

**AN EXTENSIVE STUDY ON MACRO-HETEROCERA (LEPIDOPTERA) FAUNA OF THE BOTAN VALLEY NATIONAL PARK, TURKIYE****Erdem SEVEN** 

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**Abstract:** *This paper presents a faunal list of Macro-Heterocera species from the Botan Valley National Park, which is Turkey's 45th national park, consisting of approximately 120 thousand acres and 29 kilometers in south-eastern Turkey, comprising the superfamilies Bombycoidea, Drepanoidea, Geometroidea, Lasiocampoidea, Noctuoidea. The area has scarcely been investigated before. This study contains the first comprehensive faunal list of macro-moths of the Botan Valley National Park. Totally 135 Lepidoptera species were determined. Among them, 99 moth species are newly reported from the Botan Valley National Park, and 6 of them are newly discovered in Siirt province. Examined samples and the location of each species are presented. Information on sites and collection dates are mentioned.*

**Keywords:** *Distribution, Fauna, Moth, The Botan Valley National Park, Türkiye*

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**1. Introduction**

The Botan River is placed in hilly-rocky geography, and has an altitude between 470-1360 meters, consisting of limestone mountain and plateau formations [1]. The river originates from the Uluçay Stream in the south of Bitlis province. It is positioned at the intersection of Southeastern Anatolia and Eastern Anatolia Regions, and extends from east to south of Siirt province, joining the Tigris River. The Botan Stream surrounds the Norduz Plateau from the west and takes its source from the high mountains forming the borders of the Siirt-Hakkari and Siirt-Van provinces [2-3]. The Botan Valley National Park is located in Siirt province, hosting natural beauty within the borders of central Siirt, Tillo, and Eruh districts [4]. The Botan Valley is very curved and rotating and commonly consists of rocky mountainous areas (Figure 1). A rich ecosystem diversity has been created within the valley with the effect of the geomorphological structure. In the upper parts of the mountains, oak trees are common vegetation while the slopes of the mountains contain *Paliurus* and *Juniperus* plants. In addition, *Salix*, *Platanus*, *Junglans*, and *Tamarix* species are seen with rich herbaceous vegetation along the edge of the Botan River.

The Macro-Heterocera of Siirt province was well studied, especially the northern part and approximately 500 macro-moth records have been presented by Kemal et al. [6-7], Kemal & Seven [8-9], Seven [5, 10-14], Koçak & Kemal [15] and Seven et al. [16-17]. However, extensive research have not been carried out on the Botan Valley National Park. As a first step in investigating the region, a list of 83 noctuid species from the area has been published by Seven [5]. The present paper evaluates macro-moths collected in 2015-2020 (excluding noctuoids in 2015-2016 [5]), and new records from the Botan Valley National Park and Siirt province are presented.

## 2. Materials and Methods

The materials were collected between the years 2015-2020 by irregular expeditions in 7 locations from the Botan Valley National Park, Siirt prov., south-eastern Turkey (Table 1). The previous study in 2019 [5] evaluated only the noctuid species collected from the Botan Valley in 2015-2016, and was published as the first report. This paper includes noctuid moths, which were captured afterward in 2017-2020; as well as other Macro-Heterocera families that were not examined in 2015-2016, and their specimens collected subsequently. A sweep net was used to capture the diurnal species and the nocturnal samples were caught with light traps which were formed of UV strip led, 12 volts and 7-ampere battery, a poison bottle with ethyl acetate, and a vowel box. The samples were identified after being pinned, labeled, and stretched. The specimens were diagnosed according to external characters and genital structures. The genital dissections were made with ca 10% potassium hydroxide (KOH) to macerate the full abdomen. The cleaned abdominal segments and the genital organs were dehydrated in 96% ethanol before mounting in euparal. The materials were stored in the Batman University Entomology Research Laboratory (BTU). Terminology follows that of Seven [5], Koçak & Kemal [15], Seven et al. [17], Kornoşor [18-19], De Freina [20], Seven [21], Hausmann [22-23], Ronkay et al. [24], Mironov [25], Zilli, et al. [26], Leraut [27], Hausmann & Viidalepp [28], Lödl et al. [29], Skou & Sihvonen [30], Müller et al. [31], Lepiforum e. V. [32].

**Table 1.** Data on sites and collection dates

Site	Altitude	Coordinate	Collection Date	Habitat
Botan road, 12 km SW	700 m	37°52'29" N 41°53'07" E	25.04.2015, 09.07.2015, 10.08.2015, 07.09.2015, 24.05.2016, 10.10.2020, 18.11.2020	Rocky area
Botan road, 3 km SW	780 m	37°53'24" N 41°53'03" E	16.03.2018, 24.08.2019, 16.09.2020,	Oak, <i>Paliurus</i> , <i>Amygdalus</i> field
Kale, Tillo	1300 m	37°57'08" N 42°01'58" E	22.07.2018, 11.03.2020	Steppe
Yerlibahçe	955 m	37°53'11" N 41°53'56" E	19.06.2017	Mountain steppe
Gökçebağ	750 m	37°51'27" N 41°52'34" E	23.03.2019, 15.04.2020	Oak field
Uluçay	555 m	37°51'26" N 41°53'09" E	12.08.2015, 28.10.2015, 21.08.2016	Rocky mountains
Sağlarca crossroad	465 m	37°49'14" N 41°51'59" E	20.05.2015, 28.03.2016, 20.10.2016	Riverside

Uluçay and Sağlarca locations, which were studied between 2015-2016, were submerged at the end of 2019 due to the rising waters of the Ilisu Dam. In the results section, newly identified species for Siirt province are marked with an asterisk (\*). Previously reported 36 noctuid moths in the paper of Seven [5] are indicated by a plus sign (+). Species are presented alphabetically within their subfamilies.



**Figure 1.** The Botan Valley, Botan road, 12 km SW, 700 m, 19.11.2020

### 3. Results

#### Superfamily Noctuoidea Latreille, 1809

##### Family Erebidae Leach, [1815]

##### Subfamily Erebinae Leach, [1815]

*Aedia funesta* (Esper, [1766]) Material: Yerlibahçe, 955 m, 19.06.2017, ♂; Kale, Tillo, 1300 m, 22.07.2018, 2♂♂, 3♀♀.

##### Subfamily Toxocampinae Guenée, 1852

*Autophila banghaasi* Boursin, 1940 Material: Yerlibahçe, 955 m, 19.06.2017, ♀; Kale, Tillo, 1300 m, 22.07.2018, ♂.

*Tathorhynchus exsiccata* (Lederer, 1855)\* Material: Botan road, 12 km SW, 700 m, 16.09.2020, ♂.

**Subfamily Boletobiinae Guenée, [1858]**

*Calymma communimacula* ([Denis & Schiffermüller], 1775) Material: Yerlibahçe, 955 m, 19.06.2017, 2♂♂; Botan road, 12 km SW, 700 m, 16.09.2020, 2♂♂, ♀.

*Eublemma ostrina* (Hübner, [1808])<sup>+</sup> Material: Botan road, 12 km SW, 700 m, 10.10.2020, 4♂♂, 3♀♀; Botan road, 3 km SW, 24.08.2019, 2♂♂, 2♀♀.

*Eublemma parva* (Hübner, [1808]) Material: Kale, Tillo, 1300 m, 22.07.2018, 2♂♂, 3♀♀.

*Eublemma polygramma* (Duponchel, [1842]) Material: Kale, Tillo, 1300 m, 22.07.2018, 3♂♂, 2♀♀; Botan road, 3 km SW, 24.08.2019, ♂.

*Metachrostis dardouini* (Boisduval, 1840) Material: Yerlibahçe, 955 m, 19.06.2017, ♂, ♀.

**Subfamily Catocalinae Boisduval, 1828**

*Catocala abacta* Staudinger, 1900 Material: Kale, Tillo, 1300 m, 22.07.2018, 4♂♂, 6♀♀; Yerlibahçe, 955 m, 19.06.2017, 2♂♂, 3♀♀; Botan road, 3 km SW, 24.08.2019, ♂.

*Catocala elocata* (Esper, [1787]) Material: Kale, Tillo, 1300 m, 22.07.2018, ♂; Botan road, 3 km SW, 24.08.2019, ♀.

*Catocala nymphagoga* (Esper, [1787]) Material: Yerlibahçe, 955 m, 19.06.2017, 2♂♂, ♀; Kale, Tillo, 1300 m, 22.07.2018, 2♂♂.

*Dysgonia algira* (Linnaeus, 1767) Material: Yerlibahçe, 955 m, 19.06.2017, 2♂♂; Kale, Tillo, 1300 m, 22.07.2018, 2♂♂, 2♀♀; Botan road, 3 km SW, 24.08.2019, ♂.

*Grammodes stolidia* (Fabricius, 1775)<sup>+</sup> Material: Kale, Tillo, 1300 m, 22.07.2018, ♂, 2♀♀; Botan road, 3 km SW, 24.08.2019, 2♂♂, ♀; Botan road, 12 km SW, 700 m, 16.09.2020, ♂, 10.10.2020, ♂.

*Minucia lunaris* ([Denis & Schiffermüller], 1775) Material: Gökçebağ, 750 m, 15.04.2020, 2♂♂.

*Pericyma albidentaria* (Freyer, [1841])<sup>+</sup> Material: Yerlibahçe, 955 m, 19.06.2017, 3♂♂, 2♀♀; Kale, Tillo, 1300 m, 22.07.2018, ♂; Botan road, 12 km SW, 700 m, 10.10.2020, ♂.

**Subfamily Hypeninae Herrich-Schäffer, [1851]**

*Hypena munitalis* Mann, 1861<sup>+</sup> Material: ♂; Botan road, 12 km SW, 700 m, 16.09.2020, ♂.

*Zekelita ravalis* (Herrich-Schäffer, [1852])<sup>+</sup> Material: Yerlibahçe, 955 m, 19.06.2017, 3♂♂, 2♀♀; Botan road, 12 km SW, 700 m, 16.09.2020, 2♂♂.

*Zethes brandti* Janzon, 1977 Material: Kale, Tillo, 1300 m, 22.07.2018, ♂; Botan road, 12 km SW, 700 m, 16.09.2020, ♂.

**Subfamily Herminiinae Leach, [1815]**

*Idia calvaria* ([Denis & Schiffermüller], 1775) Material: Kale, Tillo, 1300 m, 22.07.2018, 2♂♂.

**Subfamily Anobinae Holloway, 2005**

*Plecoptera inquinata* (Lederer, 1857)<sup>+</sup> Material: Yerlibahçe, 955 m, 19.06.2017, 3♂♂, 2♀♀; Kale, Tillo, 1300 m, 22.07.2018, 2♂♂; Botan road, 12 km SW, 700 m, 16.09.2020, 2♂♂, ♀.



**Subfamily Arctiinae Leach, [1815]**

*Cymbalophora oertzeni* (Lederer, 1855) Material: Botan road 12 km SW, 700 m, 10.10.2020, 2♂♂; Sađlarca crossroad, 465 m, 20.10.2016, ♂.

*Dysauxes famula* (Freyer, 1836) Material: Botan road 12 km SW, 700 m, 16.09.2020, ♂, ♀; 10.10.2020, 3♂♂.

*Utetheisa pulchella* (Linnaeus, 1758) Material: Kale, Tillo, 1300 m, 22.07.2018, 2♂♂, 3♀♀; Botan road 12 km SW, 700 m, 16.09.2020, ♂.

*Ocnogyna loewii* (Zeller, 1846) Material: Botan road 12 km SW, 700 m, 18.11.2020, ♂; Uluçay, 555 m, 28.10.2015, ♂.

*Paidia rica* (Freyer, [1855]) Material: Botan road, 3 km SW, 780 m, 24.08.2019, 2♂♂, 3♀♀; Kale, Tillo, 1300 m, 22.07.2018, 2♀♀; Yerlibahçe, 955 m, 19.06.2017, ♂.

**Subfamily Lymantriinae Hampson, 1893**

*Euproctis melania* (Staudinger, 1892) Material: Uluçay, 555 m, 12.08.2015, ♂, 21.08.2016, ♂; Kale, Tillo, 1300 m, 22.07.2018, ♂.

*Leucoma salicis* (Linnaeus, 1758) Material: Botan road, 12 km SW, 700 m, 16.09.2020, ♂, 10.10.2020, ♂.

*Leucoma Wiltshire* Collenette, 1938 Material: Uluçay, 555 m, 21.08.2016, 3♂♂; Botan road, 12 km SW, 700 m, 07.09.2015, ♂.

*Polymona lapidicola* (Herrich-Schäffer, [1852]) Material: Botan road, 12 km SW, 700 m, 16.09.2020, ♂, 10.10.2020, ♂.

**Family Noctuidae Latreille, 1809****Subfamily Acontiinae Guenée, 1841**

*Acontia trabealis* (Scopoli, 1763) Material: Yerlibahçe, 955 m, 19.06.2017, 2♂♂, 2♀♀; Kale, Tillo, 1300 m, 22.07.2018, ♂; Botan road, 3 km SW, 24.08.2019, 2♂♂.

**Subfamily Acronictinae Harris, 1841**

*Acronicta aceris* (Linnaeus, 1758) Material: Kale, Tillo, 1300 m, 22.07.2018, 2♂♂, ♀; Botan road, 3 km SW, 24.08.2019, ♀.

**Subfamily Metoponiinae Herrich-Schäffer, 1851**

*Aegle semicana* (Esper, [1798]) Material: Kale, Tillo, 1300 m, 22.07.2018, 2♂♂; Botan road, 3 km SW, 24.08.2019, ♀.

*Tyta luctuosa* ([Denis & Schiffermüller], 1775)<sup>+</sup> Material: Kale, Tillo, 1300 m, 22.07.2018, 3♂♂; Botan road, 3 km SW, 24.08.2019, ♂.

**Subfamily Psaphidinae Grote, 1896**

*Allophyes renalis* (Wiltshire, 1941) (Figure 2a) Material: Botan road, 12 km SW, 700 m, 18.11.2020, 2♂♂.

*Valeria oleagina* (Esper, [1786]) Material: Botan road, 3 km SW, 16.03.2018, ♂; Gökçebađ, 750 m, 23.03.2019, ♂.

**Subfamily Plusiinae Boisduval, 1829**

*Abrostola agnorista* Dufay, 1956\* Material: Botan road, 12 km SW, 700 m, 16.09.2020, ♂.

*Autographa gamma* (Linnaeus, 1758)<sup>+</sup> Material: Yerlibahçe, 955 m, 19.06.2017, 7♂♂, 2♀♀; Kale, Tillo, 1300 m, 22.07.2018, 3♂♂, 2♀♀; Botan road, 3 km SW, 24.08.2019, 4♂♂, 6♀♀.

*Trichoplusia ni* (Hübner, [1803])<sup>+</sup> Material: Yerlibahçe, 955 m, 19.06.2017, 5♂♂; Kale, Tillo, 1300 m, 22.07.2018, 3♂♂, 2♀♀; Botan road, 3 km SW, 24.08.2019, ♂.

**Subfamily Xyleninae Guenée, 1852**

*Agrochola mansueta* (Herrich-Schäffer, [1850]) Material: Botan road, 12 km SW, 700 m, 10.10.2020, 3♂♂, ♀.

*Anthraxia eriopoda* (Herrich-Schäffer, [1851]) Material: Botan road, 12 km SW, 700 m, 16.09.2020, ♀.

*Apamea polyglypha* (Staudinger, 1892)<sup>+</sup> Material: Yerlibahçe, 955 m, 19.06.2017, 2♂♂, ♀.

*Aporophyla australis* (Boisduval, 1829)<sup>+</sup> Material: Botan road, 12 km SW, 700 m, 18.11.2020, 5♂♂, 3♀♀.

*Aporophyla canescens* (Duponchel, [1827]) Material: Botan road, 12 km SW, 700 m, 10.10.2020, 5♂♂, ♀.

*Aporophyla nigra* (Haworth, [1809]) Material: Botan road, 12 km SW, 700 m, 18.11.2020, 3♂♂.

*Caradrina clavipalpis* (Scopoli, 1763)<sup>+</sup> Material: Yerlibahçe, 955 m, 19.06.2017, 4♂♂, 6♀♀; Kale, Tillo, 1300 m, 22.07.2018, 3♂♂; Botan road, 3 km SW, 24.08.2019, ♂; Botan road, 12 km SW, 700 m, 16.09.2020, ♀.

*Caradrina flavirena* (Guenée, 1852)<sup>+</sup> Material: Kale, Tillo, 1300 m, 22.07.2018, ♂, 2♀♀; Botan road, 12 km SW, 700 m, 10.10.2020, 2♂♂.

*Caradrina gilva* (Donzel, 1837)<sup>+</sup> Material: Yerlibahçe, 955 m, 19.06.2017, 2♂♂; Kale, Tillo, 1300 m, 22.07.2018, ♂.

*Caradrina syriaca* (Staudinger, 1892)\* Material: Botan road, 12 km SW, 700 m, 10.10.2020, ♂, ♀.

*Episema korsakovi* (Christoph, 1885)<sup>+</sup> Material: Botan road, 12 km SW, 700 m, 10.10.2020, ♂.

*Episema tersa* ([Denis & Schiffermüller], 1775)<sup>+</sup> (Figure 2b) Material: Botan road, 12 km SW, 700 m, 10.10.2020, 2♂♂, ♀.

*Mesogona acetosellae* (Goeze, 1781) Material: Botan road, 12 km SW, 700 m, 10.10.2020, ♂.

*Olivenebula subsericata* (Herrich-Schäffer, 1861) Material: Botan road, 12 km SW, 700 m, 10.10.2020, ♂.

*Polymixis manisadjiani* (Staudinger, 1881) Material: Botan road, 12 km SW, 700 m, 18.11.2020, 3♂♂.

*Polymixis rufocincta* (Geyer, 1828)<sup>+</sup> Material: Botan road, 12 km SW, 700 m, 18.11.2020, 2♂♂, 2♀♀.

*Spodoptera exigua* (Hübner, [1808])<sup>+</sup> Material: Yerlibahçe, 955 m, 19.06.2017, 3♂♂, 2♀♀; Kale, Tillo, 1300 m, 22.07.2018, 7♂♂.

**Subfamily Noctuinae Latreille, 1809**

*Agrotis bigramma* (Esper, [1790])<sup>+</sup> Material: Botan road, 12 km SW, 700 m, 10.10.2020, 4♂♂, 6♀♀; 18.11.2020, 2♂♂, ♀.

*Agrotis ipsilon* (Hufnagel, 1766)<sup>+</sup> Material: Yerlibahçe, 955 m, 19.06.2017, 5♂♂, 4♀♀; Kale, Tillo, 1300 m, 22.07.2018, 2♂♂, 2♀♀; Botan road, 3 km SW, 24.08.2019, 2♂♂; Botan road, 12 km SW, 700 m, 16.09.2020, 3♂♂, ♀.

*Agrotis puta* (Hübner, [1803])<sup>+</sup> Material: Botan road, 12 km SW, 700 m, 10.10.2020, 2♂♂, 2♀♀, 18.11.2020, 3♂♂, ♀.

*Agrotis segetum* ([Denis & Schiffermüller], 1775)<sup>+</sup> Material: Yerlibahçe, 955 m, 19.06.2017, 3♂♂; Kale, Tillo, 1300 m, 22.07.2018, 2♂♂, 2♀♀; Botan Road, 3 km SW, 24.08.2019, 4♂♂, 6♀♀; Botan road, 12 km SW, 700 m, 16.09.2020, 2♀♀, 10.10.2020, 3♂♂, 2♀♀.

*Dichagyris erubescens* (Staudinger, 1892)<sup>+</sup> Material: Yerlibahçe, 955 m, 19.06.2017, 4♂♂, 6♀♀; Botan road, 3 km SW, 24.08.2019, 4♂♂, 5♀♀.

*Dichagyris singularis* (Staudinger, 1877)<sup>+</sup> Material: Botan road, 12 km SW, 700 m, 16.09.2020, 3♂♂, ♀.

*Eugnorisma pontica* (Staudinger, 1892) Material: Botan road, 12 km SW, 700 m, 16.09.2020, ♂, 2♀♀.

*Euxoa obelisca* ([Denis & Schiffermüller], 1775) Material: Yerlibahçe, 955 m, 19.06.2017, 2♂♂; Kale, Tillo, 1300 m, 22.07.2018, ♀.

*Noctua comes* (Hübner, [1813]) Material: Yerlibahçe, 955 m, 19.06.2017, 2♂♂, 2♀♀; Kale, Tillo, 1300 m, 22.07.2018, 2♂♂; Botan road, 3 km SW, 24.08.2019, 2♂♂; Botan road, 12 km SW, 700 m, 16.09.2020, 3♂♂, 10.10.2020, 4♂♂, 2♀♀.

*Noctua orbona* (Hufnagel, 1766)<sup>+</sup> Material: Kale, Tillo, 1300 m, 22.07.2018, ♂, 2♀♀; Botan Road, 3 km SW, 24.08.2019, 4♂♂, 2♀♀; Botan Road, 12 km SW, 700 m, 10.10.2020, 5♂♂, ♀.

*Noctua pronuba* (Linnaeus, 1758)<sup>+</sup> Material: Yerlibahçe, 955 m, 19.06.2017, 3♂♂, ♀; Botan Road, 3 km SW, 24.08.2019, 3♂♂, 2♀♀; Kale, Tillo, 1300 m, 22.07.2018, ♂, 2♀♀.

*Xestia cohaesa* (Herrich-Schäffer, [1849])<sup>+</sup> Material: Botan Road, 12 km SW, 700 m, 10.10.2020, 3♂♂, 2♀♀.

*Xestia palaestinensis* (Kalchberg, [1898])<sup>+</sup> Material: Botan road, 12 km SW, 700 m, 10.10.2020, 2♂♂, ♀.

*Xestia xanthographa* ([Denis & Schiffermüller], 1775) Material: Botan road, 12 km SW, 700 m, 10.10.2020, ♂.

**Subfamily Bryophilinae Guenée, 1852**

*Bryophila maeonis* Lederer, 1865 Material: Kale, Tillo, 1300 m, 22.07.2018, 2♂♂, 2♀♀; Botan road, 12 km SW, 700 m, 16.09.2020, 3♂♂.

*Bryophila raptricula* ([Denis & Schiffermüller], 1775)<sup>+</sup> Material: Kale, Tillo, 1300 m, 22.07.2018, 4♂♂, 3♀♀; Botan road, 3 km SW, 24.08.2019, 5♂♂, 2♀♀.

*Bryopsis amasina* (Draudt, 1931) Material: Botan road, 3 km SW, 24.08.2019, 2♂♂.

*Cryphia receptricula* (Hübner, [1803]) Material: Kale, Tillo, 1300 m, 22.07.2018, 3♂♂, ♀; Botan road, 3 km SW, 24.08.2019, 2♂♂, 2♀♀; Botan road, 12 km SW, 700 m, 16.09.2020, ♀.

***Cryphia tephrocharis* Boursin, 1954** Material: Botan road, 3 km SW, 24.08.2019, 4♂♂; Botan road, 12 km SW, 700 m, 16.09.2020, 2♂♂, 10.10.2020, ♂, 3♀♀.

***Victrix hackeri* Varga & Ronkay, 1991** Material: Botan road, 12 km SW, 700 m, 16.09.2020, 2♂♂.

#### Subfamily Hadeninae Guenée, 1837

***Hadena sancta* (Staudinger, 1859)** Material: Yerlibahçe, 955 m, 19.06.2017, ♂; Kale, Tillo, 1300 m, 22.07.2018, ♂.

***Leucania punctosa* (Treitschke, 1825) +** Material: Botan road, 12 km SW, 700 m, 16.09.2020, ♂, 10.10.2020, 3♂♂, 2♀♀.

***Mythimna alopecuri* (Boisduval, 1840) +** Material: Botan road, 12 km SW, 700 m, 16.09.2020, 2♂♂, 2♀♀, 10.10.2020, 3♂♂, 2♀♀.

***Mythimna l-album* (Linnaeus, 1767) +** Material: Yerlibahçe, 955 m, 19.06.2017, 4♂♂, 3♀♀; Kale, Tillo, 1300 m, 22.07.2018, ♂; Botan road, 12 km SW, 700 m, 10.10.2020, 3♂♂.

***Mythimna vitellina* (Hübner, [1808]) +** Material: Yerlibahçe, 955 m, 19.06.2017, 2♂♂, 3♀♀; Kale, Tillo, 1300 m, 22.07.2018, 3♂♂, 2♀♀; Botan road, 3 km SW, 24.08.2019, 2♀♀; Botan road, 12 km SW, 700 m, 10.10.2020, 3♂♂.

#### Subfamily Oncocnemidinae Forbes & Franclemont, 1954

***Hypeuthina fulgurita* Lederer, 1855+** Material: Botan road, 12 km SW, 700 m, 10.10.2020, 3♂♂, ♀.

***Oncocnemis fuscipicta* Wiltshire, 1976** Material: Botan road, 12 km SW, 700 m, 10.10.2020, 2♂♂, ♀.

***Stilbina hypaenides* Staudinger, 1892+** Material: Botan road, 12 km SW, 700 m, 10.10.2020, 4♂♂, 2♀♀.

#### Family Nolidae Bruand, 1847

##### Subfamily Chloephorinae Stainton, 1859

***Arcyophora dentula* (Lederer, 1869)** Material: Botan road, 12 km SW, 700 m, 16.09.2020, ♂.

***Earias insulana* (Boisduval, 1833) +** Material: Yerlibahçe, 955 m, 19.06.2017, 2♂♂; Kale, Tillo, 1300 m, 22.07.2018, ♀.

#### Family Euteliidae Grote, 1882

##### Subfamily Euteliinae Grote, 1882

***Eutelia adulatrix* (Hübner, [1813])** Material: Gökçebağ, 750 m, 15.04.2020, ♂.

#### Family Thaumetopoeidae Aurivillius, 1891

##### Subfamily Thaumetopoeinae Aurivillius, 1889

***Thaumetopoea solitaria* (Freyer, [1838])** Material: Sağlarca crossroad, 20.10.2016, ♂; Botan road, 12 km SW, 700 m, 16.09.2020, ♂, 10.10.2020, ♂.



**Family Notodontidae Stephens, 1829****Subfamily Phalerinae Butler, 1886**

*Phalera bucephaloides* (Ochsenheimer, 1810) Material: Botan road, 12 km SW, 700 m, 16.09.2020, 2♂♂.

**Superfamily Drepanoidea Boisduval, 1828****Family Drepanidae Boisduval, 1828****Subfamily Drepaninae Boisduval, 1828**

*Watsonalla binaria* (Hufnagel, 1767) Material: Botan road, 3 km SW, 780 m, 24.08.2019, ♂.

**Superfamily Lasiocampoidea Harris, 1841****Family Lasiocampidae Harris, 1841****Subfamily Lasiocampinae Harris, 1841**

*Lasiocampa eversmanni* (Kindermann, 1843) Material: Botan road, 12 km SW, 700 m, 10.10.2020, 2♂♂.

*Lasiocampa grandis* (Rogenhofer, 1891) Material: Botan road, 12 km SW, 700 m, 10.10.2020, 3♂♂.

**Superfamily Bombycoidea Latreille, 1802****Family Sphingidae Latreille, [1802]****Subfamily Smerinthinae Grote & Robinson, 1865**

*Akbesia davidi* (Oberthür, 1884) Material: Uluçay, 555 m, 12.08.2015, ♂.

*Marumba quercus* ([Denis & Schiffermüller], 1775) Material: Sağlarca crossroad, 20.10.2016, ♂; Botan road, 12 km SW, 700 m, 16.09.2020, ♀.

**Subfamily Macroglossinae Harris, 1839**

*Hyles livornica* (Esper, [1780]) Material: Yerlibahçe, 955 m, 19.06.2017, ♂; Kale, Tillo, 1300 m, 22.07.2018, ♂.

**Superfamily Geometroidea Leach, 1815****Family Geometridae Leach, 1815****Subfamily Geometrinae Leach, 1815**

*Aplasta ononaria* Fuessly, 1783 Material: Botan road, 12 km SW 700 m, 10.08.2015, ♀; Kale, Tillo, 1300 m, 22.07.2018, ♂.

*Phaiogramma etruscaria* (Zeller, 1849) Material: Botan road, 12 km SW, 700 m, 24.05.2016, 2♂♂; Yerlibahçe, 955 m, 19.06.2017, ♀; Kale, Tillo, 1300 m, 22.07.2018, 2♂♂.

**Subfamily Larentiinae Duponchel, 1845**

*Aplocera plagiata* (Linnaeus, 1758) Material: Botan road, 12 km SW 700 m, 10.10.2020, ♂.

*Camptogramma bilineata* Linnaeus, 1758 Material: Yerlibahçe, 955 m, 19.06.2017, 5♂♂; Kale, Tillo, 1300 m, 22.07.2018, ♀; Botan road, 12 km SW 700 m, 10.10.2020, 2♂♂, ♀.

*Chesistege korbi* Bohatsch, 1910 Material: Uluçay, 555 m, 28.10.2015, 2♂♂; Sağlarca crossroad, 465 m, 20.10.2016, ♂; Botan road, 12 km SW 700 m, 10.10.2020, 5♂♂, 18.11.2020, ♂.

***Eupithecia breviculata* Donzel, 1837** Material: Botan road, 12 km SW, 700 m, 25.04.2015, 2♂♂; Sağlarca crossroad, 465 m, 20.05.2015, ♂.

***Eupithecia ericeata* Rambur, 1833** Material: Sağlarca crossroad, 465 m, 20.10.2016, 7♂♂, 3♀♀; Botan road, 12 km SW, 700 m, 18.11.2020, ♂.

***Eupithecia oblongata* Thunberg, 1784** Material: Botan road, 12 km SW, 700 m, 16.09.2020, ♀.

***Eupithecia schiefereri* Dietze, 1904** Material: Botan road, 12 km SW, 700 m, 24.05.2016, ♂; Gökçebağ, 750 m, 15.04.2020, ♀.

***Nebula senectaria* Herrich-Schäffer, [1852]** Material: Sağlarca crossroad, 465 m, 20.10.2016, 2♂♂; Botan road, 12 km SW, 700 m, 18.11.2020, 3♂♂, ♀.

***Orthonama obstipata* Fabricius, 1794** Material: Gökçebağ, 750 m, 15.04.2020, 2♂♂.

***Xanthorhoe inconsiderata* (Staudinger, 1892)** Material: Botan road, 12 km SW, 700 m, 18.11.2020, 2♂♂.

#### Subfamily Ennominae Duponchel, 1845

***Apochima flabellaria* (Heeger, 1838)** Material: Gökçebağ, 750 m, 23.03.2019, ♂.

***Aspitates ochrearia* Rossi, 1794** Material: Botan road, 12 km SW 700 m, 25.04.2015, ♂, ♀; 09.07.2015, ♂; Uluçay, 555 m, 12.08.2015, ♀.

***Biston achyra* Wehrli, 1936** Material: Gökçebağ, 750 m, 23.03.2019, ♂; Kale, Tillo, 1300 m, 11.03.2020, ♂.

***Charissa mutilata* (Staudinger, 1879)** Material: Botan road, 12 km SW 700 m, 25.04.2015, 2♂♂.

***Charissa staudingeri* (Wnukowsky, 1929) \*** Material: Botan road, 12 km SW 700 m, 10.10.2020, 3♂♂, ♀.

***Charissa subtaurica* Wehrli, 1934** Material: Botan road, 12 km SW 700 m, 10.08.2015, 3♂♂, 2♀♀; Sağlarca crossroad, 465 m, 20.10.2016, ♂.

***Chiasmia aestimaria* Hübner, 1809** Material: Botan road, 12 km SW, 700 m, 09.07.2015, ♂; 10.08.2015, 2♂♂; Uluçay, 12.08.2015, ♂, 21.08.2016, ♀.

***Dasycorsa modesta* Staudinger, 1879** Material: Sağlarca crossroad, 465 m, 28.03.2016, 5♂♂; Botan road, 3 km SW, 16.03.2018, 2♂♂; Gökçebağ, 750 m, 23.03.2019, ♂; Kale, Tillo, 1300 m, 11.03.2020, ♂.

***Dyscia innocentaria* Christoph, 1885** Material: Gökçebağ, 750 m, 15.04.2020, 2♀♀; Botan road, 12 km SW, 700 m, 10.10.2020, 2♂♂.

***Eilicrinia cordiaria* Hübner, 1790** Material: Uluçay, 12.08.2015, 6♂♂, ♀, 21.08.2015, ♂; Botan road, 12 km SW, 700 m, 07.09.2015, ♀; Botan road, 3 km SW, 780 m, 24.08.2019, 2♂♂.

***Eumera hoeferi* Wehrli, 1934** Material: Botan road, 12 km SW, 700 m, 10.10.2020, 2♂♂, ♀.

***Gnopharmia irakensis* Wehrli, 1938** Material: Yerlibahçe, 955 m, 19.06.2017, 2♂♂; Kale, Tillo, 1300 m, 22.07.2018, ♂, 2♀♀.

***Gnophos chorista* Wehrli, 1939\*** Material: Botan road, 12 km SW, 700 m, 16.09.2020, 2♂♂, 2♀♀.

***Gnophos pseudosnelleni* Rjabov, 1964** Material: Botan road, 12 km SW, 700 m, 10.10.2020, 2♂♂.

***Gnophos sartatus* Treitschke, 1827** Material: Uluçay, 555 m, 28.10.2015, ♂; Botan road, 12 km SW, 700 m, 16.09.2020, ♂.

***Gnophos sacrarius* Staudinger, [1895]** Material: Uluçay, 555 m, 28.10.2015, ♂; Botan road, 12 km SW, 700 m, 10.10.2020, ♀.

***Neognopharmia stevenaria* (Boisduval, 1840)** Material: Uluçay, 555 m, 21.08.2016, 2♂♂; Yerlibahçe, 955 m, 19.06.2017, 2♂♂; Kale, Tillo, 1300 m, 22.07.2018, ♀; Botan road 3 km SW, 780 m, 24.08.2019, ♂.

***Nychiodes divergaria* Staudinger, 1892\*** Material: Botan road, 12 km SW, 700 m, 07.09.2015, 4♂♂, 6♀♀, 24.05.2016, 2♂♂, 16.09.2020, ♂; Yerlibahçe, 955 m, 19.06.2017, ♂; Kale, Tillo, 1300 m, 22.07.2018, ♀; Botan road 3 km SW, 780 m, 24.08.2019, ♀.

***Peribatodes rhomboidaria* [Denis & Schiffermüller], 1775** Material: Botan road, 12 km SW, 700 m, 10.08.2015, 2♀♀; Yerlibahçe, 955 m, 19.06.2017, ♂; Kale, Tillo, 1300 m, 22.07.2018, 2♂♂.

***Selidosema plumaria* [Denis & Schiffermüller], 1775** Material: Sağlarca crossroad, 465 m, 20.10.2016, ♂; Botan road, 12 km SW, 700 m, 16.09.2020, ♂.

#### Subfamily Desmobathrinae Meyrick, 1886

***Myinodes shohami* Hausmann, 1994** Material: Botan road, 12 km SW, 700 m, 25.04.2015, 3♂♂, 2♀♀; Gökçebağ, 23.03.2019, ♂; Kale, Tillo, 1300 m, 11.03.2020, ♂.

#### Subfamily Sterrhinae Meyrick, 1892

***Cyclophora punctaria* (Linnaeus, 1758)** Material: Botan road, 12 km SW, 700 m, 16.09.2020, ♀.

***Idaea ochrata* Scopoli, 1763** Material: Sağlarca crossroad, 465 m, 20.05.2015, ♂.

***Idaea subsericeata* (Haworth, [1809])** Material: Yerlibahçe, 955 m, 19.06.2017, ♂; Kale, Tillo, 1300 m, 22.07.2018, 2♂♂.

***Rhodometra sacraria* (Linnaeus, 1767)** Material: Kale, Tillo, 1300 m, 22.07.2018, 2♀♀; Botan road, 3 km SW, 24.08.2019, 2♂♂; Botan road, 12 km SW, 700 m, 16.09.2020, 9♂♂, 2♀♀, 10.10.2020, ♂.

***Rhodostrophia discopunctata* Amsel, 1935** Material: Botan road, 12 km SW, 700 m, 24.05.2016, 3♂♂, ♀.

***Scopula decorata* [Denis & Schiffermüller], 1775** Material: Botan road, 3 km SW, 780 m, 24.08.2019, ♂.

***Scopula marginepunctata* Goeze, 1781** Material: Botan road, 12 km SW, 700 m, 24.05.2016, 7♂♂, 3♀♀, 16.09.2020, ♂, 10.10.2020, ♂; Yerlibahçe, 955 m, 19.06.2017, ♂; Kale, Tillo, 1300 m, 22.07.2018, ♀; Botan road 3 km SW, 780 m, 24.08.2019, ♂, 2♀♀.

***Scopula submutata* Treitschke, 1828** Material: Kale, Tillo, 1300 m, 22.07.2018, 3♂♂, ♀; Botan road, 12 km SW, 700 m, 16.09.2020, 2♂♂.



**Figure 2.** a. *Allophytes renalis*, b. *Episema tersa*

#### 4. Conclusion

This study includes the first comprehensive faunal list of the Botan Valley. In this research, Macro-Heterocera of the Botan Valley National Park are evaluated, and 135 moth species are examined in Noctuoidea, Drepanoidea, Lasiocampoidea, Bombycoidea, Geometroidea, superfamilies: Erebidae (29), Noctuidae (54), Nolidae (2), Euteliidae (1), Thaumetopoeidae (1), Notodontidae (1); Drepanidae (1); Lasiocampidae (2); Sphingidae (3); Geometridae (41). Ennominae (Geometridae), Xyleninae and Noctuinae (Noctuidae) are the most crowded groups respectively (Table 2).

**Table 2.** The number of species in systematic classification

Superfamily	Family	Subfamily	Species number
Noctuoidea	Erebidae	Erebinae	1
		Toxocampinae	2
		Boletobiinae	5
		Catocalinae	7
		Hypeninae	3
		Herminiinae	1
		Anobinae	1
		Arctiinae	5
		Lymantriinae	4
	Noctuidae	Acontiinae	1
		Acronictinae	1
		Metoponiinae	2
		Psaphidinae	2
		Plusiinae	3
		Xyleninae	17
		Noctuinae	14
		Bryophilinae	6
		Hadeninae	5
		Oncocnemidinae	3
		Nolidae	Chloephorinae
Euteliidae	Euteliinae	1	
Thaumetopoeidae	Thaumetopoeinae	1	
Notodontidae	Phalerinae	1	

Table 2. Continued

Superfamily	Family	Subfamily	Species number
Drepanoidea	Drepanidae	Drepaninae	1
Lasiocampoidea	Lasiocampidae	Lasiocampinae	2
Bombycoidea	Sphingidae	Smerinthinae	2
		Macroglossinae	1
		Geometrinae	2
Geometroidea	Geometridae	Larentiinae	10
		Ennominae	20
		Desmobathrinae	1
		Sterrhinae	8
<b>Total</b>			<b>135</b>

One erebid, *Tathorhynchus exsiccatus* (Lederer, 1855); 2 noctuids, *Abrostola agnorista* Dufay, 1956, *Caradrina syriaca* (Staudinger, 1892); and 3 geometrid moth species, *Charissa staudingeri* (Wnukowsky, 1929), *Gnophos chorista* Wehrli, 1939; *Nychiodes divergaria* Staudinger, 1892 are newly discovered from Siirt province.

Eighty-three noctuoid moth species from the Botan Valley were previously presented [5]. In this study, 99 macro moths are added to the region and the total number has increased to 182 species.

The diurnal species determined in the area include *Camptogramma bilineata* Linnaeus, 1758 (Geometridae); *Agrotis ipsilon* (Hufnagel, 1766); *A. segetum* ([Denis & Schiffermüller], 1775); *Autographa gamma* (Linnaeus, 1758); *Trichoplusia ni* (Hübner, [1803]) (Noctuidae).

The Botan Valley has been among the protected natural areas since 2019. Although some research has begun in recent years, it is a long-term study that takes time to fully reveal the flora and fauna elements of the area. In this regard, this study makes contributions to the determination of the biodiversity richness of the Botan Valley National Park.

### Ethical statement

The author declares that this document does not require ethics committee approval or any special permission. Our study does not cause any harm to the environment.

### Conflict of interest

The author declares no potential conflicts of interest related to this article's research, authorship, and publication.

### References

- [1] Atalay, I., Mortan, K., *Türkiye Bölgesel Coğrafyası (Regional Geography of Turkey)*, İnkılap Kitapevi, İstanbul, 2006.
- [2] Alkan, A., "An Analytical Approach to the Ecotourism Potential of Middle and Lower Botan Valley", *Current Perspectives in Social Sciences*, 22 (Special issue 1), 475-499, 2018.
- [3] Yangın, S., Botan çayı (Uluçay) vadisinin (Siirt) florası (The flora of the Botan stream (Uluçay) valley (Siirt)), Master thesis, Dicle University Institute of Science, Diyarbakır, Turkey, 2001.
- [4] Official Gazette of the Republic of Turkey, Siirt ili, merkez, Aydınlar ve Eruh ilçeleri sınırları içerisinde bulunan bazı alanın 'Botan Vadisi Milli Parkı' olarak belirlenmesi hakkında karar

- (30859), Ankara: Presidency General Directorate of Law and Legislation, 15 August 2019, pp. 9, 2019.
- [5] Seven, E., “An Investigation on the Noctuid Moths (Lepidoptera) of Botan Valley, Southeastern Turkey”, *The Black Sea Journal of Sciences*, 9(2), 238-252, 2019.
- [6] Kemal, M., Koçak, A.Ö., Seven, E., “Spring aspect of the nocturnal Lepidoptera fauna of Şirvan District (Siirt Province) (southeast Turkey)”, *Cesa News*, 11, 1-6, 2008.
- [7] Kemal, M., Koçak, A.Ö., Seven, E., “Calophasia lunula in southeast Turkey (Lepidoptera, Noctuidae)”, *Cesa News*, 64, 4-6, 2011.
- [8] Kemal, M., Seven, E., “List of the nocturnal Lepidoptera of Şirvan with new faunal records to Siirt Province and Turkey (S.E. Turkey)”, *Cesa News* 13, 1-2, 2008.
- [9] Kemal, M., Seven, E., “Studies on the fauna and ecology of the Geometridae (Lepidoptera) in Şirvan district (Siirt Province, SE Turkey)”, *Priamus Supplement*, 29, 1-48, 2013.
- [10] Seven, E., Eco-faunistic studies on the Macroheterocera species in Şirvan district of Siirt (Lepidoptera), Ph. D. Thesis, Yüzüncü Yıl University, Van, Turkey, 2014.
- [11] Seven, E., Contribution to the Macroheterocera (Lepidoptera) fauna of Siirt Province, 23. *National Biology Congress*, 5-9 September, Gaziantep, Turkey, p. 427, 2016.
- [12] Seven, E., “Ramitia kufrana sp. n. A New Species from Turkey (Lepidoptera, Geometridae)”, *Journal of the Kansas Entomological Society*, 88(4), 430-433, 2016.
- [13] Seven, E., “A new record and three little-known Eupithecia Curtis species from Turkey (Lepidoptera: Geometridae)”, *Turkish Journal of Zoology*, 41, 583-586, 2017.
- [14] Seven, E., “Notes on Some Species of Gnophini (Ennominae, Geometridae, Lepidoptera) from Turkey, with New Records”, *Journal of the Entomological Research Society*, 20(1), 53-58, 2018.
- [15] Koçak, A.Ö., Kemal, M., “A synonymous and distributional list of the species of the Lepidoptera of Turkey”, *Memoirs*, 8, 1-487, 2018.
- [16] Seven, E., Kemal, M., Koçak, A.Ö., “On the occurrence of *Idia calvaria meridionalis* in Siirt Province of SE Turkey (Lepidoptera, Noctuidae)”, *Cesa News*, 102, 13-15, 2015.
- [17] Seven, E., Ronkay, L., Ronkay, G., “Description of a new species of *Deltote* Reichenbach, Leipzig, 1817 (Lepidoptera, Noctuidae, Eustrotiinae) from Turkey and Turkmenistan”, *Zootaxa* 4576(1), 171-178, 2019.
- [18] Kornoşor, S., “Noctuidae (Lepidoptera) species of Turkey and preliminary list on their distributions, I. Trifidae group”, *Ç.U. Faculty of Arts and Sciences Yearbook*, 1-2, 74-95, 1982.
- [19] Kornoşor, S., “Noctuidae (Lepidoptera) species of Turkey and preliminary list on their distributions, II. Quadrifidae group”, *Ç.U. Faculty of Arts and Sciences Yearbook*, 1-2, 95-102, 1982.
- [20] De Freina, J., Witt, T.J., *Die Bombyces und Spingies der Westpalaearktis*, Band 1. München, 1987.
- [21] Seven, S., “Studies on the fauna and the ecology of the Lepidoptera of Turkey- I”, *Priamus* 8(1/2), 1-52, 1996.
- [22] Hausmann, A., *The Geometrid Moths of Europe 1*, Apollo Books, Stentrup, 2001.



- [23] Hausmann, A., *The Geometrid Moths of Europe 2*, Apollo Books, Stenstrup, 2004.
- [24] Ronkay, L., Yela J.L., Hreblay, M., *Noctuidae Europaeae, vol. 5, Hadeninae II*, Entomological Press, Denmark, 2001.
- [25] Mironov, V., *The Geometrid Moths of Europe 4*, Apollo Books, Stenstrup, 2003.
- [26] Zilli, A., Ronkay, L., Fibiger, M., *Noctuidae Europaeae, vol. 8, Apemeini*, Entomological Press, Denmark, 2005.
- [27] Leraut, P., *Moths of Europe. Volume 2, Geometrid moths*. N.A.P. ed., Verrières-le-Buisson, 2009.
- [28] Hausmann, A., Viidalepp, J., *The Geometrid Moths of Europe 3*, Apollo Books, Stenstrup, 2012.
- [29] Lödl, M., Gaal-Haszler, S., Jovanovic-Kruspel, S., Ronkay, G., Ronkay, L., Varga, Z., Fibigeriana, *The Vartian Collection. Part I. Noctuoidea*, Heterocera press, 2012.
- [30] Skou, P., Sihvonen, P., *The geometrid moths of Europe 5*, Brill, Leiden, 2015.
- [31] Müller, B., Erlacher, S., Hausmann, A., Rajaei, H., Sihvonen, P., Skou, P., *The Geometrid Moths of Europe 6*, Leiden, Brill, 2019.
- [32] Lepiforum e.V., Bestimmung von Schmetterlingen und ihren Präimaginalstadien. <https://lepiforum.org/>, 2023.