

# The Aphidophagus Coccinellid (Coleoptera: Coccinellidae) Species in Kahramanmaraş, Turkey

M. Murat ASLAN

Department of Plant Protection, Agricultural Faculty, University of Kahramanmaraş - TURKEY

Nedim UYGUN

Department of Plant Protection, Agricultural Faculty, University of Çukurova - TURKEY

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**Abstract:** Aphidophagus coccinellid (Coccinellidae: Coleoptera) species were determined in cultivated and uncultivated fields in Kahramanmaraş. Furthermore, aphid species preyed upon by each coccinellid species were also specified. Adult coccinellids observed feeding on the aphid species were collected by suction tube while immature stages were collected with their preys and cultivated in order to obtain adults.

This study yielded 33 coccinellid species feeding upon 59 aphid species. The most encountered coccinellid species that fed on many aphid species were *Coccinella septempunctata* (L.) 41, *Hippodamia variegata* (Goeze) 19, *Scymnus subvillosus* (Goeze) 15, *Adalia fasciatopunctata revelieri* Muls. 10 and *Oenopia conglobata* (L.) 9. On the other hand, the coccinellid species that fed on only 1 aphid species were *Chilocorus bipustulatus* (L.), *Exochomus quadripustulatus* (L.), *Harmonia quadripunctata* Puntop, *Hyperaspis repensis* (Herbst), *Nephus nigricans* Weise, *Scymnus levaillanti* Muls. and *Stethorus gilvifrons* (Muls.).

**Key Words:** Aphids; coccinellids; survey; Kahramanmaraş; Turkey

## Kahramanmaraş'ın Aphidophag Coccinellidleri (Coleoptera: Coccinellidae)

**Özet:** Bu çalışma, Kahramanmaraş ilinin tarım ve tarım dışı alanlarında bulunan yaprakbiti türleri üzerinde beslenen uğur böceği türleri (Coccinellidae: Coleoptera) belirlenmiş ve hangi uğur böceğinin hangi yaprakbiti üzerinde beslendiğini saptamak amacıyla yapılmıştır. Yaprakbiti üzerinde beslendiği gözlemlenen uğur böceği erginleri emgi şişesi, ergin öncesi bireyler ise avı ile birlikte kültüre alınarak ergin elde edilmiştir.

Yapılan örneklemeler sonucunda 59 farklı yaprakbiti üzerinden, 33 farklı uğur böceği türü elde edilmiştir. Birden fazla yaprakbiti türleri üzerinde bulunan Coccinellid türleri sırasıyla şunlardır; *Coccinella septempunctata* (L.) 41, *Hippodamia variegata* (Goeze) 19, *Scymnus subvillosus* (Goeze) 15, *Adalia fasciatopunctata revelieri* Muls. 10 ve *Oenopia conglobata* (L.) 9 yaprakbiti. Yalnız bir yaprakbiti türü üzerinde bulunan türler şunlardır; *Chilocorus bipustulatus* (L.), *Exochomus quadripustulatus* (L.), *Harmonia quadripunctata* Puntop, *Hyperaspis repensis* (Herbst), *Nephus nigricans* Weise, *Scymnus levaillanti* Muls. ve *Stethorus gilvifrons* (Muls.)'dur.

**Anahtar Sözcükler:** Yaprakbitleri; uğur böcekleri; survey; Kahramanmaraş; Türkiye

## Introduction

Aphids (Homoptera: Aphidoidea) are an economically important group of insects in Turkey, as they are throughout the world. The economic importance of aphids is mostly based on their destructiveness to agricultural and ornamental plants. Aphids belong to the most important agricultural pests worldwide, causing direct damage by plant feeding and indirectly as vectors of plant viruses (Kennedy et al., 1962; Çanakcioğlu,

1975; Carter et al., 1980; Conti, 1985). Aphids are known to have many natural enemies of different taxa. Aphid coccinellids may play a significant role in reducing aphid populations (Emden, 1995). Ladybirds, members of the Coleoptera, are well known insects because of their bright colours and beneficial roles. These beetles are also commonly called lady beetles, ladybugs and coccinellids. Most coccinellid species are carnivores; both adults and larvae are primarily predators of aphids and other insect

pests (Chinery, 1993). There are also true vegetarian coccinellids that feed on a variety of plants (Majerus and Kearns, 1989). They are found in many terrestrial habitats. Presently, there are no endangered coccinellid species, possibly due to their high reproductive capacity (Majerus and Kearns, 1989) and certain protective abilities against predators (Holloway et al., 1993; Marples et al., 1994). However, the numbers and distributions of many coccinellid species in natural populations are declining because of habitat destruction and the use of chemical pesticides (Majerus and Kearns, 1989).

Although Coccinellidae is one of the largest families among insects in terms of number of species, studies carried out in Turkey to determine the fauna and distribution of aphid coccinellids are not complete. However some studies have been carried out in different parts of Turkey (Günther, 1958; Giray, 1970; Anonymous, 1971; Kavut et al., 1974; Süzer, 1975; Soydanbay, 1976; Öncüler, 1977; Soylu and Ürel, 1977; Keleş, 1979; Kreissl and Uygun, 1980; Uygun and Fürsch, 1981; Uygun, 1981; Düzgüneş et al., 1982; Erkin, 1983; Zeren and Düzgüneş, 1983; Çiftçi et al., 1985; Karaat et al., 1986; Özkan, 1986; Zeren, 1989; Öncüler, 1991; Atakan and Özgür, 1994; Elmalı and Toros, 1994; Kiran, 1994; Yumruktepe and Uygun, 1994; Büyük and Özpınar, 1999; Ghavami and Özgür, 1999; Özder and Toros, 1999; Uygun et al., 2000; Ölmez and Ulusoy, 2002). Aphid coccinellid samples on various hosts were collected in different locations (Center, Pazarcık, Narlı, Türkoğlu, Çağlayancerit, Nurhak, Göksun, Afşin, Elbistan, Ekinözü and Andırın) in cultivated and noncultivated areas in Kahramanmaraş province, which is located between the East Mediterranean and Central Anatolia regions of Turkey.

The aim of this study was to determine aphid coccinellids and their range of habitats in the Kahramanmaraş province of Turkey.

## Materials and Methods

Aphid coccinellid samples on various hosts were collected in different locations (Center, Pazarcık, Narlı, Türkoğlu, Çağlayancerit, Nurhak, Göksun, Afşin, Elbistan, Ekinözü and Andırın) in cultivated and noncultivated areas in Kahramanmaraş province between 2000 and 2001.

Specimens were collected randomly from different host plants. Each plant sample was placed separately in a plastic bag and brought to the laboratory where it was identified to species level. A part of the aphids was preserved in 70% ethyl alcohol for later identification. The coccinellids were collected with a standard sweeping net and a hand-held aspirator. Plant samples with aphids containing coccinellid larvae were placed in plastic cages to obtain adult coccinellids. The emerging coccinellids were transferred into a killing jar. Plant and aphid identifications were performed according to the methods described by Davis, (1965-1988) and Remaudiere and Remaudiere, (1997) respectively.

## Review of Coccinellid-Aphid-Plant Associations

All the listed Aphidophagus coccinellid species belong to the Coleoptera; Coccinellidae.

### 1. *Adalia bipunctata* L.

*Aphis affinis* del Guercio; Andırın/Yenicekale, 16.VI.2000, on *Mentha arvensis* L.- *Aphis nerii* Boyer de Fonscolombe; Karacasu, 20.V.2001, on *Nerium oleander* L.- *Hyalopterus pruni* (Geoffroy); Narlı, 26.V.2001, on *Prunus armeniaca* L.- *Brachycaudus schwartzi* (Börner); Çiğce, 18.V.2001, on *Prunus avium* L.- *Hyadaphis tataricae* (Aizenberg); Ahır mountain, 18.V.2001, on *Lonicera tatarica* L.- *Myzus cerasi* (Fabricius); Pazarcık/Bağsağır, 26.V.2001, on *Prunus avium* L.- *Myzus persicae* (Sulzer); Çiğce, 18.V.2001, on *Prunus avium* L.- *Ovatus mentharius* (van der Goot); Andırın/Yenicekale, 16.VI.2000, on *Mentha arvensis* L.- *Aphis punicae* Passerini; Çataloluk, 27.V.2000, on *Punica granatum* L.

### 2. *Adalia decempunctata* L.

*Aphis fabae* Scapoli; Tekir, 27.V.2001, on *Rumex crispus* L.- *Aphis nerii* Boyer de Fonscolombe; Ahır mountain 18.V.2001, on *Nerium oleander* L.- *Aphis pomi* De Geer; Andırın/Yenicekale, 16.VI.2000, on *Malus communis* L.- *Aphis punicae* Passerini; Çataloluk, 27.V. 2000, on *Punica granatum* L.

### 3. *Adalia fasciatopunctata revelieri* Muls.

*Aphis affinis* del Guercio; Andırın/Yenicekale, 16.VI.2000, on *Mentha arvensis* L.- *Aphis nerii* Boyer de Fonscolombe; Karacasu, 20.V.2001, on *Nerium oleander* L.- *Aphis pomi* De Geer;

Andırın/Yenicekale, 16.VI.2000, on *Malus communis* L.- *Aphis punicae* Passerini; Çataloluk, 27.V.2000, on *Punica granatum* L.- *Hyalopterus amygdali* (Blanchard); Güzlek/Ahır mountain, 24.V.2001, on *Amygdalus communis* L.- *Hyalopterus pruni* (Geoffroy); Narlı, 26.V.2001, on *Prunus armeniaca* L.- *Brachycaudus divaricatae* Shaposhnikov; Afşin/Erçene, 02.VI.2001, on *Prunus cerasifera* Ehrh. Ke.- *Dysaphis plantaginea* (Passerini); Pazarcık/Bağsağır, 26.V.2001, on *Malus communis* L.- *Myzus cerasi* (Fabricius); Andırın/İsmailli, 16.VI.2000, on *Prunus avium* L.- *Ovatus mentharius* (van der Goot); Andırın/Yenicekale, 16.VI.2000, on *Mentha arvensis* L.

#### 4. *Hippodamia variegata* (Goeze)

*Aphis affinis* del Guercio; Andırın/Yenicekale, 16.VI.2000, on *Mentha arvensis* L.- *Aphis craccivora* Koch; Tekir, 27.V.2001, on *Galium aparine* L.- *Aphis fabae* Scapoli; Çokyaşar, 25.V.2000, on *Beta vulgaris* L.- *Aphis fabae* Scapoli; Göksun, 11.VIII.2001, on *Helianthus annuus* L.- *Aphis frangulae* Kaltenbach; Narlı, 07.VIII.2001, on *Cucumis sativus* L.- *Aphis gossypii* Glover; Tevekkeli, 11.VIII.2000, on *Hibiscus esculentus* L.- *Aphis nerii* Boyer de Fonscolombe; Karacasu, 20.V.2001 and Pazarcık, 26.V.2001 on *Nerium oleander* L.- *Aphis ruborum* (Börner); Göksun/Fırnız, 19.V.2001, on *Rubus caesius* L.- *Aphis* sp.; Doğankonak, 15.VI.2001, on *Salvia candidissima* subsp. *candidissima*- *Aphis* sp.; Pazarcık, 26.V.2001, on *Tamus* sp.- *Hyalopterus pruni* (Geoffroy); Elbistan, 15.VI.2001, on *Phragmites australis* (Cav.)- *Rhopalosiphum maidis* (Fitch); Elbistan/Akçırı, 14.VIII.2001, on *Zea mays* L.- *Brachycaudus helichrysi* (Kalt.); Çağlayancerit/Belen, 21.VI.2000, on *Achillea millefolium* L.- *Brachycaudus* sp.; Çağlayancerit, 21.VI.2000, on *Eryngium campestre* L.- *Brachycaudus* sp.; Pazarcık, 26.V.2001, on *Tamus* sp.- *Brachycaudus cardui* L.; Güzlek/Ahır mountain, 24.V.2001, on *Carlina cymbosa* L., *Picris* sp., *Carthamus lacucus* L.- *Myzus cerasi* (Fabricius); Pazarcık/Bağsağır, 26. V.2001, on *Prunus avium* L.- *Ovatus mentharius* (van der Goot); Andırın/Yenicekale, 16.VI.2000, on *Mentha arvensis* L.- *Phorodon humuli* (Schrank); Pazarcık, 26.V.2001, *Tamus* sp.- *Uroleucon* sp.; Afşin, 02.VI.2001, on unknown plant.- *Uroleucon* sp.;

Afşin/Erçene, 02.VI.2001, on *Centaurea macrocephala* Muss. Puschk. Ex. Willd.- *Chaitophorus leucomelas* Koch.; Elbistan/Karaaltı, 14.VIII.2001, on *Populus* sp.- *Pemphigus bursarius* (L.); Pazarcık, 26.V.2001, on *Populus* sp.

#### 5. *Chilocorus bipustulatus* L.

*Aphis acetosae* L.; Çataloluk, 27.V.2000, on *Rumex crispus* L.

#### 6. *Coccinella septempunctata* L.

*Aphis acetosae* L.; Çataloluk, 27.V.2000, on *Rumex crispus* L.- *Aphis affinis* Del Guercio; Çağlayancerit, 21.VI.2000, and Andırın/Yenicekale, 16.VI.2000 on *Mentha arvensis* L.- *Aphis craccivora* Koch; Tekir, 27.V.2001, on *Galium aparine* L.- *Aphis euphorbiae* Kaltenbach; Göksun, 15.VI.2001 and 29.VI.2000 on *Euphorbia helioscopia* L.- *Aphis fabae* Scapoli; Center, 01.V.2001, on *Pimpinella* sp.- *Aphis fabae* Scapoli; Tekir, 27.V.2001, on *Rumex crispus* L.- *Aphis fabae* subsp. *cirsiiacanthoidis* Scapoli; Center, 18.V.2001, on *Cirsium arvense* L.- *Aphis fabae* Scapoli; Çokyaşar, 25.V.2000, on *Beta vulgaris* L.- *Aphis frangulae* Kaltenbach; Narlı, 07.VIII.2001, on *Cucumis sativus* L.- *Aphis nerii* Boyer de Fonscolombe; Ahır mountain, Pazarcık and Karacasu, 18.V.2001, 26.V.2001 and 20.V.2001 , on *Nerium oleander* L.- *Aphis ruborum* (Börner); Göksun/Fırnız and Çataloluk and Afşin, 19.V.2001 and 27.V.2000 and 02.VI.2001, on *Rubus caesius* L.- *Aphis* sp.; Sır dam, 29.VI.2000, on *Sambucus nigra* L.- *Aphis* sp.; Doğankonak, 15.VI.2001, on *Salvia candidissima* subsp. *candidissima*- *Hyalopterus amygdali* (Blanchard); Güzlek/Ahır mountain, 24.V.2001, on *Amygdalus communis* L.- *Hyalopterus pruni* (Geoffroy); Döngüle, Gaffarlı and Karacasu, 16.VI.2000, 21.VI.2000 and 20.V.2001, on *Phragmites australis* (Cav.)- *Hyalopterus pruni* (Geoffroy); Narlı, 26.V.2001, on *Prunus armeniaca* L.- *Rhopalosiphum padi* L.; Göksun/Kireç, 15.VI.2001, on *Typha latifolia* L.- *Acyrtosiphon cyparissiane* Koch.; Göksun, 29.VI.2000, on *Euphorbia helioscopia* L.- *Amphorophora rubi* Kaltenbach; Afşin, 02.VI.2001, on *Rubus caesius* L.- *Brachycaudus helichrysi* (Kalt.); Çağlayancerit/Belen and Tekir, 21.VI.2000 and 27.V.2001, on *Achillea millefolium* L.- *Brachycaudus helichrysi* (Kalt.); Hasancık, 16.VI.2000, on *Centaurea solstitialis* L.- *Brachycaudus* sp.; Çağlayancerit, 21.VI.2000, on

*Eryngium campestre* L.- *Brachycaudus* sp.; Pazarcık, 26.V.2001, on *Tamus* sp. *Brachycaudus cardui* L.; Güzlek/Ahır mountain, 24.V.2001, on *Carlina cymbosa* L.- *Brachycaudus cardui* L.; Süleymanlı and Suçatı , 19.V.2001, on *Cicium arvense* L.- *Brachycaudus cardui* L.; Göksun, 15.VI.2001, on *Cirsium acarna* (L.) Moench- *Brachycaudus cardui* L.; Çağlayanerit, 21.VI.2000, on *Gundelia tournefortii* L.- *Brachycaudus cardui* L.; Türkoğlu, 09.V.2001, on *Notobasis syriaca* (L.) Cass.- *Brachycaudus cardui* L.; Kampüs, 19.V.2001, on *Umbellifera-Brachycaudus divaricatae* Shaposhnikov; Afşin/Erçene, 02.VI.2001, on *Prunus cerasifera* Ehrh. Ke.- *Brachycaudus schwartzi* (Börner); Çiğce, 18.V.2001, on *Prunus avium* L.- *Brachycaudus tragopogonis* Kalt.; Türkoğlu/Beyoğlu, 25.V.2000, on unknown plant- *Brachycaudus tragopogonis* Kalt.; Göksun/Yantepe, 02.VI.2001, on *Tropogan pratensis* L., subsp. *orientalis* L.- *Hyadaphis tataricae* (Aizenberg); Ahır mountain, 18.V.2001, on *Lonicera tatarica* L.- *Hyperomyzus lactucae* (L.); Tekir, 19.V.2001, on *Sonchus oleraceus* L.- *Myzus cerasi* (Fabricius); Andırın/İsmailli, 16.VI.2000 and Pazarcık/Bağsağır, 26. V.2001, on *Prunus avium* L.- *Myzus persicae* (Sulzer); Çiğce, 18.V.2001, on *Prunus avium* L.- *Ovatus mentharius* (van der Goot); Andırın/Yenicekale, 16.VI.2000, on *Mentha arvensis* L.- *Phorodon humuli* (Schrank); Pazarcık, 26.V.2001, *Tamus* sp.- *Uroleucon* sp.; Afşin, 02.VI.2001, on unknown plant.- *Uroleucon jaceae* Linnaeus; Çokyaşar, 25.V.2000, on *Carduus nutans* L.- *Uroleucon jaceae* L.; Türkoğlu, 09.V.2001, on *Circium arvense* (L.) Scop.- *Uroleucon* sp.; Afşin/Erçene, 02.VI.2001, on *Centaurea macrocephala* Muss. Puschk. Ex. Willd.- *Cinara cedri* Mimeur; Karacasu, 20.V.2001, on *Cedrus libani* A.Rich- *Cinara* sp.; Süleymanlı, 19.V.2001, on *Pinus brutia* Ten.- *Lachnus roboris* L.; Tekir, 27.V.2001, on *Quercus cerris* var. *cerris* L.- *Tuberolachnus salignus* (Gmelin); Göksun/Değirmendere, 07.VIII.2001 and Andırın/Harbul, 11.VIII.2001, on *Salix triandra* L. subsp. *bornmuelleri* (Hauskn)- *Myzocallis castanicola* Baker; Alaçayır, 27.V.2000, on *Prunus avium* L.- *Pemphigus bursarius* (L.); Pazarcık, 26.V.2001, on *Populus* sp.- *Pemphigus immnis* Buckton; Gaffarlı, 21.VI.2000, on *Populus* sp.- *Pemphigus* sp.; Gaffarlı, 21.VI.2000, on *Phragmites australis* (Cav.)

7. *Coccinella undecimpunctata* L.

*Aphis fabae* Scapoli; Çokyaşar, 25.V.2000, on *Beta vulgaris* L.- *Aphis frangulae* Kaltenbach; Narlı, 07.VIII.2001, on *Cucumis sativus* L.- *Aphis gossypii* Glover; Tevekkeli, 11.VIII.2000, on *Hibiscus esculentus* L.- *Aphis nerii* Boyer de Fonscolombe; Pazarcık, 26.V.2001 on *Nerium oleander* L.- *Hyalopterus pruni* (Geoffroy); Karacasu, 20.V.2001, on *Phragmites australis* (Cav.)

8. *Coccinula quatuordecimpustulata* L.

*Aphis affinis* del Guercio; Andırın/Yenicekale, 16.VI.2000, on *Mentha arvensis* L.- *Aphis euphorbiae* Kaltenbach; Göksun, 29.VI.2000, on *Euphorbia helioscopia- Hyalopterus pruni* (Geoffroy); Döngel, 16.VI.2000, on *Phragmites australis* (Cav.)- *Acyrtosiphon cyparissiane* Koch.; Göksun, 29.VI.2000, on *Euphorbia helioscopia- Myzus cerasi* (Fabricius); Andırın/İsmailli, 16.VI.2000, on *Prunus avium* L.- *Ovatus mentharius* (van der Goot); Andırın/Yenicekale, 16.VI.2000, on *Mentha arvensis* L.

9. *Exochomus nigromaculatus* (Goeze)

*Aphis affinis* del Guercio; Andırın/Yenicekale, 16.VI.2000, on *Mentha arvensis* L.- *Aphis frangulae* Kaltenbach; Narlı, 07.VIII.2001, on *Cucumis sativus* L.- *Ovatus mentharius* (van der Goot); Andırın/Yenicekale, 16.VI.2000, on *Mentha arvensis* L.

10. *Exochomus quadripustulatus* L.

*Cinara cedri* Mimeur; Karacasu, 20.V.2001, on *Cedrus libani* A. Rich

11. *Harmonia quadripunctata* Puntop

*Hyalopterus amygdali* (Blanchard); Güzlek/Ahır mountain, 24.V.2001, on *Amygdalus communis* L.

12. *Hyperaspis femorata* Matschulsky

*Aphis fabae* Scapoli; Göksun, 11.VIII.2001, on *Helianthus annuus* L.- *Aphis* sp.; Sır dam, 29.VI.2000, on *Sambucus nigra* L.

13. *Hyperaspis quadrimaculata* Redten

*Aphis acetosae* L.; Çataloluk, 27.V.2000, on *Rumex crispus* L.- *Brachycaudus helichrysi* (Kalt.); Hasancık, 16.VI.2000, on *Centaurea solstitialis* L.



14. *Hyperaspis repensis* Herbst  
*Aphis fabae* Scapoli; Göksun, 11.VIII.2001, on *Helianthus annus* L.
15. *Myrrha octodecimguttata* L.  
*Aphis affinis* del Guercio; Andırın/Yenicekale, 16.VI.2000, on *Mentha arvensis* L.- *Dysaphis plantaginea* (Passerini); Çataloluk, 27.V.2000, on *Malus communis* L.- *Myzus cerasi* (Fabricius); Pazarcık/Bağsağır, 26.V.2001, on *Prunus avium* L.- *Ovatus mentharius* (van der Goot); Andırın/Yenicekale, 16.VI.2000, on *Mentha arvensis* L.
16. *Nephus nigricans* Weise  
*Brachycaudus helichrysi* (Kalt.); Hasancık, 16.VI.2000, on *Centaurea solstitialis* L.
17. *Oenopia conglobata* (L.)  
*Aphis acetosae* L.; Çataloluk, 27.V.2000, on *Rumex crispus* L.- *Aphis affinis* Del Guercio; Çağlayancerit, 21.VI.2000, on *Mentha arvensis* L.- *Aphis nerii* Boyer de Fonscolombe; Karacasu, 20.V.2001, on *Nerium oleander* L.- *Aphis pomi* De Geer; Andırın/Yenicekale, 16.VI.2000, on *Malus communis*- *Hyalopterus pruni* (Geoffroy); Narlı, 26.V.2001, on *Prunus armeniaca* L.- *Myzus cerasi* (Fabricius); Pazarcık/Bağsağır, 26.V.2001, on *Prunus avium* L.- *Cinara cedri* Mimeur; Karacasu, 20.V.2001, on *Cedrus libani* A. Rich
18. *Oenopia oncina* (Ol)  
*Aphis craccivora* Koch; Tekir, 27.V.2001, on *Galium aparine* L.- *Brachycaudus cardui* L.; Güzlek/Ahır mountain, 24.V.2001, on *Carlina cymbosa* L.- *Macrosiphum* sp.; Güzlek/Ahır mountain, 24.V.2001, *Valerianella orientaklis* Boiss & Ball
19. *Platynaspis luteorubra* (Goeze)  
*Aphis fabae* Scapoli; Göksun/Kireç, 15.VI.2001, on *Centaurea solstitialis*- *Aphis fabae* Scapoli; Göksun, 11.VIII.2001 and Andırın/Harbul, 11.VIII.2001 on *Helianthus annus* L.- *Uroleucon* (*Uromelan*) *jaceae* (L.); Elbistan/Akçırı, 15.VI.2001, on *Centaurea solstitialis* L.
20. *Propylaea quatuordecimpunctata* (L.)  
*Aphis affinis* Del Guercio; Çağlayancerit, 21.VI.2000, on *Mentha arvensis* L.- *Rhopalosiphum maidis* (Fitch); Elbistan/Akçırı, 14.VIII.2001, on *Zea mays* L.- *Capidophorus* sp.; Karaelbistan, 15.VI.2001, on *Artemisia vulgaris* L.- *Macrosiphoniella artemisiae* Boyer de Fonscolombe; Karaelbistan, 15.VI.2001, on *Artemisia vulgaris* L.- *Myzus cerasi* (Fabricius); Andırın/İsmailli, 16.VI.2000, on *Prunus avium* L.
21. *Psyllobora vigintiduopunctata* L.  
*Uroleucon* sp.; Afşin/Erçene, 02.VI.2001, on *Centaurea macrocephala* Muss. Puschk. Ex. Willd.- *Chromaphis juglandicola* (Kalt.); Elbistan, 15.VI.2001, on *Juglans regia* L.
22. *Scymnus apetzii* Mulsant  
*Aphis affinis* del Guercio; Andırın/Yenicekale, 16.VI.2000, on *Mentha arvensis* L.- *Aphis* sp.; Sirdam, 29.VI.2000, on *Sambucus nigra* L.- *Brachycaudus helichrysi* (Kalt.); Tekir, 27.V.2001, on *Achillea millefolium* L.- *Myzus persicae* (Sulzer); Center, 19.VI.2000, *Prunus percica* L.- *Ovatus mentharius* (van der Goot); Andırın/Yenicekale, 16.VI.2000, on *Mentha arvensis* L.- *Pterochloroides persicae* (Cholodkovsky); Merkez, 19.VI.2000, on *Prunus percica* L.
23. *Scymnus bivulneris* Capra  
*Uroleucon* sp.; Afşin/Erçene, 02.VI.2001, on *Centaurea macrocephala* Muss. Puschk. Ex. Willd.
24. *Scymnus frontalis* (Fabricius)  
*Aphis gossypii* Glover; Tevekkeli, 11.VIII.2000, on *Hibiscus esculentus* L.- *Rhopalosiphum padi* L.; Aksu, 06.I.2000, on *Triticum aestivum* L.
25. *Scymnus interruptus* (Goeze)  
*Aphis fabae* subsp. *mordvilkoii* Börner and Janich; Karaelbistan, 15.VI.2001, on *Arctium lappa* L.- *Capidophorus* sp.; Karaelbistan, 15.VI.2001, on *Artemisia vulgaris* L.- *Macrosiphoniella artemisiae* Boyer de Fonscolombe; Karaelbistan, 15.VI.2001, on *Artemisia vulgaris* L.- *Chaitophorus leucomelas* Koch.; Elbistan/Karaaltı, 14.VIII.2001, on *Populus* sp.- *Pemphigus bursarius* (L.); Pazarcık, 26.V.2001, on *Populus* sp.
26. *Scymnus levillanti* Muls.  
*Aphis gossypii* Glover; Tevekkeli, 11.VIII.2000, on *Hibiscus esculentus* L.

**27. *Scymnus mimulus* Capra & Fürsch**

*Rhopalosiphum maidis* (Fitch); Elbistan/Akçırı, 14.VIII.2001, on *Zea mays* L.- *Chaitophorus leucomelas* Koch.; Elbistan/Karaaltı, 14.VIII.2001, on *Populus* sp.- *Pemphigus bursarius* (L.); Pazarcık, 26.V.2001, on *Populus* sp.

**28. *Scymnus pallipediformis* Günther**

*Chaitophorus leucomelas* Koch.; Elbistan/Karaaltı, 14.VIII.2001, on *Populus* sp.- *Pemphigus bursarius* (L.); Pazarcık, 26.V.2001, on *Populus* sp.

**29. *Scymnus quadriguttatus* Fürsch**

*Aphis affinis* del Guercio; Andırın/Yenice kale, 16.VI.2000, on *Mentha arvensis* L.- *Aphis euphorbiae* Kaltenbach; Göksun/Yazıköy, 02.VI.2000, on *Euphorbia peplus* L.- *Aphis sambuci* L.; Çataloluk, 27.V.2001, on *Sambucus ebulus* L.- *Brachycaudus helichrysi* (Kalt.); Hasancık, 16.VI.2000, on *Centaurea solstitialis* L.- *Ovatus mentharius* (van der Goot); Andırın/Yenice kale, 16.VI.2000, on *Mentha arvensis* L.- *Uroleucon (Uromelan) jaceae* (L.); Göksun, 27. V.2001, on *Onopordum anatolicum* (Boiss)

**30. *Scymnus rubromaculatus* (Goeze)**

*Aphis ruborum* (Börner); Afşin, 02.VI.2001, on *Rubus caesius* L.- *Amphorophora rubi* Kaltenbach; Afşin, 02.VI.2001, on *Rubus caesius* L.- *Chaitophorus leucomelas* Koch.; Elbistan/Karaaltı, 14.VIII.2001, on *Populus* sp.- *Pemphigus bursarius* (L.); Pazarcık, 26.V.2001, on *Populus* sp.

**31. *Scymnus subvillosus* (Goeze)**

*Aphis affinis* Del Guercio; Çağlayançerit, 21.VI.2000, on *Mentha arvensis* L.-*Aphis fabae* subsp. *cirsiacanthoidis* Scapoli; Merkez, 18.V.2001, on *Cirsium arvense* L.- *Aphis pomi* De Geer; Andırın/Yenice kale, 16.VI.2000, on *Malus communis* L.- *Aphis punicae* Passerini; Çataloluk, 27.V.2000, on *Punica granatum* L.- *Aphis ruborum* (Börner); Afşin, 02.VI.2001, on *Rubus caesius* L.- *Aphis* sp.; Sır dam, 29.VI.2000, on *Sambucus nigra* L.- *Hyalopterus pruni* (Geoffroy); Pazarcık/Kırnı, 26.V.2001, on *Prunus armeniaca* L.- *Amphorophora rubi* Kaltenbach; Afşin, 02.VI.2001, on *Rubus caesius* L.-*Hyalopterus pruni* (Geoffroy); Narlı, 26.V.2001, on *Prunus armeniaca* L.- *Dysaphis*

*plantaginea* (Passerini); Çataloluk, 27.V.2000, on *Malus communis* L.- *Dysaphis pyri* (B.D. Fancolombe); Çataloluk, 27.V.2000, on *Pinus communis* L.- *Hyadaphis tataricae* (Aizenberg); Ahır mountain, 18.V.2001, on *Lonicera tatarica* L.- *Myzus cerasi* (Fabricius); Pazarcık/Bağsağır, 26.V.2001, on *Prunus avium* L.- *Myzus persicae* (Sulzer); Çiğce, 18.V.2001, on *Prunus avium* L.- *Uroleucon (Uromelan) jaceae* (L.); Göksun, 27.V.2001, on *Onopordum anatolicum* (Boiss)

**32. *Scymnus syriacus* Mars.**

*Aphis* sp.; Sır dam, 29.VI.2000, on *Sambucus nigra* L.

**33. *Stethorus gilvifrons* (Muls.)**

*Aphis affinis* Del Guercio; Çağlayançerit, 21.VI.2000, on *Mentha arvensis* L.

## Discussion

Turkey doubtless requires a special research targeting the coccinellids of aphids. to date, research interest has prevalently focused on individual species of pest aphids or their groups on various crops, but no complex study on coccinellid-aphid-plant associations has been performed. In addition, research on native species as potential biocontrol agents for use abroad warrants support.

Aphid coccinellids were commonly found in the Kahramanmaraş area, which has not been adversely affected yet by the use of pesticides. Our research centered prevalently on fruit trees, ornamental trees and weeds in a variety of habitats between the natural ecosystems. Thus, both aphids and their coccinellids were sampled in non-cultivated areas more than in the other areas. The analysis of the associations includes both pest and indifferent aphid species as well their indicated interactions (switching of coccinellids from one host to another) in the area.

This study yielded 33 coccinellid species feeding upon 59 aphid species. The most encountered coccinellid species and the number of aphid species that were fed on by each coccinellid species were *Coccinella septempunctata* (L.) 41, *Hippodamia variegata* (Goeze) 19, *Scymnus subvillosus* (Goeze) 15, *Adalia fasciatopunctata revelieri* Muls. 10 and *Oenopia conglobata* (L.) 9. On the other hand, the coccinellids that

fed on the least number of aphid species were *Chilocorus bipustulatus* (L.) 1, *Exochomus quadripustulatus* (L.) 1, *Harmonia quadripunctata* Puntop 1, *Hyperaspis repensis* (Herbst) 1, *Nephus nigricans* Weise 1, *Scymnus levaillanti* Muls. 1 and *Stethorus gilvifrons* (Muls.) 1.

This study is hoped to provide a general basis on the aphidophagous coccinellid species for future work.

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