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Notes on *Archaeoripiphorus nuwa* Hsiao, Yu & Deng, 2017 (Coleoptera: Tenebrionoidea) from the Middle Jurassic of China

Jiří Háva

Forestry and Game Management Research Institute, Strnady 136,
CZ-156 00 Praha 5 - Zbraslav, Czech Republic
e-mail: jh.dermestidae@volny.cz; ORCID ID: 0000-0001-8076-9538

Háva, J.: *Notes on Archaeoripiphorus nuwa Hsiao, Yu & Deng, 2017 (Coleoptera: Tenebrionoidea) from the Middle Jurassic of China.*
Abstract: Characteristics of the fossil beetle *Archaeoripiphorus nuwa* Hsiao, Yu & Deng, 2017 (Coleoptera: Tenebrionoidea) from the Middle Jurassic of China are supplemented and illustrated.

Keywords: Taxonomy, second record, middle Jurassic, Coleoptera, Tenebrionoidea, China.

Introduction

The genus and species *Archaeoripiphorus nuwa* Hsiao, Yu & Deng, 2017 were described as the holotype specimen to fall into the family Ripiphoridae, unknown subfamily. Batelka et al. (2018) transferred the genus and species to superfamily Tenebrionoidea family incertae sedis based on morphological characters.

Results of studying the second specimen are presented here and illustrations are provided including the habitus (lateral aspect).

Material and methods

The habitus photograph was made by a digital camera Olympus DP 72 on a stereo binocular microscope (Olympus SZX 16) using the programme Quick Photo Camera 2.3 and Deep Focus 3.0 for the modification of the pictures.

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Results

Order **Coleoptera** Linnaeus, 1758
Suborder **Polyphaga** Emery, 1886
Superfamily **Tenebrionoidea** Latreille, 1802
Family incertae sedis (see BATELKA et al. 2018)

Genus *Archaeoripiphorus* Hsiao, Yu & Deng, 2017

Diagnosis: Body large-sized (about 15.5 mm); head elongate, abruptly constricted posteriorly to form broad neck; eyes oval, shallowly emarginate, distinctly separated from each other; antennae 11-antennomered, antennomeres IV to X rectangular or trapezoid and antennomere XI with pointed apex; terminal maxillary palpomere elongate securiform, not modified, about 4.0 times longer than minimum width; pronotum almost triangular, trilobed at base; elytra complete, covering entire abdomen; abdomen with five ventrites; protibiae nearly as long as protarsi; apices of tibiae without spiniform seta; claws pectinate, at least in middle and hind legs.

Species *Archaeoripiphorus nuwa* Hsiao, Yu & Deng, 2017
(Figs. 1-4)

Type horizon: Jiulongshan Formation, Middle Jurassic, about 165 Ma (GAO & REN 2006).

Material examined: 1 spec., sex unknown: „China, Inner Mongolia, Daohugou Formation, Middle Jurassic, Callovian, 2021“ / „Topotype“ / J. Háva det. 2021. Deposited in Private Entomological Laboratory & Collection, Jiří Háva, Únětice u Prahy, Prague-West, Czech Republic.

The matrix presented a number of *Conchostracan* individuals (Order: Diplostraca, Suborder: Spinicaudata, Superfamily: Lioestherioidea, Family: Triglyptidae) (LIAO et al. 2017).

Remarks: The surface of the specimen studied is densely covered with fine setation. The body length 15.0 mm (measured laterally in matrix as shown in Fig. 1). Antennae 11-antennomered (Fig. 2). Abdomen with five tergites and five ventrites (Fig. 3). Legs covered with fine setation (Fig. 4). Due to these facts, the description should include the body length of 15.0-15.5 mm.

„Placement of *Archaeoripiphorus* elsewhere within Tenebrionoidea is premature, and a comprehensive cladistics analysis of this superfamily is needed including all described fossil families and genera“ (BATELKA et al. 2018). The illustration of the lateral aspect provided here could perhaps help to solve the classification into the appropriate family.

Acknowledgements

I am indebted very much to Miloslav Rakovič (Czech Republic) for the revision of the English text. The paper was supported by the Ministry of Agriculture of the Czech Republic, institutional support MZE-RO0118.

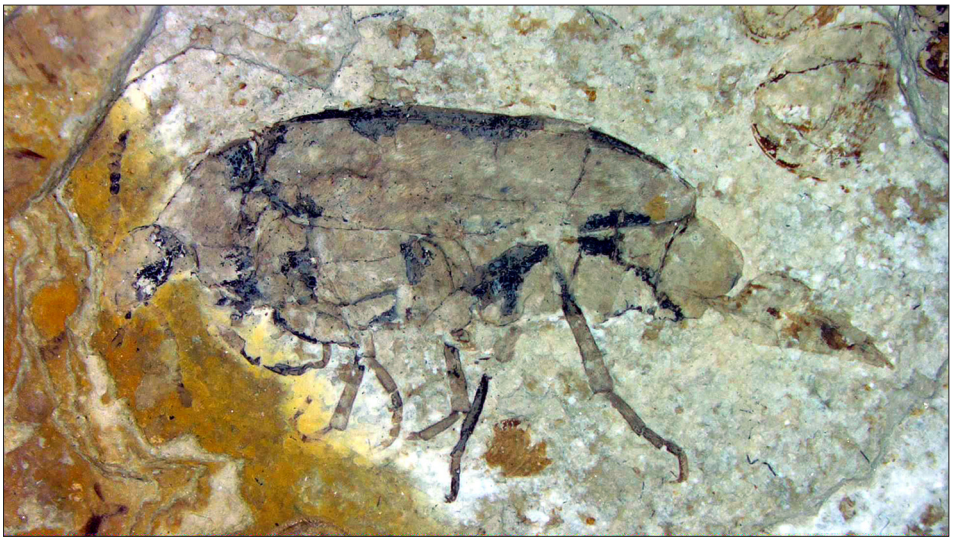

Fig. 1: *Archaeoripiphorus nuwa* Hsiao, Yu & Deng, 2017: habitus in lateral view

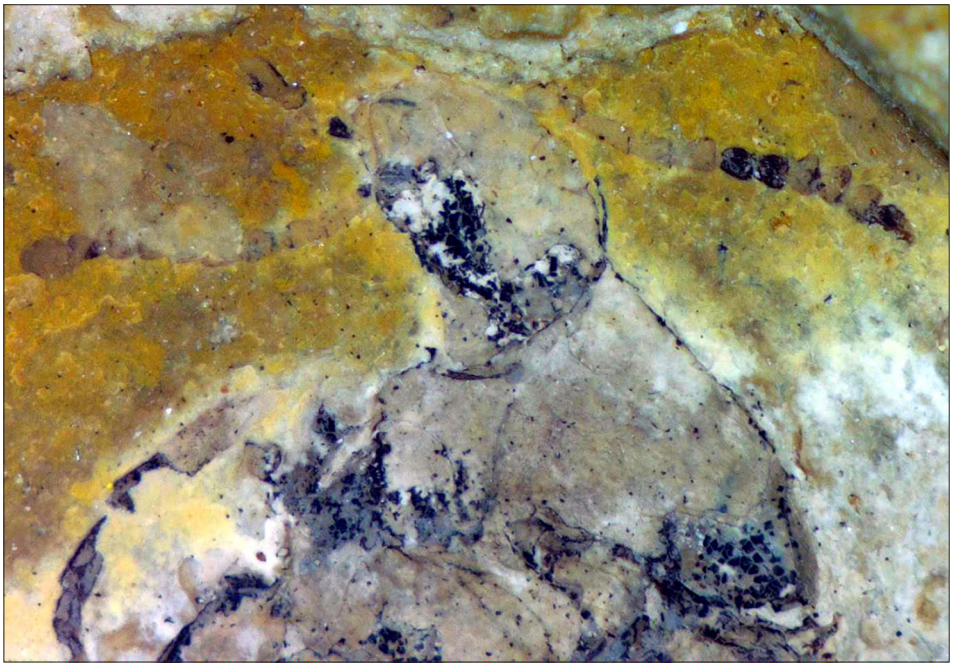

Fig. 2: The same, head and antennae

Fig. 3: The same, abdominal ventrites

Fig. 4: The same, posterior leg

References

Batelka, J., Engel, M. S. & Prokop, J. 2018: A remarkable diversity of parasitoid beetles in Cretaceous amber, with a summary of the Mesozoic record of Tenebrionoidea. - Cretaceous Research 90: 296-310. https://doi.org/10.1016/j.cretres.2018.04.019

Gao, K.-Q. & Ren, D. 2006: Radiometric dating of ignimbrite from Inner Mongolia provides no indication of a post-Middle Jurassic Age for the Daohugou Beds. - Acta Geologica Sinica 80: 42-45. http://dx.doi.org/10.1111/j.1755-6724.2006.tb00793.x

Hsiao, Y., Yu, Y., Deng, C. & Pang, H. 2017: The first fossil wedge-shaped beetle (Coleoptera, Ripiphoridae) from the middle Jurassic of China. - European Journal of Taxonomy 277: 1-13. http://dx.doi.org/10.5852/ejt.2017.277

Liao, H-Y., Shen, Y-B. & Huang, D-Y. 2017: Conchostracans of the Middle–Late Jurassic Daohugou and Linglongta bedsin NE China. - Paleoworld 26: 317-330. http://dx.doi.org/10.1016/j.palwor.2016.11.001

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Contribution to the knowledge of the sawflies (Hymenoptera: Symphyta) from Turkey

Emin Kaplan[1] & Attila Haris[2]

[1]Bingöl University, Faculty of Agriculture, Department of Plant Protection, 12000 Bingöl Turkey, email: eminkaplan021@gmail.com
[2]H-1076 Budapest, Garay street 19., Hungary, email: attilaharis@yahoo.com

Kaplan, E. & Haris, A: *Contribution to the knowledge of the sawflies (Hymenoptera: Symphyta) from Turkey.*
Abstract: This study is based on the *Symphyta (Hymenoptera)* material collected from Bingol and Diyarbakır provinces of Turkey in 2019.The present paper is the second part of the series of papers investigating the sawfly fauna of the Anatolian biogeographic region. The so far recorded 38 species is extended to 58 species. *Arge auripennis* Konow, 1891, *Arge pallidinervis* Gussakovskij, 1935, *Dolerus hispanicus* Mocsáry, 1881 and *Athalia dimidiata* Konow, 1891 are new to the Turkish fauna. Sawfly biodiversity, flying activity and population densities are discussed. Moreover, dominant species, rare and interesting species are also listed. Collection localities, local names and geographical features of those localities, with threatening factors for the species are provided.

Keywords: *Hymenoptera, Symphyta*, new records, new species, Bingöl, Diyarbakır, Turkey

Introduction

The investigation of sawfly fauna of Turkey started relatively late. The earliest expedition to Anatolia which resulted in collection of sawflies was conducted by Imre Frivaldszky and János Frivaldszky, Hungarian zoologists and botanists, in 1846. The sawfly material was sent to Peter Friedrich Ludwig Tischbein, German entomologist and forester and he described from the Frivaldszky collection (housed in the Hungarian Natural History Museum) the first sawflies from Turkey, namely *Macrophya superba* Tischbein, 1852 and *Cephus orientalis* Tischbein, 1852 (valid name: *Syrista parreyssii* (Spinola, 1843)) (Tischbein 1852). These specimens have very general locality information: "*Klein-Asien*". The first sawflies from Turkey with detailed locality information were published by Sándor Mocsáry (Hungarian hymenopterologist, curator of the Hungarian National Museum and royal councilor) in 1881. He described Tarpa orientalis Mocsáry 1881. Mocsáry gave the place of collection this way: "*In Asia Minore ad Brussam a Joanne Pavel inventa*" Now it is Bursa. János Pável was an entomologist of the Hungarian National Museum, he made an expedition to Istanbul and Bursa in 1870. The other early species with well-defined locality is *Macrophya ottomana* Mocsáry, 1881: In Asia Minore ad Amasiam a Josepho Mann, Lepidopterologiae cultore eximio, anno 1860 inventa et in Museo Caesario Vindobonensi custodita. Now, it is Amasya in Turkey. Sándor Mocsáry continued the description of sawflies of Turkey and the

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Ottoman Empire in 1883 (MOCSÁRY 1883) describing *Megalodontes (Tarpa) anatolicus* Mocsáry 1883 from "*Asia minore ad Brussam ab Eduardo Merkl anno praeterito detectus*". (Ede Merkl was a Hungarian naturalist, *Coleoptera* specialist and poet from Resicabánya).

In the following years, we have only few species descriptions from Turkey (will be detailed in a separate paper) until the publication of the first monograph completed by Robert Benson, published posthumous by the trustees of the former British Museum Natural History (now The Natural History Museum London) (BENSON 1968). The investigations of Hungarian, German, Russian, English, and French specialists were continued by Turkish scientists, namely Önder Çalmaşur, Hikmet Özbek, Hasan Başıbüyük, Çetin Mutlu and Sevda H. Örgen (ÇALMAŞUR & ÖZBEK 2004a, b, 2006, ÇALMAŞUR 2006, 2019, 2020, ÖRGEN & BASIBUYUK 2006, MUTLU 2019). For now, the number of Symphyta species recorded from Turkey is 370 (according to the estimation of ÇALMAŞUR 2019 and 2020). Generally we can say that the Turkish sawfly fauna is relatively rich compared to the fauna of the neighboring Mediterranean region and poor compared to the Northern territories of Europe. For comparison, the sawfly fauna of Somogy county (6065 km²) consists of 316 species, the Bakony Mountains with the adjoining Balaton Upland (circa 4 800 km²) consists of 359 Symphyta species, while all of Turkey with an area of 780 580 km² has only circa 370 species. This low number could be the result of its Southern location of the country on one hand and the late starting of intensive sawfly-faunistic research of this region on other hand. Finally, the investigation of the Anatolian sawflies (and other groups of plants and animals) is more than exciting, since this region is in the crossroad of East Mediterranean, Sumerian and Irano-Turanian provinces of Palearctic Region resulting the richness of the fauna and flora (YILDIRIM 2016).

Material and Methods

Material was collected by various methods, mostly by sweeping grass on meadows and pasture lands containing a variety of flowering plants. Provinces of the collected specimens are given in alphabetical order in the following list. The first author in 2019 spent 11 days in March, 16 days in April, 13 days in May, 6 days in June, 5 days in July, 4 days in August and 3 days in September in the field collecting (Fig. 1 and 2).

The material is deposited partly in the Rippl-Rónai Museum, Kaposvár and partly in the Atatürk University, Biodiversity Application and Research Center, Erzurum, Turkey and in the Bingöl University, Faculty of Agriculture, Department of Plant Protection, Bingöl, Turkey.

For the identification of the specimens we consulted the comprehensive works of ZHELOCHOVTSEV 1988 and BENSON 1968 completed with other papers as ENSLIN 1910a, b, TAEGER 1992 and GUSSAKOVSKIJ 1935.

Fig. 1: Landscape at Yukari: Elmali in Bingöl province (photo: Kaplan)

Fig. 2: Landscape at Bağıvar in Diyarbakir province (photo: Kaplan)

Results

List of species collected

Megalodontesidae

Megalodontes cephalotes (Fabricius, 1781): Bingöl: Genç: N 38° 45' 54.03″, E 40° 32' 56.02″, 988 m, 09. 05. 2019, 1 male; Ardıçdibi, N 38° 46' 32.40″, E 40° 36' 40.02″, 1054 m, 09. 05. 2019, 1 female; Diyarbakır: Dicle: Yeşilsırt, N 38° 20' 31.21″, E 40° 01' 53.75″, 724 m, 19. 04. 2019, 1 female. Frequent. Host plant: *Peucedanum cervaria*. West-palaearctic species.

Megalodontes phaenicius (Lepeletier, 1823): Bingöl: Sancak, N 39° 05' 37.56″, E 40° 22' 38.07″, 1585 m, 26. 05. 2019, 1 female. Frequent. Host plant unknown. East-Mediterranean-Anatolian species.

Cephidae

Cephus pulcher Tischbein, 1852: Bingöl: Kiğı: Duranlar, N 39° 16' 17.12″, E 40° 20' 47.91″, 1304 m, 12. 06. 2019, 1 female. Rare. East-European-Anatolian species.

Cephus pygmeus (Linné, 1767): Bingöl: Güvercinlik, N 37° 59' 06.08″, E 40° 14' 29.81″, 613 m, 29. 03. 2019, 1 female; Adaklı: Kamışgülü, N 39° 12' 00.38″, E 40° 24' 40.32″, 1586 m, 29. 05. 2019, 1 female; Diyarbakır: Dicle, N 37° 52' 06.13″, E 40° 13' 45.41″, 608 m, 10. 03. 2019, 1 female; Bismil: Köseli, N 37° 50' 51.99″, E 40° 36' 49.34″, 558 m, 30. 03. 2019, 1 female. Generally common. Pest of cereals and grasses. Holarctic.

Cephus spinipes (Panzer, 1800)

Diyarbakır: Çüngüş: Sağtepe, N 38° 13' 41.26″, E 39° 22' 33.16″, 1128 m, 19. 04. 2019, 1 female. Frequent. Host plant: *Phleum pratense*. Eurasian.

Syrista parreyssii (Spinola, 1843)

Diyarbakır: Çüngüş: N 38° 12' 32.95″, E 39° 22' 09.37″, 1007 m, 27. 03. 2019, 1 female. Frequent. Host plant: *Rosa* spp. North-Mediterranean-Anatolian-Caucasian-Persian

Argidae

Arge aurata (Zaddach, 1864): Bingöl: Küçükterkören, N 38° 51' 01.40″, E 40° 30' 02.62″, 1182 m, 19. 05. 2019, 1 female; Diyarbakır: Çüngüş: Oyuklu, N 38° 13' 24.88″, E 39° 22' 12.56″, 1076 m, 19. 04. 2019, 1 female; Lice: Çavundur, N 38° 19' 36.25″, E 40° 40' 53.59″, 1040 m, 19. 04. 2019, 1 female. Frequent. Middle-East – Anatolian.

Arge auripennis Konow, 1891: Diyarbakır: Lice: Türeli, N 38° 25' 09.84″, E 40° 53' 54.09″, 738 m, 12. 04. 2019, 1 female. North-Mediterranean – Anatolian. Rare. New record for Turkey.

Arge beckeri Tournier, 1889: Diyarbakır: Karpuzlu, N 37° 50' 51.25″, E 40° 14' 36.03″, 579 m, 12. 03. 2019, 1 female. Frequent. Host plant: *Euphorbia* spp. North-Mediterranean – Anatolian.

Arge cyanocrocea (Förster, 1771): Bingöl: Çeltiksuyu, N 38° 51' 20.68″, E 40° 34' 04.34″, 1015 m, 04. 05. 2019, 1 male. Frequent. Host plant: *Rubus idaeus*. West-Palaearctic.

Arge melanochra (Gmelin, 1790): Bingöl: Elmalı, N 39° 01' 00.57″, E 40° 43' 12.15″, 1286 m, 05. 05. 2019, 1 female; Küçükterkören, N 38° 51' 18.63″, E 40° 29' 10.84″, 1477 m, 23. 05. 2019, 1 male; Diyarbakır: Lice: Çavundur, N 38° 19' 47.72″, E 40° 39' 58.29″, 1185 m, 06. 05. 2019, 1 male. Common species. Host plant: *Crataegus oxycantha*. West-Palaearctic.

Arge pallidinervis Gussakovskij, 1935: Bingöl: Adaklı: Güngörsün, N 39° 15' 20.29″, E 40° 28' 18.93″, 1539 m, 12. 06. 2019, 1 male; Yayladere: Boğazköy, N 39° 15' 13.64″, E 40° 03' 32.56″, 1772 m, 14. 06. 2019, 1 male. Pontomediterranean, Caucasian and Anatolian. New record for Turkey.

Arge ochropus (Gmelin, 1790): Material examined: Bingöl: Bilaloğlu, N 38° 55' 34.87″, E 40° 23' 14.72″, 1288 m, 15. 05. 2019, 1 female. Pest of *Rosa* spp. Locally frequent.

Arge scita (Mocsáry, 1880): Bingöl: Solhan: N 38° 56' 23.25″, E 41° 08' 18.56″, 1727 m, 02. 06. 2019, 1 female; Diyarbakır: Çermik: Güzel, N 38° 01' 08.45″, E 39° 11' 31.16″, 840 m, 15. 04. 2019, 1 female; Lice: Kutlu, N 38° 21' 37.67″, E 40° 46' 28.39″, 825 m, 28. 04. 2019, 1 female. Frequent. Host plant: *Prunus amygdalus*. East-Mediterranean, Iranian, and Anatolian.

Arge yildirimi Haris and Kaplan, 2021: Diyarbakır: Lice: Yalaza, N 38° 20' 16.33″, E 40° 40' 35.45″, 921 m, 25. 04. 2018, 1 female; Eğil: Yatır, N 38° 08' 09.41″, E 40° 08' 56.18″, 836 m, 28. 03. 2019, 1 female. Kocaköy, Ambar, N 38° 16' 07.99″, E 40° 28' 29.61″, 733 m, 24. 04. 2018, 1 female; Lice, Beni, N 38° 20' 07.29″, E 40° 38' 57.00″, 1124 m, 25. 04. 2018, 1 female, Kutlu, N 38° 21' 37.62″, E 40° 46' 28.39″, 825 m, 28. 04. 2018, 1 female, Oyuklu, N 38° 19' 44.71″, E 40° 45' 31.90″, 939 m, 28. 04. 2018, 1 female. (Fig. 3).

Fig. 3: *Arge yildirimi* Haris & Kaplan, 2021 holotype in dorsal view (photo: Haris)

Tenthredinidae

Dolerinae

Dolerus (Dolerus) hispanicus Mocsáry, 1881: Bingöl: Genç: Döşekkaya, N 38° 38' 11.11″, E 40° 23' 07.23″, 1015 m, 16. 05. 2019, 1 male; Yayladere: Aydınlar, N 39° 10' 24.61″, E 40° 03' 53.16″, 1626 m, 14. 06. 2019, 1 female; Diyarbakır: Lice: Tepe, N 38° 23' 47.61″, E 40° 44' 15.82″, 799 m, 20. 04. 2019, 1 male. Frequent. North Mediterranean, Anatolian and Persian.

Dolerus (Poodolerus) puncticollis Thomson, 1871: Diyarbakır: Kocaköy: Gökçen, N 38° 18' 32.65″, E 40° 32' 24.30″, 901 m, 01. 04. 2019, 1 female. Frequent in Anatolia. The detected low denisty is surprising. Larva on Graminae including cereals. West-Palaearctic.

Allantinae

Allantus (Emphytus) didymus (Klug, 1818): Bingöl: Genç: Yağızca, N 38° 48' 41.26″, E 40° 45' 15.59″, 1152 m, 10. 05. 2019, 1 female. Sporadic. Host plant: *Sanguisorba minor*; old records from *Rubus* and *Rosa* spp. needs checking. West Palaearctic.

Athalia dimidiata Konow, 1891: Diyarbakır: Dicle: Biçer, N 38° 22' 22.24″, E 40° 00' 55.39″, 921 m, 20. 04. 2019, 1 female. Rare, Caucasian and Anatolian. Host plant: unknown. New record for Turkey.

Athalia circularis ssp. circularis (Klug, 1815): Diyarbakır: Esenbağ, N 38° 00' 35.71″, E 40° 22' 21.78″, 612 m, 21. 03. 2019, 1 female. Frequent. Host plants: *Arctium lappa, Ajuga reptans, Veronica beccabunga, V. longifolia, V. officinalis, Alliaria petiolata, Glechoma hederacea, Melampyrum, Capsella* and *Lycopus* spp. Palaearctic.

Athalia liberta (Klug, 1815): Diyarbakır: Silvan: Dolapdere, N 38° 18' 30.36″, E 40° 53' 09.11″, 910 m, 05. 04. 2019, 1 male. Frequent. Host plants: *Alliaria petiolata, Arabidopsis thaliana, Cardamine hirsuta* and *Sisymbrium officinale*. West Palaearctic.

Blennocampinae

Eutomostethus gagathinus (Klug, 1816): Diyarbakır: Lice: Ziyaret, N 38° 20' 15.95″, E 40° 33' 31.60″, 996 m, 01. 04. 2019, 1 female. Sporadic. Host plant: *Carex paniculata*. West Palaearctic.

Tenthredininae

Macrophya (Macrophya) annulata (Geoffroy, 1785): Bingöl: Çayağzı, N 38° 48' 42.61″, E 40° 33' 25.15″, 1018 m, 19. 05. 2019, 1 male; N 38° 48' 21.94″, E 40° `33' 26.53″, 992 m, 20. 05. 2019, 1 female; Genç: Kepçeli, N 38° 49' 27.91″, E 40° 48' 57.90″, 1570 m, 18. 05. 2019, 1 female; Sürekli, N 38° 46' 25.37″, E 40° 36' 49.76″, 1095 m, 18. 05. 2019, 1 female; Karlıova: Yeniköy, N 39° 11' 40.44″, E 40° 55' 37.11″, 1711 m, 31. 05. 2019, 1 female. Frequent. Host plants: *Potentilla reptans, Origanum vulgare, Euphorbia, Rosa, Rubus* and *Sambucus* spp. European, Persian and Anatolian.

Macrophya (Macrophya) blanda (Fabricius, 1775): Bingöl: Genç: Pınaraltı, N 38° 44' 55.35″, E 40° 53' 49.59″, 1569 m, 10. 05. 2019, 1 female. Frequent. Host plants: *Rubus* and *Fragaria* spp., *Potentilla reptans*. European and Anatolian.

Macrophya (Macrophya) consobrina Mocsáry, 1881: Diyarbakır: Hani: Kalaba, N 38° 25' 52.76″, E 40° 25' 02.34″, 1106 m, 27. 03. 2019, 1 female; Süslü, N 38° 23' 28.52″, E 40° 19' 01.95″, 1098 m, 29. 03. 2019, 1 male; Lice: Oyuklu, N 38° 19' 55.42″, E 40° 45' 05.76″, 925 m, 11. 04. 2019, 1 male. Sporadic, Middle-East and Anatolian.

Macrophya (Macrophya) diversipes (Schrank, 1782): Bingöl: Çeltiksuyu, N 38° 51' 51.72″, E 40° 34' 23.38″, 1022 m, 16. 05. 2019, 1 female; Erentepe, N 38° 48' 32.68″, E

40° 28' 10.84″, 1477 m, 23. 05. 2019, 1 female; Kurudere, N 38° 54' 25.44″, E 40° 27' 40.39″, 1188 m, 15. 03. 2019, 1 female; Büyükterkören, N 38° 50' 35.45″, E 40° 34' 13.20″, 1017 m, 20. 05. 2019, 1 male; Genç: Dedebağı, N 38° 40' 37.61″, E 40° 19' 33.71″, 1234 m, 16. 05. 2019, 1 male; Karlıova: Sudurağı, N 39° 06' 52.44″, E 40° 51' 06.87″, 1648 m, 31. 05. 2019, 1 female; Solhan: Düzağac, N 38° 53' 12.22″, E 40° 56' 01.31″, 1332 m, 18. 05. 2019, 1 female; Oymapınar, N 38° 51' 03.96″, E 40° 58' 48.67″, 1183 m, 26. 05. 2019, 1 female; Diyarbakır: Lice: Daralan, N 38° 27' 46.65″, E 40° 32' 06.82″, 1400 m, 18. 04. 2019, 1 female. Frequent. Host plant: unknown. European, Caucasian and Anatolian.

Macrophya (Macrophya) postica (Brullé, 1832): Bingöl: Çeltiksuyu, N 38° 51' 15.71″, E 40° 33' 56.68″, 1013 m, 04. 05. 2019, 1 female; Genç: Binekli, N 38° 45' 49.24″, E 40° 52' 66.19″, 1579 m, 10. 05. 2019, 1 female; Doğanca, N 38° 42' 26.73″, E 40° 32' 93.88″, 1179 m, 14. 05. 2019, 1 female; Koçsırtı, N 38° 47' 07.12″, E 40° 49' 06.97″, 1277 m, 10. 05. 2019, 1 female; Meşedalı, N 38° 47' 07.96″, E 40° 37' 31.11″, 1002 m, 14. 05. 2019, 1 female; Soğukpınar, N 38° 42' 31.51″, E 40° 25' 46.40″, 1162 m, 15. 05. 2019, 1 female; Şehitköy, N 38° 42' 04.23″, E 40° 30' 41.61″, 1147 m, 14. 05. 2019, 1 female; Şeyhismail, N 38° 43' 53.35″, E 40° 21' 19.62″, 1177 m, 15. 05. 2019, 1 female; Karlıova: Ilıpmar, N 39° 22' 44.70″, E 40° 56' 47.05″, 1808 m, 06. 06. 2019, 1 male; Kiğı: Demirkanat, N 39° 13' 18.45″, E 40° 20' 42.25″, 1457 m, 05. 07. 2019, 1 female; N 39° 13' 16.52″, E 40° 20' 37.14″, 1454 m, 12. 06. 2019, 1 female; Duranlar, N 39° 16' 17.12″, E 40° 20' 47.91″, 1304 m, 12. 06. 2019, 1 female; Solhan: N 38° 57' 32.25″, E 41° 00' 51.26″, 1338 m, 24. 05. 2019, 1 female; Gündüz, N 38° 16' 29.97″, E 40° 55' 10.39″, 911 m, 29. 04. 2019, 1 male; Yedisu: Karapolat, N 39° 26' 55.53″, E 40° 29' 30.47″, 1440 m, 02. 06. 2019, 1 female; Diyarbakır: Bismil: Başaklı, N 37° 49' 42.46″, E 40° 28' 49.43″, 558 m, 30. 03. 2019, 1 female; Cermik: Bahçe, N 38° 66' 56.35″, E 39° 23' 29.84″, 826 m, 22. 04. 2019, 1 female; Gözerek, N 38° 21' 57.21″, E 39° 46' 27.37″, 1052 m, 15. 04. 2019, 1 female; Karakaya, N 38° 03' 24.42″, E 39° 18' 54.30″, 618 m, 13. 04. 2019, 1 female; Karataş, N 38° 04' 20.52″, E 39° 24' 17.08″, 677 m, 13. 04. 2019, 1 male; Korudağ, N 38° 05' 31.20″, E 39° 17' 34.30″, 897 m, 13. 04. 2019, 1 female; Çınar: Bozçalı, N 37° 45' 19.49″, E 40° 21' 08.98″, 669 m, 30. 03. 2019, 1 female; Çüngüş: Oyuklu, N 38° 13' 24.88″, E 39° 22' 12.56″, 1076 m, 19. 04. 2019, 1 female; Dicle: Kocaalan, N 38° 21' 39.51″, E 39° 07' 09.51″, 806 m, 20. 04. 2019, 1 female; Yeşilsırt, N 38° 20' 31.21″, E 40° 01' 53.75″, 724 m, 19. 04. 2019, 1 male; Yeşilyurt, N 38° 20' 06.24″, E 40° 01' 53.98″, 724 m, 19. 04. 2019, 1 male; Eğil: Ulubaş, N 38° 18' 57.92″, E 40° 02' 15.77″, 839 m, 19. 04. 2019, 1 female; N 38° 18' 57.60″, E 40° 02' 14.45″, 792 m, 14. 04. 2019, 1 female; Ergani: Çayköy, N 38° 11' 48.11″, E 39° 48' 45.67″, 979 m, 22. 04. 2019, 1 female; Çayırdere, N 38° 11' 40.80″, E 39° 34' 19.42″, 803 m, 21. 04. 2019, 1 male; Sağırlı, N 38° 15' 41.31″, E 39° 41' 26.43″, 899 m, 21. 04. 2019, 1 female; N 38° 15' 41.31″, E 39° 41' 26.43″, 899 m, 21. 04. 2019, 1 female; Salar, N 38° 15' 41.31″, E 39° 41' 26.43″, 899 m, 21. 04. 2019, 1 female; Yolköprü, N 38° 15' 03.79″, E 39° 42' 03.03″, 864 m, 21. 04. 2019, 1 male; Yolbulan, N 38° 13' 40.57″, E 39° 37' 10.46″, 983 m, 21. 04. 2019, 2 males; Hani: Bademli, N 38° 19' 41.62″, E 39° 23' 29.84″, 754 m, 21. 04. 2019, 1 female; Lice: Fisovaso, N 38° 21' 18.77″, E 40° 34' 19.57″, 899 m, 25. 04. 2019, 1 male; Kabakaya, N 38° 20' 21.67″, E 40° 44' 26.39″, 873 m, 28. 04. 2019, 1 male. Common. Hostplant unknown. East and Central European, Mediterranean, Caucasian and Anatolian.

Macrophya (Macrophya) rufipes (Linné, 1758): Bingöl: Genç: Tavus, N 38° 48' 08.61″, E 40° 58' 08.43″, 1893 m, 25. 05. 2019, 1 male. Frequent. Host plant: *Agrimonia eupatoria*. European, Anatolian and Persian.

Macrophya (Macrophya) superba Tischbein, 1852: Bingöl: Dikköy, N 38° 49' 21.02″, E 40° 40' 33.96″, 1010 m, 18. 05. 2019, 1 male. Frequent. North Mediterranean, Caucasian and Anatolian.

Macrophya (Macrophya) teutona (Panzer, 1799): Bingöl: Solhan: Dilektepe, N 38° 57' 04.70″, E 40° 59' 77.74″, 1288 m, 24. 05. 2019, 1 female. Sporadic. Host plant: *Euphorbia* spp. European and Anatolian.

Tenthredo (Elinora) asiatica (Enslin, 1910): Bingöl: Yeniköy, N 38° 50' 47.74″, E 40° 37' 49.49″, 1080 m, 25. 05. 2019, 1 male. Rare. Endemic to Turkey.

Tenthredo (Tenthredella) balteata Klug, 1817: Diyarbakır: Lice: Oyuklu, N 38° 19' 44.71″, E 40° 45' 31.90″, 939 m, 28. 04. 2019, 1 female. Rare in Turkey. Host plants: *Sorbus, Salix, Ribes, Spiraea, Rosa, Athyrium* and *Filipendula* spp. Also recorded from *Dasyphora fruticosa* and *Pteridium aquilinum*.

Tenthredo (Cephaledo) bifasciata ssp. *bifasciata* O.F. Müller, 1766: Bingöl: Büyükterkören, N 38° 50' 07.39″, E 40° 33' 46.34″, 1012 m, 20. 05. 2019, 1 male; Çeltiksuyu, N 38° 51' 06.77″, E 40° 33' 56.61″, 1013 m, 24. 05. 2019, 1 female; N 38° 52' 57.59″, E 40° 35' 21.66″, 1045 m, 20. 05. 2019, 1 female; Köklü, N 38° 55' 52.81″, E 40° 38' 31.61″, 1086 m, 17. 05. 2019, 1 female; Kiğı: Duranlar, N 39° 16' 17.12″, E 40° 20' 47.91″, 1304 m, 12. 06. 2019, 1 female; Solhan: Arakonak, N 38° 58' 40.46″, E 41° 08' 31.48″, 1775 m, 24. 05. 2019, 1 female; Yayladere: Günlük, N 39° 10' 09.98″, E 40° 08' 20.42″, 1156 m, 13. 06. 2019, 1 male; Diyarbakır: Lice: Dallıca, N 38° 24' 14.68″, E 40° 45' 51.13″, 786 m, 12. 04. 2019, 1 male. Frequent. Host plant: unknown, probably *Aegopodium*.

Tenthredo (Maculedo) cinctipleuris (Enslin, 1910):

Material examined: Bingöl: Büyükterkören, N 38° 49' 49.46″, E 40° 34' 28.59″, 1009 m, 16. 05. 2019, 1 male. Rare Caucasian, Iranian and Anatolian.

Tenthredo (Cephaledo) costata Klug, 1817: Bingöl: Çeltiksuyu, N 38° 52' 16.89″, E 40° 33' 45.63″, 1017 m, 04. 05. 2019, 1 female; Sancak, N 39° 05' 37.56″, E 40° 22' 38.07″, 1585 m, 26. 05. 2019, 1 female; Genç: Gözütok, N 38° 46' 51.24″, E 40° 41' 07.08″, 1283 m, 18. 05. 2019, 1 female; Sırmalıoya, N 38° 38' 04.553″, E 40° 11' 28.70″, 1858 m, 17. 05. 2019, 1 male;: Soğukpınar, N 38° 42' 59.41″, E 40° 27' 11.55″, 1162 m, 15. 05. 2019, 1032 m, 1 female; Solhan: N 38° 57' 06.75″, E 41° 02' 04.00″, 1321 m, 24. 05. 2019, 1 male; Yedisu: Dinarbey, N 39° 22' 03.92″, E 40° 39' 21.11″, 1831 m, 06. 05. 2019, 1 female; Güzgülü, N 39° 26' 17.68″, E 40° 25' 05.83″, 1424 m, 02. 06. 2019, 1 female; Kabaoluk, N 39° 25' 55.09″, E 40° 29' 59.21″, 1412 m, 06. 07. 2019, 1 female; Diyarbakır: Çermik: Karakaya, N 38° 02' 48.67″, E 39° 19' 62.05″, 618 m, 15. 04. 2019, 1 female; Kayagediği, N 38° 09' 16.86″, E 39° 34' 28.52″, 1085 m, 15. 04. 2019, 1 female; Dicle: Bozbaba, N 38° 20' 14.51″, E 40° 06' 21.15″, 829 m, 20. 04. 2019, 1 female; Hani: Döğer, N 38° 21' 59.83″, E 40° 13' 08.19″, 750 m, 21. 04. 2019, 1 male; Lice: Angül, N 38° 24' 18.81″, E 40° 33' 55.14″, 879 m, 18. 04. 2019, 1 female; Bağlan, N 38° 20' 03.91″, E 40° 43' 41.69″, 835 m, 28. 04. 2019, 1 male. Frequent. Host plants: *Chondrilla juncea* and *Ch. ramosissima*. North-Mediterranean and Anatolian. Central Europe is the northern border of its distribution where it appears occasionally.

Tenthredo (Elinora) dahlii Klug, 1817: Diyarbakır: Hani: Uzunlar, N 38° 24' 34.34″, E 40° 27' 03.41″, 923 m, 27. 03. 2019, 1 female. Frequent. Host plant: unknown. Central- and East European, East-mediterranean and Anatolian species.

Tenthredo (Zonuledo) distinguenda ssp. *distinguenda* (Stein, 1885): Bingöl: Ağaçyolu, N 38° 56' 49.59″, E 40° 31' 38.93″, 1555 m, 22. 05. 2019, 1 female; İncesuyu, N 38° 51' 51.50″, E 40° 38' 09.08″, 1095 m, 25. 05. 2019, 1 female; Yedisu: Ayanoğlu, N 39° 77' 29.75″, E 40° 25' 49.65″, 1402 m, 02. 06. 2019, 1 female; Diyarbakır: Hazro: Uzunargıt, N 38° 14' 07.05″, E 40° 46' 58.96″, 942 m, 04. 04. 2019, 1 female. Frequent. Host plant: *Hypericum perforatum*. European and Anatolian.

Tenthredo (Zonuledo) distinguenda ssp. *hyrcana* Benson, 1968: Bingöl: Balıklıçay, N 39° 02' 35.06″, E 40° 22' 53.35″, 1548 m, 12. 06. 2019, 1 female; Solhan: N 38° 57' 36.43″, E 41° 00' 48.83″, 1333 m, 24. 05. 2019, 1 male; Yayladere: Zeyneli, N 39° 11' 49.13″, E 40° 11' 51.78″, 1202 m, 13. 06. 2019, 1 female; Diyarbakır: Lice: Budak, N 38° 24' 14.68″, E 40° 45' 51.13″, 786 m, 11. 04. 2019, 1 female; Yalaza, N 38° 20' 24.89″, E 40° 40' 19.71″, 963 m, 01. 04. 2019, 1 female. Frequent. Caucasian, Iranian and Anatolian. Host plant unknown.

Tenthredo (Cephaledo) excellens (Konow, 1886): Bingöl: Çayağzı, N 38° 46' 58.60″, E 40° `33' 26.53″, 992 m, 20. 05. 2019, 1 female; Çeltiksuyu, N 38° 51' 15.71″, E 40° 33' 28.63″, 1013 m, 04. 05. 2019, 1 female; Çiçekdere, N 38° 57' 05.81″, E 40° 27' 49.41″, 1640 m, 22. 05. 2019, 1 female; Inalı, N 38° 52' 22.49″, E 40° 32' 05.49″, 1053 m, 19. 05. 2019, 1 female; Kartal, N 39° 01' 05.56″, E 40° 23' 56.68″, 1013 m, 04. 05. 2019, 1 female; Adaklı: N 39° 12' 59.81″, E 40° 28' 09.21″, 1360 m, 12. 06. 2019, 1 female; Kamışgülü, N 39° 12' 56.17″, E 40° 25' 34.99″, 1262 m, 11. 06. 2019, 1 female; Genç: Soğukpınar, N 38° 42' 23.51″, E 40° 25' 46.40″, 1162 m, 15. 05. 2019, 1 female; Kiğı: Darköprü, N 39° 11' 58.56″, E 40° 18' 02.73″, 1222 m, 05. 07. 2019, 1 female; Solhan: Arakonak, N 38° 57' 19.42″, E 41° 07' 02.48″, 1589 m, 24. 05. 2019, 1 female. Frequent. Host plant: *Lactuca serriola*. Mediterranean, Central European, Middle-Eastern, Caucasian and Anatolian.

Tenthredo (Zonuledo) flavipennis Brullé, 1832: Bingöl: Genç: Şehitköy, N 38° 42' 04.23″, E 40° 30' 41.61″, 1147 m, 14. 05. 2019, 1 female. Sporadic. Host plant: unknown. North Mediterranean, Anatolian and Central-European.

Tenthredo (Elinora) krausi Blank & Taeger, 2006: Bingöl: Adaklı: Hasbağlar, N 39° 11' 01.77″, E 40° 22' 23.77″, 1569 m, 12. 06. 2019, 1 male; Diyarbakır: Hani: Belen, N 38° 24' 55.61″, E 40° 22' 14.45″, 931 m, 27. 03. 2019, 1 male; Lice: Dallıca, N 38° 23' 36.64″, E 40° 47' 27.94″, 790 m, 20. 04. 2019, 1 male. Frequent. Host plant: unknown. Middle Eatern-Anatolian, known from Syria and Turkey.

Tenthredo (Elinora) persica (André, 1882): Diyarbakır: Bismil: Ambar, N 37° 50' 41.20″, E 40° 33' 30.69″, 548 m, 20. 03. 2019, 1 male; Çermik: Başarı Bucağı, N 38° 09' 16.86″, E 39° 34' 28.52″, 699 m, 15. 04. 2019, 1 female. Sporadic. Iranian, Anatolian and Caucasian. Known from Turkey, Iran and Russia. Host plant unknown.

Tenthredo (Zonuledo) zonula Klug, 1817: Bingöl: Çayboyu, N 38° 53' 57.77″, E 40° 30' 52.08″, 1083 m, 05. 05. 2019, 1 female; Çeltiksuyu, N 38° 51' 06.77″, E 40° 33' 56.61″, 1013 m, 24. 05. 2019, 1 female; N 38° 51' 20.68″, E 40° 34' 04.37″, 1015 m, 04. 05. 2019, 1 male; N 38° 51' 06.77″, E 40° 33' 56.61″, 1013 m, 24. 05. 2019, 1 female; Çevrimpınar, N 38° 55' 49.40″, E 40° 22' 12.63″, 1318 m, 15. 05. 2019, 1 female; Düzyayya, N 38° 48' 05.38″, E 40° 28' 57.28″, 1373 m, 06. 05. 2019, 1 female; Elmalı, N 39° 01' 00.57″, E 40° 43' 12.15″, 1286 m, 05. 05. 2019, 1 male; Kardeşler, N 38° 54' 33.91″, E 40° 37' 10.63″, 1083 m, 19. 05. 2019, 1 female; Adaklı: Karaçubuk, N 39° 11' 48.76″, E 40° 28' 28.42″, 1418 m, 06. 07. 2019, 1 male; Karlıova: Kalencik, N 39° 09' 14.89″, E 40° 54' 69.47″, 1772 m, 31. 05. 2019, 1 female; Kiğı: Duranlar, N 39° 15' 46.46″, E 40° 21' 01.32″, 1207 m, 13. 06. 2019, 1 female; Solhan: Çermük, N 38° 59' 39.49″, E 40° 50' 40.75″, 1776 m, 26. 05. 2019, 1 female; Dilektepe, N 38° 57' 04.85″, E 41° 00' 27.10″, 1291 m, 24. 05. 2019, 1 male; N 38° 54' 04.70″, E 40° 59' 47.74″, 1288 m, 24. 05. 2019, 1 male; Yenibaşak Bucağı, N 38° 48' 06.69″, E 41° 00' 45.85″, 1481 m, 25. 05. 2019, 1 male; Yedisu: Şenköy, N 39° 25' 17.82″, E 40° 31' 48.37″, 1493 m, 06. 07. 2019, 1 male; Diyarbakır: Çermik: Bahçe, N 38° 06' 12.65″, E 39° 23' 43.79″, 833 m, 27. 03. 2019, 1 male; Ergani: Değirmendere, N 38° 20' 48.68″, E 39° 42' 45.71″, 866 m, 24. 03. 2019, 1 female; Hani: Kırım, N 38° 23' 44.75″, E 40° 26' 24.13″, 863 m, 25. 04. 2019, 1 male; Lice: Dolunay, N 38° 19' 48.68″, E 40° 40' 41.33″, 1018 m, 25. 04. 2019, 1 male. Common. Host plant: *Hypericum perforatum*. West Palaearctic.

Tenthredopsis albonotata (Brullé, 1832): Bingöl: Ağaçeli, N 38° 56' 38.01″, E 40° 43' 08.09″, 1315 m, 26. 05. 2019, 1 female; Karlıova: Hacılar, N 39° 05' 01.63″, E 40° 49' 21.67″, 1417 m, 31. 05. 2019, 1 female; Diyarbakır: Hantepe, N 38° 05' 59.83″, E 40° 09' 29.20″, 649 m, 23. 03. 2019, 1 male; Bismil: Tatlıçayır, N 37° 59' 33.41″, E 40° 36' 24.42″, 620 m, 19. 03. 2019, 1 female; Hazro: Kavaklı, N 38° 15' 57.72″, E 40° 41' 31.16″, 1335 m, 04. 04. 2019, 1 female; Hani: Topçular, N 38° 27' 51.53″, E 40° 24' 31.26″, 930 m, 27. 03. 2019, 1 female. Frequent. Host plant: unknown. East-Mediterranean and Anatolian.

Tenthredopsis annuligera (Eversmann, 1847): Bingöl: Beyaztoprak, N 38° 55' 32.50″, E 40° 38' 24.50″, 1089 m, 21. 05. 2019, 1 female; Kaleönü, N 38° 53' 28.91″, E 40° 33' 25.74″, 1025 m, 21. 05. 2019, 1 female; Genç: Sülünkaş, N 38° 49' 38.68″, E 40° 56' 57.07″, 1647 m, 25. 05. 2019, 1 female; Yedisu: Şenköy, N 39° 25' 20.03″, E 40° 31' 59.60″, 1483 m, 02. 06. 2019, 1 female; Diyarbakır: Çüngüş: Akbaşak, N 38° 15' 47.59″, E 39° 18' 27.74″, 1372 m, 24. 03. 2019, 1 male; Hazro: Ormankaya, N 38° 18' 13.20″, E 40° 44' 29.38″, 1099 m, 19. 04. 2019, 1 female; Silvan: Dolapdere, N 38° 18' 30.36″, E 40° 53' 09.11″, 910 m, 05. 04. 2019, 1 female. Frequent. Host plant: unknown. East-Mediterranean, Anatolian and East-European.

Results

181 specimens of 45 species were collected from Bingöl and Diyarbakir privonces of Turkey.

The earliest capture of sawflies was on 10th of March, the last was on 6th of July. From the 45 collected species, 40 species are flower visitors, which is an extremely high proportion and probably typical for the Anatolian biogeographic region. The measured population density is extremely low, one day from one sampling site only 1-2 specimens of one species were captured which is seems to be specific for the Anatolian biogeographic region either.

Dominant species

The most frequently collected species are: *Macrophya postica* (Brullé, 1832) with 39 specimens, *Tenthredo zonula* Klug, 1817 with 20 and *Tenthredo costata* Klug, 1817 with 15. These 3 species comprise 41% of the total collected material.

Rare and interesting species

Cephus pulcher Tischbein, 1852: Kiğı: Duranlar, N 39° 16' 17.12″, E 40° 20' 47.91″, 1304 m, 12. 06. 2019, 1 female. From Turkey, we have only one other record: Aksaray: Güzelyurt, 38°16´N 34°25´E, 1785 m, 02. 06. 2002, 1 female (MUTLU 2019). It is distributed in Austria, Czech Republic, Hungary, Poland, Russia, Slovakia, Ukraine and Uzbekistan. This species is described from Hungary, based on 2 male specimens sent by Mr. Kovács, collection manager of the Hungarian National Museum, Natural History to Tischbein.

Arge auripennis Konow, 1891: New record for Turkey. Diyarbakır: Lice: Türeli, N 38° 25' 09.84″, E 40° 53' 54.09″, 738 m, 12. 04. 2019, 1 female. Rare. So far, it is known from Croatia, Italy, Romania and Slovenia. We have data from the Carpathian Basin from Segesvár, Kolozs county and Nagyszeben (formerly Hungary: Transylvania, now Romania). The Croatian record is indefinite. The Italian specimen was collected next to Triest at Santa Croce; Kirchenbauer published it as *Hylotoma graeffei* Kriechbaumer,

1892. From Slovenia, Schedl (2017) reported it from Istria: Čičarija, s.v. Vodice, Slavnik W Podgorje and Vodice. Çalmaşur & Özbek 2013 erroneously referred Benson 1968 this way: "*Distribution: Europe, Syria, Turkey, Transcaucasia* (Benson 1968)". Benson (1968) never recorded it from Turkey, he listed this species only as potenial species for Turkey: "*Arge auripennis Konow S. E. Europe, Syria and Transkaukasia*" see similar mistake in Çalmaşur & Özbek 2013 at *Arge pallidinervis* Gussakovskij below.

Arge pallidinervis Gussakovskij, 1935: Bingöl: Adaklı: Güngörsün, N 39° 15' 20.29″, E 40° 28' 18.93″, 1539 m, 12. 06. 2019, 1 male; Yayladere: Boğazköy, N 39° 15' 13.64″, E 40° 03' 32.56″, 1772 m, 14. 06. 2019, 1 male. Improper citacion by Çalmaşur & Özbek 2013: „Distribution: Transcaucasia, Turkey (Benson 1968, Liston 1995).” The original citation by Benson (1968) is only "Transcaucasia" without mentioning Turkey and Liston (1995) reported it only from Ukraine. Benson, in his monograph, listed not only Turkish sawflies, but as he wrote in the introduction part: "*The present work on the sawflies,..., has been broadened to include material from other countries bordering the Eastern Mediterranean*".

Arge yildirimi Haris & Kaplan, 2021: Recently described species, see Haris & Kaplan (2021). Specimens were captured in the montane region of Anatolia, Diyarbakır province, between 733 and 1124 meters above sea level from 28. 03. till 28. 04. Probably frequent species. This species easy to confuse with 3 other Turkish Argidae species, namely: *Kokujewia ectrapela* Konow, 1902, *Kokujewia clementi* Zirngiebl, 1949 and *Arge frivaldszkyi* (Tischbein, 1852). The 2 Kokujewia species differs from *Arge yildirimi* having 3 cubital cells and hind tibia smooth, while *Arge yildirimi* similar to other *Arge* species, has 4 cubital cells and hind tibia with long submedian spine. *A. yildirimi* is most similar to *Arge frivaldszkyi* (Tischbein, 1852). These two species differ as follows: the frontal basin of the *A. yildirimi* is triangularly elongated down to the level of the antennal sockets and clearly carinate; in *A. frivaldszkyi* this elongate and carinate frontal basin is missing. In the fore wing of *A. yildirimi*, veins basalis and cubitalis meet at one point on the subcosta, and the wings are weakly infumated, with subcostal area strongly and strikingly infumate, veins, including costa, subcosta and stigma black. In contrast, the wings of *A. frivaldszkyi* are uniformly infumated, and the subcostal area is not darker than the other parts of the wing, costa and subcosta yellow and basalis and cubitalis of anterior wing reach the subcosta having distance equal with subcostal cross-vein. The last abdominal segment in *A. yildirimi* is bluish black, while in *A. frivaldszkyi* it is orange, only the ovipositor is black. Finally, all dark colour in *A. yildirimi* is black with strong blue lustre, while in *A. frivaldszkyi* it is black without any metallic lustre.

Dolerus (*Dolerus*) *hispanicus* Mocsáry, 1881: Bingöl: Genç: Döşekkaya, N 38° 38' 11.11″, E 40° 23' 07.23″, 1015 m, 16. 05. 2019, 1 male; Yayladere: Aydınlar, N 39° 10' 24.61″, E 40° 03' 53.16″, 1626 m, 14. 06. 2019, 1 female; Diyarbakır: Lice: Tepe, N 38° 23' 47.61″, E 40° 44' 15.82″, 799 m, 20. 04. 2019, 1 male. It was described from Spain and also recorded from Iran and Morocco. New record for Turkey. Probably frequent in Anatolia.

Athalia dimidiata Konow, 1891: Rare. From Turkey, so far, we have only indefinite data: "Turkey: endemic" (Benson 1968). Actually, it is not endemic, since the locus typicus is "Araxes-Thal bei Ordubad" (Konow 1891). Ordubad is not in Turkey, it is in Azerbaijan (mistake in Benson 1968). Therefore it is new record for Turkey.

Tenthredo (*Elinora*) *asiatica* (Enslin, 1910): Rare. Probably, it is endemic to Turkey. So far, we had only indefinite data: "Kleinasien" . Our record: Bingöl: Yeniköy, N 38° 50' 47.74″, E 40° 37' 49.49″, 1080 m, 25. 05. 2019, 1 male, is the first precise data for this species.

Endangering factors

Intensive beekeping

Intensive beekeeping creates increased competition for other native flower visitors, including many sawflies, displacing them from their feeding habitas.

The intensive beekeping is typical for the following areas: Diyarbakır: Karpuzlu, Dicle: Biçer, Bingöl: Güvercinlik, Solhan: Gündüz.

Invasive plants

In the extensively applied traditional farming, the high number of sheep and goats are able to control the invasive plants. In the examined ares, we observed the following invasive plants: *Euphorbia macroloda, Euryops pectinatus, Roman chamomile* and *Grammasciadium macrodan*.

Intensive grazing.

Normally, traditional farming is helpful to control the invasive plants and preserve pastures and meadows preventing the pioneer plant-associations to occupy these areas. Unfortunately, we observed large flocks of sheep and goats that may severely impact the native vegetation around the following villages: Diyarbakır: Karpuzlu, Solhan: Gündüz, Çermik: Korudağ, Çermik: Bahçe, Çermik: Karakaya, Çınar: Bozçalı, Dicle: Yeşilsu and Ergani: Yolköprü.

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References

Belokobyskij, S. A. & Leley, A. S. 2017: Annotated Catalog of the Hymenoptera of Russia. Volume 1. Symphyta amd Apocrita: Aculeata. – Proceedings of the Zoological Institute of the Russian Academy of Sciences. Sankt Petersburg. Suppl. 6. 389 pp.

Benson, R. B. 1968: Hymenoptera from Turkey, Symphyta. – Bulletin of the British Museum (Natural History). - Entomology series, London 22(4): 111-207. https://doi.org/10.5962/bhl.part.9952

Çalmaşur, Ö. & Özbek, H. 2004a: A contribution to the knowledge of the Tenthredinidae. (Symphyta, Hymenoptera) fauna of Turkey. Part I: The subfamily Tenthredininae. – Türkish Journal of Zoology 28: 37-54.

Çalmaşur, Ö. & Özbek, H. 2004b: A contribution to the knowledge of Tenthredinidae (Symphyta, Hymenoptera) fauna of Turkey Part II: Subfamilies Blennocampinae, Dolerinae, Nematinae and Selandrinae. – Türkish Journal of Zoology 28: 55-71.

Çalmaşur, Ö. & Özbek, H. 2006: Check-list of the Argidae fauna (Hymenoptera: Symphyta) of Turkey. – Zoology of the Middle East 39: 89-96. https://doi.org/10.1080/09397140.2006.10638187

Çalmaşur, Ö. 2006: Four new records for the Turkish Tenthredinidae. – Türkiye Entomoloji Dergisi 30 (3): 201-207.

Çalmaşur, Ö. 2019: New records and some new distribution data to the Turkish Allantinae, Blennocampinae, Heterarthrinae, and Selandrinae (Tenthredinidae, Symphyta, Hymenoptera) fauna. – Munis Entomology and Zoology 14(1): 96-103.

Çalmaşur, Ö. 2020: New records and some new distribution data for the Turkish Nematinae (Hymenoptera: Symphyta: Tenthredinidae) fauna. – Türkiye Entomoloji Dergisi 44 (3): 413-422. https://doi.org/10.16970/entoted.715181

Chevin, H. & Desmier de Chenon, R. 1982: Contribution à la faune des Hyménoptères Symphytes de Turquie. – Bulletin de la Société Entomologique de France, Paris 87: 43-47.

Choi, J.-K., Lee, S. B., Wei, M. & Lee, J. W. 2016: Three new species of the genus Arge (Hymenoptera: Symphyta: Argidae) from South Korea with key to species of the subfamily Arginae. – Journal of Asia-Pacific Entomology, Suwon 9: 183-193.

Costa, A. 1890: Miscellanea Entomologica. – Reprint from Atti della R. Accademia delle Scienze fis. e mat. di Napoli 5: 1-19.

Enslin, E. 1910a: Systematische Bearbeitung der paläarktischen Arten des Tenthrediniden-Genus Macrophya Dahlb. (Hym.). - Deutsche Entomologische Zeitschrift, Berlin [1910](5): 465-503.

Enslin, E. 1910b: Das Tenthrediniden-Genus Allantus Jur. – Russkoje entomologitscheskoje obozrenije, S. Peterburg 10(4): 335-372.

Kaplan, E., Mart, A., Haris, A. & Yildirim, E. 2018: Contribution to the knowledge of the Megalodontesidae, Argidae, Cimbicidae, Cephidae and Tenthredinidae (Symphyta: Hymenoptera) fauna from Bingöl and Diyarbakır provinces of Turkey. – Natura Somogyiensis 32: 109-120. http://doi.org/10.24394/NatSom.2018.32.109

Kaplan, E. & Haris, A. 2021: New species of Arge (Schrank, 1802) (Hymenoptera, Argidae) from Turkey – Acta Zoologica Academiae Scientiarum Hungaricae 67(4): 341–347. DOI: 10.17109/AZH.67.4.341.2021

Koçak, A. Ö. & Kemal, M. 2015: Hymenoptera of Turkey. – Priamus Serial Publication of the Centre for Entomological Studies Ankara. Supplement 38: 1-393.

Konow, F. W. 1891: Neue Blattwespen. – Wiener entomologische Zeitung, Wien 10(2): 41-48.

Mocsáry, S. 1883: Hymenoptera nova europaea et exotica. Európai és másföldi új hártyaröptűek. – Értekezések a természettudományok köréből, Budapest 13(11): 1-72.

Mocsáry, S. 1881: Hymenoptera nova e variis orbis terrarum partibus. Új hártyaröptűek a föld különböző részeiből. (In Latin, abstract in Hungarian.) - Természetrajzi Füzetek, Budapest 5(1): 29-37.

Mutlu, C. 2019: Wheat Stem Sawflies in the Southeast Anatolia Region of Turkey. – Entomological News 128(3): 267-283. https://doi.org/10.3157/021.128.0307

Roller, L. 1999: Check list of the sawflies (Hymenoptera: Symphyta) of Slovakia. – Entomological Problems 30(2): 37-48.

Roller, L. & Haris, A. 2008: Sawflies of the Carpathian Basin, history and current research. – Natura Somogyiensis 11: 1-259.

Schedl, W. 2017: Die Pflanzenwespen (Hymenoptera: Symphyta) der gesamten istrianischen Halbinsel von Duino (JulischVenetien) bis Opatija (Kroatien). – Linzer biologische Beiträge, Linz 49(2): 1411-1446.

SUNDUKOV, Y. Y. 2017: Suborder Symphyta – sawflies and wood wasps. In: LELEJ A. S. (Ed.). Annotated catalogue of the Hymenoptera of Russia. Volume I. Symphyta and Aculeata. – Proceedings of the Zoological Institute RAS. Supplement 6: 20-117.

TAEGER, A. 1992: Fünfter Beitrag zur Systematik der Blattwespengattung Tenthredo L. (Hymenoptera, Symphyta). – Beiträge zur Entomologie 42(1): 3-53.

TISCHBEIN P. F. L. 1852: Hymenopterologische Beiträge. – Entomologische Zeitung, Stettin 13(5): 137-140.

YILDIRIM E. 2016: The current knowledge of some hymenopterous families (Insecta: Hymenoptera) in Turkey. - Linzer biologische Beiträge 48 (2): 1817-1822.

ZHELOCHOVTSEV, A. N. 1988: Otryad Hymenoptera – Pereponchatokrylye, Podotryad Symphyta – Sidyachebryukhie, 7-234. In: MEDVEDEV, K.H. (ed.) Opredelitel nasekomykh evropeiskoi chasti SSSR, Vol. 3 Hymenoptera, Part 6, Nauka, Leningrad. https://doi.org/10.5962/bhl.title.46334

Natura Somogyiensis 37: 25-42. Kaposvár, 2021 DOI:10.24394/NatSom.2021.37.25
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Sawflies of the Cserhát Mountains (Hymenoptera: Symphyta)

Attila Haris

H-1076 Budapest, Garay street 19., Hungary, email: attilaharis@yahoo.com

Haris, A.: *Sawflies of the Cserhát Mountains (Hymenoptera: Symphyta).*
Abstract: 573 specimens of 110 species were collected in the Cserhát Mountains. The presence of *Sterictiphora furcata* (Villers, 1789) confirmed and documented first time in the Carpathian Basin. Rare species are: *Empria hungarica* (Konow, 1895), *Aprosthema austriacum* (Konow, 1892), *Arge pleuritica* (Klug, 1834), *Monardis plana* (Klug, 1817), *Hoplocampa pectoralis* Thomson, 1871, *Pachynematus moerens* (Förster, 1854) and *Pristiphora abbreviata* (Hartig, 1837).

Keywords: Hymenoptera, Symphyta, Cserhát Mountains, Hungary, new record

Introduction

Cserhát is a member of the North Hungarian Mountains (Fig. 1 and 3). It is bordered on the north by the Ipoly Valley, on the east by the Tarján and the Zagyva brooks, on the south by the Great Hungarian Plain, and on the west by the Nógrád Basin and the Börzsöny Mountains. It's geology and surface forms are diverse. Unlike the two neighboring mountains, the Börzsöny and the Mátra, not the vulcanic but the sedimentary rocks dominate here.

The mountains can be divided into five parts. The western Cserhát consists mostly of Oligocene sediments the highest point of the mountains: the Naszály is located here. The North Cserhát (or Kopasz-Cserhát) has heavily fragmented, hilly landscape. Miocene volcanoes and sediments are mixed in the Central Cserhát. The rock material of the Eastern Cserhát (Pásztói-Cserhát) is mostly volcanic. In the south, the hills of Cserhátalja melts gradually into the Great Hungarian Plain.

Due to the characteristic inter-mountainous "basin effect", the climate of the area is moderately cool and moderately dry. The shiny hours are quite low, 1900-1950 hours / year. The average annual temperature varies between 8 and 10 °C increasing from North to South. Frosts occur from middle of October, the number of frost-free days is only 170-180 days per year.

Due to the inter-mountainous basin effect, Cserhát is drier than the surrounding areas. The annual rainfall varies between 560 and 620 mm. In the north it is 600-620 mm/year, while in the south and at the eastern foots of the mountains it is only 560-600 mm. The dominant wind direction of the area is northwest-west.

The area of the mountains was originally covered with Turkey oak (*Quercus cerris*) forests and hornbeam-oak forest associations (*Querco petreae-Carpinetum*), most of these forest associations disappeared as a result of human activity. Now, the typical for-

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est associations of the southern slopes and the Gödöllő Hills are the xerotherm oak forests frequently mixed with Tartar maple (*Aceri tatarico-Quercetum*). Alien Robinia (black locust) or black pine were often planted in place of former vineyards abandoned during the phylloxera disaster.

In addition to the forests, two characteristic grassland associations are also native: the loess steppe grasslands and the subcontinental semi-dry grasslands. They are mostly repressed due to human intervention and harmful alien species such as the Canadian goldenrod (*Solidago canadensis)*, the tall goldenrod (*Solidago gigantea*) or the silkworm (*Asclepias syriaca*).

Material and methods

The applied method was net sweeping from the beginning till the last decade of May. After this, the capture of individuals was the dominant method combined with netsweeping of lower canopies and bushes.

For identification, Zhelochovtsev's work on the sawflies of the European part of the former USSR, the handbook of Lacourt on the identification of the European sawflies and the latest Czeh and Slovakian monograph (ZHELOCHOVTSEV 1988, MACEK et al. 2020, LACOURT 2020) were consulted. We also used some recent revisions and works to make the identifications even more precise (HARIS 2006, KOCH 1988, PROUS et al. 2021).

For the discussion of the distribution of sawflies, we consulted the book of ROLLER and HARIS titled Sawflies of the Carpathian Basin, History and Current Research (ROLLER & HARIS 2008), the most recent European checklist of species (TAEGER et al. 2006) and the monograph of Sundukov of the sawflies of Russia (SUNDUKOV 2017) augmented by other faunistic records from the Carpathian Basin (MOCSÁRY 1900, ROLLER 1993, 1994, 1996, 1998, 1999a, b, c, d, e, 2000a, b, c, 2001, 2004, 2005, 2006a, b, 2010, ROLLER & LUKÁŠ 1999. ROLLER et al. 2006, ROLLER & MACEK, 2017 ROLLER & OLŠOVSKÝ, 2012, BALÁZS & HARIS 2019a, b, HARIS 2001a, 2009, 2010, 2011, 2012, 2018a, b, HARIS & GYURKOVICS 2012).

The used nomenclature in this paper, follows the latest monograph of European sawflies (LACOURT 2020).

The higher classification of sawflies applied in this work follows the Hymenoptera part of Fauna Europaea (ACHTERBERG 2013).

List of sampling sites

Alsópetény: Bánki-völgy (Bánki valley): between 47°53'8.26"N, 19°13'50.50"E and 47°53'15.09"N, 19°13'56.40"E, altitude: 219-237 m.

Alsópetény: Cser-tó (Cser lake): between 47°52'7.97"N, 19°15'17.19"E and 47°52'6.68"N, 19°15'8.67"E, altitude: 215 m.

Alsótold: Nagy-Mező-hegy (Nagy-Mező hill): between 47°56'47.79"N, 19°35'29.85"E and 47°56'32.58"N, 19°35'32.87"E, altitude: 230-258 m.

Bánk: Száva-hegy (Száva hill):between 47°55'20.06"N, 19°12'52.27"E and 47°55'32.80"N, 19°12'43.31"E, altitude: 169-202 m.

Bokor: Belterület (inside the village): between 47°55'27.95"N, 19°32'47.30"E and 47°55'23.63"N, 19°32'53.72"E, altitude: 254 m.

Cserhátszentiván: Zsunyi-patak (Zsunyi brook): between 47°56'29.70"N, 19°35'21.54"E and 47°56'42.07"N, 19°35'13.29"E, altitude: 218-224 m.

Csővár: Sinkár-tó (Sinkár lake): between 47°48'7.45"N, 19°21'26.83"E and 47°47'57.97"N, 19°21'35.35"E, altitude: 162-165 m (Fig. 2).

Ecseg: Kozárdi-tó (Kozárdi lake): between 47°54'15.28"N, 19°36'36.72"E and 47°54'21.82"N, 19°36'51.85"E, altitude: 172-185 m (Fig.4).

Felsőtold: temető (meadow opposite of the cementery): between 47°57'53.11"N, 19°36'19.44"E and 47°57'54.36"N, 19°36'15.58"E, altitude: 234 m.

Galgaguta: Galga-patak (Galga brook): between 47°49'50.94"N, 19°23'36.37"E and 47°49'44.25"N, 19°23'41.15"E, altitude: 171-172 m.

Garáb: Garábi-patak (Garábi brook): between: 47°58'25.16"N, 19°37'29.95"E and 47°58'14.36"N, 19°37'24.59"E, altitude: 276-277 m.

Kébodony: Rákóczi-emlékmű (meadow at Rákóczi monument): between 47°55'37.03"N, 19°16'13.96"E and 47°55'34.33"N, 19°16'13.30"E, altitude: 160-162 m.

Kisecset: Kiliántelep: between 47°55'59.80"N, 19°19'32.30"E and 47°56'2.11"N, 19°19'36.76"E, altitude: 218-233 m.

Kozárd: Bézma: between 47°55'56.12"N, 19°36'37.38"E and 47°55'51.97"N, 19°36'27.53"E, altitude: 349-355 m.

Kutasó: Középső-hegy (Középső hill, former vineyards): between 47°57'3.51"N, 19°32'55.93"E and 47°57'12.90"N, 19°32'48.09"E, altitude: 284-318 m.

Legénd: Hosszú-föld: between 47°52'19.05"N, 19°19'17.99"E and 47°52'18.13"N, 19°19'12.68"E, altitude: 206 m.

Nagylóc: Alsó-Zsúny: between 47°59'27.86"N, 19°36'45.75"E and 47°59'33.82"N, 19°36'37.35"E, altitude: 257-259 m.

Nagylóc: Zsunypuszta: between 47°59'56.32"N, 19°37'8.74"E and 47°59'53.99"N, 19°37'6.64"E, altitude: 261 m.

Penc: Kis-völgy (Kis valley): between 47°47'41.32"N, 19°15'22.00"E and 47°47'47.59"N, 19°15'22.33"E, altitude: 149-151 m.

Penc: Obszervatórium (forest at Observatory): between 47°47'34.14"N, 19°15'53.15"E and 47°47'20.40"N, 19°16'7.32"E, altitude: 189-173 m.

Penc: Ujhrabina: between 47°49'6.82"N, 19°15'49.80"E and 47°49'6.52"N, 19°15'56.41"E, altitude: 218-217 m.

Penc: Zsobrák: between 47°48'47.10"N, 19°14'28.16"E and 47°48'37.27"N, 19°14'31.81"E, altitude: 155-164 m.

Rád: Lágyas-erdő (Lágyas forest): between 47°47'14.85"N, 19°13'21.50"E and 47°47'8.51"N, 19°13'33.56"E, altitude: 135-148 m.

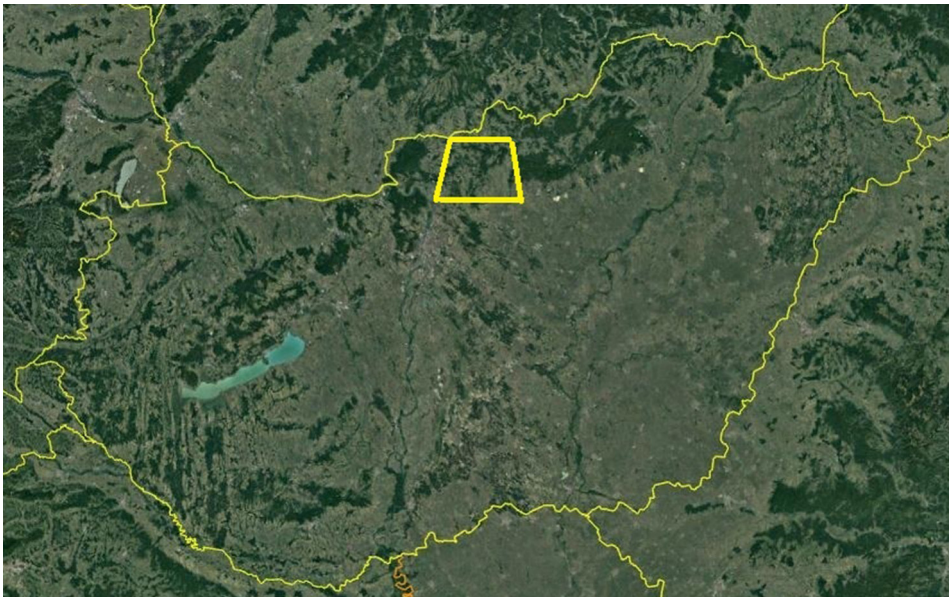

Fig. 1: The Cserhát Mountains in Hungary

Fig. 2: Willow forest around Sinkár lake at Csővár (photo: A. Haris)

Fig. 3: Cserhát Mountains landscape (photo: A. Haris)

Fig. 4: Ecseg: Kozárdi-tó (Kozárdi lake) (photo: A. Haris)

Results

List of species

Argidae

Aprosthema austriacum (Konow, 1892): Bánk: Száva-hegy, 26. 04. 2021, 1 female. Rare. Hostplant is unknown.

Arge ciliaris (Linné, 1767): Bánk: Száva-hegy, 26. 04. 2021, 1 male. Sporadic. Hostplants: *Filipendula ulmaria* and *F. vulgaris.*

Arge cyanocrocea (Forster, 1771): Kutasó: Középső-hegy, 08. 05. 2021, 2 females; Bánk: Száva-hegy, 15. 05. 2021, 1 female, 29. 05. 2021, 1 female, 30. 05. 2021, 1 female; Nagylóc: Alsó-Zsúny, 24. 05. 2021, 1 female, 24. 05. 2021, 1 male, 29. 05. 2021, 1 male; Alsópetény: Cser-tó, 09. 05. 2021, 1 male; Penc: Zsobrák, 15. 05. 2021, 1 male, 17. 07. 2021, 4 females, 1 male. Common species. Known host plants: *Rubus idaeus* and *Sanguisorba officinalis.*

Arge enodis (Linné, 1767): Csővár: Sinkár-tó, 10. 05. 2021, 1 female; Nagylóc: Alsó-Zsúny, 24. 05. 2021, 1 female, 20. 08. 2021, 1 female; Nagylóc: Alsó-Zsúny, 14. 08. 2021, 1 male. Frequent, locally common. Larvae on smooth leaved willows like *Salix fragilis, Salix alba* and *Salix purpurea.*

Arge melanochra (Gmelin, 1790): Csővár: Sinkár-tó, 27. 05. 2021, 1 female; Garáb: Garábi-patak, 12. 06. 2021, 2 females; Penc: Observatory, 27. 05. 2021, 1 male; Penc: Zsobrák, 27. 05. 2021, 1 male, 05. 06. 2021, 1 male. Generally the commonest Argid sawfly, however, not common in this region. Hostplant: *Crataegus oxycantha*.

Arge nigripes (Retzius, 1783): Kutasó: Középső-hegy, 11. 04. 2021, 1 female, 21. 04. 2021, 1 female, 24. 04. 2021, 2 females, 01. 05. 2021, 1 female, 08. 05. 2021, 1 female; Ecseg: Kozárdi-tó, 24. 04. 2021, 2 females. Fequent. Host plants: *Rosa* spp.

Arge ochropus (Gmelin, 1790): Ecseg: Kozárdi-tó, 01. 05. 2021, 1 male; Nagylóc: Alsó-Zsúny, 24. 05. 2021, 1 female, 1 male, 12. 06. 2021, 1 male; Penc: Zsobrák, 03. 07. 2021, 1 female, 03. 07. 2021,1 female, 17. 07. 2021, 1 male; Csővár: Sinkár-tó, 07. 08. 2021, 1 male, 07. 08. 2021, 1 female. Pest of *Rosa* spp. Locally frequent.

Arge pleuritica (Klug, 1834): Bánk: Száva-hegy, 26. 04. 2021, 1 male, 09. 05. 2021, 1 male, 22. 05. 2021, 1 female, 30. 05. 2021, 1 female. Rare. Hostplant is unknown.

Sterictiphora angelicae (Panzer, 1799): Penc: Zsobrák, 17. 07. 2021, 1 male, 24. 07. 2021, 1 female, 1 male, 31. 07. 2021, 2 females; Penc: patakpart (Penci ág, Mulató utca), 31. 07. 2021, 1 female; Nagylóc: Alsó-Zsúny, 14. 08. 2021, 1 female. Frequent. Larva on *Prunus spinosa* and *Rubus* spp.

Sterictiphora furcata (Villers, 1789): Penc: Observatory, 09. 05. 2021, 1 female. First verified specimen from Hungary and from the Carpathian Basin. So far, all checked specimen proved to be *S. angelicae*. Hostplant: *Rubus idaeus*.

Sterictiphora geminata (Gmelin, 1790): Penc: Kis-völgy, 22. 04. 2021, 1 female. Larva on *Rosa* spp. and *Sorbus aucuparia*. Sporadic.

Cephidae

Calameuta (Calameuta) haemorrhoidalis (Fabricius, 1781): Bánk: Száva-hegy, 09. 05. 2021, 1 female, 29. 05. 2021, 2 females; Garáb: Garábi-patak, 28. 04. 2021, 1 female. Frequent. Hostplant unknown.

Calameuta (Calameuta) punctata (Klug, 1803): Kutasó: Középső-hegy, 24. 04. 2021, 1 female, 21. 04. 2021, 1 male, 25. 04. 2021, 1 male, 08. 05. 2021, 1 male; Ecseg: Kozárdi-tó, 21. 04. 2021, 3 males, 10. 04. 2021, 1 female, 1 male, 24. 04. 2021, 1 female, 1 male, 25. 04. 2021, 1 female, 28. 04. 2021, 1 female, 01. 05. 2021, 1 female, 28. 04. 2021, 1 male; Garáb: Garábi-patak, 24. 05. 2021, 1 female; Bánk: Száva-hegy, 26. 04. 2021, 1 female, 09. 05. 2021, 1 female, 29. 05. 2021, 1 female, 30. 05. 2021, 1 male; Nagylóc: Alsó-Zsúny, 08. 05. 2021, 1 female, 1 male. In the last years, this species was rare. Here is frequent. Host plant unknown.

Cephus brachycercus C. G. Thomson, 1871: Bánk: Száva-hegy, 30. 04. 2021, 1 female; Ecseg: Kozárdi-tó, 01. 05. 2021, 1 male. Widely distributed, sporadic species. Host plant unknown.

Cephus pygmeus (Linné, 1767): Kutasó: Középső-hegy, 08. 05. 2021, 1 female; Csővár: Sinkár-tó, 15. 05. 2021, 2 females, 05. 06. 2021, 15 females, 6 males. Common. Insect pest of cereals and Gramineae.

Cephus runcator Konow, 1896: Csővár: Sinkár-tó, 27. 05. 2021, 1 female; Bánk: Száva-hegy, 29. 05. 2021, 1 female, 1 male. Sporadic. Host plant unknown.

Cephus spinipes (Panzer, 1800): Ecseg: Kozárdi-tó, 28. 04. 2021, 1 male; Penc: Zsobrák, 15. 05. 2021, 1 female, 27. 05. 2021, 1 male; Kutasó: Középső-hegy, 01. 05. 2021, 1 male, 24. 05. 2021, 1 male. Frequent. Hostplant: *Phleum pratense*.

Tenthredinidae

Dolerinae

Dolerus (Poodolerus) aeneus Hartig, 1837: Garáb: Garábi-patak, 28. 04. 2021, 1 female. Sporadic. Host plants: Gramineae.

Dolerus (Poodolerus) anthracinus (Klug, 1818): Cserhátszentiván: Zsunyi-patak, 27. 03. 2021, 1 female. Host plants: Gramineae.

Fig. 5: ***Arge pleuritica*** **(Klug, 1834)**

Fig. 6: ***Sterictiphora furcata*** **(Villers, 1789)**

Dolerus (Oncodolerus) eversmanni W.F. Kirby, 1882: Nagylóc: Alsó-Zsúny, 29. 05. 2021, 1 female. Frequent. Larva on *Equisetum arvense* and *E. palustre.*

Dolerus (Dolerus) germanicus ssp. *germanicus* (Fabricius, 1775): Csővár: Sinkár-tó, 22. 05. 2021, 1 female; Penc: Zsobrák, 24. 07. 2021,1 female; Nagylóc: Alsó-Zsúny, 05. 08. 2021, 1 female; Bokor: Béke út, 14. 08. 2021, 1 female. Common. Larva on *Equisetum arvense* and *E. palustre*.

Dolerus (Poodolerus) gonager (Fabricius, 1781): Nagylóc: Alsó-Zsúny, 10. 04. 2021, 1 female, 1 male; Cserhátszentiván: Zsunyi-patak, 17. 04. 2021, 1 male; Garáb: Garábi-patak, 25. 04. 2021, 1 male. Common. Larva on Gramineae.

Dolerus (Poodolerus) nigratus (O.F. Müller, 1776): Alsótold: Nagy-Mező-hegy, 27. 03. 2021, 2 females, 3 males, 05. 04. 2021, 1 female, 4 males; Galgaguta: Galga-patak, 01. 04. 2021, 1 male; Cserhátszentiván: Zsunyi-patak, 05. 04. 2021, 1 female, 3 males, 21. 04. 2021, 2 females, 28. 04. 2021, 1 male; Nagylóc: Alsó-Zsúny, 10. 04. 2021, 5 females, 1 male, 21. 04. 2021, 1 female, 3 males, 24. 04. 2021, 3 females, 1 male; Garáb: Garábi-patak, 10. 04. 2021, 1 female, 1 male, 25. 04. 2021, 1 male, 28. 04. 2021, 1 female, 01. 05. 2021, 2 females, 1 male; Nagylóc: Zsunypuszta, 10. 04. 2021, 1 female; Penc: Kis-völgy, 23. 04. 2021, 1 female; Penc: Zsobrák, 23. 04. 2021, 1 male; Kutasó: Középső-hegy, 28. 04. 2021, 2 females. Common. Larva on Gramineae including cereals.

Dolerus (Poodolerus) picipes (Klug, 1818): Ecseg: Kozárdi-tó, 24. 04. 2021, 1 female. Frequent. Larva on Gramineae.

Dolerus (Poodolerus) puncticollis Thomson, 1871: Legénd: Hosszú-föld, 01. 04. 2021, 1 male; Alsótold: Nagy-Mező-hegy, 05. 04. 2021, 2 females; Felsőtold: temető, 10, 04, 2021, 2 females; Nagylóc: Alsó-Zsúny, 10. 04. 2021, 1 female, 21. 04. 2021, 1 female, 24. 04. 2021, 1 female, 1 male; Nagylóc: Zsunypuszta, 10. 04. 2021, 1 male; Ecseg: Kozárdi-tó, 10. 04. 2021, 1 female; Cserhátszentiván: Zsunyi-patak, 11. 04. 2021, 2 females, 17. 04. 2021, 1 male; Bokor: falu vége, 21. 04. 2021, 1 male; Kutasó: Középső-hegy, 08. 05. 2021, 1 female; Penc: Observatory, 09. 05. 2021, 1 male, 10. 05. 2021, 1 male. Common. Larva on Gramineae including cereals.

Dolerus (Dicrodolerus) vestigialis (Klug, 1818): Alsópetény: Cser-tó, 30. 04. 2021, 1 female; 09. 05. 2021, 1 male; Galgaguta: Galga-patak, 10. 05. 2021, 1 female. Common. Host plants: *Equisetum palustre, E. sylvaticum, E. arvense* and *E. pratense.*

Selandrinae

Birka (Birka) cinereipes (Klug, 1816): Garáb: Garábi-patak, 28. 04. 2021, 1 male, 01. 05. 2021, 1 female. Sporadic. Host plants: *Myosotis* spp.

Nesoselandria morio (Fabricius, 1781): Penc: Zsobrák, 27. 05. 2021, 1 female. Frequent. Host plants: *Brachytecium reflexum, Ceratodon purpureus, Chenopodium album, Dicranum scoparium, Fragaria vesca, Hedwigia ciliata, Myosotis arvensis*, *Plagiomnium cuspidatum, Plagiothecium denticulatum, Polygonum aviculare, Polytrichum commune, Pseudobryum cinclidiodes, Sanionia uncinata, Stellaria media, Veronica chamaedrys* and *V. officinalis.*

Allantinae

Allantus (Emphytus) calceatus (Klug, 1818): Penc: Zsobrák, 22. 04. 2021, 1 male; Kutasó: Középső-hegy, 01. 05. 2021, 1 female. Sporadic, locally frequent. Host plants: *Rubus, Sanguisorba, Rosa, Filipendula, Fragaria* and *Alchemilla* spp.

Allantus (Emphytus) cinctus (Linné, 1758): Ecseg: Kozárdi-tó, 21. 04. 2021, 1 female; Bánk: Száva-hegy, 26. 04. 2021, 1 female; Kutasó: Középső-hegy, 25. 04. 2021, 1 male; Penc: Zsobrák, 15. 05. 2021, 1 male. Frequent. Host plants: *Rosa* spp.

Allantus (Emphytus) cingulatus (Scopoli, 1763): Penc: Zsobrák, 22. 05. 2021, 1 male. Frequent. Larva on *Fragaria* and *Rosa* spp.

Allantus (Emphytus) didymus (Klug, 1818): Bánk: Száva-hegy, 15. 05. 2021, 1 female. Sporadic. Larva on Sanguisorba minor; old records from *Rubus* and *Rosa* spp. need checking.

Ametastegia (Protemphytus) pallipes (Spinola, 1808): Penc: Observatory, 22. 04. 2021, 1 female. Frequent. Host plants: *Viola* spp.

Athalia bicolor Serville, 1823: Kutasó: Középső-hegy, 08. 05. 2021, 1 female; Kozárd: Bézma, 08. 05. 2021, 1 female; Penc: Zsobrák, 10. 05. 2021, 1 female, 27. 05. 2021, 1 female, 05. 06. 2021, 1 female. Frequent. Host plant: *Ranunculus* spp.

Athalia cordata Serville, 1823: Penc: Observatory, 22. 04. 2021, 1 male; Bánk: Száva-hegy, 30. 04. 2021, 1 female; Kutasó: Középső-hegy, 01. 05. 2021, 1 male, 08. 05. 2021, 2 males; Garáb: Garábi-patak, 08. 05. 2021, 1 male; Kozárd: Bézma, 08. 05. 2021, 1 male. Common. Larva on *Misopates orontinum, Antirrhinum majus, Ajuga reptans, Teucrium scorodonia* and *Plantago* spp.

Athalia circularis (Klug, 1815): Penc: Zsobrák, 27. 05. 2021, 1 female. Frequent. Host plants: *Arctium lappa, Ajuga reptans, Veronica beccabunga, V. longifolia, V. officinalis, Alliaria petiolata, Glechoma hederacea, Melampyrum, Capsella* and *Lycopus* spp.

Athalia liberta (Klug, 1815): Penc: Observatory, 09. 05. 2021, 1 female; Nagylóc: Alsó-Zsúny, 24. 05. 2021, 1 male. Frequent. Feeding on *Alliaria petiolata, Arabidopsis thaliana, Cardamine hirsuta* and *Sisymbrium officinale.*

Athalia rosae (Linné, 1758): Common pest. Kutasó: Középső-hegy, 08. 05. 2021, 1 female; Csővár: Sinkár-tó, 22. 05. 2021, 1 female, 29. 05. 2021, 1 female, 1 male, 17. 07. 2021, 3 females, 2 males, 24. 07. 2021, 6 females, 2 males, 31. 07. 2021, 6 females, 3 males, 07. 08. 2021, 1 female, 20. 08. 2021, 1 female; Nagylóc: Alsó-Zsúny, 24. 05. 2021, 15 females, 5 males, 29. 05. 2021, 11 females, 7 males, 03. 06. 2021, 13 females, 8 males, 12. 06. 2021, 2 females, 1 male; Penc: Observatórium, 27. 05. 2021, 3 females; Penc: Zsobrák, 17. 07. 2021, 3 females, 24. 07. 2021, 5 females, 1 male, 31. 07. 2021, 3 females, 2 males; Garáb: Garábi-patak, 10. 07. 2021, 2 females; Bánk: Száva-hegy, 17. 07. 2021, 1 female; Bokor: Béke út, 3 females, 1 male. Host plants: *Raphanus sativus, R. raphanistrum, Sinapis arvensis, Sisymbrium officinale, Armoracia rusticana, Barbarea sp., Brassica napus, B. juncea, B. rapa, B. oleracea, Tropaeolum majus, Sinapis arvensis, Alliara petiolata* and *Cardamine* spp.

Empria hungarica (Konow, 1895): Bánk: Száva-hegy, 30. 04. 2021, 1 female, 09. 05. 2021, 1 female. Rare. Host plant unknown.

Empria parvula (Konow, 1892): Penc: Observatory, 22. 04. 2021, 1 female. Sporadic. Host plant unknown.

Empria pumila (Konow, 1896): Nagylóc: Alsó-Zsúny, 17. 04. 2021, 1 male, 21. 04. 2021, 1 male. Sporadic. Host plant unknown.

Empria sexpunctata (Serville, 1823): Penc: Observatory, 22. 04. 2021, 1 female. Frequent. Larva on *Geum* spp.

Empria liturata (Gmelin, 1790): Garáb: Garábi-patak, 01. 05. 2021, 1 female, 01. 05. 2021, 1 male; Kutasó: Középső-hegy, 08. 05. 2021, 1 female; Penc: Observatory, 09. 05. 2021, 1 female; Alsópetény: Bánki-völgy, 30. 04. 2021, 1 male; Bánk: Száva-hegy, 09. 05. 2021, 1 male. Frequent. Host plants: *Fragaria* and *Geum* spp.

Empria tridens (Konow, 1896): Penc: Observatory, 22. 04. 2021, 1 female; Kutasó: Középső-hegy, 25. 04. 2021, 1 female; Garáb: Garábi-patak, 28. 04. 2021, 1 female; Alsópetény: Bánki-völgy, 30. 04. 2021, 1 female; Penc: Zsobrák, 22. 05. 2021, 1 female, 30. 05. 2021, 1 female. Frequent. Host plants: *Geum* spp. and *Rubus* idaeus.

Eriocampa ovata ssp. *ovata* (Linné, 1760): Nagylóc: Alsó-Zsúny, 14. 08. 2021, 1 female. Frequent. Larva on *Alnus*.

Monostegia abdominalis (Fabricius, 1798): Penc: Zsobrák, 09. 05. 2021, 1 female, 10. 05. 2021, 1 female, 15. 05. 2021, 2 females, 22. 05. 2021, 3 females, 07. 08. 2021, 1 female, 20. 08. 2021, 1 female. Frequent. Recorded on *Glaux maritima, Lysimachia numularia* and *L. vulgaris.*

Taxonus agrorum (Fallén, 1808): Penc: Zsobrák, 15. 05. 2021, 1 female; 10. 05. 2021; Csővár: Sinkár-tó, 22. 05. 2021, 1 female. Frequent. Host plants: *Rubus idaeus* and *R. caesius.*

Heterarthrinae

Endelomyia aethiops (Gmelin, 1790): Penc: Observatory, 09. 05. 2021, 1 female. Sporadic-Larva on *Rosa* spp.

Hinatara nigripes (Konow, 1907): Penc: Observatory, 22. 04. 2021, 1 male, 23. 04. 2021, 5 femlaes, 1 male. Sporadic. Host plant: *Acer campestre*.

Heterarthrus microcephalus (Klug, 1818): Nagylóc: Alsó-Zsúny, 03. 06. 2021, 1 female. Host plants: *Salix caprea* and *Salix starkeana*. Sporadic.

Heterarthrus vagans (Fallén, 1808): Nagylóc: Alsó-Zsúny, 03. 06. 2021, 1 female. Sporadic, larva on *Alnus* spp.

Metallus pumilus (Klug, 1816): Penc: Zsobrák, 30. 05. 2021, 1 female. Frequent. Larva on *Rubus* spp.

Blennocampinae

Cladardis elongatula (Klug, 1817): Rád: Lágyas-erdő. 22. 05. 2021, 1 female. Sporadic. Larva bores in shoots of *Rosa* spp.

Claremontia alternipes (Klug, 1816): Cserhátszentiván: Zsunyi-patak, 21. 04. 2021, 1 female. Sporadic. Host plant: *Rubus idaeus*.

Claremontia brevicornis (Brischke, 1883): Penc: Újhrabina, 01. 04. 2021, 1 female; Ecseg: Kozárdi-tó, 10. 04. 2021, 1 female, 10. 04. 2021, 1 female; Nagylóc: Alsó-Zsúny, 21. 04. 2021, 1 female; Penc: Zsobrák, 23. 04. 2021, 1 female; Kétbodony: Rákóczi-emlékmű, 26. 04. 2021, 1 female. Frequent. Host plants: *Fragaria* spp., *Sanguisorba* spp. and *Potentilla reptans.*

Eutomostethus ephippium (Panzer, 1798): Kutasó: Középső-hegy, 28. 04. 2021, 1 female; Penc: Zsobrák, 27. 05. 2021, 1 female, 30. 05. 2021, 1 female, 09. 05. 2021, 1 male, 22. 05. 2021, 1 male. Common, larva on *Poaceae*.

Halidamia affinis (Fallén, 1807): Penc: Zsobrák, 22. 05. 2021, 1 female. Frequent. Host plants: *Galium aparine* and *G. molugo*.

Monardis plana (Klug, 1817): Ecseg: Kozárdi-tó, 21. 04. 2021, 1 female, 01. 05. 2021, 1 female; Kutasó: Középső-hegy, 24. 04. 2021, 1 male; Garáb: Garábi-patak, 28. 04. 2021, 1 male. Rare. Host plants: *roses (Rosa* spp.) including cultivars; eggs are laid in buds; initially, larvae are feeding inside the buds than they pass through buds and feeding on freshly developed leaves and shoots.

Monophadnoides rubi (Harris, 1845): Bánk: Száva-hegy, 30. 04. 2021, 1 female. Generally frequent. Host plants: *Filipendula ulmaria, Geum* spp. and *Rubus* spp.

Monophadnoides rufi cruris (Brullé, 1832): Penc: Zsobrák, 09. 05. 2021, 1 female; Csővár: Sinkár-tó, 10. 05. 2021, 1 male. Frequent. Host plant: *Rubus fructicosus*.

Monophadnus pallescens (Gmelin, 1790): Penc: Zsobrák, 30. 04. 2021, 1 female. Common. Host plants: *Ranunculus acris, R. repens, R. lanuginosus and Anemone nemorosa.*

Monophadnus monticola (Hartig, 1837): Penc: Zsobrák, 30. 04. 2021, 2 females; Garáb: Garábi-patak, 24. 05. 2021, 1 female. Sporadic. Larva on *Helleborus* spp.

Monophadnus spinolae (Klug, 1816): Penc: Zsobrák, 30. 05. 2021, 1 female. Sporadic. Host plants: *Clematis vitalba* and *C. flammula*.

Pareophora pruni (Linné, 1758): Ecseg: Kozárdi-tó, 28. 04. 2021, 1 female, 01. 05. 2021, 1 female; Bánk: Száva-hegy, 30. 04. 2021, 1 female. Frequent. Larva on *Prunus spinosa.*

Periclista (Periclista) albiventris (Klug, 1816): Penc: Observatory, 10. 05. 2021, 1 female. Sporadic. Host plant unknown.

Stethomostus fuliginosus (Schrank, 1781): Nagylóc: Alsó-Zsúny, 08. 05. 2021, 1 female; Penc: Zsobrák, 09. 05. 2021, 1 female; Garáb: Garábi-patak, 24. 05. 2021, 1 male. Frequent. Larva on *Ranunculus acris, R. repens* and *R. sceleratus*.

Tenthredininae

Aglaostigma (Astochus) aucupariae (Klug, 1817): Cserhátszentiván: Zsunyi-patak, 21. 04. 2021, 1 male; Bánk: Száva-hegy, 26. 04. 2021, 1 male. Common. Larva on *Galium mollugo* and *G. boreale*.

Aglaostigma (Astochus) fulvipes (Scopoli, 1763): Bánk: Száva-hegy, 26. 04. 2021, 2 males; Nagylóc: Alsó-Zsúny, 08. 05. 2021, 1 male; Penc: Zsobrák, 22. 05. 2021, 1 female. Common. Larva on *Galium mollugo* and *G. verum*.

Macrophya (Macrophya) albicincta (Schrank, 1776): Penc: Observatory, 09. 05. 2021, 1 female, 1 male, 10. 05. 2021, 1 female; Alsópetény: Bánki-völgy, 09. 05. 2021, 1 female, 1 male; Penc: Zsobrák, 10. 05. 2021, 1 female, 15. 05. 2021, 1 female, 1 male, 22. 05. 2021, 1 female, 1 male; Csővár: Sinkár-tó, 19. 06. 2021, 1 female. Common. Host plants: *Sambucus ebulus, S. nigra, S. racemosa, Valeriana officinalis* and *Viburnum opalus.*

Macrophya (Macrophya) annulata (Geoffroy, 1785): Csővár: Sinkár-tó, 15. 05. 2021, 1 male, 05. 06. 2021, 1 male; Nagylóc: Alsó-Zsúny, 24. 05. 2021, 1 male, 03. 06. 2021, 1 male. Frequent. Larva on *Potentilla reptans, Origanum vulgare, Euphorbia, Rosa, Rubus* and *Sambucus* spp.

Macrophya (Macrophya) duodecimpunctata (Linné, 1758): Penc: Zsobrák, 15. 05. 2021, 1 male. Frequent. Host plants: *Graminae, Cyperaceae* and *Carex* spp.

Macrophya (Macrophya) montana ssp. montana (Scopoli, 1763): Penc: Kis-völgy, 27. 05. 2021, 1 female; Penc: Zsobrák, 30. 05. 2021, 1 female, 05. 06. 2021, 2 females, 4 males; Kutasó: Középső-hegy, 03. 06. 2021, 1 female, 1 male. Common. Host plant: *Rubus caesius*.

Macrophya (Pseudomacrophya) punctumalbum (Linné, 1767): Penc: Observatory, 27. 05. 2021, 1 female; Cserhátszentiván: Zsunyi-patak, 03. 06. 2021, 1 female. Sporadic. Host plants: *Fraxinus spp.* and *Ligustrum* spp.

Macrophya (Macrophya) rufipes (Linné, 1758): Kutasó: Középső-hegy, 08. 05. 2021, 1 female; Bánk: Száva-hegy, 29. 05. 2021, 1 male, 30. 05. 2021, 1 male. Frequent. Larva on *Agrimonia eupatoria*.

Sciapteryx consobrina (Klug, 1816): Alsótold: Nagy-Mező-hegy, 27. 03. 2021, 1 female; Kisecset: Kiliántelep, 26. 04. 2021, 1 male. Frequent. Larval hosts: *Adoxa* spp., *Anemone* spp., *Ranunculus acris* and *Ranunculus ficaria*.

Pachyprotasis rapae (Linné, 1767): Nagylóc: Alsó-Zsúny, 03. 06. 2021, 1 female. Frequent. Host plants: *Solanum tuberosum, Pedicularis palustris, Angelica sylvestris, Veronica beccabunga, Betonica officinalis, Corylus avellana, Salix caprea, Fraxinus excelsior, Tussilago farfara, Symphoricarpos albus, Scrophularia, Solidago, Verbascum,*

Origanum, Atropa, Sarothamnus, Senecio, Polygonum, Aspidium, Epilobium, Hypericum, Galeopsis, Mentha, Polystichum, Plantago, Quercus and *Stachys* spp.

Rhogogaster (Rhogogaster) chlorosoma (Benson, 1943): Nagylóc: Alsó-Zsúny, 24. 05. 2021, 1 female; Csővár: Sinkár-tó, 30. 05. 2021, 1 female; Penc: Zsobrák, 30. 05. 2021, 1 female. Frequent. Host plants: *Pteridium aquilinum, Alnus glutinosa, Circaea* spp*., Prunus* spp*., Ranunculus* spp*., Rosa* spp*., Salix alba, S. purpurea , Stellaria* spp*., Filipendula ulmaria, Populus tremula, Padus* spp*., Betula* spp*., Corylus avellana* and *Sorbus* spp.

Tenthredopsis friesei (Konow, 1884): Kutasó: Középső-hegy, 03. 06. 2021, 1 female, 1 male. Frequent. Host plants: *Holcus mollis* and other *Poaceae*.

Tenthredopsis litterata (Geoffroy, 1785): Kutasó: Középső-hegy, 24. 05. 2021, 1 male. Frequent. Larva on *Agrostis, Dactylis* and *Calamagrostis* spp.

Tenthredopsis sordida (Klug, 1817): Kutasó: Középső-hegy, 08. 05. 2021, 1 male; Nagylóc: Alsó-Zsúny, 24. 05. 2021, 2 females; Penc: Zsobrák, 30. 05. 2021, 1 female. Frequent. Larva on *Arrhenatherum elatius, Lolium perene, Carex* spp., *Calamagrostis* spp. and *Dactylis glomerata*.

Tenthredopsis stigma (Fabricius, 1798): Kutasó: Középső-hegy, 08. 05. 2021, 1 male; Bánk: Száva-hegy, 09. 05. 2021, 3 males, 29. 05. 2021, 2 females; Rád: Lágyas-erdő. 29. 05. 2021, 1 female. Frequent. Known host plant: *Triticum intermedium*.

Tenthredopsis tarsata (Fabricius, 1804): Penc: Zsobrák, 10. 05. 2021, 1 male. Frequent. Host plants: *Poaceae particularly Brachypodium silvaticum*.

Tenthredopsis tessellata (Klug, 1817): Bánk: Száva-hegy, 30. 04. 2021, 1 male, 29. 05. 2021, 1 female. Sporadic. Larva on *Deschampsia, Dactylis, Aira* and *Lolium* spp.

Tenthredo (Endotethryx) campestris Linné, 1758: Cserhátszentiván: Zsunyi-patak, 03. 06. 2021, 1 female. Frequent. Host plant: *Aegopodium podagraria*.

Tenthredo (Maculedo) maculata Geoffroy, 1785: Kutasó: Középső-hegy, 24. 04. 2021, 1 female. Sporadic. Host plants: *Brachypodium* spp. and *Dactylis* spp.

Tenthredo (Zonuledo) distinguenda (Stein, 1885): Bánk: Száva-hegy, 29. 05. 2021, 1 female; Nagylóc: Alsó-Zsúny, 12. 06. 2021, 1 male. Frequent. Host plant unknown.

Tenthredo (Zonuledo) zonula Klug, 1817: Bánk: Száva-hegy, 30. 05. 2021, 1 male. Common. Host plant: *Hypericum perforatum*.

Tenthredo (Temuledo) temula Scopoli, 1763: Penc: Observatory, 09. 05. 2021, 1 female. Frequent, locally common. Larva on *Ligustrum* and *Origanum* spp.

Nematinae

Cladius (Priophorus) brullei (Dahlbom, 1835): Penc: Zsobrák, 22. 05. 2021, 1 female. Frequent. Larva on *Rubus* spp.

Cladius (Cladius) pectinicornis (Geoffroy, 1785): Kutasó: Középső-hegy, 28. 04. 2021, 1 female; Garáb: Garábi-patak, 01. 05. 2021, 1 male. Common. Host plant: *Rubus* spp.

Euura atra (Jurine, 1807): Nagylóc: Alsó-Zsúny, 24. 05. 2021, 1 male. Frequent. Hostplants: *Salix alba, S. fragilis sometimes S. viminalis*. Females lay eggs in the meristematic tissues of leaves.

Hoplocampa crataegi (Klug, 1816): Nagylóc: Alsó-Zsúny, 29. 05. 2021, 1 female, 1 male. Frequent. Larva on *Crataegus* spp.

Hoplocampa pectoralis Thomson, 1871: Nagylóc: Alsó-Zsúny, 03. 06. 2021, 1 female. Rare. Larva in immature furits of *Crataegus* spp.

Nematinus bilineatus (Klug, 1819): Nagylóc: Alsó-Zsúny, 29. 05. 2021, 1 female, 03. 06. 2021, 1 female, 1 male. Sporadic. Larva on *Alnus* spp.

Pachynematus clitellatus (Serville, 1823): Nagylóc: Alsó-Zsúny, 21. 04. 2021, 1 male; Kutasó: Középső-hegy, 25. 04. 2021, 1 female. Frequent. Larval hosts: Gramineae*, Carex* and *Juncus* spp.

Pachynematus fallax (Serville, 1823) known as Pachynematus xanthocarpus (Hartig, 1840): Penc: Zsobrák, 22. 04. 2021, 1 male. Frequent. Larva on Gramineae.

Pachynematus moerens (Förster, 1854): Kutasó: Középső-hegy, 05. 04. 2021, 1 male; Garáb: Garábi-patak, 28. 04. 2021, 1 male. Rare. Larva on *Calamagrostis arundinacea* and *Festuca* spp.

Pachynematus vagus (Fabricius, 1781): Csővár: Sinkár-tó, 15. 05. 2021, 1 female. Larva on *Carex* spp. Frequent.

Pteronidea bergmanni (Dahlbom, 1835): Csővár: Sinkár-tó, 27. 05. 2021, 1 female, 2 males, 05. 06. 2021, 1 female; Nagylóc: Alsó-Zsúny, 03. 06. 2021, 1 female, 1 male. Frequent. Host plant: *Salix* spp.

Pteronidea oligospila (Förster, 1854): Csővár: Sinkár-tó, 10. 05. 2021, 6 females, 3 males, 15. 05. 2021, 3 females, 5 males, 22. 05. 2021, 11 females, 4 males, 27. 05. 2021, 3 females. Frequent. Hostplants: *Salix* spp. It is also reported from *Populus* spp.

Pteronidea myosotidis (Fabricius, 1804): Kisecset: Kiliántelep, 26. 04. 2021, 1 female; Garáb: Garábi-patak, 28. 04. 2021, 2 males; 01. 05. 2021 1 female, 08. 05. 2021, 1 female, 1 male, 24. 05. 2021, 1 female, 1 male; Alsópetény: Cser-tó, 30. 04. 2021, 1 male; Penc: Zsobrák, 30. 04. 2021, 2 males, 15. 05. 2021, 1 male, 27. 05. 2021, 1 male; Bokor: Belterület, 01. 05. 2021, 1 male; Nagylóc: Alsó-Zsúny, 08. 05. 2021, 1 male; Kutasó: Középső-hegy, 03. 06. 2021, 1 female. Common. Larval hosts: *Onobrychis* and *Trifolium* spp.

Pteronidea tibialis (Newman, 1837): Penc: Observatory, 10. 05. 2021, 1 female. Frequent. Larva on *Robinia pseudacacia* and also on *Robinia viscosa, R. hispida* and *Gleditsia triacanthos.*

Pontania proxima (Serville, 1823): Nagylóc: Alsó-Zsúny, 29. 05. 2021, 1 gall, Csővár: Sinkár-tó, 07. 08. 2021, 9 galls. Frequent, larva on *Salix fragilis* and *S. alba*.

Nematus lucidus (Panzer, 1801): Kutasó: Középső-hegy, 05. 04. 2021, 1 female. Frequent. Larva on *Crataegus* and *Prunus spinosa*.

Platycampus luridiventris (Fallén, 1808): Nagylóc: Alsó-Zsúny, 24. 05. 2021, 1 male, 29. 05. 2021, 1 female. Larva on *Alnus glutionosa* and *A. incana*. Sporadic.

Pristiphora abbreviata (Hartig, 1837): Kutasó: Középső-hegy, 24. 04. 2021, 1 male. Rare. Larva on *Pyrus communis*.

Pristiphora armata (Thomson, 1863): Alsópetény: Bánki-völgy, 30. 04. 2021, 1 male. Frequent. Larva on *Crataegus* spp.

Pristiphora insularis Rohwer, 1910: Kozárd: Bézma, 24. 04. 2021, 1 male; Bánk: Száva-hegy, 30. 04. 2021, 1 male. Sporadic. Larva on *Amelanchier asiatica, Chaenomeles japonica, Rosa* spp*., Rosa majalis, Rosa pimpinellifolia* and *Rosa onoei*.

Pristiphora monogyniae (Hartig, 1840): Penc: Observatory, 23. 04. 2021, 1 female; Kutasó: Középső-hegy, 28. 04. 2021, 1 female. Frequent. Larva on *Prunus spinosa, ocasionally* on *P. domestica.*

Pseudodineura fuscula (Klug, 1816): Garáb: Garábi-patak, 25. 04. 2021, 1 female. Sporadic. Larva in mines of leaves of *Ranunculus* spp.

Rare and interesting species

Sterictiphora furcata (Villers, 1789): We wrote in ROLLER & HARIS, 2008: *"The presence of this species in the Carpathian Basin needs confirmation following the recent revision of Koch. Till this time, all checked specimens proved to be S. angelicae"*. In this book, we were not able to cancel this species from the fauna of the Carpatian Basin, since many old specimen mainly from the 19th century were not available. However, this is the first documented specimen from the Carpathian Basin following the subrecent revision of KOCH (1988).

Sterictiphora furcata (Villers, 1789): is widely distributed rare species in Central, South and Western Europe, out of Europe, it was captured in Jordan (Fig. 6).

Empria hungarica (Konow, 1895): From Hungary, it is recorded from Simontornya, Budapest: Hármashatárhegy, Budakeszi. Ócsa, Jósvafő, Lébény. Köveskál, Ádánd and Magyaralmás. It is known from Central, South and Western Europe and Kazakhstan.

Aprosthema austriacum (Konow, 1892): From the Carpathin Basin, we have records from Burgenland (Austria), Budapest, Mecsek hills, Simontornya, Szilvásvárad and Hetes (Hungary), Lepsa (from Transylvania) and Zakarpatskaya obl. (from Subcarpathia). It is recently captured in Slovakia either in Čamovce (Csomatelke). It is known from Austria, Croatia, Finland, Germany, Greece, Hungary, Italy, Romania, Spain, Sweden and Ukraine. We have record from Kazakhstan either.

Arge pleuritica (Klug, 1834): From the 19th century till 1918, we have historical records from Budapest, Isaszeg, Visegrád, Simontornya, later it was collected in Budaörs, Sashegy, Mecsek: Tettye, Budafok, Érd, Sukoró, Mecsek: Zobák, and Csepel (part of Budapest). It is known from Armenia, Bulgaria, Croatia, Greece, Hungary, Macedonia, Romania, Russia, Slovakia, Turkey and Ukraine also from Caucasus, Asia Minor and Uzbekistan (Fig. 5).

Monardis plana (Klug, 1817): It is widely distributed rare European species. From Hungary, most of the records are from the 19th century: Forró, Budapest and Kőszeg. From the 20th century, we have records only from Nagykovácsi, Pomáz, Kerecsend and Kalocsa.

Hoplocampa pectoralis C. G. Thomson, 1871: It is also a widely distributed rare European species. From the Carpathian Basin, we have only few records: Devín-NPR Devínska Kobyla (Pozsony: Dévény), Lúka (Vágluka), Červený Kameň: Vršatské bradlá (Vöröskő-Oroszlánkő) and Petrovce (Gömörpéterfala) from Slovakia, Budapest: Csiki hegyek, Nagykovácsi, Simontornya and the Bátorligeti láp from Hungary.

Pachynematus moerens (Förster, 1854): Widely distributed rare European species. Out of Europe, it is collected in Canada and USA. From the Carpathian Basin, it is known from Donau-Auen (Austria), Korytnica (Slovakia), Újszentmargita and Őrszentmiklós (Hungary), Hohe Rinne (Szebenjuharos), Prahova and Szeben (Sibiu) (Transylvania).

Pristiphora abbreviata (Hartig, 1837): Holarctic species. Rare in the Carpathian Basin. We have records from Ujszentmargita, Nagykovácsi, Kaszó (Hungary) and Brebenyeszkul (Subcarpathia).

Characteristic species and endangering factors on the main sampling sites

Kutasó: Középső-hegy

This hill was covered once by wineyards in the middle of the 19th century. The wineyards were abandoned during the phyloxera disaster and valuable mesophilous grassland took place surrounded by oak forest. The main endangering factors for the pasture are the invasive black locust (*Robinia pseudoacacia* L.). It's typical sawfly is *Arge nigripes* (Retzius, 1783). *Monardis plana* (Klug, 1817), *Tenthredo maculata* Geoffroy, 1785,

Pristiphora abbreviata (Hartig, 1837) and *Pachynematus moerens* (Förster, 1854) were also captured here.

Garáb meadows

Mesophilous grassland in the walley of Garáb Brook (Garábi-patak). *Monardis plana* (Klug, 1817), *Pachynematus moerens* (Förster, 1854) and *Pseudodineura fuscula* (Klug, 1816) are the most interesting sawfly species captured here. At the end of the neighborouing village, Felsőtold, pokeweed (*Phytolacca* sp.) vegetation spot was detected, fortunately, in middle of August, this invasive weed was removed. On the meadow common milkweed (*Asclepias syriaca* L.) grows in sporadic spots and daisy fleabane (*Stenactis annua* L.) is also frequent. Around the meadows and on the side of road, black locust is the most frequent invasive plant endangering the local habitats.

Bánk: Száva-Hegy (Száva Hill)

It hold a special habitat: the slope is covered by dry loes stepp meadow and in the bottom of the valley mesophilous grassland take place with 3 old willow trees. *Aprosthema austriacum* (Konow, 1892), *Arge ciliaris* (Linné, 1767), *Arge pleuritica* (Klug, 1834), *Cephus runcator* Konow, 1896, *Empria hungarica* (Konow, 1895), *Tenthredopsis tessellata* (Klug, 1817) and *Pristiphora insularis* Rohwer, 1910 captured only here. The condition of the habitat is fine, however, on the roadside is covered by black locust (*Robinia pseudacacia* L.) and regular control of the Robinia is necessary to maintain the habitat.

Penc: Zsobrák

No rare species was captured here but hold high diversity sawfly fauna: 35 species were captured in this small area. The area is covered by partly mesophilous grassland partly marshy meadow bordered by the Penc branch of the Gombás Brook (Gombás-patak: Penci ág) with poplar gallery mixed with willows. The good condition of the meadow is mainteined by regular cutting of grass which prevent the invasive reproduction of goldenrode (*Solidago* spp.), common milkweed (*Asclepias syriaca* L.) which were found in sporadic spots. In summertime, the daisy fleabane (*Stenactis annua* L.) is frequent. Also the black locust (*Robinia pseudoacacia* L.) is agressively growing on the wet, partly on the mesophilous part of the meadow. Regular cut is very necessary to maintain the habitat.

Csővár: Sinkár-tó, Sinkár fishing pond

Sinkár-tó (Sinkár lake) is an artificial fishing pond widely surrounded by smooth leaved willow forest and next to the willow mesophilous meadow takes place. The sawfly fauna is moderately rich. The typical sawfly is *Pteronidea oligospila* (Förster, 1854). In summer time, the invasive daisy fleabane (*Stenactis annua* L.) is frequent and in smaller spots common milkweed (*Asclepias syriaca* L.) takes place. Invasive plants are succesfully controlled by regular cutting of grasses, 2 times per year.

Penc: Observatory

The typical association is the xerotherm oak forests. The habitat is in good condition, although black locust (*Robinia pseudoacacia* L.) was detected in small spots. Along the road, golden rod (*Solidago* spp.), daisy fleabane (*Stenactis annua* L.) frequently occur, common ragweed (*Ambrosia artemisifolia* L.) is also frequent on the roadsides. Sporadically, Canadian horseweed (*Erigeron canadensis* L.) may also occur. The first voucher specimen of *Sterictiphora furcata* (Villers, 1789) was captured here. Other

interesting sawfly species of the area are *Empria parvula* (Konow, 1892), *Hinatara nigripes* (Konow, 1907) and *Periclista albiventris* (Klug, 1816).

Nagylóc: Alsó-Zsúny

Officially, this area belongs to Nagylóc but it is situated next to Hollókő village. The Zsunyi brook (Zsunyi-patak) flows through this habitat. Alder and willow associations take place along the brook. Due to the regular cut of grasses, the habitat is in good condition. Only the invasive daisy fleabane (*Stenactis annua* L.) is frequent, but relatively well controlled. The following rare and sporadic species captured in this area: *Empria pumila* (Konow, 1896), *Heterarthrus microcephalus* (Klug, 1818), *Heterarthrus vagans* (Fallén, 1808), *Hoplocampa pectoralis* Thomson, 1871 and *Nematinus bilineatus* (Klug, 1819).

Ecseg: Kozárdi-tó (Kozárd lake)

There is mesophilous grassland around the fishing pond. On the lower and steep lakeshore, daisy fleabane (*Stenactis annua* L.) is frequent, since here the grass cutting is difficult. *Monardis plana* (Klug, 1817) is the only rare species captured here.

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References

Achterberg, C. 2013: Hymenoptera in Fauna Europaea version 2.6.2. - http://www.faunaeur.org. last accessed 5th August 2019. Last checked: 24. 08. 2021

Balázs, A. & Haris, A. 2019a: Sawflies (Hymenoptera: Symphyta) of Cerová vrchovina Upland (South Slovakia). - Natura Somogyiensis 33: 61-74. DOI:10.24394/NatSom.2019.33.61

Balázs, A. & Haris, A. 2019b: Three species of sawflies (Symphyta: Pamphiliidae, Argidae, Tenthredinidae) new for the fauna of Slovakia. - In MendelNet 2019: Proceedings of 26th International PhD Students Conference. - 1.vyd. Brno: Mendel University in Brno, 2019, s. 243-247. ISBN 978-80-7509-688-3

Gyurkovics, H. & Haris, A. 2012: Sawflies (Hymenoptera: Symphyta) from Szeged and its surroundings (SE Hungary). - Natura Somogyiensis 22: 163-182. DOI:10.24394/NatSom.2012.22.163

Haris, A. 2001a: Revisional list of the Hungarian Nematinae with the description of three new species (Hymenoptera: Tenthredinidae). - Folia Entomologica Hungarica 62: 95-114.

Haris, A. 2001b: Somogy megye levéldarázs-alkatúinak katalógusa (Hymenoptera, Symphyta). - Natura Somogyiensis 1: 261-268. DOI:10.24394/NatSom.2001.1.261

Haris, A. 2006: Study on the Palaearctic Pristiphora species (Hymenoptera: Tenthredinidae). - Natura Somogyiensis 9: 201-277. DOI:10.24394/NatSom.2006.9.201

Haris, A. 2009: Sawflies of the Zselic Hills, SW Hungary (Hymenoptera: Symphyta). - Natura Somogyiensis 15: 127-158. DOI:10.24394/NatSom.2009.15.127

Haris, A. 2010: Sawflies of the Vértes Mountains (Hymenoptera: Symphyta). - Natura Somogyiensis 17: 221-250. DOI:10.24394/NatSom.2010.17.221

Haris, A. 2011: Sawflies of the Börzsöny Mountains (North Hungary) (Hymenoptera: Symphyta). - Natura Somogyiensis 19: 149-176. DOI:10.24394/NatSom.2011.19.149

Haris, A. 2012: Sawflies of Belső-Somogy (Hymenoptera: Symphyta). - Natura Somogyiensis 22: 141-162. DOI:10.24394/NatSom.2012.22.141

Haris, A. 2018a: Second contribution to the sawflies of Belső Somogy (Hymenoptera: Symphyta). - Natura Somogyiensis 31: 45-62. DOI:10.24394/NatSom.2018.31.45

Haris A. 2018b: Sawflies from Külső-Somogy, South-West Hungary (Hymenoptera: Symphyta). - Natura Somogyiensis 32: 147-164. DOI:10.24394/NatSom.2018.32.147

Koch, F. 1988: Die Gattung Sterictiphora Billberg (Insecta, Hymenoptera, Symphyta: Argidae). - Entomologische Abhandlungen. Staatliches Museum für Tierkunde in Dresden , Leipzig 52(2): 29-61.

Lacourt, J. 2020: Sawflies of Europe: Hymenoptera of Europe 2 N. A. P. Editions. Verriéres-le-Buisson 876 pp.

Macek, J., Roller, L., Beneš, K. Holý, K. & Holuša, J. 2020: Blanokřídlí České a Slovenské republiky II. Širopasí. - Academia Praha. 669 pp.

Mocsáry, S. 1900: Ordo Hymenoptera. p. 7-113. - In: Paszlavsky, J. (ed.): Fauna Regni Hungariae, Regia Societas Scientiarum Naturalium Hungarica, Budapest.

Prous, M., Liston, A. & Mutanen, M. 2021: Revision of the West Palaearctic Euura bergmanni and oligospila groups (Hymenoptera, Tenthredinidae). - Journal of Hymenoptera Research 84: 187-269. doi: 10.3897/jhr.84.68637

Roller, L. 1993: New records of sawflies (Hymenoptera: Symphyta) from Slovakia. - Entomological Problems 24(2): 81-84.

Roller, L. 1994: Faunistics records. Symphyta. - Entomological Problems 25(2): 24.

Roller, L. 1996: New records of sawflies (Hymenoptera, Tenthredinidae) in Slovakia. - Biologia, Bratislava 51(1): 549-550.

Roller, L. 1998: Sawfly (Hymenoptera, Symphyta) community in the Devínska Kobyla National Nature Reserve. - Biologia, Bratislava 53(2): 213-221.

Roller, L. 1999a: Spoločenstvá hrubopásych (Hymenoptera: Symphyta) vybraných zoogeografických regiónov Slovenska. PhD thesis. - Ústav zoológie, Slovenská akadémia vied, Bratislava, 180 pp.

Roller, L. 1999b: First records of Nematinae (Hymenoptera, Symphyta, Tenthredinidae) in Slovakia. - Biologia, Bratislava 54(5): 599-600.

Roller, L. 1999c: Faunistic records from Slovakia. Hymenoptera: Symphyta: Tenthredinidae: Nematinae. - Entomological Problems 30(1): 30.

Roller, L. 1999d: Faunistic records from Slovakia. Hymenoptera: Symphyta: Tenthredinidae: Nematinae. - Entomological Problems 30(1): 52.

Roller, L. 1999e: Check list of the sawflies (Hymenoptera: Symphyta) of Slovakia. - Entomological Problems 30(2): 37-48.

Roller, L. 2000a Zubačkovité (Megalodontesidae) - hrubopáse xerotermov. - Hmyz 1(1): 17-18.

ROLLER, L. 2000b First records of Blasticotomidae, Tenthredinidae, Pamphiliidae (Hymenoptera) from Slovakia. - Biologia, Bratislava 55(5): 561-562.

ROLLER, L. 2000c Súčasný stav poznania fauny hrubopásych (Hymenoptera, Symphyta) na Slovensku. - Správy Slovenskej zoologickej spoločnosti 18: 109-114.

ROLLER, L. 2001: Príspevok k poznaniu hrubopásych (Hymenoptera, Symphyta) a rohačkovitých (Diptera, Sciomyzidae) prírodnej pamiatky Mitická slatina. p. 32-36. - In: MÁJSKY, J. (ed.), Zborník výsledkov inventarizačného výskumu prírodnej pamiatky Mitická slatina. Občianske združenie Pre Prírodu, Trenčín, 99 pp.

ROLLER, L. 2004. Hrubopáse blanokrídlovce (Hymenoptera, Symphyta) Tematínskych kopcov. - Entomofauna Carpathica 16: 56-64.

ROLLER, L. 2005: Blanokrídlovce (Hymenoptera): hrubopáse (Symphyta) pp. 117-123. - In: Fauna Devínskej Kobyly. APOP, Bratislava, 181 pp.

ROLLER, L. 2006a: Seasonal flight activity of sawflies (Hymenoptera, Symphyta) in submontane region of the West Carpathians, Central Slovakia. - Biologia, Bratislava 61(2): 193-205.

ROLLER, L. 2006b: Hrubopáse blanokrídlovce (Hymenoptera, Symphyta) Tematínskych vrchov – zhrnutie faunistického výskumu. p. 53-55. In: K. RAJCOVÁ (ed.): Najvzácnejšie prírodné hodnoty Tematínskych vrchov. - Zborník výsledkov inventarizačného výskumu územia európskeho významu Tematínske vrchy. KOZA, Trenčín a Pre Prírodu, Trenčín, 101 pp.

ROLLER, L. 2010. Hrubopáse blanokrídlovce (Hymenoptera: Symphyta) PR Šúr, pp. 215-235. - In: MAJZLAN, O. & VIDLIČKA, Ľ. (eds). Príroda rezervácie Šúr. Ústav zoológie SAV, Bratislava, 410 pp.

ROLLER, L. & HARIS, A. 2008: Sawflies of the Carpathian Basin, History and Current Research. - Natura Somogyiensis 11: 1-261.

ROLLER, L. & LUKÁŠ, J. 1999: New records of sawflies (Hymenoptera, Symphyta) in Slovakia. -Biologia, Bratislava 54(2): 225-228.

ROLLER L., BENEŠ K., BLANK S. M., HOLUŠA J., JANSEN E., JÄNICKE M., KALUZA S., KEHL A., KEHR I., KRAUS M., LISTON A. D., NYMAN T., NIE H., SAVINA H., TAEGER A. & WEI M., 2006: -Contribution to the knowledge of sawfly fauna (Hymenoptera, Symphyta) of the Low Tatras National Park in Central Slovakia. - Naturae Tutela 10: 57-72.

ROLLER, L. & MACEK, J. 2017: Provnález Hrubopásych Blanokrídlovcov (Hymenoptera, Symphyta) na Slovensku - Entomofauna carpathica, 29(1): 53-63.

ROLLER, L. & OLŠOVSKÝ, T. 2012: Prvonálezy hrubopásych blanokrídlovcov (Hymenoptera, Symphyta) v slatinných lesoch s tavoľníkom vŕbolistým (Spiraea salicifolia) v Borskej nížine. - Entomofauna Carpathica 24(1): 15-20.

SUNDUKOV, Y. N. 2017: Suborder Symphyta – Sawflies and wood wasps. In: LELEJ A.S. (ed.). Annotated catalogue of the Hymenoptera of Russia. Volume I. Symphyta and Aculeata. - Proceedings of the Zoological Institute RAS. Supplement 6: 20-117.

TAEGER, A, BLANK, S. M. & LISTON,A. 2006: European Sawflies (Hymenoptera: Symphyta) -A Species Checklist for the Countries. 399-504. – In BLANK, S. M., SCHMIFT, S. & TAEGER, A. (eds) Recent Sawfly Research: Synthesis and Prospects, Goecke & Evers, Kelter. 701 pp.

ZHELOCHOVTSEV, A. N. 1988: Otryad Hymenoptera – Pereponchatokrylye, Podotryad Symphyta. - Sidyachebryukhie, 7-234. - In: MEDVEDEV, K.H. (ed.) Opredelitel nasekomykh evropeiskoi chasti SSSR, Vol. 3 Hymenoptera, Part 6, Nauka, Leningrad. https://doi.org/10.5962/bhl.title.46334

Natura Somogyiensis 37: 43-48. Kaposvár, 2021 DOI:10.24394/NatSom.2021.37.43
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Nohoveus zigan (H. Aspöck et al., 1980) - a new record for the Greek antlion fauna (Neuroptera: Myrmeleontidae)

Levente Ábrahám

Rippl-Rónai Museum, H-7400 Kaposvár, P.O. Box 70, Hungary,
e-mail: labraham@smmi.hu

Ábrahám, L.: *Nohoveus zigan (H. Aspöck et al., 1980) - a new record for the Greek antlion fauna (Neuroptera: Myrmeleontidae).*
Abstract: Author reports the first occurrence of *Nohoveus zigan* (H. Aspöck et al., 1980) in Greece. Distribution, habitat, and major morphological features of the species are given.

Keywords: antlion, new faunistic record, Greece.

Introduction

European antlions are the most investigated group in taxonomic and faunistic point of view (Aspöck et al. 2001). Several papers (e.g., Esben-Petersen 1918-1919, Zakharenko & Krivokhatsky 1993) and monographs (e.g., Kis et al. 1970, Aspöck et al. 1980,) described the European species. The most important summary of the European fauna is provided by Aspöck et al. (1980), who also published distribution maps of the species. Nowadays, the digital information and the database (LDL) developed and continuously updated by Oswald (2021) giving excellent tool for neuropterology research. According to this database, 40 taxa of Myrmeleontidae occur in Greece and 5 of these species have uncertain taxonomic status by various reasons.

Neuroleon (*Neuroleon*) *telosensis* Navás, 1929 - nomen dubium, type material apparently lost (Aspöck et al. 2001).
Neuroleon (*Ganussa*) *aegaeus* Willmann, 1977 - taxonomic status uncertain (Aspöck et al. 2001).
Myrmecaelurus ghigii Navás, 1929 and *Myrmecaelurus nematophorus* Navás, 1929 - nomen dubium, possibly conspecific with *Myrmecaelurus trigrammus* (Pallas, 1781) (Aspöck et al. 2001)
Myrmeleon (*Myrmeleon*) *elongatus* Olivier, 1811 - type material apparently lost, possibly conspecific with *Neuroleon nemausiensis* (Borkhausen, 1791) (Krivokhatsky 2011).

The Greek antlion fauna compared to other European countries is rich and well known at species level. *Nohoveus zigan* (H. Aspöck et al. 1980), as a new record for the Greek antlion fauna was found in the sandy delta of the Strymonas river in North Greece.

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Material and methods

Sándor Ilniczky, colepterologist collected these specimens on his Greek expedition in 2021 and donated the voucher specimens to the Rippl-Rónai Museum. During, collecting, he used a 20-watt UV lamp.

Other species from the collected material were previously known in the Greek fauna. *Material examined:* 1 male 2 female, Greece, Amphipolis, Nea Kerdylia [Greek: Νέα Κερδύλια], N40º46,727'; E23º51,808'; 5m; 27.06.2021; Leg: S. Ilniczky.

Results and discussion

Nohoveus zigan (H. Aspöck et al. 1980) is an objective replacement name for *Myrmeleon punctulatus* Steven in Fischer von Waldheim, 1849 since *Myrmeleon punctulatus* Steven in Fischer von Waldheim, 1849 is a homonym of *Myrmeleon punctulatus* Rambur, 1842 (current name: *Cueta punctulata* (Rambur, 1842).

STANGE (2004) based on ASPÖCK et al. (1980), took it into the genus *Myrmecaelurus* Costa, 1855. Later, KRIVOKHATSKY (2011) placed this species into the genus *Nohoveus* Navás, 1919, again.

Main feautres of the genus *Nohoveus* Navás, 1919: The abdomen of males is longer than the wings in rest, there are no cross-veins in the costal area of the hind wings and the male gonarcus with parameres is strongly curved in the lateral view.

Distribution: Mongol Eremial faunaelement. Known in Armenia, Azerbaijan, Georgia, Hungary, Serbia, Romania, Ukraine, Kazakhstan, Tajikistan, Turkmenistan, Uzbekistan, Mongolia, Russia (ASPÖCK et al. 2001) Slovakia (CHLÁDEK & JAKEŠ 2008), Kyrgyzstan, Albania (KRIVOKHATSKY 2012, KRIVOKHATSKY et al. 2015,), China (Xinjiang) (WANG et al. 2018). The distribution map of the species was published by ASPÖCK et al. (1980) and KRIVOKHATSKY (2011).

Data from Turkey (Agri and Konya) (ARI et al. 2007 as *Nohoandus* (sic!) *punctulatus* (Waldheim, 1822)) needs to be confirmed, because neither HÖLZEL (1972) nor ASPÖCK et al. (2001) did publish its occurrence in Turkey.

This species distributes in the Palearctic region, so its occurrence in India (KRIVOKHATSKY et al. 2015, KAUR et al. 2019) should be revised in the future. CHANDRA & SHARMA (2009) did not cite it from India in the latest checklist.

DEVETAK et al. (2019) concluded that this species is probably extinct in Serbia for more than 100 years.

The new occurrence of the species in Greece is unexpected as it has not been found in neighboring Bulgaria so far.

In Central Europe, the typical habitat of the species is the open sandy grasslands (VELLAY 1899, STEINMANN 1967, KIS et al. 1970, GEPP 2010). The habitats of the species are usually endangered by agricultural activities but the grazing livestock is favorable for the survival of the populations.

The species is also found in the Strimonas river estuary, border zone of riverside sandbanks, and seashore sandy dunes, with diverse, sparse vegetation. The population of the species is highly endangered and isolated.

The flying period of adults in Central Europe and mostly in the Palearctic, starts from mid-July and ended at mid-August (GEPP 2010, SZENTKIRÁLYI & KAZINCZY 2002).

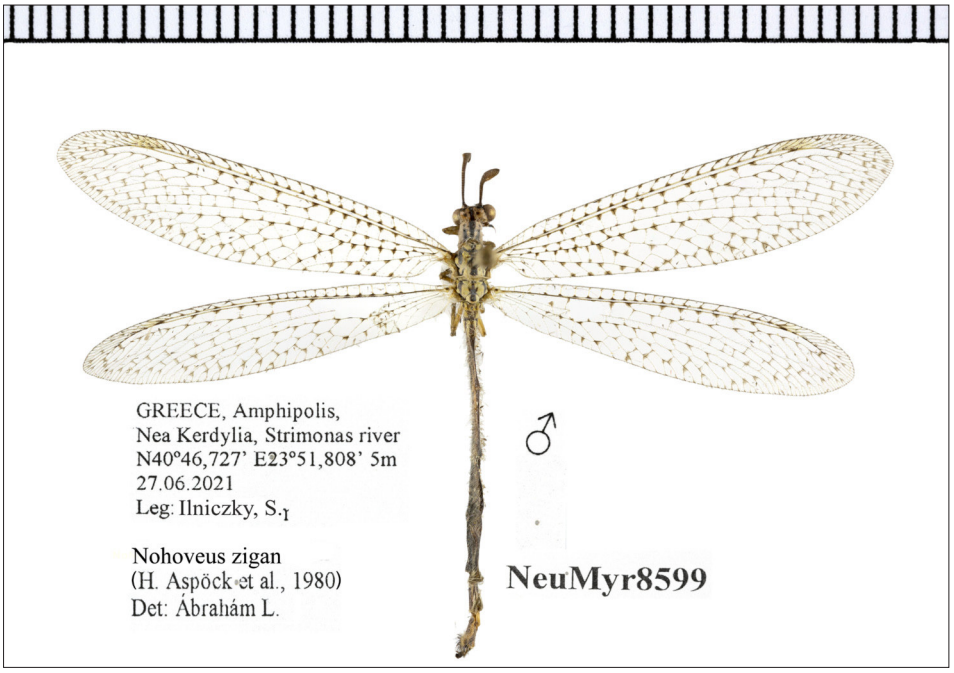

Fig. 1: *Nohoveus zigan* (H. Aspöck et al., 1980) from Greece (scale in mm)

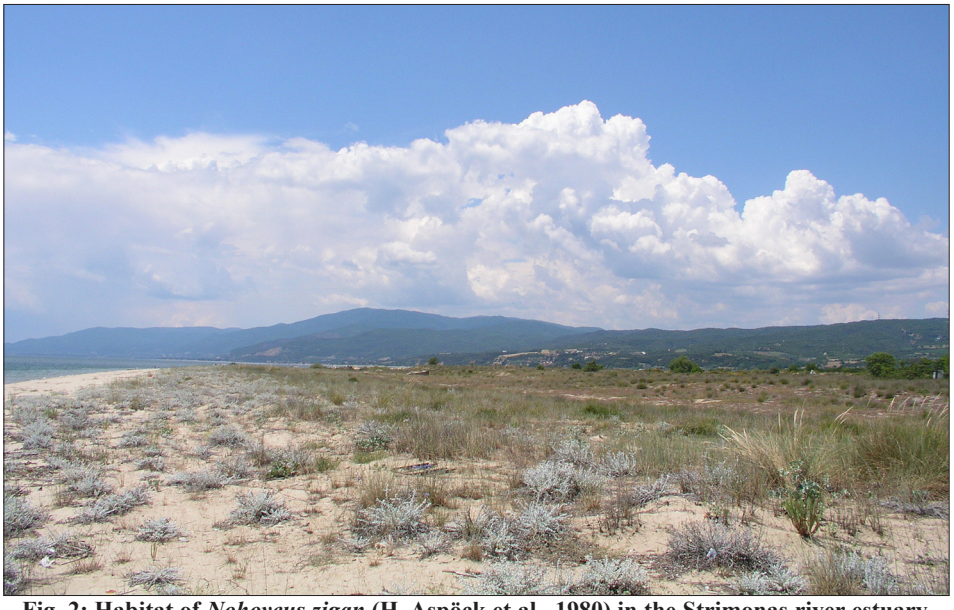

Fig. 2: Habitat of *Nohoveus zigan* (H. Aspöck et al., 1980) in the Strimonas river estuary (Photo: S. Ilniczky)

The smaller size of the adults and the dark spots on the fore wing at the intersection of the longitudinal and cross-veins can be easily distinguished from the larger and unspotted winged *Myrmecaelurus trigrammus*.

Its larva is pit-building in the open sandy grasslands, often co-occurring with the larva of *Myrmecaelurus trigrammus*. The larvae of the two species is distinguished in ÁBRAHÁM & PAPP (1990).

References

ARI, I., AKTAŞ, M. & KIYAK, S., 2007: Contributions to the Fauna of Turkish myrmeleonidae (Neuroptera, Insecta) from Ardahan, Iğdır, and Kars. - Turkish Journal of Zoology 31(3): 229-234.

ASPÖCK, H.; ASPÖCK, U. & HÖLZEL, H.[; RAUSCH, H.] 1980: Die Neuropteren Europas. Vol. 1. Goecke and Evers, Krefeld, West Germany. 495 pp.

ASPÖCK, H., HÖLZEL, H. & ASPÖCK, U. 2001: Kommentierter Katalog der Neuropterida (Insecta: Raphidioptera, Megaloptera, Neuroptera) der Westpaläarktis. - Denisia, 2: 1-606.

ÁBRAHÁM, L. & PAPP, Z. 1990: Preliminary report on the larva of Myrmecaelurus zigan Aspöck, Aspöck et Hölzel, 1980 (Planipennia: Myrmeleonidae). - Folia Historico-Naturalia Musei Matraensis 15: 37-42.

CHANDRA, K. & SHARMA, R. M. 2009: Checklist of Indian Neuropterids (Insecta: Megaloptera; Raphidioptera; Neuroptera). - https://www.scribd.com/document/72138241/neuroptera (accessed: on 18 October 2021)

CHLÁDEK, F. & JAKEŠ, O. 2008: Myrmecaerulus (Nohoveus) zigan a další zajímavé nálezy mravkolvů na Slovensku (Insecta, Neuroptera, Myrmeleonidae) - Myrmecaerulus (Nohoveus) zigan und weitere interessante Funde von Ameisenlöwen in der Slowakei. - Tetrix 2(4): 13-16.

DEVETAK, D., JAKŠIĆ, P., KLENOVŠEK, T., KLOKOČOVNIK, V., PODLESNIK, J., JANŽEKOVIČ, F. & IVAJNŠIČ, D. 2019. Neuroptera in two protected sand dune areas in the southern rim of the Pannonian Plain. Pp. 187-195. In: WEIHRAUCH, F., FRANK, O., GRUPPE, A.. JEPSON, J. E., KIRSCHEY, L. & OHL, M. (eds). Proceedings of the XIII International Symposium of Neuropterology. Meeting: 17-22 June 2018, Laufen, Germany. Osmylus Scientific Publishers, Wolnzach, Germany. 297 pp.

ESBEN-PETERSEN, P. 1918-1919: Help-notes towards the determination and the classification of the European Myrmeleonidae. - Entomologiske Meddelelser 12: 97-127.

GEPP, J. 2010: Ameisenlöwen und Ameisenjungfern. Myrmeleontidae. Eine weltweite Betrachtung unter besonderer Berücksichtigung Mitteleuropas. 3. Auflage, neubearbeitete [=3rd edition, revised]. Die Neue Brehm-Bücherei. Heft 589. Westarp Wissenschaften-Verlagsgesellschaft, Hohenwarsleben. 168 pp.

KAUR, S., RAJMOHANA, K. & PANDHER, M. S. 2019: Morphological studies on male and female genitalia of Myrmecaelurus acerbus (Walker, 1853) (Neuroptera: Myrmeleontidae). - Records of the Zoological Survey of India 119: 438-443.

KIS, B., NAGLER, C. & MÂNDRU, C. 1970. Insecta: Neuroptera (Planipennia). - Fauna Republicii Socialiste România 8(6):1-[345].

KRIVOKHATSKY, V. A. 2011: Муравьиные львы (Neuroptera: Myrmeleontidae) России [=Antlions (Neuroptera: Myrmeleontidae) of Russia]. - Товарищество Научных Изданий КМК [=KMK Scientific Press], Санкт-Петербург [=St. Petersburg]. 334 pp.

KRIVOKHATSKY, V. A., WANG, Z.-L. & WANG, X.-L. 2012: Новые находки и новые синонимы муравьиных львов (Neuroptera, Myrmeleontidae) из китая [=New records and new synonyms of ant-lions (Neuroptera, Myrmeleontidae) from China]. - Энтомологическое Обозрение [=Entomologicheskoe Obozrenie; =Entomological Review, Leningrad] 91:569-582.

KRIVOKHATSKY, V. A., DOBOSZ, R. & KHABIEV, G. N. 2015: Муравьиные львы и аскалафы (Neuroptera: Myrmeleontidae, Ascalaphidae) Киргизии [=Antlions and owlflies (Neuroptera: Myrmeleontidae, Ascalaphidae) of Kyrgyzstan]. - Энтомологическое Обозрение [=Entomologicheskoe Obozrenie; =Entomological Review, Leningrad] 94: 803-818.

KRIVOKHATSKY, V. A., KARAGYAN, G. H., GHREJYAN, T. L. & KALASHIAN, M. Y. 2019: New faunistic records of myrmeleontoid lacewings (Neuroptera: Myrmeleontidae, Ascalaphidae, Nemopteridae) in Armenia. - Caucasian Entomological Bulletin [=Кавказский Ентомологический Бюллетень; =Kavkazskij Entomologičeskij Bjulleten] 15: 293-298.

Oswald, J. D. 2021: Bibliography of the Neuropterida. - Lacewing Digital Library, Research Publication No. 2. http://lacewing.tamu.edu/Biblio/Main. Last accessed [06.12.2021].

Steinmann, H. 1967: Tevenyakú fátyolkák, Vízifátyolkák, Recésszárnyúak és Csőrös rovarok -- Raphidioptera, Megaloptera, Neuroptera és Mecoptera. - Magyarország Állatvilága [=Fauna Hungariae] 82: 1-204.

Szentkirályi, F. & Kazinczy, L. 2002: Seasonal flight patterns of antlions (Neuroptera, Myrmeleontidae) monitored by the Hungarian light trap network. Sziráki, Gy. (editor). Neuropterology 2000. - Proceedings of the Seventh International Symposium on Neuropterology. Meeting: 6-9 August 2000, Budapest, Hungary. Acta Zoologica Academiae Scientiarum Hungaricae 48(Suppl. 2): 311-328.

Vellay, I. 1899: Adatok Szeged faunájához [Data on the fauna of Szeged]. - Rovartani Lapok 6: 104-107.

Zakharenko, A. V. & Krivokhatsky, V. A. 1993: Сетчатокрылые (Neuroptera) европейской части бывшего СССР [=Setchatokrylye (Neuroptera) evropeiskoi chasti byvshego SSSR; =Neuroptera from the European part of the former USSR]. - Известия Харьковского Энтомологического Общества [=Izvestiya Kharkovskogo Entomologicheskogo Obshchestva; =Kharkov Entomological Society Gazette] 1(2): 34-83.

Wang, X.-l., Zhan, Q.-b. & Wang, A.-q. 2018: 中国动物志 [=Fauna Sinica]. 昆虫纲 第六十八卷, 脉翅目, 蚁蛉总科 [=Vol. 68 (Insecta, Neuroptera, Myrmeleontoidea)]. - Science Press, Beijing. [viii] + x + 285 pp.

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Zebeeba falsalis (Herrich-Schäffer, 1839) (Erebidae, Rivulinae) magyarországi előfordulása

Szeőke Kálmán

H-8000 Székesfehérvár, Táncsics Mihály út 4. 1/8, email: szeokek@gmail.com

Szeőke, K. : *The occurrence of Zebeeba falsalis (Herrich-Schäffer, 1839) (Erebidae, Rivulinae) in Hungary.*
Abstract: *Zebeeba falsalis* (Herrich-Schäffer, 1839) has a Mediterranean distribution. In Hungary it was not recorded until 2020. One male specimen was attracted to light on Zöld-hegy near Csákvár in the Vértes Mountains. This species feeds on *Asparagus* plants, mainly on *Asparagus acutifolius* in the Mediterranean region. Presumably, its host plant in Hungary is *Asparagus officinalis*. Its occurrence is due to the climatic changes in recent years.

Keywords: *Zebeeba falsalis*, *Asparagus* spp., Hungary, Vértes-hegység (Csákvár, Zöldhegy)

Bevezetés

A *Zebeeba falsalis* lepkefajt 1839-ben szicíliai példányok alapján *Hypena falsalis* néven írták le és a Noctuidae családba helyezték (Herrich-Schäffer 1839). Később Abafi-Aigner & Pável (1897), Abafi-Aigner (1907) és Spuler (1910) Nycteolidae családban *Nycteola falsalis* néven tárgyalta. Napjainkban érvényes rendszertani besorolása szerint az Erebidae család, Rivulinae alcsaládjába sorolták be (Karsholt & Razowski 1996, Varga et al. 2004, Fibiger et al. 2010, Pastoralis et al. 2014). A faj ismert elterjedése Délnyugat-Európa. Karsholt & Razowski (1996) európai fajlistája Franciaországból, Spanyolországból, Portugáliából, Korzikáról, Szíciliáról, Máltáról, Olaszországból, Jugoszlávia utódállamaiból, Bulgáriából, Albániából, Görögországból és Krétáról idézi. Valójában holomediterrán elterjedésű, ismertté vált, hogy É-Afrikában (Marokkóban, Tunéziában) és a Közel-Keleten (Törökországban, Iránban), sőt Hausmann & Kravchenko (2020) szerint Izraelben is megtalálható. A bizonyító példányok a nagy múzeumi gyűjteményekben és számos magángyűjteményben, mint a Hreblay gyűjteményben (Bálint et al. 2014) megtalálhatók. Magyarországhoz közeli előfordulását Stojanovic & Glavendekic (2003) Szerbiából közli.

Anyag és módszer

A *Zebeeba falsalis* (Herrich-Schäffer, 1839) lepkefajt eddig Magyarországon nem észlelték. Egy példánya 2020. június 20-án a Vértes-hegységben, Csákváron a Zöld-hegyen repült fényre.

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1. ábra: *Zebeeba falsalis* (Herrich-Schäffer, 1839) első hazai példánya a Vértes-hegységből

Eredmény és megvitatás

A *Zebeeba falsalis* a magyarországi faunában eddig nem fordult elő. ABAFI-AIGNER (1907), majd KOVÁCS (1953, 1956), sőt VARGA et al. (2004), PASTORÁLIS et al. (2016) és TÓTH (2019) sem jelzik a hazai előfordulását. A Vértes-hegységben, a csákvári Zöld-hegyen, 2020. június 20-án egy hím *Zebeeba falsalis* faj egy példányát gyűjtöttem (1. ábra).

A szakirodalomban tápnövényeként gyakran említett *Asparagus acutifolius* Magyarországon, így Csákváron sem fordul elő (JÁVORKA 1962). Ugyanakkor számos szakíró tápnövényként tágabb értelemben az *Asparagus* fajokat nevezi meg. Ezért feltételezhető, hogy hernyója a nálunk is honos, közönséges spárgát (*Asparagus officinalis*) is elfogadja táplálékul. A közönséges spárgát országszerte megtalálhatjuk, főként a száraz homoktalajokat és kopárosokat kedveli. A spárga a Vértes-hegységben számos ponton előfordul, de alkalmanként kertekben dísznövényként is ültetik. Haszonnövényként történő termesztése Magyarországon visszaszorult. A *Zebeeba falsalis* melegigényes, délies, jobbára mediterrán előfordulású lepkefaj (2. ábra). Hazai megtelepedése kérdéses lehet. A magyarországi klimatikus viszonyok, az utóbbi évek felmelegedése miatt, egyre inkább megfelelőek számára. Ezért a megtelepedése inkább attól függhet, hogy a hernyója az *Asparagus officinalis* fajt ténylegesen elfogyasztja-e?

Az *Asparagus officinalis* közismert tápnövénye az országosan elterjedt spárgalepkének (*Parahypopta caestrum*) és a spárgaszár fúrómolynak (*Phtheochroa pulvillana*) is. A *Zebeeba falsalis* javasolt magyar elnevezése: spárga-bagolylepke.

2. ábra: *Zebeeba falsalis* (Herrich-Schäffer, 1839) elterjedése Európában

Irodalom

Abafi-Aigner & Pável J. 1897: Lepidoptera. - Fauna Regni Hungariae. Budapest, 82 p.

Abafi-Aigner, L. 1907: Magyarország lepkéi. - Királyi Magyar Természettudományi Társulat, Budapest, 137 p.

Bálint Zs, Katona G. & Gubányi A. 2014: The owlet moths of Márton Hreblay (1963-2000). Hungarian Natural Museum, 270.

Fibiger, M., Ronkay, L. , Yela, J. L. & Zilli, A. 2010 : Noctuidae Europeae, Volume 12. Rivulinae – Eutelinae – Micronoctuinae. - Supplement to voume 1-11.

Hausmann, A., G. C. & Kravchenko V. D. 2020: The Lepidoptera of Israel. - Museum Witt, München.

Herrich-Schäffer, G. A. W. 1839: Faunae Insectorum Germaniae intia oder Deutschlands Insecten. - Inhaltsverzeichnis, Regensburg (G. J. Manz), 166: 49-96.

Jávorka, S. 1962: Növényhatározó II. kötet. Harasztok – virágos növények. - Tankönyvkiadó, Budapest, 527.

Karsholt, O. & Razowski, J. 1996: The Lepidoptera of Europe. - Apollo Books, Stenstrup. 380 pp.

Kovács, L. 1953: A magyarországi nagylepkék és elterjedésük. - Rovartani közlemények 6(2): 76-164.

Kovács, L. 1956: A magyarországi nagylepkék és elterjedésük. II. - Folia Entomologica Hungarica 9: 89-140.

Pastoralis, G. Buschmann. F. & Ronkay L. 2016: Magyarország lepkéinek névjegyzéke. (Checklist of the Hungarian Lepidoptera). - e-Acta Naturalia Pannonica 12 Pannon Intézet, Pécs, 258 pp.

Stojanović D. & M. Glavendekić 2003: Five species of Noctuidae (Lepidoptera) new for the fauna of Serbia and Montenegro. - Acta entomologica serbica 8: 85-90.

Tóth, B. 2019: Magyarország nagylepkéinek határozója. - Magyar Biológiai Társaság, Budapest, 316 pp.

Varga, Z., Ronkay, L., Bálint, Zs., László, Gy & Peregovits, L. 2004: A magyar állatvilág fajjegyzéke, 3. kötet. Nagylepkék. - Magyar Természettudományi Múzeum, Budapest, 111 p.

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Seasonal flight activity and seasonal dynamics of biodiversity of sawflies in the Cserhát Mountains

Attila Haris

H-1076 Budapest, Garay street 19., Hungary, email: attilaharis@yahoo.com

Haris, A.: *Seasonal flight activity and seasonal dynamics of biodiversity of sawflies of the Cserhát Mountains.*
Abstract: Seasonal flight activity and seasonal dynamics of biodiversity of sawflies of the Cserhát Mountains are analysed, dominance and biodiversity indices are given. Both of them are modelled by normal distribution which are verified by Shapiro-Wilk and Kolmogorov-Smirnov tests. Dominance diversity curve of assemblage of sawflies is also provided.

Keywords: Hymenoptera, Symphyta, Cserhát Mountains, Hungary, seasonal flight activity, seasonal dynamics of biodiversity, sawfly ecology

Introduction

The first checklist of sawflies from the Cserhát Mountains (Fig. 5) were presented by Haris (2021). In this paper, 573 specimens of 110 species were published. The presence of *Sterictiphora furcata* (Villers, 1789) confirmed and documented first time in the Carpathian Basin. Rare species are: *Empria hungarica* (Konow, 1895), *Aprosthema austriacum* (Konow, 1892), *Arge pleuritica* (Klug, 1834), *Monardis plana* (Klug, 1817), *Hoplocampa pectoralis* Thomson, 1871, *Pachynematus moerens* (Förster, 1854) and *Pristiphora abbreviata* (Hartig, 1837).

In this phase of the research, the seasonal flight activity and the seasonal dynamics of biodiversity are analysed.

In Hungary, seasonal activities of sawflies were studied at only few insect pests (like *Dolerus* spp., *Hoplocampa* spp., *Pachynematus* spp., *Athalia rosae* L.) (Haris 1994a, b, 1995, Sáringer 1957, Nagy 1960) although their mathematical analyses were not performed.

Out of Hungary, only Roller (2006) studied the seasonal flight activity of sawflies of the sub-montane areas of the West Carpathians. He studied and analysed the total Symphyta group.

Material and methods

Standardisation of the sampling sites and collecting times

Average size of a sampling site was 35 000 sqm (3.5 ha). In each sampling sites, we spent 1.5 hour with collection in each day. During this 1.5 hour, approx. 900 net-sweepings were performed on 950-1100 m route inside the sampling sites. Grass-level, bush

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level and lower canopy level were swept. With this method, we successfully eliminated the high selectivity of the frequently applied Malaise trap method. In one days, 3-5 sites were investigated (generally, in one day the Eastern part and on the other day the Western part of the mountains). Minimum 2 days, we spent in each decades of the flying season with sawfly collection. During the intensive eruption of the sawflies density we spent more days (if the weather allowed, every days were spent with field-work). In this way, each decades were represented by average of minimum 2 days of collection, while decades of the intensive flying period is represented by the average of 5-7 days collections and the suppressed (sleeping) period of flight activity is represented by the average of 2-4 days collections. Frequent sampling in the spring flying season was very necessary to capture the rare species of the region for faunistic analysis.

In this way, during the 2021 collecting season, I spent 1 day with collecting in March, 13 days in April, 8 days in May, 5 days in June, 5 days in July and 4 days in August.

We had unique opportunity to investigate the flying dynamics of sawflies in extreme weather conditions. The spring of 2021, was one of the three coldest springs, in the 21st and 20th centuries and it was the coldest since 1987. Furthermore, the Cserhát Mountains is one of the northernmost and coldest region of Hungary. See the temperature charts of Hollókő (at Eastern Cserhát Mts.) for the most critical months of sawfly flying period: April and May (2020 and 2021 years).

Models for flying and biodiversity dynamics were tested by Kolmogorov-Smirnov test (NEDOREZOV 2014). Biodiversity indices were interpreted and applied following the works of DALY et al. 2018 and YOUNG 2017. Dominance diversity curve of sawflies and the curve fitting (mathematical model) follow the work of SOUTHWOOD 1984 and MÁJER 1994.

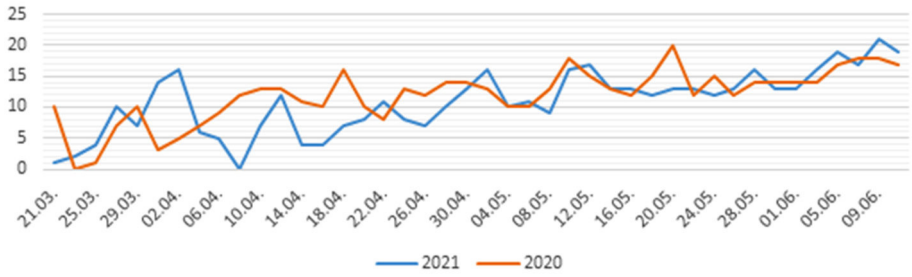

Fig. 1: Mean temperature in Hollókő in 2020 and 2021 during the main flying period of sawflies in Celsius

Frequency and rarity of species

RABINOWITZ (1981) established 7 categories according to geographical distribution, habitat specificity and local population size for the so called rarity of species. Her method was not applicable here, since with this method, most of the species would fall into DD (data deficient) category as they are indicated in ROLLER & HARIS 2008. Instead of this, the method of KOZÁR et al. (1992) for larger territories (like Carpathian Basin or Hungary) was applied where the natural history collections of the museums and the published faunistic data are the bases to categorise the species into rare, sporadic, frequent and common categories:

- rare species: max. 5 exemplars are captured and/or published in every 50 years in average (i.e. we have data on maximum of 15 exemplars from the last 150 years (see ROLLER & HARIS 2008);

Fig. 2: Map of Kutasó: Középső-hegy (Középső hill, former vineyards)

Fig. 3: Map of Nagylóc: Alsó-Zsúny

Fig. 4: Map of Penc: Obszervatórium (forest at Observatory)

Fig. 5: Cserhát landscape (photo: Haris)

Fig. 6: Sinkár lake at Csővár (photo: Haris)

- sporadic: max. 5 exemplars are captured and/or published in every 10 years in average (i.e. we have data on maximum of 75 exemplars from the last 150 years;
- frequent: we have data more than 75 exemplars from the last 150 years;
- common: these are approximately 10 species in the Carpathian Basin which occur regularly in the highest densities (some of them are insect pests).

List of sampling sites

Alsópetény: Bánki-völgy (Bánki valley): between 47°53'8.26"N, 19°13'50.50"E and 47°53'15.09"N, 19°13'56.40"E, altitude: 219-237 m.

Alsópetény: Cser-tó (Cser lake): between 47°52'7.97"N, 19°15'17.19"E and 47°52'6.68"N, 19°15'8.67"E, altitude: 215 m.

Alsótold: Nagy-Mező-hegy (Nagy-Mező hill): between 47°56'47.79"N, 19°35'29.85"E and 47°56'32.58"N, 19°35'32.87"E, altitude: 230-258 m.

Bánk: Száva-hegy (Száva hill):between 47°55'20.06"N, 19°12'52.27"E and 47°55'32.80"N, 19°12'43.31"E, altitude: 169-202 m.

Bokor: Belterület (inside the village): between 47°55'27.95"N, 19°32'47.30"E and 47°55'23.63"N, 19°32'53.72"E, altitude: 254 m.

Cserhátszentiván: Zsunyi-patak (Zsunyi brook): between 47°56'29.70"N, 19°35'21.54"E and 47°56'42.07"N, 19°35'13.29"E, altitude: 218-224 m.

Csővár: Sinkár-tó (Sinkár lake): between 47°48'7.45"N, 19°21'26.83"E and 47°47'57.97"N, 19°21'35.35"E, altitude: 162-165 m (Fig. 6).

Ecseg: Kozárdi-tó (Kozárdi lake): between 47°54'15.28"N, 19°36'36.72"E and 47°54'21.82"N, 19°36'51.85"E, altitude: 172-185 m.

Felsőtold: temető (meadow opposite of the cementery): between 47°57'53.11"N, 19°36'19.44"E and 47°57'54.36"N, 19°36'15.58"E, altitude: 234 m.

Galgaguta: Galga-patak (Galga brook): between 47°49'50.94"N, 19°23'36.37"E and 47°49'44.25"N, 19°23'41.15"E, altitude: 171-172 m.

Garáb: Garábi-patak (Garábi brook): between: 47°58'25.16"N, 19°37'29.95"E and 47°58'14.36"N, 19°37'24.59"E, altitude: 276-277 m.

Kébodony: Rákóczi-emlékmű (meadow at Rákóczi monument): between 47°55'37.03"N, 19°16'13.96"E and 47°55'34.33"N, 19°16'13.30"E, altitude: 160-162 m.

Kisecset: Kiliántelep: between 47°55'59.80"N, 19°19'32.30"E and 47°56'2.11"N, 19°19'36.76"E, altitude: 218-233 m.

Kozárd: Bézma: between 47°55'56.12"N, 19°36'37.38"E and 47°55'51.97"N, 19°36'27.53"E, altitude: 349-355 m.

Kutasó: Középső-hegy (Középső hill, former vineyards): between 47°57'3.51"N, 19°32'55.93"E and 47°57'12.90"N, 19°32'48.09"E, altitude: 284-318 m (Fig. 2).

Legénd: Hosszú-föld: between 47°52'19.05"N, 19°19'17.99"E and 47°52'18.13"N, 19°19'12.68"E, altitude: 206 m.

Nagylóc: Alsó-Zsúny: between 47°59'27.86"N, 19°36'45.75"E and 47°59'33.82"N, 19°36'37.35"E, altitude: 257-259 m (Fig. 3).

Nagylóc: Zsunypuszta: between 47°59'56.32"N, 19°37'8.74"E and 47°59'53.99"N, 19°37'6.64"E, altitude: 261 m.

Penc: Kis-völgy (Kis valley): between 47°47'41.32"N, 19°15'22.00"E and 47°47'47.59"N, 19°15'22.33"E, altitude: 149-151 m.

Penc: Obszervatórium (forest at Observatory): between 47°47'34.14"N, 19°15'53.15"E and 47°47'20.40"N, 19°16'7.32"E, altitude: 189-173 m (Fig. 4).

Penc: Ujhrabina: between 47°49'6.82"N, 19°15'49.80"E and 47°49'6.52"N, 19°15'56.41"E, altitude: 218-217 m.

Penc: Zsobrák: between 47°48'47.10"N, 19°14'28.16"E and 47°48'37.27"N, 19°14'31.81"E, altitude: 155-164 m.

Rád: Lágyas-erdő (Lágyas forest): between 47°47'14.85"N, 19°13'21.50"E and 47°47'8.51"N, 19°13'33.56"E, altitude: 135-148 m.

Results and discussion

Mosaic structure of sawfly distribution in the Cserhát Mountains

Twenty-three sampling sites were investigated in the initial time (first 4 weeks), from these 23 sampling sites, only 10 held reasonable population densities and biodiversity although all of them seemed to be ideal for sawfly collection with divers vegetation and low human disturbances. In these 10 sites (Alsópetény: Bánki-völgy, Bánk: Száva-hegy, Cserhátszentiván: Zsunyi-patak, Csővár: Sinkár-tó, Ecseg: Kozárdi-tó, Garáb: Garábi-patak, Kutasó: Középső-hegy, Nagylóc: Alsó-Zsúny, Penc: Obszervatórium, Penc: Zsobrák) we collected 557 specimens of 108 species, while in the remaining 13 sites, only 30 specimens of 16 species were collected. This kind of mosaic structure was observed everywhere in the Pannonian biogeographic region, although its acceptable scientific explanation is still missing.

Seasonal activity of flying period of sawflies

The extreme cold weather during the main flying period of sawflies in the Pannonian zoogeographical region (March-May 2021) provided unique possibility, to investigate the behaviours of populations in extreme weather conditions.

Significant shift of population peak measured at the first wave (spring population peak). It lasted 3 decades. Normally, the culmination of flying periods is positioned to the 3rd decade of April in the Pannonian Zoogeographic Region. Instead of this, now, it culminated in the third decade of May (one month later than regular time). This shift is partly or entirely caused by the extreme cold spring, not the Northern location of the mountains (compare with the data of HARIS (2011)).

Two peaks (Fig. 7) were detected during the year which can be modelled by normal distribution. The first curve is the spring flying period while the second one is that of the summer flying period. These 2 curves are separated by 40 days (June, early July), when the densities of imago populations close to zero (only 1-2 specimens were captured even with intensive collecting).

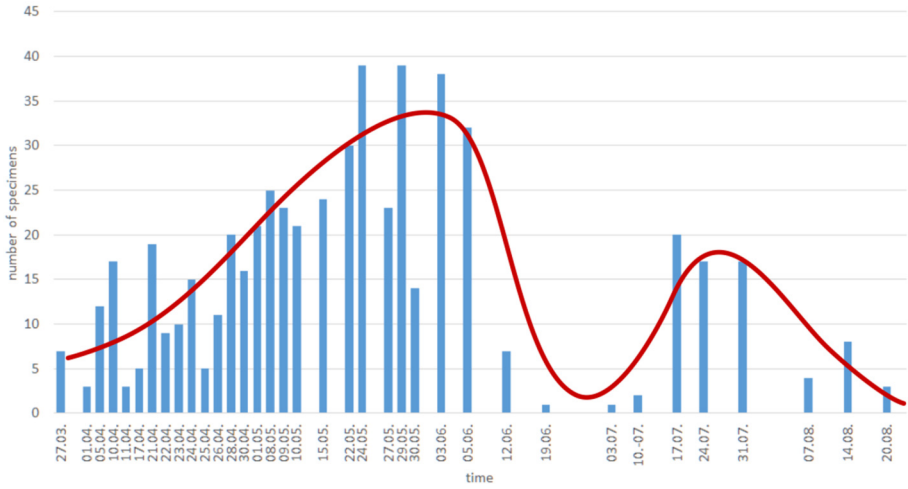

Fig. 7: Seasonal flight activity of sawflies (specimens captured per day)

Table 1: Normality probes of the 2 flight activity curves (spring and summer eruption in the Cserhát Mountains)

Parameters	Spring eruption of sawflies	Summer eruption of sawflies
Mean value	17.46	9.00
Median value	16.50	6.00
Standard Deviation	11.140457	7.782765
Skewness	0.47993	0.467894
Kurtosis	-0.57411	-1.979512
	Kolmogorov-Smirnov test	
p-value	0.97915	0.59498
Value of the K-S test statistic (D)	0.26084	0.25390
	Shapiro-Wilk test	
p-value	0.1357	0.09047
W-value	0.9435	0.8433
α-value	0.093	0.097
effect size	0.08096	0.23970

The main Gauss curve (spring flying period) has mean value 17.46 and the median is 16.50 (in number of specimens captured per day). The standard deviation of the model is 11.140457, kurtosis: -0.57411. The 0.479934 skewness value is caused by the extremely cold April. The normal distribution is verified by the 0.97915 p value (compared with the 0.26084 D value of the K-S statistics).

Opposite of this, the second active period in summer was observed between the second decade of July and the second decade of August is significantly smaller with mean value 9,000 and median value 6,000 with standard deviation: 7.782765, the model has skewness: 0.467894 and kurtosis -1.979512. Similarly to the previous, this period can be modelled with normal distribution either (D value of the K-S test 0.2539 versus the calculated p: 0.59498). According to the Shapiro-Wilk tests, the observed effect size KS - D is very small, 0.08096. This indicates that the magnitude of the difference between the sample distribution and the normal distribution is very small (Table 1). Opposite of this, in the second, summer period, the observed effect size KS - D is large, 0.2397. This indicates that the magnitude of the difference between the sample distribution and the normal distribution is large. However, since the null assumption cannot be rejected, in this case, we may ignore the effect size (Table 1).

We may say: both tests (Table 1) confirm the 2 curves normal distribution model of the seasonal flight activity of sawflies as it figured in Fig. 7.

Seasonal dynamics of sawflies biodiversity

From the 110 species, 108 were collected in the first wave of flying period and only 9 species were collected in the second wave (Fig. 8). Species richness culminated from the last decade of April till the first decade of June which is also the result of the cold spring (generally the culmination period of species diversity is nearly always in the first decade of May, sometimes in the 3rd decade of April).

Although the diversity of the first eruption of sawfly populations is 12x larger than the small diversity of the second curve, the frequency of the individuals (density of the populations) measured as high as 52% of the mean value (17.46 vs. 9.00) and 36% of the median value (16.5 vs. 6.00).

The dynamics of species composition follows the normal distribution either. It has (similarly to the previous chart) 2 curves, however, the second curve hardly elevated.

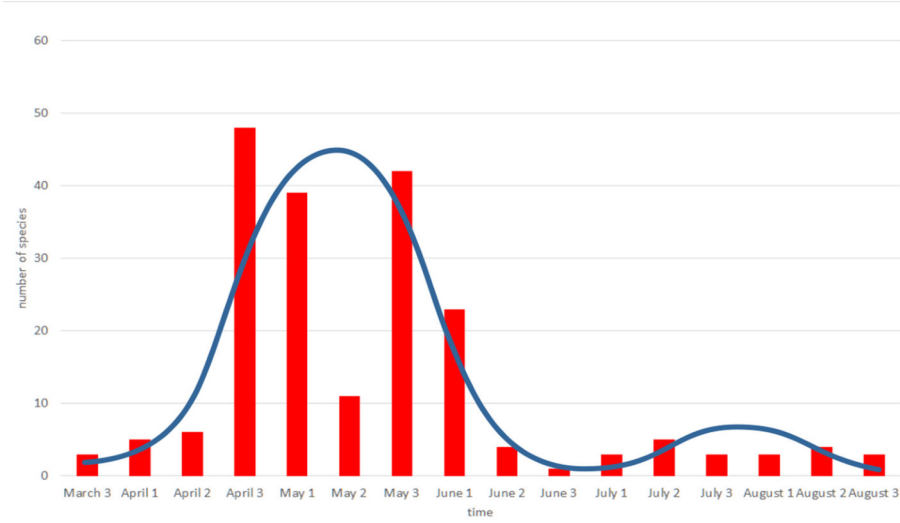

Fig. 8: Seasonal dynamics of biodiversity of sawflies in the Cserhát mountains in 2021 (number of species captured / decade)

The parameters of the spring eruption curve: mean value: 18.2. median value: 8.5. Standard deviation: 18.298755, skewness: 0.750333 and kurtosis: -1.353329 (D (K-S) 0.26084 vs. p-value 0.43115) (Table 2).

Kolmogorov–Smirnov test (Table 2) confirms normal distribution model of the 2 biodiversity curves as it figured in Fig. 8. Opposite of this, Shapiro-Wilk test doesn't confirm the normal distribution of the dynamic of sawfly biodiversity since p-value<α, therefore we shall reject the H0. It is assumed that the data is not from normal distribution. According to our opinion, in this case, Shapiro-Wilk test is not able to eliminate the

Table 2: Normality probes of 2 seasonal curves of biodiversity (spring and summer curves in the Cserhát Mountains)

Parameters	**Spring eruption**	**Summer curve**
Mean value	18.2	3.14
Median value	8.5	3.00
Standard Deviation:	18.298755	1.214986
Skewness	0.750333	-0.366392
Kurtosis	-1.353329	1.778772
	Kolmogorov-Smirnov test	
p-value	0.43115	0.43977
Value of the K-S test statistic (D)	0.26084	0.30661
	Shapiro-Wilk test	
p-value	0.02905	0.2645
W-value	0.8198	0.8828
α-value	0.060	0.102
effect size	0.2530	0.3103

influencing factor of the extreme cold spring, therefore for modelling the flight activity, the Kolmogorov–Smirnov test is more suitable.

According to the Shapiro-Wilk tests, the observed effect sizes KS - D are large, 0.253 and 0.3103. This indicates that the magnitude of the difference between the sample distribution and the normal distribution is large. But in the summer period, since the null assumption cannot be rejected, you may ignore the effect size.

Biodiversity and dominance indices

Biodiversity and dominance indices are good tools to follow the spatial and temporal change of biodiversity and species composition. They are very important to compare different areas and different periods and to recognise the tendencies. They are also useful in nature conservation and zoogeography. Unfortunately, in Hungarian sawfly faunistics, these indices haven't been used so far, however, to publish the calculated indices is still important to have data for comparison with further research preformed in different time or in different regions.

The dominant species was *Athalia rosae* (Linné, 1758) with 114 exemplars. Other frequent species (with 20 or more collected exemplars) were *Dolerus nigratus* (O.F. Müller, 1776) with 47, *Dolerus puncticollis* Thomson, 1871 with 20, *Pteronidea oligospila* (Förster, 1854) with 35, *Cephus pygmeus* (Linné, 1767) with 24 and *Calameuta punctata* (Klug, 1803) with 22 specimens. These 6 species (with 262 exemplars) amounts 45.7 % of the total collected material.

Rare and interesting species: *Sterictiphora furcata* (Villers, 1789): "all checked specimens proved to be *S. angelicae*" (ROLLER & HARIS 2008). We were not able to cancel this species from the fauna of the Carpatian Basin in that time, since many old specimen mainly from the 19th century were not available. However, this is the first documented specimen from the Carpathian Basin following the sub-recent revision of KOCH 1988.

Other rare species: *Empria hungarica* (Konow, 1895), *Aprosthema austriacum* (Konow, 1892), *Arge pleuritica* (Klug, 1834), *Monardis plana* (Klug, 1817), *Hoplocampa pectoralis* C. G. Thomson, 1871, *Pachynematus moerens* (Förster, 1854) and *Pristiphora abbreviata* (Hartig, 1837).

Table 3: Biodiversity and dominance indices of sawflies, Cserhát Mountains, 2021

Index	Value	Index	Value
Simpson Index	0.06	Berger-Parker Dominance Index	0.2
Dominance Index	0.94	Inverted Berger-Parker Dominance	5.03
Reciprocal Simpson Index	17.11	Menhinick Index	4.6
Shannon-Wiener Index log2	5.37	Buzas and Gibson's Index	0.38
Shannon-Wiener Index ln	3.72	Equitability Index	0.79
Shannon-Wiener Index log10	1.62	Margalef Richness Index	17.16
Gini Coeffificient	0.65		

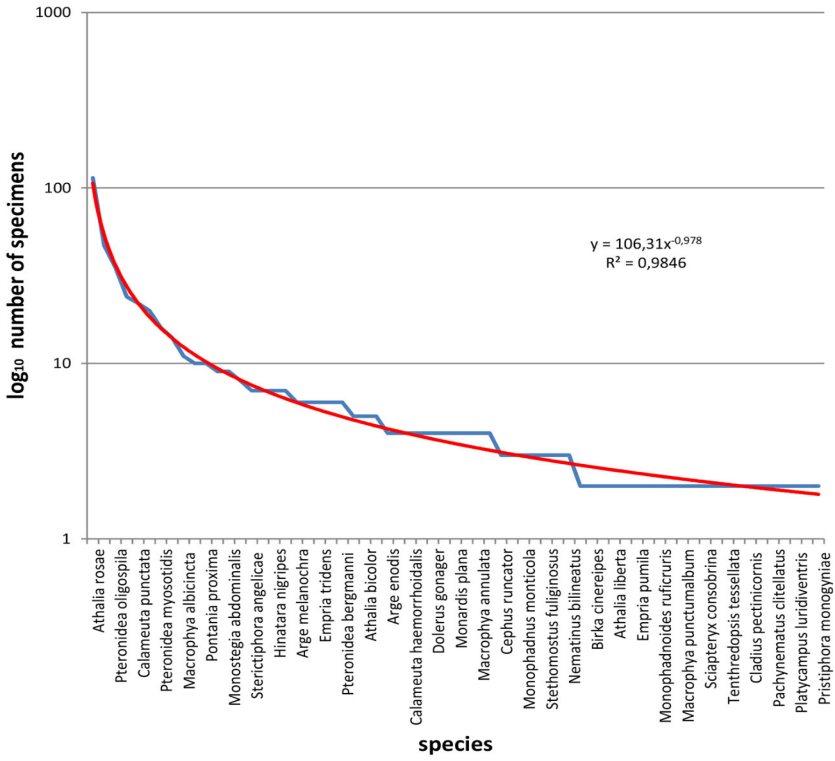

Fig. 9: Dominance diversity curve of assemblage of sawflies in the Cserhát Montains

Excellent fit (98.45%) were detected to the $100x^{-1}$ curve (with $y=106.31x^{-0.978}$ experienced parameters) (Fig. 9).

Only Argidae, Cephidae and Tenthredinidae families were collected. The other families of Symphyta remained hidden. It indicates, these families are not frequent in the Cserhát Mountains including the insect pests from these families. Also interesting the total lack of summer flying Tenthredo L. species.

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References

Daly, A. J.; Baetens, J. M. & De Baets, J. 2018: Ecological Diversity: Measuring the Unmeasurable. - Mathematics 2018, 6. 119pp. doi:10.3390/math6070119

Haris, A. 1994a: Preliminary examinations on food-choice of Pachynematus clitellatus Lepletier (Hymenoptera, Tenthredinidae). - Acta Phytopathologica et Entomologica Hungarica 29(3-4): 329-334.

Haris, A. 1994b: Food-choice of wheat sawflies (Dolerus spp., Hymenoptera, Tenthredinidae). - Acta Phytopathologica et Entomologica Hungarica 29(3-4): 335-342.

Haris, A. 1995: Further data on the food-choice of Wheat-sawflies (Dolerus spp., Hymenoptera, Tenthredinidae). - Acta Phytopathologica et Entomologica 30(3-4): 255-263.

Haris, A. 2011: Sawflies of the Börzsöny Mountains (North Hungary) (Hymenoptera: Symphyta). - Natura Somogyiensis 19: 149-176.

Koch, F. 1988: Die Gattung Sterictiphora Billberg (Insecta, Hymenoptera, Symphyta: Argidae). - Entomologische Abhandlungen. Staatliches Museum für Tierkunde in Dresden, Leipzig 52(2): 29-61.

Kozár, F., Samu, F. & Jermy, T.: 1992: Az állatok populációdinamikája. - Akadémiai Kiadó Budapest. 162 pp.

Majer, J. 1994: Az ökológia alapjai. - Szaktudás Kiadó Kft. 246 pp.

Nagy, B. 1960: Gyümölcsdarazsak (Hoplocampa spp.). - Mezőgazdasági Kiadó, Budapest.151 pp.

Nedorezov, L.V. 2014: Entomological data collection and unreal assumptions. - Population Dynamics: Analysis, Modelling, Forecast 2(2): 73-86.

Rabinowitz, D. 1981: Seven forms of rarity. - In Ed. Synge, H: The Biological Aspects of Rare Plant Conservation. 19R I John Wiley & Sons Ltd. 205-217.

Roller, L. 2006: Seasonal flight activity of sawflies (Hymenoptera, Symphyta) in submontane region of the West Carpathians, Central Slovakia. - Biologia, Bratislava 61(2): 193-205.

Roller, L. & Haris, A. 2008: Sawflies of the Carpathian Basin, History and Current Research. - Natura Somogyiensis 11: 1-261.

Sáringer, Gy. 1957: A repcedarázs [Athalia rosae L. (= colibri Christ) Hym. Tenthredinidae]. - Annales Instituti Protectionis Hungarici 7: 125-183.

Southwood, T. R. E. 1984: Ökológiai módszerek különös tekintettel a rovarpopulációk tanulmányozására. - Mezőgazdasági Kiadó 314 pp.

Young, T. M. 2017: Biodiversity Calculator for the Simpson and Shannon Indexes. https://www.alyoung.com/labs/biodiversity_calculator.html last checked 24.08. 2021

Natura Somogyiensis 37: 65-78. Kaposvár, 2021 DOI:10.24394/NatSom.2021.37.65
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Contribution to the Rogadinae (Hymenoptera, Braconidae) fauna of Turkey

*Ahmet Beyarslan[1] & Mikail Çakici[2]

[1]Department of Biology, Faculty of Science, Trakya University, Edirne, Turkey. TR
[2]Bitlis Eren University Graduate Education Institute Department of Biology. TR-13000, Bitlis, Turkey
*Corresponding author: abeyars@gmail.com

Beyarslan, A. & Çakici, M.: *Contribution to the Rogadinae (Hymenoptera, Braconidae) fauna of Turkey.*
Abstract: This study was carried out to determine Rogadinae (Hymenoptera, Braconidae) fauna of Turkey. Adult specimens were collected from different habitats of the Eastern Anatolia Region and a few localities from other parts of Turkey, using sweeping nets and Malaise traps. The obtained material was prepared and appropriately labeled. A total of 20 species of genus *Aleiodes* Wesmael, 1838 were recorded. The following species are new record for fauna of Turkey: *Aleiodes* (*Aleiodes*) *arnoldii* (Tobias,1976), *A*. (*A*.) *modestus* (Reinhard, 1863) and *Aleiodes* (*Neorhogas*) *fortipes* (Reinhard, 1863).

Keywords: Rogadinae, endoparasitoid, Braconidae, taxonomy, fauna

Introduction

Rogadinae is a cosmopolitan, species-rich braconid wasp subfamily whose species are endoparasitoids that attack larvae of a number of lepidopteran families. The members of this subfamily are characterized by pupating within the mummified host larval skin (Shaw & Huddleston 1991, Shimbori & Shaw 2015), posteroventral margin of 1st tergite and anteroventral margin of 2nd tergite distinct and usually propodeum, 1st and 2nd abdominal tergites with fine medial longitudinal ridge (Shimbori et al. 2016, Sulca et al. 2017, Tobias 1986). The subfamily contains six tribes whose relationships have only been partially clarified: Aleiodini, Betylobraconini, Clinocentrini, Rogadini, Stiropiini and Yeliconini. The limits and composition of the closely related subfamilies to the Rogadinae, Hormiinae and Lysiterminae, also remain unclear (Jasso-Martinez et al. 2020). Ultraconserved element data to reconstruct an almost fully resolved phylogeny for the members of Rogadinae and related subfamilies were generated. The monophyly of Rogadinae was confirmed: Betylobraconini synonymize *Xenolobus* Fahringer and Bequartia Cameron within the species-rich genus *Aleiodes* Wesmael based on DNA, and synonymize *Promesocentrus* van Achterberg with *Pilichremylus* Belokobylskij based on morphology (Jasso-Martinez et al. 2020). The framework is still important for the necessity of revising the limits and evolutionary relations of some groups (Townsend & Shaw 2009, Zaldivar-Riveron et al. 2008). Worldwide, about 1243 described species of Rogadinae have been under 62 genera. Approximately 632 host species are known. It is distributed in 306 countries in zoogeographical regions of Afrotropical, Australasian,

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Nearctic, Neotropical, Oceania, Oriental and Palaearctic. Also California, Connecticut, Hawaii, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, Pennsylvania, Rhode Island, Vermont and Washington of U.S.A.; Canada-Ontario; Yugoslavia; Yugoslavia-Serbia have imported species of Rogadinae and introduced them into their countries for the biocontrol of Agricultural pests (BUTHER et al. 2012, SHIMBORI & SHAW 2014, YU et al. 2016).

The ancestral host preference for Rogadinae was probably attacking concealed lepidopteran larvae, with the occurrence of at least two main subsequent transitions to attack both concealed and exposed hosts, one within Rogadini and a second within Aleiodini (SULCA et al. 2017).

The first records for the Turkish fauna of Rogadinae is *Aleiodes* (*Aleiodes*) *pallidator* (Thunberg, 1822). This species was obtained from beet pest (*Laphygma exigua* Hb.) larvae (Steiner, 1936). The studies to determine Rogadinae fauna of Turkey was started in 1979.

22 rogadine species were recorded within 1 genus and 4 subgenera until now (AYDOĞDU & BEYARSLAN 2005, 2006, BEYARSLAN 2015, BEYARSLAN et al. 2002). However, *Aleiodes* (*Chelonorhogas*) *gasterator* (Jurine) by PAPP (1985) and *Aleiodes* (*Neorhogas*) *dissector* (Nees) by QUICKE et al. (2006) were recorded from Turkey (YU et al. 2016).

Anatolia, which has been under the influence of complex geological changes, is a rich biodiversity area. At the junction of the continents of Asia, Africa and Europe, Anatolia or Asia Minor led to the mixing of biota. Anatolia has east-west and north-south oriented mountains that can serve as a distribution corridor for cold-adapted species (ÇIPLAK, 2003). However Rogadinae fauna of Turkey is represented by a small number of species of genus *Aleiodes* Wesmael, 1838 (BEYARSLAN 2015).

Material and methods

Adult samples of Rogadinae were collected from different habitats of Turkey. Most of the studied localities belong to the provinces of the eastern Anatolian region (Fig. 1). Material was collected from May to October, using sweeping net. Adult individuals were separated from the other material, and was brought to the laboratory in storage containers and in 70% ethylalcohol medium.

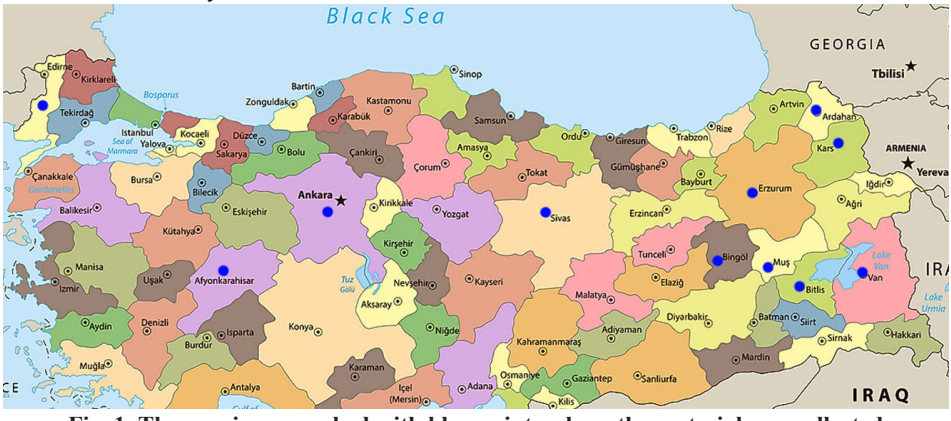

Fig. 1. The provinces marked with blue points where the material was collected

Samples were put into pure water in the laboratory, purified from ethylalcohol, dried and corrected so that the morphological features that are important in diagnosis can be seen on plain paper. The triangle attached to insect needles is glued to cartons and is labeled with locality labels.

The prepared material was identified with the aid of the encounter material found in our collection and the relevant literature: Belokobylskij 1996, 2000, Marsh & Shaw 2003, Quicke et al. 2006, Shaw 1983, 2002, 2006, Shaw & Marsh 1997, Shaw et al. 2006, Tobias 1986, van Achterberg 1985, 1991, 1993, van Achterberg & Polaszek 1996. The identified species were recorded with their habitat characteristics, namely their locality address, height and coordinates. New species for the Turkish fauna are marked with asterisks (*). The specimens are stored in Trakya University, Faculty of Sciences, Department of Biology, Zoology collection.

Results

Subfamily: **Rogadinae**, Foerster, 1862
Genus: ***Aleiodes*** Wesmael, 1838
Subgenus: ***Aleiodes*** s. str. Wesmael, 1838

Aleiodes (Aleiodes) albitibia (Herrich-Schäffer, 1838)
Rogas albitibia Herrich-Schäffer, 1838
Aleiodes (Aleiodes) albitibia: Belokobylskij 2000.
Synonym: *Aleiodes heterogaste.*

Material examined: Erzurum-İspir, Yeşilyurt, (40°31'29"N, 41°04'55"E), 1570 m, 26.6.2013, 1♀.

Distribution: Palaearctic, Nearcttic, Neotropic.

Host: Lepidoptera, Arctiidae: *Atolmis rubricollis* (Linnaeus, 1758), Crambidae: *Anania crocealis* (Hubner, 1796), Erebidae: *Leucoma salicis* (Linnaeus, 1758), Gelechiidae: *Caryocolum amaurella* (M. Hering 1924), Geometridae: *Abraxas grossulariata* (Linnaeus 1758), *Bupalus piniarius* (Linnaeus, 1758), *Cyclophora ruficiliaria* (Herrich-Schaffer,1855), *Epirrhoe galiata* (Denis & Schiffermuller, 1775), *Epirrita autumnata* (Borkhausen, 1794), *Eupithecia alliaria* (Staudinger, 1870), *E. linariata* (Denis & Schiffermuller 1775), *E. subfuscata* (Haworth, 1809), *Gymnoscelis rufifasciata* (Haworth, 1809), *Hylaea fasciaria* (Linnaeus, 1758), *Lycia isabellae* (Harrison, 1914), *Thera variata* (Denis & Schiffermuller 1775), Noctuidae: *Apamea crenata* (Hufnagel, 1766), *Autographa gamma* (Linnaeus, 1758), *Diarsia rubi* (Vieweg, 1790), *Helicoverpa armigera* (Hubner, 1808), *Hoplodrina octogenaria* (Goeze, 1781), *Lithomoia solidaginis* (Hubner, 1803), *Mamestra brassicae* (Linnaeus, 1758), *Noctua fimbriata* (Schreber, 1759), *N. pronuba* (Linnaeus, 1758), *Notodonta dromedarius* Linnaeus, 1767, *Orthosia gracilis* (Denis & Schiffermuller, 1775), *O. incerta* (Hufnagel, 1766), *O. stabilis* (Denis & Schiffermuller, 1775), *Pammene amygdalana* (Duponchel, 1842), *Penicillaria jocosatrix* Guenee, 1852, *Pseudaletia unipuncta* (Haworth, 1809), *Spodoptera exigua* (Hubner, 1808), *Xestia agathina* (Duponchel, 1827), *X. baja* (Denis & Schiffermuller, 1775), *X. xanthographa* (Denis & Schiffermuller, 1775), Pterophoridae: *Pterophorus pentadactyla* (Linnaeus, 1758), Pyralidae: *Dioryctria abietella* (Denis & Schiffermuller, 1775), Tortricidae: *Archips rosana* (Linnaeus, 1758), *Croesia bergmanniana* (Linnaeus, 1758), *C. holmiana* (Linnaeus, 1758), *Cydia conicolana* (Heylaerts,

1874), *C. strobilella* (Linnaeus, 1758), *Pammene gallicolana* (Lienig ve Zeller, 1846), *Tortrix viridana* (Linnaeus, 1758), *Zeiraphera griseana* (Hubner, 1799).

Aleiodes (Aleiodes) arnoldii (Tobias, 1976)
Rogas arnoldii Tobias, 1976
Aleiodes (Aleiodes) arnoldii: Huflejt 1997.

Material examined: Bitlis Rahva, Üçyol, (38°29'18.11"N, 42°11'07.00"E), 1795 m, 12.8.2019, 1♂.
Distribution: Palaearctic.
Host: Unknown.
This species is the first record for fauna of Turkey.

Aleiodes (Aleiodes) bicolor (Spinola, 1808)
Bracon bicolor Spinola, 1808
Aleiodes (Aleiodes) bicolor: Wesmael 1838.
Synonym: *Aleiodes esseni; Aleiodes tristis; Bracon assimilis; Bracon praerogator; Rhogas coxator; Rhogas docavoi.*

Material examined: Ankara Gölbaşı (*Heliothis peltigera* üzerinden), (39°49'57"N, 32°54'07"E), 1236 m, 16.6.2018, 1♂; Bingöl Adaklı, Hasbağlar, (39°05'42.87”N, 40°24'05.91"E), 1591 m, 25.9.2012, 2d, 1♂; Salköy, (38°53'7.6704"N, 40°29'47.8464" E) 1757 m, 29.7.2016, 1♀, 1♂; Bitlis-Eren üniversitesi tesisteleri, (38°29'18.11”N, 42°11'07.00"E), 1795 m, 17.9.2015, 1♂; Ahlat, Erik Kapı Köyü, (38°46'49.8504"N 42°6'34.4520"E), 1943 m, 28.7.2016, 1♀, 1♂; Tatvan, Küçüksu, (38°25'21.73”N, 42°19'27.11"E), 2219 m, 5.8.2014, 2♀. 9.8.202014, 8♀, 13.6.2014, 4♀; Tatvan, Reşadiye, (38°29'20.67”N, 42°32'14.40"E), 1688 m, 27.7.2016, 1♀; Tatvan Kuşlu mezra (38°45'27"K, 42°18'40"E), 1654 m, 13.9.2014,2♀; Muş-Mercimek Kale, (38°56'11”N, 41°30'27”E), 1263 m, 20.6.2013, 1♀; Varto, (39°09'55"N 41°27'52"E), 1525 m, 20.6.2013, 1♀; Sivas Gürün, İncesu Köyü, (38°52'49.86"N, 37°28'30.79"E), 1536 m, 15.9.207, 1♀; Gürün, Suti mahlesi Köyü, (38°43'09.43"N, 37°20'22.89"E), 1289 m, 15.9.207, 1♀; Gürün, Yazyurdu Köyü, (38°52'49.86"N, 37°28'30.79"E), 1536 m, 15.9.207, 1♀; Van-Erciş, (39°01'43.39”N, 43°21'32.51"E), 1693 m, 28.7.2016, 1♀.
Distribution: Palaearctic.
Host: Lepidoptera, Crambidae: *Loxostege sticticalis* (Linnaeus, 1761), *Pyrausta purpuralis* (Linnaeus, 1758), *P. sanguinalis* (Linnaeus, 1767), Erebidae: *Dasychira albodentata* Bremer, 1864, *Leucoma salicis* (Linnaeus, 1758), Geometridae: *Apocheima cinerarius* (Erschoff, 1874), *Archiearis parthenias* (Linnaeus, 1761), *Eupithecia linariata* (Denis & Schiffermuller, 1775), Lycaenidae: *Aricia agestis* (Denis & Schiffermuller, 1775), *A. artaxerxes* (Fabricus, 1793), *Cupido alcetas* (Hoffmannsegg, 1804), *C. minimus* (Fuessly 1775), *Lysandra coridon* (Poda, 1761), *Plebejus idas* (Linnaeus, 1761), *Polyommatus albicans* (Gerhard, 1851), *P. damon* (Denis & Schiffermuller, 1775), *P. eros* (Ochsenheimer, 1808), *P. icarus* (Rottemburg, 1775), Noctuidae: *Apamea sordens* (Hufnagel, 1766), Nymphalidae: *Maniola jurtina* (Linnaeus, 1758), *Aglais urticae* (Linnaeus, 1758), Pterophoridae: *Emmelina monodactyla* (Linnaeus, 1758), *Hellinsia tephradactyla* (Hubner, 1813), Zygaenidae: *Jordanita chloros* (Hubner, 1813), *J. graeca* (Jordan, 1907), *Rhagades pruni* (Denis & Schiffermuller, 1775), *Zygaena filipendulae* (Linnaeus, 1758), *Z. lonicerae* (Scheven, 1777), *Z. purpuralis* (Brunnich, 1763), *Z. viciae* (Denis & Schiffermuller, 1775).

Aleiodes (Aleiodes) circumscriptus (Nees, 1834)

Rogas circumscriptus Nees, 1834

Aleiodes (Aleiodes) circumscriptus: Beyarslan et al. 2002.

Synomym: *Aleiodes bistrigatus, Aleiodes nigriceps, Aleiodes nigricornis, Bassus minutus, Ichneumon testaceus, Rogas pictus.*

Material examined: Muş-Mercimek Kale, (38°56'11"N, 41°30'27"E), 1263 m, 20.6.2013, 1♀; Yaygın Solhan arası, (38°56'1.48"N, 40°45'23.99"E) 1560 m, 29.7.2016, 3♀, 1♂; Sivas-Gürün, İncesu Köyü, (38°52'49.86"N, 37°28'30.79"E), 1536 m, 15.9.207, 1♀; Gürün, Yazyurdu Köyü, (38°48'11.27"N, 36°55'40.89"E), 1798 m, 15.9.207, 1♀; Van-Gevaş, Değirtaş, (38° 17′ 52.05"N, 43° 06′ 20.12"E), 1687 m, 30.9.2017, 2♂.

Distribution: Palaearctic.

Host: Lepidoptera, Arctiidae: *Atolmis rubricollis* (Linnaeus, 1758), Erebidae: *Leucoma salicis* (Linnaeus, 1758), Gelechiidae: *Caryocolum amaurella* (Hering, 1924), Geometridae: *Thera variata* (Denis & Schiffermuller, 1775), *Abraxas grossulariata* Linnaeus, 1758, *Bupalus piniarius* Linnaeus, 1758, *Cyclophora ruficiliaria* (Herrich-Schaffer, 1855), *Epirrhoe galiata* (Denis & Schiffermuller 1775), *Epirrita autumnata* (Borkhausen, 1794), *Eupithecia alliaria* (Staudinger, 1870), *E. linariata* (Denis & Schiffermuller, 1775), *E. subfuscata* (Haworth, 1809), *Gymnoscelis rufifasciata* (Haworth, 1809), *Hylaea fasciaria* (Linnaeus, 1758), *Lycia isabellae* (Harrison, 1914), Noctuidae: *Apamea crenata* (Hufnagel, 1766), *Autographa gamma* (Linnaeus, 1758), *Diarsia rubi* (Vieweg, 1790), *Helicoverpa armigera* (Hubner, 1808), *Hoplodrina octogenaria* (Goeze, 1781), *Lithomoia solidaginis* (Hubner 1803), *Mamestra brassicae* (Linnaeus, 1758), *Noctua fimbriata* (Schreber, 1759), *N. pronuba* (Linnaeus, 1758), *Orthosia gracilis* (Denis & Schiffermuller, 1775), *O. incerta* (Hufnagel, 1766), *O. stabilis* (Denis & Schiffermuller, 1775), *Penicillaria jocosatrix* Guenee, 1852, *Pseudaletia unipuncta* (Haworth, 1809), *Spodoptera exigua* (Hubner, 1808), *Xestia agathina* (Duponchel, 1827), *X. baja* (Denis & Schiffermuller, 1775), *X. xanthographa* (Denis & Schiffermuller, 1775), *Pterophorus pentadactyla* (Linnaeus, 1758), Pyralidae: *Dioryctria abietella* (Denis & Schiffermuller, 1775), *Ebulea crocealis* (Denis &Schiffermuller, 1775), Tortricidae: *Archips rosana* (Linnaeus, 1758), *Croesia bergmanniana* Linnaeus, 1758, *C. holmiana* Linnaeus, 1758, *Cydia conicolana* (Heylaerts, 1874), *C. strobilella* (Linnaeus, 1758), *Pammene amygdalana* (Duponchel, 1842), *P. gallicolana* (Lienig & Zeller, 1846), *Tortrix viridana* (Linnaeus, 1758), *Zeiraphera griseana* (Hubner, 1799).

Aleiodes (Aleiodes) esenbeckii (Hartig, 1838)

Rogas esenbeckii Hartig, 1838

Aleiodes (Aleiodes) esenbeckii: You ve Wei 2006.

Synomym: *Phanomeris dendrolimi, Phanomeris spectabilis, Rhogas corsicus, Rhogas metanastriae, Rogas gastropachae.*

Material examined: Kars-Sarıkamış (40°21'59"N, 42°32'10"E), 2472 m, 8.9.2017, 1♀; Sarıkamiş, Büyükkumru, (40°25'05"N, 42°28'13"E), 2400 m, 16.9.2012, 1 ♂; 20.6.2018, 1♀.

Distribution: Palaearctic, Oriental.

Host: Lepidoptera, Endromidae: *Endromis versicolora* (Linnaeus, 1758), Lasiocampidae: *Dendrolimus albolineatus* Matsumura, 1921, *D. pini* (Linnaeus, 1758), *D.punctatus* Walker, 1855, *D. sibiricus* (Tschetverikov, 1908), *D. spectabilis* (Butler, 1877), *D. superans* (Butler 1877), *D.tabulaeformis* Tsai & Liu, 1962, *Selenephera lunigera* (Esper, 1911), Zygaenidae: *Zygaena lonicerae* (Scheven, 1777).

Aleiodes (Aleiodes) gastritor (Thunberg, 1822)

Ichneumon gastritor Thunberg, 1822

Aleiodes (Aleiodes) gastritor: Papp 2012.

Synomym: *Aleiodes armatus, Aleiodes caudalis, Aleiodes ochraceus; Rhogas fuscomaculatus, Rhogas japonicus, Rhogas rossicus,Rogas similis, Rogas spathuliformis.*

Material examined: Ardahan-Posof, (41°30'30”N, 42°44'03”E), 1445 m, 23.6.2012, 4♀; Bitlis-Tatlı kaynak köyü, (38°21'59.28”N, 42°04'10.66"E), 1502 m,14.10.2018, 1♂; Adilcevaz (38°48'16.93”N, 42°44'16.20"E), 1678 m, 28.7.2016, 1♀; Edirne-Güllapoğlu yerleşkesi (41°40'41”N, 26°37'43”E), 116 m, 3.5.2002, 1♀; Kars-Sarıkamiş, Büyükkumru, (40°25'05”K, 42°28'13”D), 2400 m, 16.9.2012, 1 ♂; 20.6.2013, 1♀; Muş-Bulanık, Güllüova Köyü, (39°03'34”N, 42°20'01"E), 1554 m, 23.9.2017, 1♀.

Distribution: Holarctic, Oceanic, Oriental.

Host: Lepidoptera, Crambidae: *Ostrinia nubilalis* (Hubner, 1796), *Phlyctaenia coronata* (Hufnagel, 1767), Drepanidae: *Cilix glaucata* (Scopoli, 1763), Elachistidae: *Depressaria absynthiella* (Herrich-Schaffer, 1865), Geometridae: *Alsophila pometaria* (Harris, 1841), *Apocheima cinerarius* (Erschoff, 1874), *A. hispidaria* (Denis & Schiffermuller, 1775), *Chiasmia clathrata* (Linnaeus, 1758), *Chloroclystis v-ata* (Haworth, 1809), *Digrammia gnophosaria* (Guenee, 1857), *Epirrita autumnata* (Borhausen, 1794), *Erannis defoliaria* (Clerck, 1759), *Eupithecia alliaria* (Staudinger, 1870), *E. miserulata* (Grote, 1863), *E. pusillata* (Denis & Schiffermuller, 1775), *Glena cribrataria* (Guenee, 1858), *Hylaea fasciaria* (Linnaeus, 1758), *Hypagyrtis unipunctata* (Haworth, 1809), *Isturgia limbaria* (Fabricius, 1775), *Lycia hirtaria* (Clerck, 1760), *Lycia pomonaria* (Hubner, 1790), *Operophtera brumata* (Linnaeus, 1758), *Phthonandria atrilineata* (Butler 1881), *Tephrina arenacearia* (Denis & Schiffermuller, 1775), Lasiocampidae: *Malacosoma neustria* (Linnaeus, 1758), Erebidae: *Euproctis chrysorrhoea* (Linnaeus, 1758), *E. similis* (Fuessly, 1775), *Hypena scabra* (Fabricius, 1798), *Leucoma salicis* (Linnaeus, 1758), Noctuidae: *Agrapha agnata* (Staudinger, 1892), *Autographa gamma* (Linnaeus, 1758), *Harpyia hermelina* (Stephens, 1829), *Helicoverpa armigera* (Hubner, 1808), *Pseudaletia unipuncta* (Haworth, 1809), *Spodoptera exigua* (Hubner, 1808), *Trichoplusia ni* (Hubner, 1803), Notodontidae: *Cerura vinula* (Linnaeus, 1758), *Thaumetopoea processionea* (Linnaeus, 1758), Yponomeutidae: *Prays oleae* (Bernard, 1788), Tortricidae: *Archips rosana* (Linnaeus, 1758), *Lobesia botrana* (Denis & Schiffermuller, 1775).

****Aleiodes (Aleiodes) modestus*** (Reinhard, 1863)

Rogas modestus Reinhard, 1863

Aleiodes (Aleiodes) modestus: Belokobylskij 2000.

Synonym: *Rhogas piceus*.

Material examined: Ardahan-Posof, (41°30'30”N, 42°44'03”E), 1445 m, 21.8.2013, 1♀.

Distribution: Palaearctic.

Host: Lepidoptera, Geometridae: *Eupithecia absinthiata* (Clerck, 1759) [*Artemisia absinthium*], *E. exiguata* (Hübner, 1813), *E. lariciata* (Freyer, 1842), *E. nanata* (Hübner, 1813), *E. pimpinellata* (Hübner, 1813), *E. satyrata* (Hübner, 1813), *Idaea aureolaria* (Denis & Schiffermüller, 1775), *Macaria liturata* (Clerck, 1759), *Macrothylacia rubi* (Linnaeus, 1758).

This species is the first record for the fauna Turkey.

Aleiodes (Aleiodes) moldavicus Tobias, 1986 var

Material examined: Bitlis-Tatvan, Dibekli Köyü, (38°28'10.44”N, 42°25'06.39"E), 1826 m, 21.6.2017, 1♀; Hizan, Alabalık tesisleri, (38°10'34.62”N, 42°23'29.88"D, 1268 m,13.6.2015, 1♂.

Distribution: Western Palaearctic.

Host: Unknown.

Aleiodes (Aleiodes) nocturnus (Telenga, 1941)

Rhogas nocturnus Telenga, 1941

Aleiodes (Aleiodes) nocturnus: Papp 1987.

Material examined: Kars-Kağızman, Kuloğlu, (40°05'49”N, 42°57'49”E), 1287 m, 23.6.2013, 1♀.

Distribution: Palaearctic.

Host: Lepidoptera, Erebidae: *Euproctis karghalica* (Moore, 1878), Noctuidae: *Helicoverpa armigera* (Hubner, 1808), *H. zea* (Boddie, 1850), Notodontidae: *Cerura menciana* (Moore, 1877), *C. vinula* (Linnaeus, 1758), *Harpyia hermelina* (Goeze, 1781).

Aleiodes (Aleiodes) pallidator (Thunberg, 1822)

Ichneumon pallidator Thunberg, 1822

Aleiodes (Aleiodes) pallidator: Papp 2012.

Synonym: *Aleiodes unicolor, Rhogas apiculatus, Rhogas pellucens, Rogas apicalis, Rogas ochraceus.*

Material examined: Muş-Konukbekler, (39°3'39.68”N, 42°19'0.34"E), 1573 m, 29.7.2016, 1♂.

Distribution: Holarctic, Neotropical, Oriental.

Host: Lepidoptera, Erebidae: *Euproctis karghalica* (Moore, 1878), *Orgyia definita* (Packard, 1865), *O. leucostigma* (Smith, 1797), Gelechiidae: *Anarsia lineatella* (Zeller, 1839), *Caryocolum amaurella* (Hering, 1924), Geometridae: *Bupalus piniarius* (Linnaeus, 1758), *Cyclophora pendularia* (Hufnagel, 1767), *C. punctaria* (Linnaeus 1758), *C. quercimontaria* (Bastelberger 1897), *Dyscia conspersaria* (Denis & Schiffermuller, 1775), *Eupithecia pimpinellata* (Hubner, 1813), *Hylaea fasciaria* (Linnaeus 1758), Lasiocampidae: *Selenephera lobulina* (Schiffermuller, 1775), Noctuidae: *Agrotis segetum* (Denis & Schiffermuller, 1775), *Heliothis viriplaca* (Hufnagel, 1766), *Helicoverpa armigera* (Hubner, 1808), *H. zea* (Boddie, 1850), *Spodoptera exigua* (Hubner, 1808), Notodontidae: *Cerura menciana* (Moore, 1877), *C. vinula* (Linnaeus, 1758), *Harpyia hermelina* (Goeze, 1781), Psychidae: *Megalophanes viciella* (Denis & Schiffermuller, 1775), Tortricidae: *Apotomis sororculana* (Zetterstedt, 1839).

Aleiodes (Aleiodes) seriatus (Herrich-Schäffer, 1838)

Rogas seriatus Herrich-Schäffer, 1838

Aleiodes (Aleiodes) seriatus: Farahani et al. 2015.

Synonym: *Aleiodes vittige. Rogas kuslitkyi.*

Material examined: Bitlis-Rahva, Üçyol, (38°29'18.11"N, 42°11'07.00"E), 1795 m, 12.8.2019, 1♀,1♂; Eren üniversitesi tesisteleri, (38°29'18.11”N, 42°11'07.00"E), 1795 m, 17.9.2015, 1♂; Tatlı kaynak köyü, (38°21'59.28”N, 42°04'10.66"E), 1502

m,14.10.2018, 1♀; Vani-Gevaş, Değirtaş, (38°17'52.05”N, 43°06'20.12"E), 1687 m, 30.9.2017, 1♂.

Distribution: Oriental, Palaearctic.

Host: Lepidoptera, Noctuidae: *Atolmis rubricollis* Linnaeus, 1758, *Orthosia gracilis* (Denis & Schiffermuller, 1775).

Aleiodes (Aleiodes) signatus (Nees, 1811)

Braccon signatus (Nees, 1811)

Aleiodes (Aleiodes) signatus: Papp 2012.

Synonym: *Aleiodes esseni, Rhogas cassinielloi, Rhogas dubius,Rogas alternator, Rogas annulipes, Rogas balteatus,Rogas geniculator.*

Material examined: Bitlis-Tatvan, Küçüksu, mezarlık, (38°25'21.73”N, 42°19'27.11"E), 2219 m, 9.8..202014, 4♀; Tatvan, Nemrut kalderası, Büyük göl, (38°38'38.58”N, 42° 4'15.48"E), 2259 m,13.9.2014, 4♀; Tatvan Kuşlu mezra (38°45'27"N, 42°18'40"E), 1654 m, 13.9.2014,4♀.

Distribution: Palaearctic.

Host: Lepidoptera, Arctiidae: *Arctia caja* (Linnaeus, 1758), *Coscinia cribraria* (Linnaeus, 1758), *Epicallia villica* (Linnaeus, 1758), *Ocnogyna baetica* (Rambur, 1837), Erebidae: *Euproctis chrysorrhoea* (Linnaeus, 1758), *E.similis* (Fuessly, 1775), *Gynaephora selenitica* (Esper, 1789), *Orgyia antiqua* (Linnaeus, 1758), *O. aurolimbata* (Guenee, 1835), Lasiocampidae: *Euthrix potatoria* (Linnaeus, 1758), Noctuidae: *Acronicta psi* (Linnaeus, 1758), *A. rumicis* (Linnaeus, 1758), *Autographa gamma* (Linnaeus, 1758), *Noctua fimbriata* (Schreber, 1759), *N. pronuba* (Linnaeus, 1758), Notodontidae: *Taumetopoea pityocampa* (Denis & Schiffermuller, 1775), *T. processionea* (Linnaeus, 1758), Tortricidae: *Spilonota ocellana* (Denis & Schiffermuller, 1775).

Aleiodes (Aleiodes) varius (Herrich-Schäffer, 1838)

Rogas varius Herrich-Schäffer, 1838

Aleiodes (Aleiodes) varius: Belokobylskij ve Taeger 2003.

Synonym: *Aleiodes procerus*.

Material examined: Ardahan-Bilbilan Yaylası, (41°4'19”N, 42°21'13”E), 2965 m, 15.9.2012, 1♀.

Distribution: Palaearctic.

Host: Unknown.

Subgenus: ***Chelonorhogas*** Enderlein, 1912

Aleiodes (***Chelonorhogas***) ***dimidiatus*** (Spinola, 1808)

Bracon dimidiatus Spinola, 1808

Aleiodes (*Chelonorhogas*) *dimidiatus*: Papp 2008.

Synonym: *Aleiodes brevicornis, Aleiodes nigripalpis, Rogas alpinus, Rogas ruficornis.*

Material examined: Bingöl-Salköy, (38°53'7.6704"N, 40°29'47.8464" E) 1757 m, 29.7.2016, 1♀, 1♂; Muş-Mercimek Kale, (38°56'11”N, 41°30'27”E), 1263 m, 13.7.2013, 1♂.

Distribution: Western Palaearctic, Oriental.

Host: Lepidoptera, Chloropidae: *Lipara lucens* Meigen, 1830, Erebidae: *Diacrisia russula* (Linnaeus, 1758), *D. sannio* (Linnaeus, 1758), *Orgyia dubia* (Tauscher, 1806),

Palearctia gratiosa (Grum-Grshimailo, 1890), *Palearctia gratiosa rupicola* (Grum-Grshimailo, 1890), *Orgyia antiqua* (Linnaeus, 1758), Lasiocampidae : *Euthrix potatoria* (Linnaeus, 1758), *Lasiocampa quercus* (Linnaeus, 1758), *Macrothylacia rubi* (Linnaeus, 1758), Noctuidae: *Agrotis (Agrotis) ipsilon* (Hufnagel, 1766), *A. clavis* (Hufnagel, 1766), *A. exclamationis* (Linnaeus, 1758), *A. segetum* (Denis & Schiffermuller, 1775), *A. vestigialis* (Hufnagel, 1766), *Apamea anceps* (Denis & Schiffermüller, 1775), *Arctia caja* (Linnaeus, 1758), *Caradrina (Caradrina) morpheus* (Hufnagel, 1766), *Cerapteryx graminis* (Linnaeus, 1758), *Cladius pectinicornis* (Geoffroy, 1785), *Cosmia subtilis* Staudinger 1888, *Euxoa sibirica* (Boisduval, 1837), *E. temera* (Hubner, 1808), *E. tritici* (Linnaeus, 1761), *Helicoverpa armigera* (Hübner, [1808]), *Helicoverpa zea* (Boddie, 1850) [*Gossypium hirsutum*], *Hoplodrina blanda* (Denis & Schiffermuller, 1775), *H. octogenaria* (Goeze, 1781), *Mythimna separata* (Walker, 1865), Thaumetopoeidae: *Thaumetopoea processionea* (Linnaeus, 1758).

Aleiodes (***Chelonorhogas***) ***ductor*** (Thunberg, 1822)
Ichneumon ductor Thunberg, 1822
Aleiodes (Chelonorhogas) ductor: Belokobylskij 2000.
Synonym: *Rhogas similis, Rogas bicolor, Rogas nobilis, Rogas reticulator.*

Material examined: Bingöl-Karlıova, Kalencik, (39°26'25”N, 41°03'27"E), 2.144 m, 26.9.2012, 1♂.
Distribution: Palaearctic.
Host: Lepidoptera, Lasiocampidae: *Anarta (Calocestra) trifolii* (Hufnagel, 1766), *Autographa gamma* (Linnaeus, 1758), *Euthrix potatoria* (Linnaeus, 1758), *Mamestra brassicae* (Linnaeus, 1758), Nymphalidae: *Brenthis ino* (Rottemburg, 1775), Sesiidae: *Synanthedon scoliaeformis* (Borkhausen, 1789).

Aleiodes (***Chelonorhogas***) ***miniatus*** (Herrich-Schäffer, 1838)
Rogas miniatus Herrich-Schäffer, 1838
Aleiodes (Chelonorhogas) miniatus: Belokobylskij 2000.
Synonym: *Aleiodes formosus, Rogas bicoloratus.*

Material examined: Kars-Sarıkamış, (40°15'03”N, 42°39'11”E), 2016 m, 23.6.2019, 1♀.
Distribution: Palaearctic.
Host: Unknown.

Subgenus: ***Neorhogas*** Szépligeti, 1906

Aleiodes (***Neorhogas***) ***caucasicus*** (Tobias, 1976)
Rogas (Rogas) caucasicus Tobias, 1976
Aleiodes (Neorhogas) caucasicus: Papp 1985.

Material examined: Afyon-Dinar, Kazanpınar, (38°4'0.83" N, 30°10'7.68"E), 1.101 m, 28.6.1998, 1 ♀
Distribution: Western Palaearctic.
Host: Unknown.

Aleiodes (***Neorhogas***) ***dissector*** (Nees, 1834)
Rogas dissector (Nees, 1834)
Aleiodes (Neorhogas) dissector: Papp 1985.
Synonym: *Bracon rugulosus, Phylax aestivalis, Rhogas diversus*.

Material examined: Bingöl-Karlıova, Kalencik, (39°26'25”N, 41°03'27"E), 26.9.2012, 1♂; Bitlis-Tatvan Kuşlu mezra (38°45'27"N, 42°18'40"E), 1654 m, 13.6.2015, 1♂.
Distribution: Palaearctic.
Host: Lepidoptera, Noctuidae: *Acronicta rumicis* (Linnaeus, 1758), *A. tridens* (Denis & Schiffermuller, 1775), *Orthosia incerta* (Hufnagel, 1766).

***Aleiodes** (**Neorhogas**) **fortipes** (Reinhard, 1863)
Rogas fortipes Reinhard, 1863
Aleiodes (Neorhogas) fortipes: Papp 1987.
Synonym: *Rhogas freyi*.

Material examined: Sivas-Gürün, Göbek .Ö. (38°43'09.43"N, 37°20'22.89"E), 1289 m, 14.5.2018, 3♂.
Distribution: Western Palaearctic.
Host: Unknown.
This species is the first record for the fauna of Turkey.

Subgenus: ***Tetrasphaeropyx*** Ashmead, 1889

***Aleiodes** (**Tetrasphaeropyx**) **arcticus** (Thomson, 1892)
Rogas arcticus Thomson, 1892
Aleiodes (Tetrasphaeropyx) arcticus: Fortier 2009.
Synonym: *Rhogas reticulatus*.

Material examined: Bingöl-Ilıcalar, (38°58'50.96”N, 40°40'42.98"E), 1250 m, 26.9.2012, 1♂; Sancak, (39°5'38.35”N, 40°23'7.25"E), 1590 m, 5.7.2012, 1♀, 1♂; Bingöl-Solhan, Çavuşlar, (38°56'1.48"N, 40°45'23.99"E). 1560 m, 26.9.2012, 5♀; Bitkis-Ağaçlı Köy, (38°10'34.49”N, 42°23'29.92"E), 1267 m, 14.10.2018, 1♀; Tatlı kaynak köyü, (38°21'59.28”N, 42°04'10.66"E), 1502 m,14.10.2018, 2♂; Tatvan, Güntepe, (38°21'58.80”N, 42°37'40.69"E), 1710 m, 30.9.2017, 9♀; Tatvan, Küçüksu, mezarlık, (38°25'21.73”N, 42°19'27.11"E), 2219 m, 13.6.2015, 6♀, 31♂; Tatvan, Mezra, (38°45'27’‘N, 42°18'40"E), 1654 m, 13.6.2015, 3♀; Tatvan, Nemrut kalderası, Küçük göl, (38°38'38.58”N, 42°14'15.48"E), 2259 m,13.6.2015, 1♀; Ahlat, Ovakışla, Gören Köyü, (8°49'19"N, 42°19'36"E).1831 m, 23.9.2017, 1♀; Muş- Bulanık,Güllüova Köyü, (39°03'34”N, 42°20'01"E), 1554 m, 23.9.2017, 2♀; Van-Gevaş, Değirtaş, (38°17'52.05”N, 43°06'20.12"E), 1687 m, 30.9.2017, 5♀.
Distribution: Palaearctic.
Host: Lepidoptera, Arctiidae: *Arctia caja* (Linnaeus, 1758), Geometridae: *Itame wauaria* (Linnaeus, 1758), *Macaria brunneata* (Thunberg, 1784), *M. fusca* (Thunberg, 1792).

Discussion

The collected adult specimens were identified. In total, 20 species belonging 1 genus and 4 subgenera were determined. The distribution of the species by subgenera are as follows. *Aleiodes* s. str.: 13, *Chelonorhogas*: 3 *Neorhogas*: 3; *Tetrasphaeropyx*: 1. All species identified are new records for the fauna of the researched area. *Aleiodes (Aleiodes) arnoldii*, *A.(A.) modestus* and *Aleiodes (Neorhogas) fortipes* are the first records for the fauna of Turkey (Table 1 and Fig. 2).

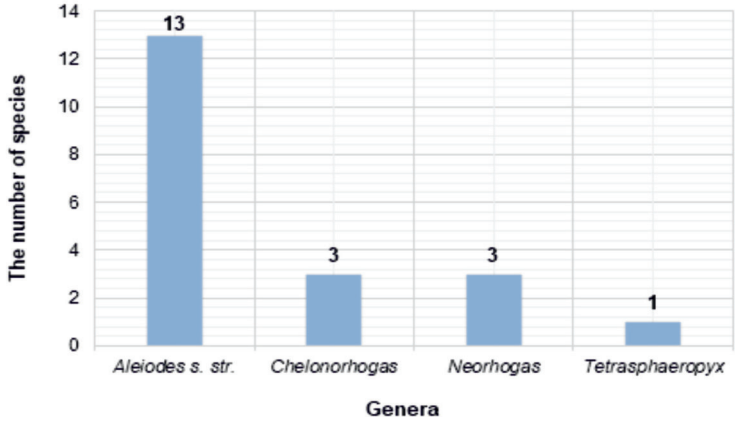

Fig. 2. Genera and their species numbers

A. (A.) bicolor and *A. (A.) circumscriptus* are the most common species in the area researched and each were recorded from the 16 localities. *A. (A.) circumscriptus* was recorded from 42 localities and attack 42 pest species of Arctiidae, Erebidae, Gelechiidae, Noctuidae, Pterophoridae, Pyralidae and Tortricidae families of Lepidoptera. *A. (A.) bicolor* was recorded from 34 localities. It attacks 28 pest species of families Crambidae, Erebidae, Geometridae, Lycaenidae, Noctuidae, Nymphalidae, Pterophoridae and Zygaenidae of Lepidoptera (Yu et al. 2016).

A. (A.) pallidator is common in Neotropic, Nearctic and Palaearctic regions, covering 66 countries. It was imported and placed in Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Washington of USA for biocontrol of agricultural pests (Bartlett et al. 1978). This species can be used in the biocontrol of *Thaumetopoea pityocampa*. Adequate basic research has not been done on species of Rogadinae. The hosts of 6 of the identified species are still unknown (Table 1).

The distribution of the identified species according to zoogeographical regions are as follows: Palaearctic: 12; Holarctic and Neotropic: 3; Oriental and Palaearctic: 3. (Table 1).

A. (A.) signatus is distributed in Palaearctic region. It uses 18 plant pest species of the subfamilies Arctiidae, Erebidae, Lasiocampidae, Noctuidae, Notodontidae and Tortricidae of the order Lepidoptera as hosts. *Thaumetopoea pityocampa*, one of these species, causes significant damage in our pine forests, especially in the Mediterranean, Aegean and Marmara regions (Ipekdal & Çağlar 2019). *A.(A) signatus*, the parasitoid of the pine moth, can be used in the biocontrol of this pest. Plant pests can be used against harmful biological control applied in the same in Turkey. The hosts of *A. (A.) arnoldii, A. (A.) moldavicus, A. (A.) varius, A. (C.) miniatus, A.(N.) caucasicus* and *A. (N.) fortipes* are unknown. The biology of these species should also be studied.

Table 1. Localities and number of host species, host families and zoogeographic distribution of the species

Recorcded species	Number of locaties there the species was collected	Number of the host	Host families	Distribution zoogeography of species
Aleiodes (Aleiodes) albitibia	1	42	Arctiidae, Erebidae,Gelechiidae. Geometridae, Noctuidae, Pterophoridae, Pyralidae, Tortricidae	Holarctic, Neotropic
A. (A.) arnoldii	1		—	Palaearctic
A. (A.) bicolor	16	28	Crambidae, Erebidaee, Geometridae, Lycaenidae, Noctuidae, Nymphalidae, Pterophoridae, Zygaenidae	Palaearctic
A. (A.) circumscriptus	16	42	Arctiidae, Erebidae, Gelechiidae,Geometridae, Noctuidae, Pyralidae, Tortricidae	Palaearctic
A. (A.) esenbeckii	2	10	Endromidae,Lasiocampidae, Zygaenidae	Oriental, Palaearctic
A. (A.) gastritor	2	40	Crambidae, Drepanidae, Elachistidae, Geometridae, Lasiocampidae, Notodontidae, Yponomeutidae	Hoarctic, Neotropic
A. (A.) modestus	1	9	Geometridae	Palaearctic
A. (A.) moldavicus	2	—	—	Western Palaearctic
A. (A.) nocturnus	1	6	Erebidae	Palaearctic
A. (A.) pallidator	1	23	Arctiidae, Erebidae, Gelechiidae, Noctuidae, Pterophoridae, Pyralidae, Tortricidae	Holarctic, Neotropic
A. (A.) seriatus	3	1	Noctuidae	Oriental, Palaearctic
A. (A.) signatus	3	18	Arctiidae, Erebidae, Lasiocampidae Noctuidae	Palaearctic
A. (A.) varius	1	–	—	Palaearctic
Aleiodes (Chelonorhogas) dimidiatus	2	31	Chloropidae, Erebidae, Lasiocampidae, Noctuidae, Thaumetopoeidae	Western Palaearctic, Oriental
A. (C.) ductor	2	6	Lasiocampidae	Palaearctic
A. (C.) miniatus	1	–	—	Palaearctic
Aleiodes (Neorhogas) caucasicus	1	–	—	Western Palaearctic
A. (N.) dissector	2	1	Noctuidae	Palaearctic
A. (N.) fortipes	1	–	—	Western Palaearctic
Aleiodes (Tetrasphaeropyx) arcticus	11	4	Arctiidae, Geometridae	Palaearctic

References

Aydogdu, M. & Beyarslan, A. 2005: The first records of Aleiodes Wesmael 1838 (Hymenoptera: Braconidae: Rogadinae). The fauna of Thrace region of Turkey. - Linzer biologische Beiträge 37: 185-193.

Aydogdu, M. & Beyarslan, A. 2006: First records of Aleiodes Wesmael, 1838 species in East Marmara Region of Turkey (Hymenoptera: Braconidae: Rogadianae). - Acta Entomologica Slovenica14: 81-88.

Bartlett, B.R., Clausen, C.P., Debach, P., Goeden, R.D., Legner,.E.F., Mcmurtry, J.A. & Oatman, E.R. 1978: Introduced parasites and predators of arthropod pests and weeds: A world review. - Agricultural Research Service. United States Department of Agriculture. Agriculture Handbook No.480. 545 pp.

Belokobylskij, S.A.1996: Contribution to the knowledge of Braconid fauna of the subfamily Rogadinae (Hymenoptea: Braconidae) of Russian far east and eastern Siberia. Part 2. - Far Eastern Entomologist 28: 13-36.

Belokobylskij, S.A. 2000: Key to insects of the Russian Far East Neuropteroidea, Mecoptera, Hymenoptera. Vol. 4. - P.A.L. Vladivostok: Dal'nauka; 2000. Fam Braconidae. Subfam. Rogadinae, pt. 4; pp. 15-109.

Beyarslan, A. 2015: Taxonomic survey on the Rogadinae Förster, 1862 (Hymenoptera, Braconidae) in the northeastern Anatolian region, Turkey. - Turkish Journal of Zoology 39: 811-819.

Beyarslan, A., Inanc, F., Cetin, O. & Aydoğdu, M. 2002: Braconidae species of the Turkish Aegean region. In: Melika G, Thuroczy C, editors. Parasitic Wasps: Evolution, Systematics, Biodiversity and Biological Control. International Symposium: Parasitic Hymenoptera: Taxonomy and Biological Control; 14–17 May 2001; Kőszeg, Hungary. Budapest: Agroinform, pp. 285-290.

Butcher, B.A., Smith, M.A., Sharkey, M.J. &, Quicke. D.L. 2012: A turbotaxonomic study of Thai Aleiodes (Aleiodes) and Aleiodes (Arcaleiodes) (Hymenoptera: Braconidae: Rogadinae) Based largely on COI barcoded specimens, with rapid descriptions of 179 new species. - Zootaxa 3457: 1-232.

Çiplak, B. 2003: Distribution of Tettigoniinae (Orthoptera, Tettigoniidae) bush-crickets in Turkey: the importance of the Anatolian Taurus Mountains in biodiversity and implications for conservation. - Biodiversity and Conservation 12: 47-64.

Jasso-Martinez, J.M., Quicke, D.L.J., Belokobylskij, S.A., Meza-Lázaror.N. & Zaldivar-Riveró, A. 2020: Phylogenomics of the lepidopteran endoparasitoid wasp subfamily Rogadinae (Hymenoptera: Braconidae) and related subfamilies. - Systematic Entomology, (2021) 46. 83-95. https://doi.org/10.1111/syen.12449

Ipekdal K. & Çağlar S.S. 2019: Thaumetopoea pityocampa ve T. wilkinsoni'nin Türkiye'deki Yayılışının ve melezleşmesinin Moleküler Yöntemlerle Araştırılması. Türkiye I. - Orman Entomolojisi ve Patolojisi Sempozyumu 23-25 Kasım 2011/Antalya

Marsh, P.M. & Shaw S.R. 2003: Revision of North American Aleiodes Wesmael (Part 7): the compressor Herrich-Schaeffer, ufei (Walley), gressetti (Muesebeck), and procerus (Wesmael) species-groups (Hymenoptera: Braconidae: Rogadinae). - Proceedings of the Entomological Society of Washington 105: 698-707.

Quicke, D.L.J., Mori, M., Zaldivar-Ríveron, A., Laurenne, N.M. & Shaw, M.R. 2006: Suspended mummies in Aleiodes species (Hymenoptera: Braconidae: Rogadinae) with descriptions of six new species from western Uganda based largely on DNA sequence data. - Journal of Natural History 40: 2663-2680. https://doi.org/10.1080/00222930601121288

Papp J. 1985: Braconidae (Hymenoptera) from Greece. 2. - Annales Historico-Naturales Musei Nationalis Hungarici. 77:217-226.

Shaw, M.R. 1983: On[e] evolution of endoparasitism: the biology of some genera of Rogadinae (Braconidae). - Contributions of the American Entomological Institute 20: 307-328.

Shaw, M.R. 2002: Host ranges of Aleiodes species (Hymenoptera: Braconidae), and an evolutionary hypothesis. In: Melika G, Thuroczy C, editors. Parasitic Wasps: Evolution, Systematics, Biodiversity and Biological Control. - International Symposium: Parasitic Hymenoptera: Taxonomy and Biological Control; 14–17 May 2001; Kőszeg, Hungary. Budapest: Agroinform, pp. 321-327.

Shaw, M.R. 2006: Aleiodes wasps of eastern forests: a guide to parasitoids and associated mummified caterpillars. - Forest Health Technology Enterprise Team, Technology Transfer Series. Washington, DC, USA: USDA, 2006.

Shaw, M.R. & Huddleston, T. 1991: Classification and Biology of Braconid Wasps (Hymenoptera: Braconidae). - Handbooks for the Identification of British Insects, Vol. 7, Part 11. London,UK: Royal Entomology Society of London.

SHAW, M.R., MARSH, P.M. & FORTIER, J.C. 1997: Revision of North American Aleiodes Wesmael (Part 1): the pulchripes Wesmael species-group in the New World (Hymenoptera: Braconidae: Rogadinae). - Journal of Hymenoptera Research 6: 10-35. DOI:10.5962/BHL.PART.28126

SHAW, M.R., MARSH, P.M. & FORTIER, J.C. 2006: Revision of North American Aleiodes Wesmael (Part 8): the coxalis Spinola species-group (Hymenoptera: Braconidae: Rogadinae). - Zootaxa 1314: 1-30.

SHIMBORI, E.M. & SHAW, S.R. 2014: Twenty-four new species of Aleiodes Wesmael from the eastern Andes of Ecuador with associated biological information (Hymenoptera, Braconidae, Rogadinae). - Zookeys, 405: 1-81. doi: http://dx.doi.org/10.3897/zookeys.405.7402.

SHIMBORI, E.M., PENTEADO-DIAS, A. & SHAW, S.R. 2015: A revision of the New World species of the Aleiodes compressor species-group (Hymenoptera: Braconidae: Rogadinae). - The Canadian Entomologist, 147:665-673. doi: http://dx.doi. org/10.4039/tce.2015.9.

SHIMBORI, E.M., SHAW, S.R., ALMEIDA, L.F.V. & PENTEADO-DIAS, A.M. 2016: Eleven new species of Athacryvac Braet & van Achterberg from the Neotropical Region (Hymenoptera, Braconidae, Rogadinae). - Zootaxa 4138(1): 83-117. doi: http:// dx.doi.org/10.11646/zootaxa.4138.1.3

STEINER, P. 1936: Beiträge zur Kenntnis der Schädlingsfauna Kleinasiens. III. Laphygma exigua Hb., ein Großschädling der Zuckerrübe in Anatolien. - Zeitschrift für Angewandte Entomologie. 23:177-222.

SULCA, L., SHIMBORI E.M. & SHAW, S.R. 2017: Four new species of the Aleiodes compressor Herrich-Schäffer species-group (Hymenoptera: Braconidae: Rogadinae) from South America. - Revista peruana de biología 23(3): 227-236. DOI: 10.15381/rpb.v23i3.12857

TOBIAS, V.I. 1986: Subfamily Braconinae. In: MEDVEDEV G.S, editor. Keys to the Insects of the European Part of the USSR. Vol. 3. Hymenoptera. Part 4. Leningrad, USSR: Nauka, pp. 156-254.

TOWNSEND, A.C. & SHAW, S.R. 2009: Nine new species of Aleiodes Wesmael reared at Yanayacu Biological Station (Hymenoptera: Braconidae: Rogadinae) in eastern Ecuador. - Journal of Insect Science, 9: 1-37. doi: http://dx.doi. org/10.1673/031.009.3701

VAN ACHTERBERG, C. 1985: The Aleiodes dispar-group of the Palaearctic region (Hymenoptera: Braconidae: Rogadinae). - Zoologische Verhandelingen Leiden 59: 178-187.

VAN ACHTERBERG, C. 1991: Revision of the genera of the Afrotropical and W. Palaearctic Rogadinae Foerster (Hymenoptera: Braconidae). - Zoologische Verhandelingen Leiden 273: 1–102.

VAN ACHTERBERG, C. 1993: Illustrated key to the subfamilies of the Braconidae (Hymenoptera: Ichneumonoidea). - Zoologische Verhandelingen Leiden 283: 1-189.

VAN ACHTERBERG, C. & POLASZEK, A. 1996: The parasites of cereal stem borers (Lepidoptera: Cossidae, Crambidae, Noctuidae, Pyralidae) in Africa, belonging to the family Braconidae (Hymenoptera: Ichneumonoidea). - Zoologische Verhandelingen Leiden 304: 123.

YU, D.S., VAN ACHTERBERG, C. & HORSTMANN, K. 2016: World Ichneumonoidea 2004. Taxonomy, Biology, Morphology and Distribution (Braconidae). - Taxapad 2005 (Scientific Names for Information Management) Interactive Catalogue on DVD/CDROM. Vancouver, Canada.

ZALDIVAR–RÍVERON, A., SHAW, M.R., SAEZ, A.G. MORI, M., BELOKOBYLSKIJ, S.A. & SHAW, S.R. 2008: Evolution of the parasitic wasp subfamily Rogadinae (Braconidae): phylogeny and evolution of lepidopteran host ranges and mummy characteristics. - BMC Evolutionary Biology, 8: 1-20. doi: http://dx.doi. org/10.1186/1471- 2148-8-329.