

# On the Lepidoptera collection created by Petar Novak, stored in Natural History Museum in Split

Toni Koren<sup>1,\*</sup>, Bože Kokan<sup>2</sup>

<sup>1</sup>Association Hyla, Lipovac I 7, HR-10000 Zagreb, Croatia (e-mail:)

<sup>2</sup>Natural History Museum and Zoo, Kolombatovićevo šetalište 2, HR-21000 Split, Croatia (e-mail: [boze@prirodoslovni.hr](mailto:boze@prirodoslovni.hr))

\*Corresponding author E-mail address: [toni.koren@hhdhyla.hr](mailto:toni.koren@hhdhyla.hr) (T. Koren)

## Abstract

In this work we will present the Lepidopterological collection which is stored in the Natural History Museum in Split created by Petar Novak for the exhibition purposes of the Museum. Aside from Lepidoptera, the collection contains other orders of insects including Coleoptera, Hemiptera, Orthoptera, Odonata, Hymenoptera, and Diptera which await taxonomical reevaluation. The material was collected in the first half of the 20<sup>th</sup> century, mostly around Kaštela near Split. The collection contains 273 specimens belonging to 143 species. The Rhopalocera are presented with five families and 36 species, while Heterocera contains 21 families and 107 species.

**Keywords:** Rhopalocera, Heterocera, Dalmatia, museum collections

## Sažetak

Ovdje predstavljamo Lepidopterološku zbirku pohranjenu u Prirodoslovnom muzeju u Splitu koju je za izložbene potrebe Muzeja izradio Petar Novak. Osim Lepidoptera, zbirka sadrži i druge redove kukaca uključujući Coleoptera, Hemiptera, Orthoptera, Odonata, Hymenoptera i Diptera koji čekaju taksonomsku revalorizaciju. Građa je prikupljena u prvoj polovici 20. stoljeća, najviše u okolini Kaštela kod Splita. Zbirka sadrži 273 primjerka odnosno 143 vrste. Danji leptiri obujvaćaju pet porodica s 36 vrsta, dok noćni leptiri obuhvaćaju 21 porodicu i 107 vrsta.

**Ključne riječi:** Rhopalocera, Heterocera, Dalmatia, muzejske zbirke

## Introduction

Croatian entomologist and vineyard inspector Petar Novak (1879-1968) was one of the most famous insects collecting entomologists in Dalmatia in the first half of the 20<sup>th</sup> century. His catalogs regarding Coleoptera of Dalmatia and the Adriatic islands still represent the most detailed overview of this group in Croatia (Novak 1952, 1970). His extensive Coleoptera collection is fortunately preserved, but divided between the Croatian Natural History Museum in Zagreb and the Institute for Plant Protection and Environment in Belgrade (Nonveiller 1989). Aside from Coleoptera, he was interested in and collected other insect groups, and his Heteroptera collection is stored in Natural History Museum in Belgrade (Protić 2006). During his lifetime, he was asked by several institutions in Croatia and abroad to perform taxonomic analysis of their collections or to organize entomology collections for them. While being temporarily employed in Natural History Museum in Split (1946 to 1952) he rearranged the old Coleoptera Collection of Dr. Eduard Karaman (1849-1923) to update its taxonomy. The collection contains about 30.000 beetle specimens collected around Split, but also wide across European countries and even some parts of Asia and Africa (Kokan 2014). During his work in the museum in Split, Petar Novak collected local insects belonging to different insect orders to create another insect collection. The collection is named „Insect collection of Petar Novak for exhibition purposes" and consists of about 5270 specimens, mainly belonging to Coleoptera, Hemiptera, Orthoptera, Odonata, Hymenoptera, Diptera, and Lepidoptera. Only the Coleoptera specimens from this collection were partially published (Novak 1952) while the specimens belonging to the other insect orders are still unpublished. The complete museum entomology material is digitalized and requires taxonomical revision. Here we present the Lepidoptera material belonging to the „Insect collection of Petar Novak for exhibition purpose “.

## Materials and methods

All the species stored in the collection were identified by Petar Novak, and the identification was verified by the authors using standard identification keys for butterflies (Tolman and Lewington 2008) and moths (e.g. Nowacki 1998). In some cases, the specimens were damaged, or mostly destroyed, or completely faded. For each recognizable species, all available data on the labels is provided. The data on the labels is represented in the original language, usually Italian (e.g. Spalato=Split, etc.).

## Results and discussion

The analysed collection Novak (Figure 1) contains 273 specimens belonging to 21 families and 174 species (Table 1). The Rhopalocera are presented with five families and 36 species, while Heterocera contains 21 families and 107 species. The specimens are prepared and labeled with the locality and sometimes with the smaller toponym. However, 37 specimens are lacking the labels, one has only the

locality, and only have the collecting date. The specimens in this collection were collected between 1922 and 1965, but most of them were in the period between 1920-1930. Most of the specimens were collected around Split (e.g. Split, Kaštela, Sućurac), but some originate from the Adriatic islands (Korčula, Iž, Ugljan, Brač, Mljet), and one specimen originates from Livno in Bosnia and Herzegovina. Most of the moth species present in the collection can be regarded as common in Croatia, but some of them deserve additional consideration.



**Figure 1.** One of the exhibition boxes of Lepidoptera was created by Petar Novak and stored in the Natural History Museum in Split.

**Table 1:** Lepidoptera specimens from the Novak collection stored in the Natural history museum in Split.

	Species	Locality	Date
	Hesperiidae		
1.	<i>Carcharodus alceae</i> (Esper 1780)	Sučurac	25.V.1924
2.	<i>Ochlodes sylvanus</i> (Esper 1777)	/	/
	Papilionidae		
3.	<i>Iphiclides podalirius</i> (Linnaeus 1758)	Marjan, Split	22.VI.1960
4.	<i>Papilio machaon</i> (Linnaeus 1758)	/	20.VI.1960
5.	<i>Parnassius mnemosyne</i> (Linnaeus 1758)	/	/
6.	<i>Zerynthia polyxena</i> (Denis and Schiffermüller 1775)	/	/
	Pieridae		
7.	<i>Anthocharis cardamines</i> (Linnaeus 1758)	Marjan, Split	14.VI.1960
		Marjan, Split	29.VI.1965
8.	<i>Aporia crataegi</i> (Linnaeus 1758)	/	/
9.	<i>Colias croceus</i> (Fourcroy 1785)	Stobreč	23.VII.1960
		Stobreč	9.VI.1961
10.	<i>Colias alfacariensis</i> (Ribbe 1905)	/	/
11.	<i>Gonepteryx cleopatra</i> (Linnaeus 1767)	Iž Veli	5.VII.1928
12.	<i>Gonepteryx rhamni</i> (Linnaeus 1758)	Sučurac	5.III.1925
		Sučurac	5.IV.1925
13.	<i>Leptidea cf. sinapis</i> (Linnaeus 1758)	Lumbarda, Curzola	25.VI.1925
14.	<i>Pieris brassicae</i> (Linnaeus 1758)	Turska kula, Split	25.VI.1959
		/	/
		/	/
15.	<i>Pieris rapae</i> (Linnaeus 1758)	/	/
		Split	15.III.1942
		Split	15.III.1942
16.	<i>Pontia edusa</i> (Fabricius 1777)	Sučurac	5.V.1924
		Sučurac	5.IV.1926
	Lycaenidae		
17.	<i>Lycaena phlaeas</i> (Linnaeus 1761)	Sučurac	1.X.1923
		Sučurac	18.VIII.1924
18.	<i>Polyommatus bellargus</i> (Rottemburg 1775)	/	/
		/	/
19.	<i>Polyommatus icarus</i> (Rottemburg 1775)	Sučurac	1.VIII.1923
		Sučurac	1.VIII.1923
	Nymphalidae		
20.	<i>Aglais urticae</i> (Linnaeus 1758)	Botanički vrt. Marjan, Split	1965
21.	<i>Argynnis pandora</i> (Denis and Schiffermüller 1775)	Hutovo Blato	27.V.1965
22.	<i>Fabriciana niobe</i> (Linnaeus 1758)	/	/
23.	<i>Hipparchia cf. fagi</i> (Scopoli 1763)	Murter	1.VII.1934
		/	24.VI.1965
24.	<i>Hipparchia statilinus</i> (Hufnagel 1766)	Bena, Marjan, Split	29.VIII
		Turska kula, Split	10.VIII.1959
25.	<i>Hipparchia semele</i> (Linnaeus 1758)	Lesina	5.IX.1924
26.	<i>Issoria lathonia</i> (Linnaeus 1758)	Sučurac	25.V.1924

	Species	Locality	Date
		Sućurac	5.IV.1925
27.	<i>Lasiommata megera</i> (Linnaeus 1767)	Marjan, Split	24.IX.1970
28.	<i>Limnitis reducta</i> Staudinger 1901	Sućurac	25.VI.1924
29.	<i>Melanargia galathea</i> (Linnaeus 1758)	/	/
30.	<i>Melitaea didyma</i> (Esper 1778)	Sućurac	15.VII.1924
		Trau	13.VIII.1925
31.	<i>Nymphalis antiopa</i> (Linnaeus 1758)	Sućurac	15.VI.1924
32.	<i>Nymphalis polychloros</i> (Linnaeus 1758)	Marjan, Split	20.V.1945
33.	<i>Polygonia egea</i> (Cramer 1775)	/	/
34.	<i>Pyronia cecilia</i> (Vallantin 1894)	/	/
35.	<i>Vanessa atalanta</i> (Linnaeus 1758)	/	/
36.	<i>Vanessa cardui</i> (Linnaeus 1758)	Split	15.VI.1928
	Psychidae		
37.	<i>Pachythelia villosella</i> (Ochsenheimer 1810)	Split	5.X.1943
		Sućurac	5.VI.1924
		Sućurac	5.VI.1924
	Yponomeutidae		
38.	<i>Yponomeuta padella</i> (Linnaeus 1758)	Knin D.	VI.1926
		Livno Bos.	26.VI.1930
		Vrana D.	29.VI.1930
	Plutellidae		
39.	<i>Plutella xylostella</i> (Linnaeus 1758)	Split	4.VI.1941
	Praydidae		
40.	<i>Prays oleae</i> (Bernard 1788)	Split D.	31.V.1937
		Split D.	31.V.1937
		Split D.	31.V.1937
		Split D.	31.V.1937
		Split D.	31.V.1937
		Split D.	31.V.1937
	Gelechiidae		
41.	<i>Phthorimaea operculella</i> (Zeller 1873)	Ugljan	20.III.1940
		Ugljan	20.III.1940
		Ugljan	27.VIII.1940
	Choreutidae		
42.	<i>Choreutis nemorana</i> (Hübner 1799)	Sućurac D.	10.VIII.1926
		S. Pietro D. Brazza	7.VII.1930
	Tortricidae		
43.	<i>Acleris variegana</i> (Denis and Schiffermüller 1775)	Modrave Zlosela D.	9.V.1924
		Split D.	28.IV.1941
44.	<i>Cydia pomonella</i> (Linnaeus 1758)	Split D.	25.V.1940
45.	<i>Lobesia botrana</i> (Denis and Schiffermüller 1775)	/	/
		/	/
		/	/
46.	<i>Rhyacionia buoliana</i> (Denis and Schiffermüller 1775)	Mosor	27.V.1934
		Mosor	27.V.1934
	Cossidae		
47.	<i>Dyspessa ulula</i> (Borkhausen 1790)	Sućurac	5.VI.1924
		Lumbarda, Curzola	15.V.1925

	Species	Locality	Date
48.	<i>Parahypopta caestrum</i> (Hübner 1808)	Stafilić	8.VII.1932
		Stafilić	8.VII.1932
		Stafilić	8.VII.1932
	<b>Sesiidae</b>		
49.	<i>Paranthrene tabaniformis</i> (Rottemburg 1775)	Spalato	10.VI.1927
		Spalato	10.VI.1927
		Spalato	1.VI.1927
	<b>Zygaenidae</b>		
50.	<i>Zygaena lonicerae</i> (Scheven 1777)	Vrana	18.VI.1924
	<b>Pyralidae</b>		
51.	<i>Ancylois cinnamomella</i> (Duponchel 1836)	Sućurac	1922
		Sućurac	15.VII.1924
52.	<i>Cryptoblabes gnidiella</i> (Millière 1867)	Curzola D.	X.1923
		Curzola D.	XI.1923
		Rogotin Metković D.	10-1925
		Rogotin Metković D.	10-1925
53.	<i>Epischnia illotella</i> (Zeller 1839)	Sućurac	1922
		Sućurac	VII.1923
		Sućurac	25.VII.1924
54.	<i>Etiella zinckenella</i> (Treitschke 1832)	Sućurac	5.V.1924
		Sućurac	25.V.1924
		Sućurac	25.V.1924
55.	<i>Homoeosoma sinuella</i> (Fabricius 1794)	Sućurac	VII.1923
		Sućurac	25.V.1924
		Sućurac	25.V.1924
56.	<i>Plodia interpunctella</i> (Hübner 1813)	Sućurac D.	25.VIII.1924
		Sućurac D.	25.VIII.1924
		Sućurac D.	25.VIII.1924
		Sućurac D.	25.VIII.1924
57.	<i>Stemmatophora brunnealis</i> (Treitschke 1829)	Sućurac	VIII.1923
		Sućurac	IX.1923
	<b>Crambidae</b>		
58.	<i>Achyra nudalis</i> (Hübner 1796)	/	/
59.	<i>Euchromius cf. superbellus</i> (Zeller 1849)	Sućurac	1.VII.1923
		Sućurac	1.VII.1923
		Sućurac	15.V.1924
60.	<i>Nomophila noctuella</i> (Denis and Schiffermüller 1775)	/	/
61.	<i>Ostrinia nubilalis</i> (Hübner 1796)	Curzola D.	25.VI.1929
		Curzola D.	25.VI.1929
	<b>Lasiocampidae</b>		
62.	<i>Gastropacha quercifolia</i> (Linnaeus 1758)	Spalato D.	1.VI.1929
		Spalato D.	2.VI.1931
		Split	12.IX.1947
63.	<i>Lasiocampa quercus</i> (Linnaeus 1758)	Split	5.IX.1928
		Split	25.IX.1928
64.	<i>Lasiocampa trifolii</i> (Denis and Schiffermüller 1775)	Split	5.IX.1928
	<b>Saturniidae</b>		

	Species	Locality	Date
65.	<i>Saturnia pavoniella</i> (Scopoli 1763)	/	/
66.	<i>Saturnia spini</i> (Denis and Schiffermüller 1775)	/	/
67.	<i>Saturnia pyri</i> (Denis and Schiffermüller 1775)	/	/
	Sphingidae		
68.	<i>Agrius convolvuli</i> (Linnaeus 1758)	Sućurac	5.X.1925
69.	<i>Daphnis nerii</i> (Linnaeus 1758)	/	/
		/	/
70.	<i>Hemaris croatica</i> (Esper 1800)	Marjan, Split	5.X.1961
71.	<i>Hyles euphorbiae</i> (Linnaeus 1758)	/	/
72.	<i>Hyles livornica</i> (Esper 1780)	Spalato	15.VII.1931
73.	<i>Macroglossum stellatarum</i> (Linnaeus 1758)	/	/
74.	<i>Mimas tiliae</i> (Linnaeus 1758)	/	/
75.	<i>Smerinthus ocellata</i> (Linnaeus 1758)	/	/
	Geometridae		
76.	<i>Charissa variegata</i> (Duponchel 1830)	Sućurac	1922
		Sućurac	1.VII.1923
77.	<i>Chiasmia aestimaria</i> (Hübner 1809)	/	/
78.	<i>Coenotephria ablutaria</i> (Boisduval 1840)	Sućurac	XI.1923
		Sućurac	25.III.1924
		Sućurac	5.V.1924
79.	<i>Dyscia raunaria</i> (Freyer 1852)	Sućurac	1.VI.1923
		Sućurac	15.IX.1924
80.	<i>Epirrhoe galiata</i> (Denis and Schiffermüller 1775)	Sućurac	25.VIII.1924
81.	<i>Eucrostes indigenata</i> (de Villers 1789)	Sućurac	1.VII.1923
		Sućurac	25.VII.1924
82.	<i>Eupithecia centaureata</i> (Denis and Schiffermüller, 1775)	Sućurac	5.V.1924
83.	<i>Eupithecia semigraphata</i> (Bruand 1850)	Sućurac	1922
		Sućurac	25.VIII.1924
84.	<i>Gnophos sartata</i> (Treitschke 1827)	Sućurac	25.IX.1924
85.	<i>Heliomata glarearia</i> (Denis and Schiffermüller 1775)	Sućurac	25.VI.1924
		Sućurac	25.VI.1924
86.	<i>Horisme vitalbata</i> (Denis and Schiffermüller 1775)	Sućurac	25.V.1924
		Sućurac	5.VI.1924
87.	<i>Idaea degeneraria</i> (Hübner 1799)	Sućurac	25.VIII.1924
		Sućurac	10.IX.1924
88.	<i>Idaea obsoletaria</i> (Rambu 1833)	Sućurac	1922
		Sućurac	1.VII.1923
		Sućurac	25.VII.1924
89.	<i>Lycia graecarius</i> (Staudinge 1861)	Sućurac	20.III.1927
		Sućurac	20.III.1927
		Sućurac	20.III.1928
90.	<i>Menophra abruptaria</i> (Thunber 1792)	/	/
91.	<i>Menophra japygiaria</i> (OCosta 1849)	Sućurac	1.VI.1923
		Sućurac	1.VIII.1923
92.	<i>Microloxia herbaria</i> (Hübner 1813)	Sućurac	1922
		Sućurac	25.VI.1924
93.	<i>Minoa murinata</i> (Scopoli 1763)	Sućurac	5.V.1924
		Sućurac	5.V.1924

	Species	Locality	Date
94.	<i>Nycterosea obstipata</i> (Fabricius 1794)	Sućurac	1922
		Sućurac	1922
		Sućurac	25.VIII.1924
95.	<i>Odezia atrata</i> (Linnaeus 1758)	Svilaja	1.V.1925
96.	<i>Rhodometra sacraria</i> (Linnaeus 1767)	Sućurac	1922
		Sućurac	25.VII.1924
97.	<i>Rhodostrophia calabra</i> (Petagna 1786)	Sućurac	25.V.1924
98.	<i>Scopula confinaria</i> (Herrich-Schäffer 1847)	Sućurac	25.V.1924
		Sućurac	5.V.1926
99.	<i>Scopula imitaria</i> (Hübner 1799)	Sućurac	15.VII.1924
		Sućurac	10.IX.1924
100.	<i>Scopula marginepunctata</i> (Goeze 1781)	Sućurac	1922
		Sućurac	1.VIII.1923
		Sućurac	25.VII.1924
101.	<i>Scopula ornata</i> (Scopoli 1763)	Sućurac	1922
		Sućurac	1922
		Sućurac	25.VII.1924
102.	<i>Xanthorhoe fluctuata</i> (Linnaeus 1758)	Sućurac	25.VIII.1924
	<b>Notodontidae</b>		
103.	<i>Thaumetopoea pityocampa</i> (Denis and Schiffermüller 1775)	Spalato	25.VII.1930
	<b>Erebidae</b>		
104.	<i>Amata phegea</i> (Linnaeus 1758)	Mosor	/
		Mosor	16.VI.1935
105.	<i>Arctia villica</i> (Linnaeus 1758)	Sućurac	25.V.1924
106.	<i>Cymbalophora pudica</i> (Esper 1785)	Sućurac	15.IX.1924
		Sućurac	25.IX.1926
107.	<i>Dysauxes famula</i> (Freyer 1836)	Sućurac	1.VI.1923
		Sućurac	5.VI.1924
		Sućurac	25.VIII.1924
108.	<i>Dysgonia algira</i> (Linnaeus 1767)	Sućurac	25.VI.1924
		Sućurac	25.VI.1924
		Spalato	12.VII.1930
		Spalato	12.VII.1930
109.	<i>Eilema caniola</i> (Hübner 1808)	Sućurac	15.V.1924
		Sućurac	5.VI.1924
		Sućurac	15.VI.1924
110.	<i>Phragmatobia fuliginosa</i> (Linnaeus 1758)	Sućurac	1.VI.1923
		Sućurac	25.VI.1924
111.	<i>Catocala nymphagoga</i> (Esper 1787)	Sućurac	25.VI.1924
112.	<i>Catocala sponsa</i> (Linnaeus 1767)	Marjan, Split	14.VII.1970
113.	<i>Herminia tarsicrinalis</i> (Knoch 1782)	Sućurac	1.IX.1923
114.	<i>Eublemma parva</i> (Hübner 1808)	Sućurac	1922
		Sućurac	1.VI.1923
		Sućurac	5.V.1926
115.	<i>Grammodes stolidia</i> (Fabricius 1775)	Spalato	4.VII.1931
		Spalato	4.VII.1931
116.	<i>Euproctis chrysorrhoea</i> (Linnaeus 1758)	Vrana D.	VI.1925
		Split D.	18.VI.1940



	Species	Locality	Date
117.	<i>Lymantria dispar</i> (Linnaeus 1758)	/	/
		/	/
		/	/
	<b>Noctuidae</b>		
118.	<i>Acontia lucida</i> (Hufnagel 1766)	Split	5.VII.1932
119.	<i>Acontia trabealis</i> (Scopoli 1763)	Sućurac	1922
		Sućurac	1.IX.1923
		Sućurac	1.IX.1923
120.	<i>Aegle</i> cf. <i>vespertinalis</i> (Rambur 1858)	Sućurac	1922
		Sućurac	1.VIII.1923
121.	<i>Agrotis puta</i> (Hübner 1803)	Sućurac	1922
		Sućurac	5.V.1924
		Sućurac	25.VIII.1924
122.	<i>Agrotis segetum</i> (Denis and Schiffermüller 1775)	Split	15.VIII.1928
123.	<i>Aporophyla australis</i> (Boisduval 1829)	Sućurac	15.X.1924
124.	<i>Autographa gamma</i> (Linnaeus 1758)	Split	15.VI.1937
		/	/
125.	<i>Calophasia opalina</i> (Esper 1793)	Sućurac	29.VI.1926
		Sućurac	15.VIII.1926
126.	<i>Diloba caeruleocephala</i> (Linnaeus 1758)	Morter	20.X.1924
127.	<i>Episema</i> cf. <i>glaucina</i> (Esper 1789)	Sućurac	25.IX.1926
		Sućurac	25.X.1926
128.	<i>Hadena perplexa</i> (Denis and Schiffermüller 1775)	Sućurac	18.IX.1924
129.	<i>Heliothis peltigera</i> (Denis and Schiffermüller 1775)	Split D.	15.VII.1928
		Split D.	15.VII.1928
		/	/
130.	<i>Hoplodrina ambigua</i> (Denis and Schiffermüller 1775)	Sućurac	10.IX.1924
		Spalato	2.VI.1931
131.	<i>Leucania putrescens</i> (Hübner 1824)	Sućurac	15.IX.1924
132.	<i>Mamestra brassicae</i> (Linnaeus 1758)	Metković	4.VIII.1930
133.	<i>Mniotype solieri</i> (Boisduval 1829)	Sućurac	25.IX.1924
		Sućurac	25.IX.1924
		Sućurac	15.IX.1926
		Split	27.VII.1932
134.	<i>Mythimna vitellina</i> (Hübner 1808)	Sućurac	15.IX.1924
135.	<i>Noctua pronuba</i> (Linnaeus 1758)	/	/
136.	<i>Peridroma saucia</i> (Hübner 1808)	Split	25.VIII.1928
		Split	15.V.1929
		Split	15.V.1929
137.	<i>Phlogophora meticulosa</i> (Linnaeus 1758)	Split	3.XI.1923
		Sućurac	15.X.1927
138.	<i>Sesamia cretica</i> Lederer 1857	Split D.	20.IV.1932
		Split	20.V.1932
		Split D.	20.V.1932
		Split D.	25.V.1932
		Split D.	10.V.1932
139.	<i>Spodoptera exigua</i> (Hübner 1808)	Sućurac D.	15.X.1926
		Berane Mont.	22.VII.1928

	Species	Locality	Date
140.	<i>Trichoplusia ni</i> (Hübner 1803)	Sućurac	20.VI.1926
		Split	19.VII.1928
141.	<i>Tyta luctuosa</i> (Denis and Schiffermüller 1775)	Sućurac	1.VIII.1923
		Sućurac	5.V.1924
142.	<i>Ulochlaena hirta</i> (Hübner 1813)	Sućurac	25.IX.1924
		Sućurac	15.X.1925
	<b>Nolidae</b>		
143.	<i>Nola chlamitulalis</i> (Hübner 1813)	Sućurac	1922

The record of *Aglais urticae* (Linnaeus 1758) in the Botanical Garden Marjan in Split is of some specific interest. This species is local in most of the coastal parts of Dalmatia, being more common only on the mountains (e.g. Biokovo, Dinara). While it is known from Dalmatia, almost no recent records from the coastline exist (Koren et al. 2019). A similar situation is with *Nymphalis antiopa* (Linnaeus, 1758), a forest-dwelling species that can be locally common only in some areas of Dalmatia (Koren, pers. observ.).

The specimen of *Saturnia spini* (Denis and Schiffermüller 1775) unfortunately does not contain any label, but we can assume that it was collected around Split just as the most other specimens in the collection. This is a very local species in Croatia, with no recent records. Historically, it was recorded from Rijeka (Abafi-Aigner 1910), Krapina (Abafi-Aigner 1910), Zagreb-Josipovac (Grund 1918), Zagreb (Vukotinović 1879), Bakar (Grund 1918) and Vinkovci (Koča 1901). The most recent record originates from Spačva in Slavonia and Kutjevo, Bektež (Kovačević and Franjević-Oštrc 1978).

Another interesting species in the collection is *Ulochlaena hirta* (Hübner 1813). This autumn species has so far been recorded in Croatia only several times. Stauder (1926) mentions it for Dalmatia but without any precise locality. While the two specimens in the Novak collection have already almost faded away, the remaining markings, as well as wing shape, are enough to confirm the species identity.

From the Geometridae family, the most interesting is the record of *Odezia atrata* (Linnaeus, 1758) from Mt. Svilaja. This species is distributed across the Palearctic, in mid to high montane areas (Macek et al. 2012). This is only the second published record for Croatia, following the records from Drniš (Stauder 1920).

The Novak Lepidopterological collection, while rather small, is an important contribution to the butterfly and moth diversity of Dalmatia. With only a limited amount of published and available data from most parts of the country, the publication of the data from existing entomological collections is extremely important, and fills the gaps in our knowledge. While the collection contains mostly common and widespread species, it is of immense historical importance for understanding the distribution of some species in the past. The publication of data from other museum collections across the country would be beneficial for

filling the gaps in species' distribution in the country and give an additional insight into the Lepidoptera of Croatia. So far this was undertaken very rarely and mostly contained the data about one or few families, like the Noctuidae from the lepidopterous collection of Faculty of Forestry in Zagreb (Kučinić and Hrašovec 1999), Geometridae and Noctuidae from Košćec Collection is stored in the Entomological Department of the Varaždin Municipal Museum (Kučinić and Bregović 1996, Mihoci and Bregović 2008) and Sessidae from the collections of the Croatian Natural History Museum in Zagreb and the Entomological Department of the Varaždin Municipal Museum (Predovnik 2010). With the revisions and publications of other families/collections, our knowledge about the Lepidoptera diversity of Croatia would be greatly increased and the data would become available to the scientists and the general public.

## Literature

- Abafi-Aigner, L. 1910. Adelék Magyar Tengeremellék, Horvátország és Dalmácia lepkefaunájához. *Rovartani lapok*. 17: 71-105.
- Grund, A. 1918. Beitrage zur kroatischen Lepidopteren-Fauna. Beitrag C. Lepidopteren der Umgebung von Zagreb (Agram). *Glasnik Hrvatskog prirodoslovnog društva*. 30: 59-71.
- Koča, Gj. 1901. Prilog fauni leptira (Lepidoptera) Hrvatske i Slavonije. *Glasnik Hrvatskoga Naravoslovnoga Društva*. 13: 1-67.
- Kokan, B. 2014. 90 godina Zbirke kornjaša dr. Eduarda Karamana u Prirodoslovnom muzeju u Splitu. *Prirodoslovni muzej i zoološki vrt Split*. Spli. 24 pp.
- Koren, T., Burić, I., Glavan, G., Verovnik, R. 2019. Contribution to the knowledge of the butterfly fauna (Lepidoptera: Papilionoidea) of Mt Kozjak, Split, Croatia. *Natura Croatica*. 28: 21-33.
- Kovačević, Ž., Franjević-Oštrc, M., 1978. Značaj faune Macrolepidoptera u šumama SR Hrvatske s biocenološkog i biogeografskog stanovišta. *Šumarski institut Jastrebarsko*. Zagreb. 104 pp.
- Kučinić, M., Bregović, A. 1996. A contribution to the knowledge of faunal and zoogeographical characteristics of noctuids (Insecta, Lepidoptera, Noctuidae) in north-western Croatia. *Natura Croatica*. 5: 265-289.
- Kučinić, M., Hrašovec, B. 1999. Faunal and zoogeographical review of the Lepidoptera collection of the Faculty of Forestry, University of Zagreb, Part I: Noctuidae (Insecta: Lepidoptera). *Natura Croatica*. 8 (1): 27-47.
- Macek, J., Procházka, J., Traxler, L. 2012. Motýli a housenky střední Evropy. Noční motýli III. In Macek, J. (ed.) *Motýli a housenky střední Evropy*. Vol. 3. Academia. Praha. 424 pp.
- Mihoci, I., Bregović, A. 2008. Grbice (Lepidoptera, Geometroidea, Geometridae) zbirke Košćec, in: Franjo Košćec i njegovo djelo 1882.-1968.: zbornik radova sa znanstvenog skupa. Presented at the Franjo Košćec i njegovo djelo 1882.-1968. Varaždin. pp. 129-168.
- Nonveiller, G., 1999. The Pioneers of the research on the insects of Dalmatia (Croatia). *Croatian Natural History Museum*. Zagreb. 400 pp.
- Novak, P., 1952. Kornjaši jadranskog primorja. *Jugoslavenska akademija znanosti i umjetnosti*. Zagreb. 523 pp.
- Novak, P. 1970. Rezultati istraživanja kornjaša našeg otočja. *Acta Biologica VI, Prirodoslovna istraživanja*. 38: 5-38.
- Nowacki, J. 1998. The noctuida (Lepidoptera, Noctuidae) of Central Europe. František Slamka. Bratislava. 51 pp.

- Predovnik, Ž. 2010. A revision of clearwing moths (Lepidoptera: Sesiidae) in the collections of the Croatian Natural History Museum in Zagreb and the Entomological Department of the Varaždin Municipal Museum. *Natura Croatica*. 19: 381-388.
- Protić, Lj. 2006. Nabidae (Heteroptera) from former Yugoslavia in the Collection of the Natural History Museum in Belgrade. *Acta Entomologica Slovenica*. 14(1): 69-80.
- Stauder, H. 1923. Die Schmetterlingsfauna der illyro-adriatischen Festland- und Inselzone (Faunula Illyro-Adriatica). *Zeitschrift für wissenschaftliche Insektenbiologie Berlin*. 18: 10-18, 58-68, 106-114, 187-202, 253-267, 317-327.
- Stauder, H. 1926. Die Schmetterlingsfauna der illyro-adriatischen Festland- und Inselzone (Faunula Illyro-Adriatica). *Zeitschrift für wissenschaftliche Insektenbiologie Berlin*. 21: 179-190, 223-238.
- Stauder, H., 1920: Neue mediterrane Geometridae. *Internationale Entomologische Zeitschrift Guben*. 14 (5): 34-39.
- Tolman, T., Lewington, R. 2008. *Collins butterfly guide the most complete field guide to the butterflies of Britain and Europe*. Collins. London. 384 pp.
- Vukotinović, L., 1879. *Fauna leptirah u okolišu Zagrebačkom*. Jugoslavenska akademija znanosti i umjetnosti. Zagreb. 129 pp.