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Sawflies from Yeşilırmak Delta, Samsun province, Türkiye (Hymenoptera: Symphyta)

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Can, I. & Haris, A. 2025: *Sawflies from Yeşilırmak Delta, Samsun province, Türkiye (Hymenoptera, Symphyta). - Natura Somogyienis 45: 99-114.*
Abstract: A total of 54 species have been recorded from the Yeşilırmak Delta in Samsun province. *Allantus melanarius* (Klug, 1818), *Pteronidea glutinosae* (Cameron, 1882) and *Calameuta antigae* (Konow, 1894) are represent new records for the Turkish fauna.

Keywords: sawflies, faunistics, new records

Introduction

The study of Türkiye's sawfly fauna began relatively late. The earliest expedition to Anatolia that led to the collection of sawflies was conducted in 1846 by Imre Frivaldszky and János Frivaldszky, Hungarian zoologists and botanists.

Later, Robert Benson made significant contributions to sawfly research, with his work published posthumously by the trustees of the former British Museum of Natural History (now The Natural History Museum, London) (Benson 1968). The investigations initiated by Hungarian, German, Russian, English, and French specialists were subsequently continued by Turkish scientists, including Önder Çalmaşur, Hikmet Özbek, Hasan Başıbüyük, Çetin Mutlu, and Sevda H. Örgen (Çalmaşur & Özbek, 2004a,b, 2006; Çalmaşur 2006, 2019, 2020, Örgen & Başıbüyük 2006, Mutlu 2019).

More recently, our team has undertaken research on Anatolia's sawfly fauna, focusing on the Bingöl and Diyarbakır provinces (Kaplan et al. 2018, Kaplan & Haris 2021, 2022, Kaplan et al. 2024). According to current estimates, the number of recorded Symphyta species in Türkiye stands at 370, based on assessments by Çalmaşur (2006, 2019, 2020).

Among the three biogeographic regions of Türkiye, this study area belongs to the Black Sea (Pontic) Biogeographic Region (Fig. 1), which remains poorly investigated (EEA, 2025).

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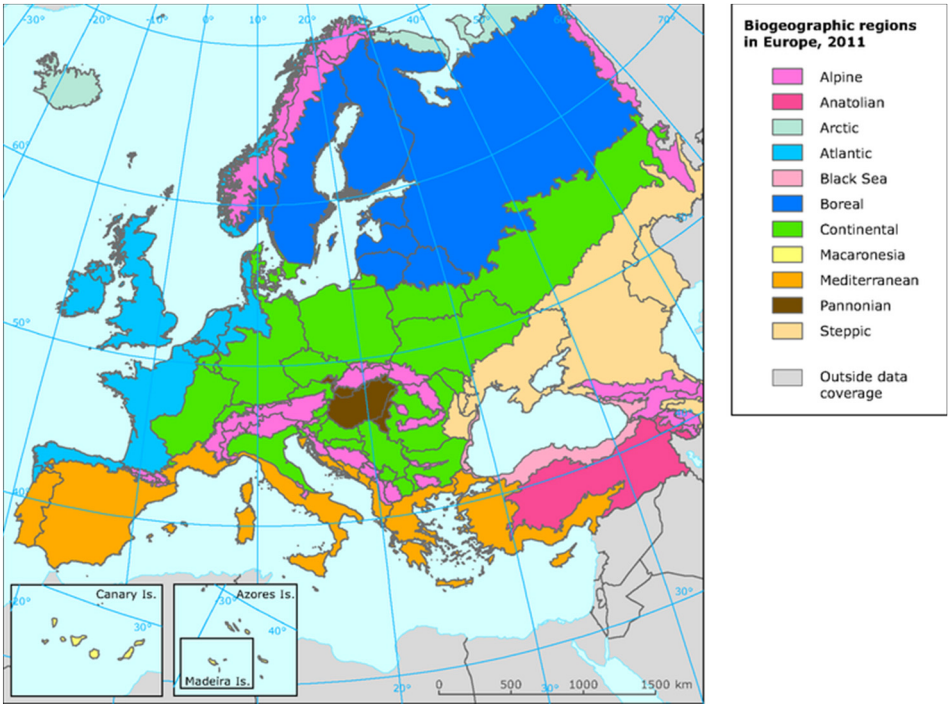

Fig. 1: Biogeographic regions of Europe and Asia Minor

Material and methods

This research was conducted between 2022 and 2023 with the objective of cataloging the wasp fauna (Hymenoptera) in the Yeşilırmak Delta, located in Samsun Province, Türkiye (Fig. 2).

Specimens were primarily collected using Malaise traps (deployed at three locations) and insect nets (used at multiple sites) throughout the Yeşilırmak Delta in northern Türkiye. The collected specimens were preserved in 75% ethanol and submitted to the second author for identification.

The Malaise traps were set up in three different habitat types:

Forest: Tree covered meadow. The Malaise trap was placed in a meadow adjacent to a wooded area. *Alnus* (Alder) is the dominant tree species. The surrounding area also includes habitats with pine and poplar trees (Figs. 3, 4 and 5).

Mixed vegetation: Malaise traps were placed among apple and peach trees. Other plant species in this locality include *Helianthus* sp., *Phaseolus* sp., *Daucus* sp., *Allium* sp., *Fragaria* sp., *Morus* sp., and *Zea* sp.

Corylus Garden: The primary vegetation in this area consists of hazelnut trees (*Corylus*), alongside cultivated poplar trees. Additionally, villagers grow various vegetables such as lettuce, eggplant, tomatoes, peppers, beans, and cucumbers near their homes.

For species identification, we consulted the comprehensive works of ZHELOCHOVTSEV (1988), LACOURT (2020), MACEK et al. (2020), GUSSAKOVSKIJ (1935, 1947) and BENSON

Fig. 2: Map of sampling sites

(1968), complemented by the latest monograph of Prous et al. (2021). For information on the distribution of the species and host plant records, the monographs and books by Sundukov (2017), Lacourt (2020), Macek (2020), Benson (1968), along with numerous other papers on the Turkish fauna, were studied.

Fig. 3: Areal view of Terme, Amazon Nature Park

List of localities

1. Çarşamba, Hacıbeyli, 41°12'43.2"N, 36°44'07.7"E, 09. 04. 2022, insect net, mixed vegetation
2. Çarşamba, Hacıbeyli, 41°12'43.2"N, 36°44'07.7"E, 17. 04. 2022, insect net, mixed vegetation
3. Çarşamba, Hacıbeyli, 41°12'43.2"N, 36°44'07.7"E, 06. 06. 2022, insect net, mixed vegetation
4. Çarşamba, Hacıbeyli, 41°12'43.2"N, 36°44'07.7"E, 17. 04. - 01. 05. 2022, Malaise trap, mixed vegetation
5. Çarşamba, Hacıbeyli, 41°12'43.2"N, 36°44'07.7"E, 01. 05. - 14. 05. 2022, Malaise trap, mixed vegetation
6. Terme, Geçmiş,41°15'57"N 36°50'43"E, 15. 05. 2022, insect net, Corylus garden
7. Çarşamba, Hacıbeyli, 41°12'43.2"N, 36°44'07.7"E, 14. 05. - 05. 06. 2022, Malaise trap, mixed vegetation
8. Çarşamba, Hacıbeyli, 41°12'43.2"N, 36°44'07.7"E, 05. 06. 2022, insect net, mixed vegetation
9. Çarşamba, Hacıbeyli, 41°12'43.2"N, 36°44'07.7"E, 05. 06 - 05. 07. 2022, Malaise trap, mixed vegetation
10. Çarşamba, Hacıbeyli, 41°12'43.2"N, 36°44'07.7"E, 11. 07. 2022, insect net, mixed vegetation
11. Çarşamba, Hacıbeyli, 41°12'43.2"N, 36°44'07.7"E, 14. 07. 2022, insect net, mixed vegetation
12. Çarşamba, Hacıbeyli, 41°12'43.2"N, 36°44'07.7"E, 15. 07. - 19. 08. 2022, Malaise trap, mixed vegetation
13. Çarşamba, Hacıbeyli, 41°12'43.2"N, 36°44'07.7"E, 19. 08. - 03. 09. 2022, Malaise trap, mixed vegetation
14. Çarşamba, Hacıbeyli, 41°12'43.2"N, 36°44'07.7"E, 03. 09. - 16. 09. 2022, Malaise trap, mixed vegetation
15. Çarşamba, Hacıbeyli, 41°12'43.2"N, 36°44'07.7"E, 16. 09. - 22. 10. 2022, Malaise trap, mixed vegetation
16. Çarşamba, Hacıbeyli, 41°12'43.2"N, 36°44'07.7"E,10. 03. - 10. 04. 2023, Malaise trap, mixed vegetation
17. Terme, Amazon Nature Park, 41°15'48.9"N 36°59'14. 0"E, 08. 04. - 30. 04. 2023, Malaise trap, forest
18. Terme, Geçmiş, 41°15'57"N 36°50'43"E,08. 04. - 30. 04. 2023,Malaise trap, Corylus garden
19. Çarşamba, Hacıbeyli, 41°12'43.2"N, 36°44'07.7"E, 10. 04. - 30. 04. 2023, Malaise trap, mixed vegetation
20. Terme, Amazon Nature Park, 41°15'48.9"N 36°59'14. 0"E, 30. 04. - 28. 05. 2023, Malaise trap, forest21. Terme, Geçmiş, 41°15'57"N 36°50'43"E, 30. 04. - 28. 05. 2023,Malaise trap, Corylus garden
22. Çarşamba, Hacıbeyli, 41°12'43.2"N, 36°44'07.7"E, 30. 04. - 28. 05. 2023, Malaise trap, mixed vegetation
23. Çarşamba, Hacıbeyli, 41°12'43.2"N, 36°44'07.7"E, 28. 05. - 19. 06. 2023, Malaise trap, mixed vegetation
24. Terme, Amazon Nature Park, 41°15'48.9"N 36°59'14. 0"E, 28. 05. - 11. 07. 2023, Malaise trap. forest
25. Terme, Geçmiş, 41°15'57"N 36°50'43"E, 28. 05. - 11. 07. 2023, Malaise trap, Corylus garden
26. Terme, Amazon Nature Park, 41°15'48.9"N 36°59'14. 0"E, 11. 07. - 30. 07. 2023, Malaise trap, mixed vegetation
27. Terme, Geçmiş, 41°15'57"N 36°50'43"E,11. 07. - 30. 07. 2023,Malaise trap, Corylus garden
28. Çarşamba, Hacıbeyli, 41°12'43.2"N, 36°44'07.7"E, 11. 07. - 30. 07. 2023, Malaise trap, mixed vegetation
29. Çarşamba, Hacıbeyli, 41°12'43.2"N, 36°44'07.7"E, 30. 07. - 25. 08. 2023, Malaise trap, mixed vegetation
30. Terme, Amazon Nature Park, 41°15'48.9"N 36°59'14. 0"E, 30. 07. - 25. 08. 2023, Malaise trap, forest
31. Terme, Geçmiş, 41°15'57"N 36°50'43"E,30. 07. - 25. 08. 2023,Malaise trap, Corylus garden
32. Çarşamba, Hacıbeyli, 41°12'43.2"N, 36°44'07.7"E, 25. 08. - 25. 09. 2023, Malaise trap, mixed vegetation

Results

List of species

Argidae

Arge melanochra (Gmelin, 1790): Çarşamba, Hacıbeyli, 30. 04. - 28. 05. 2023, mixed vegetation, 1 female. Frequent. Hostplant: *Crataegus oxycantha*.

Arge ochropus (Gmelin, 1790): Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 1 female; Terme, Amazon Nature Park, 30. 04. - 28. 05. 2023, forest, 1 female, 2 males. Pest of *Rosa* spp. Frequent.

Tenthredinidae

Dolerus (*Oncodolerus*) *eversmanni* W.F. Kirby, 1882: Çarşamba, Hacıbeyli, 30. 04. - 28. 05. 2023, mixed vegetation, 1 female, 1 male; Terme, Amazon Nature Park, 11. 07. - 30. 07. 2023, mixed vegetation, 3 females; Çarşamba, Hacıbeyli, 17. 04. - 01. 05. 2022,

Fig. 4: Seashore, Terme, Amazon Nature Park

Fig. 5: Vegetation in Terme, Amazon Nature Park

mixed vegetation, 1 female; Çarşamba, Hacıbeyli, 01. 05. - 14. 05. 2022, mixed vegetation, 4 females; Çarşamba, Hacıbeyli, 10. 03. - 10. 04. 2023, mixed vegetation, 3 males. Frequent. Larva on *Equisetum arvense* and *E. palustre*.

Dolerus (*Poodolerus*) *haematodes* (Schrank, 1781): Çarşamba, Hacıbeyli, 17. 04. 2022. mixed vegetation, 1 male. Frequent. Larva on *Juncus, Scirpus, Carex* and *Gramineae*.

Dolerus (*Dicrodolerus*) *vestigialis* ssp. *vestigialis* (Klug, 1818): Çarşamba, Hacıbeyli, 30. 04. - 28. 05. 2023, mixed vegetation, 1 female; Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 1 female, 1 male; Terme, Geçmiş, 15. 05. 2022, Corylus garden, 1 female; Çarşamba, Hacıbeyli, 10. 03. - 10. 04. 2023, mixed vegetation, 1 female; Terme, Geçmiş, 28. 05. - 11. 07. 2023, *Corylus* garden, 1 male. Common. Host plants: *Equisetum palustre, E. sylvaticum, E. arvense* and *E. pratense*.

Nesoselandria morio (Fabricius, 1781): Çarşamba, Hacıbeyli, 25. 08 - 25. 09. 2023, mixed vegetation, 10 females; Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 2 females; Terme, Amazon Nature Park, 30. 04. - 28. 05. 2023, forest, 5 females; Çarşamba, Hacıbeyli, 10. 04. - 30. 04. 2023, mixed vegetation, 2 females. 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*.

Selandria serva (Fabricius, 1793): Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 1 female; Terme, Amazon Nature Park, 30. 04. - 28. 05. 2023, forest, 1 female; Çarşamba, Hacıbeyli, 16. 09 - 22. 10. 2022, mixed vegetation, 1 female; Çarşamba, Hacıbeyli, 10. 04. - 30. 04. 2023, mixed vegetation, 1 female. Frequent. Host plants: Poaceae, *Carex* spp. and *Juncus* spp.

Allantus (*Emphytus*) *cinctus* (Linné, 1758): Çarşamba, Hacıbeyli, 25. 08 - 25. 09. 2023, mixed vegetation, 2 females, 13 males; Çarşamba, Hacıbeyli, 30. 04. - 28. 05. 2023, mixed vegetation, 1 female, 8 males; Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 3 female, 16 males; Terme, Amazon Nature Park, 30. 04. - 28. 05. 2023, forest, 2 females, 3 males; Terme, Amazon Nature Park, 11. 07. - 30. 07. 2023, mixed vegetation, 2 females; Terme, Amazon Nature Park, 11. 07. - 30. 07. 2023, mixed vegetation, 1 female, 7 males; Çarşamba, Hacıbeyli, 16. 09 - 22. 10. 2022, mixed vegetation, 5 males, 3 females; Çarşamba, Hacıbeyli, 10. 04. - 30. 04. 2023, mixed vegetation, 1 male, 1 female; Terme, Geçmiş, 30. 04 - 28 .05. 2023, Corylus garden, 3 females; Terme, Amazon Nature Park, 08. 04. - 30. 04. 2023, forest, 1 female, 1 male; Çarşamba, Hacıbeyli, 09. 04. 2022. mixed vegetation, 1 female; Çarşamba, Hacıbeyli, 17. 04. 2022. mixed vegetation, 1 male; Çarşamba, Hacıbeyli, 17. 04. - 01. 05. 2022, mixed vegetation, 1 female, 1 male; Çarşamba, Hacıbeyli, 01. 05. - 14. 05. 2022, mixed vegetation, 1 female; Çarşamba, Hacıbeyli, 11. 07. 2022. mixed vegetation, 1 female; Çarşamba, Hacıbeyli, 15. 07. - 19. 08. 2022, mixed vegetation, 2 males; Çarşamba, Hacıbeyli, 03. 09. - 16. 09. 2022, mixed vegetation, 3 males; Çarşamba, Hacıbeyli, 10. 03. - 10. 04. 2023, mixed vegetation, 1 male, 1 female; Terme, Geçmiş, 28. 05. - 11. 07. 2023, Corylus garden, 3 males. Common. Host plants: *Rosa* spp.

Allantus (*Emphytus*) *calceatus* (Klug, 1818): Çarşamba, Hacıbeyli, 25. 08 - 25. 09. 2023, mixed vegetation, 2 males; Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 2 females, 5 males; Terme, Amazon Nature Park, 30. 04. - 28. 05. 2023, forest, 2 females; Terme, Amazon Nature Park, 11. 07. - 30. 07. 2023, mixed vegetation, 1 male; Çarşamba, Hacıbeyli, 16. 09 - 22. 10. 2022, mixed vegetation, 1 female, 1 male; Çarşamba, Hacıbeyli, 17. 04. 2022. mixed vegetation, 2 males; Terme, Geçmiş, 15. 05. 2022, Corylus garden, 1 male; Çarşamba, Hacıbeyli, 14. 05. - 05. 06. 2022, mixed vegetation, 1 male; Çarşamba, Hacıbeyli, 05. 06. 2022, mixed vegetation, 3 males; Çarşamba, Hacıbeyli, 05. 06 - 05. 07. 2022, mixed vegetation, 1 male; Çarşamba, Hacıbeyli, 03. 09. - 16. 09. 2022, mixed vegetation, 1 male; Terme, Geçmiş, 28. 05. - 11. 07. 2023, Corylus garden, 1 male. Frequent. Host plants: *Rubus, Sanguisorba, Rosa, Filipendula, Fragaria* and *Alchemilla* spp.

Allantus (*Emphytus*) *melanarius* (Klug, 1818): Çarşamba, Hacıbeyli, 25. 08 - 25. 09. 2023, mixed vegetation, 1 female; Çarşamba, Hacıbeyli, 10. 04. - 30. 04. 2023, mixed vegetation, 1 female; Terme, Geçmiş, 15. 05. 2022, Corylus garden, 1 female; Çarşamba, Hacıbeyli, 05. 06. 2022, mixed vegetation, 1 female; Çarşamba, Hacıbeyli, 10. 03. - 10. 04. 2023, mixed vegetation, 1 female; Terme, Geçmiş, 28. 05. - 11. 07. 2023, Corylus garden, 1 female. Frequent. Host plant: *Cornus sanguinea*.

Allantus (*Allantus*) *viennensis* (Schrank, 1781): Çarşamba, Hacıbeyli, 10. 04. - 30. 04. 2023, mixed vegetation, 3 females. Host plants: *Rosa* spp. Sporadic.

Ametastegia (*Ametastegia*) *equiseti* (Fallén, 1808): Çarşamba, Hacıbeyli, 25. 08 - 25. 09. 2023, mixed vegetation, 2 females, 19 males; Çarşamba, Hacıbeyli, 30. 04. - 28. 05. 2023, mixed vegetation, 4 female, 36 males; Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 26 males; Terme, Amazon Nature Park, 30. 04. - 28. 05. 2023, forest, 2 females, 18 males; Terme, Amazon Nature Park, 11. 07. - 30. 07. 2023, mixed vegetation, 2 males; Terme, Amazon Nature Park, 11. 07. - 30. 07. 2023, mixed vegetation, 1 female, 6 males; Çarşamba, Hacıbeyli, 16. 09 - 22. 10. 2022, mixed vegetation, 19 males, 4 females; Çarşamba, Hacıbeyli, 10. 04. - 30. 04. 2023, mixed vegetation, 5 males; Çarşamba, Hacıbeyli, 30. 07 - 25. 08. 2023, mixed vegetation, 1 male; Çarşamba, Hacıbeyli, 17. 04. 2022. mixed vegetation, 1 male; Çarşamba, Hacıbeyli, 01. 05. - 14. 05. 2022, mixed vegetation, 3 males; Terme, Geçmiş, 15. 05. 2022, Corylus garden, 1 male; Çarşamba, Hacıbeyli, 03. 09. - 16. 09. 2022, mixed vegetation, 2 males, 2 females; Çarşamba, Hacıbeyli, 10. 03. - 10. 04. 2023, mixed vegetation, 1 male. Common. Larva on *Chenopodium album, Lythrum salicaria, Polygonum persicaria* and *Rumex acetosella*.

Ametastegia (*Protemphytus*) *carpini* (Hartig, 1837): Çarşamba, Hacıbeyli, 25. 08 - 25. 09. 2023, mixed vegetation, 7 females; Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 12 females, 16 males; Terme, Amazon Nature Park, 30. 04. - 28. 05. 2023, forest, 1 female, 2 males; Terme, Amazon Nature Park, 11. 07. - 30. 07. 2023, mixed vegetation, 1 female; Çarşamba, Hacıbeyli, 16. 09 - 22. 10. 2022, mixed vegetation, 2 males, 9 females; Çarşamba, Hacıbeyli, 11. 07 - 30. 07. 2023, mixed vegetation, 1 female. Frequent. Host plant: *Geranium* spp.

Ametastegia (*Ametastegia*) *glabrata* (Fallâén, 1808): Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 1 female; Terme, Amazon Nature Park, 11. 07. - 30. 07. 2023, mixed vegetation, 2 females; Çarşamba, Hacıbeyli, 05. 06 - 05. 07. 2022, mixed

vegetation, 1 female. Frequent. Larva on *Chenopodiaceae, Polygonaceae, Plantago*, *Salix, Lithrum, Ribes* and *Rubus* spp.

Ametastegia (*Protemphytus*) *pallipes* (Spinola, 1808): Çarşamba, Hacıbeyli, 25. 08 - 25. 09. 2023, mixed vegetation, 1 male; Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 1 female; Çarşamba, Hacıbeyli, 17. 04. 2022. mixed vegetation, 1 female; Çarşamba, Hacıbeyli, 05. 06. 2022, mixed vegetation, 1 female; Çarşamba, Hacıbeyli, 03. 09. - 16. 09. 2022, mixed vegetation, 3 females; Çarşamba, Hacıbeyli, 10. 03. - 10. 04. 2023, mixed vegetation, 1 female; Terme, Geçmiş, 28. 05. - 11. 07. 2023, Corylus garden, 1 female. Frequent. Host plants: *Viola* spp.

Ametastegia (*Protemphytus*) *tenera* (Fallén, 1808): Çarşamba, Hacıbeyli, 25. 08 - 25. 09. 2023, mixed vegetation, 17 males; Çarşamba, Hacıbeyli, 30. 04. - 28. 05. 2023, mixed vegetation, 8 males; Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 23 males; Terme, Amazon Nature Park, 11. 07. - 30. 07. 2023, mixed vegetation, 9 males; Çarşamba, Hacıbeyli, 16. 09 - 22. 10. 2022, mixed vegetation, 3 males; Çarşamba, Hacıbeyli, 11. 07 - 30. 07. 2023, mixed vegetation, 1 male; Çarşamba, Hacıbeyli, 09. 04. 2022. mixed vegetation, 1 male; Çarşamba, Hacıbeyli, 03. 09. - 16. 09. 2022, mixed vegetation, 2 males. Frequent. Larva on *Rumex* spp.

Athalia cordata Serville, 1823: Çarşamba, Hacıbeyli, 25. 08 - 25. 09. 2023, mixed vegetation, 3 females; Çarşamba, Hacıbeyli, 30. 04. - 28. 05. 2023, mixed vegetation, 2 females, 3 males; Terme, Amazon Nature Park, 11. 07. - 30. 07. 2023, mixed vegetation, 11 females, 16 males; Çarşamba, Hacıbeyli, 16. 09 - 22. 10. 2022, mixed vegetation, 7 females; Çarşamba, Hacıbeyli, 11. 07 - 30. 07. 2023, mixed vegetation, 1 female; Çarşamba, Hacıbeyli, 01. 05. - 14. 05. 2022, mixed vegetation, 1 female. Frequent. Larva on *Misopates orontinum, Antirrhinum majus, Ajuga reptans, Teucrium scorodonia* and *Plantago* spp.

Athalia circularis (Klug, 1815): Çarşamba, Hacıbeyli, 25. 08 - 25. 09. 2023, mixed vegetation, 4 males, 6 females; Çarşamba, Hacıbeyli, 30. 04. - 28. 05. 2023, mixed vegetation, 3 females; Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 8 females, 4 males; Terme, Amazon Nature Park, 30. 04. - 28. 05. 2023, forest, 1 male, 4 females; Çarşamba, Hacıbeyli, 16. 09 - 22. 10. 2022, mixed vegetation, 1 male, 7 females; Çarşamba, Hacıbeyli, 10. 03. - 10. 04. 2023, mixed vegetation, 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 lugens (Klug, 1815): Terme, Amazon Nature Park, 30. 04. - 28. 05. 2023, forest, 2 females; Terme, Amazon Nature Park, 28.05 - 11. 07. 2023, forest, 1 female. Frequent. Feeding on various *Cruciferae*.

Empria archangelskii Dovnar-Zapolskij, 1929: Terme, Amazon Nature Park, 11. 07. - 30. 07. 2023, mixed vegetation, 1 female, 1 male; Çarşamba, Hacıbeyli, 17. 04. - 01. 05. 2022, mixed vegetation, 1 male; Çarşamba, Hacıbeyli, 01. 05. - 14. 05. 2022, mixed vegetation, 1 male. Sporadic. Hostplatn unknown.

Empria sexpunctata (Serville, 1823): Çarşamba, Hacıbeyli, 10. 03. - 10. 04. 2023, mixed vegetation, 1 male. Frequent. Larva on *Geum* spp.

Monostegia abdominalis (Fabricius, 1798): Çarşamba, Hacıbeyli, 25. 08 - 25 . 09. 2023, mixed vegetation, 3 females; Terme, Amazon Nature Park, 30. 04. - 28. 05. 2023, forest, 1 female; Çarşamba, Hacıbeyli, 16. 09 - 22. 10. 2022, mixed vegetation, 1 female; Çarşamba, Hacıbeyli, 10. 04. - 30. 04. 2023, mixed vegetation, 1 female. Frequent. Recorded on *Glaux maritima, Lysimachia numularia* and *L. vulgaris*.

Taxonus sticticus (Klug, 1817): Terme, Amazon Nature Park, 11. 07. - 30. 07. 2023, mixed vegetation, 2 males; Terme, Amazon Nature Park, 08. 04. - 30. 04. 2023, forest, 1 male. Sporadic. Host plant unknown.

Eutomostethus ephippium (Panzer, 1798): Çarşamba, Hacıbeyli, 30. 04. - 28. 05. 2023, mixed vegetation, 1 male; Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 1 female; Çarşamba, Hacıbeyli, 10. 03. - 10. 04. 2023, mixed vegetation, 1 male; Terme, Geçmiş, 28. 05. - 11. 07. 2023, Corylus garden, 1 male. Frequent. Larva on *Poaceae*.

Eutomostethus gagathinus (Klug, 1816): Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 1 male. Sporadic. Host plant: *Carex paniculata*.

Cladardis elongatula (Klug, 1817): Çarşamba, Hacıbeyli, 30. 04. - 28. 05. 2023, mixed vegetation, 2 females, 2 males; Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 1 male; Terme, Amazon Nature Park, 11. 07. - 30. 07. 2023, mixed vegetation, 6 males. Frequent. Larva bores in shoots of *Rosa* spp.

Halidamia affinis (Fallén, 1807): Terme, Amazon Nature Park, 08. 04. - 30. 04. 2023, forest, 1 female. Frequent. Host plants: *Galium aparine* and *G. molugo*.

Caliroa cerasi (Linné, 1758): Terme, Geçmiş, 30. 04 - 28. 05. 2023, Corylus garden, 1 female; Çarşamba, Hacıbeyli, 14. 05. - 05. 06. 2022, mixed vegetation, 1 female. Frequent. Larva on *Pyrus, Malus, Prunus, Crataegus, Sorbus, Rosa, Cydonia, Mespilus, Rubus, Amygdalus, Cerasus, Amelanchier, Pyracantha, Cotoneaster* rarely *Quercus* and *Salix* spp.

Metallus albipes (Cameron, 1875): Çarşamba, Hacıbeyli, 25. 08 - 25. 09. 2023, mixed vegetation, 3 females; Çarşamba, Hacıbeyli, 30. 04. - 28. 05. 2023, mixed vegetation, 1 female; Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 1 female; Terme, Amazon Nature Park, 30. 04. - 28. 05. 2023, forest, 2 females; Çarşamba, Hacıbeyli, 10. 04. - 30. 04. 2023, mixed vegetation, 4 females; Çarşamba, Hacıbeyli, 03. 09. - 16. 09. 2022, mixed vegetation, 1 female. Frequent. Larva on *Rubus idaeus*.

Metallus pumilus (Klug, 1816): Çarşamba, Hacıbeyli, 25. 08 - 25. 09. 2023, mixed vegetation, 3 females, 79 males; Çarşamba, Hacıbeyli, 30. 04. - 28. 05. 2023, mixed vegetation, 44 males; Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 1 female, 44 males; Terme, Amazon Nature Park, 30. 04. - 28. 05. 2023, forest, 1 female, 21 males; Terme, Amazon Nature Park, 11. 07. - 30. 07. 2023, mixed vegetation, 2 males; Çarşamba, Hacıbeyli, 16. 09 - 22. 10. 2022, mixed vegetation, 23 males; Çarşamba, Hacıbeyli, 10. 04. - 30. 04. 2023, mixed vegetation, 31 males; Çarşamba, Hacıbeyli, 03. 09. - 16. 09. 2022, mixed vegetation, 1 male; Çarşamba, Hacıbeyli, 14. 05. - 05. 06. 2022, mixed vegetation, 1 male; Çarşamba, Hacıbeyli, 03. 09. - 16. 09. 2022, mixed vegetation, 1 male. Frequent. Larva on *Rubus* spp.

Heterarthrus vagans (Fallén, 1808): Terme, Amazon Nature Park, 28.05 - 11. 07. 2023, forest, 1 female; Çarşamba, Hacıbeyli, 10. 03. - 10. 04. 2023, mixed vegetation, 1 male. Sporadic, larva on *Alnus* spp.

Heterarthrus leucomela (Klug, 1818): Çarşamba, Hacıbeyli, 01. 05. - 14. 05. 2022, mixed vegetation, 1 female. Sporadic. Host plants: *Acer pseudoplatanus* and *A. campestre*.

Aglaostigma (*Astochus*) *aucupariae* (Klug, 1817): Terme, Amazon Nature Park, 11. 07. - 30. 07. 2023, mixed vegetation, 1 male; Çarşamba, Hacıbeyli, 10. 03. - 10. 04. 2023, mixed vegetation, 1 female. Frequent. Larva on *Galium mollugo* and *G. boreale*.

Macrophya (*Macrophya*) *annulata* (Geoffroy, 1785): Çarşamba, Hacıbeyli, 30. 04. - 28. 05. 2023, mixed vegetation, 4 males; Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 1 female; Çarşamba, Hacıbeyli, 14. 05. - 05. 06. 2022, mixed vegetation, 1 female; Çarşamba, Hacıbeyli, 05. 06. 2022, mixed vegetation, 1 female, 1 male; Çarşamba, Hacıbeyli, 05. 06 - 05. 07. 2022, mixed vegetation, 1 male, 1 female, 1 male. Frequent. Larva on *Potentilla reptans, Origanum vulgare, Euphorbia, Rosa, Rubus* and *Sambucus* spp.

Macrophya (*Macrophya*) *alboannulata* Costa, 1859: Çarşamba, Hacıbeyli, 30. 04. - 28. 05. 2023, mixed vegetation, 3 females, 4 males; Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 2 females, 3 males; Terme, Amazon Nature Park, 30. 04. - 28. 05. 2023, forest, 1 female; Terme, Amazon Nature Park, 11. 07. - 30. 07. 2023, mixed vegetation, 1 female; Çarşamba, Hacıbeyli, 11. 07 - 30. 07. 2023, mixed vegetation, 2 females; Çarşamba, Hacıbeyli, 17. 04. - 01. 05. 2022, mixed vegetation, 1 female, 2 males; Çarşamba, Hacıbeyli, 01. 05. - 14. 05. 2022, mixed vegetation, 1 female, 1 male; Terme, Geçmiş, 15. 05. 2022, Corylus garden, 1 male. Frequent, West Palaearctic species. Larva on *Sambucus nigra, S. racemosa* and *S. ebulus*.

Macrophya (*Macrophya*) *diversipes* (Schrank, 1782): Çarşamba, Hacıbeyli, 05. 06 - 05. 07. 2022, mixed vegetation, 1 male. Frequent. Host plant unknown.

Macrophya (*Macrophya*) *duodecimpunctata* (Linné, 1758): Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 1 female; Terme, Geçmiş, 30. 04 - 28 .05. 2023, Corylus garden, 6 males, 1 female; Terme, Geçmiş, 28. 05. - 11. 07. 2023, Corylus garden, 14 males. Frequent. Host plants: *Graminae, Cyperaceae* and *Carex* spp.

Macrophya (*Macrophya*) *postica* (Brullé, 1832): Çarşamba, Hacıbeyli, 30. 04. - 28. 05. 2023, mixed vegetation, 1 female; Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 2 females, 3 males; Çarşamba, Hacıbeyli, 14. 05. - 05. 06. 2022, mixed vegetation, 1 female, 2 males; Çarşamba, Hacıbeyli, 05. 06 - 05. 07. 2022, mixed vegetation, 2 males, 3 females; Çarşamba, Hacıbeyli, 11. 07. 2022. mixed vegetation, 1 male. Frequent. Host plant unknown.

Macrophya (*Macrophya*) *rufipes* (Linné, 1758): Terme, Geçmiş, 30. 04 - 28 .05. 2023, Corylus garden, 1 female; Çarşamba, Hacıbeyli, 05. 06 - 05. 07. 2022, mixed vegetation, 1 male. Frequent. Larva on *Agrimonia eupatoria*.

Macrophya (*Macrophya*) *crassula* (Klug, 1817): Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 1 female; Çarşamba, Hacıbeyli, 05. 06 - 05. 07. 2022, mixed vegetation, 1 female. Sporadic. Hostplant unknown.

Rhogogaster (*Rhogogaster*) *chlorosoma* (Benson, 1943): Terme, Geçmiş, 30. 04 - 28 .05. 2023, Corylus garden, 5 female. A widely distributed and abundant species. Host plants: Willows (*Salix*), including goat willow (*S. caprea*) and crack willow (*S. fragilis*).

Tenthredo (*Zonuledo*) *zonula* Klug, 1817: Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 1 female; Terme, Amazon Nature Park, 11. 07. - 30. 07. 2023, mixed vegetation, 1 female. Frequent. Host plant: *Hypericum perforatum*.

Cladius (*Priophorus*) *brullei* (Dahlbom, 1835): Çarşamba, Hacıbeyli, 25. 08 - 25. 09. 2023, mixed vegetation, 7 females; Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 2 females; Terme, Amazon Nature Park, 30. 04. - 28. 05. 2023, forest, 15 females; Çarşamba, Hacıbeyli, 10. 04. - 30. 04. 2023, mixed vegetation, 6 females. Frequent. Larva on *Rubus* spp.

Cladius (*Priophorus*) *compressicornis* (Fabricius, 1804): Çarşamba, Hacıbeyli, 25. 08 - 25. 09. 2023, mixed vegetation, 1 females. Frequent. Host plants: *Betula, Cotoneaster, Rubus, Sorbus, Prunus, Crataegus, Corylus, Fragaria* and *Rosa* spp., also *Laurus nobilis* and *Aronia arbutifolia*.

Cladius (*Cladius*) *pectinicornis* (Geoffroy, 1785): Çarşamba, Hacıbeyli, 25. 08 - 25. 09. 2023, mixed vegetation, 15 females, 101 males; Çarşamba, Hacıbeyli, 30. 04. - 28. 05. 2023, mixed vegetation, 2 females, 22 males; Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 4 female, 57 males; Terme, Amazon Nature Park, 30. 04. - 28. 05. 2023, forest, 13 females, 53 males; Terme, Amazon Nature Park, 11. 07. - 30. 07. 2023, mixed vegetation, 2 females, 36 males; Çarşamba, Hacıbeyli, 16. 09 - 22. 10. 2022, mixed vegetation, 11 males, 1 female; Çarşamba, Hacıbeyli, 10. 04. - 30. 04. 2023, mixed vegetation, 34 males, 12 females; Çarşamba, Hacıbeyli, 11. 07 - 30. 07. 2023, mixed vegetation, 3 males; Terme, Amazon Nature Park, 08. 04. - 30. 04. 2023, forest, 1 male; Çarşamba, Hacıbeyli, 17. 04. 2022. mixed vegetation, 3 males; Çarşamba, Hacıbeyli, 17. 04. - 01. 05. 2022, mixed vegetation, 1 female; Çarşamba, Hacıbeyli, 01. 05. - 14. 05. 2022, mixed vegetation, 1 female, 3 males; Çarşamba, Hacıbeyli, 14. 05. - 05. 06. 2022, mixed vegetation, 2 males; Çarşamba, Hacıbeyli, 05. 06. 2022, mixed vegetation, 1 female; Çarşamba, Hacıbeyli, 05. 06 - 05. 07. 2022, mixed vegetation, 3 males, 1 female; Çarşamba, Hacıbeyli, 14. 07. 2022, mixed vegetation, 1 male; Çarşamba, Hacıbeyli, 15. 07. - 19. 08. 2022, mixed vegetation, 4 males, 2 females; Çarşamba, Hacıbeyli, 19. 08. - 03. 09. 2022, mixed vegetation, 1 male; Çarşamba, Hacıbeyli, 03. 09. - 16. 09. 2022, mixed vegetation, 2 males, 1 female; Çarşamba, Hacıbeyli, 16. 09 - 22. 10. 2022, mixed vegetation, 1 male; Çarşamba, Hacıbeyli, 10. 03. - 10. 04. 2023, mixed vegetation, 1 male. Common. Host plant: *Rubus* spp.

Craesus alniastri (Scharfenberg, 1805) [*Nematus alniastri* (Scharfenberg, 1805)]: Terme, Amazon Nature Park, 11. 07. - 30. 07. 2023, mixed vegetation, 1 female. Larva on *Alnus* spp. Sporadic.

Nematus lucidus (Panzer, 1801): Terme, Amazon Nature Park, 11. 07. - 30. 07. 2023, mixed vegetation, 1 male; Terme, Amazon Nature Park, 08. 04. - 30. 04. 2023, forest, 1 male; Çarşamba, Hacıbeyli, 10. 03. - 10. 04. 2023, mixed vegetation, 1 male. Frequent. Larva on *Crataegus* and *Prunus spinosa*.

Pteronidea glutinosae (Cameron, 1882) [*Euura glutinosae* (Cameron, 1882)]: Terme, Geçmiş, 30. 04 - 28 .05. 2023, Corylus garden, 1 male; Terme, Geçmiş, 28. 05. - 11. 07. 2023, Corylus garden, 2 males. Frequent. Host plant: Alder (*Alnus*).

Pteronidea myosotidis (Fabricius, 1804) [*Euura myosotidis* (Fabricius, 1804)]: Çarşamba, Hacıbeyli, 25. 08 - 25. 09. 2023, mixed vegetation, 2 females, 10 males; Çarşamba, Hacıbeyli, 30. 04. - 28. 05. 2023, mixed vegetation, 29 males; Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 6 females, 41 males; Terme, Amazon Nature Park, 30. 04. - 28. 05. 2023, forest, 1 female, 5 males; Terme, Amazon Nature Park, 11. 07. - 30. 07. 2023, mixed vegetation, 20 males; Çarşamba, Hacıbeyli, 16. 09 - 22. 10. 2022, mixed vegetation, 18 males, 5 females; Çarşamba, Hacıbeyli, 10. 04. - 30. 04. 2023, mixed vegetation, 1 male; Çarşamba, Hacıbeyli, 17. 04. 2022. mixed vegetation, 1 male, 1 female; Çarşamba, Hacıbeyli, 17. 04. - 01. 05. 2022, mixed vegetation, 1 male; Terme, Geçmiş, 15. 05. 2022, Corylus garden, 1 female, 1 male; Çarşamba, Hacıbeyli, 14. 05. - 05. 06. 2022, mixed vegetation, 2 males; Çarşamba, Hacıbeyli, 19. 08. - 03. 09. 2022, mixed vegetation, 1 male; Çarşamba, Hacıbeyli, 03. 09. - 16. 09. 2022, mixed vegetation, 2 males; Çarşamba, Hacıbeyli, 10. 03. - 10. 04. 2023, mixed vegetation, 1 male; Terme, Geçmiş, 28. 05. - 11. 07. 2023, Corylus garden, 1 male. Common. Larval hosts: *Onobrychis* and *Trifolium* spp.

Pristiphora pallidiventris (Fallén, 1808): Çarşamba, Hacıbeyli, 30. 04. - 28. 05. 2023, mixed vegetation, 1 male; Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 1 female; Terme, Amazon Nature Park, 30. 04. - 28. 05. 2023, forest, 3 females; Terme, Amazon Nature Park, 11. 07. - 30. 07. 2023, mixed vegetation, 1 female; Terme, Geçmiş, 30. 04 - 28 .05. 2023, Corylus garden, 1 female; Terme, Amazon Nature Park, 28.05 - 11. 07. 2023, forest, 1 female; Çarşamba, Hacıbeyli, 10. 03. - 10. 04. 2023, mixed vegetation, 1 female. Frequent. Larva on *Geum, Potentilla, Rubus* and *Filipendula* spp., *Filipendula ulmaria, Geum urbanum, G. rivale, Rubus chamaemorus, R. idaeus, R. fruticosus* and *R. ulmifolius*.

Stauronematus platycerus (Hartig, 1840): Çarşamba, Hacıbeyli, 25. 08 - 25. 09. 2023, mixed vegetation, 1 male; Çarşamba, Hacıbeyli, 30. 04. - 28. 05. 2023, mixed vegetation, 1 male; Çarşamba, Hacıbeyli, 10. 04. - 30. 04. 2023, mixed vegetation, 1 female, 1 male; Çarşamba, Hacıbeyli, 30. 07 - 25. 08. 2023, mixed vegetation, 1 male. Host plants: *Populus tremula* and *Salix* spp. The only European sawfly, whose larva erects a palisade of dried saliva around its feeding place. Frequent.

Cephidae

Calameuta (*Calameuta*) *antigae* (Konow, 1894): Çarşamba, Hacıbeyli, 28. 05 - 19. 06. 2023, mixed vegetation, 1 female. Sporadic. Hostplant unknown.

Calameuta (*Calameuta*) *grombczewskii* (Jakowlew, 1891): Çarşamba, Hacıbeyli, 30. 04. - 28. 05. 2023, mixed vegetation, 1 female. Frequent. Host plant unknown.

Janus compressus (Fabricius, 1793): Çarşamba, Hacıbeyli, 30. 04. - 28. 05. 2023, mixed vegetation, 1 male. Host plants: Pear trees (*Pyrus*), apple trees (*Malus*), rowans (*Sorbus*), hawthorns (*Crataegus*). Eggs are laid individually on young shoots. Before oviposition, the female uses her ovipositor to create 10-26 spiral incisions 4-5 cm below the shoot tip, disrupting the conductive tissues. This process causes the shoot to wilt prematurely. Larvae mine within the wilting shoots over a period of 10-15 days.

Discussion

New species for the fauna of Türkiye

Calameuta antigae (Konow, 1894)

The species, originally thought to be West-Palearctic and previously known only from Barcelona, Spain, was recorded in the Caucasus in 2022. Given this, its presence in Türkiye is not unexpected. It is a North Mediterranean species, and its host plant remains unknown.

Allantus melanarius (Klug, 1818)

Its larvae feed on *Cornus sanguinea*. This species is widely distributed across the Western Palearctic, including Europe, the southern Caucasus, and northern Iran. Although it is not considered rare, it is surprising that no records of its presence in Türkiye have been reported so far.

Pteronidea glutinosae (Cameron, 1882) [*Euura glutinosae* (Cameron, 1882)]

This species was originally known as *Nematus viridissimus* Möller, 1882. However, Cameron's article was published in February 1882, whereas Möller's article was published no earlier than mid-December 1882. The seniority of the name *glutinosae* has previously been overlooked. It is a Western Palearctic species, distributed from the British Isles through Central, Northern, and Eastern Europe to the Caucasus. Host plant: Alder (*Alnus*).

Zoogeographic analysis

In zoogeographic point of view, most of the species (51 from the 54 species) have wide geographic distribution, i.e. Holarctic, Palaearctic and West Palaearctic; their proportion is 94%. Three species have limited distribution areas: Ponto-Caspian-Central Asian, North Mediterranean and Ponto-Caspian-East Mediterranean. These species are: *Calameuta grombczewskii* (Jakowlew, 1891) (Ponto-Caspian-Central Asian species), *Calameuta* (*Calameuta*) *antigae* (Konow, 1894) (originally it was ranked as West Mediterranean species, now it seems a North Mediterranean species) and *Empria archangelskii* Dovnar-Zapolskij, 1929 (Ponto-Caspian, East Mediterranean). Their proportion is 6%.

Flight Period of Sawflies

The dynamics of the flight period resemble the pattern observed in the Pannonian biogeographic region. Both species richness and population density follow a multiple-events category, characterized by a single-type, univariable pattern (Kaplan et al., 2023) (Figs. 6 and 7).

From another perspective, considering the low species richness and reduced population density, the pattern also shows similarities to the Mediterranean type, as observed in Sicily (Haris and Józan 2018).

The flight period began in mid-March, reaching an initial culmination peak before experiencing a temporary decline in August. Subsequently, a second peak was detected, featuring some species with a third generation emerging in early autumn.

Endangering factors

Agriculture and animal husbandry are conducted intensively in the region. In particular, the heavy use of agricultural chemicals such as pesticides and herbicides can have negative impacts on the ecosystem.

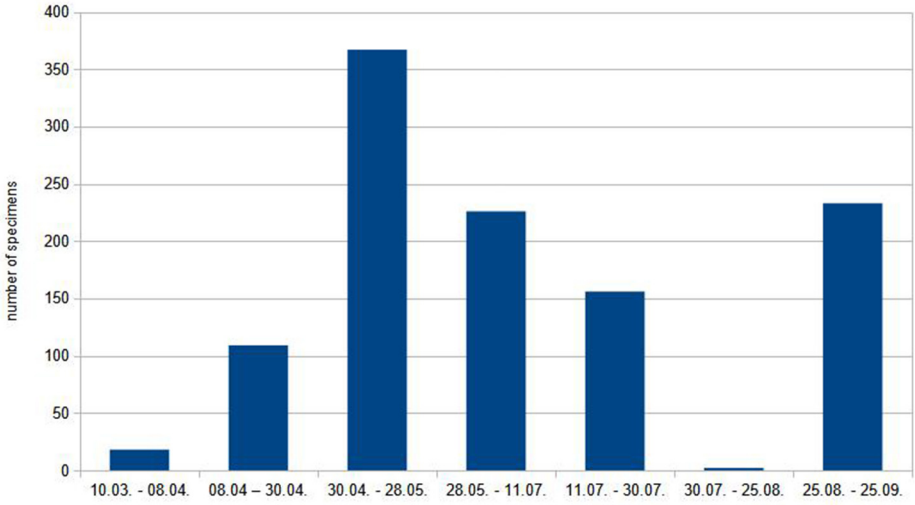

Fig. 6: Change in population numbers of sawflies in 2023

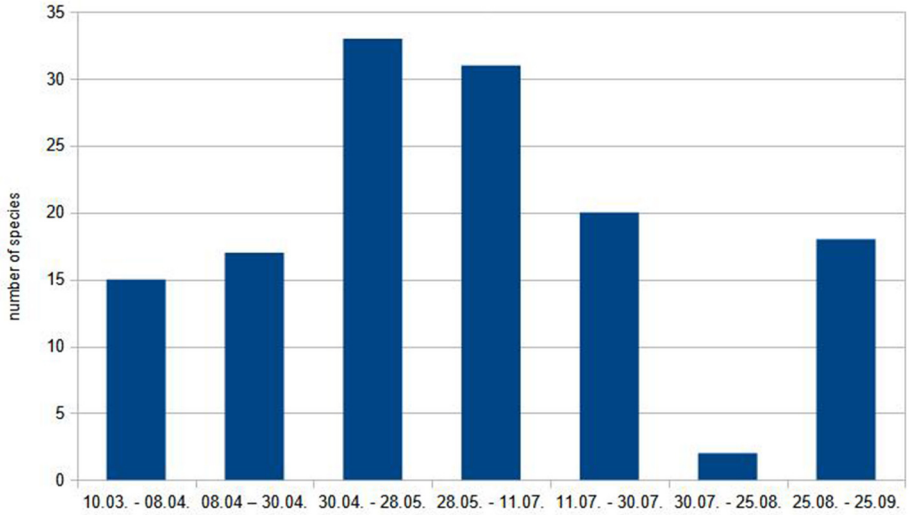

Fig. 7: Change in species richness of sawflies in 2023

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