



Contributions to the fauna of Türkiye geometridae

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ABSTRACT

The Geometridae is one of the most populous families in terms of the number of species in the order Lepidoptera. It is known to have more than 23.000 species worldwide. Geometridae species cause damage to forest trees, but it has been reported that they also cause damage to cultivated plants in studies. This research was carried out in Türkiye's Central Black Sea Region (Amasya, Çorum, Ordu, Samsun, Sinop, Tokat, and Yozgat) in 2017 and 2018 years. Adult specimens of Geometridae were collected using an insect net and a light trap in the study region. Obtained specimens were prepared according to standard museum methods for butterflies and prepared genitalia structures. As a result of the study, five subfamilies (Ennominae, Geometrinae, Larentiinae, Orthostixinae, Sterrhinae), 36 genera, and 48 species were determined. Also in this paper, the examined materials and adult photographs of the species are given. This study provides new information about the zoogeographic distribution of Geometridae species identified in the research area.

Keywords: Geometridae, fauna, lepidoptera, Türkiye.

1. INTRODUCTION

Geometridae is one of the crowded moth families of the order Lepidoptera. Eggs are generally laid under the leaves of the host plant by adult female species. Geometridae larvae are generally polyphagous and cause damage to forest trees. However, in recent studies, it has been reported that it also damages cultivated plants (almond, olive, citrus, corn, sorghum).¹ Species spend the pupal stage in the soil and then emerges as an adult. Adults feed on water and pollen, which benefit pollination due to feeding behavior.

Türkiye Geometridae faunasına katkılar

ÖZ

Geometridae, Lepidoptera takımının tür sayısı bakımından kalabalık familyalarından biridir. Dünyada 23.000' den fazla türü olduğu bilinmektedir. Geometridae türleri orman ağaçlarında zarar yapmaktadır ancak yapılan çalışmalarda kültür bitkilerinde de zarar yaptığı bildirilmiştir. Bu çalışma 2017 ve 2018 yıllarında Türkiye'nin orta Karadeniz bölgesinde (Amasya, Çorum, Ordu, Samsun, Sinop, Tokat, Yozgat) yapılmıştır. Çalışmada ergin Geometridae örnekleri atrap ve ışık tuzağı kullanılarak toplanmıştır. Elde edilen örnekler kelebekler için standart müze yöntemlerine göre hazırlanmış ve genital yapılar hazırlanmıştır. Çalışmanın sonucunda beş alt familya (Ennominae, Geometrinae, Larentiinae, Orthostixinae, Sterrhinae), 36 cins ve 48 tür tespit edilmiştir. Ayrıca bu makalede, türlere ait incelenen materyaller ve ergin fotoğrafları verilmiştir. Bu çalışma, araştırma bölgesinde tespit edilen Geometridae türlerinin zoocoğrafik yayılışı hakkında yeni bilgileri sunmaktadır.

Anahtar kelimeler: Geometridae, fauna, lepidoptera, Türkiye

Geometridae adults and larvae adapt well to their natural environments like soil, sand, tree trunks, and branches. Species have some different coloration called cryptic coloration and their situation benefits hiding from natural enemies in their habitats. The larvae remain motionless until the danger has passed.

Geometridae species are distributed in different habitats. It has been observed that some species distribute at above 2000 m in the Black Sea region of Türkiye.² Geometridae

species are generally active at night (nocturnal), and some species are active during the day (diurnal).

In recent years, studies have been conducted in different regions of Türkiye related to the family Geometridae. Some previous studies on moths in the Black Sea region are as follows.³⁻¹² According to¹³ 687 species of Geometridae are distributed in Türkiye. *Eupithecia nemrutica* (Seven, Mironov & Akin, 2019) as a new species reported from the Adiyaman province of Türkiye.¹⁴ *Protorhoe centralisata* (Staudinger, 1892) as a new record reported from Batman province of Türkiye.¹⁵ *Perigune jordanaria* (Staudinger, 1901) as a new record reported from Batman province of Türkiye.¹⁶ *Kresnaia beschkovi* (Ganev, 1987) as a new record reported from Batman province of Türkiye.¹⁷ Also *Gnophos chorista* Wehrli, 1939 as a new record reported from Batman province of Türkiye¹⁸ Thus, 692 Geometridae species reported up to date from Türkiye.

2. MATERIALS AND METHODS

In this study, Geometridae adults were collected from Amasya, Çorum, Ordu, Samsun, Sinop, Tokat and Yozgat provinces (Figure 1) in 2017-2018. Geometridae specimens were collected by using insect trap and light trap. Obtained specimens were killed in ethyl acetate killing jars and stored in falcon tubes with label information for each sample. For diagnosis preparation of Geometridae specimens, dry samples need to be relaxed first. Relaxing method was used to relax dry samples.¹⁹ Each sample was prepared according to standard museum methods and labelled for diagnosis. Then specimens were diagnosed to literatures.²⁰⁻²⁸

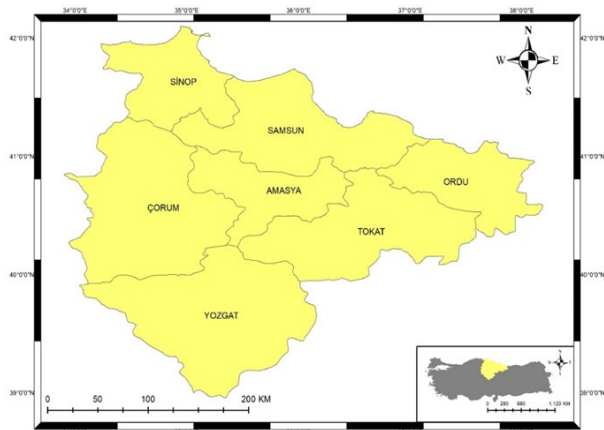


Figure 1. Research area of collected specimens.

3. RESULTS AND DISCUSSION

3.1 Results

This study provide some new faunistic information about Geometridae fauna of Türkiye. As a result of the study, five subfamilies (Ennominae, Geometrinae, Larentiinae, Orthostixinae, Sterrhinae), 36 genera, and 48 species

were determined. The identified species are presented below in alphabetical order.

Alcis repandata (Linnaeus, 1758); Figure B-1

Material examined: 4 ♂♂, **Ordu**, Gököy, Center, 40° 38' N, 37° 36' E, 1130 m, 29.06.2017.

Aplasta ononaria (Fuessly, 1783); Figure B-2

Material examined: 2 ♂♂, **Samsun**, Havza, Çelikalın, 41° 12' N, 35° 51' E, 639 m, 29.07.2017. 2 ♂♂, **Tokat**, Zile, Emirören, 40° 18' N, 35° 58' E, 810 m, 29.06.2017.

Aplocera efformata (Guenée, 1858); Figure B-3

Material examined: 2 ♂♂, **Sinop**, Boyabat, Koçak, 41° 36' N, 34° 38' E, 350 m, 16.06.2017.

Asthena albulata (Hufnagel, 1767); Figure B-4

Material examined: 1 ♂, **Ordu**, Center, Karaca, 41° 00' N, 37° 37' E, 48 m, 30.06.2017. 1 ♂, **Samsun**, Bafra, Esençay, 41° 18' N, 35° 50' E, 223 m, 29.07.2017; 1 ♂, Havza, Çelikalın, 41° 12' N, 35° 51' E, 639 m, 29.07.2017.

Campogramma bilineata (Linnaeus, 1758); Figure B-5

Material examined: 1 ♀, **Amasya**, Gümüşhacıköy, Sekü, 40° 57' N, 36° 06' E, 809 m, 22.06.2018. 8 ♂♂, 2 ♀♀, **Çorum**, Boğazkale, Hattuşa, 40° 10' N, 34° 37' E, 1070 m, 25.07.2017; 1 ♂, Oğuzlar, Ağaçcamı, 40° 48' N, 34° 40' E, 991 m, 22.06.2018; 3 ♂♂, 2 ♀♀, Bayat, Kunduzlu, 40° 45' N, 34° 14' E, 1321 m, 22.06.2018. 4 ♂♂, **Sinop**, Boyabat, Koçak, 41° 36' N, 34° 38' E, 350 m, 16.06.2017; Ayancık, Gökçesakızı, 41° 39' N, 34° 38' E, 640 m, 21.06.2018. 8 ♂♂, **Yozgat**, Center, Kalınbük, 39° 56' N, 34° 42' E, 1215 m, 19.06.2018.

Coenotephria ablutaria (Boisduval, 1840); Figure B-6

Material examined: 3 ♂♂, **Sinop**, Durağan, Çayağzı, 41° 26' N, 35° 08' E, 612 m, 28.07.2017.

Costaconvexa polygrammata (Borkhausen, 1794); Figure B-7

Material examined: 1 ♂, **Sinop**, Boyabat, Koçak, 41° 36' N, 34° 38' E, 350 m, 16.06.2017.

Cyclophora linearia (Hübner, 1799); Figure B-8

Material examined: 3 ♂♂, 1 ♀, **Samsun**, Havza, Çelikalın, 41° 12' N, 35° 51' E, 639 m, 29.07.2017.

Cabera exanthemata (Scopoli, 1763); Figure B-9

Material examined: 4 ♂♂, **Çorum**, İskilip, Başmakçı, 40° 43' N, 34° 35' E, 857 m, 27.07.2017.

Cabera pusaria (Linnaeus, 1758); Figure B-10

Material examined: 1 ♂, **Amasya**, Gümüşhacıköy, Sekü, 40° 57' N, 36° 06' E, 809 m, 27.07.2017. 4 ♂♂, 3 ♀♀, **Çorum**, Bayat, Kunduzlu, 40° 45' N, 34° 14' E, 1321 m, 31.07.2017; 2 ♂♂, Boğazkale, Hattuşa, 40° 01' N, 34° 37' E, 1019 m, 16.08.2017. 2 ♂♂, **Ordu**, Mesudiye, Gököy, 40° 36' N, 37° 37' E, 1580 m, 29.06.2017; 1 ♂,

Gölköy, Center, 40° 38' N, 37° 36' E, 1130 m, 29.06.2017; Gölköy, Döşek, 40° 45' N, 37° 37' E, 1129 m, 30.06.2017.

Chiasmia clathrata (Linnaeus, 1758); [Figure B-11](#)

Material examined: 2 ♂♂, **Ordu**, Mesudiye, Gölköy, 40° 36' N, 37° 37' E, 1580 m, 29.06.2017.

Dicrognophos sartata (Treitschke, 1827); [Figure B-12](#)

Material examined: 4 ♂♂, **Sinop**, Boyabat, Koçak, 41° 36' N, 34° 38' E, 350 m, 16.06.2017; 2 ♂♂, Durağan, Çayağzı, 41° 26' N, 35° 08' E, 612 m, 28.07.2017.

Eilicrinia cordiaria (Hübner, 1790); [Figure B-13](#)

Material examined: 1 ♂, **Yozgat**, Center, Evci, 39° 51' N, 34° 42' E, 1192 m, 19.06.2018.

Ematurga atomaria (Linnaeus, 1758); [Figure B-14](#)

Material examined: 1 ♂, **Amasya**, Taşova, Karabük, 40° 43' N, 36° 09' E, 267 m, 19.08.2017. 1 ♂, **Çorum**, Bayat, Kunduzlu, 40° 45' N, 34° 14' E, 1321 m, 16.08.2017. 2 ♂♂, **Yozgat**, Sarıkaya, Bağlıca, 39° 35' N, 35° 15' E, 1118 m, 28.06.2017.

Heliomata glarearia (Denis & Schiffermüller, 1775); [Figure B-15](#)

Material examined: 1 ♂, **Ordu**, Mesudiye, Aşağısuma, 40° 28' N, 37° 42' E, 1430 m, 29.06.2017. 2 ♂♂, 2 ♀♀, **Sinop**, Boyabat, Koçak, 41° 36' N, 34° 38' E, 350 m, 16.06.2017. 1 ♂, **Yozgat**, Center, Tayıp, 39° 50' N, 34° 42' E, 1209 m, 19.06.2018.

Eupithecia breviculata (Donzel, 1837); [Figure B-16](#)

Material examined: 1 ♂, **Samsun**, Bafra, Kabaçukur, 41° 19' N, 35° 50' E, 123 m, 18.08.2017. 2 ♂♂, **Sinop**, Boyabat, Koçak, 41° 36' N, 34° 38' E, 350 m, 16.06.2017.

Eupithecia ericeata (Rambur, 1833); [Figure B-17](#)

Material examined: 1 ♂, **Çorum**, Bayat, Karatepe, 40° 44' N, 34° 12' E, 1681 m, 22.06.2018.

Eupithecia subfuscata (Haworth, 1809); [Figure B-18](#)

Material examined: 1 ♂, 1 ♀, **Ordu**, Mesudiye, Gölköy, 40° 36' N, 37° 37' E, 1580 m, 29.06.2017.

Horisme tersata (Denis & Schiffermüller, 1775); [Figure B-19](#)

Material examined: 2 ♀♀, **Tokat**, Niksar, Mutluca, 40° 25' N, 37° 07' E, 436 m, 18.05.2017.

Hydriomena impluviata (Denis & Schiffermüller, 1775); [Figure B-20](#)

Material examined: 1 ♂, **Ordu**, Gölköy, Center, 40° 38' N, 37° 36' E, 1130 m, 29.06.2017.

Hylaea fasciaria (Linnaeus, 1758); [Figure B-21](#)

Material examined: 3 ♂♂, **Çorum**, Bayat, Kunduzlu, 40° 45' N, 34° 15' E, 1605 m, 26.07.2017.

Hypomecis punctinalis (Scopoli, 1763); [Figure B-22](#)

Material examined: 7 ♂♂, **Tokat**, Niksar, Mutluca, 40° 25' N, 37° 07' E, 436 m, 18.05.2017.

Idaea aversata (Linnaeus, 1758); [Figure B-23](#)

Material examined: 3 ♂♂, **Çorum**, Bayat, Kunduzlu, 40° 45' N, 34° 15' E, 1605 m, 26.07.2017; 1 ♀, Bayat, Kunduzlu, 40° 45' N, 34° 14' E, 1321 m, 31.07.2017.

Idaea filicata (Hübner, 1799); [Figure B-24](#)

Material examined: 1 ♂, **Samsun**, Havza, Çelikalan, 41° 12' N, 35° 51' E, 639 m, 29.07.2017. 2 ♂♂, **Sinop**, Durağan, Center, 41° 23' N, 35° 16' E, 1140 m, 28.07.2017.

Idaea ochrata (Scopoli, 1763); [Figure B-25](#)

Material examined: 4 ♂♂, 2 ♀♀, **Çorum**, Mecitözü, İbek, 40° 22' N, 35° 03' E, 870 m, 1.07.2017. 8 ♂♂, **Yozgat**, Center, Büyükincirli, 39° 37' N, 34° 55' E, 1028 m, 19.06.2018.

Idaea politaria (Hübner, 1799); [Figure B-26](#)

Material examined: 1 ♂, **Çorum**, Uğurludağ, Kumçeltiği, 40° 34' N, 34° 30' E, 784 m, 1.07.2017; 1 ♀, İskilip, Başmakçı, 40° 43' N, 34° 35' E, 857 m, 27.07.2017; 1 ♂, Center, Konak, 40° 38' N, 35° 11' E, 980 m, 28.07.2017. 1 ♂, **Ordu**, Center, Karaca, 41° 00' N, 37° 37' E, 48 m, 30.06.2017. **Samsun**, Bafra, Kabaçukur, 41° 19' N, 35° 50' E, 123 m, 18.08.2017; 1 ♂, Kavak, Akbelen, 41° 09' N, 35° 53' E, 910 m, 18.08.2017; 6 ♂♂, **Samsun**, Havza, Ortaklar, 41° 00' N, 35° 34' E, 830 m, 21.06.2018. 3 ♂♂, **Sinop**, Boyabat, Koçak, 41° 36' N, 34° 38' E, 350 m, 16.06.2017.

Idaea rufaria (Hübner, 1799); [Figure B-27](#)

Material examined: 1 ♂, **Samsun**, Havza, Çelikalan, 41° 12' N, 35° 51' E, 639 m, 29.07.2017. 1 ♂, **Sinop**, Durağan, Center, 41° 23' N, 35° 16' E, 1140 m, 28.07.2017.

Isturgia arenacearia (Denis & Schiffermüller, 1775); [Figure B-28](#)

Material examined: 3 ♂♂, **Samsun**, Vezirköprü, Güldere, 41° 17' N, 35° 55' E, 630 m, 29.07.2017.

Ligdia adustata (Denis & Schiffermüller, 1775); [Figure B-29](#)

Material examined: 1 ♂, **Yozgat**, Center, Kalmbük, 39° 56' N, 34° 42' E, 1215 m, 19.06.2018.

Lomaspilis bithynica Wehrli, 1939; [Figure B-30](#)

Material examined: 2 ♂♂, **Çorum**, Bayat, Kunduzlu, 40° 45' N, 34° 14' E, 1321 m, 22.06.2018.

Lythria cruentaria (Hufnagel, 1767); [Figure B-31](#)

Material examined: 1 ♂, **Amasya**, Gümüşhacıköy, Sekü, 40° 57' N, 36° 06' E, 809 m, 30.07.2017; 3 ♂♂, Taşova, Karabük, 40° 43' N, 36° 09' E, 267 m, 19.08.2017. 1 ♂,

Çorum, Sungurlu, Kamışlı, 40° 07' N, 34° 28' E, 1000 m, 2.07.2017; 4 ♂♂, Sungurlu, Tuğcu, 40° 11' N, 34° 19' E, 796 m, 19.06.2018. 4 ♂♂, Samsun, Havza, Boyalı,

41° 13' N, 35° 52' E, 770 m, 29.07.2017; 3 ♂♂, Ladik, İbi, 40° 58' N, 35° 54' E, 779 m, 30.07.2017. 1 ♀,

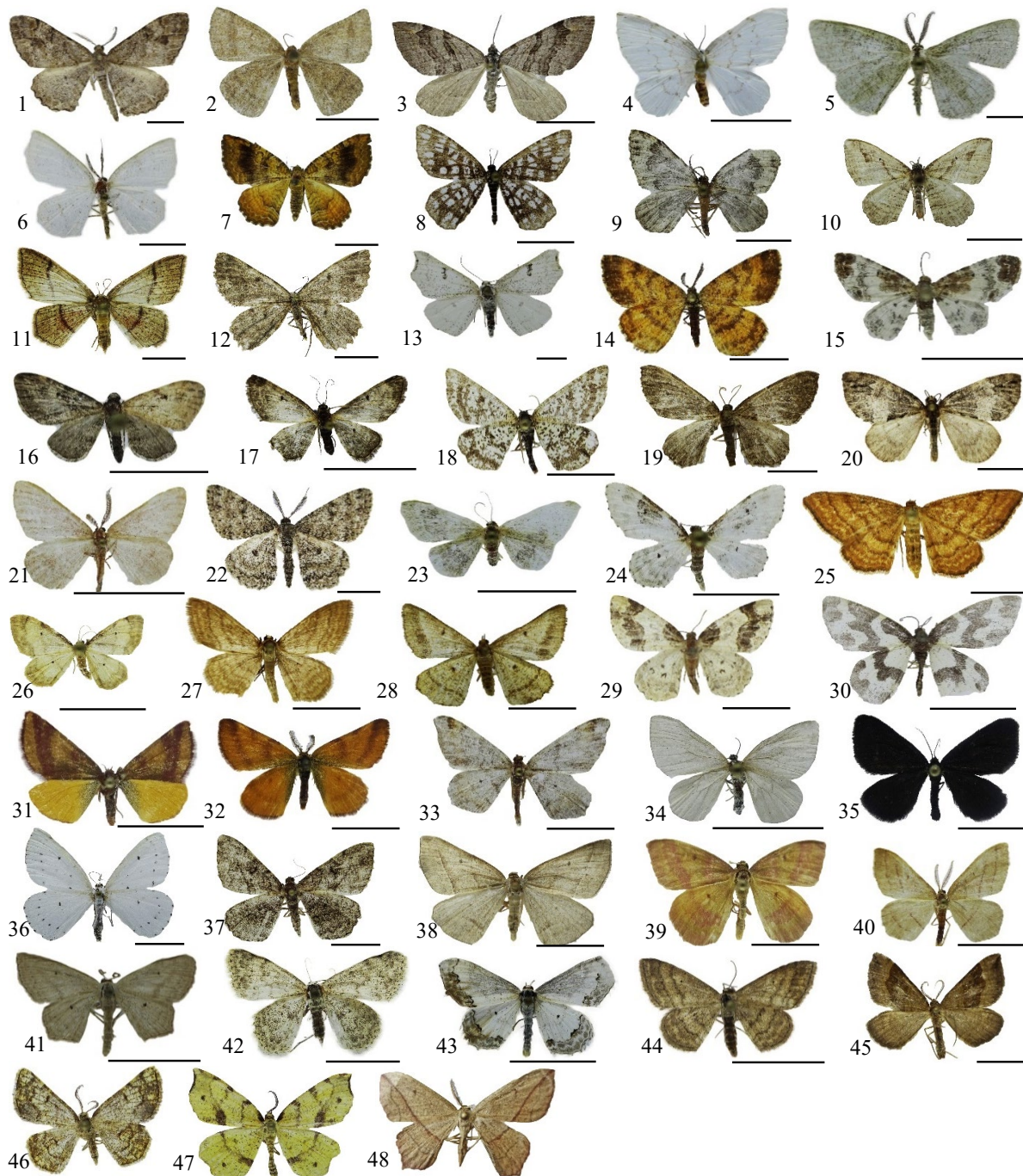


Figure 2. Adult of Geometridae species: 1. *Alcis repandata*, 2. *Aplasta ononaria*, 3. *Aplocera efformata*, 4. *Asthena albulata*, 5. *Cabera exanthemata*, 6. *C. pusaria*, 7. *Camptogramma bilineata*, 8. *Chiasmia clathrata*, 9. *Coenotephria ablutaria*, 10. *Costaconvexa polygrammata*, 11. *Cyclophora linearia*, 12. *Dicrognophos sartata*, 13. *Eilicrinia cordiaria*, 14. *Ematurga atomaria*, 15. *Eupithecia breviculata*, 16. *E. ericeata*, 17. *E. subfuscata*, 18. *Helimata glarearia*, 19. *Horisme tersata*, 20. *Hydriomena impluviata*, 21. *Hylaea fasciaria*, 22. *Hypomecis punctinalis*, 23. *Idaea aversata*, 24. *I. filicata*, 25. *I. ochrata*, 26. *I. politaria*, 27. *I. rufaria*, 28. *Isturgia arenacearia*, 29. *Ligdia adustata*, 30. *Lomaspilis bithynica*, 31. *Lythria cruentaria*, 32. *L. purpuraria*, 33. *Macaria alternata*, 34. *Minoa murinata*, 35. *Odezia atrata*, 36. *Orthostixis cribraria*, 37. *Peribatodes rhomboidaria*, 38. *Petrophora chlorosata*, 39. *Rhodostrophia discopunctata*, 40. *R. vibicaria*, 41. *Scopula flaccidaria*, 42. *S. marginepunctata*, 43. *S. ornata*, 44. *S. turbulentaria*, 45. *Scotopteryx chenopodiata*, 46. *Stegania dilectaria*, 47. *Therapis flavicaria*, 48. *Timandra comae*. (Scale: 1cm).

Yozgat, Sarıkaya, Yeşilkışla, 39° 24' N, 35° 21' E, 1220 m, 28.06.2017; 1 ♀, Sarıkaya, Bağlıca, 39° 35' N, 35° 15' E, 1118 m, 28.06.2017.

Lythria purpuraria (Linnaeus, 1758); [Figure B-32](#)

Material examined: 2 ♂♂, **Amasya**, Taşova, Karabük, 40° 43' N, 36° 09' E, 267 m, 19.08.2017. 1 ♂, **Sinop**, Durağan, Çayağzı, 41° 26' N, 35° 08' E, 612 m, 28.07.2017. 2 ♂♂, **Tokat**, Pazar, Center, 40° 17' N, 36° 19' E, 552 m, 18.05.2017.

Macaria alternata (Denis & Schiffermüller, 1775) [Figure B-33](#)

Material examined: 1 ♂, **Çorum**, Bayat, Kunduzlu, 40° 45' N, 34° 15' E, 1605 m, 26.07.2017.

Minoa murinata (Scopoli, 1763); [Figure B-34](#)

Material examined: 2 ♂♂, **Sinop**, Ayancık, Gökçukur, 41° 39' N, 34° 40' E, 866 m, 17.08.2017.

Odezia atrata (Linnaeus, 1758); [Figure B-35](#)

Material examined: 7 ♂♂, **Tokat**, Almus, Bakımlı, 40° 37' N, 36° 80' E, 826 m, 17.05.2017.

Orthostixis cribraria (Hübner, 1799); [Figure B-36](#)

Material examined: 5 ♂♂, **Çorum**, Bayat, Kunduzlu, 40° 45' N, 34° 14' E, 1360 m, 26.07.2017; 1 ♂, Center, Konak, 40° 38' N, 35° 11' E, 980 m, 28.07.2017; 7 ♂♂, 2 ♂♂, Bayat, Kunduzlu, 40° 45' N, 34° 14' E, 1321 m, 31.07.2017.

Peribatodes rhomboidaria (Denis & Schiffermüller, 1775); [Figure B-37](#)

Material examined: 1 ♂, **Samsun**, Vezirköprü, Güldere, 41° 17' N, 35° 55' E, 630 m, 29.07.2017. 3 ♂♂, **Sinop**, Boyabat, Koçak, 41° 36' N, 34° 38' E, 350 m, 16.06.2017.

Petrophora chlorosata (Scopoli, 1763); [Figure B-38](#)

Material examined: 1 ♂, **Ordu**, Akkuş, Center, 40° 48' N, 37° 00' E, 1310 m, 30.06.2017. 1 ♂, **Yozgat**, Sarıkaya, Yeşilkışla, 39° 24' N, 35° 21' E, 1220 m, 28.06.2017.

Rhodostrophia discopunctata Amsel, 1935; [Figure B-39](#)

Material examined: 1 ♂, **Çorum**, Dodurga, Yeniköy, 40° 51' N, 34° 42' E, 977 m, 22.06.2018. 5 ♂♂, **Sinop**, Boyabat, Koçak, 41° 36' N, 34° 38' E, 350 m, 16.06.2017. 1 ♂, **Yozgat**, Sarıkaya, Yeşilkışla, 39° 24' N, 35° 21' E, 1220 m, 28.06.2017; 1 ♀, Center, Büyükcincirli, 39° 37' N, 34° 55' E, 1028 m, 19.06.2018; 1 ♀, Center, Tayıp, 39° 50' N, 34° 42' E, 1209 m, 19.06.2018; 1 ♂, Center, Evci, 39° 51' N, 34° 42' E, 1192 m, 19.06.2018.

Rhodostrophia vibicaria (Clerck, 1759); [Figure B-40](#)

Material examined: 1 ♀, **Çorum**, Bayat, Kunduzlu, 40° 45' N, 34° 14' E, 1360 m, 26.07.2017; 2 ♂♂, Dodurga, Yeniköy, 40° 51' N, 34° 42' E, 977 m, 22.06.2018; 1 ♂,

İskilip, Asarcık, 40° 44' N, 34° 34' E, 1071 m, 22.06.2018; 1 ♂, Bayat, Kunduzlu, 40° 45' N, 34° 14' E, 1321 m, 22.06.2018.

Scopula flaccidaria (Zeller, 1852); [Figure B-41](#)

Material examined: 3 ♂♂, **Samsun**, Tekkeköy, Ovabaşı, 41° 12' N, 36° 30' E, 3 m, 18.08.2017.

Scopula marginepunctata (Goeze, 1781); [Figure B-42](#)

Material examined: 1 ♂, **Sinop**, Boyabat, Koçak, 41° 36' N, 34° 38' E, 350 m, 16.06.2017.

Scopula ornata (Scopoli, 1763); [Figure B-43](#)

Material examined: 1 ♂, **Sinop**, Boyabat, Koçak, 41° 36' N, 34° 38' E, 350 m, 16.06.2017; 1 ♂, Erfelek, Hasandere, 41° 52' 55"N, 34° 56' 42"E, 346 m, 17.08.2017.

Scopula turbulentaria (Staudinger, 1870); [Figure B-44](#)

Material examined: 2 ♂♂, 1 ♀, **Sinop**, Boyabat, Gökçeagaçsakızı, 41° 38' N, 34° 36' E, 459 m, 21.06.2018.

Scotopteryx chenopodiata (Linnaeus, 1758); [Figure B-45](#)

Material examined: 2 ♂♂, **Çorum**, Bayat, Kunduzlu, 40° 45' N, 34° 14' E, 1360 m, 26.07.2017; 4 ♂♂, Bayat, Kunduzlu, 40° 45' N, 34° 15' E, 1605 m, 26.07.2017.

Stegania dilectaria (Hübner, 1790); [Figure B-46](#)

Material examined: 2 ♂♂, 1 ♀, **Çorum**, Boğazkale, Hattuşa, 40° 01' N, 34° 37' E, 1019 m, 16.08.2017.

Therapis flavicaria (Denis & Schiffermüller, 1775); [Figure B-47](#)

Material examined: 1 ♂, **Ordu**, Gököy, Center, 40° 38' N, 37° 36' E, 1130 m, 29.06.2017.

Timandra comae A. Schmidt, 1931; [Figure B-48](#)

Material examined: 2 ♂♂, **Çorum**, Boğazkale, Hattuşa, 40° 01' N, 34° 37' E, 1019 m, 16.08.2017. 2 ♂♂, **Samsun**, Havza, Dereköy, 41° 06' N, 35° 42' E, 564 m, 29.07.2017; 1 ♂, Tekkeköy, Ovabaşı, 41° 12' N, 36° 30' E, 3 m, 18.08.2017.

3.2 Discussion

692 species of Geometridae were identified in Türkiye. According to,¹³ 199 from Amasya, 2 from Çorum, 87 from Ordu, 13 from Samsun, 23 from Sinop, 41 from Tokat, and 3 from Yozgat Geometridae species were reported. In this paper, 5 species of Geometridae were determined and 3 of them were recorded for the first time in Amasya province; 18 species of Geometridae were determined and 18 of them were recorded for the first time in Çorum province; 10 species of Geometridae were determined and 7 of them were recorded for the first time in Ordu province; 12 species of Geometridae were

Provinces	Geometridae species	Species count before this study	Determined species in this study	New record for provinces	Species count after this study
Amasya		199	5	3	202
Çorum		2	18	18	20
Ordu		87	10	7	94
Samsun		13	12	11	24
Sinop		23	16	14	37
Tokat		41	5	3	44
Yozgat		3	9	9	12

Table 1. Distribution of Geometridae species in provinces.

determined and 11 of them were recorded for the first time in Samsun province; 16 species of Geometridae were determined and 14 of them were recorded for the first time in Sinop province; 5 species of Geometridae were determined and 3 of them were recorded for the first time in Tokat province; 9 species of Geometridae were determined and 9 of them were recorded for the first time in Yozgat province (Table 1).

Conflict of interests

Authors declare that there is no a conflict of interest with any person, institute, company, etc.

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