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MOLLUSCS OF SELECTED WATERCOURSES AND RESERVOIRS IN VILNIUS

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ABSTRACT: The 2002 field research on the malacofauna of selected watercourses and reservoirs in Vilnius (Lithuania) revealed the occurrence of 35 mollusc species represented by 1,915 live specimens. Out of the 50 water mollusc species recorded from the Vilnius region before World War II, 30 were represented by live specimens in this study. Five of the live species found in 2002 had not been earlier recorded from the area. The highest number of species represented by live specimens was found in the river Vilnia (23) and in its reservoir (22). Fewer species were found in the river Viliya (15) and in the reservoir on the stream Cedronas (4). No live molluscs were collected in the stream Cedronas.

KEY WORDS: freshwater molluscs, Lithuania, Vilnius

INTRODUCTION

Most information on water molluscs of the Vilnius region – now divided between Lithuania and Belarus - comes from the period before World War II (POLIŃSKI 1917, MŁODZIANOWSKA-DYRDOWSKA 1930, BOWKIEWICZ 1930, URBAŃSKI 1947). No detailed data on the water malacofauna of this region from the last half century are available in the published literature. ŠIVICKIS (1960), in his work on terrestrial and aquatic molluscs of Lithuania, included a list of species recorded from the country. A list of water molluscs found in the Kaliningrad Province, Lithuania, Latvia, and Estonia jointly was given by ZHADIN (1952) but – like ŠIVICKIS (1960) – he did not provide detailed data on the distribution of individual species. None of these works includes any data on the malacofauna of water habitats in the city of Vilnius. This study aimed at a preliminary assessment of the taxonomic composition of water mollusc communities in Vilnius, its comparison with the lists of species recorded from the Vilnius region by various authors and with the list of Lithuanian molluscs reported by ŠIVICKIS (1960).

CHARACTERISTICS OF THE INVESTIGATED WATERCOURSES AND RESERVOIRS

In the area of Vilnius, 11 collection sites were selected in the river Viliya (Neris) and its two tributaries – Vilnia and Cedronas – with their two reservoirs (Fig. 1).

The Viliya is the second largest river of Lithuania, about 509 km long (the river section in the area of Vilnius is 50 km long). Its sources are in Belarus, near Minsk. It is a left-bank tributary of the river Neman (Nemunas) and joins it near Kaunas. The main tributaries of the Viliya are: Žeimena, Šventoji and Širvinta. The Viliya is wide and shallow, with a relatively fast water flow. In its mid section, its banks are steep and up to 40 m high, covered largely by mixed forest. In the centre of Vilnius, its banks are in places reinforced with concrete. The bottom is mostly sandy or sandy with stones.

Molluscs were collected from the Viliya in four sites (1–4). Site 1 is located in the district Verkiai, farthest away from the city centre. The river is about 60 m wide there. Molluscs were collected at the depth of 1.5 m, about 0.8 m from the bank. The banks are rather flat, sparsely overgrown with reed (*Phragmites*

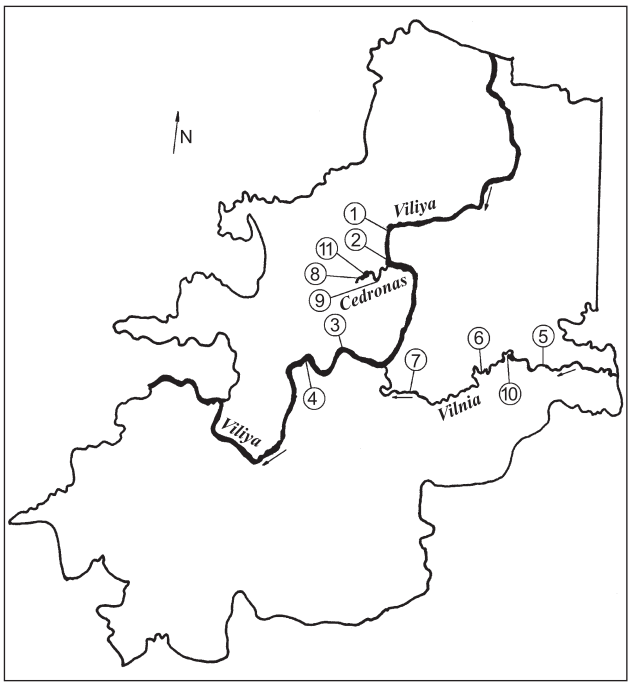

Fig. 1. Location of collection sites within the borders of Vilnius city: 1, 2, 3, 4 – the river Viliya (Neris); 5, 6, 7 – the river Vilnia; 8, 9 – the stream Cedronas; 10 – reservoir on the Vilnia, 11 – reservoir on the Cedronas

australis), bulrush (*Typha* sp.) and sedges (*Carex* sp.). The bottom is composed of stones and sand, and water flow is rather slow. Site 2, opposite the Trinopolis monastery, is very similar to site 1. The bottom consists of numerous stones and fine gravel. Site 3 is situated in the city centre, near the Geležino Vilko bridge. The river is 50–60 m wide, its banks covered with concrete. Molluscs were collected in a place where the concrete covering was partly destroyed. The river bottom is composed of sand and silt and water flow is rather slow. Site 4 is located in the Vingio park. The banks of the river are very high in places. The river is about 25 m wide and shallow at a distance of up to about 10 m away from the bank. The bottom is stony, with some sandy shallows. Water flow is fast, like in a mountain river.

The Vilnia is a left-bank tributary of the Viliya, the largest in the area of Vilnius. It is 82 km long (about 30 km in Vilnius). Its water flow is fast in some places. The Vilnia flows through strongly industrialized areas. There is a dam reservoir on the river, within the borders of Vilnius.

In the Vilnia molluscs were collected in three sites (5–7). Site 5 is located in the district Naujoji Vilnio, near the Žalakaino bridge. The river is about 6 m wide, the banks are high and partly overgrown with sedges (*Carex* sp.) and infrequent bulrushes (*Typha* sp.). The bottom is composed of sand and silt; water flow is slow. Site 6 lies near the Pučkorai – geological site and viewpoint on a steep bank (65 m high), covered by deciduous forest. At this site the river is about 10 m wide and shallow (20–30 cm over a large distance from the bank). Water flow is very fast. The bottom consists of sand, gravel and some large stones, and is visible all over the width of the river. Site 7 is situated in the city centre, near the Bernardine cemetery (Bernardinu Kapinës).The river banks are low and accessible. The river is about 20 m wide and quite shallow. The bottom is sandy, with patches of gravel.

The stream Cedronas is a small (10 km long) right-bank tributary of the Viliya. The tributary is strongly degraded, mainly because of direct discharge of sewage from the nearby buildings. A small dam reservoir impounds water in its upper course.

In the Cedronas, two collection sites (8, 9) were selected. Site 8 is located about 40 m upstream from the reservoir. The stream is up to 0.5 m wide and 0.4—0.5 m deep. The banks are flat and grassy, with sedges (*Carex* sp.) near water. The bottom is soft, covered with fine sand. Site 9 is situated about 500 m downstream from the reservoir, among low houses. The stream is about 1 m wide and 10–20 cm deep. The bottom is very hard, consisting of small stones; water flow is fast.

The reservoir on the Vilnia (site 10), near Uživankos Street, covers about 10 ha. It is surrounded by a wide belt of reeds (*Phragmites australis*). Also in the reservoir interior, numerous shallows are overgrown with reeds. This water body is commonly visited by anglers. Molluscs were collected along its western shore.

The reservoir on the Cedronas (site 11) is located near a new housing estate (apartment houses). It covers about 5 ha. Its edges are overgrown by reeds and the bottom is composed of sand and silt. The reservoir is used for bathing.

METHODS

Materials were collected in early October 2002 with the use of a dredge (0.4 m side) dragged along the bottom for 10 m, bail and by direct searching. The material was washed on sieves of 0.5 mm mesh. Live individuals were preserved with 75% ethanol. Species identification was based on keys by PIECHOCKI (1979), PIECHOCKI & DYDUCH-FALNIOWSKA (1980), GLÖER & MEIER-BROOK 1994 and JACKIEWICZ (1998). Mollusc classification follows FALKNER et al. (2001).

RESULTS AND DISCUSSION

In the studied water habitats of Vilnius, 2,970 individuals of 47 species of molluscs were collected in 2002. These included 27 snail and 20 bivalve species. Live individuals (1,915, i.e. 64.5% total) represented 35 species: 18 snail and 17 bivalve species (Table 1). The list of species is presented in Table 2.

In the early 20th century, POLIŃSKI (1917) recorded from the Vilnius region (mainly from Lake Trakai) 16 species of water molluscs: 13 snail and 3 bivalve species. In Lake Kryžiokai near Vilnius BOWKIEWICZ (1930) found 5 mollusc species: 3 snail and 2 bivalve species. MŁODZIANOWSKA-DYRDOWSKA (1930), as a result of her research near N'astaniški (now in Belarus), i.e. at the border between the Vilnius and Švenčionys provinces, recorded 40 species: 27 snail and 13 bivalve species. URBAŃSKI (1947) reported on the occurrence of 50 mollusc species (35 snails and 15 bivalves) in the Vilnius and Novogrudok regions.

Out of the 50 mollusc species recorded from the Vilnius region in the first half of the 20th century, 40 species were found also in 2002, including 30 represented by live individuals. Eleven of the species recorded earlier were not found in 2002: *Valvata naticina, Marstoniopsis scholtzi, Planorbis planorbis, P. carinatus, Anisus vorticulus, Gyraulus gredleri, G. riparius, Hippeutis complanatus, Armiger crista, Pseudoanodonta complanata, Dreissena polymorpha* (Table 3).

Seven of the species collected in 2002 had not been reported earlier from the Vilnius region. These include *Pisidium henslowanum, P. hibernicum, P. milium, P. obtusale* and *P. pseudosphaerium*, represented by live individuals, as well as *Lymnaea corvus* and *Pisidium pulchellum*, represented by shells only. All of them, except *Pisidium pseudosphaerium*, are on the list of Lithuanian molluscs compiled by ŠIVICKIS (1960) (Table 3).

The largest number of species (23), represented by 557 live individuals, was found in the Vilnia. The number of species and individuals decreased along the course of the river. In site 5 – the most remote from the city centre – 17 mollusc species (281 individuals) were recorded. In the next site (no. 6), 15 mollusc species (266 individuals) were found. In the last site on the Vilnia (no. 7), only three mollusc species (10 individuals) were collected (Table1).

Also the reservoir on the Vilnia was rich in molluscs – 22 species, represented by 1,064 individuals were collected there (Table 1).

In the Viliya, 15 mollusc species were identified, represented by a total of 133 individuals (WŁOSIK-BIEŃCZAK 2003). In contrast to the Vilnia, numbers of species and individuals increased along the course of the Viliya. In site 1, only five species were found (9 individuals). In the next site (no. 2), again five mollusc species were recorded, but the number of specimens was slightly higher (13 individuals). In site 3, molluscs were represented by nine species (40 individuals). In the last site (no. 4), also nine mollusc species were detected (71 individuals) (Table 1).

In the reservoir on the Cedronas, only four species of molluscs were found (162 individuals). In the Cedronas itself, no live molluscs were collected (Table 1).

Among the live individuals from the Vilnia, the most frequent were: *Lithoglyphus naticoides* (28.5% total catch in the river), *Lymnaea peregra* (12.0%), *Sphaerium corneum* (9.1%), *Valvata piscinalis* (7.5%), *Pisidium henslowanum* (7.1%), *P. subtruncatum* (6.8%),

Table 1. Numbers of species and live specimens of molluscs found in the studied watercourses and reservoirs of Vilnius in 2002

	Viliya					Vilnia				Reservoir on the Vilnia	Reservoir on the Cedronas
	1	2	3	4	together	5	6	7	together	10	11
Number of species											
Gastropoda	3	3	7	7	9	9	9	1	13	13	1
Bivalvia	2	2	2	2	6	8	7	2	10	9	3
total	5	5	9	9	15	17	15	3	23	22	4
Number of individuals											
Gastropoda	7	10	37	59	113	261	87	5	353	162	2
Bivalvia	2	3	3	12	20	20	179	5	204	902	160
total	9	13	40	71	133	281	266	10	557	1064	162

Table 2. List of mollusc species found in the studied watercourses and reservoirs in Vilnius in 2002; + – species represented by live specimens, * – species represented by shells only

Family / Species	Viliya	Vilnia	Cedronas	Reservoir on the Vilnia	Reservoir on the Cedronas
Neritidae					
Theodoxus fluviatilis (Linnaeus)	+				
Viviparidae					
Viviparus contectus (Millet)				*	
Viviparus viviparus (Linnaeus)	*				
Bithyniidae					
Bithynia tentaculata (Linnaeus)	+	+	*	+	+
Bithynia leachii (Sheppard)	*			*	
Hydrobiidae					
Lithoglyphus naticoides (C. Pfeiffer)		+			
Valvatidae					
Valvata cristata O. F. Müller	*	+		*	
Valvata pulchella Studer	+	+		+	
Valvata piscinalis (O. F. Müller)	+	+		+	
Acroloxidae					
Acroloxus lacustris (Linnaeus)				+	
Lymnaeidae					
Galba truncatula (O. F. Müller)	+				
Stagnicola palustris (O. F. Müller)	*				
Stagnicola corvus (Gmelin)	*				
Radix auricularia (Linnaeus)	*	+		+	*
Radix peregra (O. F. Müller)	+	+	*	+	
Myxas glutinosa (O. F. Müller)				+	
Lymnaea stagnalis (Linnaeus)	+	+	*	+	
Physidae					
Physa fontinalis (Linnaeus)	+	+		+	
Aplexa hypnorum (Linnaeus)			*		
Planorbidae					
Planorbarius corneus (Linnaeus)		+		*	*
Anisus spirorbis (Linnaeus)				*	
Anisus vortex (Linnaeus)	*	*		*	
Bathyomphalus contortus (Linnaeus)	*	+		+	*
Gyraulus albus (O. F. Müller)	*	+		+	
Gyraulus rossmaessleri (Auerswald)	*	*		*	
Segmentina nitida (O. F. Müller)				+	
Ancylus fluviatilis O. F. Müller	+	+		+	
Unionidae					
Unio pictorum (Linnaeus)	+				
Unio tumidus Philipsson	+			+	
Unio crassus Philipsson	*	+			
Anodonta anatina (Linnaeus)	+				
Anodonta cygnea (Linnaeus)	*	*			+
Sphaeriidae					
Sphaerium corneum (Linnaeus)	*	+		*	
Sphaerium rivicola (Lamarck)	*				
Musculium lacustre (O. F. Müller)				*	
Pisidium amnicum (O. F. Müller)	*	+			
Pisidium casertanum (Poli)	+	+	*	+	+
Pisidium personatum Malm	*	+		+	
Pisidium obtusale (Lamarck)				+	
Pisidium henslowanum (Sheppard)		+		+	
Pisidium supinum Schmidt	*	+			
Pisidium hibernicum Westerlund		*	*	+	
Pisidium nitidum Jenyns	+	+	*	+	
Pisidium pseudosphaerium Schlesch	+				
Pisidium milium Held		+		+	+
Pisidium subtruncatum Malm	*	+	*		
Pisidium pulchellum Jenyns	*				

Table 3. Comparison of the list of species recorded by various authors from the Vilnius region and the list of Lithuanian species compiled by ŠIVICKIS (1960); + – species represented by live specimens: * – species represented by shells only

Species	POLIŃSKI (1917)	BOWKIEWICZ (1930)	MŁODZIANOWSKA-DYRDOWSKA (1930)	URBAŃSKI (1947)	ŠIVICKIS (1960)	WŁOSIK-BIEŃCZAK
	Vilnius region (mainly Lake Trakai)	Lake Kryžiokai near Vilnius	Vilnius region	Vilnius and Novogrudok regions	Lithuania	Vilnius
Theodoxus fluviatilis			+	+	+	+
Viviparus contectus			+	+	+	*
V. viviparus	+	+	+	+	+	*
Bithynia tentaculata			+	+	+	+
B. leachii				+	+	+
Potamopyrgus antipodarum					+	
Marstoniopsis scholtzi	+			+	+	
Lithoglyphus naticoides				+	+	+
Valvata cristata			+	+	+	+
V. pulchella			+	+	+	+
V. piscinalis			+	+	+	+
V. naticina			+	+	+	
Acroloxus lacustris		+	+	+	+	+
Lymnaea stagnalis	+	+	+	+	+	+
Stagnicola palustris	+		+	+	+	*
S. corvus					+	*
Galba truncatula			+	+	+	+
Omphiscola glabra					+	
Radix auricularia			+	+	+	+
R. peregra			+	+	+	+
Myxas glutinosa				+	+	*
Physa fontinalis	+		+	+	+	+
P. acuta					+	
Aplexa hypnorum	+		+	+	+	*
Planorbarius corneus	+		+	+	+	+
Planorbis planorbis			+	+	+	
P. carinatus	+		+	+	+	
Anisus spirorbis			+	+	+	*
A. leucostoma					+	
A. septemgyratus					+	
A. vortex	+		+	+	+	*
A. vorticulus				+	+	
Bathyomphalus contortus	+		+	+	+	+
Gyraulus albus			+	+	+	+
G. laevis					+	
G. riparius				+	+	
G. rossmaessleri				+		+
G. gredleri			+	+	+	
Armiger crista	+		+	+	+	

Hippeutis complanatus				+	+	
Segmentina nitida	+		+	+	+	+
Ancylus fluviatilis	+		+	+	+	+
Margaritifera margaritifera					+	
Unio pictorum		+	+	+	+	+
U. tumidus			+	+	+	+
U. crassus			+	+	+	+
Anodonta cygnea	+	+		+	+	+
A. anatina	+		+	+	+	+
Pseudanodonta complanata			+	+	+	
Sphaerium corneum			+	+	+	+
S. rivicola			+	+	+	*
S. solidum					+	
Musculium lacustre			+	+	+	+
Pisidium amnicum			+	+	+	+
P. henslowanum					+	+
P. supinum					+	+
P. lilljeborgii					+	
P. milium					+	+
P. pseudosphaerium						+
P. subtruncatum			+	+	+	+
P. pulchellum					+	*
P. nitidum			+	+	+	+
P. hibernicum					+	+
P. obtusale					+	+
P. personatum			+	+	+	+
P. casertanum	+		+	+	+	+
P. conventus					+	
P. moitessierianum					+	
P. tenuilineatum					+	
Dreissena polymorpha				+	+	

P. nitidum (6.6%) and *Ancylus fluviatilis* (6.3%). The most common species in site 5 were: *Lithoglyphus naticoides* (56.6% of total catch in the site), *Valvata picinalis* (14.2%) and *Lymnaea peregra* (11.0%); in site 6: *Sphaerium corneum* (18.8%), *Pisidium henslowanum* and *P. nitidum* (13.5% each), *Ancylus fluviatilis* (13.1%), *Pisidium subtruncatum* (12.0%), *Lymnaea peregra* (11.7%); and in site 7: *L. peregra* (50.0%).

In the reservoir on the Vilnia, most collected specimens represented *Pisidium subtruncatum* (59.8%), *P. henslowanum* (16.0%) and *Valvata piscinalis* (5.7%).

In the Viliya, most individuals represented *Lymnaea peregra* (20.7% total catch in the river), *Theodoxus fluviatilis* (17.8%), *Valvata piscinalis* (15.6%), *V. pulchella* (12.6%), *Lymnaea stagnalis* (9.6%) and *Pisidium pseudosphaerium* (8.1%) (Table 5). The most frequent species in site 1 were: *Lymnaea stagnalis* (55.5% total catch at the site); in site 2: *Theodoxus fluviatilis* and *Lymnaea peregra* (30.8% each); in site 3: *Valvata piscinalis* (32.5%), *V. pulchella* (27.5%) and *Lymnaea stagnalis* (15.0%); and in site 4: *L. peregra* (32.8%), *Theodoxus fluviatilis* (26.8%) and *Pisidium pseudosphaerium* (15.5%).

In the reservoir on the Cedronas, *Pisidium casertanum* accounted for 93.8% of the total catch.

Generally, the most widespread at the studied sites in Vilnius were: *Valvata piscinalis* (present in 7 of the 11 sites), *Bithynia tentaculata*, *Lymnaea peregra* and *Pisidium casertanum* (in 6 sites each).

Among the studied watercourses and reservoirs in Vilnius, some species were represented exclusively in one of them by live individuals: five species in the Viliya (*Theodoxus fluviatilis*, *Lymnaea truncatula*, *Unio pictorum*, *Anodonta anatina* and *Pisidium pseudosphaerium*), six species in the Vilnia (*Valvata cristata*, *Lithoglyphus naticoides*, *Planorbarius corneus*,

Unio crassus, *Sphaerium corneum* and *Pisidium amnicum*), five species in the reservoir on the Vilnia (*Lymnaea glutinosa*, *Segmentina nitida*, *Acroloxus lacustris*, *Pisidium hibernicum* and *P. obtusale*), and one species in the reservoir on the Cedronas (*Anodonta cygnea*) (Table 2).

Because of the short and unfavourable collecting period, the results should be treated as preliminary, making it impossible to draw any definite conclusions. Nevertheless, they form a basis for further research on the water malacofauna of Vilnius.

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