

Which *Physella* (Mollusca: Gastropoda) lives in the Czech Republic?

LUBOŠ BERAN

Kokořínsko Protected Landscape Area Administration, Česká 149, CZ–276 01 Mělník, Czech Republic;
e-mail: lubos.beran@schkocr.cz

Received January 23, 2004; accepted March 5, 2004
Published August 31, 2005

Abstract. For the first time in the Czech Republic specimens belonging to the genus *Physella* Haldeman, 1843 were dissected to help in the identification of the species living here. Specimens collected from 11 sites situated in the Czech Republic were dissected. Occurrence of *Physella gyrina* (Say, 1821), a mollusc introduced in Great Britain from North America, has not been documented in the Czech Republic yet and the results presented here indicate that only one species of the genus *Physella* occurs in the Czech Republic.

Distribution, Mollusca, Gastropoda, *Physella acuta*, *Physella heterostropha*, Palaearctic region

INTRODUCTION

The first specimens of the genus *Physella* Haldeman, 1843 were found by J. Brabenec in 1919 in Prague, Czech Republic (Beran 2002). There has been a quick increase in the recording of *Physella*, especially since 1990. Currently this taxon is known from a large part of the Czech Republic, occurring mainly on the floodplains of large rivers such as the Elbe, Dyje, Morava and Odra (Fig. 1). This mollusc inhabits mainly man-made habitats (sandpits, ponds) and is also able to live in very polluted water e. g. in sewage treatment plants (Mácha 1971). Specimens of the genus *Physella* were not dissected in the Czech Republic before 2003 and were usually determined as *Physella acuta* (e. g. Ložek 1956, Beran 1998) or *Physella* cf. *acuta* (e. g. Beran 2002).

MATERIAL AND METHODS

Specimens of the genus *Physella* were collected for dissection in 2003 from 11 different habitats and sites in the Czech Republic. Most of the places were located in the Elbe Lowland, but many were in Moravia in the Morava River Basin (see below). Molluscs were collected from vegetation at water level or from the mud by means of a sieve (diameter 20 cm and mesh of 0,5 to 1 mm) and many specimens were also collected from things in the water, stones, wood, waste and especially plastic. Molluscs for dissection were killed in hot water and later fixed in 70 % ethanol. The dissections, focused on the differences in the copulatory organs described by Anderson (1996), in particular the ratio preputium/penial sheath. Dissected specimens are deposited in author's collection.

List of studied localities

Specimens of the genus *Physella* were collected for dissection from the following localities. Data presented are as follows: number of the locality, code for faunistic mapping according to Pruner & Míka (1996), name of the nearest village or town, description of the locality, date. Material is deposited in author's collection.

1 – 5753, Stará Boleslav, sandpit near the road Stará Boleslav – Dřísy, 2. VII. 2003; 2 – 5552, Elbe River around the weir between Račice and Záluží, 6. VII. 2003; 3 – 6369, Chomoutov, large sandpit in the Chomoutovské jezero Nature Reserve, 17. VII. 2003; 4 – 5753, sandpit east of Konětopy, 18. VII. 2003; 5 – 5859, Káranice, sandpit near the road Nové Město – Kratonohy, 19. VII. 2003; 6 – 5953, Praha, small water reservoirs in Spořilov near Blažimská bus stop, 7. VIII. 2003; 7 – 5957, Velký Osek, sandpit in Velký Osek, 10. VIII. 2003; 8 – 5552, Hněvice, Elbe River at Hněvice, 24. VIII. 2003; 9 – 5653, Mělník, small sandpit in Na Podolí Park, 14. IX. 2003; 10 – 7267, Břeclav, the Dyje River at Břeclav, 26. IX. 2003; 11 – 7267, Kostice, the Kyjovka River near Kostice, 10. X. 2003.

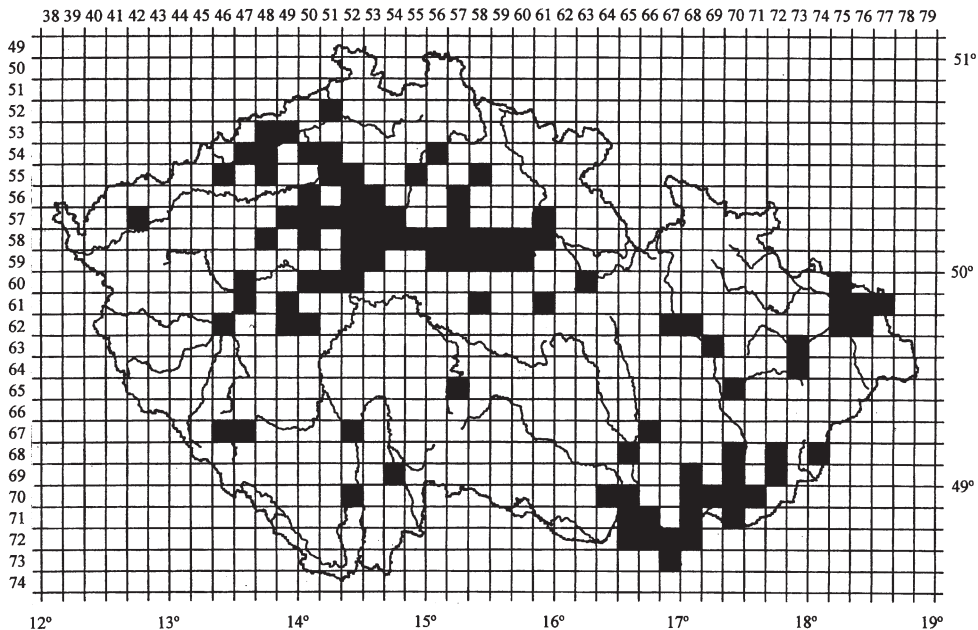


Fig. 1. The map showing the current distribution of the genus *Physella* Haldeman in the Czech Republic.

RESULTS AND DISCUSSION

The ratio preputium/penial sheath was very similar in all cases and varied around 1:1. The problem is that according to Anderson (1996) this ratio is diagnostic of *Physella heterostropha* (Say, 1817), however this ratio is also recorded by Paraense & Pointier (2003) in their description of topotypic specimens of *Physella acuta* (Draparnaud, 1805) from France. The penial sheath was not divided into sections and was only slightly glandular (penial morphology Type C according to Anderson 1996). In no case was the penial sheath divided into two sections, one glandular, the other non-glandular (penial morphology Type B according to Anderson 1996). This feature was used to identify *Physella gyrina* (Say, 1821), the species introduced into Great Britain from North America (Anderson 1996). The preputial gland was usually moderately large and not depressed (according to Anderson 1996 the diagnostic feature of *P. heterostropha*). The shape of the bursa copulatrix varied from ovoid to slightly rectangular. According to Anderson (1996) an ovoid bursa copulatrix is diagnostic of *P. acuta* and a rectangular one of *P. heterostropha*. All my results (especially the ratio preputium/penial sheath) indicate the occurrence of only one species of the genus *Physella* in the Czech Republic.

A recent study in the USA (Dillon et al. 2002) indicated that *P. acuta* from Europe is not reproductively isolated from American *P. heterostropha* and *P. integra* (Haldeman, 1841). These authors suggest that the name *P. acuta* should be used for American and European populations of *P. heterostropha*, *P. integra* and *P. acuta*. Studies of allozymes and mitochondrial DNA sequence data have confirmed this result (Wethington et al. 2003). Thus, the name *Physella acuta* should be also used for populations of the genus *Physella* living in the Czech Republic.

A c k n o w l e d g e m e n t s

This study was partly supported by a grant from the Ministry of Culture of the Czech Republic No. RK01P030MGO04.

REFERENCES

- ANDERSON R. 1996. *Physa gyrina* (Say), a North American freshwater gastropod new to Ireland, with a key to the British Isles Physidae. *Irish Naturalists J.*, **25**: 355–372.
- BERAN L. 1998: Vodní měkkýši ČR. *Metodika Českého svazu ochránců přírody č. 17 [Aquatic Molluscs of the Czech Republic. Methodics of the Czech Union of Nature Conservation No. 17]*. Vlašim: ZO ČSOP, 113 pp (in Czech).
- BERAN L. 2002: Vodní měkkýši České republiky – rozšíření a jeho změny, stanoviště, šíření, ohrožení a ochrana, červený seznam. [Aquatic molluscs of the Czech Republic – distribution and its changes, habitats, dispersal, threat and protection, Red List]. *Sborník přírodovědného klubu v Uh. Hradišti, Supplementum 10*: 1–258 (in Czech, English summary).
- DILLON R. T., WETHINGTON A. R., RHETT J. M. & SMITH T. P. 2002: Populations of the European freshwater pulmonate *Physa acuta* are not reproductively isolated from American *Physa heterostropha* or *Physa integra*. *Inverteb. Biol.* **121**: 226–234.
- LOŽEK V. 1956: *Klíč československých měkkýšů [Key to Czechoslovak Molluscs]*. Bratislava: Vydavatelstvo SAV, 437 pp (in Czech).
- MÁCHA S. 1971: Kultureinflüsse auf die Molluskenfauna. *Acta Mus. Siles., S. A 20*: 121–134 (in Czech, German summary).
- PARAENSE W. L. & POINTIER J. 2003: *Physa acuta* Draparnaud, 1805 (Gastropoda: Physidae): a study of topotypic specimens. *Mem. Inst. Oswaldo Cruz* **98**: 513–517.
- PRUNER L. & MIKA P. 1996: List of settlements in the Czech Republic with associated map field codes for faunistic grid mapping system. *Klapalekiana* **32** Suppl.: 1–175 (in Czech, English summary).
- WETHINGTON A. R., DILLON R. T., RHETT J. M. & LYDEARD C. 2003: Tracking the evolutionary legacy of the biologically invasive cosmopolitan species – *Physa acuta*. *3rd Biennial Symposium of the Freshwater Mollusk Conservation Society*. March 16–19 2003, Durham, North Carolina, 26–27.