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THE FAUNA OF GEOMETRIDAE (LEPIDOPTERA) IN THE REGION OF UŽICE IN WESTERN SERBIA

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ABSTRACT: It is considered that the fauna of Geometridae in Serbia includes 354 species, although it has to be said that certain regions have not been examined. The present paper constitutes a faunistic examination of Geometridae in the region of Užice (Western Serbia) during the period 1995-2005, when the presence of six subfamilies and 231 species was established (211 determined). Among them, 28 species are registered for the first time for Western Serbia. The species *Triphosa sabaudiata* (Duponchel, 1830) is a new one for Central Serbia. Nine species are new for the Serbian fauna: *Menophra abruptaria* (Thunberg, 1792), *Scopula submutata* (Treitschke, 1828), *Epirrhoe molluginata* (Hübner, 1813), *Pennithera firmata* (Hübner, 1822), *Electrophaeas corylata* (Thunberg, 1792), *Rheumaptera undulata* (Linnaeus, 1758), *Perizoma bifaciata* (Haworth, 1809), *Asthena anseraria* (Herrich - Schaffer, 1847), and *Acacis viretata* (Hübner, 1799).

KEY WORDS: Lepidoptera, Geometridae, fauna, Serbia

INTRODUCTION

All published research works and most of the collection data are presented in the paper "Fauna of Geometrids in Serbia" (TOMIĆ *et al*., 2002), which listed 354 species. According to ZEČEVIĆ (2002), two species should be taken off the list because of misdetermination: *Eupithecia gelidata* (Moschler,1860) and *Cabera leptographa* (Wehrli, 1936). The same author (ZEČEVIĆ, 1996) indicates that the species *Idaea laevigata* (Scopoli, 1763) is missing and should be added, as should *Idaea sylvestraria* (Hübner, 1799), which is recorded in Eastern Serbia (ZEČEVIĆ, 2002).

The territory of Serbia has not been examined at the same level: certain regions have been inadequately examined and some regions not at all. In Western Serbia Geometridae were examined before World War II by Prof. Mihajlo Gradojević (ZEČEVIĆ and VAJGAND, 2001). He found 76 species in Western Serbia, among them 24 species in the region explored by us (on Mt. Tara). Professor Konstanitin Vasić and assistants at the Faculty of Forestry in Belgrade explored Geometridae together with other moth families [Noctuidae (VASIĆ, 2002), Sphingidae, etc.], and their results are presented by TOMIĆ *et al*., (2002). VAJGAND collected Geometridae in Petnica near

Table 1. Review of explored localities in the region Užice in Western Serbia

No. of locality	Areas and localities	UTM designation	Altitude (m a.s.l.)
	Town of Užice and its surroundings		
Loc 1	Settlement Krčagovo	DP 05	450-550
Loc 2	Settlement Sevojno	DP 15	400
Loc 2a	Village Karan	DP 16	420
Loc 2b	Village Godovik near Požega	DP 24	550
Loc 3	River Djetinja gorge	CP 95, DP 05	430-800
Loc 4	Settlement Bela Zemlja	DP 04	650-750
Loc 6	Mount Jelova Gora	DP 06	900-950
	Mount Tara		
Loc 7	Vill. Jagoštica (NW Tara Mt.)	CP 67	850-950
Loc 8	Vill. Zaovine: settlement Sekulići (C Tara Mt.)	CP 75	1250
Loc 8a	Vill. Zaovine: Zaovine lake: Kik peak	CP 75	760-850
Loc 8b	Vill. Zaovine: Zaovine lake: East banks	CP 76	900-960
Loc 9	Vill. Zaovine: settl. Karaklije (W Tara Mt.)	CP 66	1100-1200
Loc 9a	Vill. Zaovine: settl. Karaklije: Janjač peak	CP 66	1400-1473
Loc 10	Derventa gorge near Drina canyon (N Tara Mt.)	CP 66	330
Loc 11	Kaluđerske Bare (E Tara Mt.)	CP 86	1050-1100
	Mount Zlatibor and its foothills		
Loc 5	Uvac gorge near vill. Rutoši (S Zlatibor Mt.)	CP 92	800-900
Loc 12	Settlement Vode (C Zlatibor)	CP 94	1000
Loc 12a	Ribnica lake and its surroundings (C Zlatibor)	CP 93	900-1100
Loc 12b	Road from Vode to village Semegnjevo (N Zlatibor)	CP 94	850
Loc 13	Veliki Rzav valley (E Zlatibor)	DP 14	450-650
Loc 14	Murtenica (SE Zlatibor): Brijač paek slopes	DP 02	1250-1350
Loc 15	Mokra Gora (W Zlatibor): Kamišnica gorge	CP 84	660-720
Loc 15a	Mokra Gora: Jatare	CP 85	700-750

Valjevo.

The purpose of this field research was to determine the fauna, ecology and distribution of Geometridae in the unexamined Užice region in Western Serbia.

EXPLORED REGION

The region explored is situated in the central part of Western Serbia and includes the town of Užice and the mountains Tara and Zlatibor. Twenty-three localities are listed with both their altitude and UTM designations in ex-Yugoslavia (SURVEY, 1969). Detailed data on nine localities (1-9) are to be found in an earlier papers (DODOK, 2003b).

MATERIAL AND METHODS

Geometridae were examined together with other families of Lepidoptera (DODOK, 2003b)

in the period 1995-2005. Field research at localities in Užice and its vicinity was performed throughout the year, while reserch on Mt. Tara was carried out during the summer months (July, August). Altogether, exploration of localities was performed on 243 nights (Table 3). Some day-active species were collected together with butterflies at localities 2a, 2b, 8a, 8b, 9a, 10, 11, 12, 12a, 12b, 13, 14, 15, and 15a (Table 4). All findings were carefully recorded in the field diary and entered in the computer database.

Moths were caught in an entomological net, neutralized by medical ether, and packed in transport envelopes. Ones active at night were attracted by the light of a 400 W mercury lamp set on a tripod. That method was used at localities 3, 4, 5, 6, 7, 8, and 9; in the town (localities 1 and 2), moths were collected next to public lighting. At locality 3, moths were collected around the lighting of a hydro-electric power plant.

Specimens were prepared, labeled, and deposited according to standard entomological methods. One thousand twenty-nine geometrid specimens are in the author's collection (Užice, W. Serbia). Determination of species was based on wing drawings as per: FORSTER and WOHLFAHRT (1973-1981); KOCH (1976); and BELIN (2003). Twenty species from the genera *Eupithecia, Idaea,* and *Scopula* are undetermined or disputable species and will be added to the fauna after dissection of genitals.

Systematization and nomenclature of the family Geometridae are given as per the book "The Lepidoptera of Europe" (KARSHOLT and RAZOWSKI, 1996).

RESULTS AND DISCUSSION

Results of exploring the fauna of Geometridae in the Užice region are summarized and presented in Table 2 in the form of a list of found species. A "+" sign means that the species was recorded at the given locality.

Field research in the described area enabled us to establish the existence of 231 Geometridae species, 211 of which were determined and found to belong to six subfamilies (Table 2). Nine species are new for the Serbian fauna, making a total of 363 species in Serbia. The 211 established species represent 58% of the Serbian fauna. According to TOMIĆ *et al*. (2002) and ZEČEVIĆ and VAJGAND (2001), another 24 species have been recorded in Western Serbia, which combined with our results gives a total of 235 species or 65% of the Serbian fauna.

The largest numbers of species (Table 3) were recorded at locality 4 (137 species or 65%), locality 6 (96 species or 45%) and locality 1 (110 species or 52%). The reason for this is that these localities were most intensively researched. A total of 95 species (45 %) were recorded on Mt. Tara their finding representing the first contribution to knowledge of that mountain's Geometridae fauna. Geometridae were collected on Mt. Zlatibor during the daytime, except at locality 5 (Table¾ 2 and 4); a total of 62 species were recorded there. In the gorge of the Djetinja River, 69 species were recorded, together with 79 species of Noctuidae (DODOK, 2003b) and 110 species of butterflies (DODOK, 2003a).

Analysis of the zoogeographic division of established species according TOMIĆ *et al*. (2002) (Table 2, last column "Z D") showed dominance of Eurasian (1) species (169 or 80%). Forms typical of other zoogeographic areas are present with a small number of species: Mediterranean-Asian (2) forms with 38 species (18%), Holarctic (3) forms with two species (1%), and Subtropical (4)

Table 2. Review of Geometridae species recorded in the Užice region (Western Serbia)

No.	Subfamily and species	Uzice and surroundings				Uvac	J.Gora	Mount Tara			Z D
		lok 1	lok 2	lok 3	lok 4	lok 5	lok 6	lok 7	lok 8	lok 9	
	Archiaerinae										
1.	*Archiearis parthenias* (Linnaeus, 1761)	+			+						1
2.	*Archiearis notha* (Hubner, 1803)	+			+						1
	Ennominae										
3.	*Calospilos sylvata* (Scopoli,1763)				+		+	–		+	1
4.	*Lomaspilis marginata* (Linnaeus, 1758)	+		+	+		+	–			1
5.	*Ligdia adustata* (Denis & Schiffermuller, 1775)	+	+	+	+	+					1
6.	*Stegania dilectaria* (Hubner, 1790)	+								+	2
7.	*Heliomata glarearia* (Denis & Schiffermuller, 1775)	+		+	+	+					1
8.	*Macaria notata* (Linnaeus, 1758)	+			+						1
9.	*Macaria alternata* (Herrich - Schaffer, 1775)										1
10.	*Macaria liturata* (Clerck, 1759)				+			–		+	1
11.	*Chiasmia clathrata* (Linnaeus, 1758)	+		+	+	+	+	–		+	1
12.	*Petrophora chlorosata* (Scopoli,1763)	+			+		+				1
13.	*Plagodis pulveraria* (Linnaeus, 1758)			+			+				1
14.	*Plagodis dolabraria* (Linnaeus, 1767)				+		+			+	1
15.	*Pachycnemia hippocastanaria* (Hubner, 1799)							–		+	2
16.	*Opisthograptis luteolata* (Linnaeus, 1758)	+			+		+				1
17.	*Epione vespertaria* (Linnaeus, 1767)							–			1
18.	*Therapis flavicaria* (Denis &Schiffermuller, 1775)										1
19.	*Pseudopanthera macularia* (Linnaeus, 1758)	+		+	+		+				1
20.	*Ennomos quercinaria* (Hufnagel, 1767)	+			+		+	–		+	2
21.	*Ennomos erosaria* (Denis & Schiffermuller, 1775)	+			+		+				1
22.	*Selenia dentaria* (Fabricius, 1775)	+			+		+	–			1
23.	*Selenia lunularia* (Hubner, 1788)			+	+		+				1
24.	*Selenia tetralunaria* (Hufnagel, 1767)	+		+	+			–		+	1
25.	*Artiora evonymaria* (Denis & Schiffermuller, 1775)										2
26.	*Odontopera bidentata* (Clerck, 1759)						+				1
27.	*Crocallis tusciaria* (Borkhausen, 1793)	+			+						2
28.	*Crocallis elinguaria* (Linnaeus, 1758)				+		+	–		+	1
29.	*Ourapteryx sambucaria* (Linnaeus, 1758)				+			–		+	1
30.	*Colotois pennaria* (Linnaeus, 1761)	+			+		+				1
31.	*Angerona prunaria* (Linnaeus, 1758)	+			+			–			1
32.	*Apocheima hispidaria* (Denis & Schiffermuller, 1775)	+		+	+						2
33.	*Apocheima pilosaria* (Denis & Schiffermuller, 1775)	+			+						1
34.	*Lycia hirtaria* (Clerck, 1759)										1
35.	*Biston strataria* (Hufnagel, 1767)	+			+						2
36.	*Biston betularia* (Linnaeus, 1758)				+			–	+	+	1
37.	*Agriopis leucophaeria* (Denis & Schiffermuller, 1775)	+			+						1
38.	*Agriopis bajaria* (Denis & Schiffermuller, 1775)			+	+						2
39.	*Agriopis aurantiaria* (Hubner, 1799)	+		+			+				1
40.	*Agriopis marginaria* (Fabricius, 1776)	+		+	+						1
41.	*Erannis defoliaria* (Clerck, 1759)	+		+	+		+				1
42.	*Menophra abruptaria* (Thunberg, 1792)										2
43.	*Peribatodes rhomboidaria* (Denis & Schiffermuller, 1775)	+	+		+		+				1
44.	*Peribatodes secundaria* (Denis & Schiffermuller, 1775)									+	1
45.	*Selidosema plumaria* (Denis & Schiffermuller, 1775)			+							1
46.	*Cleora cinctaria* (Denis & Schiffermuller, 1775)	+			+		+				1
47.	*Alcis repandata* (Linnaeus, 1758)				+		+	–	+	+	1
48.	*Hypomecis roboraria* (Denis & Schiffermuller, 1775)	+					+	–			1
49.	*Hypomecis punctinalis* (Scopoli, 1763)	+		+	+		+	–			1
50.	*Cleorodes lichnearia* (Hufnagel, 1767)							–			2
51.	*Fagivorina arenaria* (Hufnagel, 1767)				+		+				1

Table 2. Continued.

52.	*Ascotis selenaria* (Denis & Schiffermuller, 1775)	+			+		+	+		+	2
53.	*Ectropis crepuscularia* (Denis & Schiffermuller, 1775)	+		+	+		+	+			1
54.	*Paradarisa consonaria* (Hubner, 1799)			+			+				1
55.	*Parectropis similaria* (Hufnagel, 1767)	+			+						1
56.	*Aethalura punctulata* (Denis & Schiffermuller, 1775)				+		+				1
57.	*Ematurga atomaria* (Linnaeus, 1758)	+	+	+	+	+	+			+	1
58.	*Bupalus piniaria* (Linnaeus, 1758)				+			+		+	1
59.	*Cabera pusaria* (Linnaeus, 1758)	+		+	+		+		+		1
60.	*Cabera exanthemata* (Scopoli, 1763)										1
61.	*Lomographa bimaculata* (Fabricius, 1775)		+		+		+				1
62.	*Lomographa temerata* (Denis & Schiffermuller, 1775)	+		+	+		+			+	1
63.	*Theria rupicapraria* (Denis & Schiffermuller, 1775)	+		+	+						2
64.	*Campaea margaritata* (Linnaeus, 1767)	+	+	+	+		+	+		+	1
65.	*Hylaea fasciaria* (Linnaeus, 1758)				+			+			1
66.	*Puengeleria capreolaria* (Denis & Schiffermuller, 1775)				+		+				1
67.	*Gnophos furvata* (Denis & Schiffermuller, 1775)			+	+			+		+	1
68.	*Odontognophos dumetata* (Treitschke, 1827)			+							2
69.	*Charissa obscurata* (Denis & Schiffermuller, 1775)										1
70.	*Charissa pullata* (Denis & Schiffermuller, 1775)							+			1
71.	*Siona lineata* (Scopoli, 1763)	+		+			+				1
72.	*Aspitates gilvaria* (Denis & Schiffermuller, 1775)										1
	Oenochrominae										
73.	*Alsophila aescularia* (Denis & Schiffermuller, 1775)	+		+	+						1
74.	*Alsophila aceraria* (Denis & Schiffermuller, 1775)	+			+		+				2
	Geometrinae										
75.	*Aplasta onoraria* (Fuessly, 1783)	+			+		+				2
76.	*Pseudoterpna pruinata* (Hufnagel, 1767)			+	+						1
77.	*Geometra papilionaria* (Linnaeus, 1758)						+	+		+	1
78.	*Comibaena bajularia* (Denis & Schiffermuller, 1775)	+			+						2
79.	*Hemithea aestivaria* (Hubner, 1789)	+			+						1
80.	*Chlorissa viridata* (Linnaeus, 1758)	+		+	+		+				1
81.	*Chlorissa cloraria* (Hubner, 1813)				+		+				1
82.	*Thalera fimbrialis* (Scopoli, 1763)				+	+	+	+			1
83.	*Hemistola chrysoprasaria* (Esper, 1795)	+		+	+			+		+	1
84.	*Jodis lactearia* (Linnaeus, 1758)	+			+						1
	Sterrhinae										
85.	*Cyclophora pendularia* (Clerck, 1759)	+			+		+				1
86.	*Cyclophora albiocellaria* (Hubner, 1789)			+		+					1
87.	*Cyclophora annularia* (Fabricius, 1775)	+	+	+	+		+				1
88.	*Cyclophora pupillaria* (Hubner, 1799)										1
89.	*Cyclophora ruficiliaria* (Herrich - Schaffer, 1775)	+			+						2
90.	*Cyclophora porata* (Linnaeus, 1767)				+						2
91.	*Cyclophora quercimontaria* (Bastelberger, 1897)	+		+	+		+				1
92.	*Cyclophora punctaria* (Linnaeus, 1758)	+			+		+				2
93.	*Cyclophora linearia* (Hubner, 1789)										1
94.	*Timandra comae* (A.Schmidt, 1931)	+		+	+		+	+			1
95.	*Scopula immorata* (Linnaeus, 1758)	+		+	+		+			+	1
96.	*Scopula umbelaria* (Hubner, 1813)						+				1
97.	*Scopula nigropunctata* (Hufnagel, 1767)	+									1
98.	*Scopula virgulata* (Denis & Schiffermuller, 1775)	+	+								1
99.	*Scopula ornata* (Scopoli, 1763)	+		+	+		+		+	+	1
100.	*Scopula submutata* (Treitschke, 1828)			+							2
101.	*Scopula decorata* (Denis & Schiffermuller, 1775)										1
102.	*Scopula rubiginata* (Hufnagel, 1767)	+		+	+	+	+			+	1
103.	*Scopula marginepunctata* (Goeze, 1781)	+		+	+	+	+				1

Table 2. Continued.

104.	*Scopula imitaria* (Hubner, 1789)			+							2
105.	*Scopula immutata* (Linnaeus, 1758)										1
106.	*Glossotrophia confinaria* (Herrich - Schaffer, 1847)							+			2
107.	*Idaea rufaria* (Hubner, 1789)	+			–						1
108.	*Idaea serpentata* (Hufnagel, 1767)	+	+		–				+		1
109.	*Idaea rusticata* (Denis & Schiffermuller, 1775)	+		+	–	+					1
110.	*Idaea filicata* (Hubner, 1799)				–						2
111.	*Idaea laevigata* (Scopoli, 1763)					+					2
112.	*Idaea moniliata* (Denis & Schiffermuller, 1775)			+				+			1
113.	*Idaea sylvestraria* (Hubner, 1799)										1
114.	*Idaea biselata* (Hufnagel, 1767)										1
115.	*Idaea dilutaria* (Hubner, 1799)						+				2
116.	*Idaea fuscovenosa* (Goeze, 1781)				–						1
117.	*Idaea humiliata* (Hufnagel, 1767)	+									2
118.	*Idaea politaria* (Hubner, 1799)	+									1
119.	*Idaea seriata* (Schrank, 1802)	+		+							2
120.	*Idaea dimidiata* (Hufnagel, 1767)	+				+					1
121.	*Idaea subsericeata* (Haworth, 1809)				–		+				1
122.	*Idaea trigeminata* (Haworth, 1809)	+			–						2
123.	*Idaea aversata* (Linnaeus, 1758)	+	+	+	–	+	+	+		+	1
124.	*Idaea degeneraria* (Hubner, 1799)	+			–		+				1
125.	*Idaea straminata* (Borkhausen, 1794)	+			–		+				1
126.	*Idaea deversaria* (Herrich - Schaffer, 1847)			+	–					+	1
127.	*Rhodostophia vibicaria* (Clerck, 1759)	+		+		+	+	+		+	1
128.	*Rhodometra sacraria* (Linnaeus, 1767)										4
	Larentiinae										
129.	*Lythria cruentaria* (Hufnagel, 1767)	+	+		–		+				2
130.	*Cataclysme riguata* (Hubner, 1813)			+		+					1
131.	*Scotopteryx moenitata* (Scopoli, 1763)						+				2
132.	*Scotopteryx bipunctaria* (Denis & Schiffermuller, 1775)	+		+	–	+		+		+	2
133.	*Scotopteryx chenopodiata* (Linnaeus, 1758)										1
134.	*Scotopteryx luridata* (Hufnagel, 1767)	+			–						1
135.	*Orthonama obstipata* (Fabricius, 1794)	+			–						4
136.	*Xanthorhoe spadicearia* (Denis & Schiffermuller, 1775)	+			–		+			+	1
137.	*Xanthorhoe ferrugata* (Clerck, 1759)	+	+	+	–		+	+		+	1
138.	*Xanthorhoe quadrifasciata* (Clerck, 1759)	+						+			1
139.	*Xanthorhoe montanata* (Denis & Schiffermuller, 1775)								+	+	1
140.	*Xanthorhoe fluctuata* (Linnaeus, 1758)	+	+	+	–	+	+	+	+	+	1
141.	*Catarhoe rubidata* (Denis & Schiffermuller, 1775)							+			1
142.	*Catarhoe cuculata* (Hufnagel, 1767)										1
143.	*Epirrhoe alternata* (Muller, 1764)	+		+	–		+	+		+	1
144.	*Epirrhoe rivata* (Hubner, 1813)						+				1
145.	*Epirrhoe molluginata* (Hubner, 1813)								+	+	1
146.	*Epirrhoe galiata* (Denis & Schiffermuller, 1775)							+			1
147.	*Camptogramma bilineata* (Linnaeus, 1758)	+		+	–		+		+	+	1
148.	*Anticlea badiata* (Denis & Schiffermuller, 1775)	+		+	–						1
149.	*Anticlea derivata* (Denis & Schiffermuller, 1775)	+									1
150.	*Mesoleuca albicillata* (Linnaeus, 1758)						+	+			1
151.	*Pelurga comitata* (Linnaeus, 1758)										1
152.	*Lampropteryx suffumata* (Denis & Schiffermuller, 1775)						+				1
153.	*Cosmorhoe ocellata* (Linnaeus, 1758)	+		+	–	+	+	+		+	1
154.	*Nebula salicata* (Denis & Schiffermuller, 1775)			+	–		+	+			2
155.	*Eulithis prunata* (Linnaeus, 1758)							+		+	1
156.	*Eulithis pyraliata* (Denis & Schiffermuller, 1775)				–	+	+	+		+	1
157.	*Echoctopera silaceata* (Denis & Schiffermuller, 1775)						+	+	+	+	1
158.	*Chlorociysta siterata* (Hufnagel, 1767)			+	–		+				2

Table 2. Continued.

159.	*Cidaria fulvata* (Forster, 1771)	+			+			+		+	1
160.	*Pennithera firmata* (Hubner, 1822)				+			+			1
161.	*Thera variata* (Denis & Schiffermuller, 1775)				+					+	1
162.	*Thera cognata* (Thunberg, 1792)							+			1
163.	*Thera juniperata* (Linnaeus, 1758)				+		+				1
164.	*Eustroma reticulata* (Denis & Schiffermuller, 1775)									+	1
165.	*Electrophaeas corylata* (Thunberg, 1792)				+						1
166.	*Colostygia olivata* (Denis & Schiffermuller, 1775)										1
167.	*Colostygia pectinataria* (Knoch, 1781)	+			+		+		+		1
168.	*Hydriomena furcata* (Thunberg, 1784)							+		+	1
169.	*Horisme vitalbata* (Denis & Schiffermuller, 1775)	+			+	+	+			+	1
170.	*Horisme corticata* (Treitschke, 1835)	+									2
171.	*Horisme tersata* (Denis & Schiffermuller, 1775)	+						+			1
172.	*Horisme aemulata* (Hubner, 1813)	+		+	+					+	1
173.	*Melanthia procellata* (Denis & Schiffermuller, 1775)	+		+	+			+		+	1
174.	*Rheumaptera undulata* (Linnaeus, 1758)								+		1
175.	*Triphosa sabaudiata* (Duponchel, 1830)										1
176.	*Triphosa dubitata* (Linnaeus, 1758)						+				1
177.	*Philereme transversata* (Hufnagel, 1767)							+			2
178.	*Euphyia biangulata* (Haworth, 1809)			+		+					1
179.	*Euphyia frustata* (Treitschke, 1828)			+							2
180.	*Epirrita dilutata* (Denis & Schiffermuller, 1775)	+		+	+		+				3
181.	*Epirrita autumnata* (Borkhausen, 1794)						+				1
182.	*Operophtera brumata* (Linnaeus, 1758)	+		+	+		+				1
183.	*Operophtera fagata* (Scharfenberg, 1805)						+				1
184.	*Perizoma affinitata* (Stephens, 1831)										1
185.	*Perizoma alchemillata* (Linnaeus, 1758)					+	+	+			1
186.	*Perizoma lugdunaria* (Herrich - Schaffer, 1847)				+						2
187.	*Perizoma bifaciata* (Haworth, 1809)				+						1
188.	*Perizoma blandiata* (Denis & Schiffermuller, 1775)				+	+	+			+	1
189.	*Perizoma albulata* (Denis & Schiffermuller, 1775)	+	–		+	+	+		+		3
190.	*Perizoma flavofasciata* (Thunberg, 1792)				+			+		+	1
191.	*Perizoma parallelolineata* (Retzius, 1783)										1
192.	*Eupithecia linariata* (Denis & Schiffermuller, 1775)				+		+				1
193.	*Eupithecia insigniata* (Hubner, 1813)				+						1
194.	*Eupithecia centaureata* (Denis & Schiffermuller, 1775)				+		+				1
195.	*Eupithecia icterata* (Villers, 1789)					+		+		+	1
196.	*Gymnoscelis rufifasciata* (Haworth,1809)			+	+						1
197.	*Chloroclystis w-ata* (Haworth, 1809)				+			+			1
198.	*Rhinoprora rectangulata* (Linnaeus, 1758)	+			+			+			1
199.	*Rhinoprora chloreata* (Mabille, 1870)	+									1
200.	*Rhinoprora debiliata* (Hubner, 1817)										1
201.	*Aplocera plagiata* (Linnaeus, 1758)				+		+				1
202.	*Aplocera praeformata* (Hubner, 1826)							+	+	+	1
203.	*Odezia atrata* (Linnaeus, 1758)	+			+						1
204.	*Euchoeca nebulata* (Scopoli, 1793)	+									1
205.	*Asthena albulata* (Hufnagel, 1767)	+	–	+	+	+	+				1
206.	*Asthena anseraria* (Herrich - Schaffer, 1847)						+				2
207.	*Hydrelia flammeolaria* (Hufnagel, 1767)				+		+				1
208.	*Minoa murinata* (Scopoli, 1793)	+		+	+		+				1
209.	*Lobophora halterata* (Hufnagel, 1767)										1
210.	*Trichopteryx carpinata* (Borkhausen, 1794)				+		+				1
211.	*Acacis viretata* (Hubner, 1799)				+						1
Total	**211 species**	**110**	**19**	**69**	**137**	**27**	**96**	**62**	**15**	**55**	**-**

Table 3. Number of night field explorations and number of recorded species per locality

Locality	1	2	3	4	5	6	7	8	9	Total
Number of field explploration	110	11	11	68	1	21	12	1	8	243
Number of species	110	19	69	137	27	96	62	15	55	211

Table 4. Number of recorded species of Geometridae at localities which were examined during the daytime only

Locality	The numbers of species from Table 2	Total
Loc 2 a	75,82,108,167,170	5
Loc 2 b	16,57,97,118	4
Loc 8 a	115	1
Loc 8 b	1,69	2
Loc 9 a	75,133	2
Loc 10	42	1
Loc 11	76,108,113,127,132,133	6
Loc 12	11,19,46,143,154	5
Loc 12a	11,47,72,76,99,130,131,132,133,134,136,142,154	13
Loc12b	95,99,101,102	4
Loc 13	4,11,19,41,43,57,59,99,105,129,140,143,150,173,177,208	16
Loc 14	4,13,16,23,26,69,115,116,127,131,133,136,150,153,154,157,202	17
Loc 15	72,88,99,103,169,175	6
Loc 15a	65	1

forms with two species (1%).

Twenty eight species of Geometridae are registered for the first time for Western Serbia: (number in front of species name are given in Table 2)

45. ***Selidosema plumaria*** (Denis and Schiffermuller, 1775): one dead male, October 19, 2003, locality 3.
54. ***Paradarisa consonaria*** (Hübner, 1799): one male, April 18, 1998, locality 3 and one male, May 13, 1998, locality 6.
56. ***Aethalura punctulata*** (Denis and Schiffermuller, 1775): two females, May 23, 1997, locality 4; two females, April 29, 2001, locality 6; one male, July15, 2001, locality 4.
68. ***Odontognophos dumetata*** (Treitschke, 1827): one male, September 24, 2005, locality 3.
75. ***Aplasta onoraria*** (Fuessly, 1783): frequent species, recorded at five localities from June to August.
84. ***Jodis lactearia*** (Linnaeus, 1758): two males, June 1, 1996, locality 1; one male, June 6, 1996,

locality 1; one male, August 31, 1999, locality 4; one female, June 2, 2002, locality 1.
88. ***Cyclophora pupillaria*** (Hübner, 1799): only one female collected on August 28, 2004 at locality 15. This is the first record of the given species in Serbia after 1926 (TOMIĆ *et al*., 2002).
97. ***Scopula virgulata*** (Denis and Schiffermuller, 1775): one female, August 24, 1998, locality 1; one female, August 31, 2000, locality 2.
100. ***Scopula decorata*** (Denis and Schiffermuller, 1775): one female, August 15, 2000, locality 12b.
103. ***Scopula imitaria*** (Hübner, 1789): one male, May 27, 2005, locality 3.
109. ***Idaea filicata*** (Hübner, 1799): one female, August 17, 2000, locality 4.
110. ***Idaea laevigata*** (Scopoli, 1763): one male, July 29, 1998, locality 5.
112. ***Idaea sylvestraria*** (Hübner, 1799): one male, July 29, 2002, locality 11.
117. ***Idaea politaria*** (Hübner, 1799): one male, July 17, 1996, locality 1; five females, July 22, locality 2b.
125. ***Idaea deversaria*** (Herrich - Schaffer, 1847): solitary specimens recorded at five localities from June to August.
133. ***Scotopteryx luridata*** (Hufnagel, 1767): one male, July 14, 1996, locality 12a; one male, May 29, 1998, locality 4; one male June 3, 1999, locality 1.
148. ***Anticlea derivata*** (Denis and Schiffermuller, 1775): one female, May 3, 2003, locality 1.
151. ***Lampropteryx suffumata*** (Denis and Schiffermuller, 1775): one male, May 1, 1998, locality 6.
162. ***Thera juniperata*** (Linnaeus, 1758): frequent species, recorded at two localities from end October to mid November.
179. ***Epirrita dilutata*** (Denis and Schiffermuller, 1775): solitary specimens recorded at 3 localities from mid October to mid November.
185. ***Perizoma lugdunaria*** (Herrich - Schaffer, 1847): one female, July 7, 1998, locality 4.
192. ***Eupithecia insigniata*** (Hübner, 1813): recorded only at locality 4 with: two males, April 26, 1996; one male, April 27, 1997 and three males May 23,1997.
195. ***Gymnoscelis rufifasciata*** (Haworth,1809): one female, July 24, 2000, locality 4; one female, April 27, 2005, locality 3.
197. ***Rhinoprora rectangulata*** (Linnaeus, 1758): two males, June 8, 1996, locality 4; one female, July 6, 1996, locality 4, one female, July 26 1996, locality 7; one male, May 23, 2000, locality 1.
198. ***Rhinoprora chloreata*** (Mabille, 1870): one female, June 14, 1999, locality 1.
199. ***Rhinoprora debiliata*** (Hübner, 1817): one male, May 5, 2002, locality 1; one female, May 31, 2005, locality 1.
202. ***Odezia atrata*** (Linnaeus, 1758): frequent species at localities 1 and 4 in June.
203. ***Euchoeca nebulata*** (Scopoli, 1793): one specimen recorded at locality 1 in 1995.

Next 30 species of Geometridae were previosly recorded very rarely in the fauna of Serbia (TOMIĆ *et al*., 2002) or with a single record only in our research work (DODOK, 1997):

1. ***Archiearis parthenias*** (Linnaeus, 1761): solitary specimens recorded at localities 1 and 4 from mid March to mid-April and one female collected on Mt. Tara (locality 8b) on May 1, 2003.
15. ***Pachycnemia hippocastanaria*** (Hübner, 1799): this species was recorded on Mt. Tara for the first time in Serbia with one male collected on July 23, 1996 at locality 7 (DODOK, 1997). Later, one male was collected at locality 9 on July 30, 2003.
17. ***Epione vespertaria*** (Linnaeus, 1767): this species was recorded on Mt. Tara for the first time in Serbia with one male collected on July 25, 1996 at locality 7 (DODOK, 1997) and not again.
44. ***Peribatodes secundaria*** (Denis and Schiffermuller, 1775): recorded only on Mt. Tara at locality 9 with: one male on July 20, 2001; two males and 1 females on July 27, 2003.
50. ***Cleorodes lichnearia*** (Hufnagel, 1767): previously recorded only in Dimitrovgrad (SE Serbia) in 1915 (TOMIĆ *et al*., 2002). one male recorded on Mt. Tara (locality 7) on July 26, 1996.
67. ***Gnophos furvata*** (Denis and Schiffermüller, 1775): recorded on Mt. Tara: three males on

July 19, 1995 (locality 7); four males and one female on July 24, 1996 (locality 7); one male on July 28, 2003. Ten males and two females were recorded on August 6, 1999 (locality 3) and one female on August 12, 1999 (locality 4).
70. ***Charissa pullata*** (Denis and Schiffermuller, 1775): three females, July 24, 1996, locality 7.
72. ***Aspitates gilvaria*** (Denis and Schiffermuller, 1775): very rare species in Serbia, recorded according TOMIĆ *et al*. (2002) on Mt. Paštrik (Kosovo and Metohija). This species was recorded on Mt. Zlatibor at two localities: two males, July 14, 1996, locality 12a; three males, August 25, 1996, locality 12a; one male and two females, August 17, 2003, locality 12a; one male, August 28, 2004, locality 15.
76. ***Pseudoterpna pruinata*** (Hufnagel, 1767): frequent species, recorded at four localities on July and August.
79. ***Hemithea aestivaria*** (Hübner, 1789): two males, June 16, 1996, locality 1; two males, June 22, 1996, locality 1; one male, July 2, 1996, locality 1; two females, July 5, 1996, locality 4.
85. ***Cyclophora pendularia*** (Clerck, 1759): one female, May 26, 1996, locality 1; one male, August 3, 1996, locality 4; one female, August 10, 1998, locality 6; one female, August 12, 1999, locality 4.
96. ***Scopula umbelaria*** (Hübner, 1813): one female, August 14, 1998, locality 6.
106. ***Glossotrophia confinaria*** (Herrich - Schaffer, 1847): only one male recorded on July 23, 1996 at locality 7.
112. ***Idaea moniliata*** (Denis and Schiffermüller, 1775): one male, July 21, 1996, locality 7; one female, August 6, 1999, locality 3; one female, July 21, 2002, locality 3.
119. ***Idaea seriata*** (Schrank, 1802): frequent species at localities 1 and 3 from the end of May to the end of August.
136. ***Xanthorhoe spadicearia*** (Denis and Schiffermüller, 1775): frequent species, recorded at six localities from May to August.
144. ***Epirrhoe rivata*** (Hübner, 1813): recorded only at locality 6 with: one female on August 11, 1997 and one male on August 24, 1998.
146. ***Epirrhoe galiata*** (Denis and Schiffermuller, 1775): only one female collected on July 25, 1996 at locality 7.
162. ***Thera cognata*** (Thunberg, 1792): only two females recorded on July 24, 1996 at locality 7.
164. ***Eustroma reticulata*** (Denis and Schiffermuller, 1775): only one female recorded on July 26, 2003 at locality 9.
177. ***Philereme transversata*** (Hufnagel, 1767): only two specimens recorded: one male on July 23, 1996 (locality 7) and one female on July 24, 2004 (locality 13).
178. ***Euphyia biangulata*** (Haworth, 1809): only 2 specimens collected: one female on July 29, 1998 (locality 5) and one male on August 6, 1999 (locality 3) (Fig.10). These are the first records of the given species in Serbia after 1926 (TOMIĆ *et al*., 2002).
179. ***Euphyia frustata*** (Treitschke, 1828): recorded only at locality 3 with: one male on August 16, 2002 and one female on August 9, 2003.
181. ***Epirrita autumnata*** (Borkhausen, 1794): frequent species, recorded at localities 1 and 6 in October and November.
184. ***Perizoma affinitata*** (Stephens, 1831): previosly recorded in Serbia only in 1931 on Mt. Žljeb (Kosovo and Metohija) by Rebel and Zerny (TOMIĆ *et al*., 2002). One female was collected on Mt. Tara on July 21, 1996 (locality 7).
188. ***Perizoma blandiata*** (Denis and Schiffermüller, 1775): previously recorded in Serbia only in 1931 on Mt. Žljeb (Kosovo and Metohija) by Rebel and Zerny (TOMIĆ *et al*., 2002). We recorded solitary specimens of this species with at localities 4, 5, and 6 from May to August, but it was recorded as a very frequent species on Mt. Tara (locality 9) in the second half of July.
191. ***Perizoma parallelolineata*** (Retzius, 1783): recorded for the first time in Serbia with one male collected on September 11, 1996 at locality 4 (DODOK, 1997) and not again.
207. ***Hydrelia flammeolaria*** (Hufnagel, 1767): previously recorded only in Dimitrovgrad (SE Serbia) in 1915 (TOMIĆ *et al*., 2002). One female was collected on June 8, 1996 (locality 4) and one male on May 28, 2005 (locality 6).
209. ***Lobophora halterata*** (Hufnagel, 1767): numerous solitary specimens recorded during exam-

Fig. 1 *Triphosa sabaudiata* (Duponchel)

Fig. 2: *Scopula submutata* (Treitschke)

ination at three localities from the end of April to the end of May.
210. ***Trichopteryx carpinata*** (Borkhausen, 1794): recorded for the first time in Serbia at locality 4 (DODOK, 1997) with: two females on April 26, 1996; one female on April 27, 1997; one female on April 29, 1997 and one female on May 2, 1997. Later, one male and two females were recorded at locality 6 on May 1, 1998.
Species 174 [***Triphosa sabaudiata*** (Duponchel, 1830)] is a new one for Central Serbia; it was previosly recorded in Kosovo and Metohija on Mt. Paštrik in 1931 (TOMIĆ *et al*., 2002). A single female specimen (Fig. 1) was collected at locality 15 during the daytime on August 28, 2004.

Nine species of Geometridae are newly recorded in the Serbian fauna:

42. ***Menophra abruptaria*** (Thunberg, 1792) – A single male specimen was collected at locality 10 (Mt. Tara) during the daytime on July 24, 2002.
Caterpillars of the species feed on the leaves of *Syringa* spp. and *Ligustrum* spp. Distribution: SW, S, and SE Europe (Bulgaria, Albania) according to KARSHOLT and RAZOWSKI (1996).
100. ***Scopula submutata*** (Treitschke, 1828) – A single male specimen (Fig. 2) was collected at locality 3 during the daytime on August 8, 2003.
Distribution: SW, S and SE Europe (Romania, Bulgaria, Albania) according to KARSHOLT and RAZOWSKI (1996).

Fig. 3: *Epirrhoe molluginata* (Hübner)

Fig. 4: *Pennithera firmata* (Hübner)

Fig. 5: *Electrophaeas corylata* Thunberg

Fig. 6: *Rheumaptera undulata*(Linnaeus)

145. ***Epirrhoe molluginata*** (Hübner, 1813) – Recorded only on Mt. Tara: one male (Fig. 3) was collected at locality 8 on July 3, 1998 and one female at locality 9 during the daytime at 1300 m a.s.l. on July 25, 2005.
According to TOMIĆ *et al*. (1990), the species was recorded in Former Yugoslavia in Montenegro (Mt. Durmitor), Macedonia, Croatia, and Slovenia. Distribution: S, C, and SE Europe (Hungary, Romania, Bulgaria) according to KARSHOLT and RAZOWSKI (1996).
160. ***Pennithera firmata*** (Hübner, 1822) – recorded in two places. One male was collected on July 21, 1996 at locality 7 (Mt. Tara). Three specimens were collected at Bela Zemlja (locality 4): one male and one female on October 5, 1996 and another female on October 13, 2000 (Fig. 4).
Caterpillars of the species feed on *Pinus* spp. (*P. sylvestris*), and moths are on the wing from August till November (BELIN, 2003). According to TOMIĆ *et al*. (1990), the species was recorded in Former Yugoslavia in Montenegro (Mt. Durmitor), Macedonia and Slovenia. Distribution: the whole of Europe according to KARSHOLT and RAZOWSKI (1996).
165. ***Electrophaeas corylata*** (Thunberg, 1792) – A single male specimen (Fig. 5) was collected at locality 4 on May 23, 1997.
Caterpillars of the species feed on the leaves of *Betula* spp., *Corylus avellana*, *Tilia* sp., *Quercus* spp., *Prunus spinosa,* and *Acer pseudoplatanus* (BELIN, 2003), and moths are on the wing from May till July. Distribution: the whole of Europe according to KARSHOLT and RAZOWSKI (1996).
174. ***Rheumaptera undulata*** (Linnaeus, 1758) – Two male specimens were collected at locality 8

Fig. 7: *Perizoma bifaciata* (Haworth)

Fig. 8: *Asthena anseraria* (Herrich – Schaffer)

Fig. 9: *Acacis viretata* (Hübner)

Fig. 10. *Euphyia biangulata* (Haworth)

(Mt. Tara) on July 3, 1998 (Fig. 6).
Caterpillars of the species feed on the leaves of *Salix* spp. and *Vaccinium myrtillus*. Moths are on the wing from the end of June to August. Distribution: the whole of Europe according to KARSHOLT and RAZOWSKI (1996).
187. ***Perizoma bifaciata*** (Haworth, 1809) – A single female specimen (Fig. 7) was collected at locality 4 on August 21, 1996.
Caterpillars feed on *Odontites vernus* and *Euphrasia* spp. Moths are on the wing from July to September. Distribution: mostly of Europe except in Former Yugoslavia according to KARSHOLT and RAZOWSKI (1996).
206. ***Asthena anseraria*** (Herrich - Schaffer, 1847) – A single male specimen (Fig. 8) was collected at locality 6 on August 21, 1997.
Distribution: most of Europe except the Iberian and Scandinavian Peninsulas and the S Balkans (KARSHOLT and RAZOWSKI, 1996).
211. ***Acacis viretata*** (Hübner, 1799) – This species was recorded only at locality 4: one female was collected on May 29, 1998 and one male (Fig. 9) on April 27, 2000.
Caterpillars feed on the leaves of *Ligustum vulgare, Frangula alnus, Rhamnus* spp*., Crataegus* spp*, Swida sanguinea* and *Hedera helix* (BELIN, 2003). Moths are on the wing from April to Jun and July to September. According to TOMIĆ *et al*. (1990), the species was recorded in Former Yugoslavia on Mt. Durmitor (Tara River gorge only) in Montenegro and in Slovenia.
Distribution: most of Europe except the S Balkans (KARSHOLT and RAZOWSKI, 1996).

The recorded fauna of Geometridae will be filled out by exploration of those localities to which attention was not paid this time, as well as by determination of unidentified specimens of *Eupithecia, Idaea and Scopula* spp. after dissection of genitals.

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ФАУНА GEOMETRIDAE (LEPIDOPTERA) УЖИЧКОГ КРАЈА У ЗАПАДНОЈ СРБИЈИ

И. Додок

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Фауна фамилије Geometridae Србије садржи 354 врсте (ТОМІЖ *et al*., 2002). Са листе се скидају две врсте због грешке у одређивању: *Eupithecia gelidata* (Moschler, 1860) и *Cabera leptographa* (Wehrli, 1936). На листу се стављају: једна прескочена врста *Idaea laevigata* (Scopoli, 1763) и једна недавно забележена врста *Idaea sylvestraria* (Hьbner, 1799) у Тимочкој Крајини (ZEИEVIЖ, 2002).

Поједина подручја у Србији су недовољно истражена. Подручје Ужица и планина Таре и Златибора је у потпуности неистржено, па смо спровели фаунистичко - еколошка истраживања фамилије Geometridae у периоду од 1995 - 2005. године. На 9 локалитета су вршена ноћна и дневна истраживања Geometridae, на осталим само приликом истраживања дневних лептира.

Истраживањима је утврђено присуство 231 врсте, 211 је детерминисано и сврстано у шест подфамилија (Табела 2), што чини 58% врста фауне Geometridae Србије. У табели су дати и локалитети (са УТМ кодовима) где су врсте забележене. Међу врстама се налази 30 врста ретко забележених у фауни Србије и 28 врста које су први пут забележене у целој Западној Србији. Врста *Triphosa sabaudiata* (Duponchel, 1830) је забележена у Мокрој Гори (Златибор), нова је за Централну Србију, претходно нађена пре 1931. године на планини Паштрик на Косову и Метохији.

Девет врста Geometridae је први пут забележено на територији Србије, па фауна Geometridae Србије сада садржи 363 врсте. Нове врсте су: *Menophra abruptaria* (Thunberg, 1792) – Тара пл.(кањон Дервенте); *Scopula submutata* (Treitschke, 1828) – Ужице (клисура Ђетиње); *Epirrhoe molluginata* (Hьbner, 1813) – Тара пл. (Секулићи и Караклије); *Pennithera firmata* (Hьbner, 1822) – Тара пл.(Јагоштица), Бела Земља; *Electrophaeas corylata* (Thunberg, 1792) – Ужице (Бела Земља); *Rheumaptera undulata* (Linnaeus, 1758) – Тара пл. (Секулићи); *Perizoma bifaciata* (Haworth, 1809) – Ужице (Бела Земља); *Asthena anseraria* (Herrich - Schaffer, 1847) – Јелова Гора; *Acacis viretata* (Hьbner, 1799) – Ужице (Бела Земља)

Највећи број врста Geometridae 137 (65 %) је забележен на локалитету Бела Земља у близини Ужица, на планини Јелова Гора 96 врста (45%), у насељу Крчагово у Ужицу 110 врста (52%). На планини Тари је забележено 95 врста (45 %), што представља први прилог познавању фауне Geometridae те планине. Исто је и за Златибор, где су на 8 локалитета Geometridae сакупљане дању (осим Увца) и укупно је забележено 62 врсте. У клисури реке Ђетиње је забележено 69 врста.

Утврђена фауна Geometridae Ужичког краја биће увећана теренским истраживањима локалитета којима није посвећена пажња, као и детерминацијом преко карактера гениталних органа врста из родова *Eupithecia, Idaea, Scopula*.

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