



Araştırma Makalesi

Determining Noctuidae, Erebidae, Euteliidae and Nolidae (Lepidoptera, Noctuoidea) Families of Hasankeyf in Batman, Turkey

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Abstract: The present study conducted on the Noctuoidea (Lepidoptera) fauna takes place in Hasankeyf, Batman prov., southeastern Turkey, between 2018-2020. Field based investigations were prominently carried out from sunset till sunrise due to the fact that the dominance of Noctuoidea species are regarded as nocturnal. Insect nets and UV light traps took over efficient roles in capturing noctuid moths. The cycle of collecting those samples comprised of softening, stretching, and identifying consecutively in accordance with the current literature. The results of the research indicated that there are 160 noctuid moth species in the study area, 110 of which are newly recorded from Batman. The second report of *Haemerosia vassilini* A. Bang-Haas, 1912 and endemic *Dryobotodes glaucus* Ronkay & Gyulai, 2006 in Turkey, are highlighted.

Key words: Fauna, Noctuoidea, Moth, Lepidoptera, Hasankeyf, Turkey

Hasankeyf'in Noctuidae, Erebidae, Euteliidae ve Nolidae (Lepidoptera, Noctuoidea) Familyalarının Belirlenmesi, Batman, Türkiye

Öz: Noctuoidea (Lepidoptera) faunası üzerinde yürütülen bu çalışma, 2018-2020 yılları arasında Türkiye'nin güneydoğusundaki Batman ili Hasankeyf ilçesinde gerçekleştirilmiştir. Noctuoidea türlerinin büyük çoğunluğu gece aktif olduğundan örnek toplama çalışmaları daha çok gece yapılmıştır. Noctuid güveler, atrap ve UV ışık tuzakları ile yakalanmıştır. Toplanan örnekler yumuşatılıp gerildikten sonra literatür verilerine göre teşhis edilmiştir. Araştırma sonuçlarına göre çalışma alanında 160 noctuid güve türü tespit edilmiştir, bunlardan 110 tanesi Batman ili için yeni kayıttır. *Haemerosia vassilini* A. Bang-Haas, 1912 ile endemik *Dryobotodes glaucus* Ronkay & Gyulai, 2006 türlerinin Türkiye'deki ikinci kayıtları verilmiştir.

Anahtar kelimeler: Fauna, Noctuoidea, Güve, Lepidoptera, Hasankeyf, Türkiye

1. Introduction

The species in the Noctuoidea superfamily contain the richest and most crowded group in the Macro-Heterocera (Lepidoptera). Typically, Noctuoidea species are nocturnal in large numbers, but some species are also diurnal. Their larvae, which are significant pests, feed on plants in forestry and agriculture, thus some of them are of great economic importance. More than 25.000 noctuoid moth species have been identified worldwide, and approximately 1.400 species are known in Europe [1]. Since Turkey contains around 1.250 species of Noctuoidea [2], it is regarded as rich for that species.

Hasankeyf takes place on the creeks of the Tigris River, and the widespread natural vegetation in this district is the steppe formation consisting of rocky-stony mountains including sparse oak areas. Studies regarding the butterfly and moth fauna of Batman province were conducted by Kemal et al. [3], Kemal and Koçak [4,5], and Seven [6] also added 77 species to 34 noctuoid species from Batman. Additionally, studies in the district of Hasankeyf include moth species, 67 species of which were defined in the research of Aykal [7] on Geometridae, and among them, a new subspecies was described [8]. Within this research, 160 species are identified, and 110 new species of the noctuoid moth are found in Batman province.

2. Material and Method

The specimens were collected from Hasankeyf district, Batman prov., south-eastern Turkey, between in June-November 2018, March-November 2019, and March-June 2020. The materials were caught by insect nets and UV light traps in 27 different locations (Figure 1): **1.** Kumluca-1, 490 m, 37°44'10"N-41°16'08"E; **2.** Kumluca-2, 510 m, 37°44'16"N-41°16'27"E; **3.** Ağlayan Mağara 750m-N, 550 m, 37°42'22"N-41°25'43"E; **4.** Ağlayan Mağara, 550 m, 37°42'19"N-41°25'41"E; **5.** Üçyol, 630 m, 37°41'41"N-41°27'36"E; **6.** Üçyol Kavak, 500 m, 37°43'10"N-41°29'25"E; **7.** Suçeken, 480 m, 37°43'58"N-41°18'12"E; **8.** Urganlı, 480 m, 37°43'30"N-41°20'48"E; **9.** Karaköy, 920 m, 37°40'60"N-41°24'55"E; **10.** Karaköy 2km-N, 620 m, 37°42'10"N-41°26'15"E; **11.** Gürbüz, 820 m, 37°38'20"N-41°25'39"E; **12.** Saklı, 580 m, 37°42'58"N-41°32'22"E; **13.** Irmak, 530 m, 37°43'10"N-41°32'25"E; **14.** Akyar, 700 m, 37°40'17"N-41°27'17"E; **15.** Akalın, 750 m, 37°41'56"N-41°32'47"E; **16.** Akalın 1km-N, 900 m, 37°41'10"N-41°32'60"E; **17.** Akalın 500m-N, 830 m, 37°41'15"N-41°33'15"E; **18.** Büyükdere, 950 m, 37°40'41"N-41°32'42"E; **19.** Büyükdere 2km-N, 1250 m, 37°39'25"N-41°32'20"E; **20.** Güzelöz, 1100 m, 37°38'20"N-41°33'54"E; **21.** İncirli, 610 m, 37°42'45"N-41°33'16"E; **22.** İncirli 3km-N, 500 m, 37°42'34"N-41°33'16"E; **23.** Yolüstü, 700 m, 37°43'52"N-41°34'41"E; **24.** Palamut, 750 m, 37°42'13"N-41°38'55"E; **25.** Soğucak, 1040 m, 37°41'02"N-41°36'42"E; **26.** Uzundere, 1000 m, 37°39'57"N-41°22'47"E; **27.** Aksu, 1010 m, 37°39'05"N-41°21'33"E.

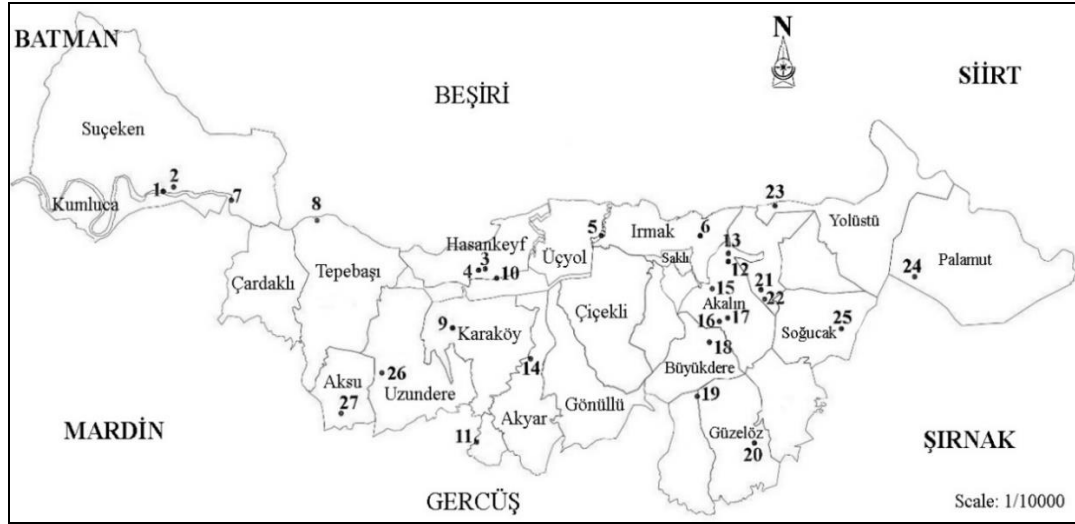


Figure 1. Studied sites in Hasanköy

The traps were positioned at the trapping sites before sunset and were taken back in the early hours of the morning. Specimens from the traps were pinned or packed in transport envelopes. The specimens are deposited in the collection of Batman University (BTU), Faculty of Science and Arts, Department of Biology, Entomology Laboratory, Turkey. External characters were photographed with a Canon EOS6D macro lens camera. Preparations of male and female genitalia were carried out considering Robinson [9], embedded as permanent slides in Euparal.

The sources used in diagnosis include Fibiger [1, 10,11], Ronkay G. and Ronkay L. [12,13], Hacker [14-18], Fibiger and Hacker [19], Ronkay et al. [20], Ebert and Hacker [21], Hacker et al. [22], Goater et al. [23], Zilli et al. [24], Fibiger et al. [25,26], Leraut [27].

3. Results

In the investigated area, 160 noctuid moth species were determined in Noctuidae, Erebidae, Euteliidae, and Nolidae families (* new records for Batman, [1-27] location numbers (see material and method)).

Superfamily NOCTUOIDEA Latreille, 1809

Family NOCTUIDAE Latreille, 1809

- Abrostola agnorista* Dufay, 1956 [2, 3, 6, 9, 19]
- Acontia lucida* (Hufnagel, 1766)* [2, 4]
- Acontia titania* (Esper, [1798])* [1, 2, 4, 6, 11]
- Acontia trabealis* (Scopoli, 1763)* [3, 4, 15]
- Acronicta aceris* (Linnaeus, 1758)* [1, 4, 12]
- Acronicta psi* (Linnaeus, 1758) [2, 3, 15, 19]
- Aegle rebeli* Schawerda, 1923* [3, 5, 14, 16]
- Aegle semicana* (Esper, [1798])* [4, 11]
- Agrochola gratiosa* (Staudinger, 1882)* [3, 5, 6, 12, 17]
- Agrochola helvola* (Linnaeus, 1758)* [3, 5, 10, 12, 21]
- Agrochola macilenta* (Hübner, [1809])* [8, 11]
- Agrochola mansueta* (Herrich-Schäffer, [1850])* [4, 12]
- Agrochola pistacina* (Goeze, 1781)* [10, 11, 12, 13, 17, 19, 21, 22, 23, 25, 27]

Agrotis biconicus Kollar, [1844]* [3, 5]
Agrotis bigramma (Esper, [1790]) [3, 10, 11, 12, 17, 21, 24, 25, 26, 27]
Agrotis ipsilon (Hufnagel, 1766) [2, 3, 4, 5, 9, 10, 11, 12, 14, 15, 19]
Agrotis puta (Hübner, [1803]) [2, 11, 12, 16, 17, 21]
Agrotis segetum ([Denis & Schiffermüller], 1775) [2, 3, 4, 5, 9, 10, 11, 12, 14, 15, 19, 21]
Allophyes asiatica (Staudinger, 1892)* [2, 5, 13]
Allophyes renalis (Wiltshire, 1941)* [11]
Ammoconia senex (Geyer, [1828])* [4, 9, 11]
Apamea maraschi (Draudt, 1934)* [3, 6, 8, 11, 12]
Apamea monoglypha (Hufnagel, 1766)* [3, 12, 14]
Apamea polyglypha (Staudinger, 1892) [3, 4, 6, 10, 12, 14, 15, 16]
Aporophyla australis (Boisduval, 1829)* [4, 12, 13, 15, 22, 23, 24, 25, 26, 27]
Aporophyla nigra (Haworth, [1809])* [3, 4, 8, 9, 12, 13, 21, 24, 25, 26, 27]
Atethmia centrigo (Haworth, [1809])* [4, 11]
Autographa gamma (Linnaeus, 1758) [1, 3, 4, 6, 9, 11, 12, 14, 19]
Behounekia freyeri (Frivaldsky, 1835)* [3, 4, 11, 12, 14]
Calloplistria latreillei (Duponchel, 1827)* [4]
Calophasia opalina (Esper, [1796])* [4, 6, 12]
Caradrina clavipalpis (Scopoli, 1763) [2, 4, 5, 10, 12, 15, 16, 19, 20, 24]
Caradrina draudti (Boursin, 1936) [4, 16]
Caradrina gilva (Donzel, 1837)* [4, 6]
Chloantha hypericii (Fabricius, 1787)* [4, 12, 19, 20]
Cleoceris scoriacea (Esper, [1789])* [18]
Cleonymia opposita (Lederer, 1870) [2, 3, 4, 9, 11]
Clytie terrulenta (Christoph, 1893)* [7]
Cornutiplusia circumflexa (Linnaeus, 1767) [2, 4]
Cryphia amasina (Draudt, 1931)* [3, 12]
Cryphia ochsi (Boursin, 1941)* [4, 5, 7, 12, 15]
Cryphia raptricula ([Denis & Schiffermüller], 1775)* [3, 4, 10, 15, 16, 19]
Cryphia receptricula (Hübner, [1803])* [3, 10, 16]
Dichagyris erubescens (Staudinger, 1892) [4, 3, 5, 10, 19]
Dichagyris flavina (Herrich-Schäffer, [1852])* [2, 3, 4, 11, 15, 19, 22, 25]
Dichagyris nigrescens (Hofner, 1888)* [1, 3, 10, 11, 12, 14]
Dichagyris renigera (Hübner, [1808])* [1, 3, 4]
Dichagyris singularis (Staudinger, 1877) [2, 5, 22]
Dichonia aeruginea (Hübner, [1803])* [6, 11, 25]
Dicycla oo (Linnaeus, 1758)* [1, 3, 4, 12, 15, 24]
Drasteria caucasica (Kolenati, 1846)* [11]
Drasteria sesquilina (Staudinger, 1888)* [4, 12]
Dryobotodes carbonis (Wagner, 1931)* [5, 8, 12, 13, 23]
Dryobotodes eremita (Fabricius, 1775)* [4, 13]
Dryobotodes glaucus Ronkay & Gyulai, 2006* [4, 10, 12] (Figure 2 a-b)
Egira tibori Hreblay, 1994* [2, 3, 12, 16]
Episema didymogramma (Boursin, 1955)* [6, 12]
Episema korsakovi (Christoph, 1885) [3, 4, 5, 15, 18]
Episema tersa ([Denis & Schiffermüller], 1775) [3, 4, 5, 16]
Eremobia asiatica Draudt, 1936* [3, 4] (Figure 2 c)
Euchalcia augusta (Staudinger, 1892)* [4]
Euchalcia dorsiflava (Standfuss, 1892)* [4, 5, 9, 12]
Eugnorisma pontica (Staudinger, 1892)* [2, 3, 16, 19, 20]

Euxoa distinguenda (Lederer, 1857)* [4, 10]
Euxoa obelisca ([Denis & Schiffermüller], 1775)* [12, 15]
Hadena magnolii (Boisduval, 1828)* [4]
Hadena ronkayorum Hacker, 1996* [3, 4]
Hadena sancta (Staudinger, 1859)* [10, 12]
Hadjina lutosa Staudinger, 1892* [15, 19]
Hadula mendica (Staudinger, [1895])* [12]
Haemerosia renalis (Hübner, [1813]) [3, 5, 11, 12]
Haemerosia vassilini A.Bang-Haas, 1912* [15] (Figure 2 d)
Hecatera bicolorata (Hufnagel, 1766) [2, 3, 4, 24]
Hecatera spinaciae (Vieweg, 1790) [2, 5, 7]
Hecatera weissii (Boursin, 1952) [13]
Helicoverpa armigera (Hübner, [1808]) [2, 5]
Heliothis nubigera Herrich-Schäffer, [1851] [4, 12, 14, 15, 19, 20]
Heliothis peltigera ([Denis & Schiffermüller], 1775) [3, 11]
Heliothis virescens (Hufnagel, 1766)* [3, 4, 5, 11]
Hoplodrina ambigua ([Denis & Schiffermüller], 1775)* [2, 3, 4, 11, 16, 19, 20, 21, 22, 25]
Hypeuthina fulgurita Lederer, 1855 [2, 12, 19, 22, 23]
Leucania loreyi (Duponchel, 1827) [2, 4, 19]
Leucania punctosa (Treitschke, 1825) [3, 12, 16, 19, 20, 22, 26, 27]
Leucochlaena muscosa (Staudinger, 1892) [2, 4]
Luperina rjabovi (Kljutschko, 1967)* [5, 12, 24]
Macdunnoughia confusa (Stephens, 1850)* [7]
Melanchra persicariae (Linnaeus, 1761)* [4, 5, 6]
Mesogona acetosellae (Goeze, 1781)* [2, 3, 16, 18, 20, 27]
Metalopha gloriosa (Staudinger, 1892)* [2, 3, 11, 12, 13, 15, 18]
Metalopha liturata (Christoph, 1887)* [4, 5, 10, 11, 12, 13, 14, 20]
Mythimna albipuncta (Fabricius, 1787)* [9, 11, 12]
Mythimna alopecuri (Boisduval, 1840) [2, 3, 13, 15]
Mythimna l-album (Linnaeus, 1767) [3, 4, 11, 12, 16, 17, 18, 21]
Mythimna vitellina (Hübner, [1808]) [3, 4, 10, 11, 12, 14, 16, 17, 18, 20]
Noctua comes (Hübner, [1813]) [2, 11, 12, 20, 24]
Noctua janthina ([Denis & Schiffermüller], 1775) [5, 10]
Noctua orbona (Hufnagel, 1766) [3, 4, 12, 14, 17, 21, 22]
Noctua pronuba (Linnaeus, 1758) [2, 4, 7, 11, 12, 14, 17, 20]
Olivenebula subsericata (Herrich-Schäffer, 1861)* [5, 19, 21]
Omphalophana antirrhinii (Hübner, [1803])* [2, 3, 4, 14, 15]
Oncocnemis fuscipicta Wiltshire, 1976* [2, 11, 16, 21]
Orthosia cerasi (Fabricius, 1775)* [3, 11, 13, 18]
Perigrappa rorida (Frivaldsky, 1835)* [4, 5, 11]
Phlogophora meticulosa (Linnaeus, 1758)* [4, 9, 12, 24]
Phylapora canescens (Duponchel, 1826) [2, 3, 4, 9, 11, 18, 22, 23, 25, 26, 27]
Polymixis manisadjiani (Staudinger, 1881)* [11, 12, 18, 21]
Polymixis rufocincta (Geyer, 1828)* [5, 22, 23]
Pseudenargia deleta (Osthelder, 1933) [12, 15, 26, 27]
Rhizedra lutosa (Hübner, [1803])* [11]
Scotochrosta pulla ([Denis & Schiffermüller], 1775) [11, 5]
Sesamia cretica Lederer, 1857* [3, 5, 11, 12, 20]
Shargacucullia verbasci (Linnaeus, 1758)* [2, 4, 5, 11]
Simyra dentinosa Freyer, 1839* [12]

Spodoptera exigua (Hübner, [1808]) [1, 2, 3, 4, 5, 9, 10, 11, 14, 17, 18, 20]
Stilbina hypaenides Staudinger, 1892 [11, 12, 16, 21]
Trichoplusia ni (Hübner, [1803])* [3, 4, 11, 12, 13, 15]
Tyta luctuosa ([Denis & Schiffermüller], 1775)* [2, 4, 5, 11, 15, 18, 20]
Valeria oleagina (Esper, [1786])* [2, 3, 4, 5, 11, 12]
Victrix hackeri Varga & Ronkay, 1991* [1, 2, 4, 11, 19] (Figure 2 e-f)
Xanthia gilvago ([Denis & Schiffermüller], 1775)* [3, 8, 18, 27]
Xestia castanea (Esper, [1798])* [3, 5, 6, 11, 24]
Xestia palaestinensis (Kalchberg, [1898]) [2, 3, 4, 8, 15, 20, 21, 26]
Xestia sareptana (Herrich-Schäffer, [1851])* [3, 4, 21]
Xestia xanthographa ([Denis & Schiffermüller], 1775)* [4, 11, 25, 26, 27]

Family EREBIDAE Leach, [1815]

Acantholipes regularis (Hübner, [1813])* [1, 3, 12, 16, 19]
Aedia funesta (Esper, [1786])* [3, 11]
Autophila banghaasi Boursin, 1940 [4, 18, 24]
Catocala abacta Staudinger, 1900 [1, 3, 4]
Catocala disjuncta (Geyer, [1828])* [4, 5, 12, 16]
Catocala diversa (Geyer, [1828])* [4, 10, 15, 16, 24]
Catocala lesbia Christoph, 1887* [4, 5]
Catocala mesopotamica Kuznesov, 1903* [2, 8]
Colobochoyla platyzona (Lederer, 1870) [2, 4, 10, 15, 19]
Dysgonia algira (Linnaeus, 1767)* [2, 3, 4, 9, 14, 15]
Dysgonia torrida (Guenée, 1852) [2, 3, 5, 19]
Eublemma gratissima (Staudinger, 1892)* [4, 12]
Eublemma ostrina (Hübner, [1808]) [2, 3, 15, 16, 19]
Eublemma pallidula (Herrich-Schäffer, 1856)* [2, 4, 12, 15]
Eublemma parva (Hübner, [1808])* [4, 5]
Eublemma polygramma (Duponchel, [1842]) [3, 5, 15]
Grammodes stolidus (Fabricius, 1775) [3, 4, 5, 10, 12, 15, 19]
Hypena munitalis Mann, 1861* [2, 3, 10, 11, 15, 20]
Idia calvaria ([Denis & Schiffermüller], 1775)* [5, 15]
Lygephila cracca (Fabricius, 1787)* [2, 15]
Minucia bimaculata Osthelder, 1933* [3, 9, 18]
Ophiusa lunaris (Goeze, 1781)* [4, 5]
Pandesma robusta Walker, [1858]* [4, 5, 11, 12]
Pericyma albidentaria (Freyer, [1841])* [2, 3, 11, 18]
Pericyma squalens Lederer, 1855 [11]*
Plecoptera inquinata (Lederer, 1857) [2, 3, 4, 5, 10, 11, 14, 17, 18, 20, 24]
Tathorhynchus exsiccata (Lederer, 1855)* [20]
Zekelita antiqualis (Hübner, [1809])* [1, 3, 7, 10, 11, 18]
Zekelita ravalis (Herrich-Schäffer, [1852]) [4, 5, 12, 15, 18, 20]
Zethes brandti Janzon, 1977* [2, 4, 11, 20]
Zethes insularis Rambur, 1833* [5, 19]

Family EUTELIIDAE Grote, 1882

Eutelia adulatrix (Hübner, [1813])* [3, 15]

Family NOLIDAE Bruand, 1847

Arcyophora dentula (Lederer, 1869)* [4, 7, 11]

Bena bicolorana (Fuessly, 1775)* [3, 12, 16]

Earias insulana (Boisduval, 1833) [4, 11]

Meganola togatalis (Hübner, 1796)* [3, 15, 20]

4. Conclusion and Comment

The current literature and investigations have shown that Noctuoidea species in Hasankeyf district have not been investigated properly so far; therefore, the results of this research assert that 160 species of noctuid moths are detected in the aforementioned area, and 110 species of them are new records for the Batman province.

Dryobotodes glaucus Ronkay & Gyulai, 2006, which is described and accounted in a limited region from Iran (Southern Zagros Mountains) [28], is reported in this study following the samples in Turkey (Siirt prov.) [29]. Although *Haemerosia vassilini* A. Bang-Haas, 1912 was mentioned in the Lepidoptera checklist of Turkey [2], the locality information was not provided. But Hacker [30] reported this species in Mersin province, and the second exact locality record of the species in Turkey is reported from the research area.

Comparing the number of species to the locations (see material and method for locality information), it is indicated that most of the species are found in Ağlayan Mağara (4), Ağlayan Mağara 750m-N (3), and Saklı (12) locations, on the other hand, least of them is determined in Yolüstü (23) habitat with 6 species (Figure 3).

Considering the evaluation of the noctuid moths in some provinces close to the study area, it is clear that the number of the species in Bitlis and Siirt provinces is the highest [2, 6, 31-33]; on the other hand, the number of the species found in Mardin and Muş provinces is the lowest (Figure 4); the main reasons for these results may be “research rates of the provinces” and “habitat diversity”.

The study shows that noctuid moth species in Batman province increased from 77 [2, 6] to 187, rising by approximately 143%. However, the fact that Hasankeyf has a small surface area and plant diversity mostly includes steppe formations close to each other, is thought to negatively affect the variety and number of species. Increasing research in other districts of Batman will enable us to reveal the Lepidoptera species diversity in the province.



Figure 2. a-b. Adult of *Dryobotodes glaucus* Ronkay & Gyulai, 2006, c. Adult of *Eremobia asiatica* Draudt, 1936, d. Adult of *Haemosia vassilini* A.Bang-Haas, 1912, e-f. Adult and male genitalia of *Victrix hackeri* Varga & Ronkay, 1991

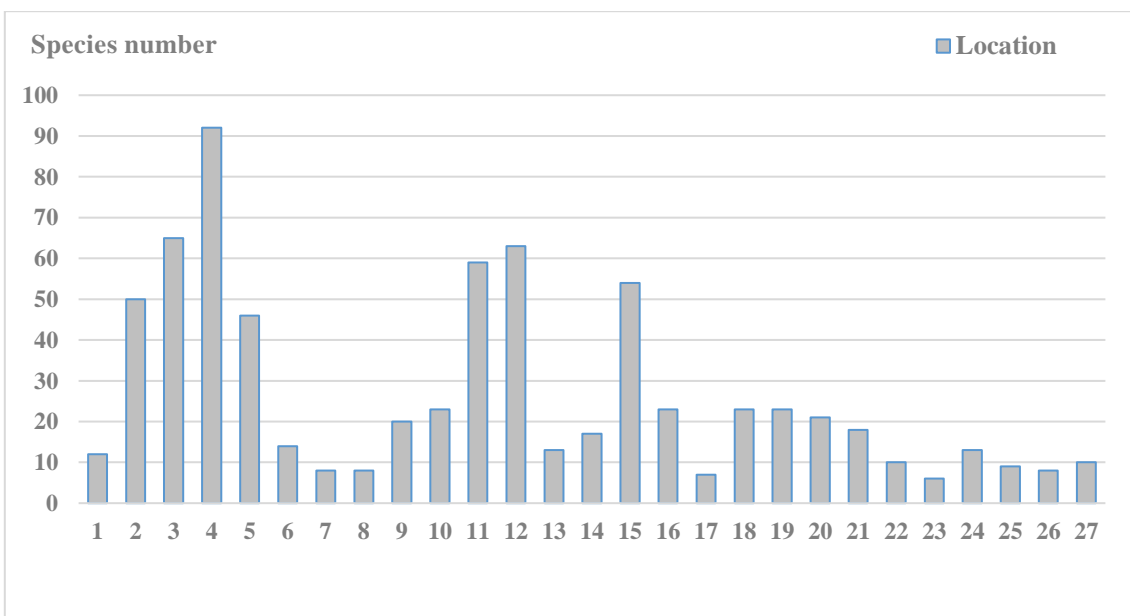


Figure 3. Number of the species by locations

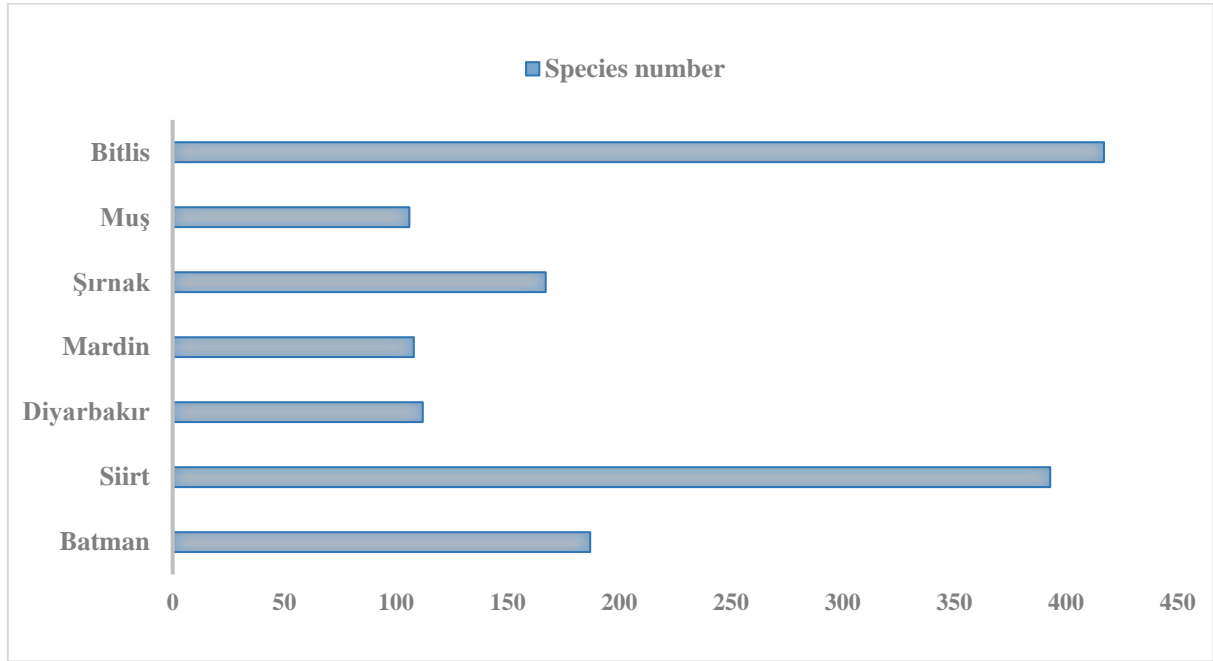


Figure 4. Comparison of noctuid species numbers in the study area and some nearby provinces

Author Statement

Erdem Seven: Investigation, Methodology, Formal Analysis, Project Administration, Data Curation, Supervision, Observation, Advice, Validation.

Abdulaziz Aykal: Investigation, Resource/Material/Instrument Supply, Data Curation, Validation, Original Draft Writing.

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Conflict of Interest

As the authors of this study, we declare that we do not have any conflict of interest statement.

Ethics Committee Approval and Informed Consent

As the authors of this study, we declare that we do not have any ethics committee approval and/or informed consent statement.

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