

## New Host Plant Records for Heteroptera (Hemiptera) Species: Feeding Behavior on the Thistle (*Gundelia* sp.) Plant

Hakan Çelik<sup>1\*</sup> Halil Bolu<sup>1</sup> İnanç Özgen<sup>2</sup>

<sup>1</sup>Dicle University, Faculty of Agriculture, Department of Plant Protection, Diyarbakır, Türkiye

<sup>2</sup>Firat University, Faculty of Engineering, Department of Bioengineering, Elazığ, Türkiye

E-mails: 144061018a@gmail.com, ORCID iD: 0000-0002-2318-3474 (HÇ);  
besni@dicle.edu.tr, ORCID iD: 0000-0001-5488-0056 (HB);  
iozgen@firat.edu.tr, ORCID iD:0000-0003-1742-9324 (İÖ)

\*Corresponding Author

**ABSTRACT:** This study was conducted in 2021 in the Karacadağ region, within the boundaries of Diyarbakır (Bağlar, Ergani, and Çınar districts) and Şanlıurfa (Siverek and Viranşehir districts) provinces, to investigate the Heteroptera (Hemiptera) species associated with the Thistle plant (*Gundelia* sp.). The research aimed to identify both pest and predatory insect species found on the plant and assess their ecological roles. Through systematic field and laboratory studies, seven species from the Heteroptera suborder were identified on *Gundelia* sp. Among them, five species were classified as pests due to their feeding activities on the plant, while two species were predatory, contributing to natural biological control. The pest species identified were *Carpocoris coreanus* Distant, 1899, *Carpocoris pudicus* (Poda, 1761), *Dolycoris baccarum* (Linnaeus, 1758), *Codophila varia* (Fabricius, 1787) (Pentatomidae), and *Odontotarsus purpureolineatus* (Rossi, 1790) (Scutelleridae). The predatory species recorded were *Orius laevigatus* (Fieber, 1860) and *Orius vicinus* (Ribaut, 1923) (Anthocoridae). The study revealed that except for *Dolycoris baccarum*, all other species were recorded feeding on the Thistle plant for the first time. The highest population density was observed for *Dolycoris baccarum*, which primarily fed on the fresh seed parts of the plant. Other pest species were also found feeding on the seeds and leaves, potentially affecting the plant's growth and seed viability. These findings contribute to the understanding of insect-plant interactions in the Karacadağ region

**To cite this article:** Çelik, H., Bolu, H., Özgen, İ., 2025, New Host Plant Records for Heteroptera (Hemiptera) Species: Feeding Behavior on the Thistle (*Gundelia* sp.) Plant, *J.Het.Turk.*, 7(1):179-193

**DOI:**10.5281/zenodo.15313400

**To link to this article:** <https://www.j-het.org/wp-content/uploads/2025/05/V71-A7.pdf>

**Received:** Feb 24, 2024; **Revised:** Apr 14, 2025; **Accepted:** Apr 15, 2025; **Published online:** May 7, 2025



and highlight the importance of conserving the Thistle plant's natural habitat. Additionally, *Dolycoris baccarum* was noted as a key species in this ecosystem, possibly playing an indirect role as an alternative host for parasitoids of *Eurygaster integriceps*, a major pest in wheat and barley cultivation. Therefore, preserving Thistle-rich areas could have significant implications for biodiversity conservation and agricultural sustainability in the region.

**KEYWORDS:** Diyarbakır, Şanlıurfa, Karacadağ, *Gundelia* sp., Heteroptera, pest species, biological control.

## INTRODUCTION

The thistle plant (*Gundelia* sp.) (Asteraceae), or "Kenger" as it is called in Turkish, which grows widely in our country, is used in various fields and for different purposes. As a gum, it is known to be effective in treating toothaches, gum disorders, and teeth whitening, as well as in the treatment of inflamed or ruptured eardrums, expelling gallstones, relieving stomach pain and bloating, improving appetite and indigestion, and benefiting patients with hypertension, facial paralysis, and diabetes. After being harvested in the Eastern Anatolia and Southeastern Anatolia regions, the head and stem parts of the Thistle plant, which resemble artichokes, are consumed as vegetables. In the Central Anatolia and Mediterranean regions, the seeds are roasted, then ground using stone mills and sieved to produce Thistle coffee (Polat et al., 2012). The chemical composition of *Gundelia tournefortii* is particularly notable for its high phenolic content, which includes caffeoylquinic acid derivatives (such as cynarin and chlorogenic acid), vanillic acid, fumaric acid, gallic acid, as well as other components responsible for its biological activity, such as limonene, zingiberene, and saponins. These compounds contribute to the positive effects of the plant on human health (Haghi et al., 2011). Regarding its everyday uses, the milk of the plant has been reported to be useful in curdling, as a stabilizer in ice cream production, and Thistle can be used in pulp form to improve the quality of yogurt (Demir, 2013; Say & Güzeler, 2016).

Throughout history, *Gundelia tournefortii* has been used by many societies not only as a food product but also as a remedy for many diseases, earning its reputation as a cure-all in traditional medicine. It has been particularly noted for its benefits in treating liver diseases, diabetes, cramps, indigestion, bronchitis, mumps, stomach pain, diarrhea, mouth ulcers, migraines, stroke, vitiligo, strengthening nerves, and blood purification (Azeez and Kheder, 2012; Samani et al., 2013). It has also been reported to have a positive effect on biliary tract inflammation, cirrhosis, and chronic liver diseases caused by excessive alcohol and drug consumption (Tabibian et al., 2013). In addition, its hypoglycemic, anti-inflammatory, anti-parasitic, anti-bacterial, and hepatoprotective effects have been expressed (Çoruh et al., 2007; Polat et al., 2012). The leaves are leathery, veined, and whitish with hairs, and the stems are without stalks. The root, located underground, is thick and woody. Thistle is a perennial plant that produces seeds every year. The seeds are spiny and have a very hard structure. As a perennial plant, Thistle has a strong root system. During its development, it forms a rosette stem that thickens each year beneath the soil. It has a taproot system that can reach deep into the ground (Pirinç et al., 2014).

There have been very few studies on Thistle pests in our country. Özdikmen (2003) reported that *Cortodera syriaca* Pic, 1901 (Coleoptera: Cerambycidae) feeds on *Gundelia tournefortii* in Aksaray and is monophagous. Çelik & Bolu (2023), in their study conducted in 2021 in Diyarbakır (Bağlar, Çınar, and Ergani districts), Mardin (Derik district), and Şanlıurfa (Siverek and Viranşehir districts), identified species belonging to the Aphididae, Pseudococcidae (Hemiptera: Sternorrhyncha), and Coccinellidae families. These species are: *Brachycaudus cardui* (Linnaeus, 1758), *Brachycaudus helichrysi* (Kaltenbach, 1843), *Protaphis middletonii* (Thomas, 1879)

(Aphididae); *Trionymus multivorus* (Kiritshenko, 1936) (Pseudococcidae); and *Nephus nigricans* Weise, 1879 (Coccinellidae). There have been very few literature studies regarding pest species on Thistle plants. Some studies conducted in Iran are available. Saeidi (2012) reported that *Euxoa agricola* Boisduval, 1829 (Lepidoptera: Noctuidae) is the most important pest of Thistle in Iran, with its larvae feeding on the leaves of the plant and causing significant damage. Identifying the pest species that cause crop loss and affect the productivity of Thistle plants is crucial for determining plant protection issues.

Therefore, identifying harmful insect species that reduce productivity in Thistle is of significant importance. This study is the first in identifying Heteroptera (Hemiptera) species on the Thistle plant, and it provides valuable insights into pest management.

## MATERIALS AND METHODS

The methodology of the study consists of two sections: field and laboratory studies.

### Materials

The main materials of the study were the Thistle plant and insects naturally growing on the slopes of the Karacadağ (extinct volcanic mountain) in the provinces of Diyarbakır and Şanlıurfa (Figures 1, 2, 3).



**Figure 1.** The different phenological stages of the Thistle plant.

### Methods

The methodology of the study consists of two sections: field and laboratory studies. Based on preliminary research, it is known that the Thistle ger plant enters its flowering period in April. With this assumption, the fieldwork began in the second week of March 2021, taking into account the weather conditions.

### Field Studies

#### Observation and Control Method

In each village surveyed, 25 randomly selected plants in areas where Thistle grows were monitored. The insects found on the plants were collected using an aspiration tube for the smaller ones and soft tweezers for the larger ones. These insects were then placed in killing jars containing ethyl acetate to be killed. The collected insects were transferred to Petri dishes with drying paper and brought to the laboratory. Samples collected in the pre-adult stage were also brought to the laboratory along with the plant parts they were found on, for further examination. During the survey,

information such as the location, collection date, the part of the host plant, the type of damage caused, and the biological stage of the insect was recorded on tags. Fieldwork started in mid-March and continued in weekly intervals until the last week of June.

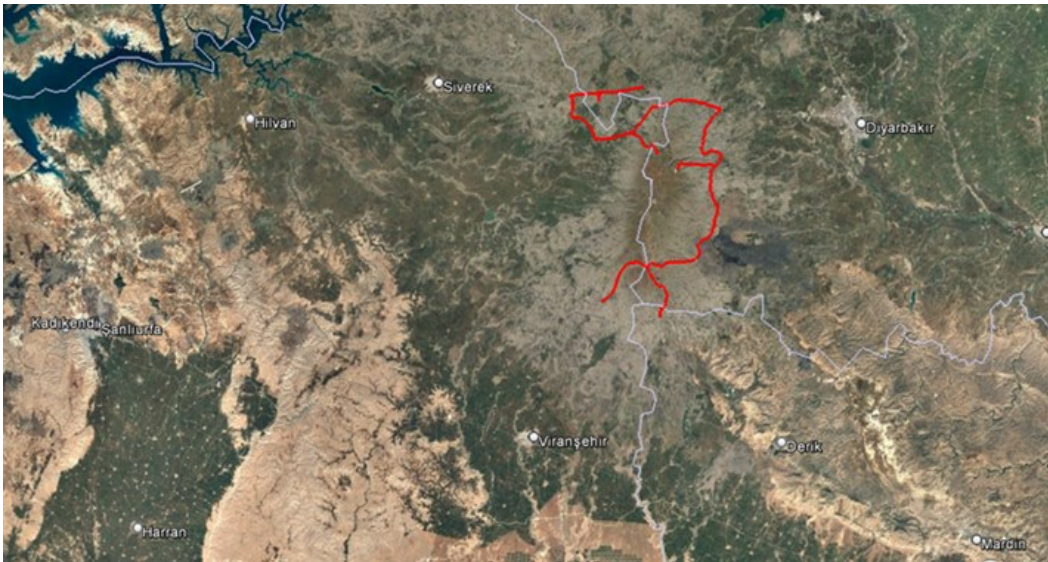
### Laboratory Studies

Insects collected in the adult stage and brought to the laboratory were initially grouped based on their morphological similarities. They were then numbered, and details such as the location and date of collection, the part of the host plant, the damage caused, their biological stage at the time, preliminary identification, and the processes they underwent were recorded. The adult specimens were preserved in Petri dishes inside closed cardboard boxes.

Additionally, all adult specimens were pinned according to standard procedures, and smaller species were glued to triangular or rectangular cards that were then pinned. The identification of the samples obtained in the study was made by the third author. Samples collected in the pre-adult stage using the observation method, along with the plant parts they were found on, were separately cultured in plastic containers with fine mesh covers in a climate chamber set to  $26\pm 1^\circ\text{C}$ ,  $65\pm 5\%$  humidity, and a 16:8 light/dark cycle at 3500 lux. Specimens that reached the adult stage were also prepared for identification and sent to specialists. Coordinates and elevation information of the areas where the samples were collected were recorded via GPS and transferred to a computer system. Furthermore, the species that caused damage to the area were photographed.

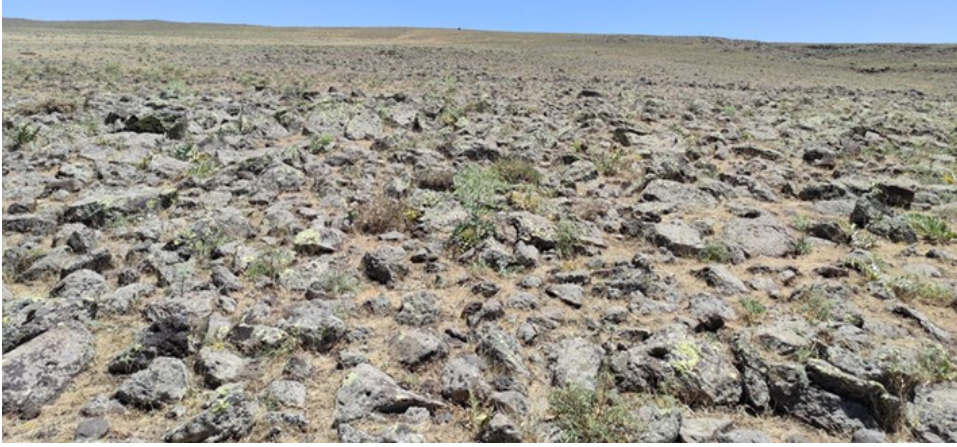
### Study Area

This study was conducted in the Karacadağ region, located within the boundaries of Diyarbakır (Bağlar, Ergani, Çınar districts) and Şanlıurfa (Siverek, Viranşehir districts) provinces. Karacadağ is an extinct volcanic mountain located in the South-eastern part of Turkey. To the northeast of Karacadağ lies Diyarbakır, to the west and south is Şanlıurfa (Siverek-Viranşehir), to the east is Mardin (Derik), and to the north, it is surrounded by the Southeastern Taurus Mountains.



**Figure 2.** The Karacadağ region within the borders of Diyarbakır, Mardin, and Şanlıurfa provinces.

The Karacadağ region has a rich flora, hosting hundreds of plant species at various elevations, as well as a diverse insect fauna. It is known that some insect species prefer Karacadağ for overwintering. These insects are found under perennial vegetation, such as the hedgehog plant (*Acantholimon acerosum* (Willd.) Boiss. var. *Acerosum*), hedgehog astragalus (*Astragalus echinops* Auch. ex Boiss.), astragalus species (*Astragalus* sp.), thorny plants (*Noea spinosissima* Moq.), and mullein (*Verbascum* sp.), as well as in cracks in stones and soil (Lodos, 1961; Yüksel, 1968). Due to its geological structure, most of the land in the Karacadağ region is covered with volcanic rocks. According to Erinç (1971), Karacadağ spreads over an area with a nearly circular shape, with a diameter of 120 km. Although Karacadağ is not very tall, it does not appear as a towering mountain. The highest point of Karacadağ is Mergimir Hill (1981 m) (Ertekin, 2002).



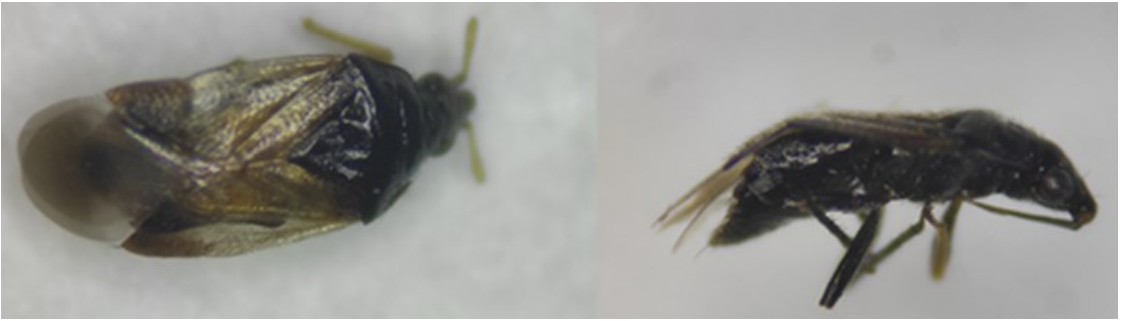
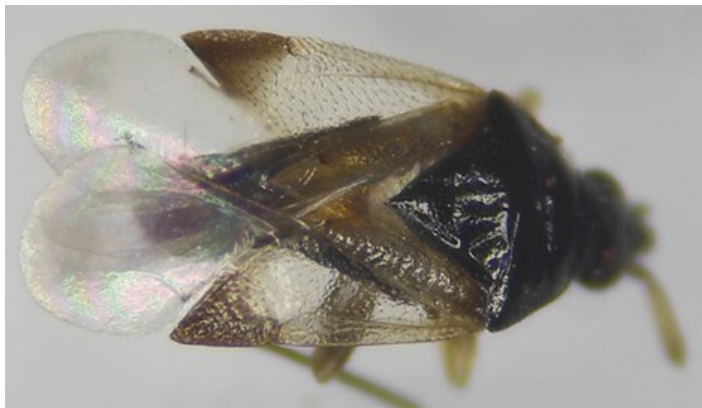
**Figure 3.** A region where the borders of Diyarbakır (Bağlar) and Şanlıurfa (Siverek) provinces intersect.



**Figure 4.** Karacadağ in the spring months.

## RESULTS AND DISCUSSION

As a result of this study conducted in 2021 on the Thistle plant in the Karacadağ area, where the borders of Diyarbakır and Şanlıurfa provinces intersect, 2 insect species from the Anthocoridae family, 4 from the Pentatomidae family, and 1 from the Scutelleridae family were identified during the flowering period of the plant within the Heteroptera suborder.

**Suborder: Heteroptera Latreille, 1810****Superfamily:** Cimicoidea Stephen, 1829**Family:** Anthocoridae Fieber, 1836**Subfamily:** Anthocorinae Fieber, 1836**Genus:** *Orius* Wolff, 1811**Species:** *Orius laevigatus* (Fieber, 1860) (Figure 5)**Material Examined:** Şanlıurfa (Siverek district) 37°46'27"N, 39°48'19"E, 1588 m., 30/05/2021, 12 specimens. Diyarbakır (Ergani district) 37°50'37"N, 39°42'02"E, 1052 m., 16/05/2021, 14 specimens. Diyarbakır (Bağlar district) 37°46'18"N, 39°48'53"E, 1630 m., 16/05/2021, 14 specimens. **Total:** 40 specimens.**Distribution Area in Southeastern Anatolia:** Diyarbakır, Mardin, Şanlıurfa (Önder & Adıgüzel, 1979).*Orius laevigatus* was identified for the first time on the Thistle plant in this study. It was observed that this predatory species feeds on aphids found on the Thistle plant.**Figure 5.** The adult stage of *Orius laevigatus*.**Species:** *Orius vicinus* (Ribaut, 1923) (Figure 6)**Material examined:** Şanlıurfa (Siverek district) 37°46'27"N, 39°48'19"E, 1588 m., 30/02/2021, 10 specimens, Diyarbakır (Ergani district) 37°50'37"N, 39°42'02"E, 1052 m., 16/05/2021, 11 specimens, Diyarbakır (Bağlar district) 37°46'18"N, 39°48'53"E, 1630 m., 16/05/2021, 5 specimens. **Total:** 26 specimens.**Figure 6.** The adult stage of *Orius vicinus*.*Orius vicinus* was identified on the Thistle plant for the first time in this study. It was observed that this predatory species feeds on aphids found on the Thistle plant.

**Superfamily:** Pentatomoidea Leach, 1815

**Family:** Pentatomidae Leach, 1815

**Subfamily:** Pentatominae Leach, 1815

**Genus:** *Dolycoris* Mulsant & Rey, 1866

**Species:** *Dolycoris baccarum* (Linnaeus, 1758) (Figures 7, 8)

**Material examined:** Diyarbakır (Bağlar district) 37°46'23"N, 39°48'42"E, 1615 m., 23/05/2021, 34 specimens, Şanlıurfa (Siverek district) 37°46'27"N, 39°48'19"E, 1588 m., 30/05/2021, 22 specimens, Şanlıurfa (Siverek district) 37°46'37"N, 39°46'47"E, 1418 m., 16/06/2021, 11 specimens, Diyarbakır (Bağlar district) 37°45'53"N, 39°49'22"E, 1646 m., 13/06/2021, 10 specimens, Şanlıurfa (Siverek district) 37°46'12"N, 39°43'48"E, 1207 m., 13/06/2021, 22 specimens, Diyarbakır (Ergani district) 37°49'57"N, 39°39'54"E, 1077 m., 20/06/2021, 7 specimens. **Total:** 106 specimens.

**Distribution Area in Southeastern Anatolia:** Adıyaman, Batman, Diyarbakır, Gaziantep, Kilis, Mardin, Siirt, Şanlıurfa, Şırnak (Lodos et al., 1984; Karaat, 1986; Akkaya, 1995; Önder et al., 1995; Lodos et al., 1998; Bolu, 2002; Özgen et al., 2005a, 2005b; Bolu et al., 2006; Gözüaçık et al., 2011; Kaplan et al., 2011; Fent & Dursun, 2022).

**Host Plants:** Almond, Leguminous Forage Plants, Olive, Pistachio, Pomegranate, Tobacco, Weeds, Wheat, *Brassica napus* var. *oleifera*, *Sinapis arvensis*, *Sysmbrium officinale*, *Lens culinaris*, *Ervum ervilia*, *Onopordum acanthium*, *Sesamum indicum*, *Onopordum carduchorum*, *Gundelia* sp., *Silene colorata*, *Verbascum thapsus* (Lodos et al., 1984; Karaat, 1986; Akkaya, 1995; Önder et al., 1995; Lodos et al., 1998; Bolu, 2002; Özgen et al., 2005a, 2005b; Bolu et al., 2006; Gözüaçık et al., 2011; Kaplan et al., 2011).



**Figure 7.** Habitus of *Dolycoris baccarum*.

*Dolycoris baccarum*, which has previously been identified feeding on the Thistle plant, has also been recorded in earlier studies within the study area, which includes the provinces of Diyarbakır, Mardin, and Şanlıurfa. It has been observed that *Dolycoris baccarum* feeds on the fresh seed parts of the Thistle plant (Figure 8).



**Figure 8.** The adults of *Dolycoris baccarum* feeding on the Thistle plant.

**Genus:** *Carpocoris* Kolenati, 1846

**Species:** *Carpocoris coreanus* Distant, 1899 (Figure 9)

**Material examined:** Şanlıurfa (Siverek district) 37°46'37"N, 39°46'47"E, 1418 m., 16/06/2021, 7 specimens, Diyarbakır (Bağlar district) 37°45'53"N, 39°49'22"E, 1646 m., 13/06/2021, 5 specimens, Şanlıurfa (Siverek district) 37°46'12"N, 39°43'48"E, 1207 m., 13/06/2021, 3 specimens, Şanlıurfa (Siverek district) 37°46'26"N, 39°47'10"E, 1471 m., 20/06/2021, 2 specimens. **Total:** 17 specimens.



**Figure 9.** The adult stage of *Carpocoris coreanus* and its feeding on the Thistle plant.



**Distribution Area in Southeastern Anatolia:** Adıyaman, Gaziantep, Diyarbakır, Kilis, Mardin, Siirt, Şanlıurfa, Şırnak (Karaat, 1986; Önder et al., 1995; Lodos et al., 1998; Fent & Dursun, 2022).

**Host Plants and Habitat:** *Carduus pycnocephalus*, *Centaurea calcitrapa* L., *Centaurea* sp., *Onopordum acanthium* (Önder et al., 2006; Gözüaçık et al., 2011; Matocq et al., 2014). *Euphorbia* sp., *Centaurea* sp., *Medicago sativa*, *Sinapis* sp., *Trifolium* sp., *Verbascum* sp., *Triticum* sp., scrub and meadow areas, Tobacco, weeds (Karaat, 1986; Önder et al., 1995; Lodos et al., 1998); *Carduus pycnocephalus*, *Centaurea* sp., *Centaurea calcitrapa* L., *Onopordum acanthium* (Önder et al., 2006; Gözüaçık et al., 2011; Matocq et al., 2014).

*Carpocoris coreanus* was identified for the first time feeding on the Thistle (*Gundelia* sp.) plant in this study. It was observed that *Carpocoris coreanus* feeds on the fresh seed parts and leaves of the Thistle plant (Figure 9).

**Species:** *Carpocoris pudicus* (Poda, 1761) (Figure 10).

**Material examined:** Şanlıurfa (Siverek district) 37°46'37"N, 39°46'47"E, 1418 m., 16/06/2021, 3 specimens, Diyarbakır (Bağlar district) 37°45'53"N, 39°49'22"E, 1646 m., 13/06/2021, 2 specimens, Şanlıurfa (Siverek district) 37°46'12"N, 39°43'48"E, 1207 m., 13/06/2021, 1 specimen. **Total:** 6 specimens.

**Distribution Area in Southeastern Anatolia:** Adıyaman, Diyarbakır, Gaziantep, Mardin, Şanlıurfa (Önder et al., 1995; Özgen et al., 2005a, 2005b; Bolu et al., 2006; Gözüaçık et al., 2011; Matocq et al., 2014; Fent & Dursun, 2022).

**Host Plants:** *Centaurea iberica*, *Carduus pycnocephalus*, *C. solstitialis*, *Trifolium* sp., *Echinops microcephalus*, Cherry, Wheat (Önder et al., 1995; Özgen et al., 2005a, 2005b; Bolu et al., 2006; Gözüaçık et al., 2011; Matocq et al., 2014).



**Figure 10.** Habitus of *Carpocoris pudicus*

*Carpocoris pudicus* was identified for the first time feeding on the Thistle (*Gundelia* sp.) plant in this study. It was observed that *Carpocoris pudicus* feeds on the fresh seed parts and leaves of the Thistle plant (Figure 11).



**Figure 11.** The adult stage of *Carpocoris pudicus* feeding on the Thistle plant.

**Genus:** *Codophila* Mulsant & Rey, 1866

**Species:** *Codophila varia* (Fabricius, 1787) (Figure 12)

**Material examined:** Şanlıurfa (Siverek district) 37°46'37"N, 39°46'47"E, 1418 m., 16/06/2021, 11 specimens, Diyarbakır (Bağlar district) 37°45'53"N, 39°49'22"E, 1646 m., 13/06/2021, 7 specimens, Şanlıurfa (Siverek district) 37°46'12"N, 39°43'48"E, 1207 m., 13/06/2021, 3 specimens. **Total:** 21 specimens.

**Distribution Area in Southeastern Anatolia:** Adıyaman, Diyarbakır, Gaziantep, Kilis, Mardin, Siirt (Önder et al., 1995, 2006; Lodos et al., 1998; Matocq et al., 2014; Gözüaçık et al., 2011; Fent & Dursun, 2022)

**Host Plants:** *Carthamus* sp., *Carduus pycnocephalus*, *Centaurea iberica*, *Cirsium* sp., *C. solstitialis*, *Daucus* sp., *Echinops ritro*, *Scolymus* sp., *Eryngium campestre*,



**Figure 12.** The adult stage of *Codophila varia* and its feeding on the seed parts of the Thistle plant.

*E. creticum*, *Sesamum indicum*, *Helianthus annuus*, *Echium plantagineum*, *Onopordum* sp., *Medicago sativa*, *Sinapis* sp., *Verbascum* sp., umbrella and herbaceous plants, weeds (Önder et al., 1995; Lodos et al., 1998; Matocq et al., 2014; Önder et al., 2006; Gözüaçık et al., 2011).

*Codophila varia* was identified for the first time feeding on the Thistle (*Gundelia* sp.) plant in this study. It was observed that *Codophila varia* feeds on the fresh seed parts and leaves of the Thistle plant (Figure 12).

**Family:** Scutelleridae Leach, 1815

**Subfamily:** Odontotarsinae Mulsant & Rey, 1865

**Genus:** *Odontotarsus* Laporte, 1832

**Species:** *Odontotarsus purpureolineatus* (Rossi, 1790) (Figure 13)

**Material examined:** Şanlıurfa (Siverek district) 37°46'37"N, 39°46'47"E, 1418 m., 16/06/2021, 2 specimens, Diyarbakır (Bağlar district) 37°45'53"N, 39°49'22"E, 1646 m., 13/06/2021, 4 specimens, Şanlıurfa (Siverek district) 37°46'12"N, 39°43'48"E, 1207 m., 13/06/2021, 6 specimens. **Total:** 12 specimens.

**Distribution Area in Southeastern Anatolia:** Adıyaman, Diyarbakır, Gaziantep, Mardin, Siirt, Şanlıurfa, Şırnak (Lodos et al., 1998; Önder et al., 1995, 2006; Gözüaçık & Fent, 2012).

**Host Plants and Habitat:** *Centaurea calcitrapa*, *Sesamum indicum*, *Carduus pycnocephalus*, *Centaurea iberica*, *Eryngium campestre*, scrub and meadow areas, weeds (Lodos et al., 1998; Önder et al., 1995; Önder et al., 2006; Gözüaçık and Fent, 2012).



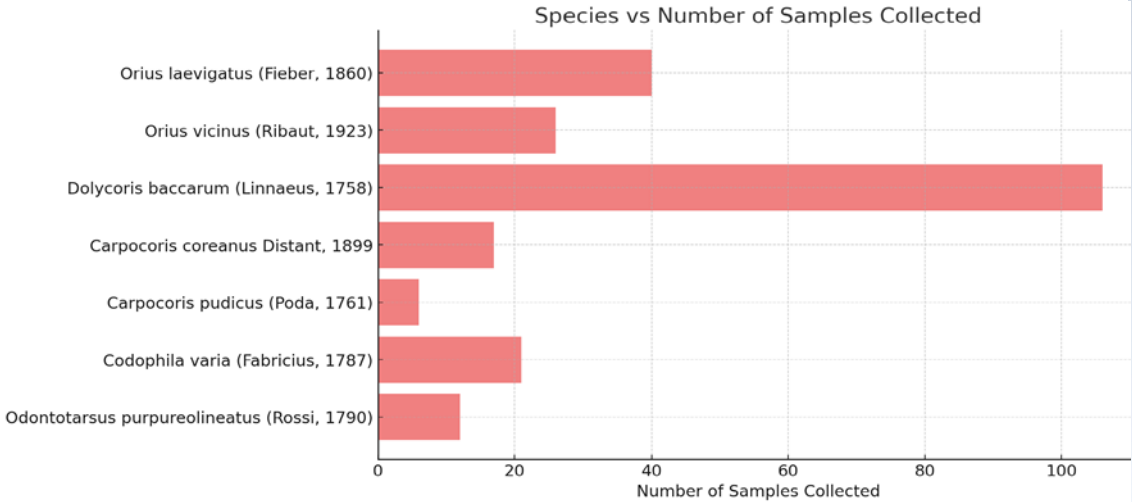
**Figure 13.** The adult stage of *Odontotarsus purpureolineatus* and its feeding on the seed parts of the Thistle plant.

*Odontotarsus purpureolineatus* was identified for the first time feeding on the Thistle (*Gundelia* sp.) plant in this study. It was observed that *Odontotarsus purpureolineatus* feeds on the fresh seed parts and leaves of the Thistle plant (Figure 13).

## CONCLUSION

The findings of this study provide significant insights into the insect-plant interactions associated with *Gundelia* sp. in the Karacadağ region. The identification of seven

Heteroptera (Hemiptera) species, five of which were pests and two predatory species, highlights the importance of Thistle (*Gundelia* sp.) as a host plant in the ecosystem. Notably, except for *Dolycoris baccarum*, all other species were recorded feeding on the Thistle plant for the first time, marking an important contribution to the entomological records of Turkey. Among the identified species, *Dolycoris baccarum* exhibited the highest abundance, particularly targeting the fresh seed parts of *Gundelia* sp. (Figure 14.).



**Figure 14.** The number of Samples Collected for Each Species.

This aligns with previous studies, such as those by Lodos et al. (1984) and Önder et al. (1995), which reported *Dolycoris baccarum* as a common pest species in agricultural landscapes of Southeastern Anatolia. The feeding habits of this species may impact Thistle's seed viability and reproductive success, raising concerns about its potential role in altering plant population dynamics. The role of *Dolycoris baccarum* as an alternative host for egg parasitoids of *Eurygaster integriceps*, a major pest of wheat and barley, is particularly noteworthy. Previous research (Lodos, 1961; Yüksel, 1968) suggests that conserving habitats where such alternative hosts thrive may indirectly support biological control by enhancing parasitoid populations. This study, therefore, supports the conservation of Thistle-rich areas not only for biodiversity but also for integrated pest management (IPM) strategies in cereal crops. The discovery of four other pentatomid and scutellerid species (*Carpocoris coreanus*, *Carpocoris pudicus*, *Codophila varia*, and *Odontotarsus purpureolineatus*) feeding on Thistle suggests a broader host range than previously documented. This observation extends findings from Matocq et al. (2014), who reported similar Pentatomidae species on *Centaurea* and other Asteraceae plants. The feeding preference of these species on fresh seeds and leaves could indicate a seasonal dependency on Thistle, further necessitating long-term monitoring. Additionally, the predatory species *Orius laevigatus* and *Orius vicinus* (Anthocoridae) were identified on *Gundelia* sp., feeding on aphids and small insects present on the plant. Similar findings were reported by Gözüaçık & Fent (2012), emphasizing the potential role of *Orius* species in natural pest control. Their presence on Thistle suggests that this plant could serve as a refuge for beneficial insects, contributing to the biological balance within its habitat. From an agricultural perspective, the interaction of these Heteroptera species with Thistle underscores the ecological significance of non-crop plants in sustaining insect populations. Studies by Önder et al. (2006) and Bolu et al. (2006) have emphasized the role of wild plant species in supporting both pest and beneficial insects in agroecosystems. Protecting

Thistle habitats could thus enhance natural enemy populations, contributing to a more sustainable pest management approach in surrounding cultivated lands.

The presence of Heteroptera species on Thistle provides an opportunity to further investigate:

1. Seasonal population dynamics of pest species and their impact on Thistle's reproductive success.
2. Trophic interactions between herbivorous insects, predatory insects, and parasitoids within Thistle habitats.
3. The potential agricultural benefits of preserving wild plant species as alternative host sites for beneficial insects.

In conclusion, the study not only expands the knowledge of Heteroptera fauna in Turkey but also underscores the ecological and agricultural importance of *Gundelia* sp. as a key plant in the Karacadağ region. Conservation efforts aimed at maintaining Thistle populations could have dual benefits enhancing biodiversity while supporting biological control programs in cereal crop cultivation.

## ACKNOWLEDGEMENTS

This study is part of the Master's thesis titled "Identification of Pest Insect Species and Their Natural Enemies on the Thistle Plant (*Gundelia* sp.) in Diyarbakır, Şanlıurfa, and Mardin Provinces," which was accepted by the Institute of Science of Dicle University in June 2024. We would like to thank the Dicle University Scientific Research Projects Coordination (Project No: DÜBAP-FBE.21.002) for their financial support provided for this thesis.

## REFERENCES

- Akkaya, A., 1995, Güneydoğu Anadolu Bölgesinde Baklagil Yem Bitkilerinde Entomolojik Sorunlar ve Çözüm Önerileri. *GAP Bölgesindeki Bitki Koruma Sorunları ve Çözüm Önerileri Sempozyumu*, 27-29 Nisan 1995, Şanlıurfa, Türkiye, 304-316 s.
- Azeez, O.H., Kheder, A.E., 2012, Effect of *Gundelia tournefortii* on some Biochemical Parameters in Dexamethasone-Induced Hyperglycemic and Hyperlipidemic Mice, *Iraqi Journal of Veterinary Sciences*, 26(2): 73-79.
- Bolu, H., 2002, Güneydoğu Anadolu Bölgesi Antepfıstığı Alanlarındaki Böcek ve Akar Faunasının Saptanması, *Türk. entomol. derg.*, 26 (3): 197-208.
- Bolu, H., Özgen, İ., Fent, M., 2006, Diyarbakır, Elâzığ ve Mardin İlleri Badem Ağaçlarında Bulunan Pentatomidae (Heteroptera) Türleri, *Yüzüncü Yıl Üniversitesi, Ziraat Fakültesi, Tarım Bilimleri Dergisi*, 16 (1): 25-28.
- Çelik, H., Bolu, H., 2023, Kenger (*Gundelia* spp.) Bitkisinde Beslenen İlk Kayıt Sternorrhyncha (Hemiptera) Türleri; *Rachycaudus cardui*, *Brachycaudus helichrysi*, *Protaphis middletonii* (Aphididae) ve *Trionymus multiorus* (Pseudococcidae), *International Dicle Scientific Research and Innovation Congress*, 9 Eylül 2023, Diyarbakır, 270-280 s.
- Çoruh, N., Sağdıçoğlu Celep, A.G., Özgökçe, F., İşcan, M., 2007, Antioxidant Capacities of *Gundelia tournefortii* L. Extracts and Inhibition on Glutathione-S-Transferase Activity, *Food Chemistry*, 100(3): 1249-1253.
- Demir, A., 2013, Sürdürülebilir Gelişmede Yükselen Değer; Biyolojik Çeşitlilik Açısından Türkiye Değerlendirilmesi, *İstanbul Ticaret Üniversitesi Fen Bilimleri Dergisi*, 12(24): 67-74.
- Erinç, S., 1971, Jeomorfoloji II. (Genişletilmiş 2. baskı) İst. Üni. Coğrafya Enstitüsü yay., no 23. 496 pp.

- Ertekin, S., 2002, Karacadağ Bitki Çeşitliliği, Sürdürülebilir Kırsal ve Kentsel Kalkınma Derneği, Diyarbakır, 117 pp..
- Fent, M. & Dursun, A., 2022. An up-to-date checklist of Turkish Pentatomidae (Hemiptera: Heteroptera) with additional records. *Trakya Univ J Nat Sci*, 23 (Special Issue): S65-S111, DOI: 10.23902/trkjnat.1123152.
- Gözüaçık, C., Fent, M., 2012, Güneydoğu Anadolu Bölgesi'nde Scutelleridae (Hemiptera) Faunası Üzerinde Araştırmalar, *Bitki Koruma Bülteni*, 52(4): 313- 323.
- Gözüaçık, C., Fent, M., Özgen, İ., 2011, Güneydoğu Anadolu Bölgesi Pentatomidae (Hemiptera: Heteroptera) faunasına katkılar. *Türk. entomol. bült.*, 1 (4): 235-252.
- Haghi, G., Hatami, A., Arshi, R., 2011, Distribution of caffeic acid derivatives in *Gundelia tournefortii* L., *Food Chemistry*, 124: 1029-1035.
- Kaplan, C., Büyük, M., Eren, S., 2011, Güneydoğu Anadolu Bölgesi zeytin bahçelerinde saptanan zararlı ve faydalı böcek türleri. *Bitki Koruma Bülteni*, 51(3): 267-275.
- Karaat, Ş., 1986, Doğu ve Güneydoğu Anadolu Bölgelerinde Tütün (*Nicotiana tabacum* (L.))'de Zararlı Olan Böcek Türleri, Tanınmaları Yayılış Alanları ve Zararları Üzerinde Araştırmalar, *Diyarbakır Ziraat Mücadele Araştırma Enstitüsü Araştırma Eserleri Serisi*, 4: 26-34.
- Lodos, N., 1961, Türkiye, Irak, İran ve Suriye' de Süne (*Eurygaster integriceps* Put.) Problemi Üzerinde İncelemeler. (Yayıllığı, Zararları, Biyolojisi, Parazitleri ve Savaşı), *Ege Üniversitesi Ziraat Fakültesi Dergisi*, 51: 115 pp.
- Lodos, N., Önder, F., Pehlivan, E., Atalay, R., Erkin, E., Karsavuran, Y., Tezcan, S., Aksoy, S., 1998, Faunistic Studies on Pentatomoidea (Plataspidae, Acanthosomatidae, Cydnidae, Scutelleridae, Pentatomidae) of Western Black Sea, Central Anatolia And Mediterranean Regions of Turkey. Project Numbers: TOAG/336 & 502. Ege Üniversitesi Basımevi, Bornova, İzmir, 75 pp.
- Lodos, N., Önder, F., Şimşek, Z., 1984, Diyarbakır (Karacadağ)' da Süne (*Eurygaster integriceps* Put.) (Heteroptera: Scutelleridae)' nin Ovalara Göç Ettiği Dönemde Kışlak Böcek Faunasının Tespiti ve Süne ile Bazı Türlerin Kışlak Yerlerinden Çıkış ve Göç Etme Davranışları Üzerinde Araştırmalar (II), *Bitki Koruma Bülteni*, 24 (2): 75-87.
- Matocq, A., Pluot-Sigwalt, D., Özgen, İ., 2014, Terrestrial Hemiptera (Heteroptera) Collected in South-East Anatolia (Diyarbakır, Mardin And Elâzığ Provinces) (Turkey): Second List., *Mun. Ent. Zool.*, 9 (2): 884-930.
- Önder, F., Adıgüzel, N., 1979, Some Heteroptera Collected by Light Trap in Diyarbakır (Turkey), *Türkiye Bitki Koruma Dergisi*, 3 (1): 25-34.
- Önder, F., Karsavuran, Y., Pehlivan, E., Turanlı, F., 1995. Güneydoğu Anadolu Projesi (GAP) Uygulama Alanında Saptanan Pentatomidae (Heteroptera) Türleriyle İlgili Bir Değerlendirme, *GAP Bölgesindeki Bitki Koruma Sorunları ve Çözüm Önerileri Sempozyumu*, 27-29 Nisan, 1995, Şanlıurfa, Türkiye, S. 120-130.
- Önder, F., Karsavuran, Y., Tezcan, S., Fent, M., 2006, *Türkiye Heteroptera (Insecta) Kataloğu*, Ege Üniversitesi Ziraat Fakültesi, İzmir, 164 pp.
- Özdikmen, H., 2003, The Genus *Cortodera* Mulsant, 1863 (Cerambycidae: Coleoptera) in Turkey, *Phytoparasitica*, 31(5):433-441.
- Özgen, İ., Gözüaçık, C., Karsavuran, Y., Fent, M., 2005a, Güneydoğu Anadolu Bölgesi Buğday Alanlarında Bulunan Pentatomidae (Heteroptera) Familyasına Ait Türler Üzerinde Araştırmalar, *Türkiye Entomoloji Dergisi*, 42 (2):35-43.
- Özgen, İ., Gözüaçık, C., Karsavuran, Y., Fent, M., 2005b, Doğu ve Güneydoğu Anadolu Bölgesi'nde Antepfıstığı, Kayısı, Kiraz ve Zeytin Ağaçlarında Bulunan Pentatomidae (Heteroptera) Familyasına Ait Türlerin Saptanması Üzerinde Çalışmalar, *Ege Üniversite Ziraat Fakültesi Dergisi*, 42 (2): 35-43.
- Pirinç, V., Yakacı, M., Toncer, Ö., 2014, Kenger (*Gundelia tournefortii* L.)'in Genel Özellikleri ve

- Yetiştiriciliği, 5. Uluslararası Katılımlı Tohumculuk Kongresi, 19-23, Eylül, Diyarbakır, 650-655.
- Polat, R., Çakılcıoğlu, U., Ertuğ, F., Satıl, F., 2012, An Evaluation of Ethnobotanical Studies in Eastern Anatolia, *Biological Diversity and Conservation*, 5(2): 23-40.
- Saeidi, K., 2012, Biology of *Euxoa agricola* Boisduval, 1829 (Lep. Noctuidae) in Yasouj Iran, *Australian Journal of Basic and Applied Science*.
- Samani, M.A., Kopaei, M.R., Azimi, N., 2013, *Gundelia*: A Systematic Review of Medicinal and Molecular Perspective, *Pakistan Journal of Biological Sciences*, 16 (21): 1238-1247.
- Say, D., Güzeler, N., 2016, Süt Pıhtılaştırılmasında Kullanılan Bazı Bitkiler, *Neuşehir Bilim ve Teknoloji Dergisi*, Özel Sayı, 253-261.
- Tabibian, M., Nasri, S., Kerishchi, P., Amin, G., 2013, The Effect of *Gundelia Tournefortii* Hydro-Alcoholic Extract on Sperm Motility and Testosterone Serum Concentration in Mice, Zahedan, *Journal of Research in Medical Sciences*, 15(8): 18-21.
- Yüksel, M., 1968, Güney ve Güneydoğu Anadolu'da Süne (*Eurygaster integriceps* Put.)'nin Yayılışı, Biyolojisi, Ekolojisi, Epidemiolojisi ve Zararı Üzerinde Araştırmalar, T.C. Tarım Bakanlığı Zirai Müc. ve Kar. Gn. Md. Yayınları No: 46, Teknik Bülten, Yenidesen Matb., Ankara, 255 s.