

First record of alien crustaceans *Atyaephyra desmarestii* (Millet, 1831) and *Jaera istri* Veuille, 1979 from the Czech Republic

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Abstract

The alien crustaceans *Atyaephyra desmarestii* (Millet, 1831) and *Jaera istri* Veuille, 1979 were recorded for the first time in the territory of the Czech Republic. *Atyaephyra desmarestii* was found in May 2007 in the River Elbe near Liběchov and *Jaera istri* was found in August 2008 in the River Elbe at Děčín. Only a single specimen of *Atyaephyra desmarestii* was collected, while *Jaera istri* was found in tens of specimens and was the most numerous aquatic invertebrate on site.

Key words: *Atyaephyra desmarestii*, *Jaera istri*, Elbe, alien species, Czech Republic

The main entrance for alien aquatic invertebrates to the Czech Republic is the River Elbe (Labe). In the last decade, several species have invaded the Czech Republic through the Elbe: *Corbicula fluminea* (O. F. Müller, 1774), *Dikerogammarus villosus* (Sowinsky, 1894), *Hemimysis anomala* (Sars, 1907), and *Caspiobdella fadejewi* (Epstein, 1961). The rapidity of their expansion and their ability to colonize inland waters are surprising. The Asian clam *Corbicula fluminea* was reported for the first time from the Czech Republic in Hřensko in 1999 (Beran 2000), and by 2006 it was present about 83 km further upstream (Beran 2006). By early 2009 it had reached Velký Osek (50°06'09"N, 15°09'27"E), 183 km upstream from Hřensko (Špaček unpubl.). The amphipod *Dikerogammarus villosus*, reported for the first time in 2001 in Hřensko (Špaček et al. 2003), was found in the Vltava river 163 km upstream from Hřensko in 2008 (Berezina and Ďuriš 2008). The mysid *Hemimysis anomala*, reported for the first time in Hřensko in 2003 (Horecký et al. 2005), was found in the Elbe near Jiřice (50°14'09"N, 14°33'37"E), about 128 km upstream, in 2008

(Špaček unpubl.). Spread of the leech *Caspiobdella fadejewi* in the Czech Republic is difficult to study because it is often confused with the common genus *Piscicola* (Schenkova et al. in press).

The species that have colonized the Czech stretch of the Elbe have now been joined by two other alien species – *Atyaephyra desmarestii* (Millet, 1831) and *Jaera istri* Veuille, 1979.

Atyaephyra desmarestii

The freshwater shrimp *Atyaephyra desmarestii* was found for the first time in the territory of the Czech Republic in a hand-net sample on May 2nd, 2007. The sample was obtained by 3 min. of multihabitat kick-sampling in the River Elbe at Liběchov. This site (Figure 1) is located on the right bank of the River Elbe (50°24'08"N, 14°26'58"E) at an altitude of 155 m asl. Only one specimen was collected, and repeated visits did not yield any more shrimps.

The nearest recorded sighting in the River Elbe is close to Tangermünde (Germany) (Thomas Ols Eggers, pers. comm.), which is

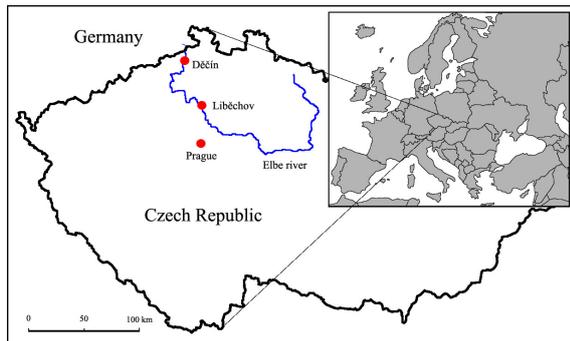


Figure 1. Schematic map of the Czech Republic with records of *Atyaephyra desmarestii* (Liběchov) and *Jaera istri* (Děčín)

approximately 500 km downstream. The individual collected in Liběchov therefore most likely reached the Czech territory via human activities, possibly in ballast water. It is unlikely that the shrimp was released or escaped from aquarium culture, as it is not a commonly bred species; however, this possibility cannot be excluded. Time will show whether this was just a single specimen that did not reproduce, or whether a vital population of this species will settle in the Czech stretch of the Elbe.

The native range of *Atyaephyra desmarestii* is the Mediterranean. At the end of the 19th century, it spread to Western and lately to Central Europe (Tittizer et al. 2000). It is impossible to confuse this species with any other crustacean in Central European inland waters thanks to several morphological features, for example its serrated rostrum (Figure 2) or the presence of a tuft of setae on its chelae (Anastasiadou et al. 2006). We do not consider this species to be a threat to native fauna of the Czech Republic because it seems that in Western and Central Europe it lives at its ecological limits (Van Den Brink and Van Den Velde 1986) and it does not reach densities that could have a negative impact in this area (Grabowski et al. 2005; Wittenberg 2005).

Jaera istri

Jaera istri was found for the first time during a faunistic survey of the Elbe gravel bar at Dětín (Figure 1) on the right bank of the River Elbe (50°46'27"N, 14°12'27"E). Three individuals were found on August 20th, 2008. Two weeks later there were already tens of specimens at this site. Unlike *Atyaephyra*, the invasion of *Jaera* was not surprising because it was known to be present in the German part of the Elbe close to

the border (Beilharz et al. 2005) and it was predicted to reach the Czech stretch within a short space of time (Petrusek 2006). *Jaera* most likely crossed the German-Czech border spontaneously without direct human influence.



Figure 2. *Atyaephyra desmarestii* collected at Labe-Liběchov (body size 25 mm) (Photograph by M. Straka)



Figure 3. *Jaera istri* collected at Labe-Dětín (body size 2.8 mm) (Photograph by J. Špaček)

The native range of *Jaera istri* is in the Ponto-Caspian region. In 1958, it was observed in the upper section of the Danube River (Kothé 1968), then it extended its range to Western Europe through the Main-Danube Canal (Tittizer et al. 2000) and was found for the first time in the Elbe River in 1999 (Bij de Vaate et al. 2002). Confusion with other species known to live in the Czech Republic is unlikely. There are two other species of aquatic isopods living in the Czech stretch of the Elbe – *Asellus aquaticus* (Linnaeus, 1758) and *Proasellus coxalis* (Dollfus, 1892). They differ from *Jaera* (Figure 3) in their body form and size. Interactions between *Jaera istri* and other aquatic invertebrates are not well understood, but a

potential negative effect on native fauna cannot be excluded, mainly due to its high densities (Bernauer and Jansen 2006). It was the most numerous invertebrate on the gravel bottom in Hřensko (Czech-German borders) in autumn 2008, with its population comprising 30% of the total number of aquatic invertebrates.

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References

- Anastasiadou Ch, Kitsos M-S, Koukoras A (2006) Redescription of *Atyaephyra desmarestii* (Millet, 1831) based on topological specimens. *Crustaceana* 79: 1195-1207 [doi:10.1163/156854006778859597](https://doi.org/10.1163/156854006778859597)
- Beilharz M, Koop JHE, Benndorf J (2005) Das Makrozoobenthos der Oberelbe zwischen Regeneration, hydrologischen Störungseignissen und Neozoenproblematik. Tagungsbericht der Jahrestagung 2004 (Potsdam), (Deutsche Gesellschaft für Limnologie) Berlin: 325-329
- Beran L (2000) First record of *Corbicula fluminea* (Mollusca: Bivalvia) in the Czech Republic. *Acta Societatis Zoologicae Bohemicae* 64: 1-2
- Beran L (2006) Spreading expansion of *Corbicula fluminea* (Mollusca: Bivalvia) in the Czech Republic. *Heldia* 6: 187-192
- Berezina NA, Ďuriš Z (2008) First record of the invasive species *Dikerogammarus villosus* (Crustacea: Amphipoda) in the Vltava River (Czech Republic). *Aquatic Invasions* 3 (4): 455-460 [doi:10.3391/ai.2008.3.4.16](https://doi.org/10.3391/ai.2008.3.4.16)
- Bernauer D, Jansen W (2006) Recent invasions of alien macroinvertebrates and loss of native species in the upper Rhine River, Germany. *Aquatic Invasions* 1(2): 55-71 [doi:10.3391/ai.2006.1.2.2](https://doi.org/10.3391/ai.2006.1.2.2)
- Bij de Vaate A, Jadzewski K, Ketelaars HAM., Gollash S, Van der Velde G (2002) Geographical patterns in range extension of Ponto-Caspian macroinvertebrate species in Europe. *Canadian Journal of Fisheries and Aquatic Sciences* 59: 1159-1174 [doi:10.1139/f02-098](https://doi.org/10.1139/f02-098)
- Grabowski M, Jadzewski K, Konopacka A. (2005) Alien Crustacea in Polish Waters – Introduction and Decapoda. *Oceanological and Hydrobiological Studies* 34, Supplement 1: 43-61
- Horecký J, Šporka F, Stuchlík E (2005) First record of *Hemimysis anomala* Sars (Crustacea: Mysidacea) from Czech stretch of Elbe river (Czech Republic). *Lauterbornia* 55: 89-91
- Kothé P (1968) *Hypania invalida* (Polychaeta: Sedentaria) und *Jaera sarsi* (Isopoda) erstmals in der deutschen Donau. *Archiv für Hydrobiologie, Suppl. Donauforschung* 3, Stuttgart, 34: 88-114
- Petrusek A (2006) Korýši (Crustacea). In: Milíkovský J, Stýblo P (eds) *Nepůvodní druhy ve fauně a flóře České Republiky* [Alien species in fauna and flora of the Czech Republic]. ČSOP, Praha, pp 227-229
- Schenkova J, Sychra J, Košel V, Kubová N, Horecký J (2009) Freshwater leeches (Annelida: Clitellata: Hirudinida) of the Czech Republic (Central Europe): check-list, new records, and remarks on species distributions. *Zootaxa* (accepted)
- Špaček J, Koza V, Havlíček V (2003) Isopoda, Amphipoda and Decapoda on monitoring profiles on Labe River in the Czech Republic. In: Bitušík P, Novikmec M (eds) *Proceedings of the 13th Conference of SLS and CLS, Banská Štiavnica, June 2003*. *Acta Facultatis Ecologiae* 10, Suppl. 1:309
- Tittizer T, Schöll F, Banning M, Haybach A, Schleuter M (2000) Aquatische Neozoen im Makrozoobenthos der Binnenwasserstrassen Deutschlands. *Lauterbornia* 39:1-72
- Van Den Brink FWB, Van Der Velde G (1986) Observations on the seasonal and yearly occurrence and the distribution of *Atyaephyra desmarestii* (Millet, 1831) (Crustacea, Decapoda, Natantia) in the Netherlands. *Hydrobiological Bulletin* 19: 2193-2198
- Wittenberg R (ed) (2005) *An inventory of alien species and their threat to biodiversity and economy in Switzerland*. CABI Bioscience Switzerland Centre report to the Swiss Agency for Environment, Forests and Landscape. 416 pp