

**FIRST COMPREHENSIVE FAUNISTIC LIST ON THE
LEPIDOPTERA SPECIES OF BATMAN PROVINCE
(SOUTHEASTERN TURKEY)**

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ABSTRACT: In this paper, Lepidoptera samples collected from Batman Province, south-east of Turkey, in 2014-2018, are evaluated faunistically. In total, detected 177 species are listed. The number of butterflies increased to 85, moths increased to 165 and total Lepidoptera species reached to 250, in the study area. Among them, 15 butterfly and 96 moth species are reported for the first time from Batman Province. Additionally, noteworthy adult and genitalia armature figures of *Stueningia wolfi* Hausmann, 1993 (Geometridae) and *Valerietta boursini* De Freina & Hacker, 1985 (Noctuidae), which are endemic, are provided.

KEY WORDS: Fauna, Lepidoptera, moth, butterfly, Batman, Turkey

The province of Batman, in the Southeastern Anatolia Region, is mostly steep and mountainous in the north and northeast, and the south is generally hilly. The provincial lands are more often covered with steppes and on the other hand, in some mountainous regions contains sparse oak forests.

Even though, Hesselbarth et al. (1995) were given some butterfly species, first studies on the Lepidoptera fauna of Batman Province was conducted by Kemal et al. and Kemal & Koçak, in 2008 from collected samples in Kozluk district. And with result of these surveys, they were reported totally 58 diurnal Lepidopteran species. Later, Koçak & Kemal (2009) listed 66 butterfly and 8 moth species in their paper. In 2016, 4 butterflies and 50 moth species were added to these list by Seven (2016a). Then, respectively *Idaea allongata* (Staudinger, 1898) (Geometridae), (Seven, 2016b), *Agriphila cyrenaicella* (Ragonot, 1887) (Pyrilidae) (Akın & Seven, 2017) and *Charissa adjectaria* Staudinger, 1897 (Geometridae) (Seven, 2018) were reported with different papers. According to the latest published list in 2018, the known Lepidoptera species in Batman Province raised to 139 (Koçak & Kemal, 2018) and, with this study, this number is reached to 250 species.

In Turkey, 5577 taxa of the Lepidoptera in 76 families (9 butterfly, 67 moth families) are known (Koçak & Kemal, 2018). But, Batman's Lepidoptera fauna is extremely little known, yet it is poorly studied and, even insect fauna is the least known in the region. The number of Lepidoptera species, especially moths, which are mostly active at night, is quite low because of the area is very mountainous and rugged, security problems and insufficient studies in the field. Until now, 70 butterfly and 69 moth species have been known in Batman (Kemal et al., 2008; Kemal & Koçak 2008a,b; Koçak & Kemal, 2018; Seven, 2016a,b, 2018). As a result of the research, the number of butterflies increased to 85 and the number of moths increased to 165 species (Table 1, 2). And all of them, 15 butterflies and 96 moths are new recorded in the Lepidoptera fauna of Batman Province.

MATERIALS AND METHODS

The present materials were collected from Batman Province, between in the years of 2014-2018 by irregular expeditions, conducted during daytime and night. The nocturnal moths were caught with a special automatic UV light trap. And a sweep net was used to capture diurnal species. Once the collected samples were inactivated, pinned, labeled and placed in wooden boxes. Nikon SMZ1000 stereo microscope was used for the preparation of the genitals and Olympus SZ61 stereo microscope and Olympus DP20 camera were used for photographing. Diagnosis was made according to the literature data by considering the external morphological and genital structures of the softened and stretched materials. To identification and distribution of the species, the sources utilized are as follows: Freina & Hermann (1985), Freina & Witt (1987), Hausmann (1993, 1996), Koçak & Seven (1994a, 1994b), Hesselbarth et al. (1995), Seven (1996), Fibiger (1997), Riemis (1998), Ronkay et al. (2001), Hacker et al. (2002), Mironov (2003), Zilli et al. (2005), Leraut (2006, 2009), Akkuzu et al. (2007), Fibiger & Hacker (2007), Can (2008), Okyar & Mironov (2008), Okyar (2009), Hausmann & Viidalepp (2012), Akın (2014, 2015), Seven (2014, 2016a, 2016b, 2018), Skou & Sihvonen (2015) Akın & Seven (2017), Koçak & Kemal (2018) and Kemal & Koçak (2018). Samples are deposited in the special collection of the author (SCES) and in the Biology Laboratory of Batman University.

Abbreviations:

Arc: Arctiidae, **Arg:** Argynnididae, **Cos:** Cossidae, **Cte:** Ctenuchidae, **Eth:** Ethmiidae, **Geo:** Geometridae, **Hes:** Hesperidae, **Las:** Lasiocampidae, **Lyc:** Lycaenidae, **Lym:** Lymantriidae, **Noc:** Noctuidae, **Pap:** Papilionidae, **Pie:** Pieridae, **Pyr:** Pyralidae, **Sat:** Saturniidae, **Ses:** Sesiidae, **Sph:** Sphingidae, **Str:** Satyridae, **Tha:** Thaumetopoeidae, **Zgy:** Zygaenidae.

RESULTS

In this paper, totally 177 species gathered from Batman Province, representing 6 butterfly and 14 moth families, are presented in alphabetical order by listing. The species, new recorded in Batman Province, are marked with “(*)” an asterisk.

Faunistic list of the species

List of the butterflies

Family Argynnididae

1. *Argynnis pandora* ([Denis & Schiffermüller], 1775)
2. *Melitaea phoebe* (Goeze, 1779)*
3. *Melitaea cinxia* (Linnaeus, 1758)
4. *Precis orithya* (Linnaeus, 1758)*
5. *Vanessa cardui* (Linnaeus, 1758)
6. *Vanessa atalanta* (Linnaeus, 1758)*

Family Hesperidae

7. *Carcharodus alceae* (Esper, [1780])
8. *Muschampia poggei* (Lederer, 1858)
9. *Spialia orbifer* (Hübner, [1823])
10. *Thymelicus acteon* (Rottemburg, 1775)

11. *Thymelicus sylvestris* (Poda, 1761)

Family Lycaenidae

12. *Chilades trochylus* (Freyer, [1843])
13. *Glaucopsyche lessei* Bernardi, 1964*
14. *Glaucopsyche alexis* (Poda, 1761)*
15. *Lycaena phlaeas* (Linnaeus, 1761)
16. *Lycaena kefersteinii* (Gerhard, [1850])*
17. *Polyommatus icarus* (Rottemburg, 1775)
18. *Tomares callimachus* (Eversmann, 1848)
19. *Zizeeria karsandra* (Moore, 1865)

Family Papilionidae

20. *Papilio machaon* Linnaeus, 1758*
21. *Zerynthia deyrollei* (Oberthür, 1869)*

Family Pieridae

22. *Anthocharis cardamines* (Linnaeus, 1758)*
23. *Aporia crataegi* (Linnaeus, 1758)
24. *Colias crocea* (Fourcroy, 1785)
25. *Colotis fausta* (Olivier, [1804])*
26. *Euchloe ausonia* (Hübner, [1804])*
27. *Pieris ergane* (Geyer, [1828])
28. *Pieris manni* (Mayer, 1851)*
29. *Pontia chloridice* (Hübner, [1813])*
30. *Pontia edusa* (Fabricius, 1777)*

Family Satyridae

31. *Brintesia circe* (Fabricius, 1775)
32. *Coenonympha pamphilus* (Linnaeus, 1758)
33. *Hyponephele lupina* (Costa, [1836])
34. *Maniola telmessia* (Zeller, 1847)
35. *Pararge aegeria* (Linnaeus, 1758)*

List of the Moths

Family Arctiidae

36. *Cymbalophora oertzeni* (Lederer, 1855)*
37. *Manulea pseudocomplana* (Daniel, 1939)*
38. *Ocnogyna loewii* (Zeller, 1846)
39. *Paidia rica* (Freyer, [1855])*
40. *Phragmatobia fuliginosa* (Linnaeus, 1758)*
41. *Utetheisa pulchella* (Linnaeus, 1758)*

Family Cossidae

42. *Dyspessa ulula* (Borkhausen, 1790)
43. *Stygia mosulensis* Daniel, 1965*

Family Ctenuchidae

44. *Dysauxes famula* (Freyer, 1836)*

Family Ethmiidae

45. *Ethmia bipunctella* (Fabricius, 1775)

Family Geometridae

46. *Aspitates ochrearia* (Rossi, 1794)*
47. *Camptogramma bilineatum* (Linnaeus, 1758)*
48. *Charissa dubitaria* (Staudinger, 1892)*
49. *Charissa adjectaria* (Staudinger, 1898)
50. *Charissa onustaria* (Herrich-Schäffer, [1852])*
51. *Chiasmia aestimaria* (Hübner, [1809])*
52. *Cyclophora puppillaria* (Hübner, [1799])*
53. *Eumera hoeferi* Wehrli, 1934*
54. *Eupithecia breviculata* (Donzel, 1837)*
55. *Eupithecia cerussaria* (Lederer, 1855)*
56. *Eupithecia oblongata* (Thunberg, 1784)*
57. *Glossotrophia sacraria* (A. Bang-Haas, 1910)*
58. *Gnophos pseudosnelleni* (Rjabov, 1964)*
59. *Idaea allongata* (Staudinger, 1898)
60. *Idaea camparia* (Herrich-Schäffer, [1852])*
61. *Idaea degeneraria* (Hübner, [1799])*
62. *Nychiodes variabilis* Brandt, 1938*
63. *Orthonama obstipata* (Fabricius, 1794)
64. *Phaiogramma etruscaria* (Zeller, 1849)*
65. *Protorhoe unicata* (Guenée, [1858])
66. *Rhodometra sacraria* (Linnaeus, 1767)
67. *Scopula marginepunctata* (Goeze, 1781)
68. *Scopula submutata* (Treitschke, 1828)
69. *Selidosema plumarium* ([Denis & Schiffermüller], 1775)*
70. *Stueningia wolffi* Hausmann, 1993 (fig. 1 a-b, fig. 2 a)

Family Lasiocampidae

71. *Lasiocampa eversmanni* (Kindermann, 1843)*
72. *Lasiocampa grandis* (Rogenhofer, 1891)*

Family Lymantriidae

73. *Euproctis melania* (Staudinger, 1892)*
74. *Leucoma wiltshirei* Collenette, 1938*
75. *Ocnerogyia amanda* Staudinger, [1892]*
76. *Polymona lapidicola* (Herrich-Schäffer, [1852])*

Family Noctuidae

77. *Abrostola agnorista* Dufay, 1956
78. *Abrostola clarissa* (Staudinger, 1900)*
79. *Acronicta psi* (Linnaeus, 1758)*
80. *Acronicta rumicis* (Linnaeus, 1758)*
81. *Agrotis bigramma* (Esper, [1790])*

82. *Agrotis obesa* (Boisduval, 1829)*
83. *Agrotis puta* (Hübner, [1803])*
84. *Agrotis ipsilon* (Hufnagel, 1766)
85. *Agrotis segetum* ([Denis & Schiffermüller], 1775)
86. *Apamea polyglypha* (Staudinger, 1892)*
87. *Autographa gamma* (Linnaeus, 1758)
88. *Autophila banghaasi* Boursin, 1940*
89. *Caradrina draudti* (Boursin, 1936)*
90. *Caradrina clavipalpis* (Scopoli, 1763)
91. *Caradrina flavirena* (Guenée, 1852) *
92. *Catocala abacta* Staudinger, 1900
93. *Catocala hymenaea* ([Denis & Schiffermüller], 1775)*
94. *Chersotis margaritacea* (Villers, 1789)*
95. *Cleonymia baetica* (Rambur, 1837)
96. *Cleonymia opposita* (Lederer, 1870)
97. *Clytie syriaca* (Bugnion, 1837)
98. *Colobochyla platyzona* (Lederer, 1870)*
99. *Cornutiplusia circumflexa* (Linnaeus, 1767)
100. *Craniophora pontica* (Staudinger, 1879)*
101. *Dichagyris erubescens* (Staudinger, 1892)
102. *Dichagyris singularis* (Staudinger, 1877)*
103. *Dichagyris nachadira* (Brandt, 1941)*
104. *Dysgonia torrida* (Guenée, 1852)*
105. *Earias insulana* (Boisduval, 1833)
106. *Episema korsakovi* (Christoph, 1885)*
107. *Episema lederi* Christoph, 1885
108. *Episema tersa* ([Denis & Schiffermüller], 1775)*
109. *Eublemma straminea* (Staudinger, 1892)*
110. *Eublemma pura* (Hübner, [1813])
111. *Eublemma polygramma* (Duponchel, [1842])*
112. *Eublemma ostrina* (Hübner, [1808])
113. *Euchalcia maria* (Staudinger, 1892)
114. *Grammodes bifasciata* (Petagna, 1786)
115. *Grammodes stolidi* (Fabricius, 1775)*
116. *Hadena impressa* (Esper, [1790])*
117. *Haemerosia renalis* (Hübner, [1813])*
118. *Hecatera bicolorata* (Hufnagel, 1766)*
119. *Hecatera spinaciae* (Vieweg, 1790)*
120. *Hecatera weissii* (Boursin, 1952)
121. *Helicoverpa armigera* (Hübner, [1808])*
122. *Heliothis nubigera* Herrich-Schäffer, [1851]
123. *Heliothis peltigera* ([Denis & Schiffermüller], 1775)*
124. *Hoplodrina ambigua* ([Denis & Schiffermüller], 1775)*
125. *Hypeuthina fulgurita* Lederer, 1855
126. *Leucania loreyi* (Duponchel, 1827)*
127. *Leucania punctosa* (Treitschke, 1825)*
128. *Leucochlaena muscosa* (Staudinger, 1892)
129. *Metachrostis dardouini* (Boisduval, 1840)

130. *Mythimna alopecuri* (Boisduval, 1840)
131. *Mythimna l-album* (Linnaeus, 1767)
132. *Mythimna vitellina* (Hübner, [1808])*
133. *Noctua janthina* ([Denis & Schiffermüller], 1775)*
134. *Noctua orbona* (Hufnagel, 1766)
135. *Noctua comes* (Hübner, [1813])*
136. *Noctua pronuba* (Linnaeus, 1758)*
137. *Nola subchlamydula* Staudinger, 1870
138. *Pamparama acuta* (Freyer, [1837])
139. *Phylapora canescens* (Duponchel, 1826)
140. *Plecoptera inquinata* (Lederer, 1857)*
141. *Polymixis bischoffi* (Herrich-Schäffer, 1850)*
142. *Polymixis serpentina* (Treitschke, 1825)
143. *Pseudenargia deleta* (Osthelder, 1933)*
144. *Scoliopteryx libatrix* (Linnaeus, 1758)
145. *Scotochrosta pulla* ([Denis & Schiffermüller], 1775)*
146. *Shargacucullia lychnitis* (Rambur, 1833)
147. *Spodoptera exiguum* (Hübner, [1808])
148. *Stilbina hypaenides* Staudinger, 1892
149. *Valerietta boursini* De Freina & Hacker, 1985* (fig. 1 c, fig. 2 b)
150. *Victrix tabora* (Staudinger, 1892)*
151. *Xestia palaestinensis* (Kalchberg, 1898)*
152. *Zekelita ravalis* (Herrich-Schäffer, [1852])*

Family Pyralidae

153. *Anania crocealis* (Hübner, 1796)*
154. *Anthophilopsis baphialis* (Staudinger, 1870)*
155. *Antigastra catalaunalis* (Duponchel, 1833)*
156. *Cynaeda gigantea* (Staudinger, 1879)*
157. *Denticera divisella* (Duponchel, 1842)*
158. *Endotricha flammealis* ([Denis & Schiffermüller], 1775)*
159. *Epascestria pustulalis* (Hübner, [1823])*
160. *Ephelis cruentalis* (Geyer, [1832])*
161. *Epischnia prodromella* (Hübner, [1799])*
162. *Eudonia mercurella* (Linnaeus, 1758)*
163. *Nomophila noctuella* ([Denis & Schiffermüller], 1775)*
164. *Pyralis farinalis* (Linnaeus, 1758)*
165. *Pyralis kacheticalis* (Christoph, 1893)*
166. *Pyrausta aurata* (Scopoli, 1763)*
167. *Pyrausta despicata* (Scopoli, 1763)*
168. *Pyrausta virginalis* Duponchel, 1832*
169. *Udea ferrugalis* (Hübner, 1796)*
170. *Uresiphita gilvata* (Fabricius, 1794)*

Family Sphingidae

171. *Hyles euphorbiae* (Linnaeus, 1758)*
172. *Hyles livornica* (Esper, [1780])
173. *Macroglossum stellatarum* (Linnaeus, 1758)
174. *Marumba quercus* ([Denis & Schiffermüller], 1775)*

175. *Smerinthus kindermanni* Lederer, 1852*

Family Thaumetopoeidae

176. *Thaumetopoea solitaria* (Freyer, [1838])*

Family Zygaenidae

177. *Jordanita notata* (Zeller, 1847)*

DISCUSSION

According to the results, the number of Lepidoptera in Batman Province reached to totally 250 species (85 butterflies and 165 moths) in the family of Arctiidae, Argynniidae, Cossidae, Ctenuchidae, Ethmiidae, Geometridae, Hesperidae, Lasiocampidae, Lycaenidae, Lymantriidae, Noctuidae, Papilionidae, Pieridae, Pyralidae, Saturniidae, Sesiidae, Sphingidae, Satyridae, Thaumetopoeidae, and Zygaenidae. Among them, totally 111 species (15 butterflies and 96 moths) are detected for the first time in the Lepidoptera fauna of Batman. 34 % of these species are butterflies and 66 % are moths. The family of Lycaenidae is the species rich group with detected 29 species so far in the butterflies. And nearly 47 % of moths were found to contain members of the Noctuidae family. These numbers will rise in the future reports, as the ongoing researches in the study area.

Stueningia wolfi (Figs. 1a-b, 2a) was described by Hausmann (1993) and he reported that the species was distributed in the “Southern Anatolia, Southern and Western Taurus” from Turkey. *S. wolfi* is also known from Adana, Antalya, Hakkari, Mersin, Konya, Van and Batman Provinces (Koçak & Kemal, 2018; Kemal & Koçak, 2018). The species is endemic and still only known in Turkey.

Valerietta boursini (Figs. 1c, 2b) was diagnosed by De Freina & Hacker in 1985 from Hakkari and Bitlis Provinces. Koçak and Kemal (2018) reported that the species is spread of “Bitlis, Hakkari, Van and Şırnak Provinces” from Turkey. It is new recorded from Batman Province. The species is rare and endemic and just known from east and south of Turkey.

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Table 1. The number of butterflies before and after the research.

Butterflies	Arg	Hes	Lyc	Pap	Pie	Str	Total
Before	11	13	26	-	5	15	70
After	14	13	29	2	11	16	85

Table 2. The number of moths before and after the research.

Moths	Arc	Cos	Cte	Eth	Geo	Las	Lym	Noc	Pyr	Sat	Ses	Sph	Tha	Zyg	Total
Before	2	1	-	1	20	2	-	34	3	1	1	3	-	1	69
After	7	2	1	1	37	4	4	77	21	1	1	6	1	2	165

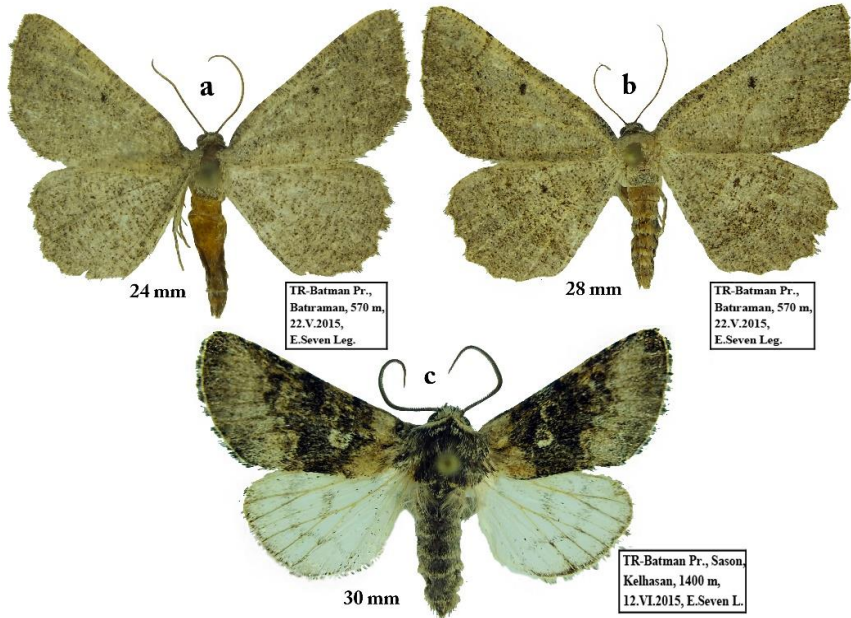


Figure 1. Adult species: a-b. Male and female of *Stueningia wolfi* Hausmann, 1993, c. Male of *Valerietta boursini* De Freina & Hacker, 1985.



Figure 2. Male genitalia (scale bar: 1 mm): a. *Stueningia wolfi* Hausmann, 1993 (slide No: 2015-040), b. *Valerietta boursini* De Freina & Hacker, 1985 (slide No: 2015-035).