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Determination of the Species of Curculionoidea Superfamily on Alfalfa Fields (*Medicago sativa* L.) and Their Distribution in Bursa Province of Turkey

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ABSTRACT

This study was carried out to determine superfamily species of Curculionoidea which is living in the alfalfa areas of Bursa province of Turkey during 2004-2005. Insect samplings were collected by sweep net over a 7-12 day period, on alfalfa fields. In this study, among determined species, *Hypera postica* (Gyllenhal 1813), *Apion pisi* (Fabricius 1801), *Sitona macularius* (crinitus) (Marsham 1802), *Sitona hispidulus* (Fabricius 1777) and *Sitona humeralis* Stephens 1831 were recorded as important pests and widespread. The most abundance species rates were *Apion pisi* 85.0%, *Hypera postica* 7.2%, *S. humeralis* 3.4%, *S. macularis* 2.1%, *S. hispidulus* 1.3 % respectively. Nonetheless *Sitona lineatus* (Linneaus 1758), *Sitona flavescens* (Marshall 1802), *Ceutorhynchus pallidactylus* (Marsham 1802), *Ceutorhynchus anatolicus* Schultze, 1900, *Phyllobius* sp., *Protapion trifolii* (Linnaeus 1768), *Ceratapion gibbirostre* (Gyllenhal 1813), *Gymnetron rotundicolle* Gyllenhal 1838 were also found in towns of Bursa province. *S. flavescens, Ceutorhynchus pallidactylus, C. anatolicus, Protapion trifolii, C. gibbirostre* were the first record in Bursa province.

Key Words: Alfalfa, Curculionoidae, distribution, Bursa.

INTRODUCTION

Alfalfa (*Medicago sativa*), also known as Lucerne, Purple Medic and Trefoil, is a perennial flowering plant cultivated as an important forage crop. The total amount of alfalfa produced in Bursa is about 71 285 tons (Anonymous 2010a). Many insect species, occuring in different phenological periods damage all parts of alfalfa directly or indirectly and cause economical crop loss. Insects belonging to the superfamily Curculionoidea are among these pests.

Insect pests are a perennial problem that can cause reduced alfalfa productivity. These pests occur at various times of the growing season and reduce forage production in many ways. During the spring and summer months, defoliation is a common form of damage in alfalfa. It is caused by the alfalfa weevil and several larvae (Mulder and Berberet 2010).

Alfalfa weevils from the genera *Sitona*, *Hypera* and *Apion* are important pests of perennial fodder legumes, including lucerne and clover. The damage caused by adults and larvae occurs in different forms. For first year crops, which can be completely destroyed, the most dangerous are characteristic injuries made by *Sitona* adults. In the following years, more significant damage includes injuries of bacterial nodes and roots made by larvae. The damage caused by alfalfa leaf weevil are mostly made by larvae, which feed on stems, buds and leaves and significantly reduce hay yield during mass attack. Adults of the genus *Apion* make numerous tiny holes in leaves and their larvae damage the inside of stems, buds and root neck, resulting in significant losses in the first mowing hay yield (Strbac 2005). After researches in Adiyaman, Agri, Bingol, Bitlis, Elazig, Erzincan, Erzurum, Hakkari, Malatya, Mus, Tunceli and Van cities, Bingol (1978), they showed that 20 species of Curculionidae species make damage in *Medicago sativa*, *Onobrychs sativa* Lam., and *Vicia sativa*. Kivan (1995) was found four *Sitona* species in Tekirdag (European part of Turkiye) during the surveys on cultivated *Medicago* and *Vicia* species. Anay and Kornosor (2000) were recorded *H. postica*, *S. crinitus*, *S. hispidulus* and *S. humeralis* which are economically important species on alfalfa in Adana.

This study includes the basic knowledge on harmful and possible harmful supperfamily species of Curculionoidea which is living in the alfalfa areas of Bursa region. This information is important for the studies in the future and Bursa region Curculionoidea bio-diversification.

MATERIALS AND METHODS

This study was conducted in Bursa province (Northwest of Turkey) during 2004-2005. Insect samplings were conducted over a 7-12 day period, on alfalfa fields in 31 localities of Osmangazi, Nilufer, Inegol, Orhaneli, Karacabey, Mustafakemalpasa, Iznik, Orhangazi, Kestel, Yenisehir and Keles towns, in Bursa. For this purpose, the mentioned locations were visited at different times, because of their various climatic and

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floristic properties. While doing sampling, according to the size of fields. Superfamily species of Curculionoidae which fell were collected by sweep net. In total 3441 specimens were collected using a net trap. Label information of the collected species were then written and pasted to triangle papers, then these species were sent to experts for identification, in order to check if the found species on alfalfa fields were gave pests or not. Alfalfa leaves, stems and roots were collected then brought to the laboratory for larvae examination. In the laboratory, the iner part of stems and roots were opened and notes taken for the larvae characteristics of the pest species. The recorded species are listed alphabetically. Status of species were determined according to the distribution in Bursa province and their presence in the localities.

RESULTS AND DISCUSSION

In this study, information about the distribution of Curculionoidea in alfalfa fields in Bursa province, Turkey, during 2004-2005 are represented. As a result of this study a total of 13 species were found. Among these species, five were important. Their distribution were shown on the map (Fig.1). Other living species on alfalfa fields, which are the main hosts, are weeds and live temporary in alfalfa fields.

Important Species
As a consequence of this study totally 5 species were found to be important. This important species were determined as *Hypera postica* (Gyllenhal 1813), *Apion pisi* (Fabricius 1801), *Sitona macularius* (crinitus) (Marsham 1802), *Sitona hispidulus* (Fabricius 1777) and *Sitona humeralis* Stephens 1831. ***H. postica*** was an important pest at all of the researched locations.

Curculioninae Pierc.

***Hypera postica* (Gyllenhal 1813)**
This species was widely distributed and collected from 20 of the 24 localities visited in 9 towns. The first adult was caught on 29 March and the last on 13 October.

Distribution in Turkey: Afyon (Cay, Sultanli, Sincanli), Balikesir (Gonen, Sindirgi, Ayvalik, İvrindi, Bandirma), Bursa (Center, Mustafakemalpasa, Yenisehir), Canakkale (Center, Ezine, Gokceada), Edirne (Center), Izmir (Center, Odemis, Bornova, Yamanlardagi, Menemen, Kozak), Kirklareli (Luleburgaz), Mugla (Bodrum, Marmaris, Center, Koycegiz), Tekirdag (Saray, Center), Usak (Center), Aydin (Kusadasi, Soke, Kocarli), Bilecik (Pazaryeri, Golpazari), Denizli (Acipayam, Center), Isparta (Egirdir), Kocaeli (Karamursel), Kutahya (Center), Manisa (Center), Sakarya (Hendek, Center) (Lodos et al. 1978). Adiyaman, Agri, Bingol, Bitlis, Elazig, Erzincan, Erzurum, Hakkari, Malatya, Mus, Tunceli and Van (Bingol 1978). Ankara (Polatli, Ayas, Cubuk, Akyurt), Konya (Center, Beysehir, Karapinar) (Tamer et al. 1997). Ankara (Beytepe), Kirsehir (Cicekdagi, Mucur), Sivas (Yildizeli, Zara), Yozgat (Akdagmadeni) (Sert and Cagatay 1999). Adana, Antalya, Gaziantep, Hatay, İcel, Kahramanmaras, Kilis, Osmaniye (Lodos et al. 2003).

General Distribution: East Palaearctic (East of the border line here defined), Near East (Asian Turkey, Caucasian Russian republics, Georgia, Armenia, Azerbaidjan, Lebanon, Syria, Israel, Jordan, Sinai Peninsula (Egypt), Arabian peninsula, Iran, Iraq), Nearctic region, North Africa (Not including Sinai Peninsula) (Anonymous 2009).

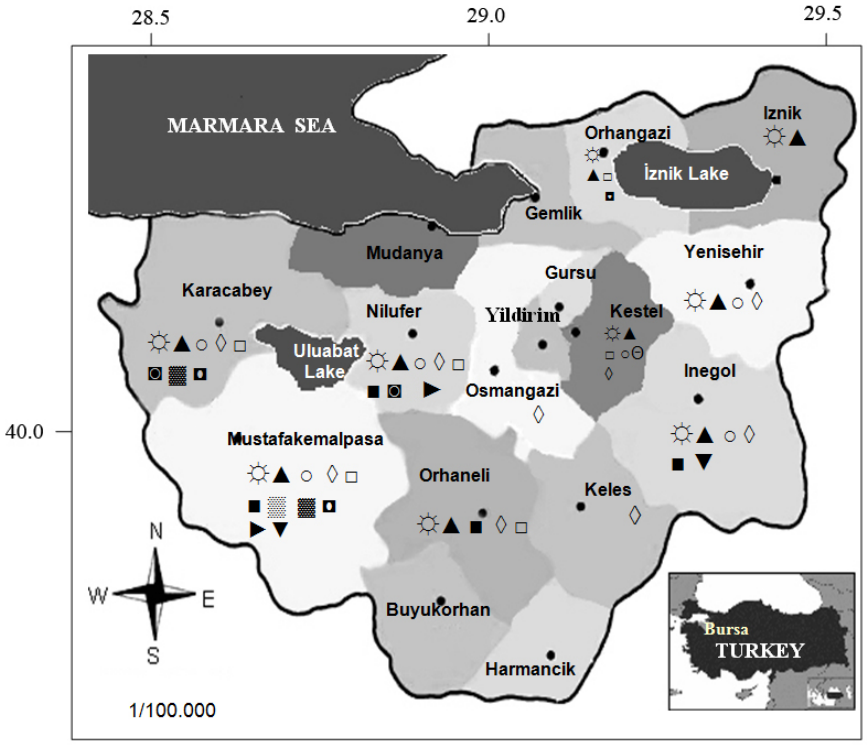

Figure 1. Map of Bursa, northwestern Turkey, the distribution of Curculionoidea in alfalfa fields in Bursa province during 2004-2005.

☼ *Hypera postica* ▲ *Apion pisi* ○*Sitona humeralis* ◊ *Sitona crinitus* □ *Sitona hispidulus* ■ *Sitona lineatus* ◙ *Sitona flavescens* ▒ *Gymnetron rotindicolle* ▓ *Ceutorhynchus pallidactylus* ◘ *Ceutorhynchus anatolicus* Θ *Phyllobius* sp. ► *Protapion trifolii* ▼ *Ceratapion gibbirostre*

Materials examined: Nilufer (Gorukle, Yolcati), From 21 April to 13 October 2004, 29; from 29 March to 10 May 2005**,** 39; Inegol 21 June 2005, (Kulaca 2, Alibey 2, Eymir 3 and Kursunlu 1 specimens), Orhaneli 01 July 2005 (Coreler 1 and Akcabuk 4 specimens), Karacabey 6 April 2005 (Bakirkoy 26 and Karasu 17), Mustafakemalpasa 6 April 2005 (Yalintas 18 and Tatkavakli 12 specimens), Iznik 13 April 2005 (Gurmuzlu 12 specimen), Orhangazi 13 April (Ornekkoy 25 specimen), Kestel 20 April (Barakfaki 2, Narlidere 17, Seymen 13, Nuzhetiye 5 and Golcuk 6 specimens), Yenisehir 20 April 2005 (Koyunhisar 17 specimens); Totally 251 specimens.

Host Plants: *Medicago sativa*, *Capparis spinosa*, *Onopordon sp.*, *Echium sp.*, *Vicia cracca*, *Matricaria chamomilla*, *Trifolium repens*, *Prunus amygdali*, *Pirus communis*, *Crataegus sp.*, *Quercus sp.*, *Vicia faba* (Lodos et al. 1978).

Apioninae Schön.

***Apion pisi* (Fabricius,1801)**
This species was widely distributed and collected from 18 of the 24 localities visited in 9 towns.

Distribution in Turkey: Afyon (Center), Balikesir (Gonen), Bilecik (Pazaryeri), Bursa (Center, Uludag, Yenisehir, Mudanya, Mustafakemalpasa), Canakkale (Lapseki, Can, Eceabat), Denizli (Acipayam), Edirne (Center, Lalapasa), Izmir (Odemis, Bergama, Tire), Kirklareli (Luleburgaz), Kocaeli (Kandira), Kutahya (Domanic), Manisa (Akhisar), Sakarya (Center) (Lodos et al. 1978).

General Distribution: Austria, France, Germany, Italy, Spain, Sweden, Switzerland (Anonymous 2010 b).

Materials examined: Nilufer (Gorukle, Yolcati) from 21 April to 20 October 2004**,** 367; from 29 March to 12 July 2005, 1028 specimens; Inegol 12 June (Kulaca 1 and Eymir 1 specimens), Orhaneli 01 July (Coreler 2 and Serceler 1 specimens), Mustafakemalpasa 6 April 2005 (Yalintas 80 and Tatkavakli 77 specimens), Karacabey 6 April 2005 (Bakirköy 182 and Karasu 189 specimens), Iznik 13 April 2005 (Gurmuzlu 8 specimens), Orhangazi 13 April (Ornekkoy 184 specimens), Kestel 20 April 2005, (Narlidere 13, Seymen 380, Gölcük 12, Nuzhetiye 14 and Barakfaki 88 specimens), Yenisehir, 20 April 2005 (Koyunhisar 298 specimens), Totally 2925 specimens.

Host plants: *Medicago sativa*, *Graminae*, *Cirsium*, *Pirus elaeagrifolia*, *Pirus malus*, *Prunus domestica*, *Vicia cracca*, *Trifolium sp.*, *Rhododendron sp*., *Corylus avellana*, *Hordeum sp.*, *Sinapis arvensis* (Lodos et al. 1978).

Polydrosinae

***Sitona humeralis* Stephens 1831**
This species was distributed and collected from 11 of the 24 localities visited in 6 towns.

Distribution in Turkey: Afyon (Center, Sincali, Emirdag, Sultandag, Cay), Balikesir (Gonen, Erdek), Bilecik (Pazaryeri, Golpazari, Sogut), Burdur (Golhisar), Bursa (Center, Yenisehir, Mustafakemalpasa), Canakkale (Gelibolu, Can, Gokceada), Denizli (Kale, Acipayam), Isparta (Egirdir, Center), Yalova, Izmir (Odemis, Urla, Karaburun), Kırklareli (Center, Luleburgaz, Pinarhisar, Vize), Kutahya (Gediz, Tavsanli, Center, Simav), Manisa (Soma, Salihli, Kula), Mugla (Koycegiz, Center, Fethiye), Sakarya (Center), Tekirdag (Center), Usak (Center, Esme) (Lodos et al. 1978). Adiyaman, Agri, Bingol, Bitlis, Elazig, Erzincan, Erzurum, Hakkari, Malatya, Mus, Tunceli and Van (Bingol 1978). Ankara (Sert and Cagatay 1994). Tekirdag (Center, Muratli-Inanli, Cerkezkoy, Evrenbey, Karademir) (Kivan 1995). Ankara (Ayas, Cubuk, Polatli, Akyurt), Konya (Karapinar, Center, Beysehir) (Tamer et al. 1997). Adana, Ankara, Antalya, Bartin, Bolu, Corum, Duzce, Eskisehir, Gaziantep, Hatay, İcel, Kahramanmaras, Karabuk, Karaman, Kayseri, Kirikkale, Kirsehir, Konya, Nevsehir, Nigde (Lodos et al. 2003).

General Distribution: East Palaearctic (East of the border line here defined), Near East (Asian Turkey, Caucasian Russian republics, Georgia, Armenia, Azerbaidjan, Lebanon, Syria, Israel, Jordan, Sinai Peninsula (Egypt), Arabian peninsula, Iran, Iraq) (Anonymous 2009).

Materials examined: Nilufer 14 April 2004 to 17 August 2005 (Gorukle 38 specimens), Karacabey 6 April 2005 (Karasu 11, Bakirköy 2 specimens); Mustafakemalpasa 6 April 2005 (Yalintas 5, Tatkavakli 6 specimens); Kestel 20 April 2005, (Seymen 20, Narlidere 3, Gölcük 20, Nuzhetiye 2 specimens); Yenisehir, 20 April 2005, (Koyunhisar 9 specimens); Inegol, 21 June 2005 (Kulaca, 2 specimens); Totally 118 specimens.

Host plants: *Medicago sativa*, *Vicia cracca*, *Prunus cerasus*, *Lens esculenta*, *Prunus domestica*, *Prunus amygdali*, *Pirus elaeagrifolia*, *Fragaria vesco*, *P. domestica*, *Prunus sp*., *V. faba*, *Rubus sp.*, *Centaurea sp.*, *Salix sp.*, *Vitis vinifera*, *Euphorbia sp.*, *Salix sp.*, *Leguminosae* (Lodos et al. 1978).

***Sitona macularius* (crinitus) (Marsham, 1802)**
This species was distributed and collected from 13 of the 24 localities visited in 8 towns.

Distribution in Turkey: Afyon (Center, Sandikli, Sincali, Bolvadin, Emirdag, Sultandag, Suhut, Cay), Balikesir (Ivrindi, Gonen, Bandirma), Bilecik (Pazaryeri, Center, Golpazari, Sogut), Bursa (Center, Mudanya, Uludag, Mustafakemalpasa), Canakkale (Can, Gokceada), Denizli (Buldan, Center, Dinar, Tavas), Edirne (Ipsala, Center), Isparta (Center), Yalova, Izmir (Odemis, Cemse, Dikili, Center), Kirklareli (Luleburgaz, Center, Pinarhisar, Vize), Kutahya (Domanic, Tavsanli, Center, Simav, Altintas), Manisa (Demirci, Salihli, Soma, Kula), Mugla (Koycegiz, Fethiye, Ula, Center), Tekirdag (Center), Usak (Center,

Banaz, Esme) (Lodos et al. 1978). Adiyaman, Agri, Bingol, Bitlis, Elazig, Erzincan, Erzurum, Hakkari, Malatya, Mus, Tunceli and Van (Bingol 1978). Ankara (Sert and Çağatay 1994). Ankara (Polatli, Ayas, Cubuk, Akyurt, Ayas), Konya (Karapinar) (Tamer et al. 1997). Adana, Aksaray, Ankara, Antalya, Bolu, Cankırı, Corum, Eskisehir, Gaziantep, Hatay, Icel, Kahramanmaras, Karabuk, Karaman, Kastamonu, Kayseri, Kilis, Kirikkale, Kirsehir, Konya, Nevsehir, Nigde, Osmaniye, Yozgat (Lodos et al. 2003).

General Distribution: East Palaearctic (East of the border line here defined), Near East (Asian Turkey, Caucasian Russian republics, Georgia, Armenia, Azerbaidjan, Lebanon, Syria, Israel, Jordan, Sinai Peninsula (Egypt), Arabian peninsula, Iran, Iraq), Nearctic region, North Africa (Not including Sinai Peninsula) (Anonymous 2009).

Materials examined: Nilufer (Yolcati) 14 April 2004 to 13 June 2005 9 specimens; Nilufer (Gorukle) 9 June 2004 to 8 July 2005, 25 specimens; Mustafakemalpasa 6 April 2005, (Tatkavakli 3 and Yalintas 1 specimens); Karacabey 6 April 2005, (Bakirkoy 1 specimen); Yenisehir 20 April 2005, (Koyunhisar 6 specimens); Inegol, (Kulaca 1 June to 21 June 2005, 10 specimens; Alibeykoy 21 June 2005, 5 specimens) ; Kestel 20 April 2005, (Seymen 1 specimen); Orhaneli 1 July 2005, (Serceler 1, Coreler 8 and Akcabuk 2 specimens), Osmangazi 19 July 2005, (Tuzakli 1 specimen); Totally 73 specimens.

Host plants: *Medicago sativa*, *Vicia cracca*, *Juglans regia*, *Weed, Triticum sp.*, *Pirus elaeagrifalia*, *Vicia ervilia*, *Pirus communis*, *Prunus persica*, *Wild graminae*, *Rubus sp.*, *Prunus amygdali*, *Prunus domestica*, *Leguminosae*, *Matricaria chamomilla*, *Citrus sp.*, Meadow, *Populus sp*., *Centaurea sp*., *Pinus sp*., *Cruciferae*, *Prunus cerasus*, *V. faba*, *Lens esculenta*, *Chenopodium sp*., *Quercus sp.*, *Pirus malus*, *Sinapis arvensis*, *Sesamum indicum*, *Myrtus communis*, *Ulmus campestris*, *P. malus*, *Crataegus sp.*, *Onobrychisativa* (Lodos et al. 1978).

***Sitona hispidulus* (Fabricius, 1777)**
This species was distributed and collected from 9 of the 24 localities visited in 6 towns.

Distribution in Turkey: Afyon (Sultandag), Aydin (Cine, Kocarli, Kosk, Kusadasi), Balikesir (Ivrindi, Bandirma), Bilecik (Golpazari), Bursa (Yenisehir, Mustafakemalpasa, Iznik, Center), Canakkale (Center, Can, Gokceada), Denizli (Cardak), Edirne (Kesan), Isparta (Ergidir, Uluborlu), Izmir (Odemis, Center, Bayindir, Dikili, Bergama, Cemse), Kirklareli (Luleburgaz), Kutahya (Center), Manisa (Center, Akhisar, Soma, Kula), Mugla (Koycegiz, Marmaris, Fethiye), Sakarya (Hendek, Center), Tekirdag (Center), Usak (Center, Banaz, Esme) (Lodos et al. 1978). Ankara (Sert and Cagatay 1994).Tekirdag (Muratli-Inanli, Velikoy) (Kivan 1995). Ankara (Ayas, Cubuk, Polatli, Akyurt), Konya (Karapinar, Center) (Tamer et al. 1997). Adana, Antalya, Bolu, Corum, Hatay, Icel, Kahramanmaras, Karabuk, Kastamonu, Kayseri, Konya, Nigde, Osmaniye, Yozgat, Zonguldak (Lodos et al. 2003).

General Distribution: East Palaearctic East of the border line here defined, Near East Asian Turkey, Caucasian Russian republics, Georgia, Armenia, Azerbaidjan, Lebanon, Syria, Israel, Jordan, Sinai Peninsula (Egypt), Arabian peninsula, Iran, Iraq, Nearctic region (Anonymous 2009).

Materials examined: Nilufer (Yolcati) 14 April to 14 October 2004, 5 specimens; (Gorukle) 9 June 2004 to 18 March 2005, 2 specimens; Mustafakemalpasa 6 April 2005 (Yalintas 1, Tatkavakli 6 specimens), Karacabey 6 April 2005, (Taslik 2, Bakirkoy 5 specimens); Orhangazi 13 April 2005, (Ornekkoy 4 specimens); Kestel 20 April 2005, (Nuzhetiye 7 specimens); Orhaneli 1 July 2005, (Akcabuk 15 specimens); Totally 47 specimens.

Host plants: *Medicago sativa*, *Onopordon sp., Leguminosae*, *Vicia cracca*, *Pirus elaeagrifolia*, *Prunus amygdali*, *Prunus domestica*, *Ulmus campestris*, *Matricaria chamomilla*, *Rubus sp.*, *Trifolium repens*, *Citrus sp*., *Leguminosae* (Lodos et al. 1978).

***Sitona lineatus* (Linneaus, 1758)**
This species was distributed and collected from 3 of the 24 localities visited in 3 towns.

Distribution in Turkey: Afyon (Center, Sandikli), Balikesir (Erdek), Bilecik (Pazaryeri), Bursa (Gemlik, Center), Canakkale (Can), Edirne (Ipsala), Yalova, Izmir (Center, Bornova, Menemen, Cesme, Urla), Kirklareli (Luleburgaz, Vize), Kutahya (Simav, Domanic, Tavsanli), Mugla (Marmaris, Bodrum, Center, Fethiye), Tekirdag (Center, Sarköy), Usak (Center) (Lodos et al. 1978). Tekirdag (Center, Muratli-Inanli, Malkara, Muratli-Arzulu) (Kivan 1995).

General Distribution: East Palaearctic (East of the border line here defined), Near East (Asian Turkey, Caucasian Russian republics, Georgia, Armenia, Azerbaidjan, Lebanon, Syria, Israel, Jordan, Sinai Peninsula (Egypt), Arabian peninsula, Iran, Iraq), Nearctic region, North Africa (Not including Sinai Peninsula) (Anonymous 2009).

Materials examined: Mustafakemalpasa 6 April, (Tatkavakli 3 specimens); Inegöl 21 June, (Eymir 3 specimens); Orhaneli 01 July in 2005, (Akcabuk 1 specimen); Totally **7** specimens.

Host plants: *Medicago sativa, Triticum sp.*,*Vicia ervilia, Vicia cracca, Humulus lupulus, Rosa* sp., *Leguminosae, Paliurus orientalis, Fragaria vesca, Prunus avium, Quercus sp., Pinus sp., Pistacia terebinthus, Euphorbia sp., Vicia faba, Pistacia vera, Vitis vinifera, Lens esculenta* (Lodos et al. 1978).

Sitona flavescens (Marsham)
This species was distributed and collected from 2 of the 24 localities visited in 2 towns.

Distribution in Turkey: Afyon (Sultandag), Aydin (Soke), Denizli (Center, Civril, Cardak), Canakkale (Gokceada), Izmir (Menemen), Manisa (Kula, Mugla, Marmaris, Bodrum, Milas, Koycegiz), Sakarya (Hendek), Tekirdag (Saray) (Lodos et al. 1978).

General Distribution: Austria, Germany, Liechtenstein (Anonymous, 2010 b).

Materials examined: Nilufer 18 March, (Yolcati 1 specimen), Karacabey 6 April (Bakirkoy 4 specimens) in 2005; Totally 5 specimens.

Host plants: *Medicago sativa, Pirus elaeagrifolia, Cydonia vulgaris, Leguminosae, Juglans regia, Prunus spinosa.* (Lodos et al. 1978).

Other Species

***Gymnetron rotundicolle* Gyll.**

General Distribution: East Palaearctic (East of the border line here defined), Near East (Asian Turkey, Caucasian Russian republics, Georgia, Armenia, Azerbaidjan, Lebanon, Syria, Israel, Jordan, Sinai Peninsula (Egypt), Arabian peninsula, Iran, Iraq) (Anonymous 2009).

Distribution in Turkey: Bursa (Mudanya), Kirklareli (Vize), Tekirdag (Center) (Lodos et al. 1978), Konya (Lodos et al. 2003).

Material examined: Mustafakemalpasa, Tatkavakli, 6 April 2005, 1 specimen.

Host plants: *Pirus communis* and weeds.

***Ceutorhynchus pallidactylus* (Marsham 1802)**

General Distribution: Germany, America, Austria, Belarus, Belgium, Bulgaria, Algeria, Czech Republic, Dagestan, Denmark, Estonia, Morocco, Finland, France, South Africa, Georgia, Netherlands, United Kingdom, Ireland, Spain, Israel, Sweden, Switzerland, Italy, Canary Islands, Kazakhstan, Cyprus, Lebanon, Latvia, Hungary, Malta, Moldova, Norway, Poland, Portugal, Romania, Russia, Serbia, Montenegro, Slovenia, Syria, Thailand, Tunisia, Turkey, Ukraine, Jordan, Greece (Colonnelli 2004).

Distribution in Turkey: Antalya Beldibi, Patara; Mersin Camliyayla, Silifke (Sert 2005).

Material examined: Mustafakemalpasa, Tatkavakli, 6 April 2005, 1 specimen; Karacabey, Bakirköy, 6 April 2005, 1 specimen; Totally 2 specimens.

Host plants: Various plants belonging to the Brassicaceae and Resedaceae families and rarely *Cannabis sativa* L**.** (Colonnelli 2004).

***Ceutorhynchus anatolicus* Schultze, 1900**

General Distribution: Lebanon, Syria, Turkey (Colonnelli 2004).

Distribution in Turkey: Kırsehir (Cicekdagi) (Sert 2005).

Material examined: Mustafakemalpasa, Tatkavakli, 6 April 2005, 2 specimens; Karacabey, Karasu, 6 April 2005 1 specimen; Orhangazi, Ornekkoy, 13 April 2005 1 specimen; Totally 4 specimens.

***Protapion trifolii* (Linnaeus 1768)**

General Distribution : East Palaearctic (East of the border line here defined), Near East Asian (Turkey, Caucasian Russian republics, Georgia, Armenia, Azerbaidjan, Lebanon, Syria, Israel, Jordan, Sinai Peninsula (Egypt), Arabian peninsula, Iran, Iraq), North Africa (Not including Sinai Peninsula) (Anonymous 2009). Europe, Near East and Middle Asia, North Africa (Dieckmann 1988).

Distribution in Turkey: Adana, Ankara, Antalya, Bartin, Bolu, Cankiri, Duzce, Eskisehir, Hatay, Icel, Kahramanmaras, Kastamonu, Kayseri, Kirikkale, Kirsehir, Konya, Nevsehir, Nigde, Osmaniye, Sinop, Yozgat, Zonguldak (Lodos et al. 2003). Artvin (Yusufeli), Erzincan (Kemaliye, Sandik, Uzumlu), Erzurum: University field ; Dumlubaba; Ispir, M. Koprubasi; Narman, Semikale; Oltu; Pazaryolu (Hayat et al. 2002). Canakkale (Lodos et al. 1978).

Material examined: Nilufer (Gorukle), 12 April 2005, 2 specimens; Mustafakemalpasa, Tatkavakli, 6 April 2005,1 specimen; Totally 3 specimens.

Host plants: *Prunus armeniaca, P avium, P. cerasus, P. persica* and *Medicaco sativa* (Hayat et al. 2002). *Trifolium* spp. (Dieckmann 1977) and *Medicago sativa* (Lodos et al. 1978) are given as host plants of this species.

***Ceratapion gibbirostre* (Gyllenhal,1813)**

General Distribution: Europe, North Africa, C. and SW Asia (Gonget 1997).

Distribution in Turkey: Amasya, Ankara, Canakkale, Izmir, Kars, Mardin (Alonso-Zarazaga 1990); Adana, Bolu, Malatya (Wanat 1995), Artvin (Yusufeli), Erzincan (Kemaliye, Uzumlu), Kars (Kagizman) (Hayat et al. 2002).

Material Examined: Mustafakemalpasa, Tatkavakli on 6 April 2005, (2 specimens); and Inegol, Eymir on 21 June 2005, (1 specimen).

Host plants: *Prunus armeniaca, P avium, P. cerasus and P. Persica* (Hayat et al. 2002). The larvae develop in roots, rootstocks and stems of *Carduus acanthoides, C. nutans, C. pycnocephalus, C. tenuiflorus, Cirsium arvense and C. eriophorum* (Wanat 1995).

Furthermore, one species of the *Phyllobius* spp**.** was found in Nilufer, 28 May 2004 and Kestel, Narlidere, 20 April 2005 (2 specimens).

During the present study 13 species belonging to the superfamily Curculionoidea were determined on Alfalfa (*Medicago sativa* L.) in Bursa province of Turkey, during 2004-2005. According to the results of these studies, *A. pisi, H. postica*, *S. humeralis*, *S. macularius*, and *S. hispidulus* were important species in terms of density and being widespread. The damage caused by adults and larvae occurs in different forms**.** The most widespread species was *H. postica*, *A.pisi*, *S.macularius*, *S.humeralis*, *S. hispidulus*, *S.lineatus* and *S.flavescens* respectively. Wiech and Clements (1992) studied on *Sitona* spp and *Apion* spp weevils feeding on white clover foliage at a site in England. Erol and Karagoz (1996) determined that *H.postica*, *Apion* spp. and *Sitona* spp. on alfalfa in Aydin province. Pacchioli and Hower (2004) were researched that movement and survival of early instar clover root curculio, *S. hispidulus* and the development of root nodules in alfalfa, *M. sativa*. In addition, on the part of various researchers were investigated control methods of alfalfa weevil, *H.postica* (Khanjani and Pour-mirza 2004, Sabahi and Kharazi 2005).

The most abundance species were *A. pisi* 85 %, *H. postica* 7.2%, *S. humeralis* 3.4%, *S. macularis* 2.1%, *S. hispidulus* 1.3% respectively. According to these studies, *H. variabilis* was found to be the second common species among all alfalfa planting in Bursa. According to Ozbek (1986), *H. variabilis* was found very low density in alfalfa fields in Erzurum. Aeschlimann (1980) was found twenty *Sitona* species in the Mediterranean region during surveys on 17 volunteer and/or cultivated species of *Medicago.*

Gymnetron rotundicolle Gyll., *Ceutorhynchus pallidactylus* (Marsham, 1802), *Ceutorhynchus anatolicus* Schultze, 1900, *Phyllobius* sp., *Protapion trifolii* (Linnaeus 1768), *Ceratapion gibbirostre* (Gyllenhal 1813) were determined secondary important pests. Their population is too low. No data could be found for these specimens showing would be a pest to the alfalfa fields. These species of alfalfa fields have no economic importance. *C. anatolicus* and *C. pallidactylus* have been reported for the first time in Mediterranean Region by Sert (2005).

S. flavescens, C.pallidactylus, C.anatolicus, P. trifolii, C. gibbirostre were the first record in Bursa province. Anay and Kornosor (2000) were recorded *H. postica*, *S. crinitus*, *S. hispidulus* and *S. humeralis* which are economically important species on alfalfa in Adana. Kivan (1995) was found four *Sitona* species in Tekirdag (European part of Turkiye) during the surveys on cultivated *Medicago* and *Vicia* species. *S.lineatus* and *S. crinitus* were common on *Vicia* spp. ; *S. humeralis* and *S.crinitus* were common on *Medicago* spp. in the sites of investigated areas and *S.hispidulus* was only occured on *Medicago* spp. Murray and Clements (1994) found that *S. lineatus*, *S. flavescens* and *S. hispidulus* commonly on white clover (*Trifolium repens*).

In conclusion, this paper reported on abundance and widespread of the superfamily Curculionoidea species in Bursa Province; however, the abundance and widespread of these species has yet to be investigated.

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