

## A study on the Bryocorinae, Deraeocorinae, Orthotylinae and Phylinae subfamilies (Hemiptera: Heteroptera: Miridae) fauna of Amasya Province, Türkiye

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**ABSTRACT:** As a result of the evaluation of Miridae samples collected from Amasya Province in 2021 and 2022, 19 species belonging to 10 genera from 4 subfamilies were identified. 3 species of Bryocorinae, 5 species of Deraeocorinae, 4 species of Orthotylinae and 7 species of Phylinae subfamilies were recorded. Of those, 18 species are new records for the Amasya province. The first exact locality record for *Deraeocoris punctum* (Rambur, 1839) was given in this study, and this finding confirmed the presence of the species in Türkiye and its distribution in Asia. *Halticus pusillus* and *Orthotylus moncreaffi* are recorded for the first time in the Black Sea Region of Türkiye. *Dicyphus hyalinipennis*, *Deraeocoris punctulatus*, *Halticus luteicollis*, *Campylomma verbasci*, *Orthonotus rufifrons*, *Plagiognathus chrysanthemi*, *Plagiognathus fulvipennis* and *Psallus varians* were determined as new records for the Miridae fauna of the Central Black Sea Region. In addition to the Distributions of the Miridae species in Türkiye and in the Palearctic region, their chorotypes were also determined. According to the chorotypes analysis, the species of the Bryocorinae, Deraeocorinae, Orthotylinae and Phylinae subfamilies from Amasya are divided into 7 categories: as Holoarctic (31,57%), Turano-European (26,32 %), Europeo-Mediterranean (10,53 %), Mediterranean (10,53 %), West Palearctic (10,53 %), European (5,26 %) and Palearctic (5,26 %).

**KEYWORDS:** Bryocorinae, Deraeocorinae, Orthotylinae, Phylinae, additional records, Amasya.

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## INTRODUCTION

The suborder Heteroptera Latreille, 1810 classified under the order Hemiptera Linnaeus 1758, which includes terrestrial, aquatic, and semi-aquatic species exhibiting a wide variety of feeding habits, including phytophagous, zoophagous, zoophytophagous, mycophagous, and hematophagous, is very rich in species (Çerçi et al., 2024). The suborder Heteroptera currently comprises 45.000 described species in 24 superfamilies belonging to seven infraorders and is distributed across the world (Henry, 2017). There are numerous studies on the suborder Heteroptera in Türkiye, and as a result of these studies, the current number of species in the suborder Heteroptera has been determined to be 1639 (Çerçi et al., 2024; Yazıcı & Bal, 2025; Dursun & Fent, 2025).

The Miridae family contains the richest species within the Heteroptera suborder. The family consists entirely of terrestrial species and has 11,500 species in 1,400 genera within eight subfamilies known in the Palearctic region (Kerzhner & Josifov, 1999; Henry, 2017). The largest number of species in the Turkish Heteroptera fauna belongs to the Miridae family. Based on a review of recent publications, 609 Miridae species have been recorded in Türkiye (Çerçi & Koçak, 2016; Çerçi et al. 2018; 2019; 2020; 2021; 2022; 2024; Tezcan, 2020; Yazıcı & Bal, 2025).

Although the Bryocorinae, Deraeocorinae, Orthotylinae and Phylinae subfamilies are not particularly species-rich as the Mirinae subfamily, several members exhibit remarkably broad distributions. As a result of the studies conducted with the Miridae family in Türkiye, Bryocorinae subfamily by 24 species belonging to 6 genera, Deraeocorinae subfamily by 20 species belonging to 5 genera, Orthotylinae subfamily by 115 species belonging to 31 genera and Phylinae by 200 species belonging to 79 genera (Çerçi et al., 2024).

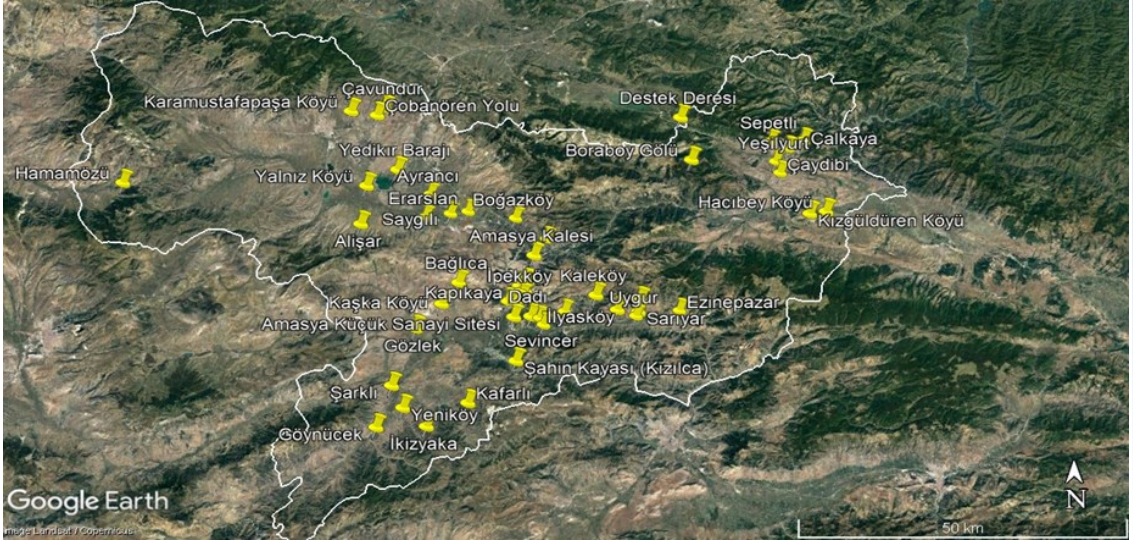
The subfamilies Bryocorinae and Deraeocorinae, within the family Miridae, include phytophagous, zoophytophagous, and carnivorous species. The species of Bryocorinae and Deraeocorine, especially Dicyphini (Bryocorinae) tribe members, are very important as biological control agents in agriculture and forest ecosystems. The species of the Deraeocorinae subfamily is primarily predatory but may also feed on stinging nettles. In case of lack of prey insects, they can also attack other predators and cannibalism is observed (Sanchez & Cassis, 2018). Önder and Lodos (1987) reported that all individuals of the subfamily Deraeocorinae found in Türkiye are predators. They generally attack non-chitinous soft-bodied insects. They feed on adults and nymphs of aphids (Hemiptera: Aphididae) and leafhoppers (Hemiptera: Psyllidae), immature Lepidopteran larvae, and mites (Arachnida). They also have a wide variety of plant preferences (Yazıcı, 2015).

Due to its location in the Black Sea Region, Amasya is known to have rich flora and fauna (Dursun, 2011). Until this study, there had been no specific studies of the Bryocorinae, Deraeocorinae, Orthotylinae and Phylinae subfamilies in Amasya province. This study aimed to investigate the Bryocorinae, Deraeocorinae, Orthotylinae and Phylinae subfamilies fauna of the area in detail, and with the findings obtained, contribute to future studies. In the present study, the Bryocorinae, Deraeocorinae, Orthotylinae and Phylinae subfamilies of the Miridae family fauna of Amasya province, new additional records and chorotypical information for taxa are presented.

## MATERIAL AND METHODS

The specimens of Bryocorinae, Deraeocorinae, Orthotylinae and Phylinae subfamilies (Hemiptera: Heteroptera: Miridae) were collected from herbaceous vegetation and

above ground with a sweep net and from trees with a Japanese umbrella from 38 localities with different vegetation and habitat in Amasya province in the years from 2021 to 2022 (Fig. 1). Research material were put in tubes in 70% ethanol and brought to the laboratory. In the laboratory, specimens were softened in hot water (80°C-100°C) for preparation of the male genitalia, which was used for further identifications. The specimens were prepared and identified using the relevant diagnostic were investigated under a stereomicroscope (Leica EZ4) and keys of Stichel (1957-1962) and Wagner (1970/71). In determining the Chorotypes of the species, Vigna Taglianti et al. (1999) were used. The material is deposited in the collection of Amasya University, School of Technical Sciences, Department of Health Information Systems (Amasya, Turkiye).



**Figure 1.** The study field and sampling localities (from Google Earth 2025).

## RESULTS

### Hemiptera Linnaeus, 1758

### Heteroptera Latreille, 1810

### Miridae Hahn, 1833

### Bryocorinae Carvalho, 1957

### Genus: *Dicyphus* Fieber, 1858

### *Dicyphus errans* (Wolff, 1804)

**Material examined:** Amasya: Çalkaya, 27.05.2021, 1♂; Gümüşhacıköy: Gümüş, 07.09.2021, 1♀; Gümüş-Maden, 07.09.2021, 1♀.

**Distribution in Türkiye:** Adapazarı, Artvin, Bursa, Çankırı, Çorum, Düzce, Erzincan, Hatay, Iğdır, İstanbul, İzmir, Kastamonu, Kars, Kayseri, Kocaeli, Konya, Nevşehir, Osmaniye, Sakarya (Önder et al., 1981, 2006; Lodos et al., 2003; Yazıcı & Bal, 2025).

**Distribution in the Palearctic Region: Europe:** Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Denmark, Estonia, France, Germany, Greece,

Hungary, Ireland, Italy, Liechtenstein, Luxembourg, Malta, Moldova, North Macedonia, Norway, Poland, Portugal, Romania, Russia (Central and Southern Europe), Serbia, Slovenia, Spain, Sweden, Switzerland, Türkiye, Ukraine, United Kingdom. **Asia:** Armenia, Azerbaijan, Georgia, Türkiye. **Extralimital:** West Africa (Kerzhner & Josifov, 1999; Aukema et al., 2013; Heckmann et al., 2015).

**Note:** This zoophytophagous species is recorded for the first time in Amasya province and it is rarely distributed in Amasya. Chorotype: West Palearctic.

### ***Dicyphus hyalinipennis* (Burmeister, 1835)**

**Material examined:** Ormanbağları, 09.09.2021, 2♀♀; Gümüşhacıköy: Gümüş-Maden, 07.09.2021, 1♀, 1♂; Göynücek: İkizyaka, 03.09.2021, 1♀.

**Distribution in Türkiye:** Antalya, Adana, Artvin, İzmir, Kırşehir, Kocaeli, Manisa, Mersin (Lodos et al., 2003; Önder et al., 2006).

**Distribution in the Palearctic Region: Europe:** Andorra, Austria, Belgium, Croatia, France, Germany, Greece, Hungary, Italy, Liechtenstein, Luxembourg, Malta, Poland, Romania, Russia (Southern Europe), Serbia, Slovakia, Spain, Switzerland, Ukraine. **North Africa:** Algeria, Madeira, Morocco. **Asia:** Azerbaijan (?), Cyprus, Iraq, Russia, Türkiye. (Kerzhner & Josifov, 1999; Aukema et al., 2013).

**Note:** This zoophytophagous species is a new record for both the Amasya province and the central Black Sea region and is rarely distributed in Amasya. Chorotype: West Palearctic.

### **Genus: *Macrolophus* Fieber, 1858**

#### ***Macrolophus costalis* Fieber, 1858**

**Material examined:** Centrum: Gözlek, 03.09.2021, 1♂.

**Distribution in Türkiye:** Aksaray, Ankara, Antalya, Artvin, Bilecik, Bursa, Çankırı, Çorum, Düzce, Erzurum, Eskişehir, Hatay, İzmir, Kahramanmaraş, Kastamonu, Kayseri, Kırıkkale, Kırşehir, Konya, Kütahya, Nevşehir, Niğde, Osmaniye, Sinop, Şanlıurfa, Zonguldak (Lodos et al., 2003; Önder et al., 2006; Yazıcı et al., 2019).

**Distribution in the Palearctic Region: Europe:** Albania, Bulgaria, Croatia, France, Greece, Italy, North Macedonia, Portugal, Romania, Serbia, Spain, Switzerland, Türkiye (European part), Ukraine. **North Africa:** Tunisia. **Asia:** Armenia, Cyprus, Georgia, Israel, Jordan, Lebanon, Türkiye (Asian part) (Kerzhner & Josifov, 1999; Aukema et al., 2013).

**Note:** This predatory species is a new record for Amasya. This species, which is widely distributed in Türkiye, was detected in a single locality in Amasya. Chorotype: European.

### **Deraeocorinae Douglas & Scott, 1865**

#### **Genus: *Deraeocoris* Kirschbaum, 1856**

#### ***Deraeocoris punctulatus* (Fallén, 1807)**

**Material examined:** Centrum: İpekköy, 18.06.2022, 3♀♀, 3♂♂; Karasenir, 09.09.2021, 1♂; Tatar, 22.06.2022, 1♀, 1♂; Saryar, 22.06.2022, 1♀; Uygur, 19.05.2021, 2♀♀, 14♂♂; Gözlek, 03.09.2021, 2♂♂, 8♀♀. Suluova: Yüzbeyi, 28.06.2021, 1♂.

**Distribution in Türkiye:** Adana, Afyon, Ağrı, Ankara, Antalya, Artvin, Aydın, Balıkesir, Burdur, Bursa, Çankırı, Çanakkale, Denizli, Diyarbakır, Düzce, Edirne, Elazığ, Erzincan, Erzurum, Eskişehir, Gaziantep, Gümüşhane, Hatay, Isparta, İçel, İzmir, Kahramanmaraş, Kayseri, Kırklareli, Konya, Kütahya, Mardin, Muğla, Rize, Siirt, Sakarya, Trabzon, Van (Önder, 1976; Önder et al., 1998, 2006; Lodos et al., 2003; Tezcan et al., 2010; Matocq & Özgen, 2010; Matocq et al., 2014; Yazıcı et al., 2019; Çerçi & Özgen, 2021; Yazıcı & Bal, 2025).

**Distribution in the Palearctic Region: Europe:** Albania, Austria, Belgium, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Italy, Kazakhstan, Latvia, Liechtenstein, Lithuania, Moldova, Poland, Romania, Russia (Central and Southern Europe), Slovakia, Slovenia, Switzerland, Türkiye, Ukraine. **North Africa:** Canary Islands, Madeira Island. **Asia:** Afghanistan, Armenia, Azerbaijan, China (Northeast, North, Northwest, Southwest, and South regions), Cyprus, Iran, Iraq, Kazakhstan, Korea, Kyrgyzstan, Mongolia, Russia (Western, Eastern, and Far Eastern Siberia regions), Syria, Tajikistan, Türkiye, Turkmenistan, Uzbekistan. **Extralimital:** North America (Alaska, Canada) (Wagner, 1970-71; Kerzhner & Josifov, 1999; Aukema et al., 2013).

**Note:** This species is a new record for the Middle black sea region and it is widely for both in the research area and in Türkiye. Chorotype: Holarctic.

### ***Deraeocoris serenus* (Douglas & Scott 1868)**

**Material examined:** Centrum: İlyasköy, 05.07.2021, 2♀♀, 1♂; Sevincer, 05.07.2021, 3♀♀, 8♂♂; Sanayi Sitesi, 24.08.2021, 2♂♂; Uygur, 19.05.2021, 2♂♂; Dadıköy, 21.04.2021, 2♂♂; Serçoban, 25.08.2021, 1♀, 09.09.2021, 1♂; Karasenir, 09.09.2021, 1♀, 4♂♂; Koza Mahallesi, 09.09.2021, 5♀♀, 5♂♂; 17.09.2022, 2♂♂; Mahmatlar, 05.07.2021, 5♀♀, 1♂; Gözlek, 03.09.2021, 7♀♀, 1♂; Boğazköy, 28.06.2021, 1♀; 18.05.2021, 1♂; Keşlik, 22.06.2022, 1♂; Ezinepazar, 22.06.2022, 1♀; İpekköy, 12.09.2021, 1♀, 18.06.2022, 1♂; Tatar, 22.06.2022, 1♀; Helvacı Mahallesi, 29.07.2022, 1♂; Bağlıca, 26.07.2022, 1♀, 1♂. Göynücek: Centrum, 03.09.2021, 8♀♀, 6♂♂; İkiyaka, 03.09.2021, 1♀, 1♂. Suluova: Eraslan, 28.06.2021, 2♂♂; Saygılı, 28.06.2021, 3♀♀, 1♂; Yüzbeyi, 28.06.2021, 4♀♀, 3♂♂; Deveci, 20.08.2021, 1♂. Gümüşhacıköy: Yeniköy, 03.09.2021, 1♀, 1♂. Taşova: Kızılgüdüren Köyü, 10.07.2021, 1♀; Hacıbey Köyü, 10.07.2021, 1♂. Merzifon: Aktarla, 20.08.2021, 2♀♀, 11♂♂.

**Distribution in Türkiye:** Adana, Ankara, Antalya, Afyonkarahisar, Ağrı, Artvin, Aydın, Balıkesir, Bilecik, Burdur, Bursa, Bolu, Çankırı, Çanakkale, Çorum, Denizli, Diyarbakır, Düzce, Eskişehir, Edirne, Elazığ, Erzurum, Gaziantep, Hatay, Hakkâri, İstanbul, İzmir, Karabük, Karaman, Kahramanmaraş, Kastamonu, Kayseri, Kırşehir, Kırklareli, Kilis, Kocaeli, Konya, Kütahya, Sakarya, Malatya, Manisa, Mardin, Muğla, Mersin, Nevşehir, Niğde, Sinop, Tekirdağ, Uşak, Van, Yozgat (Yaşarakıncı & Hıncal, 2000; Tezcan & Önder, 2003; Lodos et al., 2003; Önder et al., 2006; Tezcan et al., 2010; Fent, 2011; Matocq et al., 2014; Yazıcı et al., 2019; Özgen et al., 2020; Çerçi & Özgen, 2021; Yazıcı & Bal, 2025).

**Distribution in the Palearctic Region: Europe:** Albania, Andorra, Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, France, Germany, Greece,

Hungary, Italy, Kazakhstan (!), Malta, Moldova, Montenegro, North Macedonia, Portugal, Romania, Russia (Southern Europe), Serbia, Slovakia, Slovenia, Spain, Switzerland, Türkiye, Ukraine. **North Africa:** Algeria, Canary Islands, Egypt, Libya, Madeira, Morocco, Tunisia. **Asia:** Armenia, Azerbaijan, China (Northern and North-western regions), Cyprus, Iran, Iraq, Israel, Jordan, Kazakhstan, Kyrgyzstan, Lebanon, Mongolia (?), Saudi Arabia, Syria, Tajikistan, Türkiye, Turkmenistan, Uzbekistan (Kerzhner & Josifov, 1999; Goula & Serra, 2010; Aukema et. al., 2013).

**Note:** This species is a new record for Amasya province. It is widely in both the research area and in Türkiye. Chorotype: Palearctic.

### ***Deraeocoris punctum* (Rambur, 1839)**

**Material examined:** Centrum: Sazköy, 22.05.2022 1♂.

**Distribution in Türkiye:** This species is mentioned without locality (Önder et. al., 2006; Çerçi et al., 2024).

**Distribution in the Palearctic Region: Europe:** France, Italy, Malta, Portugal, Serbia, Spain. **North Africa:** Algeria, Azores, Canary Islands, Madeira, Tunisia. **Asia:** Türkiye (Kerzhner & Josifov, 1999; Önder et. al., 2006; Aukema et. al., 2013).

**Note:** In this study, the real locality record of this species is given for the first time from Türkiye. Chorotype: Mediterranean.

### ***Deraeocoris ruber* (Linnaeus, 1758)**

**Material examined:** Centrum: Harşena Kalesi, 29.04.2022, 1♀; Tatar, 22.06.2022, 1♂; İpekköy, 18.06.2022, 2♂♂.

**Distribution in Türkiye:** Ankara, Antalya, Bartın, Bursa, Burdur, Bolu, Çankırı, Denizli, Düzce, Erzincan, Eskişehir, Erzurum, Gümüşhane, İstanbul, İzmir, Karabük, Karaman, Kastamonu, Kütahya, Samsun, Sakarya, Zonguldak (Önder, 1976; Önder et al., 1998, 2006; Lodos et al., 2003; Yazıcı, 2015; Kaçar & Dursun, 2022).

**Distribution in the Palearctic Region: Europe:** Albania, Andorra, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Liechtenstein, Luxembourg, Moldova, Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Russia (Central, Northern, and Southern Europe), Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye, Ukraine. **North Africa:** Algeria, Canary Islands, Egypt. **Asia:** Azerbaijan, Türkiye. **Extralimital:** Brazil, North America (Wagner, 1970-71; Kerzhner & Josifov, 1999; Goula & Serra 2010; Aukema et al., 2013; Luis, 2013; Heckmann et.al., 2015).

**Note:** This species is a new record for Amasya province. Although it is rarely distributed in the research area, it is quite widely distributed in our country. Chorotype: Holarctic.

### ***Deraeocoris rutilus* (Herrich-Schäffer, 1838)**

**Material examined:** Taşova: Gürsu Barajı, 27.05.2021, 1♂, 1♀.

**Distribution in Türkiye:** Adana, Amasya, Ankara, Antalya, Aydın, Balıkesir, Bilecik,

Bolu, Burdur, Bursa, Çanakkale, Çankırı, Çorum, Denizli, Diyarbakır, Düzce, Elazığ, Erzincan, Erzurum, Eskişehir, Gaziantep, Gümüşhane, Hatay, İstanbul, İzmir, Isparta, Kahramanmaraş, Karabük, Karaman, Kastamonu, Kayseri, Kırklareli, Kırşehir, Kilis, Kocaeli, Konya, Kütahya, Manisa, Mardin, Muğla, Muş, Nevşehir, Osmaniye, Sakarya, Siirt, Sinop, Tekirdağ, Tokat, Uşak (Önder, 1976; Önder et al., 1981, 1998; Kıyak, 1990; Öz Saraç & Kıyak, 2001; Lodos et al., 2003; Tezcan & Önder, 2003; Kıyak et al., 2004; Kıyak & Akar, 2010; Tezcan et al., 2010; Matocq et al., 2014; Yazıcı, 2015; Kaçar, 2019; Çerçi & Özgen, 2021; Kaçar & Dursun, 2022; Yazıcı & Bal, 2025).

**Distribution in the Palearctic Region: Europe:** Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Hungary, Italy, Montenegro, North Macedonia, Poland, Romania, Russia (Southern Europe region), Serbia, Slovakia, Slovenia, Türkiye, Ukraine. **Asia:** Azerbaijan, Cyprus, Georgia, Iran, Iraq, Israel, Jordan, Lebanon, Syria, Türkiye (Wagner, 1970-71; Kerzhner & Josifov, 1999; Aukema et al., 2013; Küçükbasmacı & Kıyak, 2015; Heckmann et al., 2015).

**Note:** Although this species is rarely distributed in Amasya province, it is quite widely distributed in Türkiye. Chorotype: Europeo-Mediterranean.

### **Orthotylinae Van Duzee, 1916 (1865)**

#### **Genus: *Halticus* Hahn, 1832**

#### ***Halticus luteicollis* (Panzer, 1804)**

**Material examined:** Centrum: Sarıyar, 22.06.2022, 1♀, 4♂♂.

**Distribution in Türkiye:** Adana, Ankara, Balıkesir, Bartın, Bilecik, Bolu, Çanakkale, Çankırı, Düzce, Erzurum, Gaziantep, Hatay, İzmir, Kastamonu, Mersin, Muğla, Zonguldak (Hoberlandt, 1956; Önder, 1976; Önder et al., 1998; 2006; Lodos et al., 2003; Tezcan et al., 2010; Yazıcı, 2015; Yazıcı & Bal, 2025).

**Distribution in the Palearctic Region: Europe:** Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, France, Germany, Greece (Crete), Hungary, Italy, Lithuania, Luxembourg, Moldova, Netherlands, North Macedonia, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom, Ukraine. **North Africa:** Algeria, Morocco, Tunisia. **Asia:** Armenia, Georgia, Türkiye (Kerzhner & Josifov, 1999; Goula & Serra, 2010; Aukema et al., 2013; Heckmann et al., 2015).

**Note:** This species is a new record for the Middle black sea region. Although this species is rarely distributed in the research area, it is quite widely distributed in Türkiye. Chorotype: Europeo-Mediterranean.

#### ***Halticus pusillus* (Herrich-Schaeffer, 1835)**

**Material examined:** Centrum: Mahmatlar, 05.07.2021, 1♀.

**Distribution in Türkiye:** İzmir, Çankırı (Önder et al., 2006; Yazıcı & Bal, 2025).

**Distribution in the Palearctic Region: Europe:** Albania, Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, France, Germany, Greece, Hungary, Italy, Kazakhstan, Moldova, North Macedonia, Poland, Portugal, Russia, Serbia,

Slovakia, Slovenia, Spain, Switzerland, Ukraine. **Asia:** Armenia, China, Kyrgyzstan, Türkiye, Uzbekistan (Kerzhner & Josifov, 1999; Aukema et. al., 2013).

**Note:** This species is a new record for the black sea region and it is rarely distributed both in the research area and in Türkiye. It was collected by using a net on the *Pinus* sp. Chorotype: Turano-European.

### **Genus: *Orthotylus* Fieber, 1858**

#### ***Orthotylus moncreaffi* (Douglas & Scott, 1874)**

**Material examined:** Centrum: Şeyhçui, 22.08.2021, 2♀♀.

**Distribution in Türkiye:** Aydın, Edirne, İzmir, Kayseri, Kırklareli, Kırşehir, Konya (Önder et al., 2006).

**Distribution in the Palearctic Region: Europe:** Belgium, Denmark, France, Greece, Italy, Moldova, Netherlands, Portugal, Romania, Spain, Türkiye, United Kingdom. **North Africa:** Algeria, Lebanon, Tunisia. **Asia:** Türkiye (Kerzhner & Josifov, 1999).

**Note:** This species is a new record for the black sea region and it is rarely distributed in the research area. Chorotype: Mediterranean.

#### ***Orthotylus nassatus* (Fabricius, 1787)**

**Material examined:** Taşova: Çalkaya, 27.05.2021, 2♂♂.

**Distribution in Türkiye:** Ankara, Antalya, Balıkesir, Bilecik, Bolu, Çorum, Eskişehir, İzmir, Kahramanmaraş, Kastamonu, Kayseri, Konya, Manisa, Mardin, Nevşehir, Niğde (Önder et al., 2006).

**Distribution in the Palearctic Region: Europe:** Austria, Belarus, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Moldova, Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye, United Kingdom. **Asia:** Azerbaijan, China, Armenia, Georgia, Israel, Iran, Kazakhstan, Kyrgyzstan, Uzbekistan, Russia, Türkiye. **Extralimital:** North America (Kerzhner & Josifov, 1999; Aukema et. al., 2013).

**Note:** This species is a new record for Amasya and it is rarely distributed in the research area. Chorotype: Holarctic.

### **Phylinae Douglas & Scott, 1865**

#### **Genus: *Campylomma* Reuter, 1878**

#### ***Campylomma verbasci* (Meyer-Dür, 1843)**

**Material examined:** Taşova: Hacıbey Köyü, 10.07.2021, 1♀. Göynücek: Centrum, 03.09.2021, 1♂, 2♀♀.

**Distribution in Türkiye:** Adana, Ankara, Antalya, Aydın, Balıkesir, Bolu, Burdur,

Çanakkale, Çankırı, Denizli, Diyarbakır, Edirne, Erzurum, Eskişehir, Gaziantep, Hatay, Isparta, İzmir, Kahramanmaraş, Karaman, Kastamonu, Kayseri, Kırıkkale, Kırşehir, Konya, Mersin, Nevşehir, Niğde, Yozgat, Zonguldak (Önder et al., 2006; Yazıcı, 2015; Yazıcı & Bal, 2025).

**Distribution in the Palearctic Region: Europe:** Albania, Andorra, Austria, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Latvia, Liechtenstein, Luxembourg, Moldova, Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom. **North Africa:** Algeria, Canary Islands, Egypt, Libya, Tunisia. **Asia:** Afghanistan, Armenia, Azerbaijan, China, Cyprus, Georgia, Iran, Israel (!), Jordan, Kazakhstan, Kyrgyzstan, Saudi Arabia (?), Tajikistan, Türkiye, Uzbekistan. **Extralimital:** North America (Kerzhner & Josifov, 1999; Aukema et. al., 2013).

**Note:** This species is a new record for the Middle black sea region and it is rarely distributed in the research area. Chorotype: Holarctic.

### **Genus: *Oncotylus* Fieber, 1858**

#### ***Oncotylus viridiflavus* (Goeze, 1778)**

**Material examined:** Taşova: Kızgüldüren Köyü, 10.07.2021, 1♀, 3♂♂. Hacıbey Köyü, 1♀.

**Distribution in Türkiye:** Adana, Aksaray, Ankara, Antalya, Bursa, Bolu, Çankırı, Çorum, Diyarbakır, Edirne, Erzurum, Eskişehir, Kahramanmaraş, Karaman, Kastamonu, Kayseri, Kırıkkale, Konya, Nevşehir, Niğde, Sakarya, Sinop (Önder et al., 1981; Lodos et al., 2003; Yazıcı, 2015; Dirik & Kıvanç, 2016; Yazıcı & Bal, 2025).

**Distribution in the Palearctic Region: Europe:** Albania, Austria, Belgium, Bulgaria, Croatia, Czech Republic, Estonia, France, Germany, Greece, Hungary, Italy, Lithuania, Luxembourg, Moldova, Netherlands, North Macedonia, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye, Ukraine. **Asia:** Armenia, Azerbaijan, China, Georgia, Türkiye (Kerzhner et. al., 1999; Aukema et. al., 2013).

**Note:** This species is a new record for Amasya and it is rarely distributed in the research area. Chorotype: Turano-European.

### **Genus: *Orthonotus* Stephens, 1829**

#### ***Orthonotus rufifrons* (Fallén, 1807)**

**Material examined:** Centrum: Tatar, 22.06.2022, 2♂♂, 1♀.

**Distribution in Türkiye:** Balıkesir, İzmir, Kastamonu, Kocaeli, Mersin, Sakarya (Önder et al., 2006).

**Distribution in the Palearctic Region: Europe:** Austria, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Liechtenstein, Luxembourg, Moldova, Netherlands, North Macedonia, Norway, Poland, Romania, Russia, Serbia,

Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine, United Kingdom. **Asia:** Armenia, Azerbaijan, Georgia, Iran, Türkiye. (Kerzhner et. al., 1999; Aukema et al., 2013).

**Note:** This species is a new record for the Middle black sea region and it is rarely distributed in the research area. Chorotype: Turano-European.

### **Genus: *Plagiognathus* Fieber, 1858**

#### ***Plagiognathus arbustorum* (Fabricus, 1794)**

**Material examined:** Centrum: Sarıyar, 22.06.2022, 8♀♀.

**Distribution in Türkiye:** Antalya, Balıkesir, Bolu, Çankırı, Düzce, İstanbul, İzmir, Karabük, Kahramanmaraş, Kastamonu, Kocaeli, Kütahya, Mersin, Sinop, Zonguldak (Lodos et al., 2003; Önder et al., 2006); Kastamonu, Çankırı (İlgaz Dağları) (Küçükbasmacı & Kiyak, 2015; Yazıcı & Bal, 2025).

**Distribution in the Palearctic Region: Europe:** Albania, Andorra (?), Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Moldova, Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Switzerland, Turkey, Ukraine, United Kingdom. **North Africa:** Canary Islands. **Asia:** Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Mongolia, Türkiye, Uzbekistan. **Extralimital:** North America (Kerzhner et. al., 1999; Aukema et. al., 2013; Önder et al., 2006).

**Note:** This species is a new record for Amasya province and it is rarely distributed in the research area. Chorotype: Holarctic.

#### ***Plagiognathus chrysanthemi* (Wolff, 1804)**

**Material examined:** Centrum: Sarıyar, 19.05.2021, 1♂; 22.06.2022, 1♀; Keşlik, 22.06.2022, 1♀. Taşova: Arpa Deresi, 27.05.2021, 1♂.

**Distribution in Türkiye:** Adana, Aydın, Antalya, Bursa, Bilecik, Bolu, Denizli, Diyarbakır, Edirne, Erzurum, Gaziantep, Hatay, İçel, İstanbul, İzmir, Kahramanmaraş, Kayseri, Kocaeli, Kütahya, Manisa, Mersin, Muğla, Sakarya, Sivas, Şanlıurfa, (Önder et al., 1981, 2006; Matocq & Özgen, 2010; Tezcan et al., 2010; Matocq et al., 2014; Yazıcı & Yıldırım, 2016; Çerçi & Dursun, 2017; Özgen et al., 2020; Yazıcı & Bal, 2025).

**Distribution in the Palearctic Region: Europe:** Albania, Andorra, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Kazakhstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Moldova, Montenegro, Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom. **Asia:** Armenia, Azerbaijan, China, Georgia, Iran, Iraq, Israel (?), Japan, Korea, Kyrgyzstan, Mongolia, Tajikistan, Turkey, Uzbekistan. **Extralimital:** North America (Kerzhner et. al., 1999; Aukema et. al., 2003).

**Note:** This species is a new record for the Middle black sea region and it is rarely distributed in the research area. Chorotype: Holarctic.

***Plagiognathus fulvipennis* (Kirschbaum, 1856)**

**Material examined:** Centrum: Sarıyar, 22.06.2022, 1♀; Ezinepazar, 22.06.2022, 1♂, 2♀♀.

**Distribution in Türkiye:** Adana, Ankara, Antalya, Denizli, Edirne, Erzurum, Gaziantep, Hatay, Isparta, İzmir, Kahramanmaraş, Kars, Kırklareli, Konya, Kocaeli, Mersin, Muğla, Nevşehir, Osmaniye, Sakarya, (Önder et al., 1981, 2006; Yazıcı, 2015).

**Distribution in the Palearctic Region: Europe:** Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, France, Germany, Greece, Hungary, Italy, Moldova, Netherlands, North Macedonia, Poland, Portugal, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Switzerland, Turkey, Ukraine. **Asia:** Armenia, Azerbaijan, Georgia, Iran, Iraq, Israel, Jordan, Kyrgyzstan (?), Turkey. (Kerzhner & Josifov, 1999; Aukema et. al., 2013).

**Note:** This species is a new record for the Middle black sea region and it is rarely distributed in the research area. Chorotype: Turano-European.

**Genus: *Psallus* Fieber, 1858*****Psallus varians* (Herrich-Schaeffer, 1841)**

**Material examined:** Taşova: Çalkaya, 27.05.2021, 4♀♀, 2♂♂.

**Distribution in Türkiye:** Ankara, Antalya, Bartın, Bursa, Çankırı, Hatay, İzmir, Kahramanmaraş, Karaman, Kastamonu, Kayseri, Kocaeli, Konya, Manisa, Mersin (Önder et al., 2006).

**Distribution in the Palearctic Region: Europe:** Albania, Andorra, Austria, Belarus, Belgium (?), Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Liechtenstein, Luxembourg, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Russia, Slovakia, Spain, Sweden, Switzerland, Ukraine, United Kingdom. **Asia:** Azerbaijan, Georgia, Iran, Türkiye. (Kerzhner & Josifov, 1999; Aukema et. al., 2013).

**Note:** This species is a new record for the Middle black sea region and it is rarely distributed in the research area. Chorotype: Turano-European.

**CONCLUSION AND DISCUSSION**

In this study, the specimens of the subfamilies Bryocorinae, Deraeocorinae, Orthotylinae and Phylinae of the Miridae family were examined from 38 different localities in Amasya and its surroundings between 2021 and 2022. As a result of the determination of the material collected in Amasya province, a total of 19 species belonging to 10 genera in 4 subfamilies, including 3 species belonging to 2 genera of Bryocorinae subfamily, 5 species belonging to 1 genus of Deraeocorinae subfamily, 4 species belonging to 2 genera of Orthotylinae subfamily and 7 species belonging to 5 genera of Phylinae subfamily were recorded. Of those, 18 species are new records for the research area of Amasya.

*Deraeocoris punctum* (Rambur, 1839), a Mediterranean region fauna element, was reported from Türkiye by Kerzhner & Josifov (1999), Önder et al. (2006), Aukema et. al. (2013) and Çerçi et al. (2024) without locality. In this study, the specimen of this species was collected by using a net on the *Juniperus* sp. from Sazköy (Amasya) and

provides the first exact locality and confirms the species presence in Türkiye and its occurrence in Asian.

*Halticus pusillus*, one of the species identified in the research area, was determined to be quite rare in Türkiye. So far, *H. pusillus* has been recorded only from the Aegean Region (İzmir) and the Central Anatolia Region (Çankırı). This study provides the third record for this species. In the study, the rare species *H. pusillus* and *Orthotylus moncreaffi*, which are distributed in the Thrace, Aegean, and Central Anatolia regions of Türkiye, are recorded for the first time in the Black Sea Region of Türkiye.

In the study, *Dicyphus hyalinipennis*, *Deraeocoris punctulatus*, *Halticus luteicollis*, *Campylomma verbasci*, *Orthonotus rufifrons*, *Plagiognathus chrysanthemi*, *Plagiognathus fulvipennis* and *Psallus varians* are also new records for the Miridae fauna of the Central Black Sea region. Of those, *Deraeocoris punctulatus* is widely for both in the research area and in Türkiye. But the other species are rarely distributed in the research area.

In addition to the Distributions of the Miridae species in Türkiye and in the Palearctic region, their chorotypes were also determined. According to the chorotypes analysis the species of the Bryocorinae, Deraeocorinae, Orthotylinae and Phylinae subfamilies from Amasya are divided into 7 categories: as Holarctic (31,57% - *Campylomma verbasci*, *Deraeocoris punctulatus*, *Deraeocoris ruber*, *Orthotylus nassatus*, *Plagiognathus arbustorum* and *Plagiognathus chrysanthemi*), Turano-European (26,32% - *Halticus pusillus*, *Orthonotus rufifrons*, *Oncotylus viridiflavus*, *Plagiognathus fulvipennis* and *Psallus varians*), Europeo-Mediterranean (10,53% - *Deraeocoris rutilus* and *Halticus luteicollis*), Mediterranean (10,53% - *Deraeocoris punctum* and *Orthotylus moncreaffi*), West Palearctic (10,53% - *Dicyphus errans* and *Dicyphus hyalinipennis*), European (5,26% - *Macrolophus costalis*) and Palearctic (5,26% - *Deraeocoris serenus*). According to this analysis, Holarctic is a major group of Amasya province.

All species belonging to the tribe Dicyphini are used as agents of biological control, especially in greenhouses (Matocq et al., 2024).

The species of the detected in Amasya *Dicyphus errans*, *Dicyphus hyalinipennis* and *Macrolophus costalis*, belonging to the tribe Dicyphini, are very rarely distributed in the research area. They are suitable biological control agent for aphids, whiteflies, thrips, and moth eggs and larvae in vegetable crops, particularly the tomato pest *Tuta absoluta* (Meyrick) (Şahin & Keçeci, 2021). Therefore, increasing the population density and expanding the distribution range of the predator species are crucial for biological control.

These data demonstrate the richness of Amasya's fauna. These results may inform future studies on Miridae in Amasya province. As is the case worldwide, our study has also hit the worst recession due to the global COVID-19 pandemic. If the field studies had been done more regularly, more samples could have been found and more species would have been identified.

A review of studies conducted in Amasya reveals that a total of 16 species belonging to the Miridae family have been recorded (Hoberlandt, 1956; Önder, 1976; Kerzhner & Josifov, 1999; Önder et al., 2006). A previous study had added 22 species to the Mirinae subfamily (Tepecik & Dursun, 2023).

Including the 18 species recorded in this study, the Amasya Miridae fauna reaches 56 species.

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