

NOBANIS –Invasive Alien Species Fact Sheet

Pontogammarus robustoides

Author of this fact sheet: Michal Grabowski, Department of Invertebrate Zoology and Hydrobiology, University of Lodz, Banacha 12/16, 90-237 Lodz, Poland, phone +48-42-635-42-96, fax +48-42-635-46-64, e-mail: michalg@biol.uni.lodz.pl

Bibliographical reference – how to cite this fact sheet:

Grabowski, M. (2011): NOBANIS – Invasive Alien Species Fact Sheet – *Pontogammarus robustoides*. – From: Online Database of the European Network on Invasive Alien Species – NOBANIS www.nobanis.org, Date of access x/x/201x.

Species description

Scientific names: *Pontogammarus robustoides* G.O. Sars, 1894, Pontogammaridae

Synonyms: none

Common names: none



Fig 1. *Pontogammarus robustoides*, photo by Michal Grabowski.

Species identification

Pontogammarus robustoides is relatively easy to recognise. Even young individuals may be identified by characteristic antennae, shape of P7 basis, and urosome armature. Both pairs of antennae (A1 and A2) are short, obese, more or less the same length, first segment of the A1 peduncle is broadened. This type of antennae is described by Stock (1974) as *Pontogammarus* type. The P7 basis has a broad lobe, reaching not further than to the end of the next segment (ischium). The posterior-distal margin of basis P7 as well as the lower margins of coxal plates 1-4 has numerous long setae. The armature of the urosomal segment I is varying from a fan (wachlarz) of delicate setae in medial part to a row of 5-7 spines. On urosome segment II there are always more than 2 spines in mid-dorsal group, usually 4-6. The average body length is some 12mm (range 4.5-21mm) (Eggers and Martens 2001, Konopacka 2004, Konopacka and Jazdzewski 2002).

Native range

It is one of the most common Ponto-Caspian amphipods. Its native range includes coastal zones of Caspian, Azov and Black seas, lower reaches and estuaries of their affluent, as well as fresh and brackish water coastal lakes and limans (specific coastal lakes formed of old river estuaries) in Caucasus, Romania, Bulgaria and Turkey (Dedju 1980, Mordukhai-Boltovskoi *et al.* 1969, Jazdzewski 1980).

Alien distribution

History of introduction and geographical spread.

Since the 1960's *P. robustoides* has been successfully introduced to a number of Ukrainian, Caucasian and Lithuanian artificial dam reservoirs. From the Kaunas Reservoir located on the Neman (Nemunas River) it was transported to several Lithuanian lakes and to the brackish Curonian Lagoon of the Baltic Sea (Gasjunas 1972, Arbaciauskas 2002), and also to lake Võrtsjärv in Estonia where it did not establish a population (Timm 2005). In 1988, the species was found in the Szczecin Lagoon, which is a part of the Oder River deltaic system, and in the mid-1990's it was recorded from the eastern-most part of the Gulf of Finland (Berezina and Panov 2003), as well as from a number of waterbodies and canals in north-eastern Germany (Rudolph 1997, Zettler 1998, Martens *et al.* 1999) and in Poland (Vistula River, Vistula Lagoon, Oder River) (Konopacka 1998, Jazdzewski and Konopacka 2000). In 2009 it was found also in the Gulf of Riga in Estonia (Kalinkina and Berezina 2010).

Pathways of introduction

This species was intentionally introduced to several reservoirs in the former Soviet Union (see above). It is likely that it has spread along the inshore Baltic waters and penetrated inland waters through shipping, probably attached to fouling organisms, as well as by natural migration (Jazdzewski *et al.* 2002, Grabowski *et al.* 2003).

Alien status in region

This species is invasive in several Baltic countries. In Latvia, Estonia, and Kaliningrad County (Russia) it is rather local, restricted to coastal areas and few lakes. In Poland, Germany and Lithuania it is spreading along the large rivers (Vistula, Oder, Neman, Elbe) and navigable canals. It is penetrating artificial reservoirs (Wloclawski Reservoir, Zegrzynski Reservoir) as well as lakes (Mecklenburg lakes) (Arbaciauskas 2002, Jazdzewski *et al.* 2002, Konopacka 2004, Rudolph 1997, Zettler 1998) (see also table 1).

Country	Not found	Not established	Rare	Local	Common	Very common	Not known
Austria							
Belgium							
Czech republic	X						
Denmark	X						
Estonia				X			
European part of Russia				X			
Finland	X						
Faroe Islands	X						
Germany					X		
Greenland	X						
Iceland	X						
Ireland	X						
Latvia				X			
Lithuania				X			
Netherlands	X						
Norway	X						
Poland					X		
Slovakia							
Sweden	X						

Table 1. The frequency and establishment of *Pontogammarus robustoides*, please refer also to the information provided for this species at www.nobanis.org/search.asp. Legend for this table: **Not found** –The species is not found in the country; **Not established** - The species has not formed self-reproducing populations (but is found as a casual or incidental species); **Rare** - Few sites where it is found in the country; **Local** - Locally abundant, many individuals in some areas of the country; **Common** - Many sites in the country; **Very common** - Many sites and many individuals; **Not known** – No information was available.

Ecology

Habitat description

Dedju (1980) describes the species as strictly phytophilous. However, the species is often found also on stony or sand-muddy bottom (Carasu *et al.* 1955, own data).

Reproduction and life cycle

In Central Europe, *Pontogammarus robustoides* has a multivoltine life cycle, with three generations per year (spring, summer and autumn). Reproduction lasts from March/April until October, when the last breeding females are found. The first juveniles appear in May and are present in the population until the end of October. Spring and summer generations mature in a very short time (4–5 weeks). Females born in May and July start breeding at a body length of 8.5 mm, whereas the length of overwintering females breeding in spring, ranges from 11 to 18 mm. The number of eggs laid is exponentially correlated with the size of a female (Bacela and Konopacka 2005).

Dispersal and spread

Most probably the species spreads along the inshore Baltic waters and penetrates inland waters through shipping (Jazdzewski *et al.* 2002, Grabowski and Bacela 2005, Grabowski *et al.* 2003, Reinhold and Tittizer 1997, 1999).

Impact

Affected habitats and indigenous organisms

P. robustoides is a large, competitive and aggressive amphipod species – it is known to predate on other organisms (Oligochaeta, Chironomidae etc., exact data are not available). Thus it may pose a threat to local benthic fauna, including native amphipods (*e.g.* *Gammarus lacustris* in freshwaters). In the brackish Vistula Lagoon a decline of native *Gammarus zaddachi* and *Gammarus duebeni* was reported parallel to the appearance of *Pontogammarus robustoides* and other alien amphipods (Jazdzewski *et al.* 2004). Yet, the true nature of this phenomenon is unknown. In habitats of Lithuanian inland waters where *P. robustoides* is well established and numerous, it significantly reduces species richness and community diversity (Gumuliauskaite & Arbaciauskas 2008). As other gammarids, the species may be a vector of alien parasites and transfer them to local fish species. (*e.g.* Trematoda and Acanthocephala) (Sulgostowska and Vojtkova 1992).

Genetic effects

There are no related native species occurring in central and Western Europe and hybridisation is therefore impossible.

Human health effects

The species does not pose any threat to human health since it is not known to be a vector of any human pathogens.

Economic and societal effects (positive/negative)

The species provides a food base for many local fish species in large rivers (particularly Vistula River) and their estuaries (Szczecin Lagoon, Vistula Lagoon), where native gammarids disappeared most possibly due to pollution (Grabowska and Grabowski 2005, Kostrzewa and Grabowski 2003, unpublished data). On the other hand it may be a vector of alien parasites and transfer them to local fish species.

Management approaches

Prevention methods

None

Eradication, control and monitoring efforts

Monitoring of the species spread in Europe has already been started in several countries (*e.g.* Poland, Germany, the Netherlands). Eradication and control is most probably not possible.

Information and awareness

Some keys for the invasive amphipod species identification are published in Germany (Eggers and Martens 2001), and in Poland (Konopacka 2004, Konopacka and Jazdzewski 2002). But specialist expertise is needed to identify the amphipod species, which makes raising public awareness about

Pontogammarus robustoides very difficult. A further complicating factor is that the species is spread not only with shipping but also naturally along the watercourses.

Knowledge and research

Research is ongoing on the establishment success, life cycle and ecology of the species in the Netherlands, Germany and in Poland.

Recommendations or comments from experts and local communities

Pontogammarus robustoides will continue to spread despite any management initiated. It is virtually impossible to remove the species from already invaded habitats. Also any attempt to control its spreading in inland waters will be of little efficiency.

References and other resources

Contact persons

Michael Zettler (DE), Baltic Sea Research Institute, Seestr. 15 D-18119 Rostock, Germany
michael.zettler@io-warnemuende.de

Thomas Ols Eggers (DE), Institute of Geoecology of the TU Braunschweig, Langer Kamp 19c, 38106 Braunschweig, Germany, t.eggers@tu-braunschweig.de

Kestutis Arbaciauskas (LV), Institute of Ecology, Vilnius University, Akademijos St. 2, LT-08412 Vilnius-21, Lithuania, arbas@ekoi.lt

Alicja Konopacka (PL), Department of Invertebrate Zoology and Hydrobiology, University of Lodz, Banacha 12/16, 90-237 Lodz, Poland, alikon@biol.uni.lodz.pl

Krzysztof Jazdzewski (PL), Department of Invertebrate Zoology and Hydrobiology, University of Lodz, Banacha 12/16, 90-237 Lodz, Poland, kryjaz@biol.uni.lodz.pl

Michał Grabowski (PL), Department of Invertebrate Zoology and Hydrobiology, University of Lodz, Banacha 12/16, 90-237 Lodz, Poland, michalg@biol.uni.lodz.pl

Karolina Bacela (PL), Department of Invertebrate Zoology and Hydrobiology, University of Lodz, Banacha 12/16, 90-237 Lodz, Poland, karolina@biol.uni.lodz.pl

Piotr Gruszka (PL), Department of Marine Ecology and Environmental Protection, Agricultural Academy in Szczecin, ul. Kazimierza Królewicza 4/H, 71-550 Szczecin, Poland, pgruszka@fish.ar.szczecin.pl

Nadezhda Berezina (RU), Zoological Institute, RAS, Universitetskaya emb. 1, 199034 St.-Petersburg, Russia, na-berezina@rambler.ru

Links

[Aliens Species Directory](#)

References

Arbaciauskas K. 2002: Ponto-Caspian amphipods and mysids in the inland waters of Lithuania: history of introduction, current distribution and relations with native malacostracans. [In:] Leppakoski E., Olenin S., Gollasch S. (eds.), Invasive Aquatic Species of Europe: 104-115. Kluwer Acad. Publ., Dordrecht, Boston, London.

- Bacela K., Konopacka A. 2005: The life history of *Pontogammarus robustoides*, an alien amphipod species in Polish waters. *J. Crust. Biol.* 25(2): 190-195.
- Berezina N. A., Panov V. E. 2003: Establishment of new gammarid species in the eastern Gulf of Finland (Baltic Sea) and their effects on littoral communities. *Proc. Estonian Acad. Sci. Biol. Ecol.* 52, 3: 284-304.
- Carausu S., Dobreanu E., Manolache C. 1955: Amphipoda forme salmastre si de apa dulce. *Fauna Rep. popul. Romine, Crustacea*, 4.
- Dedju I. I. 1980: Amfipody presnykh i solonovatykh vod jugozapada SSSR. *Izd. „Shtiinca“*, Kishinev.
- Eggers T.O. and Martens A. 2001: Bestimmungsschlüssel der Süßwasser-Amphipoda (Crustacea) Deutschlands. *Lauterbornia* 42
- Gasjunas I. I. 1972: Obogaschenie kormovoj bazy ryb vodoemov Litvy akklimatizirovannymi rakoobraznymi Kaspijskogo kompleksa. [W:] Virbickas J. (ed.), *Voprosy razvedenija ryb i rakoobraznykh v vodoemakh Litvy*: 57-68.
- Grabowska J., Grabowski M. 2005: Diel-feeding activity in early summer of racer goby *Neogobius gymnotrachelus* (Gobiidae): a new invader in the Baltic basin. *Journal of Applied Ichthyology* 21: 282-286.
- Grabowski M., Bacela K. 2005: First finding of the Ponto-Caspian gammarid species *Pontogammarus robustoides* and *Dikerogammarus haemobaphes* (Crustacea, Amphipoda) in the post-glacial lake of the Vistula valley. *Lauterbornia* 55: 107-111.
- Grabowski M., Jazdzewski K., Konopacka A. 2003: Gammarid invasion routes in Poland – a molecular approach. [In:] Abstracts, XIth International Colloquium on Amphipoda, Tunis, Tunisia, March 25-30/2003, Universite Tunis EL MANAR: 36.
- Gumuliauskaite, S. & K. Arbaciauskas (2008): The impact of the invasive Ponto-Caspian amphipod *Pontogammarus robustoides* on littoral communities in Lithuanian lakes. *Hydrobiologia* 599: 127-134.
- Jazdzewski K. 1980: Range extensions of some gammaridean species in European inland waters caused by human activity. *Crustaceana, Suppl.* 6: 84-107.
- Jazdzewski K., Konopacka A. 2000: Immigration history and present distribution of alien crustaceans in Polish waters. [W:] VON VAUPEL KLEIN J. C., SCHRAM F. R. (eds.), *The biodiversity crisis and Crustacea. Proceedings of 4th International Crustacean Congress*, vol. 2, Brill, Leiden, *Crustacean Issues* 12: 55-64.
- Jazdzewski K., Konopacka A., Grabowski M. 2002: Four Ponto-Caspian and one American gammarid species (Crustacea, Amphipoda) recently invading Polish waters. *Contributions to Zoology* 71(4): 115-122.
- Jazdzewski K., Konopacka A., Grabowski M. 2004: Recent drastic changes in the gammarid fauna of the Vistula River deltaic system in Poland caused by alien invaders. *Diversity and Distributions* 10, 2: 81-88.
- Kalinkina N.M., Berezina N.A. 2010. First record of *Pontogammarus robustoides* Sars, 1894 (Crustacea: Amphipoda) in the Gulf of Riga (Baltic Sea). *Aquatic Invasions* 5 (Suppl. 1): S5-S7
- Konopacka A. 1998: Nowy dla Polski gatunek kielza, *Dikerogammarus haemobaphes* (EICHWALD, 1841) (Crustacea, Amphipoda) oraz dwa inne rzadkie gatunki skorupiakow obunogich w Wisle. *Przegl. Zool.* 3-4: 211-218.
- Konopacka A. 2004: Inwazyjne skorupiaki obunogie (Crustacea, Amphipoda) w wodach Polski. *Przegl. Zool.* 48:141-162
- Konopacka A., Jazdzewski K. 2002: *Obesogammarus crassus* (G.O. Sars, 1894) - one more Ponto-Caspian gammarid species in Polish waters. *Fragm. Faun.* 45:19-26
- Kostrzewa J., Grabowski M. 2003: Opportunistic feeding strategy as a factor promoting racer goby (*Neogobius gymnotrachelus* Pallas, 1811) expansion in the Vistula basin. *Lauterbornia* 48: 91-100.
- Martens A., Eggers T. O., Grabow K. 1999: Erste Funde von *Pontogammarus robustoides* (SARS) im Mittellandkanal (Crustacea: Amphipoda). *Lauterbornia*. 35: 39-42.
- Mordukhai-Boltovskoi F. D., Greze I. I., Vasilenko S. V. 1969: Otrjad amfipody, ili raznonogie - Amphipoda Latreille, 1816-1817. [In:] *Vodjanicki' V.A. (ed), Opredelitel' fauny Chernogo i Azovskogo more*: 440-524, *Izd. „Naukova Dumka“*, Kiev
- Reinhold M., Tittizer T. 1997: Zur Rolle von Schiffen als Vektoren beim Faunenaustausch Rhein/Main/Main-Donau-Kanal/Donau. *Deutsche gewässerkundliche Mitteilungen* 5: 199-205, Koblenz.
- Reinhold M., Tittizer T. 1999: Verschleppung von Makrozoen durch Kühlwasserfilter eines Schiffes. *Wasser und Boden* 51(1+2): 61-66, Berlin.
- Rudolph K. 1997: Zum Vorkommen des Amphipoden *Pontogammarus robustoides* SARS, 1894, im Peenemündungsgebiet. *Natur und Museum* 127: 306-312.
- Stock J. H. 1974: The systematics of certain Ponto-Caspian Gammaridae (Crustacea, Amphipoda). *Mitt. Hamburg. Zool. Mus. Inst.* 70: 75-95.
- Sulgostowska T., Vojtkova L. 1992: The helminth fauna of *Gammarus* spp. (Amphipoda) from the south-east Baltic Sea (Poland), *Acta Parasitol.*, 37 (4), 189–193.
- Timm T., 2005 Kuidas ma loodust ümber kujundasin, *Eesti Loodus* [2005/12. http://www.loodusajakiri.ee/eesti_loodus/artikkel1316_3078.html](http://www.loodusajakiri.ee/eesti_loodus/artikkel1316_3078.html)

Zettler M. L., 1998: Zur Verbreitung der Malacostraca (Crustacea) in den Binnen- und Küstengewässer von Mecklenburg-Vorpommern. *Lauterbornia* 32: 49-65.

Date of creation/modification of this species fact sheet: 14-12-2006/ 06-07-2011