



UDC: 594:591.55+616.5-002.9](285.2:477.82)

## MALACOFAUNA OF SVITYAZ AND PISOCHNE LAKES IN SHATSK NATIONAL NATURE PARK AND THE ROLE OF MOLLUSCS IN FORMATION OF CERCARIAL DERMATITIS NIDI

I. O. Koltun<sup>ID\*</sup>, V. V. Liesnik<sup>ID</sup>, I. S. Khamar<sup>ID</sup>

Ivan Franko National University of Lviv, 4, Hrushevskyyi St., Lviv 79005, Ukraine

\*Corresponding author: e-mail: [iryana.koltun@lnu.edu.ua](mailto:iryana.koltun@lnu.edu.ua)

Koltun I.O., Liesnik V.V., Khamar I.S. Malacofauna of Svityaz and Pischne Lakes in Shatsk National Nature Park and the role of molluscs in formation of cercarial dermatitis nidi. **Studia Biologica**, 2020: 14(1); 63–72 • DOI: <https://doi.org/10.30970/sbi.1401.610>

The article presents the results of the research on the freshwater mollusc communities of Shatsk National Nature Park water bodies. Shatsky Lakes are located on the watershed of water basins of the Baltic and the Black seas, that implies a wide diversity of species and a high level of dynamics of the hydrofauna status. The wetlands of the area, like the whole territory of Polissia, underwent a major transformation in the 1970s through the drainage reclamation. Subsequently, the Shatsk National Nature Park was unable to provide the effective management of the hydrological regime. Svityaz and Pischne Lakes, used for the recreational purposes, were severely affected, as a result, the rate of their eutrophication increased. The climatic anomalies of recent years have contributed to further development of these changes. Eutrophication manifests itself in the overgrowth of the shoreline and shallows eventually leading to an increase in the density and diversity of water molluscs groups. Two classes of molluscs – the Gastropoda and the Bivalvia – represent the malacofauna of Shatsky Lakeland. Pulmonata subclass includes most freshwater molluscs, with domination of the gastropods. 22 species of molluscs were found during the study in the low-mesotrophic lakes of Svityaz and Pischne, 7 of which occurred only in one body of water, and 15 were common to both. *Dreissena polymorpha* is the dominating mollusc species in Svityaz Lake, and *Lymnaea stagnalis* – in Pischne Lake. The molluscs of the invasive species – *Potamopyrgus jenkinsi*, whose ecological parameters have not been studied in the new location yet, can pose a threat to the indigenous species of molluscs and other organisms. Schistosomatidae larvae – furco cercarie that cause human cercarial dermatitis in Europe – were found in the molluscs under study. The representatives of *Trichobilharzia* and *Bilcharziella* genera are the most

common pathogenic agents of the disease. Selective examination of individuals of nine species of molluscs (*Lymnaea stagnalis*, *L. palustris*, *L. peregra*, *Planorbarius corneus*, *Planorbis planorbis*, *Anisus vortex*, *Viviparus viviparus*, *V. contectus*, *Bithynia tentaculata*) revealed the invasions by the trematode partenits, including schistosomes.

**Keywords:** freshwater molluscs, cercariae, cercarial dermatitis, trematodes, Shatsk National Nature Park

## INTRODUCTION

The lakes of Shatsk are located on the watershed of the Baltic and the Black seas water basins, that implies a wide diversity of species and high level of dynamics of the hydrofauna status. The area combines unique forest and lake landscapes with perfect recreational properties and is of considerable interest to researchers. Back in 1911, B. Dybovsky raised the issue of the recreational use of Shatsk lakes.

The Shatsk National Nature Park (SNNP) was created in 1983 in order to preserve the unique natural complexes including 23 lakes occupying 10 % of the entire territory [13, 16]. The wetlands of the area, like the whole territory of Polissia, underwent a major transformation in the 1970s through a drainage reclamation. Subsequently, the Shatsk National Nature Park was unable to provide an effective management of the hydrological regime that resulted in changes of the composition and population density of the aquatic biocenoses in the limnic water bodies. Among the most affected lakes, are the recreationally attractive ones – Svityaz and Pischne, whose eutrophication rate has increased. The climatic anomalies of recent years have contributed to further progress of these changes. The eutrophication manifests itself in the overgrowth of the shoreline and shallows eventually leading to an increase in the density and diversity of water molluscs groups.

The molluscs are natural biofilters that constitute an important link in the trophic chains of water bodies by indicating the quality of the environment. Besides, they are intermediate hosts of the trematodes, in particular vertebrate and human parasites. Therefore, faunal and ecological studies of the freshwater molluscs are relevant. The increased frequency of human invasions by cercariae representing one of the stages of the development of trematodes, was detected in many parts of Europe [19]. Previously, tendencies with a similar background were observed there. The Europeans have long abandoned the cultivation of consumer attitudes towards waterfowl, in particular the wild ducks. They attracted the birds to recreational areas offering food. However, ducks are known to be the definitive hosts of schistosomes – trematodes whose larvae occasionally penetrating covering of human body cause cercarial dermatitis, also referred to as “nettle”. Humans are most likely to be affected in the shoreline zone, at a depth of 0.5 m where wind and waves increase the density of caudal larvae (cercariae) – the planktonic phase of the development of worms. This also accounts for a high percentage of child affections. The human immune system successfully eliminates the larva, but its resorption is often accompanied by a painful condition. Often people cannot distinguish between cercarial papules and mosquito bites. However, the former take a longer time to heal, cause itch and occasional rise in body temperature.

## MATERIALS AND METHODS

Study of mollusc communities was conducted in summer of 2019 in deep stratified lakes – Svityaz and Pischne – located on the territory of the Shatsk National Nature

Park. The molluscs were collected by hand during the shoreline examination and washing of sediments with a hydrobiological sieve.

The research sites, or transects, were identified taking into account differences in the degree of shading, shoreline overgrowth, anthropogenic load, etc. Molluscs species were determined by common methods [10, 12, 22]. In the first half of June, we conducted a parasitological dissection of 52 individuals of gastropod molluscs from the families Limnaeidae (*Lymnaea stagnalis*, *L. palustris*, *L. peregra*), Planorbidae (*Planorbarius corneus*, *Planorbis planorbis*, *Anisus vortex*), Viviparidae (*Viviparus viviparus*, *V. con-tectus*), Bithyniidae (*Bithynia tentaculata*) extracted by Zdun method [23] from the Lakes of Svityaz and Pischne to evaluate trematode larvae invasion parameters. The parasitic species were determined according to Akimova et al. [2].

SNNP water bodies vary in trophic level, shoreline shape and substrate character, degree of overgrowth and plant species composition. On the basis of our research and data provided by V.G. Drabkova, V.K. Kuznetsov and I.S. Trifonov [6], we identified separate groups of model lakes that differ in the distribution of malacofauna due to different degrees of trophicity:

1. Large deep stratified lakes with table areas from 1.5 to 25 km<sup>2</sup> and depths over 4 m:
  - a) low-mesotrophic, transparent and low-colour, low-mineralized with low content of anthropogenic biogenic elements (Svityaz, Pischne);
  - b) mesotrophic, low transparency, low colour, highly mineralized, with high content of the biogenic elements, exposed to strong anthropogenic influence (Lucymer, Crymne).
2. Unstratified shallow lakes of various size with depths up to 3 m (Ostrivjanske, Somynets).

Svityaz and Pischne Lakes can be classified as large deep stratified lakes. They are distinguished by a distinct shoreline and a solid sand and silt-sand bed. Although such lakes are not overgrown, they are characterized by the greatest floristic and cenotic diversity. The following plant associations are the most typical of this type of lakes: *Typhetum angustifoliae*, *Eleocharitetum palustris*, *Scirpetum lacustris*, *Myriophylletum spicati*, *Phragmitetum communis*, etc. [17]. A wide variety of molluscs species is also characteristic of such bodies of water.

In Svityaz Lake, 5 transects were investigated:

- north east, non-macrophytic shore of the lake used for recreational purposes;
- north east shoreline area overgrown with macrophytes;
- south west shore of the lake used for recreational purposes;
- south west shoreline area overgrown with macrophytes;
- south shore of the lake used for recreational purposes.

In Pischne Lake, 4 transects were identified for the study:

- west shore of the lake used for recreation;
- north east shore overgrown with macrophytes;
- south west shore densely covered with macrophytes;
- east shore of the lake used for recreational purposes.

## RESULTS AND DISCUSSION

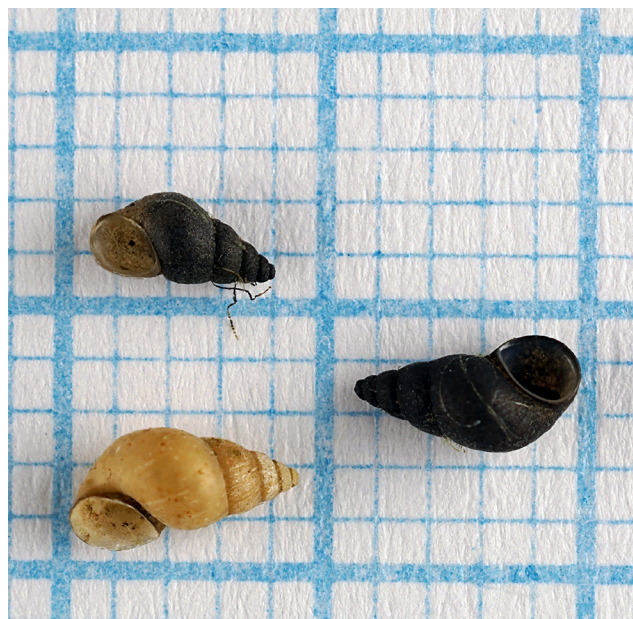
Two classes represent the Schatsky Lakeland malacofauna: the Gastropoda and the Bivalvia. The representatives of the pulmonary subclass (Pulmonata) dominate the

class of gastropod molluscs. During the study, 22 species of molluscs were found in low mesotrophic lakes. 15 of them were common for both PISOCHNE and SVITYAZ LAKES: *Planorbarius corneus*, *Lymnaea stagnalis*, *L. palustris*, *L. ovata*, *L. ampla*, *L. auricularia*, *L. peregra*, *L. corvus*, *Bithynia tentaculata*, *Potamopyrgus jenkinsi*, *Gyraulus leavis*, *Pisidium amnicum*, *Viviparus contectus*, *V. viviparus*, *Anodonta anatina*. 7 species occurred only in one of the basins: *Lymnaea truncatula*, *Anisus vortex*, *A. spirorbis*, *Dreissena polymorpha*, *Sphaerium corneum*, *Valvata piscinalis* – in Svityaz Lake; and *Planorbis planorbis* in PISOCHNE Lake.

While exploring the shore of Svityaz Lake, we found 21 species of molluscs (Table 1). The allochthonous representative of the bivalves – *Dreissena polymorpha*, first recorded there at the beginning of the 21st century [11], occurred most frequently. The lowest rate of incidence was detected for *Anisus vortex*, *A. spirorbis*, *Gyraulus leavis*, *Anodonta anatina*, found only in one of the transects; *Potamopyrgus jenkinsi* was not recorded by previous studies of Svityaz Lake [7–9, 20, 21]. *Dreissena polymorpha* proved to be the dominant species – approximately 52 individuals / m<sup>2</sup> were detected in transect No 2.

The representatives of 16 species of molluscs were found in PISOCHNE Lake (Table 1). *Lymnaea stagnalis*, that occurred in significant numbers in each research site, was the dominant species. *Lymnaea palustris*, *L. ovata*, *L. peregra*, *Planorbis planorbis*, *Bithynia tentaculata* and *Anodonta anatina* were found only in one site under study.

*Potamopyrgus jenkinsi* (syn. *P. antipodarum*) was an interesting finding (see Figure), as it had not been detected in previous studies of these bodies of water. It is an endemic species of New Zealand where it inhabits freshwater bodies. It is widely spread over the world, including almost the entire territory of Europe, and it is considered to be the 42nd most invasive alien species, as well as one with the second highest environmental and socioeconomic impact among the gastropod mollusc in Europe. Its population can reach a density of up to 500,000 individuals / m<sup>2</sup> [3, 14]. *Potamopyrgus jenkinsi*



Shells of *Potamopyrgus jenkinsi*  
Черепашки *Potamopyrgus jenkinsi*

Table 1. Qualitative and quantitative composition of the molluscs (individuals / m<sup>2</sup>)Таблиця 1. Якісний і кількісний склад молюсків (ос. / м<sup>2</sup>)

No	Species	Svityaz Lake					Pisochne Lake			
		No 1	No 2	No 3	No 4	No 5	No 1	No 2	No 3	No 4
1	<i>Lymnaea stagnalis</i> (Linnaeus, 1758)	12	19	13	5	2	33	12	28	2
2	<i>Lymnaea palustris</i> (O.F. Müller, 1774)	2	-	-	1	-	-	-	2	-
3	<i>Lymnaea ampla</i> (Hartmann, 1821)	25	5	-	-	3	2	1	1	-
4	<i>Lymnaea auricularia</i> (Linnaeus, 1758)	26	8	1	1	2	1	1	1	-
5	<i>Lymnaea ovata</i> (Draparnaud, 1805)	18	5	-	3	-	-	-	2	-
6	<i>Lymnaea peregra</i> (O.F. Müller, 1774)	9	-	-	2	-	3	-	-	-
7	<i>Lymnaea truncatula</i> (O.F. Müller, 1774)	18	-	1	3	3	-	-	-	-
8	<i>Lymnaea corvus</i> (Gmelin, 1791)	4	-	3	-	-	-	2	-	1
9	<i>Planorbis cornuus</i> (Linnaeus, 1758)	1	12	46	3	4	10	5	20	3
10	<i>Planorbis planorbis</i> (Linnaeus, 1758)	-	-	-	-	-	-	-	4	-
11	<i>Anisus vortex</i> (Linnaeus, 1758)	2	-	-	-	-	-	-	-	-
12	<i>Anisus spirorbis</i> (Linnaeus, 1758)	-	-	-	1	-	-	-	-	-
13	<i>Gyraulus laevis</i> (Alder, 1838)	-	-	-	-	2	-	1	9	1
14	<i>Viviparus contectus</i> (Millet, 1813)	4	5	2	5	-	12	3	13	-
15	<i>Viviparus viviparus</i> (Linnaeus, 1758)	2	-	-	1	-	4	2	-	-
16	<i>Bithynia tentaculata</i> (Linnaeus, 1758)	17	-	-	7	5	-	-	3	-
17	<i>Valvata piscinalis</i> (O.F. Müller, 1774)	-	-	-	3	4	-	-	-	-
18	<i>Potamopyrgus jenkinsi</i> (E.A. Smith, 1889) (syn. <i>P. antipodarum</i> (Gray, 1843))	-	-	-	-	817	-	-	15	-
19	<i>Anodonta anatina</i> (Linnaeus, 1758)	-	-	1	-	-	-	2	-	-
20	<i>Dreissena polymorpha</i> (Pallas, 1771)	24	52	5	16	7	-	-	-	-
21	<i>Sphaerium corneum</i> (Linnaeus, 1758)	9	1	4	8	5	-	-	-	-
22	<i>Pisidium amnicum</i> (O.F. Müller, 1774)	5	-	-	2	7	1	2	2	-

is highly resistant to the environmental changes. It is a euryhaline and eurythermic species whose individuals survive passing through the digestive system of fish and birds [1]. In Ukraine, it was registered for the first time in 1951 in the low salinity water bodies of the Azov and Black Sea basins. The species was first found in 2005 in fresh water basins of Ukraine [18], and in 2015 – in Lucymer Lake of the Shatsky Lakes group [5].

The density of individuals in two locations on the south shore of Svityaz Lake and the south west shore of Pischne Lake used for recreation, was 817 individuals / m<sup>2</sup> and 15 individuals / m<sup>2</sup>, respectively. The average measurements of *Potamopyrgus jenkinsi* molluscs were as follows: height of the shell – 4.2 mm (min–max – 3.5–4.8 mm; width of the shell – 2.7 mm (min–max – 2.0–2.9 mm); height of the mouth – 1.7 mm (min–max – 1.0–1.9 mm); width of the mouth – 1.2 mm (min–max – 1.0–1.5 mm). Altogether, 10 individuals of *Potamopyrgus jenkinsi* species have been measured. The collected specimens of *Potamopyrgus jenkinsi* are stored in the malacological collection of the Zoological Museum of Ivan Franko National University of Lviv.

Furco cercariae – Schistosomatidae larvae – cause human cercarial dermatitis in Europe. About a dozen species of these parasites have been identified in molluscs at the intermediate stage of development [4, 15]. The highest incidence was detected in the representatives of *Trichobilharzia* and *Bilcharziella* genera. Precise determination of parasite species is rather difficult and requires application of genetic and serological techniques. The results of the parasitological studies on molluscs are summarized in Table 2. The individuals with cases of multiple invasion (by two or more species of trematodes partenits) were detected (Table 2, n<sub>sp</sub>). In addition to cercariae, sporocysts, redias and metacercariae were found.

Table 2. Results of parasitological examination of the gastropod mollusks from Pischne and Svityaz Lakes

Таблиця 2. Результати паразитологічного обстеження деяких червоногих молюсків із озер Пісочне та Світязь

Species	Pischne Lake					Svityaz Lake				
	Total	Damaged		Schistosome		Total	Damaged		Schistosome	
	Σ	E <sub>(%)</sub>	n <sub>sp</sub>	E <sub>(%)</sub>	In	Σ	E <sub>(%)</sub>	n <sub>sp</sub>	E <sub>(%)</sub>	In
<i>Lymnaea stagnalis</i>	18	44.4	2	27.8	6–28	2	100	1	100	10
<i>L. palustris</i>	–	–	–	–	–	5	60.0	2	–	–
<i>L. peregra</i>	–	–	–	–	–	4	75.0	2	50.0	20
<i>Planorbium corneum</i>	8	12.5	1	1	16	–	–	–	–	–
<i>Planorbis planorbis</i>	–	–	–	–	–	4	25.0	2	25.0	6
<i>Anisus vortex</i>	2	–	–	–	–	–	–	–	–	–
<i>Viviparus viviparus</i>	–	–	–	–	–	1	–	–	–	–
<i>V. contectus</i>	5	40.0	1	–	–	–	–	–	–	–
<i>Bithynia tentaculata</i>	3	33.3	2	–	–	–	–	–	–	–

Comments: E<sub>(%)</sub> is the extent of invasion; n<sub>sp</sub> – species of trematodes partenits detected; In – Intensity of damage (individuals in the field of view)

Примітки: E<sub>(%)</sub> – екстенсивність інвазії; n<sub>sp</sub> – виявлено видів паразитів трематод; In – інтенсивність ураження (особин у полі зору)

Quantitative indicators of schistosome invasion are not significant. However, according to studies conducted on the bodies of water of Belarus, the pathogens of schistosome dermatitis in molluscs of Naroch Lake, that is similar to Svityaz and Pischne Lakes, occurred only twice in a sample of 2,167 individuals (extensiveness – 0.09 %) [2].

According to a number of studies [4, 15], schistosomatids are species-specific parasites. Thus, taking into account their morphological features, we identified the parasites found in the hepatopancreas of *Planorbarius corneus* and *Lymnaea stagnalis* as *Trichobilharzia regenti* (Horák, Kolářová & Dvořák, 1998) (syn. *T. szidati*) and *Bilharziella polonica* (Kowalewski, 1895), respectively. As follows from the abovementioned sources, the schistosomal cercariae in *Lymnaea peregra* also belong to the *Trichobilharzia* (*Trichobilharzia* sp.) genus. Besides mature cercariae, numerous partenits of trematodes (sporocysts) with undifferentiated larvae have been found that suggests a poor prognosis for the spread of cercariosis.

## CONCLUSIONS

Current composition of the malacofauna in the low-mesotrophic Pischne and Svityaz Lakes includes 22 species of molluscs (Table 1). Most frequently, *Lymnaea stagnalis*, *L. auricularia*, *Planorbarius corneus* occur. In contrast, *Planorbis planorbis*, *Anisus vortex* and *Anisus spirorbis* were found only in one transect.

The molluscs of the invasive species – *Potamopyrgus jenkinsi*, whose ecological parameters have not been studied in the new location yet, can pose a threat to indigenous species of molluscs and other organisms.

The Cercariae and rheidia found in *Lymnaea stagnalis*, *L. peregra*, *Planorbarius corneus* and *Planorbis planorbis* molluscs, were morphologically defined as larvae of the *Trichobilharzia* and *Bilharziella* genera. Due to their species-specific nature, parasites found in the hepatopancreas of *Planorbarius corneus* and *Lymnaea stagnalis*, were identified as *Trichobilharzia szidati* and *Bilharziella polonica*, respectively. For more precise determination of the parasites, genetic and serological techniques are required. The molluscs under study included individuals with multiple invasions (by two or more species of trematodes partenits).

The incidence of molluscs affection by the schistosomes in Svityaz and Pischne Lakes significantly exceeds the levels recorded in other lakes in the region. Besides mature cercariae, the sporocysts and redia were detected that implies a poor prognosis for a spread of the cercariosis.

## COMPLIANCE WITH ETHICAL STANDARDS

**Conflict of Interest:** The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

**Animal Rights:** This article does not contain any studies with animal subjects performed by the any of the authors.

- 
1. Aamio K., Bornsdorff E. Passing the gut of juvenile flounder *Platichthys flesus* (L.) – differential survival of zoobenthic prey species. **Marine Biology**, 1997; 129: 11–14. [DOI: <https://doi.org/10.1007/s002270050140>; [Google Scholar](#)]

2. Akimova L.N., Rizevsky S.V., Dunets T.G., Kurchenko V.P. Morphological peculiarities of trematoda larvae. **Proceedings of the Belarusian State University Series of Physiological, Biochemical and Molecular Biology Sciences**, 2007; 6(2): 225–247. (In Russian) [Google Scholar]
3. Alexandrov B., Boltachev A., Kharchenko T., Lyashenko A., Son M., Tsarenko P., Zhukinsky V. Trends of aquatic alien species invasions in Ukraine Archived. **Aquatic Invasions**, 2007; 2(3): 215–242. [DOI: <http://dx.doi.org/10.3391/ai.2007.2.3.8>; Google Scholar]
4. Beer S.A., Voronin M.V. **Cercarioses in urban ecosystems**. M.: Nauka. 2007: 240 p. (In Russian) [Google Scholar]
5. Degtyarenko O., Antonovskiy O., Anistratenko V. New data on the shellfish species composition of Shatsk lakes. **Ukrainian fauna on the verge of XX-XXI century. Status and biodiversity of ecosystems of protected areas**. 2019: 64–66.
6. Drabkova V.G., Kuznetsov V.K., Trifonova I.S. Assessment of the state of the lakes of the Shatsk National Nature Park. **Shatsk National Nature Park. Scientific research 1983–1993**, 1994: 52–79. (In Ukrainian)
7. Gural R.I., Gural-Sverlova N.V. Gastropods class – Gastropoda Cuvier, 1795. **Shatsk Lake District. The Animal World**. A.-T. Bashta, V.K. Bigun, M.G. Biletska et al. Ed. P.Y. Kilochytskyi. Lutsk: Vezha-Druk, 2016: 37–51. (In Ukrainian)
8. Gural R.I., Gural-Sverlova N.V. Bivalvia class – Bivalvia Linnaeus, 1758. **Shatsk Lake District. The Animal World**. A.-T. Bashta, V.K. Bigun, M.G. Biletska et al. Ed. P.Y. Kilochytskyi. Lutsk: Vezha-Druk, 2016: 51–57. (In Ukrainian)
9. Gural R.I., Gural-Sverlova N.V. Species Diversity of the Gastropod and Bivalvia Molluscs on the Territory of the Shatsk National Natural Park. **Nature of Western Polesie and adjacent territories**, Lutsk: Volyn National University of Lesya Ukrainian, 2008: 129–136. (In Ukrainian)
10. Gural R.I., Gural-Sverlova N.V. Land Mollusks of the Ukraine: the Illustrated Database. Lviv: State Museum of Natural History of NAS of Ukraine, 2012–2020. URL: <http://www.pip-mollusca.org/page/phg/freshwater/index.php>
11. Gural R.I., Gural-Sverlova N.V. Zebra mussel *Dreissena polymorpha* (Bivalvia, Dreissenidae) in Volhynian Polesye. **Scientific Journal Volyn National University of Lesya Ukrainian**, 2008; 3: 125–128. (In Ukrainian)
12. Gural-Sverlova N.V., Gural R.I. **Shellfish Unionidae family in the funds of the State Natural History Museum of NAS of Ukraine, their conchological variability and diagnostic features**. 2015. (In Russian) URL: <http://www.pip-mollusca.org/page/epubl/unionidae.php>
13. Melnyk S.P. Ecological ranks of macrophytes of Shatsky lakes in conditions of intensive recreation. **Visnyk of the Lviv University. Series Geography**, 1986; 9: 49–51. (In Russian)
14. Nentwig W., Bacher S., Kumschick S., Pyšek P., Vilà M. More than “100 worst” alien species in Europe. **Biol Invasions**, 2018; 20: 1611–1621. [DOI: <https://doi.org/10.1007/s10530-017-1651-6>; Google Scholar]
15. Rizevsky S.V., Kurchenko V.P. Disease control of cercarial dermatitis on Naroch lake – the main ways, difficulties and perspectives. **Proceedings of the Belarusian State University Series of Physiological, Biochemical and Molecular Biology Sciences**, 2011; 6(1): 9–22. (In Russian) [Google Scholar]
16. Romanenko V.D. **Fundamentals of Hydroecology**. Kyiv: Oberegy. 2001: 590–595. (In Ukrainian)
17. Shevchuk I.O., Borsukevych L.M., Khamar I.S. Higher aquatic vegetation of the Shatsk National Park and its distribution according to the trophy of the lakes. **Studia Biologica**, 2013; 7(1): 149–158. (In Ukrainian) [DOI: <https://doi.org/10.30970/sbi.0701.242>; Google Scholar]



18. Son M. Rapid expansion of the New Zealand mud snail *Potamopyrgus antipodarum* (Gray, 1843) in the Azov-Black Sea Region. **Aquatic Invasions**, 2008; 3: 335–340. [DOI: <https://doi.org/10.3391/ai.2008.3.3.9>; Google Scholar]
19. Stadnychenko A.P. Role of the Lymnaeid molluscs in distribution of schistosome cercariosis in Ukraine. **Zhytomyr Ivan Franko State University Journal**, 2002; 10: 18–20. (In Ukrainian)
20. Stadnychenko A.P., Melnychenko R.K., Uvayeva O.I., Pavlyuchenko O.V. Biodiversity of freshwater molluscs in the volyn lakes. **ZOOCENOSIS-2007. Biodiversity and role of animals in ecosystems: extended abstracts of the IV international conference**, 2007: 115–117. (In Ukrainian)
21. Stadnychenko A.P., Stadnychenko Yu.A. To the fauna and ecology of freshwater mollusks (Gastropoda, Bivalvia) of Ukrainian Polissya. **Hydrobiological Journal**, 1984; 20(2): 36–40 (In Russian).
22. Zhadin V.I. **Mollusks of freshwaters of the USSR**. Moscow: Academy of Sciences of the USSR, 1952. 376 p. (In Russian)
23. Zdun V.I. Examination of mollusks for infestation with larvae of digenetic trematodes. **Methods of studying the parasitological situation and the control of parasitoses of farm animals**. Kiev: Publishing House of the Academy of Sciences of the Ukrainian SSR, 1961; 96–135. (In Russian)

## МАЛАКОФАУНА ОЗЕР СВІТЯЗЬ І ПІСОЧНЕ ШАЦЬКОГО НАЦІОНАЛЬНОГО ПРИРОДНОГО ПАРКУ ТА РОЛЬ МОЛЮСКІВ У ФОРМУВАННІ ВОГНИЩ ЦЕРКАРІОЗНОГО ДЕРМАТИТУ

I. O. Колтун\*, В. В. Лєсник, І. С. Хамар

Львівський національний університет імені Івана Франка  
вул. Грушевського, 4, Львів 79005, Україна

\*Кореспондуючий автор: e-mail: [iryna.koltun@lnu.edu.ua](mailto:iryna.koltun@lnu.edu.ua)

У статті висвітлені результати проведених досліджень угруповань прісноводних молюсків водойм Шацького національного природного парку. Шацькі озера розташовані на межі водних басейнів Балтійського й Чорного морів, що передбачає наявність високого видового різноманіття і рівня динаміки стану гідрофауни. Водно-болотні угіддя району, як і всього Полісся, у 70-х роках зазнали трансформації через осушувальну меліорацію. Утворений згодом Шацький національний природний парк не зміг забезпечити ефективного управління гідрологічним режимом. Зміни торкнулися привабливих для рекреації озер Світязь і Пісочне, швидкість евтрофування яких зростає. Кліматичні аномалії останніх років сприяють підтриманню та поглибленню такого процесу. Однією з ознак евтрофування є заростання берегової лінії та прибережних відмілин, що має наслідком збільшення щільності й різноманіття угруповань водяних молюсків. Малакофауна Шацького поозер'я представлена двома класами – червононогими (Gastropoda) і двостулковими (Bivalvia). Серед червононогих молюсків домінують представники підкласу легеневих (Pulmonata), до якого належать більшість прісноводних молюсків. У слабomezотрофних озерах Світязі та Пісочному під час досліджень було виявлено 22 види молюсків, сім із яких траплялися тільки в одній водоймі, 15 – спільні. У Світязі домінував вид *Dreissena polymorpha*, а у Пісочному – *Lymnaea stagnalis*. Уперше виявлено молюски інвазійного виду – *Potamopyrgus jenkinsi*, екологічні параметри якого у нових лока-

ціях ще не вивчені, й можуть становити загрозу для стану популяцій аборигенних молюсків та інших організмів. В озерних молюсках виявлені фуркоцеркарії – личинки шистосом (*Schistosomatidae*), які у Європі зумовлюють церкаріозний дерматит людини. Найчастіше захворювання спричиняють представники родів *Trichobilharzia* і *Bilharziella*. Вибірковим обстеженням особин дев'яти видів молюсків (*Lymnaea stagnalis*, *L. palustris*, *L. peregra*, *Planorbarius corneus*, *Planorbis planorbis*, *Anisus vortex*, *Viviparus viviparus*, *V. contectus*, *Bithynia tentaculata*) з'ясовано ураження їх партенітами трематод, зокрема, шистосомами.

**Ключові слова:** прісноводні молюски, церкарія, церкаріозний дерматит, трематоди, Шацький національний природний парк