

## A review of weevils (Coleoptera, Curculionoidea) in the Zasavica Special Nature Reserve (Serbia)

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**Abstract.** Data on weevil fauna (Coleoptera, Curculionoidea) in the Zasavica Special Nature Reserve based on the adult specimens collected from 1996 to 2007, are presented here. A total of 371 specimens, including 86 species from seven families (Anthribidae, Rhynchitidae, Apionidae, Nanophyidae, Eirrhinidae, Dryophthoridae and Curculionidae), were collected. The territory of Zasavica was proclaimed as a Special Nature Reserve in 1997, due its swamp and freshwater habitats. The 20 hygrophilic and hydrophilic weevil species have been confirmed here by this study. Considering its habitats' diversity, the Zasavica SNR calls for further, more detailed research on its weevils' communities.

**Key words:** fauna, weevils (Coleoptera, Curculionoidea), Serbia, Zasavica Special Nature Reserve.

### Introduction

The cosmopolitan beetle superfamily of Curculionoidea (weevils) encompasses the most numerous animal family in the world, Curculionidae (Lyal & King 1996, Oberprieler et al. 2007). Despite that and the fact that weevils (as inhabitants of practically all terrestrial and freshwater ecosystems containing plants) are creatures of great ecological importance, their fauna in Serbia remains under-researched (Pešić 2006a). While the freshwater ecosystems are nowadays the focal point of nature conservation in the world, the weevils' fauna of wetlands and aquatic ecosystems in Serbia received scant attention in merely a handful of papers (Pešić 2000, 2002, 2004, 2006b, 2007, Pešić & Stanković 2007). There are two reasons for this: on the one hand, finding and collecting weevils in moist and aquatic habitats is a rather difficult and uncertain task (Caldara & O'Brien 1995). On the other hand, faunistic studies are unpopular among the young researchers and do not receive strong enough support from the Serbian government. As a result, the existing collections of faunistic data are sparse, yet it is strongly believed that they consist rich and valuable means for future ecological studies, biomonitoring, comparative analyses and forecasts.

The Mediterranean Basin is identified as one of 35 world's biodiversity hot spots for conservation priority (Mittermeier et al. 2011), with approximately 25,000 vascular plant species including 13,000 (52%) endemic (i.e. one tenth of worldwide endemics), and 770 vertebrate species (235 or 30.5% are endemic) (Myers et al. 2000). The Balkan

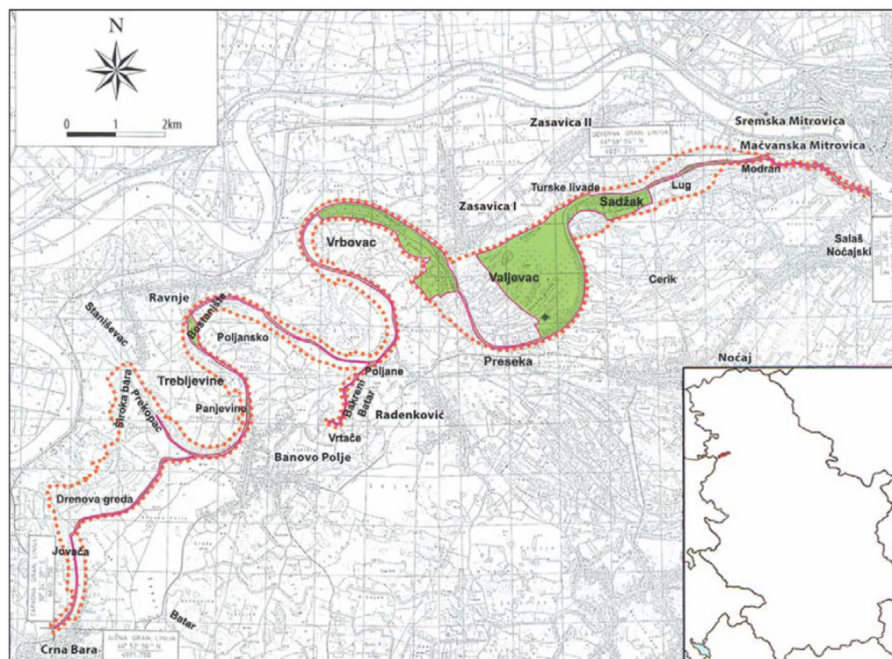
Peninsula is the part of the Mediterranean Basin, inhabited by great number of species (Stevanović & Vasić 1995, Griffiths et al. 2004). Among the 8,000 Balkans' plant species, about 2,700 are endemic (Stevanović et al. 2005). Territory of Serbia and Montenegro occupies 102,181 km<sup>2</sup> (less than 2.1% of territory of Europe), but is inhabited by big rate of European species (for example approximately 70% of mammals, 75% of birds, 52% of freshwater fishes, 39% of vascular plants), including over 1,600 internationally significant species (Radović 2005). Despite the fact that it is an important biodiversity hotspot in Europe, the territory of the Balkan Peninsula resembles a black hole on the biogeographical maps as far as many organisms are concerned.

The main aim of this paper is to present the field data heretofore collected regarding the adult weevils' appearance and the composition of their settlements in a complex of different ecosystems covered by the Zasavica Special Nature Reserve (SNR). As a group in numerous phytophagous organisms, first-order consumers, the weevil assemblies deserve to be treated as one of the cornerstones in the composition of biocenoses in this extraordinary patchwork of different, more or less wet habitats.

### Materials and methods

#### Study area

The Zasavica SNR is located in Serbia, on the territory of Southern Vojvodina, extending from 44°52'56" to the 44°58'04" N and from 19°24'07" to the 19°36'31" E, between the Drina and Sava rivers, in the northern part of



**Figure 1.** The Map of the Zasavica SNR (and position in Serbia), indicating the locations of studied sites: solid line - SNR border, dotted line - border of protected area, green coloured surface - zone of level II protection (modified from Lazić 2008).

Mačva plain (Fig. 1). The Zasavica reserve occupies an area of 33.1 km of the meandering alluvial terrain, 6 km west of the town of Sremska Mitrovića. It was proclaimed a Special Nature Reserve in 1997, primarily due to its aquatic and wet, swampy habitats (e.g. floodable meadows and forests). The area of active protection stretches across 18,12 km<sup>2</sup>, whereof 6,71 km<sup>2</sup> is under strict protection (Lazić 2008). This internationally important residence of plants, birds and butterflies was designated as the Wetland of International Importance (Ramsar site) in 2008 ([http://www.ramsar.org/cda/en/ramsar-news-archives-2008-zasavica-river-ecosystem/main/ramsar/1-26-45-85%5E17462\\_4000\\_0\\_\\_](http://www.ramsar.org/cda/en/ramsar-news-archives-2008-zasavica-river-ecosystem/main/ramsar/1-26-45-85%5E17462_4000_0__)). It is, however, unclear whether it should be classified as static or flowing water (Stanković 2006), inter alia, because Zasavica's water is refreshed underground by the Drina and Sava rivers.

Geologically speaking, the Zasavica reserve lies on powerful deposits of sand and gravel, formed by the accumulative forces of the Sava and Drina rivers. The absolute altitude of the protected area ranges from 78 to 81 m (Lazić 2008).

The area of the Zasavica complex belongs, in the biogeographical terms, to the biomes of South-European, mostly broad-leaved woodlands along the Sava River, while the rest are European broad-leaved woodlands with elements of Ponto-Caspian steppes (Lopatin & Matvejev 1995). Typical forests are from the order *Populetalia albae* Br.-Bl. 1931. Aquatic and marsh vegetation belongs to the classes *Lemnetea* Koch. et Tx. 1954, *Potametea* Tx. et Prsg. 1942 and *Phragmitetea communis* Tx. et Prsg.

1942 (Kojić et al. 1998). Different types of meadows are heavily influenced by grazing cattle, sheep, goats and pigs.

#### Collecting and processing of materials

This paper presents the data collected on weevil fauna (Coleoptera, Curculionoidea) from the Zasavica Special Nature Reserve, based on the adult specimens collected from 1996 to 2007 (excluding 1999, when Serbia was bombed). The collecting process in the period 1996-2005 was sporadic (mostly large species, easily observable), whereas during 2006 and 2007 it became more intense. In both cases, collecting was predominantly conducted by Mihajlo Stanković from the SNR, except in July 2007 when we worked together.

Adult weevils were collected at 40 localities (Fig. 1, Table 1), by means of different collecting techniques ("sweeping" of herbaceous plants, beating the bushes and tree branches, individual collecting, Malaise trap, pitfall traps, as well as soil and litter sifting). Different habitats are covered (Table 1), both natural (different deciduous forests, their flood zones, under wood and soil, Zasavica's banks and water, reeds) as well as more anthropogenic sites (pastures, ruderal vegetation beside roads, neglected lands and weedy fields).

Insects were killed by ethanol or ethyl acetate. All specimens were prepared and deposited in the weevils' collection at the Faculty of Natural Sciences in Kragujevac, Serbia. Sex was determined for each specimen, except for the two Anthribidae specimens. Male genitalia

and a series of keys (Alonso-Zarazaga 1990, Angelov 1976, 1978, 1979, 1980, 1981, Caldara 1990, Ehret 1990, Freude et al. 1981, 1983, Smreczyński 1965, Tempère et al. 1989) were used for the identification. The list of species and the accompanying taxonomic data are in accordance with world catalogue of families and genera (Alonso-Zarazaga & Lyal 1999) and Fauna Europaea (Alonso-Zarazaga 2012).

## Results and Discussion

Sporadic collecting performed during 53 field excursions, organised from 1996 to 2007 in 37 localities, resulted in the finding of 102 specimens (51 male, 49 female and two Anthribidae) of 41 various species (Pešić & Stanković 2007). The targeted field trips aimed at collecting adult weevils in three localities: Valjevac, Turske livade and Trebljevne (Pešić 2012) in the period 3rd-5th July 2007 were almost three times more productive (269 specimens, 54 different species). Viewed together, the results could be summarised as follows: during 56 field excursions, 371 specimens (180 males, 189 females, and two Anthribidae specimens whose gender was not determined) of 86 species, belonging to seven families, were registered: Anthribidae (2 species), Rhynchitidae (1), Apionidae (13), Nanophyidae (4), Eirirhinidae (4), Dryophthoridae (2) and the dominant Curculionidae (60 i.e. 69.77 % of the total number of species) (Table 1).

If this result is compared with faunistical data for some European territories - Central Europe  $\approx$ 1,200 species (Freude et al. 1981), France  $\approx$ 1,500 (Tempère et al. 1989), Italy 2216 species and subspecies (Abbazzi & Maggini 2009), Bulgaria over 900 (Angelov 1976), it could be concluded that it is modest. But, if the proportions of SNR Zasavica size are considered with cited territories (it is just 0.177% of territory of Serbia and Montenegro), as well as length of history of faunistical investigations, number of included researchers, diversity of environmental conditions etc., the registered weevils fauna is not so poor, as on the contrary it contains  $\approx$ 7.1 % of total of 1,200 weevil species which could be expected for Serbia and Montenegro (Radović et al. 1995). This conclusion is supported by data obtained on similar weevil studies in Serbia: there were registered 64 species on meadows of Goč Mt. (Pešić and Jelić 2000); 72 species on Tara Mt. and 101 on Stara Planina Mt. (Pešić 2003); 399 species for Kragujevac valley (Pešić 2013); 92 species in the National Park Fruška Gora Mt. (per-

sonal, unpublished data).

According to FaEu data (Alonso-Zarazaga 2012), as many as 27 species (23.26 %) represent new findings in the weevil-fauna of Serbia (in Table 1 marked with \*), but nine of them are presented for Serbia in the recently published Catalogue of Weevils from Palaeractic (Löbl & Smetana 2011, 2013). The species marked in Table 1 with #\* (there are 18 of them, i.e. over 20 % of total species number) could be treated as till now unknown for territory of Serbia. This fact alone demonstrates why further faunistic studies are not only necessary, but also vital for "black holes" to be cleared from the biogeographical maps, especially in the biodiversity hotspots.

As far as ecology is concerned, since Zasavica was declared a SNR on account of its swamp and freshwater habitats, the local fauna which deserves special attention includes, first and foremost, weevils developmentally related to the semiaquatic (hygrophilic) and aquatic (hydrophilic) species of plants. The aquatic and semiaquatic weevils are generally associated with stagnant or very slowly flowing water, just like the one in which Zasavica abounds. This study contributes to the description of this area by bringing forth the data for 20 hygrophilic and hydrophilic weevil species. They represent over 23% of total registered weevil fauna in SNR Zasavica, what is significantly more than 13% registered for artificial lakes in Central Serbia (Pešić 2000, 2004). From the family Nanophyidae, we found *Nanophyes brevis* Boheman, *N. globiformis* Kiesenwetter, *N. marmoratus* (Goeze) and *Nanomimus hemisphaericus* (Olivier). From the fam. Eirirhinidae there were also four species: *Notaris scirpi* (Fabricius), *Thryogenes scirrhosus* (Gyllenhal), *Stenopelmus rufinatus* Gyllenhal and *Tanysphyrus (Tanysphyrus) lemnae* (Fabricius). As in all the material, the dominant species were the representatives of the family Curculionidae: three *Bagous* species (*bagdatensis* Pic, *nodulosus* Gyllenhal and *puncticollis* Boheman); from Baridinae *Limnobaris dolorosa* (Goeze); from Ceutorhynchinae *Thamiocolus viduatus* (Gyllenhal), *Mononychus punctumalbum* (Herbst), four *Pelenomus* species (*canaliculatus* Fåhræus, *commari* (Panzer), *quadricorniger* (Colonnelli) and *waltoni* (Boheman)) and two *Rhinoncus* species (*bruchoides* (Herbst) and *perpendicularis* (Reich)).

More than one third (exactly seven species) of totally registered weevils from the category inhabiting wet habitats (semiaquatic and aquatic) are

**Table 1.** Weevil taxa registered in the SNR Zasavica from 1996 to 2007 with data on the findings. (\* - species registered for the first time in Serbia according to the data of FaEu; # - species registered for the first time in Serbia according to Löbl and Smetana 2011, 2013).

Taxa	Findings			No.		
	Data, Place	Habitat	Plant	♂	♀	Σ
Anthribidae Billberg, 1820 Anthribinae Billberg, 1820 Anthribini Billberg, 1820 <i>Anthribus</i> Geoffroy, 1762						
1 <i>nebulosus</i> Forster, 1770	22 IV 2006 Banovo Polje, Trebljevine	forest	<i>Lamium purpureum</i>			1
Platystomini Pierce, 1916 <i>Platystomos</i> Schneider, 1791						
2 <i>albinus</i> (Linnaeus, 1758)	11 IV 2006 Radenković, Poljane					1
Rhynchitidae Billberg, 1820 Rhynchitinae Gistel, 1856 Rhynchitini Gistel, 1856 Rhynchitina Gistel, 1856 <i>Rhynchites</i> Schneider, 1791 ( <i>Rhynchites</i> Schneider, 1791)						
3 <i>bacchus</i> (Linnaeus, 1758)	13 III 1997 Sadžak	under bark	<i>Ulmus</i>	1		1
Apionidae Schönherr, 1823 Apioninae Schönherr, 1823 Apionini Schönherr, 1823 <i>Apion</i> Herbst, 1797						
4 <i>frumentarium</i> (Linnaeus, 1758)	03 VII 2007 Valjevac 04 VII 2007 Valjevac	pasture Reserve edge	<i>Rumex</i> <i>Crataegus</i> , <i>Cornus</i>	2 1	2 1	4 1
Ceratapiini Alonso-Zarazaga, 1990 <i>Ceratapion</i> Schilsky, 1901 ( <i>Ceratapion</i> Schilsky, 1901)						
5 <i>carduorum</i> (W. Kirby, 1808)	04 VII 2007 Valjevac	pasture	<i>Cirsium</i> , <i>Urtica</i>	1		1
<i>Diplapion</i> Reitter, 1916						
6 <i>Detritum</i> (Mulsant & Rey, 1858)	03 VII 2007 Valjevac	pasture	<i>Matricaria inodora</i>	1		1
Kalcapiini Alonso-Zarazaga, 1990 <i>Melanapion</i> Wagner, 1930 ( <i>Melanapion</i> Wagner, 1930)						
*7 <i>Minimum</i> (Herbst, 1797)	06 VIII 2006 Ravnje, Široka b.	forest edge	<i>Roripa kernerii</i>	1		1
<i>Taenapion</i> Schilsky, 1906						
8 <i>urticarium</i> (Herbst, 1784)	04 VII 2007 Valjevac 05 VII 2007 Trebljevine, Ljubink. čuprija	pasture beside forest road	<i>Cirsium</i> , <i>Urtica</i> <i>Urtica dioica</i>	2 1	2 3	4 4
Malvapiini Alonso-Zarazaga, 1990 <i>Pseudapion</i> Schilsky, 1906						
9 <i>fulvirostre</i> (Gyllenhal, 1833)	03 VII 2007 Valjevac 03 VII 2007 Valjevac	pasture pasture	<i>Althaea officinalis</i> <i>Matricaria inodora</i>	1 1		1 1
Oxystomatini Alonso-Zarazaga, 1990 Oxystomatina Alonso-Zarazaga, 1990 <i>Cyanapion</i> Bokor, 1923 ( <i>Cyanapion</i> Bokor, 1923)						

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Table 1. (continued)

Taxa	Findings			No.		
	Data, Place	Habitat	Plant	♂	♀	Σ
10 <i>columbinum</i> (Germar, 1817)	03 IX 2006 Zasavica II, Valjevac	pasture	<i>Mentha aquatica</i>	1		1
	05 VII 2007 Trebljevine		<i>Hypericum acutum</i>		1	1
<i>Holotrichapion</i> Gyorffy, 1956 ( <i>Apiops</i> Alonso-Zarazaga, 1990)						
11 <i>pisi</i> (Fabricius, 1801)	25 V 2006 Zasavica II, Turske Livade	forest edge	<i>Hesperis matronalis</i>	1		1
	03 IX 2006 Zasavica II, Valjevac	pasture	<i>Mentha aquatica</i>		1	1
	11 IX 2006 Radenković, Poljane	bank			1	1
	11 IX 2006 Crna Bara, Drenova Greda	forest	<i>Brachypodium silvaticum</i>	1		1
	05 VII 2007 Trebljevine	flood zone	<i>Polygonum</i>	7	4	11
	05 VII 2007 Trebljevine		<i>Hypericum acutum</i>	2	1	3
<i>Catapiina</i> Alonso-Zarazaga, 1990						
<i>Catapion</i> Schilsky, 1906						
12 <i>jaffense</i> (Desbrochers, 1896)	03 VII 2007 Valjevac	pasture	<i>Ononis spinosa</i>		1	1
	03 VII 2007 Valjevac	pasture	<i>Matricaria inodora</i>		1	1
<i>Piezotrachelini</i> Voss, 1959						
<i>Protapion</i> Schilsky, 1908						
13 <i>assimile</i> (W. Kirby, 1808)	03 IX 2006 Zasavica II, Valjevac	flood zone	<i>Heleocharis palustris</i>		1	1
14 <i>fulvipes</i> (Geoffroy, 1785)	06 VIII 2006 Ravnje, Široka b.	forest edge	<i>Roripa kernerii</i>	1		1
15 <i>nigritarse</i> (W. Kirby, 1808)	05 VII 2007 Trebljevine	flood zone			1	1
16 <i>ononidis</i> (Gyllenhal, 1827)	03 IX 2006 Zasavica II, Valjevac	flood zone	<i>Heleocharis palustris</i>		1	1
	03 VII 2007 Valjevac	pasture	<i>Althaea officinalis</i>	1		1
	03 VII 2007 Valjevac	pasture	<i>Ononis spinosa</i>	7	5	12
	03 VII 2007 Valjevac	pasture	<i>Matricaria inodora</i>	1		1
	04 VII 2007 Valjevac	Reserve edge	<i>Crataegus, Cornus</i>	2	1	3
	04 VII 2007 Valjevac	pasture	<i>Cirsium, Urtica</i>	1		1
<i>Nanophyidae</i> Gistel, 1856						
<i>Nanophyini</i> Gistel, 1856						
<i>Nanophyes</i> Schoenherr, 1838						
17 <i>brevis</i> Boheman, 1845	03 VII 2007 Valjevac	reed		1		1
	04 VII 2007 Turske Livade	beside water	<i>Hottonia palustris</i>	1		1
	05 VII 2007 Trebljevine	flood zone	<i>Lithrum salicaria</i>		1	1
18 <i>globiformis</i> Kiesenwetter, 1864	14 VI - 04 VII 2007 Turske Livade				1	1
19 <i>marmoratus</i> (Goeze, 1777)	03 VII 2007 Valjevac	pasture	<i>Rumex</i>	1	1	2
	03 VII 2007 Valjevac	reed		1	2	3
	04 VII 2007 Turske Livade	beside water	<i>Hottonia palustris</i>	6	5	11
	05 VII 2007 Trebljevine	flooded ash, elm, maple forest		1	2	3

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Table 1. (continued)

Taxa	Findings			No.			
	Data, Place	Habitat	Plant	♂	♀	Σ	
	05 VII 2007 Trebljevina	flood zone		2		2	
	05 VII 2007 Trebljevina, Ljubink. ćuprija	beside forest road	<i>Lithrum salicaria</i>	5	5	10	
	05 VII 2007 Trebljevina	flood zone	<i>Lithrum salicaria</i>	1	3	4	
	05 VII 2007 Trebljevina		<i>Hypericum acutum</i>		1	1	
<i>Nanomimus</i> Alonso-Zarazaga, 1989							
20	<i>hemisphaericus</i> (Olivier, 1807)	22 IV 2006 Banovo Polje, Jovača	bank	<i>Alnus glutinosa</i>	1	1	
Eirirhinidae Schoenherr, 1825							
Eirirhininae Schoenherr, 1825							
Eirirhinini Schoenherr, 1825							
<i>Notaris</i> Germar, 1817							
21	<i>scirpi</i> (Fabricius, 1793)	03 VII 2007 Valjevac	reed		1	1	
<i>Thryogenes</i> Bedel, 1884							
22	<i>scirrhosus</i> (Gyllenhal, 1836)	05 VII 2007 Trebljevina	flood zone	<i>Scirpus lacustris</i>	1	1	
Stenopelmini LeConte, 1876							
<i>Stenopelmus</i> Schoenherr, 1835							
#*23	<i>rufinasus</i> Gyllenhal, 1835	05 VII 2007 Trebljevina	water	<i>Lemna</i>	2	1	3
		05 VII 2007 Banovo polje, Ljubink. ćuprija	beside water		3	2	5
Tanysphyrini Gistel, 1856							
<i>Tanysphyrus</i> Germar, 1817							
(Tanysphyrus Germar, 1817)							
#*24	<i>lemnae</i> (Fabricius, 1792)	03 VII 2007 Valjevac	pasture	<i>Verbascum nigrum</i>	3	3	
		03 VII 2007 Valjevac	pasture	<i>Ononis spinosa</i>		1	1
		04 VII 2007 Turske Livade	beside water	<i>Hottonia palustris</i>		1	1
		05 VII 2007 Trebljevina	water	<i>Lemna</i>	18	22	40
		05 VII 2007 Trebljevina, Rašovića ćuprija	water	<i>Lemna minor</i> , <i>L. trisulca</i>	2	2	4
Dryophthoridae Schoenherr, 1825							
Dryophthorinae Schoenherr, 1825							
<i>Dryophthorus</i> Germar, 1824							
#*25	<i>corticalis</i> (Paykull, 1792)	14 VI - 04 VII 2007 Turske Livade			1	1	
Rhynchophorinae Schoenherr, 1833							
Litosomini Lacordaire, 1866							
<i>Sitophylus</i> Schoenherr, 1838							
26	<i>zeamais</i> Motschulsky, 1855	25 V 2006 Ravnje, Bostanište	bank		1	1	
		10 VI 2006 Salaš Noćajski, Ostrovac	bank		1	1	
		11 X 2006 Ravnje, Prekopac	beside bank		1	1	
		05 XI 2006 Radenković, Batar	forest	<i>Carpinus betulus</i>	1	2	3
Curculionidae Latreille, 1802							
Curculioninae Latreille, 1802							
Curculionini Latreille, 1802							
<i>Archarius</i> Gistel, 1856							
(Archarius Gistel, 1856)							

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Table 1. (continued)

Taxa	Findings			No.		
	Data, Place	Habitat	Plant	♂	♀	Σ
27 <i>salicivorus</i> (Paykull, 1792)	04 VII 2007 Turske Livade	beside water	<i>Hottonia palustris</i>	1		1
	04 VII 2007 Valjevac	beside water and reed		1		1
Anthonomini C.G. Thomson, 1859						
<i>Anthonomus</i> Germar, 1817						
<i>(Anthonomus</i> Germar, 1817)						
28 <i>rubi</i> Herbst, 1795	05 VII 2007 Trebljevine		<i>Rubus</i>	2		2
Cionini Schoenherr, 1825						
<i>Stereonychus</i> Suffrian, 1854						
29 <i>fraxini</i> (De Geer, 1775)	09 V 2006 Radenković, Vrbovac	bank		1		1
	17 VI 2006 Zasavica II, Turske Livade	under wood		1		1
	04 VII 2007 Valjevac	soil of willow, poplar, ash forest		2	12	14
	05 VII 2007 Trebljevine	forest ash, maple, willow		1	1	
	05 VII 2007 Trebljevine	soil of flooded ash, willow, walnut forest		2	2	
Ellescini C.G. Thomson, 1859						
<i>Dorytomina</i> Germar, 1817						
<i>Dorytomus</i> Germar, 1817						
<i>(Euolamus</i> Reitter, 1916)						
#*30 <i>minutus</i> (Gyllenhal, 1836)	04 VII 2007 Valjevac	soil of willow, poplar, ash forest		1		1
Mecinini Gistel, 1856						
<i>Gymnetron</i> Schoenherr, 1825						
#*31 <i>erinaceus</i> (Bedel, 1885)	03 VII 2007 Valjevac	pasture	<i>Verbascum nigrum</i>	1	1	2
#*32 <i>villosulum</i> Gyllenhal, 1838	03 VII 2007 Valjevac	pasture	<i>Verbascum nigrum</i>	1		1
	03 VII 2007 Valjevac	pasture	<i>Ononis spinosa</i>	1		1
<i>Rhinusa</i> Stephens, 1829						
33 <i>tetra</i> (Fabricius, 1792)	03 VII 2007 Valjevac	pasture	<i>Verbascum nigrum</i>	1	2	3
Rhamphini Rafinesque, 1815						
<i>Rhamphina</i> Rafinesque, 1815						
<i>Isochnus</i> C.G. Thomson, 1859						
34 <i>sequensi</i> (Stierlin, 1894)	14 VI - 04 VII 2007 Turske Livade			4	2	6
<i>Orchestes</i> Illiger, 1798						
<i>(Orchestes</i> Illiger, 1798)						
35 <i>avellanae</i> (Donovan, 1797)	04 VII 2007 Turske Livade	beside water	<i>Hottonia palustris</i>	1		1
<i>Tachyerges</i> Schoenherr, 1825						
36 <i>salicis</i> (Linnaeus, 1758)	05 VII 2007 Trebljevine	flood zone	<i>Polygonum</i>	1		1
Tychiini C.G. Thomson, 1859						
<i>Tychiina</i> C.G. Thomson, 1859						
<i>Tychius</i> Germar, 1817						
<i>(Tychius</i> Germar, 1817)						
37 <i>stephensi</i> Schönherr, 1836	11 VII 2006 Zasavica II, Turske Livade	forest	<i>Arum maculatum</i>	1		1
Bagoinae C.G. Thomson, 1859						

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Table 1. (continued)

Taxa	Findings			No.		
	Data, Place	Habitat	Plant	♂	♀	Σ
Bagoini C.G. Thomson, 1859 <i>Bagous</i> Germar, 1817						
38 <i>bagdatensis</i> Pic, 1904	18 VI 2006 Sadžak, Salaš Noćajski	reed		6	4	10
	30 VI 2006 Zasavica II, Valjevac	flood zone		6	3	9
39 <i>nodulosus</i> Gyllenhal, 1836	04 VII 2007 Turske Livade	beside water	<i>Hottonia palustris</i>	2	1	3
#*40 <i>puncticollis</i> Boheman, 1845	18 VI 2006 Sadžak, Salaš Noćajski	reed		1		1
	30 VI 2006 Zasavica II, Valjevac	flood zone		2	1	3
	03 VII 2007 Valjevac	reed		2	1	3
	05 VII 2007 Trebljevina	water	<i>Lemna</i>	1		1
Baridinae Schönherr, 1836						
Baridini Schönherr, 1838						
Baridina Schönherr, 1838						
<i>Baris</i> Germar, 1817 ( <i>Baris</i> Germar, 1817)						
#*41 <i>artemisiae</i> (Herbst, 1795)	24 IV 2006 Banovo Polje, Prekopac	forest	<i>Rhamnus cathartica</i>	1	1	2
Madopterini Lacordaire, 1866						
Zygobaridina Pierce, 1907						
<i>Limnobaris</i> Bedel, 1885						
#*42 <i>dolorosa</i> (Goeze, 1777)	05 VII 2007 Trebljevina	water	<i>Carex</i>	2	2	4
	05 VII 2007 Trebljevina	flood zone			1	1
Ceutorhynchinae Gistel, 1856						
Ceutorhynchini Gistel, 1856						
<i>Ceutorhynchus</i> Germar, 1824						
43 <i>erysimi</i> (Fabricius, 1787)	04 VII 2007 Turske Livade	soil of oak, ash, elm forest			1	1
#*44 <i>picitarsis</i> Gyllenhal, 1837	04 VII 2007 Valjevac	soil of willow, poplar, ash forest		1		1
	05 VII 2007 Trebljevina	soil of flooded ash, willow, walnut forest		1	2	3
45 <i>typhae</i> (Herbst, 1795)	04 VII 2007 Valjevac	soil of willow, poplar, ash forest		2		2
	04 VII 2007 Turske Livade	soil of oak, ash, elm forest			1	1
<i>Datonychus</i> Wagner, 1944						
46 <i>arquata</i> (Herbst, 1795)	05 VII 2007 Trebljevina	flood zone	<i>Polygonum</i>	1	1	2
<i>Nedyus</i> Schoenherr, 1825						
47 <i>quadrinaculatus</i> (Linnaeus, 1758)	05 VII 2007 Trebljevina	flood zone	<i>Urtica dioica</i>	1		1
	05 VII 2007 Trebljevina, Ljubink. ćuprija	beside forest road	<i>Urtica dioica</i>	2	1	3
<i>Thamiochus</i> C.G. Thomson, 1859						
#*48 <i>viduatus</i> (Gyllenhal, 1813)	03 VII 2007 Valjevac	pasture	<i>Rumex</i>	1		1
Mononychini LeConte, 1876						
<i>Mononychus</i> Germar, 1824						
49 <i>punctumalbum</i> (Herbst, 1784)	15 V 2002 Trebljevina			1		1
Phytobiini Gistel, 1856						
<i>Pelenomus</i> C.G. Thomson, 1859						
*50 <i>canaliculatus</i> (Fähræus, 1843)	30 VI 2006 Zasavica II, Valjevac	flood zone		1		1
	04 VII 2007 Turske Livade	beside water	<i>Hottonia palustris</i>		1	1

Continued on next page



Table 1. (continued)

Taxa	Findings			No.		
	Data, Place	Habitat	Plant	♂	♀	Σ
	14 VI - 04 VII 2007	Turske Livade		1	1	
*51 <i>commari</i> (Panzer, 1794)	05 VII 2007	Trebljevine	flooded ash, elm, maple forest	1	1	
#*52 <i>quadricorniger</i> (Colonnelli, 1986)	05 VII 2007	Trebljevine	flood zone			
	04 VII 2007	Turske Livade	beside water		1	1
	05 VII 2007	Trebljevine	flood zone	1	1	
*53 <i>waltoni</i> (Boheman, 1843)	05 VII 2007	Trebljevine	ash, maple, willow forest	1	1	
	05 VII 2007	Trebljevine	flood zone		2	2
#*54 <i>Rhinoncus bruchoides</i> (Herbst, 1784)	03 VII 2007	Valjevac	pasture	4	2	6
	04 VII 2007	Valjevac	beside water	6	4	10
55 <i>perpendicularis</i> (Reich, 1797)	04 VII 2007	Valjevac	beside water		3	3
	04 VII 2007	Valjevac	beside water and reed	1	1	
Entiminae Schönherr, 1826						
Alophini LeConte, 1874						
<i>Craptus</i> Schönherr, 1823						
56 <i>kaufmanni</i> (Stierlin, 1884)	27 IV 2006	Zasavica I, Valjevac	forest	1	1	
Otiorhynchini Schönherr, 1826						
<i>Otiorhynchus</i> Germar, 1824						
( <i>Cryphiphorus</i> Stierlin, 1883)						
57 <i>ligustici</i> (Linnaeus, 1758)	21 VII 1997	Bogaz		1	1	
	28 V 2002	Turske Livade		1	1	
	21 VII 2006	Zasavica I, Šumareva čup.	flood zone	1	1	
Phyllobiini Schönherr, 1826						
<i>Phyllobius</i> Germar, 1824						
( <i>Metaphyllobius</i> Smirnov, 1913)						
58 <i>pilicornis</i> Desbrochers, 1873	23 VI 2005	Noćaj, Sadžak		1	1	
( <i>Pterygorrhynchus</i> Pesarini, 1969)						
*59 <i>maculicornis</i> Germar, 1824	14 VII 2005	M. Mitrovica, Modran		1	1	
Polydrusini Schönherr, 1823						
<i>Polydrusus</i> Germar, 1817						
( <i>Chrysophis</i> Gozis, 1882)						
60 <i>formosus</i> (Mayer, 1779)	20 VIII 1997	Zasavica I, Bačevica		1	1	
( <i>Eustolus</i> Thomson, 1859)						
61 <i>corruscus</i> Germar, 1824	28 V 1997	M. Mitrovica, Modran		1	1	
Sciaphilini Sharp, 1891						
<i>Sciaphobus</i> K. Daniel, 1904						
( <i>Neosciaphobus</i> Apfelbeck, 1922)						
62 <i>squalidus</i> (Gyllenhal, 1834)	10 III 2006	Banovo Polje, Panjevine	forest	1	1	
	10 IV 2006	Banovo Polje, Trebljevine	bank	4	1	5
	12 IV 2006	Ravnje, Bostanište	forest edge	1	1	
	21 IV 2006	Banovo Polje, Trebljevine	disafforested part of forest	1	1	2

Continued on next page

Table 1. (continued)

Taxa	Findings			No.		
	Data, Place	Habitat	Plant	♂	♀	Σ
	21 IV 2006 Banovo Polje, Trebljevine	bank	<i>Sparganium erectum</i>	1	1	
	28 IV 2006 Crna Bara, Jovača	forest	<i>Acer tataricum</i>	1	1	
	26 V 2006 Nočaj, Sadžak	neglected land	<i>Agrostemia githago</i>	1	1	
	07 VII 2006 Crna Bara, Jovača	bank		1	1	
	09 IX 2006 Nočaj, Lug	flood zone		1	1	
	30 X 2006 Banovo Polje, Prekopac	forest edge	<i>Achiela milefolium</i>	1	1	
	30 XI 2006 Radenković, Poljane	forest	<i>Torilis arvensis</i>	2	2	
Sitonini Gistel, 1856						
<i>Sitona</i> Germar, 1817						
<i>(Sitona</i> Germar, 1817)						
63	<i>hispidulus</i> (Fabricius, 1776)	05 VII 2007 Trebljevine	<i>Hypericum acutum</i>	1	1	
64	<i>humeralis</i> Stephens, 1831	06 XII 2006 Nočaj, Preseka under wood		1	1	
		03 VII 2007 Valjevac pasture	<i>Ononis spinosa</i>	1	1	
		04 VII 2007 Turske Livade beside water	<i>Hottonia palustris</i>	1	1	
		05 VII 2007 Trebljevine	<i>Hypericum acutum</i>	1	1	
65	<i>lateralis</i> Gyllenhal, 1834	03 VII 2007 Valjevac	reed	1	1	
66	<i>lepidus</i> Gyllenhal, 1834	08 VIII 2004 Bostanište		1	1	
67	<i>lineatus</i> (Linnaeus, 1758)	03 VII 2007 Valjevac	reed	1	1	
		04 VII 2007 Valjevac Reserve edge	<i>Crataegus, Cornus</i>	1	1	
#*68	<i>tenuis</i> Rosenhauer, 1847	04 VII 2007 Valjevac Reserve edge	<i>Crataegus, Cornus</i>	1	1	
Tanymecini Lacordaire, 1863						
<i>Tanymecus</i> Lacordaire, 1863						
<i>(Tanymecus</i> Lacordaire, 1863)						
*69	<i>palliatius</i> (Fabricius, 1787)	12 IV 2006 Ravnje, Bostanište	forest edge	<i>Rubus caesius</i>	1	1
		14 IV 2006 Salaš Nočajski, Sadžak	under wood, reed	<i>Urtica dioica</i>	1	1
		23 VI 1998 Nočaj, Sadžak		1	1	
		01 VIII 2006 Salaš Nočajski, Lug	weedy field	<i>Chenopodium album</i>	1	1
<i>(Episomecus</i> Reitter, 1903)						
70	<i>dilatocollis</i> Gyllenhal, 1834	20 VIII 1997 Zasavica II, Bačevica		1	1	
		15 III 2003 Nočaj, Cerik		1	1	
Hyperinae Marseul, 1863						
Hyperini Marseul, 1863						
<i>Hypera</i> Germar, 1817						
<i>(Erinomorphus</i> Capiomont, 1868)						
71	<i>Rumicis</i> (Linnaeus, 1758)	03 VII 2007 Valjevac	reed	1	1	
Lixinae Schönherr, 1823						
Limini Schönherr, 1823						
<i>Lixus</i> Fabricius, 1801						
<i>(Lixus</i> Fabricius, 1801)						
#*72	<i>paraplecticus</i> (Linnaeus, 1758)	03 VIII 2004 Ravnje, Staniševac		1	2	3

Continued on next page

Table 1. (continued)

Taxa	Findings			No.		
	Data, Place	Habitat	Plant	♂	♀	Σ
( <i>Compsolixus</i> Reitter, 1916) #*73 <i>ascanii</i> (Linnaeus, 1767)	03 VII 2007 Valjevac	reed		1	1	
( <i>Dilixellus</i> Reitter, 1916) 74 <i>pulverulentus</i> (Scopoli, 1763)	28 V 2002 Sadžak			1	1	
( <i>Epimeces</i> Billberg, 1820) 75 <i>cardui</i> Olivier, 1807	05 VI 2002 Cerik			1	1	
76 <i>filiformis</i> (Fabricius, 1781)	22 VI 1996 Valjevac			1	1	
	22 VI 2000 Jovača			1	1	
	04 VII 2007 Valjevac	pasture	<i>Cirsium</i> , <i>Urtica</i>	2	2	4
( <i>Eulixus</i> Reitter, 1916) 77 <i>iridis</i> Olivier, 1807	09 IV 1997 Nočaj, Sadžak			1	1	
	03 VIII 2004 Ravnje, Staniševac			1	1	
( <i>Ortholixus</i> Reitter, 1916) 78 <i>tibialis</i> Boheman, 1842	04 VII 2007 Turske Livade	beside water	<i>Hottonia</i> <i>palustris</i>	1	1	
<i>Lachnaeus</i> Schönherr, 1826 *79 <i>crinitus</i> Schönherr, 1826	01 VII 2006 Banovo Polje, Trebljevine	weedy field	<i>Kicxia clatina</i>	1	1	
<i>Larinus</i> Dejean, 1821 ( <i>Larinomesius</i> Reitter, 1924) 80 <i>obtusus</i> Gyllenhal, 1835	22 VIII 1997 Bogaz			1	1	
( <i>Phyllonomeus</i> Gistel, 1856) *81 <i>iaceae</i> (Fabricius, 1775)	04 VII 2007 Valjevac	pasture	<i>Cirsium</i> , <i>Urtica</i>	2	1	3
82 <i>sturnus</i> (Schaller, 1783)	17 VIII 2005 Vrbovac			1	1	
	03 VII 2007 Valjevac	pasture	<i>Carduus</i>	1	1	
	04 VII 2007 Valjevac	pasture	<i>Carduus</i>	4	2	6
Cleonini Schönherr, 1826 <i>Cleonis</i> Dejean, 1821 83 <i>pigra</i> (Scopoli, 1763)	03 VIII 2004 Ravnje, Staniševac			1	1	
	17 VI 2006 Zasavica II, Turske Livade			1	1	
	04 VII 2007 Valjevac		<i>Carduus</i>	1	1	
<i>Asproparthenis</i> Gozis, 1886 #*84 <i>punctiventris</i> (Germar, 1824)	19 IV 2000 B. Polje, Poljansko			1	1	
Molytinae Schönherr, 1823 <i>Hylobiini</i> W. Kirby, 1837 <i>Hylobiina</i> W. Kirby, 1837 <i>Hylobius</i> Germar, 1817 ( <i>Callirus</i> Dejean, 1821) #*85 <i>transversovittatus</i> (Goeze, 1777)	08 VIII 2002 Batar			1	1	
<i>Lepyriini</i> W. Kirby, 1837 <i>Lepyrus</i> Germar, 1817 *86 <i>capucinus</i> (Schaller, 1783)	20 VII 2003 Nočaj, Preseka			1	1	
	24 VIII 2005 Raden, Batar, Vrtače			1	1	
	14 IV 2006 Salaš Nočajski, Sadžak	under wood, reed	<i>Urtica dioica</i>	1	1	
	27 V 2006 Nočaj, Preseka	forest	<i>Salix caprea</i>	1	1	
TOTAL				180	189	371

new for Serbia, i.e. - *Stenopelmus rufinasus*, *Tanysphyrus* (*Tanysphyrus*) *lemnae*, *Bagous puncticollis*, *Limnobaris dolorosa*, *Thamiocolus viduatus*, *Pelenomus quadricorniger* and *Rhinoncus bruchoides* according to Löbl & Smetana (2011, 2013). Obviously these authors did not have the chance to know that *Tanysphyrus* (*Tanysphyrus*) *lemnae* and *Limnobaris dolorosa* are already mentioned in earlier Pešić's works (the first species in 2000, and the second in 2000 and 2004). However, the first finding of five semiaquatic or aquatic weevils' species for Serbia once again confirms the importance of wet habitats for the biodiversity of any territory.

## Conclusions

The checklist of adult weevils heretofore registered in the Zasavica SNR which is presented here is but one of the bricks in the building of this unusual natural phenomenon. Of the aforementioned species, especially interesting and important, zoogeographically speaking, are 18 species which have been registered for the first time in Serbia (marked with #\* in Table 1). In other words, this means that every fifth weevil species from Zasavica represents a new addition to the Serbian fauna.

To sum up, this paper showed that the Zasavica SNR-system calls for further, more detailed research on the weevils' communities within assemblies as well as their interactions with environment. A more comprehensive picture of the weevils' fauna of the Zasavica Nature Reserve could be assembled if more systematic collecting was organized over a number of years, covering all seasonal aspects and habitats. It is still a challenge for the entomologists to try to find more specimens of weevils hidden in the complex mixture of Zasavica habitats. Once the weevil settlement richness is thoroughly studied, the findings will greatly contribute to a better understanding of Zasavica's ecological mosaic and the environmental importance of this natural treasure.

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