

Acta entomologica serbica, 2010, 15(2): 195-204

UDC 595.768(497.11)

PRELIMINARY RESEARCH OF APIONIDAE AND NANOPHYIDAE (COLEOPTERA: CURCULIONOIDEA) OF THE BIOSPHERE RESERVE GOLLIJA-STUDENICA

SNEŽANA PEŠIĆ* and SVETLANA AVRAMOVIĆ

University of Kragujevac, Faculty of Science, P.O. Box 60, 34000 Kragujevac, Serbia

* E-mail: snpesic@kg.ac.rs

Abstract

The preliminary data of weevils from the families Apionidae and Nanophyidae from the territory of Biosphere Reserve Golija-Studenica are given. The identification of 192 adult specimens collected during August 2008 confirmed the presence of 34 species (32 from the family Apionidae and two from Nanophyidae). The taxonomy and all collecting details are presented here (date of collecting, localities, type of habitat, plants, numbers of females, males and total number of specimens).

KEY WORDS: Faunistics, weevils, Apionidae, Nanophyidae, Serbia, Biosphere Reserve Golija-Studenica.

Introduction

The Golija and Čemerno Mts. are located in south-western Serbia (Fig. 1). Both mountains belong to the east branch of the Dinaric Alps (or Dinarides).

Golija Mt. stretches 32 km in an west-east direction, covering an area of 75.183 ha, between the coordinates 43°20' - 43°33'N and 20°17' - 20°28'E. The highest peak is Jankov kamen (1833 m a.s.l.). Due to impermeable geological grounds and heavy precipitation, Golija Mt. is water-rich. Summers are fresh, while winters are long and cold, with a lot of snow. Golija Mt. is famous mainly as the most forested mountain in Serbia. The oak, beech, mixed beech-spruce and beech-fir forests are like regular altitudinal belts distributed from the base of the mountain to the highest tops. Since 2001, Golija Mt. has been protected as a Nature park due to its high biodiversity (UREDBA O ZAŠTITI PARKA PRIRODE GOLLIJA, 2001).

Čemerno Mt. is smaller mountain than Golija Mt.. It is approximately 21 km long in a northwest-southeastern direction (placed between 43°35' - 43.58'N and 20°25' - 20.43'E) along the left bank of the Ibar River. The highest peak is Smrdljuč (1579 m a.s.l.). Čemerno Mt. is covered by mixed forests and many meadows and pastures.

Thanks to the existence of the Studenica Monastery, the south part of Čemerno Mt. together with a big part of Golija Nature Park were designated as the Biosphere Reserve Golija-Studenica by the UNESCO Commission in October 2001. The total area of Biosphere Reserve is 53,804 ha.



Figure 1. Geographical position of Biosphere Reserve Golija-Studenica in Serbia (modified http://www.lib.utexas.edu/maps/europe/cen_balkan_ref802638_1999.jpg)

The students' Ecological Research Association "Mladen Karaman" of the Faculty of Science of the University of Kragujevac included parts of this area in its research program for the years 2007, 2008 and 2009. The weevils were studied there in the 2008, for the first time ever.

The superfamily Curculionoidea now includes 23 weevil families. Within this superfamily are about 80,000 described species (LYAL & KING, 1996; ALONSO-ZARAZAGA & LYAL, 1999). Two of the families are the Apionidae and the Nanophyidae. The Apionidae continued to be considered as subfamily Apioninae (EHRET, 1990), despite the fact that it has been treated as a family in the works of ALONSO ZARAZAGA since 1980, and was confirmed by many different taxonomical analysis, like BACCETTI *et al.* (1985) and BURRINI *et al.* (1986,

1988). There are still many taxonomical problems and dilemmas connected with these very small beetles (about 1-3.2 mm on average) (ALONSO-ZARAZAGA, 1990), but for the territory of Europe the system given in Fauna Europaea (2005) is accepted.

The apionids are morphologically different from the other Curculionoidea by their antennae – they are not elbow bent. On the other hand, Nanophyidae have a small pear-shaped body, similar to the Apionidae, but their antennae are elbow bent. The family Nanophyidae has been treated as a part of apionids (ZHERICHIN, 1991, 1992) for a long time.

The fauna of these two families in Serbia is very poorly known in comparison with other territories (PEŠIĆ, 2009). Three hundred and eight (308) species of Apionidae and 33 of Nanophyidae are known in Europe, while for the territory of Serbia and Montenegro only 30 apionids and five nanophyids are registered in the data of the Fauna of Europe (ALONSO-ZARAZAGA, 2005). This is far from the expected number of species. ANGELOV (1976, 1980) listed 121 Apionidae and 12 Nanophyidae species for Bulgaria. For the Republic of Moldova POIRAS (1998) named 86 Apionidae and three Nanophyidae species. For Italy 195 and 22 species respectively are registered (COLONNELLI, 2003). Only a few works written before 1980 (like TEOFILOVIĆ *et al.*, 1959; TANASIJEVIĆ & TEŠIĆ, 1962; TANASIJEVIĆ, 1975) exist about Apionidae from the territory of Serbia. Results of research of Apionidae and Nanophyidae in Serbia are still modest (PEŠIĆ, 1996, 1998, 2002a, 2002b, 2004, 2009; PEŠIĆ & JELIĆ, 2000; PEŠIĆ & STANKOVIĆ, 2007), but we can expect not less than 100 Apionidae and five Nanophyidae species. This assessment is based on the fact that for the territory of Kragujevac city more than 70 apionids and four nanophyids species were registered (PEŠIĆ, 1998). Obviously these data are not yet included in the Fauna of Europe database (ALONSO-ZARAZAGA, 2005).

Material and Methods

Adult weevils for this study were collected during the summer research action organized by the students' Ecological Research Association "Mladen Karaman", from 2nd to 8th August 2008 at Golija Mt. as well as from 16th to 21st August 2008 at Čemerno Mt.

On Golija Mt. weevils were collected in various habitats (wet and mountain meadows, mountain pastures, beech and beech-spruce forests, heath scrubs and ruderal vegetation) and localities (Tab. I). On Čemerno Mt. different habitats in the wider environs of Tolišnica village were included in the analysis, but only two findings from mixed oak-hornbeam forest on the opposite side of mountain (near the anchoress of St. Sava in the Savovo village) are used in this work, because just this locality belongs to the Golija-Studenica Reserve.

We used several different collecting techniques: sweeping (the ground floor of vegetation), beating (the tree branches and bushes), and collecting by hand. Each finding is presented by basic data (date, locality, habitat and whenever possible the plant from which the beetle was collected). Each specimen is determined by sex. All material is housed in the collection at the Faculty of Science in Kragujevac.

Keys used for the identification of species are the following: ALONSO-ZARAZAGA (1990), ANGELOV (1976, 1980), DIECKMANN (1977), EHRET (1990), HOFFMANN (1958), LOHSE (1981, 1983), MORRIS (1990), SMRECZYŃSKI (1965), and TEMPÉRE & PÉRICART (1989).

The list of taxa was prepared according to the recent weevils' nomenclature (ALONSO-ZARAZAGA & LYAL, 1999; ALONSO-ZARAZAGA, 2005).

Results and Discussion

During the short summer period (2nd to 8th August 2008), specimens of 190 adult weevils from the families Apionidae (150) and Nanophyidae (40) (Tab. I) were collected on Golija Mountain. In the very dry oak-hornbeam wood in the locality of Savovo on Čemerno Mountain we collected just two adult weevil specimens from the family Apionidae - one male of *Exapion (Exapion) elongatulum* and one female of *Hemitrichapion (Dimesomyops) pavidum* (Tab. I) - on 19th August 2008.

Table I. Data on Apionidae and Nanophyidae from the Golija-Studenica Biosphere Reserve, collected in August 2008.

Taxa	Date	Locality	Habitat	Plant	♂	♀	Σ
Fam. Apionidae Schönherr, 1823							
Subfam. Apioninae Schönherr, 1823							
Trib. Apionini Schönherr, 1823							
<i>Apion</i> Herbst, 1797							
<i>A. cruentatum</i> Walton, 1844)	2	Gradac	m.m./b.f.			1	1
<i>A. frumentarium</i> (Linnaeus, 1758)	2	Gradac	m.m./b.f.		1		1
<i>A. haematodes</i> W. Kirby, 1808	3	Srednja Reka	m.m.		1	1	2
Trib. Aplemonini Kissinger, 1968							
<i>Perapion</i> Wagner, 1907							
<i>P. (Perapion) curtirostre</i> (Germar, 1817)	3	Srednja Reka	m.m.			1	1
	5	Bajevići	m.m.		1	1	2
	6	Dajičko jezero	w.m.		1	1	2
<i>P. (P.) oblongum</i> (Gyllenhal, 1839)	3	Srednja Reka	w.m.			1	1
<i>P. (P.) violaceum</i> (W. Kirby, 1808)	2	Gradac	m.m./b.f.		2		2
	3	Srednja Reka	w.m.		2	2	4
	6	Dajičko jezero	w.m.		2		2
	6	Bele Vode	r.v.	<i>R.i.</i>		1	1
	7	Srednja Reka/Staro selo	w.m.		1		1
<i>Pseudoperapion</i> Wagner, 1930							
<i>P. brevirostre</i> (Herbst, 1797)	2	Alijino Brdo	b.s.f./m.p.	<i>H.p.</i>	9	3	12
	3	Srednja Reka	w.m.		1		1
	3	Srednja Reka	m.m.	<i>H.p.</i>	1	4	5
	4	Jankov Kamen	h.s.		3	2	5
	4	Gradac	s.f.	<i>V.sp.</i>	1		1
	5	Bajevići	m.m.	<i>H.p.</i>	1	4	5
	6	Dajičko jezero	w.m.	<i>H.p.</i>	6	11	17
	8	Bojevo Brdo	m.p.	<i>H.p.</i>	3	9	12
<i>Pseudostenapion</i> Wagner, 1930							
<i>P. simum</i> (Germar, 1817)	3	Srednja Reka	m.m.		1		1
	5	Bajevići	m.m.		3	1	4
	8	Bojevo Brdo	m.p.	<i>H.p.</i>		4	4

Taxa	Date	Locality	Habitat	Plant	♂	♀	Σ
Trib. Aspidapiini Alonso-Zarazaga, 1990							(Table I – continued)
<i>Aspidapion</i> Schilsky, 1901							
<i>(Koestlinia)</i> Alonso-Zarazaga, 1990							
<i>A. (K.) aeneum</i> (Fabricius, 1775)	7	Dajići: Miličevići	r.v.	<i>T.sp.</i>		1	1
Trib. Ceratapiini Alonso-Zarazaga, 1990							
<i>Ceratapion</i> Schilsky, 1901							
<i>(Acanephodus)</i> Alonso-Zarazaga, 1990							
<i>C. (A.) onopordi</i> (W. Kirby, 1808)	6	Srednja Reka/Dajičko brdo	r.v.		1		1
<i>(Echinostroma)</i> Alonso-Zarazaga, 1990							
<i>C. (E.) penetrans</i> (Germar, 1817)	3	Srednja Reka	m.m.		2		2
Trib. Exapiini Alonso-Zarazaga, 1990							
<i>Exapion</i> Bedel, 1887							
<i>(Exapion)</i>							
<i>E. (E.) compactum</i> (Desbrochers, 1888)	2	Alijino Brdo	b.s.f./m.p.			1	1
<i>E. (E.) corniculatum</i> (Germar, 1817)	2	Gradac	m.m./b.f.		1		1
	5	Bajeivići	m.m.			1	1
<i>E. (E.) elongatum</i> (Desbrochers, 1891)	19	Savovo	o.h.f.		1		1
Trib. Kalcapiini Alonso-Zarazaga, 1990							
<i>Squamapion</i> Bokor, 1923							
<i>S. atomarium</i> (W. Kirby, 1808)	2	Alijino Brdo	b.s.f./m.p.			1	1
	3	Srednja Reka	m.m.	<i>T.sp.</i>	6	8	14
<i>S. cineraceum</i> (Wencker, 1864)	7	Dajići: Miličevići	r.v.	<i>T.sp.</i>	1	1	2
<i>S. elongatum</i> (Germar, 1817)	6	Dajičko jezero	w.m.		1		1
<i>S. hoffmanni</i> (Wagner, 1930)	2	Alijino Brdo	b.s.f./m.p.			1	1
<i>S. minutissimum</i> (Rosenhauer, 1856)	3	Srednja Reka	m.m.	<i>T.sp.</i>	2	4	6
	4	Jankov Kamen	m.p.			2	2
<i>S. oblivium</i> (Schilsky, 1902)	3	Srednja Reka	m.m.	<i>T.sp.</i>		2	2
Trib. Metapiini Alonso-Zarazaga, 1990							
<i>Metapion</i> Schilsky, 1906							
<i>M. oculare</i> (Gyllenhal, 1833)	3	Srednja Reka	m.m.			1	1
Trib. Oxystomatini Alonso-Zarazaga, 1990							
Subtrib. Oxystomatina Alonso-Zarazaga, 1990							
<i>Oxystoma</i> Duméril, 1805							
<i>O. subulatum</i> (W. Kirby, 1808)	3	Srednja Reka	w.m.			1	1
<i>Cyanapion</i> Bokor, 1923							
<i>(Cyanapion)</i>							
<i>C. (C.) columbinum</i> (Germar, 1817)	2	Gradac	m.m./b.f.		1		1
<i>C. (C.) spencii</i> (W. Kirby, 1808)	5	Bajeivići	b.m.m.	<i>S.c., B.p., A.sp.</i>	1		1

Taxa	Date	Locality	Habitat	Plant	♂	♀	Σ
Trib. Oxystomatini Alonso-Zarazaga, 1990							(Table I – continued)
<i>(Bothryorrhynchapion)</i> Bokor, 1923							
<i>C. (B.) platalea</i> (Germar, 1817)	7	Srednja Reka/Staro selo	r.v.	<i>L.t.</i>		1	1
<i>Hemitrichapion</i> Voss, 1959							
<i>(Dimesomyops)</i> Alonso-Zarazaga, 1990							
<i>H. (D.) pavidum</i> (Germar, 1817)	5	Bajevići	m.m.		1	2	3
	19	Savovo	o.h.f.			1	1
<i>Holotrichapion</i> Gyorffy, 1956							
<i>(Apiops)</i> Alonso-Zarazaga, 1990							
<i>H. (A.) pullum</i> (Gyllenhal, 18337) (= <i>aestimatum</i> F.)	3	Srednja Reka	m.m.			2	2
<i>Pirapion</i> Reitter, 1916							
<i>P. redemptum</i> (Schatzmayr, 1920)	5	Bajevići	m.m.			1	1
<i>Catapion</i> Schilsky, 1906							
<i>C. pubescens</i> (W. Kirby, 1811)	3	Srednja Reka	m.m.			1	1
Subtrib. Sinapiina Alonso-Zarazaga, 1990							
<i>Ischnopterapion</i> Bokor, 1923							
<i>(Ischnopterapion)</i>							
<i>I. (I.) aeneomicans</i> (Wencker, 1864)	2	Alijino Brdo	b.s.f./m.p.		1	1	2
<i>I. (I.) loti</i> (W. Kirby, 1808)	2	Srednja Reka	r.v.			1	1
	6	Bele Vode	r.v.		1		1
	7	Srednja Reka/Staro selo	r.v.			1	1
<i>(Chlorapion)</i>							
<i>I. (C.) virens</i> (Herbst, 1797)	5	Bajevići	m.m.		2	1	3
Trib. Piezotrachelini Voss, 1959							
<i>Protapion</i> Schilsky, 1908							
<i>P. assimile</i> (W. Kirby, 1808)	3	Srednja Reka	w.m.		2		2
	3	Srednja Reka	m.m.			1	1
<i>P. fulvipes</i> (Geoffroy, 1785)	3	Srednja Reka	m.m.			1	1
	4	Gradac	s.f.	<i>V.sp.</i>		1	1
	7	Dajići: Miličevići	r.v.	<i>T.sp.</i>		1	1
	7	Srednja Reka/Staro selo	r.v.			1	1
Fam. Nanophyiidae Gistel, 1856							
Trib. Nanophyini Gistel, 1856							
<i>Nanophyes</i> Schoenherr, 1838							
<i>N. marmoratus</i> (Goeze, 1777)	2	Srednja Reka	r.v.	<i>L.s.</i>	4	6	10
	3	Srednja Reka	w.m.	<i>L.s.</i>	10	7	17
	6	Dajičko jezero	w.m.	<i>L.s.</i>	6	5	11
<i>Dieckmanniellus</i> Alonso-Zarazaga, 1989							
<i>D. helveticus</i> (Tournier, 1867)	2	Alijino Brdo	b.s.f./m.p.	<i>L.s.</i>	1		1

Taxa	Date	Locality	Habitat	Plant	♂	♀	Σ
Trib. Nanophyini Gistel, 1856					(Table I – continued)		
<i>Dieckmanniellus helveticus</i> (Tournier, 1867)	3	Srednja Reka	w.m.	L.s.		1	1
TOTAL					85	107	192

Abbreviations: s.f. – spruce forest; b.s.f. – beech-spruce forest; b.f. – beech forest; o.h.f. – oak-hornbeam forest; h.s. – heath scrubs; m.p. – mountain pastures; m.m. – mountain meadow; b.m.m. – border of mountain meadow; w.m. – wet meadow; r.v. – ruderal vegetation; *R.i.* – *Rubus idaeus*; *H.p.* – *Hypericum perforatum*; *T.sp.* – *Thymus* sp.; *S.c.* – *Salix caprea*; *B.p.* – *Betula pendula*; *A.sp.* – *Alnus* sp.; *V.sp.* – *Vaccinium* sp.; *L.s.* – *Lythrum salicaria*; *L.t.* – *Lathyrus tuberosus*.

We identified 34 species (32 Apionidae and two Nanophyidae) belonging to 18 genera (17 Apionidae, two Nanophyidae) (Tab. I). An identification of two species (*Squamapion oblivium* - two specimens, and *Pirapion redemptum* – one specimen) is suspected and needs further confirmation.

Sex ratio in the collected weevil material is as follows: 85 males (from this number, 21 specimens belong to Nanophyidae) and 107 females (19 Nanophyidae) (Tab. I). Obviously, the summer conditions had an impact on this relationship as well as on all the results because the insects were collected after their reproductive period.

The Mountain Golija is quite wet, shadowed woodland. This fact combined with careful choice of collecting places (close to more wet or shadowed surfaces, as well as at higher altitudes) and the time of collecting (avoiding midday) resulted in a list of Apionidae not shorter than that for the other territories of Serbia (PEŠIĆ, 1996, 1997, 1998, 2002a, 2002b, 2004, 2009; PEŠIĆ & JELIĆ, 2000).

Some Nanophyidae species prefer more wet habitats with Lythraceae plant, but with higher plant biodiversity than there is on the researched territories. That only two species were found is not surprising, because only *Lythrum salicaria* as their host plant was present at wet localities. All attempts to collect some nanophyids from Crassulaceae plants were unsuccessful.

These results lend support to need for continued research of weevils in the territory of the Golija-Studenica Biosphere Reserve during the entire vegetation season.

Acknowledgment

This study was supported by the SYNTHESIS project, grant ES-TAF-4969 for the 2008 as well as Ministry of Science and Technological Development of the Republic of Serbia, project "Promotion and Popularization of Science through Scientific Research Expeditions in Central and Southwestern Serbia 2008". We would like to thank dr. Miguel Angel ALONSO-ZARAZAGA (Natural History Museum, Madrid, Spain) giving to us opportunity to visit his laboratory and collection. We also thank the anonymous reviewers for their corrections and useful suggestions.

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APIONIDAE И NANOPHYIDAE (COLEOPTERA: CURCULIONOIDEA) У РЕЗЕРВАТУ БИОСФЕРЕ ГОЛИЈА-СТУДЕНИЦА

СНЕЖАНА ПЕШИЋ И СВЕТЛАНА АВРАМОВИЋ

Извод

У овом раду су изложени први подаци о сурлашима (Coleoptera: Curculionoidea) из фамилија Apionidae и Nanophyidae, регистрованим у Резервату биосфере Голија-Студеница. Рад је базиран на 192 адултне јединке сакупљене током августа 2008. године. Идентификоване су 34 врсте (32 из фамилије Apionidae и две из Nanophyidae). Поред детаљне таксономије изложени су подаци о налазима (датуму налажења, локалитету, станишту, биљци са које су инсекти сакупљени, број сакупљених женки, мужјака и укупан).

Упркос чињеници да је рађено у летњем периоду, утврђени фаунистички подаци који не заостају за другим подручјима Србије, указују да простор овога резервата заслужује да се истраживања наставе и прошире на читаву сезону.

Received April 26th, 2010
Accepted December 6th, 2010