

CONTRIBUTION TO THE KNOWLEDGE OF THE GEOMETRID MOTHS (LEPIDOPTERA: GEOMETRIDAE LEACH, 1815) OF MONTENEGRO AND SERBIA

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Abstract

The results of the faunal exploration of Geometer Moths (Lepidoptera, Geometridae) in the area of Montenegro and Serbia are reported. Based on fieldwork conducted in the past 50 years, data for 71 species are presented. Wherever necessary, comments are provided concerning ovipositional and nutritional plants, as well as illustrations of adults and genital armature. In Montenegro, several species have been recorded for the first time.

KEY WORDS: faunistics, diversity

Introduction

The Geometridae Leach, 1815 family belongs to the diverse order of Lepidoptera. The presence of over 900 species belonging to this family has been recorded in Europe (Hausmann, 2001). Extensive faunal research focusing on this group in the territory of Montenegro and Serbia was first conducted in the early 1900s and further intensified at the beginning of the 21st century. The faunistic knowledge of the western Balkans, however, is still fragmentary; there is no available checklist. The exact number of species in both countries remains unknown and the list of species is yet to be completed. For this reason, we focused on this specific group of Lepidoptera. This paper presents some of the results of research conducted in the past 50 years.

Materials and Methods

The survey was carried out in localities distributed throughout Montenegro and Serbia (Table I, Fig. 1). Geometer moths were collected using “Philips” Mercury Vapors Standard HPL lamps and pyramidal light traps, which used white neon lights and UV neon lights, powered by “Ultracell” UL7-12 (12 V 7 AH/20 HR) batteries. Photographs were taken with a Nikon D 3200 camera by the first author. The preparations of male genitalia were carried out following the well-known standard procedure: maceration by boiling in potash, dissecting and cleaning, clearing in xylolum and mounting in Canada balsam. Taxonomic order and nomenclature are based on *The Geometrid Moths of Europe* (Hausmann, 2001, 2004, Hausmann & Viidalepp, 2012).

The material was collected by the authors and students whose names are indicated in the text. Specimens and genitalia slides (marked with the abbreviation of the state and an ordinal number) are deposited in the first author’s collection (Jakšić Collection).

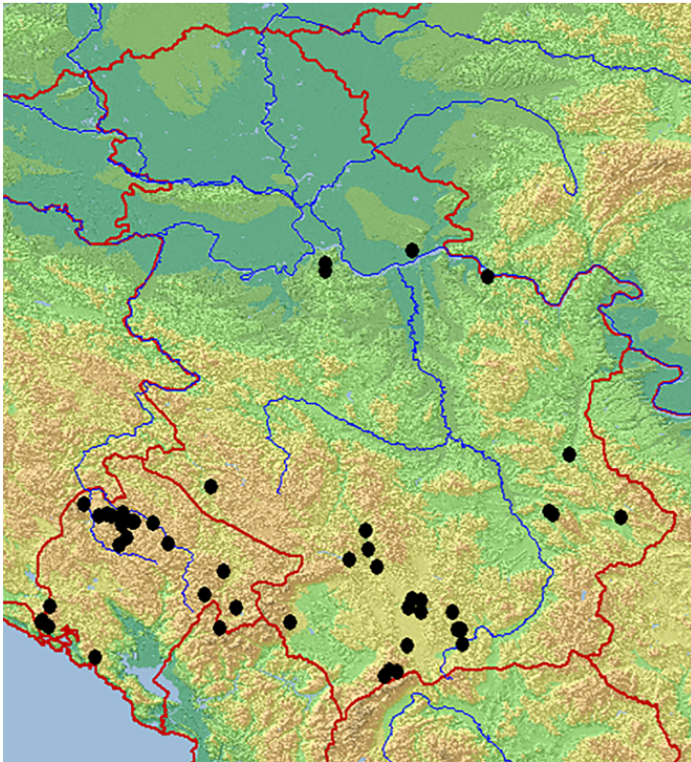


Figure 1. The map of sampling localities in Montenegro and Serbia.

Table I. Review of studied localities in the Republic of Serbia and the Republic of Montenegro. Abbreviations: MNE – Montenegro; SRB – Serbia, K&M – Kosovo and Metohija.

Locality	Elevation (m a.s.l.)	Latitude ϕ (N)	Longitude λ (E)
Avala Mt., Beograd, SRB	320	44° 41' 53"	20° 31' 28"
Beograd, SRB	80-110	44° 49' 28"	20° 27' 15"
Bojanine Vode, Suva Planina Mt., SRB	850	43° 13' 19"	22° 06' 39"
Bostane Village, Novo Brdo, SRB	800	42° 36' 47"	21° 25' 33"
Brezovica, Šar Planina Mt., SRB	900-1300	42° 12' 04"	21° 00' 33"
Crni Vrh (Motel "Stara"), Vidlič Mt., SRB	1040	43° 10' 46"	22° 41' 30"
Dečani, Peć, SRB	700	42° 32' 28"	20° 16' 18"
Devojački Grob, Suva Planina Mt., SRB	1317	43° 11' 59"	22° 08' 14"
Dubovac Village, Deliblatska Peščara, SRB	70	44° 51' 49"	21° 16' 21"
Đurđevića Tara, Durmitor Mt., MNE	720	43° 08' 59"	19° 17' 36"
Gazimestan, Priština, SRB	630	42° 41' 20"	21° 07' 46"
Golubac, SRB	70	44° 39' 21"	21° 39' 15"
Gornja Dobrilovina, Tara River Gorge, MNE	769	43° 01' 30"	19° 24' 03"
Gornje Kusce Village, Gnjilane, SRB	555	42° 29' 48"	21° 28' 56"
Govede Jezero Lake, Durmitor Mt., MNE	1520	43° 11' 28"	19° 06' 02"
Gračanica, Priština, SRB	600	42° 36' 17"	21° 11' 41"
Grbaja, Prokletije Mt., MNE	1143	42° 31' 20"	19° 47' 12"
Grmija Mt., Priština, SRB	700	42° 40' 30"	21° 11' 57"
Jokovača, Bjelasica Mt., MNE	1600-1700	42° 53' 57"	19° 37' 03"
Katun Jagnjičar, Visitor-Zeletin Mt., MNE	1848	42° 37' 35"	19° 53' 12"
Konsko, Lovćen Mt., MNE	1232	42° 20' 06"	18° 52' 00"
Košutovački Potok, Ibarska Klisura Gorge, SRB	605	42° 57' 44"	20° 50' 18"
Kruševice, MNE	1250	42° 54' 25"	19° 05' 23"
Leposavić, SRB	490	43° 06' 10"	20° 48' 30"
Ljuban vic., Komovi Mt., MNE	1463	42° 42' 49"	19° 39' 57"
Meždo, Žabljak, MNE	1376	43° 09' 34"	19° 09' 56"
Mileševka River Canyon, Prijepolje, SRB	685	43° 21' 43"	19° 44' 03"
Mratinje, MNE	772	43° 15' 58"	18° 48' 21"
Nedajno, MNE	1400	43° 12' 12"	18° 58' 32"
Orjensko Sedlo Pass, Orjen MT., MNE	1592	42° 33' 29"	18° 33' 07"
Parteš Village, Gnjilane, SRB	490	42° 24' 07"	21° 06' 01"
Pasjane Village, SRB	495	42° 24' 25"	21° 29' 44"
Petnjica, Komarnica, MNE	1026	42° 38' 39"	19° 04' 28"
Plužine, Pivska Planina Mt., MNE	1474	43° 12' 13"	18° 58' 05"
Pridvorica, Zubin Potok, SRB	580	42° 55' 22"	20° 41' 21"
Sevce Village, Šar Planina Mt., SRB	1050	42° 12' 48"	20° 56' 22"
Stanišor Village, Gnjilane, SRB	548	42° 29' 30"	21° 27' 43"
Subra, Orjen MT., MNE	1167	42° 30' 46"	18° 33' 16"
Sušica River Canyon, Durmitor Mt., MNE	1180	43° 11' 46"	19° 00' 18"
Štrpce, Šar Planina Mt., SRB	800-890	42° 14' 19"	21° 01' 45"
Tepca, Tara River Gorge, MNE	740	43° 22' 36"	19° 04' 33"
Točak, Durmitor Mt., MNE	1550	42° 08' 04"	19° 06' 01"
Ugljare Village, Priština, SRB	548	42° 37' 40"	21° 06' 33"
Ugnji, Lovćen Mt., MNE	1307	42° 19' 43"	18° 52' 58"
Velji Breg, Zubin Potok, SRB	630	42° 55' 54"	20° 40' 41"
Vojvodići, Pivska Planina Mt., MNE	1359	43° 13' 34"	18° 56' 16"
Vrbanje, Orjen Mt., MNE	1069	42° 32' 45"	18° 30' 38"
Vrbeštica, Šar Planina Mt., SRB	1011	42° 14' 34"	20° 58' 32"
Vrelo Bukovice, Durmitor Mt., MNE	1350	43° 03' 28"	19° 06' 37"
Zvečan, Kosovska Mitrovica, SRB	515	42° 54' 24"	20° 50' 35"



Figure 2. Montenegro, Bjelasica Mt., Jokovača, 1600-1700 m a.s.l., photo by P. Jakšić.



Figure 3. Serbia, Kosovo & Metohija, Šar Planina Mt., Brezovica, 900-1300 m a.s.l., photo by Vuk Nikolić.

Results and Discussion

Based on the results of our study, 71 species belonging to the Geometridae family have been confirmed in Montenegro and Serbia (37 in Montenegro and 45 in Serbia, with only seven taxa common to both countries). Details on distribution are given below. Unknown number of males and females is marked with (-).

Fam. Geometridae Leach, 1815

Subfamily Alsophilinae Herbulot, 1962

***Alsophila aescularia* (Denis & Schiffermüller, 1775)**

SRB: 3 ♂♂, Prijepolje, Mileševka Canyon, 685 m a.s.l., 04.03.2016. Genitalia checked, slides SR-2941 and SR-2944. In lit.: according to our database, there are 18 instances in the literature related to the presence of this species in Serbia, from Zečević (1975) to Živić & Jakšić (2020).

Subfamily Geometrinae Stephens, 1829

***Aplasta ononaria* (Fuessly, 1783)**

SRB: 1 ♂, Pasjane, 495 m a.s.l., 26.05.2018. Genitalia checked, slide SR-3159. In lit.: Beshkov *et al.* (2020), Dodok (2006), Jakšić (2017) and Tomić *et al.* (2002).

MNE: 1 ♂, Orjen Mt., Vrbanje, 1069 m a.s.l., 29.06.2020. In lit.: Cernelutti & Michieli (1958).

***Thetidia smaragdaria gigantean* (Millière, 1874)**

SRB: 1 ♀, Gnjilane, Gornje Kusce village, 555 m a.s.l., 20.05.2018, leg. Janičijević, T. In lit.: Lazarević (1906) first reported this species in Serbia. After Lazarević, six more authors recorded its presence in Serbia, the last being Beshkov *et al.* (2020).

Subfamily Sterrhinae Meyrick, 1892

***Idaea aureolaria* (Denis & Schiffermüller, 1775)**

MNE: 1 ♂, Lovćen Mt., Ugnji, 1307 m a.s.l., 03.07.2020. Univoltine, larva polyphagous on *Vicia*, *Rumex*, *Lactuca*, *Cytisus*, *Genista*, *Coronilla* and *Onobrychis* species.

New species for Montenegro.

***Idaea seriata* (Schrank, 1802)**

MNE: 1 ♂, Pivska Planina Mt., Plužine, 1474 m a.s.l., 18.07.2019. Genitalia checked, slide CG-3154. Subsp. *canteneraria* Boisduval, 1840 is typical for Mediterranean maquis, so this is a typical form from the continental part of Montenegro. In lit.: Cernelutti & Michieli (1958).

***Idaea aversata* (Linnaeus, 1758)**

MNE: 1 ♂, Žabljak, Meždo, 1376 m a.s.l., 21.07.2017; 1 ♀, Orjen Mt., Vrbanje, 1069 m a.s.l., 29.06.2020.

***Scopula immorata* (Linnaeus, 1758)**

SRB: 1 ♂, Beograd, Avala Mt., 320 m a.s.l., 28.05.2017; 1 ♂, Parteš, 490 m a.s.l., 10.05.2018, (Fig. 4). In lit.: Živić & Jakšić (2020), Vajgand (2016).

MNE: ~ ♂♂, ♀♀, Visitor-Zeletin Mt., Katun Jagnjičar, 1848 m a.s.l., 08.07.2020, (Fig. 5). According to Hausmann (2000), this is a new species for Montenegro, but Tomić *et al.* (1990) reported it for Žabljak, Durmitor National Park, one male, Michieli, Š., 1958. leg. Our finding is the second and is a confirmation of its presence in Montenegro.



Figure 4. *S. immorata* (Linnaeus, 1758) Serbia, K&M, Parteš, 490 m a.s.l.; 10.05.2018.



Figure 5. *S. immorata* (Linnaeus, 1758) Visitor-Zeletin Mt., Katun Jagnjičar, 1848 m a.s.l.; 08.07.2020.

***Rhodostrophia vibicaria* (Clerck, 1759)**

SRB: ~ ♂♂, ♀♀, Pasjane, 495 m a.s.l., 26.05.2018. In lit.: Rebel (1917) reported this species for the first time in Serbia, followed by Živojinović (1950) in eastern Serbia.

***Rhodostrophia calabra* (Petagna, 1787)**

SRB: 1 ♂, Pasjane, 495 m a.s.l., 26.05.2018. In lit.: Rebel (1903), Tomić *et al.* (2002).

***Cyclophora quercimontaria* (Bastelberger, 1897)**

SRB: 2 ♂♂, Pridvorica, 580 m a.s.l., 07.05.2018. Genitalia checked, slide SR-3138; 2 ♂♂, Zubin Potok, 575 m a.s.l., 20.05.2018; 1 ♂, Ugljare, 548 m a.s.l., 15.05.2020. In lit.: Živić & Jakšić (2020).

***Cyclophora ruficiliaria* (Herrich-Schäffer, 1855)**

SRB: 2 ♂♂, Pasjane, 495 m a.s.l., 26.05.2018. In lit.: Dodok (2006), Đorović (1976), Tomić *et al.* (2002).

***Cyclophora linearia* (Hübner, 1799)**

SRB: 1 ♂, Pridvorica, 580 m a.s.l., 05.05.2018; 3 ♂♂, Zubin Potok, 575 m a.s.l., 15.05.2018. In lit.: Dodok (2006), Đorović (1979), Hausmann (2004), Tomić *et al.* (2002), Živić & Jakšić (2019).

Subfamily Larentiinae Duponchel, 1845

***Scotopteryx mucronata* (Scopoli, 1763)**

MNE: 1 ♂, Durmitor Mt., Govede Jezero Lake, 1520 m a.s.l., 06.06.2017. According to Tomić *et al.* (1990), this species is well known from several places in Montenegro. Also, in lit.: Beshkov (2004).

***Scotopteryx ignorata* Huemer & Hausmann, 1998**

MNE: 1 ♂, Durmitor Mt., Vrelo Bukovice, 1350 m a.s.l., 24.07.2017, (Fig. 6). New species for Montenegro. Recently, Beshkov (2015) found this species in Serbia: 1 ♂, Niš region, Suva Planina Mt., above Bojanine Vode, 850 m a.s.l., N 43°12'56"; E 022°07'27", 02.07.2014.



Figure 6. *S. ignorata* Huemer & Hausmann, 1998. Durmitor Mt., Vrelo Bukovice, 1350 m a.s.l.; 24.07.2017.

***Scotopteryx bipunctaria* (Denis & Schiffermüller, 1775)**

MNE: 1 ♂, Durmitor Mt., Žabljak, Meždo, 1380 m a.s.l., 21.07.2017. In lit.: Tomić *et al.* (1990).

***Scotopteryx chenopodiata* (Linnaeus, 1758)**

MNE: 1 ♂, Durmitor Mt., Vrelo Bukovice, 1350 m a.s.l., 24.07.2017; 1 ♂, Nedajno, 1400 m a.s.l., 19.07.2019. In lit.: Tomić *et al.* (1990).

***Xanthorhoe incursata* (Hübner, 1813)**

MNE: 2 ♂♂, Bjelasica Mt., Jokovača, 1673 m a.s.l. (Fig. 2), 15.07.2019. In lit.: Tomić *et al.* (1990).

***Xanthorhoe montanata* (Denis & Schiffermüller, 1775)**

MNE: 1 ♀, Komovi Mt., Ljuban, 1463 m a.s.l., 24.06.2018. In lit.: Rebel (1913); Rebel (1914); Tomić *et al.* (1990).

***Catarhoe putridaria* (Herrich-Schäffer, 1852)**

SRB: 1 ♀, Pridvorica, 580 m a.s.l., 07.06.2018. In lit.: Beshkov (2015); Beshkov (2017); Beshkov & Nahirnić (2017); Živić & Jakšić (2020).

***Epirrhoe molluginata* (Hübner, 1813)**

MNE: Grbaja, 1143 m a.s.l., 26.06.2018, 1 female. In lit.: Tomić *et al.* (1990).

***Euphyia frustata* (Treitschke, 1828)**

SRB: Ibarska Klisura Gorge, Košutovački Potok, 605 m a.s.l., 08.08.1992, 1 female (Fig. 7).



Figure 7. *E. frustata* (Treitschke, 1828) Serbia, K&M, Ibarska Klisura Gorge, Košutovački Potok, 605 m a.s.l.; 08.08.1992.

***Thera cognata* (Thunberg, 1792)**

MNE: 1 ♂, Durmitor Mt., Žabljak, Meždo, 1380 m a.s.l., 21.07.2017. In lit.: Beshkov (2004); Rebel (1913); Tomić *et al.* (1990).

***Thera variata* (Denis & Schiffermüller, 1775)**

MNE: 1 ♂, 2 ♀♀, Mratinje, 772 m a.s.l., 28.09.2019. Genitalia checked, slide CG-3148. In lit.: Tomić *et al.* (1990). Also, Rebel (1913) reported this species for Albania and Macedonia.

***Eulithis prunata* (Linnaeus, 1758)**

MNE: 2 ♂♂, Pivska Planina Mt., Plužine, 1474 m a.s.l., 18.07.2019. Genitalia checked, slide CG-3151. In lit.: Tomić *et al.* (1990).

***Gandaritis pyraliata* (Denis & Schiffermüller, 1775)**

MNE: 2 ♀♀, Durmitor Mt., Žabljak, Meždo, 1380 m a.s.l., 21.07.2017; 1 ♂, 2 ♀♀, Pivska Planina Mt., Plužine, 1474 m a.s.l., 18.7.2019; 1 ♂, Nedajno, 1416 m a.s.l., 19.07.2019. In lit.: Tomić *et al.* (1990).
SRB: ~ ♂♂, ♀♀, Gnjilane, Gornje Kusce, 555 m a.s.l., 13.06.2018. In lit.: Vajgand (2016); Živić & Jakšić (2020).

***Dysstroma citrata* (Linnaeus, 1761)**

SRB: 1 ♀, Vidlič Mt. (Motel "Stara"), 1040 m a.s.l., 06.07.2016. In lit.: Hausmann & Viidalepp (2012), Tomić *et al.* (2002).

***Colostygia aptata* (Hübner, 1813)**

MNE: 1 ♂, Durmitor Mt., Žabljak, Meždo, 1380 m a.s.l., 21-24.07.2017. In lit.: Beshkov (2004); Tomić *et al.* (1990).

***Colostygia aqueata* (Hübner, 1813)**

MNE: 1 ♂, Durmitor Mt., Žabljak, 1450 m a.s.l., 05.06.2017. In lit.: Tomić *et al.* (1990).

***Epirrita autumnata* (Borkhausen, 1794)**

MNE: 3 ♂♂, 1 ♀, Petnjica, 1026 m a.s.l., 17.10.2018; 1 ♂, Tara River, Gornja Dobrilovina, 769 m a.s.l., 18.10.2018. Genitalia checked, slide CG-3054; 1 ♂, Kruševice, 1250 m a.s.l., 20.10.2018. In lit.: Tomić *et al.* (1990).

***Horisme vitalbata* (Denis & Schiffermüller, 1775)**

MNE: 1 ♀, Orjen Mt., Vrbanje, 1069 m a.s.l., 29.06.2020. In lit.: Camelutti & Michieli (1958).
SRB: 3 ♂♂, Šar Planina Mt., Štrpce, 800 m a.s.l., 20.05.2019; 1 ♂, 2 ♀♀ Pridvorica, 580 m a.s.l., 20.5.2018. In lit.: Živić & Jakšić (2020).

***Horisme tersata* (Denis & Schiffermüller, 1775)**

MNE: 1 ♂, Grbaja, 1143 m a.s.l., 26.06.2018. In lit.: Tomić *et al.* (1990).

***Melanthia procollata* (Denis & Schiffermüller, 1775)**

SRB: 1 ♂, Šar Planina Mt., Sevce, 1050 m a.s.l., 10.06.2019; 4 ♂♂, Štrpce, 890 m a.s.l., 20.05.2019, leg. Mladenović I. & Orlović A.; Štrpce, 835 m a.s.l., 03.06.2019, leg. Mladenović, I.; Štrpce, 835 m a.s.l., 06.06.2019, leg. Mladenović, I.; 3 ♂♂, Pridvorica, 05-10.05.2018, leg. Živković, M.

***Schistostege decussata dinarica* (Schawerda, 1913)**

MNE: 1 ♂, Pivska Planina Mt., Plužine, 1474 m a.s.l., 18.07.2019; 1 ♀, Pivska Planina Mt., Vojvodici, 1359 m a.s.l., 20.07.2019. In lit.: Tomić *et al.* (1990).

SRB: 3 ♂♂, Priština, Grmija, 700 m a.s.l., 28.06.1973, 1 ♂, 28.06.1987; ~ ♂♂, ♀♀, Gnjilane, Gornje Kusce, 555 m a.s.l., 07.05.2018; 1 ♂, Zubin Potok, 575 m a.s.l., 20.05.2018. In lit.: Tomić *et al.* (2002).

***Odezia atrata* (Linnaeus, 1758)**

MNE: ~ ♂♂, ♀♀, Orjen Mt., Subra, 1167 m a.s.l., 30.06.2020. In lit.: Rebel (1914).

***Aplocera plagiata* (Linnaeus, 1758)**

MNE: 1 ♂, Petnjica, 1026 m a.s.l., 18.10.2018. Genitalia checked, slide CG-3058. In lit.: Tomić *et al.* (1990).
SRB: 1 ♀, Šar Planina Mt., Štrpce, 835 m a.s.l., 09.06.2019. In Serbia, this is a common species, well-known in many localities. In lit.: Ristić (1996); Tomić *et al.* (2002).

***Aplocera praeformata urbahni* Dufay, 1981**

MNE: 1 ♂, Durmitor Mt., Žabljak, Meždo, 1300 m a.s.l., 1 ♀, 03.06.2017; 21-24.07.2017; 1 ♂, Pivska Planina Mt., Plužine, 1474 m a.s.l., 18.07.2019. In lit.: Beshkov (2004); Tomić *et al.* (1990).

***Perizoma hydrata* (Treitschke, 1829)**

MNE: 1 ♂, Durmitor Mt., Žabljak, Meždo, 1375 m a.s.l., 24.07.2017. In lit.: Tomić *et al.* (1990).

Subfamily Ennominae Duponchel, 1845

***Ligdia adustata* (Denis & Schiffermüller, 1775)**

SRB: 1 ♂, Zubin Potok, Velji Breg, 630 m a.s.l., 12.04.2018; 1 ♂, 16.04.2018; 1 ♂, Pridvorica, 580 m a.s.l., 05.05.2018. In lit.: Vajgand (2016); Živić & Jakšić (2020).

***Lomaspillia marginata* (Linnaeus, 1758)**

MNE: 1 ♂, Mratinje, 720 m a.s.l., 21.07.2019; 1 ♂, Durmitor Mt., Đurđevića Tara, 720 m a.s.l., 22.06.1985. Genitalia checked, slide CG-2224. In lit.: Carnelutti & Michieli (1958); Tomić *et al.* (1990).

***Isturgia murinaria* (Denis & Schiffermüller, 1775)**

SRB: 1 ♂, Priština, Grmija Mons, 700 m a.s.l., 11.04.1974; 1 ♀, 22.07.1974. Specimens from April are first-generation and the July specimens are second-generation. Larval food plants are *Medicago sativa* and *Onobrychis vicifolia*, as well as *Trifolium* species. According to Krivošej (2013), the first two species are not part of the Grmija Mons flora, but 13 species of *Trifolium* are present.

***Isturgia arenacearia* (Denis & Schiffermüller, 1775)**

MNE: 1 ♀, Bjelasica Mt., Jokovača, 1673 m a.s.l., 15.07.2019. In lit.: Carnelutti & Michieli (1958).

***Neognopharmia stevenaria* (Boisduval, 1840)**

SRB: 1 ♂, Pasjane, 500 m a.s.l., 19.04.2018. In lit.: Živić & Jakšić (2020).

***Macaria alternata* (Denis & Schiffermüller, 1775)**

SRB: 1 ♂, Gnjilane, G. Kusce Village, 555 m a.s.l., 16.04.2018. In lit.: Živić & Jakšić (2020); Živojinović (1950).

***Chiasmia clathrata* (Linnaeus, 1758)**

MNE: ~ ♂♂, ♀♀, Orjen Mt., Orjensko Sedlo Pass, 1592 m a.s.l., 30.06.2020. In lit.: Beshkov (2004); Tomić *et al.* (1990).

***Petrophora chlorosata* (Scopoli, 1763)**

SRB: 1 ♂, Peć, Dečani, 700 m a.s.l., 25.05.1979.

***Plagodis pulveraria* (Linnaeus, 1758)**

SRB: 1 ♀, Gornje Kusce, 555 m a.s.l., 04.05.2018. In lit.: Tomić *et al.* (2002); Vajgand (2016); Živić & Jakšić (2020).

***Ophisthograptis luteolata* (Linnaeus, 1758)**

SRB: 1 ♀, Šar-Planina Mt., Štrpce, 850 m a.s.l., 20.05.2019. Common species, present in two generations per year. In lit.: Tomić *et al.* (2002); Vajgand (2016); Živić & Jakšić (2020).

***Therapis flavicaria* (Denis & Schiffermüller, 1775)**

SRB: 1 ♀, Pridvorica, 580 m a.s.l., 05.05.2018. In lit.: Tomić *et al.* (2002); Vajgand (2016); Živić & Jakšić (2020).

***Pseudopanthera macularia* (Linnaeus, 1758)**

SRB: ~ ♂♂, ♀♀, Zubin Potok, 575 m a.s.l., 20.05.2018. Very common species, widespread in Serbia. In lit.: Tomić *et al.* (2002).

***Ennomos erosaria* (Denis & Schiffermüller, 1775)**

SRB: 1 ♂, Vidlič Mt. (Motel "Stara"), 1040 m a.s.l., 06.07.2016; 1 ♂, Laposavić, 490 m a.s.l., 26.05.2018. Genitalia checked, slide SR-3135; 1 ♂, Šar Planina Mt., Brezovica, 1000 m a.s.l., 29.07.1973, (Fig. 3). Common species. In lit.: Živić & Jakšić (2020).

***Ennomos quercaria* (Hübner, 1813)**

SRB: 1 ♂, Šar Planina Mt., Brezovica, 1000 m a.s.l., 06.08.1974; 1 ♂, Priština, Grmija Mons, 700 m a.s.l., 12.08.1974. Stojanović *et al.* (2018) reported this species as new in Serbia, from the Negotin vicinity (eastern Serbia). The larva is oligophagous, preferring *Quercus*. According to Krivošej (2013), in Grmija Mons *Q. petraea* and *Q. pubescens* are present. In lit.: Stojanović *et al.* (2018).

***Selenia dentaria* (Fabricius, 1775)**

SRB: 1 ♂, Šar Planina Mt., Brezovica, 1000 m a.s.l., 29.07.1973. In lit.: Vajgand (2016).

***Selenia lunularia* (Hübner, 1788)**

SRB: 1 ♀, Priština, Grmija Mons, 700 m a.s.l., 02.04.1973; 1 ♀, Gnjilane, Pasjane, 500 m a.s.l., 04.04.2018; 1 ♀, Gnjilane, Gornje Kusce, 555 m a.s.l., 08.04.2018. In lit.: Vajgand (2016); Živić & Jakšić (2020).

***Selenia tetralunaria* (Hufnagel, 1767)**

MNE: 2 ♀♀, Mratinje, 780 m a.s.l., 21.07.2019.

SRB: 1 ♂, Golubac, 70 m a.s.l., 07.07.2016. In lit.: Beshkov (2004); Tomić *et al.* (1990).

***Colotois pennaria* (Linnaeus, 1761)**

MNE: 1 ♂, Durmitor Mt., Tara River, Tepca, 740 m a.s.l., 19.10.2018; 2 ♂♂, Petnjica, 1026 m a.s.l., 18.10.2018, (Fig. 8). In lit.: Tomić *et al.* (1990).

SRB: 1 ♀, Šar Planina Mt., Štrpce, 850 m a.s.l., 18.10.2018; 1 ♂, Šar Planina Mt., Sevce 1050 m a.s.l., 20.10.2018. In lit.: Đorović (1976); Đorović (1979); Vajgand (2016); Živić & Jakšić (2020).



Figure 8. *C. pennaria* (Linnaeus, 1761) MNE, Petnjica, 1026 m a.s.l.; 18.10.2018.

***Lomographa bimaculata* (Fabricius, 1775)**

SRB: 1 ♂, Kovin, Dubovac, 75 m a.s.l., 08.07.2016. Common species, in two generations per year, widespread in Serbia. In lit.: Tomić *et al.* (2002).

***Theria rupicaprararia* (Denis & Schiffermüller, 1775)**

SRB: 1 ♂, Šar Planina Mt., Štrpce, 890 m a.s.l., 29.03.2019. A typical representative of the winter Geometer Moths, common in Serbia. In lit.: Tomić *et al.* (2002).

***Campaea margaritaria* (Linnaeus, 1761)**

SRB: 1 ♂, Zubin Potok, 575 m a.s.l., 20.05.2018. Common species, in two generations per year, widespread in Serbia. In lit.: Tomić *et al.* (2002).

***Gnophos furvata* (Denis & Schiffermüller, 1775)**

MNE: 1 ♀, Bjelasica Mt., 1578 m a.s.l., 15.07.2019. In lit.: Tomić *et al.* (1990).

***Synopsia sociaria* (Hübner, 1799)**

SRB: 1 ♂, Pasjane, 495 m a.s.l., 26.05.2018. Genitalia checked, slide SR-3161 (Fig. 9); 1 ♂, Ugljare, 548 m a.s.l., 15.05.2020. Genitalia checked, slide SR-3160. Common species, in two generations per year, widespread in Serbia. Larva on *Sarothamnus*, *Artemisia*, *Genista* and *Spartium* species. In lit.: Tomić *et al.* (2002).



Figure 9. *S. sociaria* (Hübner, 1799) Serbia, K&M: Pasjane, 495 m a.s.l.; 26.05.2018.

***Hypomecis roboraria* (Denis & Schiffermüller, 1775)**

MNE: 1 ♀, Mratinje, 650 m a.s.l., 21.07.2019; 1 ♂, Mratinje, 772 m a.s.l., 28.09.2019. In lit.: Tomić *et al.* (1990).

***Lycia hirtaria* (Clerck, 1759)**

SRB: 1 ♂, Gnjilane, Gornje Kusce, 555 m a.s.l., 19.03.2018; 1 ♂, Zubin Potok, Velji Breg, 630 m a.s.l., 30.03.2018; 1 ♂, Šar Planina Mt., Štrpce, 890 m a.s.l., 29.04.2019; 2 ♂♂, Gračanica, 600 m a.s.l., 09.05.2020. In lit.: Tomić *et al.* (2002); Vajgand (2016); Živić & Jakšić (2020).

***Biston betularia* (Linnaeus, 1758)**

MNE: 1 ♂, Pivska Planina Mt., Mratinje, 694 m a.s.l., 21.07.2019; 1 ♂, Durmitor Mt., Žabljak, Meždo, 1380 m a.s.l., 21.07.2017. In lit.: Tomić *et al.* (1990).

SRB: 1 ♂, Beograd, 110 m a.s.l., 04.12.1974; 1 ♂, Novo Brdo, Bostane, 800 m a.s.l., 21.11.1982; 1 ♂, 27.11.1982; 1 ♂, 10.12.1982; 1 ♂, Zvečan, 515 m a.s.l., 20.10.2016.

***Erannis defoliaria* (Clerck, 1759)**

SRB: 1 ♂, Beograd, 80 m a.s.l., 04.12.1974; 1 ♂, Novo Brdo, Bostane Village, 800 m a.s.l., 21.11.1982; 27.11.1982; 1 ♂, 10.12.1982. Genitalia checked, slides SR-3128 and SR-3129; 1 ♂, K. Mitrovica, Zvečan, 515 m a.s.l., 20.10.2016. In lit.: Vajgand (2016); Živić & Jakšić (2020).

***Agriopis leucophaeraria* (Denis & Schiffermüller, 1775)**

SRB: 5 ♂♂, Prijepolje, Mileševka, 685 m a.s.l., 04.03.2016. Genitalia checked, slides SR-2940 and SR-2943. In lit.: Glavendekić (2002).

***Agriopis marginaria* (Fabricius, 1776)**

SRB: 2 ♂♂, Priština, Grmija Mons, 700 m a.s.l., 08.03.1979; 1 ♂, 15.03.1979; 1 ♂, 20.03.1980. Genitalia checked, slide SR-3126; 1 ♂, Šar Planina Mt., Štrpce, 890 m a.s.l., 29.04.2019; 2 ♂♂, 01.05.2019; 1 ♂, Šar Planina Mt., Vrbeštica, 1011 m a.s.l., 01.03.2019, (Fig. 10). In lit.: Živić & Jakšić (2020).



Figure 10. *A. marginaria* (Fabricius, 1776) Serbia, K&M, Šar Planina Mt., Vrbeštica, 1011 m a.s.l.; 01.03.2019.

***Fagivorina arenaria* (Hufnagel, 1767)**

SRB: 2 ♂♂, Vidlič Mt., Crni Vrh (Motel "Stara"), 1040 m a.s.l., 06.07.2016. In lit.: Tomić *et al.* (2002).
MNE: 1 ♀, Lovćen Mt., Konsko, 1232 m a.s.l., 03.07.2020.

New species in Montenegro.

***Peribatodes rhomboidaria* (Denis & Schiffermüller, 1775)**

SRB: ~ ♂♂, ♀♀, Lepasavić, 490 m a.s.l., 20-26.05.2016; ~ ♂♂, ♀♀, Zubin Potok, 575 m a.s.l., 20.05.2018; 3 ♂♂, Pasjane, 495 m a.s.l., 26.05.2018; 2 ♂♂, Ugljare, 548 m a.s.l., 15.05.2020. In lit.: Beshkov *et al.* (2020); Rebel (1903); Tomić *et al.* (1994).

***Alcis repandata* (Linnaeus, 1758)**

MNE: 1 ♂, Žabljak, Meždo, 1380 m a.s.l., 23-24.07.2017; 1 ♂, Pivska Planina Mt., Mratinje, 650 m a.s.l., 21.7.2019; 1 ♂, Pivska Planina Mt., 1474 m a.s.l., 18.07.2019. Genitalia checked, slide CG-3153 (Fig. 11). This univoltine species, whose larva is polyphagous, inhabits hygrophilous to mesophilic and silvicolous habitats. In lit.: Beshkov (2004); Tomić *et al.* (1990).



Figure 11. *A. repandata* (Linnaeus, 1758) Montenegro, Pivska Planina Mt., 1474 m a.s.l.; 18.07.2019.

***Alcis jubata* (Thunberg, 1788)**

MNE: 1 ♂, Durmitor Mt., Točak, 1550 m a.s.l., 21.07.1991. The larva is oligophagous, mainly on the Usneaceae species. In lit.: Beshkov (2004); Tomić *et al.* (1990).

***Cleora cinctaria* (Denis & Schiffermüller, 1775)**

SRB: 1 ♂, Ugljare, 548 m a.s.l., 28.04. 2020, genitalia checked, slide SR-3146; 1 ♂, Gračanica, 600 m a.s.l., 05.05.2020. A well-known species in Serbia, first reported by Rothschild (1912) in Vojvodina.

Conclusions

The presence of 71 species from the Geometridae family has been ascertained through faunistic studies, 37 of which were conducted in Montenegro and 45 in Serbia. Only seven species appear to be common to both countries. The small number of common species in these similar and geographically close territories could be explained by the pronounced endemism and the specific ecological requirements of the majority of detected species. This is confirmed by the general distribution of geometrid moths in Europe according to Hausmann (2001), Hausmann (2004) and Hausmann & Viidalepp (2012).

Three new species were found in Montenegro: *Idaeae aureolaria* (Denis & Schiffermüller, 1775), *Scotopteryx ignorata* Huemer & Hausmann, 1998, and *Fagivorina arenaria* (Hufnagel, 1767). The presence of *Scopula immorata* (Linnaeus, 1758), previously reported based on a single specimen from 1958, was confirmed in Montenegro. The discovery of four species new to the Montenegrin fauna highlights the unsatisfactory level of this group's research. Only the area of Mt. Durmitor has been relatively well investigated (Tomić *et al.*, 1990). Data are presented in various publications and should be integrated into one checklist.

The situation is the same in Serbia. A checklist exists [9], but it was published 20 years ago. A significant impetus to the study of the Geometridae family came with the publication of the monograph *Geometrid Moths of Europe* in six volumes. By looking at the distribution maps, however, we can see that the territory of Serbia is only fragmentarily filled. For example, the authors provide no data on the presence of the *Alsophila aescularia* species in Serbia, although we are aware of 18 literature records. Similarly, regarding the *Thetidia smaragdaria* species, again, the authors provide no data for Serbia, while we know of six published papers containing reports from this country. It is clear that the data from Serbia were not available to the authors, in large part due to the language barrier. We believe that in the new edition, these omissions will be eliminated.

As can be seen from this review, the fauna of this group of Lepidoptera is still insufficiently studied. Likewise, the fauna of urban and rural areas, which usually contains synanthropic species, remains under-researched.

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ПРИЛОГ ПОЗНАВАЊУ ЗЕМЉОМЕРКИ ЦРНЕ ГОРЕ И СРБИЈЕ (LEPIDOPTERA: GEOMETRIDAE LEACH, 1815)

ПРЕДРАГ ЈАКШИЋ И СЛАВИША МИЛОШЕВИЋ

Извод

Приказани су резултати фаунистичких истраживања појединих представника фамилије земљомерки узоркованих на територији Црне Горе и Србије у протеклих 50 година. У периоду 2001–2019, публикована је шестотомна монографија: *The Geometrid Moths of Europe* (ур. Hausmann, A). Знатан број врста познатих и у Црној Гори, и у Србији, вероватно због језичке баријере, није укључен у волумене ове серије. Овим прилогом је учињен напор да се диверзитет ове групе ноћних лептира учини доступним европској стручној јавности. Укључене су врсте са нових локалитета, као и врсте за које постоји мало података у литератури. Поједине врсте су илустроване помоћу адулта или преко гениталне арматуре. Наведени су подаци за 71 врсту, 37 за фауну Црне Горе и 45 за фауну Србије. Само седам врста је заједничко за фауне обе територије, што говори о још увек недовољној истражености ове групе. Међу утврђеним врстама, три су нове за фауну Црне Горе: *Idaea aureolaria* (Denis & Schiffermüller, 1775), *Scotopteryx ignorata* (Hüemer & Hausmann, 1998) и *Fagivorina arenaria* (Hufnagel, 1767). За Црну Гору је потврђено присуство врсте *Scopula immorata* (Linnaeus, 1758), до сада познате само на основу једног примерка утврђеног 1958. године.