Buck method (PANTLE & BUCK, 1955; SLADEČEK, 1973; WEGL, 1983), while for some streams existing data on results of water quality of Croatia was used (ŠIRAC *et al.*, 2002).

Qualitative and quantitative data were collected on the characteristics of *C. elongatoides* only. For other species we present only data about their presence on investigated locations. *C. elongatoides* specimens collected during research are deposited in the Ichthyological collection of the Faculty of Education, University of Zagreb.

Nomenclature of fishes is given according to KOTTELAT & FREYHOF (2007) with exception of the lamprey.

Tab. 1. Certain characteristics of the investigated rivers from the Danube drainage.

Rivers-locality	Substratum	Saprobic index
Kupa – Brest	dominant g, s, m	β
Orjava – Pasikovci	mosaic: g, s, m	β
Lonja – Stružec	m	β-α
Glina – Hrvatsko Selo	mosaic: g, s, m	β

Explanations: β – betamesosaprobic; α – alfamesosaprobic; g – gravel (Ø 2–20 mm); s – sand (Ø 0,02–2 mm); m – mud (Ø <0,02 mm).

RESULTS AND DISCUSSION

This research is a contribution on ichthyofauna recorded in the Kupa, Orjava, Lonja and Glina Rivers of central Croatia. Results showed that all recorded species are common and expected in waterways of this part of Croatia.

Tab. 2. List of the investigated fish fauna with number of collected specimens of *Cobitis elongatoides* on sampling sites of four investigated rivers in central Croatia, * indicates species not native to European waters (classification according to KOTTELAT & FREYHOF (2007)).

Species	Rivers			
	Kupa	Orljava	Glina	Lonja
Family Petromizontidae				
1. <i>Eudontomyzon</i> sp.	+	+	+	+
Family Cyprinidae				
2. <i>Rhodeus amarus</i> (Bloch, 1782)	+	+	+	
3. <i>Gobio obtisurostris</i> Valenciennes, 1842	+	+	+	+
4. * <i>Pseudorasbora parva</i> (Temminck & Schlegel, 1846)		+		+
5. <i>Barbus balcanicus</i> Kotlik, Tsigenopoulos, Rab & Berrebi, 2002	+	+	+	
6. <i>Carassius gibelio</i> (Bloch, 1782)	+	+	+	+
7. <i>Cyprinus carpio</i> Linnaeus, 1758	+			+
8. <i>Abramis brama</i> (Linnaeus, 1758)				+
9. <i>Alburnoides bipunctatus</i> (Bloch, 1782)		+	+	
10. <i>Alburnus alburnus</i> (Linnaeus, 1758)	+	+	+	+
11. <i>Blicca bjoerkna</i> (Linnaeus, 1758)				+
12. <i>Chondrostoma nasus</i> (Linnaeus, 1758)	+		+	
13. <i>Leuciscus leuciscus</i> (Linnaeus, 1758)	+	+	+	
14. <i>Phoxinus phoxinus</i> (Linnaeus, 1758)		+	+	
15. <i>Rutilus virgo</i> (Heckel, 1852)	+			
16. <i>Scardinius erythrophthalmus</i> (Linnaeus, 1758)				+
17. <i>Squalius cephalus</i> (Linnaeus, 1758)	+	+	+	
18. <i>Vimba vimba</i> (Linnaeus, 1758)	+			
Family Cobitidae				
19. <i>Cobitis elongatoides</i> Băcescu & Maier, 1969	35	18	33	38
20. <i>Misgurnus fossilis</i> (Linnaeus, 1758)	+		+	+
21. <i>Sabanejewia balcanica</i> (Karaman, 1922)	+			
Family Nemacheilidae				
22. <i>Barbatula barbatula</i> (Linnaeus, 1758)		+	+	
Family Ictaluridae				
23. * <i>Ameiurus nebulosus</i> (Leseur, 1819)				+
Family Siluridae				
24. <i>Silurus glanis</i> Linnaeus, 1758	+		+	+
Family Esocidae				
25. <i>Esox lucius</i> Linnaeus, 1758	+		+	+
Family Lotidae				
26. <i>Lota lota</i> (Linnaeus, 1758)	+			
Family Centrarchidae				
27. * <i>Lepomis gibossus</i> (Linnaeus, 1758)				+

Tab. 2. continued

Species	Rivers			
	Kupa	Orljava	Glina	Lonja
Family Percidae				
28. <i>Gymnocephalus cernua</i> (Linnaeus, 1758)	+			+
29. <i>Perca fluviatilis</i> Linnaeus, 1758	+	+	+	
30. <i>Sander lucioperca</i> (Linnaeus, 1758)	+			+
31. <i>Zingel streber</i> (Siebold, 1863)	+			

In four sampled waterways, one lamprey species *Eutondomyzon* sp. (metamorphosized specimens and ammocoetes) and 30 fish species from nine families were recorded (Tab. 2). The highest number of 17 species belongs to the Cyprinidae family. The highest number of 22 species is recorded for the Kupa River, and the lowest of 14 in the Orljava River. Of particular interest are findings of *Rutilus virgo* (Heckel, 1852), *Vimba vimba* (Linnaeus, 1758) and *Lota lota* (Linnaeus, 1758) in the Kupa River locality with dominant gravel on the river bottom, and *Abramis brama* (Linnaeus, 1758), *Blicca bjoerkna* (Linnaeus, 1758) and *Scardinius erythrophthalmus* (Linnaeus, 1758) in Lonja River locality, with dominant organic mud.

MRAKOVČIĆ *et al.* (2006) listed three species of lampreys, *Lampetra planeri* (Bloch, 1784), *Eudontomyzon danfordi* (Regan, 1911) and *Eudontomyzon mariae* (Berg, 1931) for streams of Danube drainage part of Croatia, but according to KOTTELAT & FREYHOF (2007) *E. vladykovi* Oliva & Zanandrea, 1959 is the only lamprey present in this part of Croatia. On the contrary, detailed morphological analysis of all lamprey specimens collected in the area of this part of Croatia showed that *E. mariae* is the only lamprey species here (HOLČIK & DELIĆ, 2000). According to KOTTELAT & FREYHOF (2007) *E. mariae* is distributed only in northern and eastern parts of Europe (Baltic, northern Black and Caspian Sea, Morava system), far away from Croatia. Future studies should be focused on genetic population research to explain taxonomical status of lamprey species present in northern part of Croatia.



Fig. 2. *Cobitis elongatoides* from the Lonja River, Croatia (Foto: A. Delić).

The most faunistically interesting finds are that of species from the family Cobitidae. Important data on diversity of Cobitidae family in the central Croatia is presented by MRAKOVČIĆ *et al.* (2000), DELIĆ *et al.* (2003a) and MUSTAFIĆ *et al.* (2003). They give data on four Cobitidae species present in central part of Croatia: *C. elongata* Heckel & Kner, 1858, *C. elongatoides*, *Misgurnus fossilis* (Linnaeus, 1758) and *Sabanajewia balcanica* (Karaman, 1922). In our research we recorded only three species from the family: *C. elongatoides*, *Misgurnus fossilis* and *Sabanajewia balcanica*.

Danubian spined loach *C. elongatoides* (Fig. 2) was found on all sampling sites, in relatively numerous populations (Fig. 1, Tab. 2), and this species was predominant comparing to two other Cobitidae, *S. balcanica* and *M. fossilis*. All investigated rivers are environmentally relatively well preserved with a low number of nearby settlements and, except for the investigated part of the Lonja River, with high diversity of microhabitats. Substrate on all other three localities of the rivers studied consisted of sand, gravel and organogenetic mud (Tab. 1), but only the Kupa River locality bottom consisted predominantly of gravel. According to KOTTELAT & FREYHOF (2007) *C. elongatoides* habitats are flowing or still waters ranging from small brooks to large rivers, springs, lakes and oxbows on sandy, silty or muddy bottom. The same habitat characteristics are mentioned in MRAKOVČIĆ *et al.* (2008) for this species in Croatia and in POVŽ & ŠUMER (2000) for Slovenia. *C. elongatoides* was found along with *M. fossilis* in three sampling sites of investigated rivers, while in Kupa River (gravel bottom substrate dominant!) it shared habitat with *S. balcanica* too. Existing data show that *C. elongatoides* (Fig. 2) is probably widespread in all small rivers of the Sava and Drava tributaries (Danube basin) in Croatia. On researched waterways, beside *Cobitis elongatoides*, we found species typical for lower parts of streams such as *Cyprinus carpio* (Linnaeus, 1758), *Carassius gibelio* (Bloch, 1782), *Alburnus alburnus* (Linnaeus, 1758), *Misgurnus fossilis*, *Silurus glanis* (Linnaeus, 1758), *Perca fluviatilis* (Linnaeus, 1758) and *Sander lucioperca* (Linnaeus, 1758).

Recorded species not native to European waters were *Pseudorasbora parva* (Temminck & Schlegel, 1846), *Ameiurus nebulosus* (Leseur, 1819) and *Lepomis gibbosus* (Linnaeus, 1758). Almost 30% of recorded species are threatened in Croatia and listed in The Red Book of Freshwater Fishes (MRAKOVČIĆ *et al.*, 2006). Listed according to the IUCN threat status, these are *Cyprinus carpio* in endangered (EN) category, *Barbus balcanicus* Kotlik, Tsigenopoulos, Rab & Berrebi, 2002, *Vimba vimba*, *Alburnus alburnus*, *Sabanajewia balcanica*, *Misgurnus fossilis*, *Lota lota* and *Zingel streber* (Siebold, 1863) all in vulnerable (VU) category (MRAKOVČIĆ *et al.*, 2006). Our results confirmed that populations of *C. elongatoides* are quite stable (MRAKOVČIĆ *et al.*, 2008) and it is for this moment not listed on the Red List of freshwater fish of Croatia (MRAKOVČIĆ *et al.*, 2006).

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SAŽETAK

Novi podaci o rasprostranjenosti *Cobitis elongatoides* Băcescu & Maier, 1969 u središnjoj Hrvatskoj i pratećoj ihtiofauni

A. Delić, M. Bučar, D. Jugović, I. Mihoci & M. Kučinić

Od lipnja do rujna u razdoblju od 2003. do 2006. godine izvršena su istraživanja ihtiofaune na četiri lokaliteta na rijekama u središnjoj Hrvatskoj: Kupi, Orljavi, Glini i Lonji. U radu se daju samo rezultati vlastitih istraživanja. Utvrđeno je ukupno 30 vrsta riba i jedina vrsta paklare iz roda *Eudontomyzon*. Najveći broj vrsta utvrđen je u rijeci Kupi (22), a najmanji u rijeci Orljavi (14). Tri utvrđene vrste (*Pseudorasbora parva*, *Ameiurus nebulosus* i *Lepomis gibbosus*) su alohtone u europskoj fauni, a osam vrsta je ugroženo u fauni Hrvatske, što je gotovo 30% zabilježenih vrsta s Crvenog popisa riba Hrvatske (MRAKOVČIĆ et al., 2006): *Cyprinus carpio* u kategoriji ugrožene vrste (EN), *Barbus balcanicus*, *Vimba vimba*, *Alburnus alburnus*, *Sabanejewia balcanica*, *Misgurnus fossilis*, *Lota lota* i *Zingel streber* u kategoriji ranjive vrste (VU). Raspravlja se o taksonomskom statusu paklare roda *Eudontomyzon*, i daje se poseban osvrt na porodicu Cobitidae za koju su utvrđene 3 vrste: *Cobitis elongatoides*, *Misgurnus fossilis* i *Sabanajewia balcanica*. Ovaj rad je ujedno prilog poznavanju rasprostranjenja, staništa i vrsta vezanih za vijuna *C. elongatoides*.