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WEEVILS (COLEOPTERA:CURCULIONOIDEA) OF THE LAKES OF KRAGUJEVAC (first communication)

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The results of weevils collecting in July 2001, near the three lakes of Kragujevac (Šumarice, Bubanj and Grošnica), are represented here. Four hundred and nine adults were collected, including 84 species, 45 genera, and five families: Rhynchitidae, Apionidae, Nanophyidae, Eryrhinidae and Curcurlionidae. The results for individual lakes were: Šumarice, 204 specimens belonging to 47 species; Bubanj, 67 specimens, 16 species; and Grošnica, 138 specimens, 49 species. Eleven species were aquatic or semiaquatic: the only captured species of Eryrhinidae, *Tanysphirus lemnae*; three species of *Bagous* (*bagdatensis*, *collignensis*, and *lutulentus*); and seven species of the tribe Phytobiini (subfamily Ceutorhynchinae, family Cucurlionidae), viz., *Pelenomus canaliculatus*, *P. comari*, *P. waltoni*, *Phytobius leucogaster*, *Rhinoncus inconspectus*, *R. pericarpius* and *R. perpendicularis*. Fourteen of the recorded species are new for the Kragujevac basin. Seven of them are aquatic: *Tanysphirus lemnae*, *Bagous bagdatensis*, *B. collignensis, B. lutulentus, Pelenomus canaliculatus*, *Pelenomus waltoni* and *R. perpendicularis*.

KEY WORDS: Weevils, Kragujevac, lakes

INTRODUCTION

As a superfamily of beetles that includes the family of animals with the most species on our planet (Curculionidae), weevils have not bypassed freshwater habitats. In the case of China, for example, it has been established that of about 2000 species of weevils, 71 are aquatic or semiaquatic, although an experienced entomological team succeeded in collecting only 28 species, while for the others it is assumed that they are probably present (CALDARA & O'BRIEN, 1995).

A detailed ecological study of danger to the weevil fauna in Germany showed that precisely aquatic forms are the most threatened in regard to habitat (WINKELMANN, 1991).

Three-year (1982-1984) investigations in the Abrod pri Závode National Park (Slovakia) among other things yielded definition of phytocenosis-linked socions of weevils (MAJZLAN & HOLECOVÁ, 1986). Since the investigated natural biotopes included wet habitats (alder groves, reed stands, peat-bogs), it is clear that the defined socions (which are named for the dominant species, like *Bagoicium puncticoliti*) also contain hygrophilic forms.

Aquatic weevils are mainly confined to stagnant or very slowly flowing water. Aquatic and semiaquatic weevils possess many morphological and ethological adaptations to life in water or alongside it. They have water-repelent glazes, pubescence, or specialized setae for plastron formation, and exhibit different swimming techniques: *Rhinoncus* swims on the surface of the water, by moving all three pairs of legs simultaneously. The majority of *Bagous* species and other water weevils swim by "dog-paddling". Certain *Phytobius* species swim as they walk, i.e., by means of alternating movements (CALDARA & O'BRIEN, 1995).

Because they are for the most part concealed on their host plants underwater by day and emerge on the surface of the latter or other plants (flotant and emersed) at night, when they perform all activities (CALDARA & O'BRIEN, 1995), aquatic weevils were not completely listed in the earlier inventory of weevils of the Kragujevac basin (PEŠIĆ, 1997, PEŠIĆ, 1998) which included seven species of them. One hundred and fifteen species (including four that are aquatic, viz., *Bagous tempestivus* (Herbst, 1795), *Rhinoncus pericarpius*, *Rh. perpendicularis*, and *Pelenomus* (formerly *Phytobius*) *comari* (Hbst.)) were then recorded on damp meadows alongside streams and lakes; 13 species (including two that are aquatic, viz., *Eryrhinus* (formerly *Notaris*) *scirpi* (Fabricius, 1792) and *Pelenomus* (formerly *Phytobius*) *comari* (Hbst.)) were recorded on swampy meadows; and one species, viz., *Phytobius* (formerly *Litodactylus*) *leucogaster* (Marsh.) was recorded from a lake (one more species was wrongly identified). Except this, on less wet habitats some aquatic or semiaquatic adult weevils were collected: *Neophytobius* (formerly *Phytobius*) *quadrinodosus* (Gyll.), *Rhinoncus pericarpius* (valley meadows), *Rhinoncus pericarpius* and *Rh. perpendicularis* (uncultivated land) and *Rh. pericarpius* (ash forest). Specialized study of the weevil fauna in and alongside (50 to 100 m from the shore) the lakes of Kragujevac was therefore begun in 2001.

MATERIAL AND METHODS

Investigations have to date been initiated on the reservoir in the Šumarice Memorial Park, the Bubanj artificial lakelet in the center of town, and the Grošnica reservoir.

Material was collected in the morning (before 10:00 h) on July 6 in Šumarice, July 7 on the Bubanj lakelet, and July 11 on the Grošnica reservoir.

The techniques used included shaking of plants, rinsing of aquatic plants, and examination (unfruitful) of mud in the zone of water withdrawal. In the wider zone around the lakes, the methods of "scything" and separation of insects from soil and sediment with the aid of Tulgren-Berlesse apparatuses were also employed.

The following keys were used for determination: SMRECZYŃSKI (1974), DIECKMANN (1972, 1980, 1983), ANGELOV (1979, 1980), FREUDE *et al*. (1981, 1983), SMRECZYŃSKI (1974).

Nomenclature is that used by ABBAZZI *et al*. (1995) and ALONSO-ZARAZAGA & LYAL (1999).

The lake in the Šumarice Memorial Park was constructed in 1964-1967 by damming the Sušicki brook. Its original purpose (irrigation) was altered due to lack of funds, and water of the reservoir is now used by the city's firemen, the municipal sanitation department, and the park service. This reservoir is 1350 m long and 175 m wide on the average. It has a surface area of 14 ha and volume of 950,000 m^3 (STEPANOVIĆ, 1974).

The Bubanj lakelet is located almost in the center of Kragujevac. Its surface area is 2.7 ha. Average water depth is 1.2 m. The layer of bottom mud is about 0.7 m thick, which threatens to make the lake eutrophic and degrade it to the status of a swamp in the near future (SIMIĆ *et al*., 1994). It is fed by a spring of the same name and by groundwater. The lakelet is artificial in origin, having arisen in the alluvial flats of the Lepenica river in a depression from which earth was removed for a brick factory before World War II and up to 1955. It is elongated in a north-east-southwest direction, has a maximal length of 300 m, and is 215 m wide. Water temperature climbs to 30°C in summer, and the lakelet freezes over in winter. Because it was overgrown with reeds and neglected, water was diverted from the lakelet to the Lepenica in 1971, when the bottom was cleaned and gravelled, after which the refilled lakelet was annexed to the "Jezero" Sport-Recreation Center (STEPANOVIĆ, 1974).

The Grošnica reservoir was constructed on the Grošnica river (a right-hand tributary of the Lepenica) for water supply of the city of Kragujevac and industrial uses. The oldest artificial lake in Serbia, it was filled with water in the spring of 1938. It is 1750 m long, with greatest width of 250 m. Surface area comprises 22 ha. Original volume of the reservoir was 2.17×10^6 m^3. Destruction of forests occurred during and after World War II, which led to strong erosion and partial filling of the reservoir (900 m^3 of sediment/km^2 year), so that depth near the dam

shrank from 26 m originally to 19 m in 1950. Barren slopes were therefore afforested and numerous fences were constructed to check erosion, while in 1962 the dam was raised 7.3 m to reach a constructive height of 50 m, after which depth of the lake by the dam attained a value of 21 m and its capacity grew to 3.53 x 10^6 m^3 (STEPANOVIĆ, 1974).

RESULTS AND DISCUSSION

Collecting in the morning was fairly successful. Four hundred and nine adults were collected, including 84 species, 45 genera, and five families: Rhynchitidae, one species (one specimen, in the Šumarice); Apionidae, 21 species (75 specimens); Nanophyidae, four species (97 specimens); Eryrhinidae, one species (one specimen); and Curcurlionidae, 57 species (235 specimens). (Tab. I).

The results for individual lakes were as follows: Šumarice, 204 specimens (half of the total amount of collected material), including 108 males and 96 females belonging to 47 species (Rhynchitidae, one species; Apionidae, 14; Nanophyidae, three; and Cucurlionidae, 29); Bubanj, 67 specimens (31 males, 36 females) belonging to 16 species (Apionidae, five species; Nanophyidae, four; and Cucurlionidae, seven); and Grošnica, 138 specimens (78 males, 60 females) belonging to 49 species (Apionidae, 10 species; Nanophyidae, three; Eryrhinidae, one; and Cucurlionidae, 35). (Tab. I)

Eleven species (nearly 13%) were aquatic or semiaquatic: the only captured species of Eryrhinidae, *Tanysphirus lemnae*; three species of *Bagous* (*bagdatensis*, *collignensis*, and *lutulentus*); and seven species of the tribe Phytobiini (subfamily Ceutorhynchinae, family Cucurlionidae), viz., *Pelenomus canaliculatus*, *P. comari*, *P. waltoni*, *Phytobius leucogaster*, *Rhinoncus inconspectus*, *R. pericarpius* and *R. perpendicularis*.

Fourteen of the recorded species are new for the Kragujevac basin (PEŠIĆ, 1998). Seven of them are aquatic: *Tanysphirus lemnae*, *Bagous bagdatensis*, *B. collignensis, B. lutulentus, Pelenomus canaliculatus*, *Pelenomus waltoni* and *R. perpendicularis*.

Tanysphirus lemnae lives on plants of the genera *Lemna* and *Spirodela*, as well as on *Calla Palustris*. Studying its biology on *Lemna minor* in 1922, Urban found that the adult constructs a passage in leaves of the host and lays its eggs there. The larva feeds on leaf parenchyma. It damages several leaves in the course of development, swimming easily on the water surface thanks to a water-repellent secretion and a covering of water-resistant scales (CALDARA & O'BRIEN, 1995). Only when forced by necessity does this species live on *Myriophyllum spicatum* (LEKIĆ & MIHAJLOVIĆ**,**1970).

Table I
Qualitative and quantitative composition of weevils of the Kragujevac's lakes

locality	S u m a r i c e										B u b a n j						G r o s n i c a											
	1		2		3		4		5		6		7		8		9		10		11		12		13		14	
T A K S O N	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f
R h y n c h i t i d a e Gistel, 1856																												
Rhynchitinae Gistel, 1856																												
R h y n c h i t i n i Gistel, 1856																												
Rhynchitina Gistel, 1856																												
Temnocerus Thunberg, 1815																												
tomentosus (Gyllenhal, 1839)						1																						
A p i o n i d a e Schönherr, 1823																												
Apioninae Schönherr, 1823																												
A p i o n i n i Schönherr, 1823																												
Apion Herbst, 1797																												
miniatum (Germar, 1833)					1		1		1	1									2	2								
A p l e m o n i n i Schönherr, 1823																												
Perapion Wagner, 1907																												
violaceum (Kirby, 1808)								1											1		2		1	1				
A s p i d a p i i n i Alonso-Zarazaga, 1990																												
Aspidapion Schilsky, 1901																												
radiolus (Marsham, 1802)											1	1																
C e r a t a p i i n i Alonso-Zarazaga, 1990																												
Ceratapion Schilsky, 1901																												
(Acanephodus) Alonso-Zarazaga, 1990																												
onopordi (Kirby, 1808)									1	1						1			1									
K a l c a p i i n i Alonso-Zarazaga, 1990																												
Melanapion Wagner, 1930																												
minimum (Herbst, 1797)					1	2				1																		
Sqamapion Bokor, 1923																												
vicinum (Kirby, 1808)																				1								
Taeniapion Schilsky, 1906																												
urticarius (Herbst, 1784)												1			2	2												
O x y s t o m a t i n i Alonso-Zarazaga, 1990																												
Oxystomatina Alonso-Zarazaga, 1990																												
Cyanapion Bokor, 1923																												
gyllenhali (Kirby, 1808)										1																		
Eutrichapion Reitter, 1916																												

Table I (cont.)

locality	Sumarice										Bubanj						Grosnica											
	1		2		3		4		5		6		7		8		9		10		11		12		13		14	
TAKSON	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f
(Eutrichapion)																												
viciae (Paykull, 1800)						1																						
(Cnemapion) Bokor, 1923																												
gribodoi (Desbrochers, 1896)											2																	
(Psilacollymma) Alonso-Zarazaga, 1990																												
punctigerum (Paykull, 1792)								1																				
Catapiina Alonso-Zarazaga, 1990																												
Catapion Schilsky, 1906																												
seniculus (Kirby, 1808)																		1										
Sinapiina Alonso-Zarazaga, 1990																												
Ischnopterapion Bokor, 1923																												
(Ischnopterapion)																												
loti (Kirby, 1808)										1																		
(Chlorapion) Györffy, 1956																												
virens (Herbst, 1797)																	1	1	1									
Stenopterapion Bokor, 1923																												
(Stenopterapion)																												
tenue (Kirby, 1808)																					1							
Piezotrachelini Voss, 1959																												
Protapion Schilsky, 1908																												
apricans (Herbst, 1797)									1	1																		
dentipes (Gerstäcker, 1854)							1														1			1				
fulvipes (Fourcroy, 1785) (=*flavipes* Paykull, 1792)									2	2							1											
ononicola (Bach, 1854)								1	10	1	1																	
trifolii (Linnaeus, 1768)				1		1			3	2								1										
varipes (Germar, 1817)								1		2																		
Nanophyidae Gistel, 1856																												
Nanophyinae Gistel, 1856																												
Nanophyini Gistel, 1856																												
Dieckmanniellus Alonso-Zarazaga, 1989																												
helveticus (Tournier, 1867)			1	2			1	2	11			1					2	2	1									
Nanomimus Alonso-Zarazaga, 1989																												
anulatus (Aragona, 1830)													1															

Table I (cont.)

locality	Sumarice										Bubanj						Grosnica											
	1		2		3		4		5		6		7		8		9		10		11		12		13		14	
TAKSON	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f
Nanophyes Schönherr, 1838																												
brevis Boheman, 1845									2		3							2		1								
marmoratus (Goeze, 1777)			3	1			1		5	4	17	16		1		1	5	1	4	2	1	2	1					
E r i r h i n i d a e Schönherr, 1823																												
Erirhininae Schönherr, 1823																												
T a n y s p h y r i n i Gistel, 1856																												
Tanysphirus Germar, 1817																												
lemnae (Fabricius, 1792)																						1						
C u r c u l i o n i d a e Latreille, 1802																												
Curculioninae Latreille, 1802																												
A n t h o n o m i n i C. G. Thomson, 1859																												
Bradybatus Germar, 1824																												
(Bradybatus)																												
seriesetosus Petri, 1912																											1	
C u r c u l i o n i n i Latreille, 1802																												
Curculionina Latreille, 1802																												
Archarius Gistel, 1856																												
(Archarius) Gistel, 1856																												
crux (Fabricius, 1777)																					1							
salicivorus (Paykull, 1792)																				1								
M e c i n i n i Gistel, 1856																												
Gymnetron Schönherr, 1825																												
(Gymnetron)																												
erinaceus (Bedel, 1885)			2	2													3		1									
veronice (Germar, 1821)			1																									
villosulum (Gyllenhal, 1838)			13	7						1																		
(Rhinusa) Stephens, 1829																												
smreczynskii Fremuth, 1972																		1										
Stereonychus Suffrian, 1854																												
fraxini (De Geer, 1775)														1														
R h a m p h i n i Rafinesque, 1815																												
Rhamphina Rafinesque, 1815																												
Isochnus C. G. Thomson, 1859																												

Table I (cont.)

locality	Sumarice										Bubanj						Grosnica											
	1		2		3		4		5		6		7		8		9		10		11		12		13		14	
TAKSON	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f
foliorum (Müller, 1776) (=*saliceti* Paykull, 1792)				1																	3	1						
populicola Silfverberg, 1977 (=*populi* Fabricius, 1792)				1	8	7															5	3						
Tachyerges Schönherr, 1825																												
decoratus (Germar, 1821)					3	1															1							
stigma (Germar, 1821)						2																						
S m i c r o n y c h i n i Seidlitz, 1891																												
Smicronyx Schönherr, 1843																												
(Smicronyx)																												
reichi (Gyllenhal, 1836)																		1										
T y c h i i n i C. G. Thomson, 1859																												
Tychiina C. G. Thomson, 1859																												
Tychius Gemar, 1817																												
(Tychius)																												
cuprifer (Panzer, 1799)																	2	1										
junceus (Reich, 1797)										1																		
meliloti Stephens, 1831									1																			
picirostris (Fabricius, 1787)									2	3								2		1								
quinquepunctatus (Linnaeus, 1758)									2																			
stephensi Schönherr, 1836 (=*tomentosus* Herbst, 1795)									1	1																		
tibialis Boheman, 1843							1																					
Bagoinae C. G. Thomson, 1859																												
Bagous Germar, 1817																												
bagdatensis Pic, 1904 (=*wagneri* Dieckmann, 1964)			11	21	1		1		1							1												
collignensis (Herbst, 1795) (=claudicans Angelov, 1957)			1																									
lutulentus (Gyllenhal, 1813) (=*nigritarsis* Thomson, 1865)				1													1											
Baridinae Schönherr, 1836																												
M a d o p t e r i n i Lacordaire, 1866																												
Zygobaridina Pierce, 1907																												
Limnobaris Bedel, 1885																												
dolorosa (Goeze, 1777) (=*pilistriata* Stephens, 1831)			1																									
Ceutorhynchinae Gistel, 1856																												
C e u t o r h y n c h i n i Gistel, 1856																												
Amalus Schönherr, 1825																												

Table I (cont.)

locality	Sumarice										Bubanj						Grosnica											
	1		2		3		4		5		6		7		8		9		10		11		12		13		14	
TAKSON	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f
scortillum (Herbst, 1795)																				1								
Ceutorhynchus Germar, 1824																												
floralis (Paykull, 1792)																			3	1			3	2				
niyazii Hoffmann, 1957 (=*vindobonensis* Dieckm.)																							1					
sulcicollis (Paykull, 1800)																		1										
Datonychus Wagner, 1944																												
arquatus (Herbst, 1795)																			1									
melanostictus (Marsham, 1802)								1			1							1										
Nedyus Schönherr, 1825																												
quadrimaculatus (Linnaeus, 1758)																			1	3	1							
Thamiocolus C. G. Thomson, 1859																												
signatus (Gyllenhal, 1837)												1																
Phytobiini Gistel, 1856																												
Pelenomus C. G. Thomson, 1859																												
canaliculatus (Fåhraeus, 1843)			1	2																								
comari (Herbst, 1795)											2									1								
waltoni (Boheman, 1843)				1																								
Phytobius Schönherr, 1833																												
leucogaster (Marsham, 1802) (=*myriophylli* Gyllenhal, 1813)	2													2	1	5												
Rhynoncus Schönherr, 1825																												
inconspectus (Herbst,																							8	5				
pericarpius (Linnaeus, 1758)																			1	3		1						
perpendicularis (Reich, 1797)			1																									
Cryptorhynchinae Schönherr, 1825																												
Cryptorhynchini Schönherr, 1825																												
Tylodina Lacordaire, 1866																												
Echinodera Wollaston, 1863																												
(Echinodera)																												
capiomonti (H. Brisout, 1864)																												1
Entiminae Schönherr, 1823																												
Polydrusini Schönherr, 1823																												
Polydrusus Germar, 1817																												
(Eustolus) C. G. Thomson, 1859																												

Table I (cont.)

locality	Sumarice										Bubanj						Grosnica											
	1		2		3		4		5		6		7		8		9		10		11		12		13		14	
TAKSON	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f
corruscus Germar, 1824																					1	1						
Sciaphilini Sharp, 1891																												
Eusomus Germar, 1824																												
(Eusomus)																												
ovulum Germar, 1824										2																		
Sciaphobus K. Daniel, 1904																												
caesius (Hampe, 1870)									1	1															1			
Sitonini Gistel, 1856																												
Sitona Germar, 1817																												
(Sitona)																												
hispidulus (Fabricius, 1777)																	1		1									
humeralis Stephens, 1831																	2			2								
lineatus (Linnaeus, 1758)					2				4	3		2						1	2									
longulus (Gyllenhal, 1834)																	1		2	1								
puncticollis Stephens, 1831										2																		
sulcifrons (Thunberg, 1798)																				1								
Hiperinae Marseul, 1863																												
Hyperini Marseul, 1863																												
Donus Jekel, 1865																												
oxalidis (Herbst, 1795)																			1									
Hypera Germar, 1817																												
(Hypera)																												
elongata (Paykull, 1792)																				1	1							
meles (Fabricius, 1792)										1																		
nigrirostris (Fabricius, 1775)																	1			1								
rumicis (Linnaeus, 1758)																		1										
viciae (Gyllenhal, 1813)						1																						

Table I (cont.)

locality	Sumarice										Bubanj						Grosnica											
	1		2		3		4		5		6		7		8		9		10		11		12		13		14	
TAKSON	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f	m	f
Lixinae Schönherr, 1823																												
Lixini Schönherr, 1823																												
Larinus Dejean, 1821																												
(Phyllonomeus) Gistel, 1856																												
sturnus (Schaller, 1783)									1	1																		
Lixus Fabricius, 1801																												
(Epimeces) Billberg, 1820																												
filiformis (Fabricius, 1781) (=*elongatus* Goeze, 1777)																			1	1								

Legend: 1) Collected by rinsing of water plant;	9) meadow in Tresnjevak (below graveyard, between road and river);
2) tip of lake (plants in shallow water and mud);	10) by Grosnica brook;
3) willows;	11) willow grove;
4) periodically flooded meadow;	12) by canal at tip of lake, below small dam;
5) dry left bank (meadow);	13) right bank, dry part;
6) reeds near service station (left bank);	14) mixed deciduous forest above road following right bank (litter);
7) view toward road;	m - male; f - female.
8) right bank (view toward cafe and spring);	

Among the aquatic species, *Bagous bagdatensis* Pic, 1904 (= *B. wagneri* Dieckmann, 1964) stands out with respect to the number of specimens collected (36). Widely disseminated in Central, Southern, and Southeast Europe as well as Asia Minor, this species on the territory of the former Yugoslavia had up to now been registered only in the guise of three specimens from Montenegro (Budva, Virpazar, and Ulcinj), all of them collected by foreign entomologists (... , 1993). With 35 specimens, it is even the dominant species on the lake in Šumarice. The foodplant of this species is still unknown. The insects climb out of the water onto surrounding vegetation at dusk (HOLECOVA, 1993).

Bagous collignensis and *B. lutulentus* develop in *Equisetum limosum* (FREUDE *et al*., 1883).

To judge from biology of the related species *Bagous affinis* Hustache and *B. laevigatus* O'Brien and Pajni (BENNETT & BUCKINGHAM, 1991), these insects are incapable of swimming on the surface. Only the occasional specimen manages to crawl along the host's stem under water, but it surfaces immediately on being disturbed. Under conditions of submersion in an experiment, 90% of adults of both sexes of the former species survived two days. It turned out that males can remain longer under water. Adults under water obtain oxygen by means of plastron breathing (oxygen from the water diffuses into a thin layer of air around the body, which is maintained owing to scales and spines on the surface). Larvae and pupae develop in tubers of the water weed *Hydrilla verticillata*. They likewise can develop normally for only a limited time in tubers under submersed conditions, at the expense of the amount of air in hollow tubers. Under normal (nonexperimental) conditions, adults feed on all parts of the host plant. Larvae under natural conditions do not assault inundated (submersed) tubers, but instead develop in tubers (underground turions) of *Hydrilla* on the stream bank after water withdrawal, i.e., during the dry period. Complete development at 27°C on the average lasts 21.9 days. *Potamogeton pectinatus* also serves frequently as the host plant.

On the Bubanj lakelet, *Nanophyes marmoratus* is dominant with 35 captured specimens (more than half of the total number). In contrast to it, *Nanomimus anulatus* should be mentioned as a rarer species of the same family that was found only alongside this lakelet in the center of town. This species was previously recorded in the Kragujevac basin (PEŠIĆ, 1997) on damp meadows in the Šumarice park, as well as at the Drac and Grbica localities. Both species were taken from the host plant, *Lythrum salicaria* (ANGELOV, 1980). Larvae of the former develop in the fruit, those of the latter in galls on the main leaf vein. The other two species of Nanophyidae (*Dieckmanniellus helveticus* with 27 specimens and *Nanophyes brevis* with eight) are linked with the same host and were found at all three lakes.

Also characteristic of the Bubanj lakelet was the finding of eight specimens of *Phytobius leucogaster*, a species that lays its eggs in unopened emersed flower

clusters of *Myriophyllum spicatum* or between them. Development of the larvae occurs in and on the same plant, often under water. Chrysalis formation is in the water in a leathery cocoon on the stem of the host. Cocoons are supplied with air from the plant aerenchyma. May to December is given as the period of activity of the imago. During reproduction, the body of the adult is surrounded by an air bubble (it can spend 8-24 h under submersed conditions) (BUCKINGHAM & BENNET, 1981). Later during the winter, the adult hides under fallen leaves, in moss, and elsewhere. Following three-year experiments on biological suppression of *Myriophyllum spicatum* as a weed, LEKIĆ & MIHAJLOVIĆ (1970) recommended precisely this species of weevil.

Pelenomus canaliculatus is biologically linked with *Myriophyllum verticillatum* and *M. spicatum* (CALDARA & O'BRIEN, 1995) and was recorded only on the Šumarice lake. *Pelenomus waltoni,* this time recorded only on that lake, but previously recorded (PEŠIĆ, 1997) on the Bubanj lakelet, lives on *Polygonum hydropiper* and *P. mite*. On the other hand, *P. comari* is a polyphagous form that feeds on Comarum, Alchemila and Lythrum (FREUDE et. al., 1983). It is now recorded on the Grošnica reservoir and Bubanj lakelet, having been previously registered on the Šumarice lake as well (PEŠIĆ, 1997). The larvae of all *Pelenomus* species are exposed (naked) and live on the underside of leaves of the host.

Rhinoncus inconspectus (all 13 specimens of which were found by the Grošnica reservoir) and *R. perpendicularis* (only one specimen of which was found in the Šumarice park this time, but which in 1997 was also recorded both on the Grošnica reservoir and near Zdraljica river) are linked with *Polygonum amphibium* and *P. lapathifolium* (CALDARA & O'BRIEN, 1995), to some extent competing with each other as adults, although development of the former occurs in the root, while the latter develops in the leaf petiole and stem. Biologically linked with *Rumex* (FREUDE *et al*, 1983; ANGELOV, 1979), *R. pericarpius* was found this time (five specimens) only by the Grošnica reservoir, but was previously also recorded both in the Šumarice park and in the Adžine Livade (PEŠIĆ, 1997).

To the list of aquatic species of weevils in Kragujevac can also be added ones recorded previously (PEŠIĆ, 1997; PEŠIĆ, 1998), but not captured this time: *Eryrhinus scirpi* (Fabricius, 1792) (= *Notaris scirpi* F.), which is linked with *Typha*, *Scirpus*, and *Carex* species and was previously found in the Šumarice park; *Bagous tempestivus* (Herbst, 1795), which develops in *Ranunculus repens* (FREUDE *et al*., 1983) or in *Potamogeton* (ANGELOV, 1979) and was previously recorded in the Šumarice park and at the Drača and Vinjista localities; and *Neophytobius quadrinodosus* (Gyllenhal, 1813), which is biologically linked with *Polygonum* and *Rumex* and was previously found in the Šumarice park and in Vinjista.

Continuation of the present investigation is planned, together with its extension to the Gruža reservoir if circumstances permit.

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СУРЛАШИ (COLEOPTERA: CURCULIONOIDEA) КРАГУЈЕВАЧКИХ ЈЕЗЕРА (Први прилог)

СНЕЖАНА ПЕШИЋ

И з в о д

Истраживање слатководних и сурлаша око водених станишта је због специфичног, претежно скривеног начина њиховог живота, прилично захтевно. У овом раду су изложени резултати сакупљања и обраде адултних сурлаша у јулу 2001. године на крагујевачким језерима Шумарице, Бубањ и Грошница. Укупно је сакупљено 409 примерака. Идентификацијом је утврђено 84 врсте из 45 родова, пет фамилија - Rhynchitidae, Apionidae, Nanophyidae, Eryrhinidae и Curcurlionidae. Резултати по језерима су следећи: Шумарице – 204 јединке из 47 врста; Бубањ – 67 јединки из 16 врста; и Грошничко језеро – 138 јединки из 49 врста.

Од укупног броја, 11 врста је акватично или полуакватично. То су: једини представник фамилије Eryrhinidae - *Tanysphirus lemnae*; три врсте рода *Bagous* (*bagdatensis*, *collignensis*, и *lutulentus*); и седам врста трибуса Phytobiini (субфамилија Ceutorhynchinae, фамилија Cucurlionidae)- *Pelenomus canaliculatus*, *P. comari*, *P. waltoni*, *Phytobius leucogaster*, *Rhinoncus inconspectus*, *R. pericarpius* и *R. perpendicularis*.

По први пут у крагујевачкој котлини се бележи присуство 14 врста сурлаша, од чега је половина акватична (*Tanysphirus lemnae*, *Bagous bagdatensis*, *B. collignensis*, *B. lutulentus*, *Pelenomus canaliculatus*, *Pelenomus waltoni* и *R. perpendicularis*).

Изнети прелиминарни резултати указују на потребу да се истраживање настави.

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