

## A new record of the North American gastropod *Physella acuta* (Draparnaud 1805) from the Neman River Basin, Belarus

Vitaliy Semenchenko\*, Tatiana Laenko and Vladimir Razlutskiy

Scientific and Practical Centre for Bioresources, National Academy of Sciences, 220072, Minsk, Republic of Belarus  
E-mail: [zoo231@biobel.bas-net.by](mailto:zoo231@biobel.bas-net.by)

Received 25 September 2008; accepted in revised form 6 October 2008; published online 7 October 2008

### Abstract

The North American gastropod *Physella acuta* (Draparnaud 1805) has been recorded for the first time in the Neman River basin, Belarus during a biological survey carried out on 23 August 2007. One specimen was found in a shallow water microhabitat (depth 0.2 m) amongst sand and mud. Most likely, this alien gastropod was introduced either by local aquarium keepers, or from Poland via the Augustov canal.

*Key words:* alien species, Gastropoda, *Physella acuta*, new record

On 23 August 2007 one specimen of the invasive North American gastropod *Physella acuta* (Draparnaud, 1805) was found in a hand net sample taken during a survey of the Neman River basin in the Grodno River port (53°40.77'N, 23°46.46'E), Belarus (Figures 1-2). *P. acuta* was found within a typical biotope, in shallow water (depth 0.2 m) with a substrate of sand and mud, and a temperature of 21.5°C. Oxygen content and pH in the biotope was 9 mg l<sup>-1</sup> and 8.1, respectively, and the rate of flow was 0.5 m s<sup>-1</sup>. In this site *P. acuta* occurred simultaneously with two other gastropods - *Lithoglyphus naticoides* (Pfeiffer 1828) and *Radix auricularia* (Linnaeus 1758), which averaged 80% abundance of all mollusks present. Previously in Belarus *P. acuta* was found once only in the Pripyat River (Naumova et al. 1983), but during a later special survey of these sites in 2007 this species was not found. Most likely, this invasive gastropod was introduced by local

aquarium keepers. However, considering that this species is widely distributed in adjacent Poland (Serafinski et al. 1989) and that there is an existing waterway connection between this part of the Neman River and the Vistula River via the Augustov canal (close to the location of this record), this route should also be considered a likely pathway for this introduction.

*P. acuta* is the common species, which has invaded practically all fresh waters of the world, and is common in eastern part of North America and Europe. The species seems to have first spread through Mediterranean regions and then more slowly into northern Europe (Dillon et al. 2002; Taylor 2003).

*P. acuta* is frequently found in anthropogenic reservoirs, occurring in warm water discharges from power stations and in some rivers, but very rarely and not numerously in clay pit ponds (Serafinski et al. 2001). It can survive well under temporary harsh conditions (extreme temperature

and water pollution), as long as they are short-lived (Wethington 2004).



**Figure 1.** *Physella acuta* from the Neman River area (photo by V. Vezhnovetz)



**Figure 2.** Location of record of *Physella acuta* in Belarus

This species successfully co-exists with other alien gastropods: for example with *Potamopyrgus antipodarum* (Gray 1843) in many streams, lakes and ponds in New Zealand (Cope and Winterbourn 2004) and with *L. naticoides* in the Danube River (Kozel 1995). A special study showed that while *P. acuta* forages mainly on epiphytic vegetation and on the macrophytes,

other gastropods (*Planorbis planorbis* (Linnaeus, 1758), *Lymnaea ovata* (Draparnaud, 1805)) exploits the algal cover or phytobentos on the bottom (Gonzalez-Solis and Ruiz 1996). Therefore competition between *P. acuta* and other native gastropods appears to be minimal.

### Acknowledgements

We acknowledge anonymous reviewers for valuable comments and Frances Lucy for help in English editing. The study has been supported by the European Commission 6th Framework Programme Integrated Project ALARM (contract GOCE-CT-2003-506675).

### References

- Cope NJ, Winterbourn MJ (2004). Competitive interactions between two successful molluscan invaders of freshwaters: an experimental study. *Aquatic Ecology* 38(1): 83-91
- Dillon RT, Jr, Wethington AR, Rhett JM, Smith TP (2002) Populations of the European freshwater pulmonate *Physa acuta* are not reproductively isolated from American *Physa heterostropha* or *Physa integra*. *Invertebrate Biology* 121: 226-234
- Gonzalez-Solis J, Ruiz X (1996) Succession and secondary production of gastropods in the Ebro Delta ricefields. *Hydrobiologia* 337 (1-3): 85-92
- Kozel V (1995) Ripal macrozoobenthos of the Danube before and after putting hydropower structures Gabčíkovo into operation (in Slovak, Vysledky a skusenosti z monitorovania bioty uzemia ovplyvneného vodnym dielom Gabčíkovo, Ustav zoológie a ekoszológie SAV Bratislava, pp 123-131
- Naumova LA, Stavinskaya AM, Igumnova LV (1983) Species composition peculiarities and biotopic distribution of freshwater molluscs of Pripjat Poles'e. In: 7th All Union meeting on molluscan studies 'Molluscs, taxonomy, ecology and peculiarities of distribution'. Nauka Press, Leningrad, pp 105-107
- Serafinski W, Rembecka I, Strzelec M (1989) Biometrics and life cycle of *Physa acuta* Draparnaud 1805 (Gastropoda, Basommatophora: Physidae) under human impact. *Folia Malacologica* 3: 139-147
- Taylor DW (2003) Introduction to Physidae (Gastropoda: Hygrophila). *Biology, classification, morphology*. *Revista de Biologia Tropical* 51 (1): 1-299
- Wethington AR (2004) Family Physidae. A supplement to the workbook accompanying the FMCS Freshwater Identification Workshop, University of Alabama, Tuscaloosa, 24 pp