A NEW RECORD OF BITHYNIA TROSCHELII (PAASCH, 1842) (GASTROPODA: BITHYNIIDAE) FROM TWO TEMPORARY PONDS IN WARSAW (POLAND)

ANDRZEJ KOŁODZIEJCZYK¹, KRZYSZTOF LEWANDOWSKI²

¹Department of Hydrobiology, Faculty of Biology, University of Warsaw, Biological and Chemical Research Centre, Zwirki i Wigury 101, 02-089 Warsaw, Poland (e-mail: a.kolodziejczyk@uw.edu.pl)
²Institute of Biology, Siedlce University of Natural Sciences and Humanities, B. Prusa 12, 08-110 Siedlce, Poland (e-mail: krzysztof.lewandowski@uph.edu.pl)

ABSTRACT: Bithynia troschelii (Paasch), a species until recently regarded as a form of Bithynia leachii (Sheppard), was found in small artificial ponds in Skaryszewski Park in Warsaw in June 2014. The snail was abundant in two out of the five studied water bodies of the park. The two ponds were the only ones to become dry in winter. Snails of the genus Bithynia are able to survive periodic drying of water bodies.

KEY WORDS: Bithynia troschelii, park, temporary ponds

Bithynia troschelii (Paasch, 1842) was treated as a variety or form of Bithynia leachii (Sheppard, 1823): as B. leachi var. inflata Hansen, 1845 (ZHADIN 1952), as B. leachi f. troscheli Paasch (PIECHOCKI 1979), or as Bithynia leachi f. inflata (Hansen, 1845) (FALNIOWSKI 1989). According to FALNIOWSKI (1989) many authors regarded B. troscheli as a geographical race of B. leachi. Also URBANSKI (1938, 1947, 1957) treated it as a form of B. leachi, though the fact that he later referred to it as B. leachi troscheli Paasch (URBANSKI 1957) might have suggested subspecies rank. GLOER & MEIER-BROOK (1998) and GLOER (2002) regarded it as a subspecies, namely B. leachii troscheli (Paasch, 1842). However, in his comprehensive monograph of Prosobranchia, FALNIOWSKI (1989) listed B. troschelii as a distinct species. The authors of subsequent studies (FALNIOWSKI et al. 2004, GLOER et al. 2005), while emphasising the distinctness of B. leachii and B. troschelii, pointed to their close relationship, similarity and ability, though rare, to produce hybrids. In his chapter on the Bithyniidae, part of the series on the fauna of Poland, PIECHOCKI (2008) mentioned B. troschelii as the third, apart from B. tentaculata (Linnaeus, 1758) and B. leachii, species of the genus Bithynia. WELTER-SCHULTES (2012) referred to the snail as Bithynia transsilvania (E. A. Bielz, 1853).

Since B. troschelii was largely considered to be a form of B. leachii, it was rarely distinguished in studies and, consequently, information on its ecology and occurrence in Poland is very scanty. Apart from old records from the environs of Warsaw (ŚŁÓSARSKI 1876, 1877, POLIŃSKI 1917), B. troschelii was mentioned from Lake Trłag (now Lake Pakoskie) in Kujawy and from Wielkopolska, Kujawy and Polesie (URBAŃSKI 1989).

Fig. 1. Water bodies in Skaryszewski Park: 1–4 – ponds; W – waterfall; arrows indicate the water flow direction (drawing E. RYGIELSKA-SZYMAŃSKA)
1938, 1947). According to Piechocki (1979), the species is known from a few sites in the Pomeranian Lakeland, Wielkopolsko-Kujawska Lowland and Mazowiecka Lowland. Falniowski (1989) regards it as a rare species, with few sites in Poland.

In the Czech Republic, B. troschelii is very rare (some of its sites are anthropogenic) (Horsák at al. 2013) and classified as regionally extinct (RE) in the IUCN Red List (Beran & Horsák 2009). Like B. leachi, B. troschelii appears to be much less frequent than the common B. tentaculata; it is associated with small seasonal water bodies and lake phytolittoral (Piechocki 2008).

Water bodies of Skaryszewski Park in Warsaw include Lake Kamionkowskie (an oxbow of the Vistula) and four shallow ponds (Fig. 1) of reinforced shoreline. The ponds appeared during the establishment of the park in the early 20th century in an area situated on the Praga floodplain and covered by wet meadows, in the environs of the village Skaryszew. To elevate and drain the site, a layer of soil with sand and gravel was spread over the whole area (Szymkowiak & Wierzbicka 2015). The bottom and shores of pond no. 1 are paved with concrete plates; it is fed with pipeline water which then runs through an artificial waterfall to the next ponds. In winter, the water inflow is cut off and ponds no. 1 (52°14’30”N, 21°03’35”E, Figs 2–3) and no. 2 (52°14’32”N, 21°03’34”E, Figs 4–5) become completely dry.

Samples of bottom sediments and macrophytes were taken on July 3, 2014 from a depth of 0.3–0.5 m with a bottom scraper, inlet width 20 cm, which was dragged on the bottom along a distance of 1 m (sample area ca. 1/5 m²). The material was preserved with 4% formalin and then, in the laboratory, washed on a benthic sieve of 1 mm mesh. Basic physical and chemical water parameters were determined with the probe WTW Multi 3430 SET G during sampling.
The water in both ponds had similar pH values (8.20 and 8.25 in pond 1 and 2, respectively), dissolved oxygen concentration (9.28 and 9.32 mg/l), and relatively high electrolytic conductivity (1,328 and 1,312 μS/cm). Algae of the genus *Enteromorpha* and various species of submerged and floating-leaved macrophytes: Characeae, *Sagittaria sagittifolia* Linnaeus and *Nuphar lutea* (Linnaeus) Sibth. et Sm., were found in pond no. 2. Fallen leaves of trees and shrubs growing on the shores locally accumulated on the bottom of the ponds.

Macroscopically collected snails were preserved in 70% alcohol and their shells were cleaned with micro-brush. They were identified based on the shell shape, according to *Piechocki* (1979), *Falniowski* (1989) and *Welter-Schultes* (2012), as well as on the structure of genitalia (penis) according to *Falniowski* et al. (2004) and *Glöer* et al. (2005).

Sixty one individuals of *B. troschelii* were found in the sample from pond no. 1. After *Radix balthica* (Linnaeus, 1758) it was the second most abundant snail in the pond. In the sample from pond no. 2 *B. troschelii* was the dominant species; 111 individuals were found together with 14 specimens of *B. tentaculata*.

Identification of *B. troschelii* was based on the following conchological features: much convex whorls combined with deep suture, open umbilicus, short junction of the aperture edge with parietal wall (Fig. 6) in contrast to *B. tentaculata* (Fig. 7). The operculum was egg-shaped and posteriorly rounded (Fig. 8) in contrast to the pointed operculum of *B. tentaculata* and the entirely rounded one of *B. leachii* (see descriptions and illustrations in *Falniowski* 1989, *Glöer & Meier-Brook* 1998, *Glöer* 2004, *Glöer* et al. 2005, *Welter-Schultes* 2012 and *Horsák* at al. 2013). The shape of penis (Figs 9–10) was similar.
The mean shell height of *B. troschelii* in pond no. 1 was 6.18 ± 4.77 mm (n = 60). The values for two clearly separated size classes were: for larger snails (n = 44) 7.24 ± 0.88 mm, and for smaller snails (n = 16) 3.02 ± 2.02 mm. The measurements of the two largest individuals from pond no. 1 were (shell height×width) 8.81×6.44 mm and 8.30×6.56 mm, respectively. In pond no. 2, the shell height (n = 110) was 5.72 ± 4.34 mm and the two largest individuals were 9.02×6.94 mm and 8.74×6.47 mm. Forty three individuals from the first pond and 42 from the second pond exceeded the typical maximum shell height of *B. leachii* (4–6 mm as reported by Falniowski et al. 2004, Göler & Fehér 2004, Göler et al. 2005, Göler & Sîrbu 2005).

The presence of *B. troschelii* on the right bank of the Vistula near Warsaw was noted already in the 19th century by Ślósarski (1877), who in 1873 found several specimens which he referred to as “Bythinia Troschelii Paasch (Paludina similis Stein.)” in “a ditch by the flood embankment behind Saska Kępa”. In the whole area of his studies (Polish Kingdom, Lithuania and Polesie), Polinski (1917) found “Bythinia leachii Shepp. var. troschelii Paasch” only in the environs of Warsaw, almost exclusively on the right bank of the Vistula River “near the outskirts of Praga”. Hence, based on the new record we reject Falniowski’s (1989) rather pessimistic opinion on the possible disappearance of *B. troschelii* from most sites near Warsaw. It is noteworthy that after the drainage of the wet meadows the species remained in (or maybe invaded) the two seasonal, artificial water bodies that fall dry in winter, and achieved high densities of about 300 and 500 individuals/m². It is well possible that the snail, which was not included in the identification keys by Urbanski (1957) or Piechocki (1979), was often misidentified by researchers and that its actual range in Poland is much wider than reported in the literature.
ACKNOWLEDGEMENTS

We would like to express our thanks to Professor MACIEJ LUNIĄK, who encouraged us to undertake studies in Skaryszewski Park. We are also indebted to Dr EWA RYGIELSKA-SZYMANSKA for drawing the figure and to AGNIESZKA OCHOCKA MSc for taking the photos. We are grateful to the anonymous reviewers for their valuable comments and particularly to one of them for detailed corrections of the text.

REFERENCES


Received: August 8th, 2015
Revised: August 30th, October 3rd, 2015, February 12th, 2016
Accepted: February 20th, 2016
Published on-line: April 22nd, 2016