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Short communication

Recent establishment of the invasive Ponto-Caspian mysid (*Hemimysis anomala* G.O. Sars, 1907) in the Hungarian part of the Danube River

Peter Borza

Eötvös Loránd University, Faculty of Science, Institute of Biology, H-1117, Budapest, Hungary
E-mail: borzap@gmail.com

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Abstract

The mysid shrimp, *Hemimysis anomala* G.O. Sars, 1907, has recently colonized the Hungarian reach of the Danube River. It has formed self-sustaining populations. The species has been found in samples collected in September 2004 almost one year earlier than the first record published.

Key words: establishment, *Hemimysis anomala*, Hungary, mysid

The mysid shrimp *Hemimysis anomala* G.O. Sars, 1907 is one of the most successful invaders of European inland and coastal waters and continues to colonize new areas. It has recently been found in England (Holdich et al. 2006), France (Dumont 2006), and the Middle-Danube (see below). The species originates from the Ponto-Caspian region; it is native in the estuarine section of the River Danube. In 1998, however, it turned up in the Austrian reach (Wittmann et al. 1999), leaving a large gap in the known distribution of the species in the Danube. This gap was filled in 2005, when it was found in the Slovakian, Hungarian, Croatian, and Serbian reaches of the river (Wittmann 2007).

The evidence for self-sustaining populations of the species in Hungary is the high abundance observed (Annex 1) and the presence of gravid females (Figure 1) and juveniles. They have been recorded almost exclusively in rip-raps, so they seem to depend on artificial, disturbed habitats.

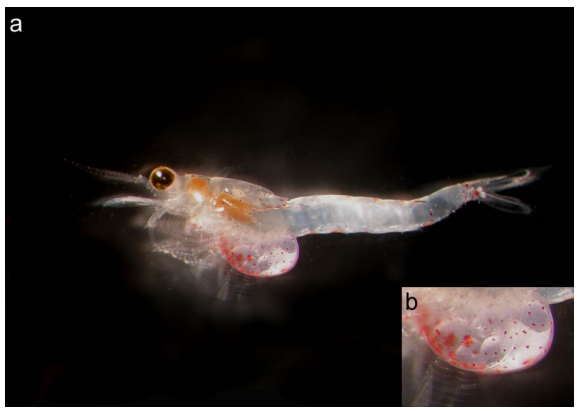

Figure 1. *Hemimysis anomala* a) gravid female b) broodpouch with eggs (photo: J Török).

Our observations on the behaviour of the species correspond with other observations; the animals avoid strong currents and are photophobic. They

show nocturnal activity. During the day they hide in crevices among stones in the deeper waters, by night they migrate to shallower places and may form pelagic swarms. The gender ratio in the samples showed strong variability (SD=0.240) nevertheless, it does not differ significantly from the 1:1 ratio (single sample t-test, t=0.886, df=4, p=0.426, considering only samples containing >10 specimens of identifiable gender).

The first record for Hungary was published by Wittmann (2007) based on a sample of 28/29 July 2005. The author found *H. anomala* in two samples of the Hungarian Danube Research Station of 15 September 2004 from Szigetköz (wetland area of the Danube in north-west Hungary). *H. anomala* can be collected specifically and efficiently only by using special methods and/or gear, and only by night (Odenwald et al. 2005; Bij de Vaate et al. 2002; personal experience). The sampling of September 2004 was not focused on collecting *H. anomala*, the samples were taken during the day and from near-natural sites, so these records can be regarded as incidental.

Identifying the source of the Middle-Danubian populations of the species is not possible on the basis of the currently available data. It can either be the native populations of the estuary, or the invasive populations of the Rhine system, but the latter is more likely (Wittmann et al. 1999; Wittmann 2007).

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Annex 1. Records of *Hemimysis anomala* in the Hungarian part of Danube River in 2004–2007.

Location	Record coordinates		Record date	Species abundance, individuals	Collection method	Collector
	Latitude, °N	Longitude, °E				
Danube, Csákányi-Duna 1	47°57'14.6"	17°21'47.7"	15.09.2004	4	hand net	J. Nosek
Danube, Disznósi-ág	47°57'00.0"	17°22'08.4"	15.09.2004	1	dredge	J. Nosek
Danube, Göd	47°42'11.5"	19°07'43.5"	23.06.2006	1	fish stomach	P.Borza
Danube, Göd	47°41'48.9"	19°07'45.0"	13.09.2006	21	hand net	P.Borza
Danube, Komárom	47°44'58.3"	18°07'16.8"	15-17.05.2007	2	bottle trap	P.Borza
Danube, Csákányi-Duna 2	47°57'03.5"	17°21'44.4"	16-17.05.2007	30	bottle trap	P.Borza
Danube, Csákányi-Duna 2	47°57'03.5"	17°21'44.4"	17.05.2007	56	hand net	P.Borza
Danube, Csákányi-Duna 3	47°57'01.2"	17°21'46.8"	17.05.2007	12	hand net	P.Borza
Danube, Budapest 1	47°29'29.2"	19°03'03.0"	26.05.2007	13	hand net	P.Borza
Danube, Budapest 2	47°31'01.9"	19°02'43.0"	26.05.2007	4	hand net	P.Borza
Danube, Budapest 3	47°32'59.9"	19°03'58.7"	26.05.2007	52	hand net	P.Borza