

HETERO CERAN (LEPIDOPTERA) FAUNA OF WESTERN BLACK SEA REGION

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Heteroceran (Lepidoptera) fauna of Western Black Sea Region

Abstract: This study was carried out in 2001-2004 in Western Black Sea Region in order to determine Heterocera (Lepidoptera) fauna and to contribute to the distributional data of species. The study material obtained from 50 different localities were collected using light traps during night and using a sweep net during the day. 218 species within 166 genera belonging to 12 families were identified. 47 of these species are first records for the region.

Key words: Lepidoptera, Heterocera, fauna, Western Black Sea Region, Turkey

Batı Karadeniz Bölgesi Heterocera (Lepidoptera) Faunası

Özet: Batı Karadeniz Bölgesi'nde 2001-2004 yılları arasında sürdürülen çalışma Heterocera (Lepidoptera) faunasının tesbiti ve türlerin dağılımlarına katkı amacıyla gerçekleştirilmiştir. Materyal, araştırma bölgesinde 50 farklı lokaliteden, gece ışık tuzakları, gündüz ise atrap yardımıyla elde edilmiştir. Araştırma sonucunda 12 familyaya ait 166 cinse bağlı 218 tür tesbit edilmiştir. Bu türlerden 47'si bölge için ilk kayıttır.

Anahtar kelimeler: Lepidoptera, Heterocera, fauna, Batı Karadeniz Bölgesi, Türkiye.

Introduction:

Western Black Sea Region which is located in north-west part of Turkey makes up 7% of the total area of the country. Geographic structure of the region is composed of mountains rising parallel to the sea with heights reaching up to 2500 m. and forest areas. This region of Turkey consists of forests (67% of the area) and agricultural fields and meadows (33%) (Mayer and Aksoy, 1998).

The studies performed for identification of heteroceran fauna of Western Black Sea Region dates back to Schwingenschuss (1939), followed by Koçak (1990), Hakyemez (1994a, 1994b), Beshkov (1996, 2000), Akbulut et al. (2003); Özdemir (2007), Çakan and Okyar (2007), Beshkov and Slivov (2006) and Okyar et al. (2009). The study of Okyar et al. (2009) is the most comprehensive study conducted in the region focusing on four different habitats and diversity of the 207 determined species in the region but does not contain distributional data. In order to

explain faunistic studies, however, it is necessary to know the distributions of species are collected from well-selected localities. Following this idea, in this study, the distributions of Heteroceran species in Western Black Sea Region given by Okyar et. al (2009) and of some new recorded species were given.

Materyal and Methods:

Adult specimens were collected between 2001 and 2004 from various habitats especially from forest ecosystems (mainly *Abies*, *Quercus*, *Platanus* forests), *Corylus* garden and meadows in western Black Sea Region. Collections were made only in months (between June and September) during which heterocerans show their peak activity patterns. Materials collected with help of a light trap at nights and a sweeping net during the day were prepared and identified following the methods used in related literature (Pierce, 1967, 1978; Fernandez-Rubio, 1986). Formerly identified collections deposited at Trakya University (Science and Art Faculty, Biology Department) were utilized in identification of the species. Systematic studies were also used (Staudinger, 1878, 1881; Pierce, 1967, 1978; Poole, 1989a,b; Freina and Witt, 1987; Hacker and Schreier, 1989; Hacker, 1990; Fibiger, 1993; Fibiger, 1997; Ronkay and Yela, 2001a,b; Ronkay et al., 2001, Goater et. al., 2003; Hacker, 2004; Gelbrecht et al., 2004; Zili et al., 2005; Fibiger and Hacker, 2007; Fibiger et al., 2009; Koçak and Kemal, 2009; Vardikyan, 1985; Skou, 1986; Hausmann, 2001, 2004; Mironov, 2003; <http://www.faunaeur.org/index.php>). Localities sampled in the region and their coordinates, altitudes, habitat types and collecting dates were given in Table 1 and the numbers and sexes of each species were given in Table 2.

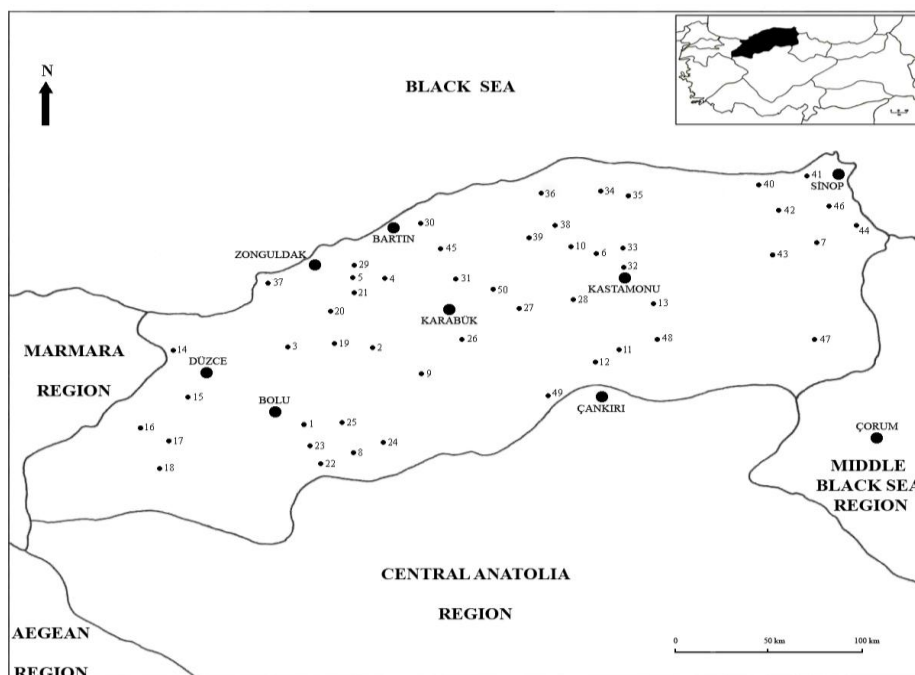


Figure 1. The map to the localities sampled in the study area.**Table 1.** Localities sampled with their coordinates, altitudes, habitats, and collecting dates.

<u>Loc. No</u>	<u>Locality</u>	<u>Coordinate</u>	<u>Altitude (m.)</u>	<u>Habitat</u>	<u>Collecting Date</u>
1	Bolu-İzzet Baysal University campus	40° 31' 50" N 31° 37' 35" E	570	<i>Pinus</i> (Pinaceae) forest	27.06.2001 28.06.2003 15.07.2004
2	Bolu-Mengen-Kıyaslar	40° 58' 26" N 32° 04' 36" E	700	<i>Pinus</i> (Pinaceae), <i>Salix</i> (Salicaceae), meadow	28.06.2001 15.07.2004
3	Bolu-Mengen-Çukurören	40° 59' 30" N 31° 36' 40" E	700	<i>Pinus</i> (Pinaceae) forest, <i>Rubus</i> (Rosaceae), meadow	29.06.2001 15.08.2004
4	Zonguldak-Devrek-Davulga	41° 20' 49" N 32° 05' 45" E	280	<i>Quercus</i> (Fagaceae), <i>Urtica</i> (Urticaceae) <i>Rhododendron</i> (Ericaceae), <i>Trifolium</i> (Fabaceae), <i>Hypericum</i> (Clusiaceae), <i>Umbellifera</i> , (Apiaceae), <i>Prunus</i> (Rosaceae)	29.06.2001 19.07.2003 12.09.2004
5	Zonguldak-Çaycuma-Kayıkcılar	41° 25' 10" N 31° 58' 20" E	20	<i>Populus</i> (Salicaceae), meadow	30.06.2001
6	Kastamonu-Daday-Sarpun	41° 30' 10" N 33° 31' 05" E	1350	<i>Abies</i> (Pinaceae) forest, orchards [<i>Malus Prunus</i> (Rosaceae)]	01.07.2001
7	Sinop-Boyalı-Drenaz geçidi	41° 35' 10" N 35° 05' 40" E	1350	<i>Abies</i> (Pinaceae) forest, <i>Rubus</i> , <i>Rosa canina</i> (Rosaceae), <i>Rhododendron</i> (Ericaceae), Pterophyta	07.09.2001 10.09.2003 08.06.2004 09.06.2004
8	Bolu-Gölcük	40° 24' 55" N 31° 57' 50" E	850	<i>Abies</i> and <i>Pinus</i> (both Pinaceae) forest	27.08.2002 28.06.2003 25.07.2004
9	Karabük-Eskipazar-Ortaköy	40° 45' 15" N 32° 20' 55" E		<i>Nicotina</i> (Solanaceae), orchard and wheat field, <i>Rumex</i> (Polygonaceae)	28.08.2002
10	Kastamonu-Daday-Ballıdağ	41° 34' 20" N 33° 24' 10" E	1750	<i>Abies</i> and <i>Pinus</i> (both Pinaceae) forest	29.08.2002 01.07.2003 29.08.2004
11	Kastamonu-Çatören	40° 56' 30" N 33° 39' 50" E	1000	<i>Abies</i> (Pinaceae) forest, <i>Rubus</i> (Rosaceae), <i>Urtica</i> (Urticaceae)	30.08.2002 07.09.2003 28.08.2004
12	Kastamonu-İlgaz dağı	40° 50' 40" N 33° 30' 10" E	1820	<i>Abies</i> (Pinaceae) forest	30.08.2002 02.07.2003 05.09.2003
13	Kastamonu-Akkaya	41° 15' 20" N 33° 51' 45" E	1150	<i>Pinus</i> (Pinaceae) forest, <i>Zea mays</i> (Poaceae), meadow	31.08.2002
14	Adapazarı-Hendek-Hüseyinşeyh	40° 57' 40" N 30° 41' 05" E	45	Mix Forest, <i>Corylus</i> (Corylaceae), meadow	25.06.2003 18.08.2003 09.09.2004
15	Düzce-Kabalar köyü- Şifalısu	40° 40' 10" N 30° 45' 30" E	200	<i>Rubus</i> (Rosaceae), <i>Corylus</i> (Corylaceae), Leguminosae	25.06.2003 03.09.2003
16	Bolu-Dokurcun-Sepetçiler	40° 31' 05" N 30° 24' 10" E	400	<i>Platanus</i> (Platanaceae) <i>Rubus</i> (Rosaceae), <i>Corylus</i> (Corylaceae), <i>Populus</i> (Salicaceae), meadow	25.06.2003 16.07.2004 18.08.2004
17	Bolu-Dokurcun-Akyokuş	40° 29' 50" N 30° 40' 18" E	1750	<i>Quercus</i> (Fagaceae), meadow	26.06.2003 21.07.2004

Loc. No	Locality	Coordinate	Altitude (m.)	Habitat	Collecting Date
18	Bolu-Göynük-Kozcağız	40° 19' 30" N 30° 30' 24" E,	720	<i>Pinus</i> (Pinaceae), <i>Populus</i> (Salicaceae), <i>Salix</i> (Salicaceae), <i>Urtica</i> (Urticaceae), meadow	26.06.2003 23.08.2004 02.09.2003
19	Bolu-Mengen-Siyamoğlu köyü	40° 59' 50" N 31° 45' 05" E	680	<i>Quercus</i> (Fagaceae) <i>Pinus</i> (Pinaceae), <i>Salix</i> (Salicaceae), meadow	26.06.2003 10.07.2003 16.08.2003 16.07.2004
20	Zonguldak-Devrek	41° 10' 10" N 31° 43' 45" E	60	<i>Platanus</i> (Platanaceae), <i>Pinus</i> (Pinaceae) forest, <i>Urtica</i> (Urticaceae), <i>Euphorbia</i> (Euphorbiaceae), meadow, Pterophyta	27.06.2003 17.07.2003 19.08.2003 12.09.2004
21	Zonguldak-Devrek Forest office	41° 18' 30" N 31° 58' 50" E	700	<i>Platanus</i> (Platanaceae), <i>Pinus</i> (Pinaceae) forest, meadow, <i>Euphorbia</i> (Euphorbiaceae), Pterophyta	27.06.2003 29.06.2003 15.07.2003 25.08.2004
22	Bolu-Seben-Yörükdağı	40° 20' 10" N 31° 40' 02" E	1300	<i>Pinus</i> (Pinaceae), <i>Fagus</i> , <i>Quercus</i> and meadow	28.06.2003
23	Bolu-Seben-Kardağ tepesi	40° 28' 50" N 31° 38' 25" E	1687	<i>Pinus</i> and <i>Abies</i> (both Pinaceae) forest and <i>Carpinus</i> forest, <i>Rhododendron</i> , <i>Urtica</i>	28.06.2003 18.07.2003 22.09.2004
24	Bolu-Gölcük-Aladağ IT.	40° 29' 20" N 32° 03' 55" E	1250	Pine (Pinaceae) forest and graminiae	28.06.2003 19.07.2003 04.08.2004
25	Bolu-Yeniçağ	40° 32' 35" N 31° 50' 10" E	700	<i>Quercus</i> (Fagaceae), <i>Rhododendron</i> (Ericaceae), <i>Urtica</i> (Urticaceae), meadow	28.06.2003
26	Karabük-Çayköy	41° 01' 30" N 32° 39' 20" E	295	Wheat field	29.06.2003 21.07.2003 06.08.2004
27	Kastamonu-Araç-İğdir	41° 11' 05" N 33° 02' 30" E	650	<i>Quercus</i> (Fagaceae) forest and Wheat field	29.06.2003 22.07.2003 17.07.2004
28	Kastamonu-Araç-Çukurpelit	41° 16' 50" N 33° 24' 50" E	650	<i>Quercus</i> (Fagaceae), <i>Salix</i> and <i>Populus</i> (both Salicaceae),	29.06.2003 20.07.2003
29	Zonguldak-Çaycuma	41° 27' 40" N 31° 59' 10" E	90	<i>Platanus</i> , (Platanaceae), <i>Populus</i> (Salicaceae), meadow, <i>Zea mays</i> (Poaceae), <i>Hipericum</i> sp. (Hypericaceae)	30.06.2003 12.07.2003 22.08.2004
30	Bartın-Çamköy	41° 42' 15" N 32° 22' 30" E	19	<i>Platanus</i> (Platanaceae), Orchard and meadow, <i>Corylus</i> (Corylaceae),	30.06.2003 13.07.2003 24.08.2004 14.09.2004
31	Karabük-Safranbolu-İnceçay Köyü-Sarıçiçek dağı	41° 20' 35" N 32° 36' 50" E	1000	<i>Pinus</i> (Pinaceae), <i>Quercus</i> (Fagaceae), <i>Ulmus</i> (Ulmaceae) forest, meadow	30.06.2003 05.07.2003 26.08.2004
32	Kastamonu-Köy hizmetleri misafirhanesi	41° 25' 10" N 33° 42' 15" E	798	<i>Pinus</i> (Pinaceae) forest	01.07.2003 06.07.2003 27.08.2004
33	Kastamonu-Küre-Masruf geçidi	41° 31' 50" N 33° 41' 50" E	1250	<i>Abies</i> (Coniferae), and <i>Pinus</i> (Pinaceae) forest	01.07.2003 21.07.2004 07.08.2004
34	Kastamonu-Küre-Alacık	41° 46' 55" N 33° 35' 30" E	1960	<i>Abies</i> and <i>Pinus</i> (Pinaceae) forest, <i>Quercus</i> (Fagaceae) forest and meadow	01.07.2003 22.07.2003 09.08.2004

<u>Loc. No</u>	<u>Locality</u>	<u>Coordinate</u>	<u>Altitude (m.)</u>	<u>Habitat</u>	<u>Collecting Date</u>
35	Kastamonu-Küre-Ersizlerdere	41° 45' 25" N 33° 45' 25" E	1560	<i>Abies</i> and <i>Pinus</i> (Pinaceae) forest, <i>Quercus</i> forest	01.07.2003 23.07.2003 10.08.2004
36	Kastamonu-Şenpazar-İsırganlı mountain	41° 46' 15" N 33° 12' 45" E	950	<i>Abies</i> (Coniferae), <i>Pinus</i> (Pinaceae) forest and meadow	17.07.2003 13.07.2004 13.08.2004 24.09.2004
37	Zonguldak-Ereğli	41° 20' 20" N 31° 25' 55" E	10	<i>Rubus</i> (Rosaceae), <i>Corylus</i> (Corylaceae), Labitacea, meadow	03.09.2003
38	Kastamonu-Azdavay-Kirazdağı şefliği	41° 41' 10" N 33° 17' 25" E	950	Mix forest and meadow	05.09.2003 30.08.2004
39	Kastamonu-Azdavay-Valla kanyonu	41° 38' 20" N 33° 05' 10" E	1100	<i>Salix</i> (Salicaceae), orchard, meadow	05.09.2003 06.06.2004
40	Sinop-Ayancık-Akgöl	41° 48' 15" N 34° 41' 15" E	15	<i>Populus</i> (Salicaceae), <i>Rubus</i> (Hypericaceae)	06.09.2003
41	Sinop-Yeniçam	41° 50' 20" N 34° 59' 20" E	25	<i>Populus</i> (Salicaceae), <i>Rubus</i> (Hypericaceae)	06.09.2003
42	Sinop-Ayancık-Bakırlızaviye	41° 43' 10" N 34° 45' 45" E	10	Mix forest, <i>Senesio sp.</i> (Asteraceae)	06.09.2003 15.07.2004
43	Sinop-Boyabat-Yabanlı	41° 25' 55" N 34° 44' 30" E	450	<i>Beta vulgaris</i> (Chenopodiaceae) and meadow	07.09.2003
44	Sinop-Demirci	41° 40' 50"N 35° 20' 05"E	21	Meadow.	07.09.2003
45	Bartın-Sipahiler-Kayadibi	41° 33' 20" N 32° 30' 25" E	1250	<i>Abies</i> and <i>Pinus</i> (both Pinaceae) forest	12.07.2004
46	Sinop-Erfelek-Kadiyırak-Göldağı tepesi	41° 43' 55" N 35° 10' 30" E	1200	Abies and <i>Pinus</i> (both Pinaceae) forest	14.07.2004 15.08.2004 25.09.2004
47	Çorum-Kargı-Sarayıkdağı	41° 01' 05" N 35° 04' 25" E	1600	<i>Quercus</i> (Fagaceae), <i>Abies</i> and <i>Pinus</i> (both Pinaceae) forest	15.07.2004 16.08.2004
48	Kastamonu-Tosya-Tosya dağı	41° 01' 55" N 33° 56' 15" E	1480	<i>Abies</i> (Pinaceae), <i>Quercus</i> (Fagaceae) forest	16.07.2004 17.08.2004 26.09.2004
49	Çankırı-Çerkeş-Yoncalı	40° 40' 25" N 33° 13' 50" E	1900	Meadow	17.07.2004 19.08.2004 27.09.2004
50	Karabük-Safranbolu-Akören	41° 19' 45" N 32° 50' 40" E	840	<i>Quercus</i> (Fagaceae), <i>Pinus</i> (Pinaceae), meadow	18.07.2004 20.08.2004 28.09.2004

Discussion and Conclusion:

In the present study carried out in Western Black Sea Region 218 Heteroceran species belonging to 166 genera within 12 families were identified from 50 localities (Fig. 1, Tab. 1, 2): (Pyrilidae, 13 genera and 14 species; Zygaenidae, 1 genus and 3 species; Limacodidae, 1 genus and 1 species; Thyatiridae, 3 genera and 4 species; Geometridae, 48 genera and 76 species; Lasiocampidae, 3 genera and 3 species; Sphingidae, 10 genera and 12 species; Notodontidae, 10

genera and 10 species; Lymantriidae, 2 genera and 2 species; Arctiidae, 13 genera and 13 species; Ctenuchidae, 2 genera and 2 species; Noctuidae, 60 genera and 78 species). 47 of these species are first records for the region (Tab. 2).

Paralanta pandalis, *Phlyctaenia coronata*, *Clostera anastomosis* and *Diacrisia Sannio* were recorded so far in Turkey from only one locality for each (Bursa, Bursa, Bilecik and Tokat, respectively) and *Mimas tilia* was recorded only from two localities (Konya, Istanbul). The present records of these species within the study area thus expanded the boundaries of their distributional ranges.

Table 2. Distribution of the heteroceran species identified in the study area.

* The first record for Western Black Sea Region.

Families and Species	Localities where the species were collected and the numbers and sexes of specimens collected
PYRALIDAE	
1. <i>Thisanotia chrysonuchella</i> (Scopoli, 1763) *	Loc.24, 1♂.
2. <i>Evergestis frumentalis</i> (Linnaeus, 1761) *	Loc.13, 2 ♀♀.
3. <i>Pyrausta sanguinalis</i> (Linnaeus, 1767) *	Loc.16, 1♀.
4. <i>Pyrausta aurata</i> (Scopoli, 1763)	Loc.2, 1♂; Loc.15, 1♂; Loc.20 2♂♂; Loc.33, 4♂♂; Loc.34, 1♂; Loc.35. 1♂.
5. <i>Loxostege sticticalis</i> (Linnaeus, 1761) *	Loc.15, 1♂.
6. <i>Sitochroa palealis</i> (Denis&Schifferrmüller, 1775)	Loc.42, 2♀♀.
7. <i>Paratalanta pandalis</i> (Hübner, 1825) *	Loc.12, 1♂; Loc.32, 2♀♀, 4♂♂.
8. <i>Eurrhyncha hortulata</i> (Linnaeus, 1758)	Loc.24, 1♂.
9. <i>Phlyctaenia coronata</i> (Hufnagel, 1767) *	Loc.18, 1♂.
10. <i>Ebulea crocealis</i> (Hübner, 1796) *	Loc.12, 1♀; Loc.17, 1♂; Loc.33, 7♂♂, 1♀.
11. <i>Pleuroptya ruralis</i> (Scopoli, 1763)	Loc.20, 1♂; Loc.21, 1♀; Loc.29, 1♀.
12. <i>Synaphe moldavica</i> Esper, 1794 *	Loc.17, 2♀♀; Loc.20, 1♂; Loc.26, 1♂; Loc.28, 1♂; Loc.31, 2♂♂.
13. <i>Pyralis farinalis</i> (Linnaeus, 1758) *	Loc.32, 1♂.
14. <i>Oncocera semirubella</i> (Scopoli, 1763)	Loc.47, 1♀.
ZYGAENIDAE	
15. <i>Zygaena purpuralis</i> (Brünnich, 1763)	Loc.12, 1♀, 1♂.
16. <i>Zygaena loti</i> (Denis&Schifferrmüller, 1775)	Loc.12, 1♂.
17. <i>Zygaena filipendulae</i> (Linnaeus, 1758)	Loc.27, 2♂♂.
LIMACODIDAE	
18. <i>Apoda limocodes</i> (Hufnagel, 1766) *	Loc.1, 2♀♀, 1♂.
THYATIRIDAE	
19. <i>Thyatira batis</i> (Linnaeus, 1758)	Loc.24, 1♀, 1♂.
20. <i>Habrosyne pyrithoides</i> (Hufnagel, 1766)	Loc.33, 3♀♀, 19♂♂.
21. <i>Tethea ocularis</i> (Linnaeus, 1767)	Loc.24, 2♂♂; Loc.33, 2♀♀.
22. <i>Tethea or</i> (Goeze, 1781)	Loc.36, 1♂.
GEOMETRIDAE	
23. <i>Aplasta ononaria</i> (Fuessly, 1783)	Loc.2, 1♀, 3♂♂; Loc.31, 1♀, 4♂♂.
24. <i>Pseudoterpnina pruinata</i> (Hufnagel, 1767)	Loc.15, 1♀.
25. <i>Comibaena bajularia</i> (Denis&Schifferrmüller, 1775)	Loc.1, 1♀, 2♂♂; Loc.33, 2♂♂; Loc.35, 1♀; Loc.36, 1♀;
26. <i>Jodis lactearia</i> (Linnaeus, 1758)	Loc.35, 1♀, 2♂♂.
27. <i>Hemitea aestivaria</i> (Hübner 1799)	Loc.1, 1♂.
28. <i>Chlorissa viridata</i> (Linnaeus, 1758)	Loc. 28, 1♂.
29. <i>Chlorissa cloraria</i> (Hübner, 1813)	Loc.4, 1♂.
30. <i>Cleta filacearia</i> Herrich-Schäffer, 1847	Loc.12, 3♂♂.

Families and Species	Localities where the species were collected and the numbers and sexes of specimens collected
31. <i>Idaea rufaria</i> (Hübner, 1827)	Loc.2, 1♀; Loc.10, 1♀; Loc.17, 2♀♀, 4♂♂; Loc.18, 1♀, 3♂♂; Loc.19, 7♀♀, 4♂♂; Loc.24, 1♀, 5♂♂; Loc.28, 1♂; Loc.31, 1♀, 3♂♂; Loc.32, 4♀♀, 2♂♂; Loc.35, 4♂♂; Loc.47, 1♀, 2♂♂; Loc.48, 1♀, 1♂.
32. <i>Idaea ochrata</i> (Scopoli, 1763)	Loc.3, 1♂; Loc.26, 1♀; Loc.32, 2♀♀; Loc.34, 1♀; Loc.35, 1♀; Loc.37, 1♂; Loc.50, 2♀♀.
33. <i>Idaea moniliata</i> (Denis&Schiffermüller, 1775)	Loc.21, 1♂; Loc.34, 1♂.
34. <i>Idaea dilutaria</i> (Hübner, 1799)	Loc.1, 1♀, 1♂; Loc.21, 1♂.
35. <i>Idaea fuscovenosata</i> (Goeze, 1781)	Loc.31, 1♀.
36. <i>Idaea humiliata</i> (Hufnagel, 1767)	Loc.12, 2♂♂; Loc.19, 4♀♀, 3♂♂; Loc.21, 15♂♂; Loc.26, 1♂; Loc.31, 1♀, 8♂♂; Loc.32, 5♀♀, 1♂; Loc.33, 4♂♂; Loc.34, 1♀, 2♂♂; Loc.48, 1♂;
37. <i>Idaea subsericea</i> (Haworth, 1809)	Loc.2, 1♂.
38. <i>Idaea politaria</i> (Hübner, 1799)	Loc.16, 1♀; Loc.34, 2♂♂.
39. <i>Idaea dimidiata</i> (Hufnagel, 1767)	Loc.4, 1♂; Loc.16, 1♀; Loc.24, 1♀.
40. <i>Idaea trigeminata</i> (Haworth, 1809)	Loc.21, 2♂♂; Loc.31, 2♂♂.
41. <i>Idaea aversata</i> (Linnaeus, 1758)	Loc.14, 1♀; Loc.1, 5♀♀, 2♀♀.
42. <i>Scopula immorata</i> (Linnaeus, 1758)	Loc.10, 2♂♂; Loc.11, 1♂; Loc.12, 5♀♀, 6♂♂; Loc.23, 2♀♀, 6♂♂;
43. <i>Scopula nigropunctata</i> (Hufnagel, 1767)	Loc.2, 1♂; Loc.28, 1♀; Loc.33, 4♀♀, 2♂♂.
44. <i>Scopula rubiginata</i> (Hufnagel, 1767)	Loc.3, 1♂; Loc.34, 1♂; Loc.36, 2♂♂.
45. <i>Rhodostrophia discopunctata</i> Amsel, 1935	Loc.3, 1♂; Loc.17, 3♂♂; Loc.18, 1♀, 1♂; Loc.27, 2♂♂; Loc.31, 5♀♀, 2♂♂; Loc.32, 3♀♀, 2♂♂.
46. <i>Rhodostrophia vibicaria</i> (Clerck, 1759)	Loc.1, 2♂♂; Loc.28, 1♂; Loc.33, 5♂♂; Loc.48, 1♂.
47. <i>Timandra comae</i> Schmidt, 1931	Loc.30, 1♀, 1♂.
48. <i>Cyclophora linearia</i> (Hübner, 1799)	Loc.35, 1♀, 4♂♂.
49. <i>Lytria purpuraria</i> (Linnaeus, 1758)	Loc.7, 1♀; Loc.27, 2♂♂; Loc.43, 1♂.
50. <i>Cataclysmes riguata</i> (Hübner, 1813)	Loc.32, 1♀, 1♂.
51. <i>Scotopteryx luridata</i> (Hufnagel, 1767)	Loc.2, 1♂; Loc.18, 2♀♀; Loc.24, 1♂; Loc.31, 1♀; Loc.33, 6♂♂; Loc.48, 6♂♂.
52. <i>Scotopteryx mucronata</i> (Scopoli, 1763)	Loc.23, 1♂.
53. <i>Xanthorhoe ferrugata</i> (Clerck, 1759)	Loc.21, 2♂♂.
54. <i>Xanthorhoe montanata</i> (Denis&Schiffermüller, 1775)	Loc.12, 2♂♂; Loc.13, 2♀♀; Loc.22, 1♂; Loc.23, 4♀♀, 12♂♂; Loc.24, 1♀, 4♂♂; Loc.33, 1♀, 13♂♂; Loc.36, 1♂.
55. <i>Camptogramma bilineata</i> (Linnaeus, 1758)	Loc.12, 1♀, 1♂; Loc.17, 2♂♂; Loc.31, 1♂; Loc.48, 1♂.
56. <i>Cosmorhoe ocellata</i> (Linnaeus, 1758)	Loc.15, 1♀; Loc.24, 1♂; Loc.33, 1♂.
57. <i>Dysstroma citrata</i> (Linnaeus, 1767)	Loc.12, 8♂♂; 7♀♀.
58. <i>Dysstroma truncata</i> (Hufnagel, 1767)	Loc.33, 3♀♀, 4♂♂.
59. <i>Cidaria fulvata</i> (Forster, 1771)	Loc.45, 1♂; Loc.48, 2♂♂.
60. <i>Thera obeliscata</i> (Hübner, 1787)	Loc.12, 2♀♀, 1♂; Loc.23, 2♂♂; Loc.24, 8♂♂; Loc.33, 4♀♀, 3♂♂; Loc.35, 1♂; Loc.40, 1♂; Loc.46, 1♀.
61. <i>Colostigia pectinaria</i> (Knoch, 1781)	Loc.23, 4♂♂; Loc.48, 2♂♂; Loc.49, 1♂.
62. <i>Pasiphila chloerata</i> (Mabille, 1870)	Loc.33, 1♂.
63. <i>Eupithecia tantillaria</i> Boisduval, 1840	Loc.33, 1♀, 1♂.
64. <i>Eupithecia centaureata</i> (Denis&Schiffermüller, 1775)	Loc.47, 1♀.
65. <i>Eupithecia orpnata</i> Petersen, 1909	Loc.33, 1♀.
66. <i>Eupithecia denotata</i> (Hübner, 1813)	Loc.12, 1♂; Loc.24, 1♂.

Families and Species	Localities where the species were collected and the numbers and sexes of specimens collected
67. <i>Eupithecia subfuscata</i> (Haworth, 1809)	Loc.33, 1♀.
68. <i>Anaitis plagiata</i> (Linnaeus, 1758)	Loc.12, 1♂.
69. <i>Anaitis annexata</i> (Freyer [1830])	Loc.12, 2♂♂.
70. <i>Anaitis uniformata</i> (Scopoli, 1763)	Loc.24, 1♂.
71. <i>Asthenes candidata</i> ([Denis&Schifferrmüller]; 1775)	Loc.28, 3♂♂; Loc.34, 1♂.
72. <i>Asthenes albulata</i> (Hufnagel, 1767)	Loc.4, 4♀♀, 10♂♂; Loc.28, 2♂♂; Loc.32, 1♀; Loc.34, 2♂♂.
73. <i>Minoa murinata</i> (Scopoli, 1763)	Loc.33, 1♀; Loc.47, 1♂.
74. <i>Abraxas sylvata</i> (Scopoli, 1763)	Loc.4, 1♂.
75. <i>Chiasmia aestimaria</i> (Hübner, 1809)	Loc.4, 1♂.
76. <i>Lomaspilis bithynica</i> Wehrli, 1954	Loc.4, 1♀, 1♂; Loc.18, 1♂; Loc.19, 1♀, 2♂♂; Loc.21, 1♂; Loc.24, 1♀, 1♂; Loc.28, 1♂; Loc.33, 12♀♀, 5♂♂.
77. <i>Semiothisa notata</i> (Linnaeus, 1758)	Loc.35, 1♂.
78. <i>Semiothisa glarearia</i> Brahm, 1791	Loc.32, 1♀.
79. <i>Semiothisa liturata</i> (Clerck, 1759)	Loc.12, 1♀; Loc.24, 1♂; Loc.36, 1♂.
80. <i>Opistograptis luteolata</i> (Linnaeus, 1758)	Loc.8, K 1♂; Loc.12, 1♀.
81. <i>Asovia maeticaria</i> (Alpheraky, 1856)	Loc.2, 6♂♂; Loc.24, 1♂; Loc.33, 1♂.
82. <i>Pseudopanthera macularia</i> (Linnaeus, 1758)	Loc.12, 1♀; Loc.33, 1♀.
83. <i>Selenia lunularia</i> (Hübner, 1788)	Loc.1, 1♂.
84. <i>Eilicrinia trinotata</i> Mentzer, 1845	Loc.36, 1♀.
85. <i>Parectropis similaria</i> (Hufnagel, 1767)	Loc.4, 1♂.
86. <i>Biston betularia</i> (Linnaeus, 1758)	Loc.1, 1♂; Loc.24, 1♂; Loc.47, 1♂; Loc.49, 1♂.
87. <i>Peribatodes gemmaria</i> (Brahm, 1791)	Loc.12, 1♂; Loc.27, 1♀.
88. <i>Peribatodes rhomboidaria</i> (Denis&Schifferrmüller, 1775)	Loc.12, 1♂; Loc.28, 1♀.
89. <i>Alcis repandata</i> (Linnaeus, 1758)	Loc.33, 1♂; Loc.47, 1♂.
90. <i>Cleorodes lichenaria</i> (Hufnagel, 1767)	Loc.8, 1♂.
91. <i>Ematurga atomaria</i> Linnaeus, 1758	Loc.1, 1♂; Loc.2, 5♂♂; Loc.3, 1♂; Loc.12, 2♂♂; Loc.14, 1♂; Loc.18, 1♀; Loc.21, 1♀; Loc.25, 2♀♀; Loc.28, 2♀♀, 2♂♂; Loc.29, 8♂♂; Loc.33, 1♂; Loc.34, 3♀♀, 5♂♂; Loc.36, 1♂; Loc.40, 1♀; Loc.41, 2♀♀; Loc.42, 1♀.
92. <i>Fritzwagneria waltheri</i> Wagner, 1919	Loc.8, 1♂; Loc.32, 1♀; Loc.45, 1♀.
93. <i>Selidosema plumaria</i> (Denis&Schifferrmüller, 1775)	Loc.38, 1♂.
94. <i>Cabera exanthemata</i> (Scopoli, 1763)	Loc.12, 1♂; Loc.28, 1♂; Loc.33, 3♀♀; Loc.35, 3♀♀.
95. <i>Cabera pusaria</i> (Linnaeus, 1758)	Loc.2, 1♂; Loc.6, 2♀♀; Loc.11, 1♂; Loc.20, 2♀♀, 2♂♂; Loc.21, 3♀♀, 3♂♂; Loc.28, 1♂; Loc.33, 1♀; Loc.34, 1♂.
96. <i>Campaea margaritata</i> (Linnaeus, 1767)	Loc.33, 1♂.
97. <i>Pungeleria capreolaria</i> (Denis&Schifferrmüller, 1775)	Loc.34, 1♀.
98. <i>Hylaea fasciaria</i> (Linnaeus, 1758)	Loc.24, 1♂.
LASIOCAMPIDAE	
99. <i>Lasiocampa quercus</i> (Linnaeus, 1758) *	Loc.36, 1♀.
100. <i>Eriogaster lanestris</i> (Linnaeus, 1758)	Loc.36, 1♀, 1♂.
101. <i>Dendrolimus pini</i> (Linnaeus, 1758)	Loc.24, 4♂♂; Loc.35, 2♂♂; Loc.36, 2♂♂.
SPHINGIDAE	
102. <i>Agrius convolvuli</i> (Linnaeus, 1758)	Loc.36, 1♂.
103. <i>Sphinx ligustri</i> Linnaeus, 1758 *	Loc.33, 2♂♂.

Families and Species	Localities where the species were collected and the numbers and sexes of specimens collected
104. <i>Sphinx pinastri</i> (Linnaeus, 1758) *	Loc.35. 4♂♂.
105. <i>Marumba quercus</i> ([Denis&Schifferrmüller], 1775) *	Loc.35, 1♀, 1♂.
106. <i>Smerinthus ocellatus</i> (Linnaeus, 1758) *	Loc.35. 1♂.
107. <i>Mimas tiliae</i> (Linnaeus, 1758) *	Loc.35, 1♀, 1♂.
108. <i>Laothoe populi</i> (Linnaeus, 1758) *	Loc.36, 1♂.
109. <i>Hemaris fuciformis</i> (Linnaeus, 1758) *	Loc.24, 2♂♂.
110. <i>Macroglossum stellatarum</i> (Linnaeus, 1758)	Loc.22, 1♀; Loc.24, 2♂♂.
111. <i>Proserpinus proserpinus</i> (Pallas, 1772) *	Loc.45, 1♀.
112. <i>Hyles euphorbiae</i> (Linnaeus, 1758) *	Loc.34, 2♂♂.
113. <i>Hyles nicaea</i> (de Prunner, 1798) *	Loc.35, 2♂♂.
NOTODONTIDAE	
114. <i>Phalera bucephala</i> (Linnaeus, 1758)	Loc.8, 1♂; Loc.36, 1♂; Loc.33, 1♂; Loc.46, 1♀, 1♂.
115. <i>Furcula furcula</i> (Fischer von Waldheim, 1820)	Loc.1, 1♂.
116. <i>Stauropus fagi</i> (Linnaeus, 1758)	Loc.15, 1♂; Loc.33, 2♂♂.
117. <i>Notodonta tritopha</i> (Denis&Schifferrmüller, 1775)	Loc.36, 1♂.
118. <i>Drymonia querna</i> (Denis&Schifferrmüller, 1775)	Loc.1, 2♂♂; Loc.33, 2♀♀.
119. <i>Pheosia tremula</i> (Clerck, 1759)	Loc. 1♂; Loc.36, 3♂♂; Loc.47, 1♂.
120. <i>Pterostoma palpinum</i> (Clerck, 1759)	Loc.2, 2♂♂; Loc.33, 2♂♂.
121. <i>Spatalia argentina</i> (Denis&Schifferrmüller, 1775)	Loc.1, 1♂.
122. <i>Clostera anastomosis</i> (Linnaeus, 1758) *	Loc.1, 2♂.
123. <i>Rhegmaphila alpina</i> (Bellier de la Chavignerie, 1881)	Loc.33, 1♂; Loc.47, 1♂; Loc.49, 1♂.
LYMANTRIIDAE	
124. <i>Lymantria dispar</i> (Linnaeus, 1758)	Loc.4, 2♀♀, 3♂♂; Loc.25, 3♂♂.
125. <i>Euproctis chrysorrhoea</i> (Linnaeus, 1758)	Loc. 11, 2♀♀, 1♂.
ARCTIIDAE	
126. <i>Atolmis rubricollis</i> (Linnaeus, 1758)	Loc.24, 1♀, 10♂♂; Loc.33, 1♀.
127. <i>Lithosia quadra</i> (Linnaeus, 1758)	Loc.4, 3♂♂.
128. <i>Eilema complana</i> (Linnaeus, 1758)	Loc.36, 1♀.
129. <i>Eilema sororcula</i> (Hufnagel, 1766) *	Loc.1, 4♀♀, 3♂♂; Loc.24, 1♀, 3♂♂.
130. <i>Spilarctia lutea</i> (Hufnagel, 1766) *	Loc.2, 1♂.
131. <i>Spilosima lubricipedum</i> (Linnaeus, 1758)	Loc.24, 1♂.
132. <i>Diaphora mendica</i> (Clerck, 1759) *	Loc.2, 1♀.
133. <i>Rhyparia purpurata</i> (Linnaeus, 1758)	Loc.32, 1♀, 1♂.
134. <i>Diacrisia sannio</i> (Linnaeus, 1758) *	Loc.33, 2♂♂.
135. <i>Spiris striata</i> (Linnaeus, 1758)	Loc.44, 3♂♂.
136. <i>Arctia villica</i> (Linnaeus, 1758)	Loc.2, 6♂♂.
137. <i>Callimorpha dominula</i> (Linnaeus, 1758)	Loc.33, 1♀.
138. <i>Tyria jacobaeae</i> (Linnaeus, 1758)	Loc.16, 1♂.
CTENUCHIDAE	
139. <i>Syntomis phegea</i> (Linnaeus, 1758) *	Loc.1, 1♀.
140. <i>Dysauxes ancilla</i> (Linnaeus, 1758) *	Loc.33, 2♂♂.
NOCTUIDAE	

Families and Species	Localities where the species were collected and the numbers and sexes of specimens collected
141. <i>Euxoa conspicua</i> (Hübner, [1824])	Loc.12, 1♂; Loc.46, 1♀, 1♂.
142. <i>Agrotis segetum</i> (Denis&Schifferrmüller, 1775)	Loc.5, 1♂; Loc.20, 1♀.
143. <i>Agrotis clavis</i> (Hufnagel, 1766) *	Loc.36, 1♀.
144. <i>Agrotis exclamationis</i> (Linnaeus, 1758)	Loc.32, 2♂♂; Loc.33, 2♀♀, 14♂♂.
145. <i>Agrotis ipsilon</i> (Hufnagel, 1766)	Loc.33, 1♀.
146. <i>Agrotis desertorum</i> Boisduval , 1840	Loc.49, 1♀, 1♂.
147. <i>Agrotis puta</i> (Hübner, 1803)	Loc.24, 1♀.
148. <i>Dichagyris celsicola</i> (Bellier, 1859) *	Loc.41, 1♂.
149. <i>Ochropleura plecta</i> (Linnaeus, 1761) *	Loc.33, 1♀, 2♂♂.
150. <i>Axylia putris</i> (Linnaeus, 1761)	Loc.1, 1♂.
151. <i>Noctua pronuba</i> (Linnaeus, 1758)	Loc.24, 3♀♀; Loc.32, 1♀; Loc.33, 1♀, 2♂♂.
152. <i>Noctua orbona</i> (Hufnagel, 1766)	Loc.24, 1♂; Loc.47, 1♂.
153. <i>Noctua fimbriata</i> (Schreber, 1759)	Loc.24, 1♀, 5♂♂; Loc.33, 1♀; Loc.36, 1♂; Loc.47, 1♂; Loc.49, 1♀, 1♂.
154. <i>Noctua janthina</i> (Denis&Schifferrmüller, 1775)	Loc.1, 1♂; Loc.24, 1♀.
155. <i>Peridroma saucia</i> (Hübner, 1803)	Loc.36, 1♀.
156. <i>Xestia c-nigrum</i> (Linnaeus, 1758) *	Loc.33, 1♂; Loc.50, 1♀.
157. <i>Anaplectoides prasina</i> (Denis&Schifferrmüller, 1775)	Loc.24, 1♂, 1♀; Loc.33, 1♂.
158. <i>Hadula mendax</i> (Staudinger, 1879)	Loc.33, 2♀♀, 2♂♂;
159. <i>Hada plebeja</i> (Hufnagel, 1761)	Loc.33, 3♀♀, 3♂♂.
160. <i>Polia nebulosa</i> (Hufnagel, 1766)	Loc.21, 1♂; Loc.24, 4♂♂; Loc.33, 2♂♂; Loc.36, 2♀♀, 6♂♂; Loc.45, 1♀, 3♂♂; Loc.46, Loc.47, 3♀♀, 4♂♂; Loc.48, 1♀, 2♂♂; Loc.49, 3♀♀, 12♂♂; Loc.50, 5♀♀, 7♂♂.
161. <i>Heliophobus reticulata</i> (Goeze, 1781)	Loc.33, 1♀; Loc.45, 1♂.
162. <i>Lacanobia contigua</i> (Denis&Schifferrmüller, 1775)	Loc.47, 1♂.
163. <i>Lacanobia w-latinum</i> (Hufnagel, 1766)	Loc.1, 2♀♀, 3♂♂; Loc.4, 1♀, 1♂; Loc.32, 3♀♀, 3♂♂; Loc.33, 1♀, 3♂♂; Loc.46, 1♀; Loc.47, 1♂.
164. <i>Lacanobia thalassina</i> (Hufnagel, 1766)	Loc.24, 1♀; Loc.33, 2♂♂; Loc.45, 1♂.
165. <i>Lacanobia oleracea</i> (Linnaeus, 1758)	Loc.1, 1♂; Loc.2, 1♀; Loc.24, 1♂; Loc.33, 1♀.
166. <i>Melanchra persicariae</i> (Linnaeus, 1761)	Loc.4, 1♀.
167. <i>Hadena magnolii</i> (Boisduval, 1829)	Loc.32, 1♀.
168. <i>Hadena compta</i> (Denis&Schifferrmüller, 1775)	Loc.33, 2♂♂.
169. <i>Mythimna ferrago</i> (Fabricius, 1787)	Loc.46, 1♂.
170. <i>Mythimna albipuncta</i> (Denis&Schifferrmüller, 1775)	Loc.1, 3♀♀, 1♂.
171. <i>Mythimna vitellina</i> (Hübner, 1808)	Loc.32, 1♂; Loc.33, 3♀♀, 2♂♂; Loc.46, 1♀.
172. <i>Mythimna l-album</i> (Linnaeus, 1767)	Loc.24, 2♀♀.
173. <i>Leucania comma</i> (Linnaeus, 1761)	Loc.33, 1♀, 7♂♂; Loc.36, 1♂; Loc.45, 1♂.
174. <i>Brachylomia viminalis</i> (Fabricius, 1776)	Loc.46, 1♂.
175. <i>Lamprosticta culta</i> (Denis&Schifferrmüller, 1775)	Loc.4, 1♂; Loc.33, 1♂.
176. <i>Aporophyla canescens</i> (Duponchel, 1826) *	Loc.2, 2♂♂.
177. <i>Lithophane socia</i> (Hufnagel, 1766)	Loc.24, 1♂.
178. <i>Dryobotodes eremita</i> (Fabricius, 1775) *	Loc.36, 1♀.

Families and Species	Localities where the species were collected and the numbers and sexes of specimens collected
179. <i>Minioptera adusta</i> (Esper, 1790) *	Loc.33, 1♂.
180. <i>Cucullia lychnitis</i> (Rambur, 1833)	Loc.36, 1♂.
181. <i>Acronicta rumicis</i> (Linnaeus, 1758)	Loc.4, 2♂♂.
182. <i>Xanthia sulphurago</i> ([Denis&Schifferrmüller], 1775)	Loc.12, 1♂.
183. <i>Xanthia icteritia</i> (Hufnagel, 1766)	Loc.36, 1♀.
184. <i>Amphipyra pyramida</i> (Linnaeus, 1758)	Loc.33, 1♂.
185. <i>Rusina ferruginea</i> (Esper, 1785)	Loc.1, 1♂.
186. <i>Polyphaenis viridis</i> (De Villers, 1789) *	Loc.50, 1♂.
187. <i>Thalpophila matura</i> (Hufnagel, 1766)	Loc.42, 1♂.
188. <i>Trachea atriplicis</i> (Linnaeus, 1758)	Loc.15, 1♂.
189. <i>Dicycla oo</i> (Linnaeus, 1758) *	Loc.47, 1♀.
190. <i>Cosmia trapezina</i> (Linnaeus, 1758)	Loc.24, 1♀, 3♂♂; Loc.33, 1♀, 1♂.
191. <i>Apamea monoglypha</i> (Hufnagel, 1766)	Loc.1, 1♂; Loc.32, 2♂♂; Loc.33, 2♂♂; Loc.46, 3♀♀, 4♂♂; Loc.47, 1♀, 6♂♂; Loc.49, 1♂; Loc.50, 1♀, 3♂♂.
192. <i>Oligia strigilis</i> Hübner, [1821] *	Loc.1, 2♂♂; Loc.2, 1♂; Loc.33, 1♀, 1♂.
193. <i>Caradrina morpheus</i> (Hufnagel, 1766)	Loc.1, 1♂; Loc.24, 1♂.
194. <i>Caradrina clavipalpis</i> (Scopoli, 1763) *	Loc.24, 1♂.
195. <i>Hoplodrina octogenaria</i> (Goeze, 1781)	Loc.32, 1♀, 1♂; Loc.33, 3♂♂.
196. <i>Charanyca trigrammica</i> (Hufnagel, 1766) *	Loc.1, 1♂; Loc.4, 1♂; Loc.24, 2♂♂; Loc.33, 6♂♂; Loc.36, 2♂♂.
197. <i>Helicoverpa armigera</i> (Hübner, 1805)	Loc.36, 2♀♀, 2♂♂; Loc.41, 1♀.
198. <i>Emmelia trabealis</i> (Scopoli, 1763)	Loc.30, 1♀.
199. <i>Acontia lucida</i> (Hufnagel, 1766) *	Loc.45, 1♂.
200. <i>Earias clorana</i> (Linnaeus, 1761)	Loc.4, 1♂.
201. <i>Bena bicolorana</i> (Fuessly, 1775) *	Loc.1, 1♀.
202. <i>Panthea coenobita</i> (Esper, 1785)	Loc.24, 1♂; Loc.45, 1♂.
203. <i>Diachrysis chrysis</i> (Linnaeus, 1758)	Loc.33, 1♂.
204. <i>Macdunnoughia confusa</i> (Stephens, 1850)	Loc.4, 1♀.
205. <i>Abrostola triplasia</i> (Linnaeus, 1759)	Loc.24, 1♀; Loc.33, 2♀♀.
206. <i>Autographa gamma</i> (Linnaeus, 1758)	Loc.12, 1♂; Loc.25, 1♀; Loc.41, 1♀, 2♂♂; Loc.47, 1♂.
207. <i>Autographa jota</i> (Linnaeus, 1758)	Loc.24, 1♂.
208. <i>Trichoplusia ni</i> (Hübner, [1803]) *	Loc.33, 2♀♀, 1♂; Loc. 24, 2♂♂.
209. <i>Chrysodeixis chalcites</i> (Esper, 1789) *	Loc.24, 1♂.
210. <i>Catocala elocata</i> (Esper, 1787) *	Loc.19, 1♂.
211. <i>Dysogonia algira</i> (Linnaeus, 1767) *	Loc.4, 1♀.
212. <i>Euclidia glyphia</i> (Linnaeus, 1758)	Loc.14, 1♀; Loc.18, 1♀.
213. <i>Aedia funesta</i> (Esper, 1786) *	Loc.14, 1♀.
214. <i>Tyta luctuosa</i> (Denis&Schifferrmüller, 1775)	Loc.20, 1♂; Loc.32, 1♂.
215. <i>Laspeyria flexula</i> (Denis&Schifferrmüller, 1775)	Loc.33, 1♀.
216. <i>Phytometra viridaria</i> (Clerck, 1759)	Loc.34, 1♂.
217. <i>Trisateles emortalis</i> (Denis&Schifferrmüller, 1775)	Loc.35, 1♀, 1♂.
218. <i>Paracolax tristalis</i> (Fabricius, 1794)	Loc.36, 1♀.

Acknowledgements: This study was supported by Trakya University Scientific Research Foundation (TUBAP) (Project #486).

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