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The First Faunistic Data on the Leaf Beetles (Coleoptera: Chrysomelidae) of 26 Ağustos Nature Park, Afyonkarahisar, Turkey

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ABSTRACT

The first data on faunistic composition of leaf beetles of 26 Ağustos Nature Park, Afyonkarahisar, Turkey are presented. The field researches were conducted from April to November 2017. During this study, a total of 46 leaf beetles species belonging to 23 genera in 6 subfamilies were identified, all of which are recorded for the first time in the study area. Galerucinae was identified as the richest subfamily with 27 species. About 42.15% of the leaf beetle abundance was represented by three species of Alticini: *Chaetocnema concinna* (17.92%), *Altica carduorum* (13.01%) and *Chaetocnema mannerheimi* (11.22%). Eleven species were represented with only one or two specimens in the study area, and they were considered as rare taxa: *Labidostomis cyanicornis*, *Cryptocephalus moraei*, *Leptinotarsa decemlineata*, *Aphthona pygmaea*, *Neocrepidodera ferruginea*, *Phyllotreta procera*, *Ph. vittula*, *Psylliodes circumdata*, *Ps. napi*, *Galeruca interrupta* and *Cassida seraphina* (0.09%). In addition, short notes about host plant, phenology and abundance of each species are presented.

Key words: Coleoptera, Chrysomelidae, Fauna, 26 Ağustos Nature Park, Afyonkarahisar.

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INTRODUCTION

The Chrysomelidae, known as the leaf beetles, is considered one of the most important groups of phytophagous beetles due to the number of species, their abundance and relationship with plants (Jolivet & Verma, 2002). Leaf beetles are among the most conspicuous beetles on plants, and perhaps they are best known for their phytophagous habit (Clark et al, 2004).

26 Ağustos Nature Park is situated to the west of Afyonkarahisar, about 17 km from the city center. It is a nature park with an area of 65 hectares located in Akören town of Sinanpaşa, at the intersection of Afyonkarahisar, Antalya and İzmir roads. The Nature Park includes about 87 plant species and there is a small lake in the park (Kervankıran, 2013). 26 Ağustos Nature Park was declared as nature park in 2008 due to camping, trekking, wildlife observations (especially aquatic birds) and scientific excursions.

There are no published records on the leaf beetle fauna of 26 Ağustos Nature Park until now. Therefore, the objectives of the present paper are to investigate the leaf beetle fauna in 26 Ağustos Nature Park and to give short information about host plants, phenology and abundance of some species.

MATERIAL AND METHODS

The specimens were collected in the period from April to November in 2017. The adult beetles were collected by sweeping from various herbaceous and bushes vegetations using an entomological net and aspirator. The specimens were killed with ethyl acetate in plastic bottles, and taken to the laboratory for dissection and identification. All specimens were deposited at the Biology Department of Süleyman Demirel University (Isparta, Turkey). Plants showing feeding marks on the leaves by the adults were considered as a host plant. Identification was performed mainly based on the keys of Gruev & Tomov (1986), Warchałowski (2003, 2010), Čížek & Doguet (2008), Sekerka (2010), Konstantinov, Baselga, Grebennikov, Prena, & Lingafelter (2011), Bezdek & Baselga (2015), Rheinheimer & Hassler (2018). The subfamilies and genera are listed according to the Catalogue of the Palaearctic Coleoptera (Löbl & Smetana, 2010).

RESULTS

During the fieldworks conducted in 2017, a total number of 1060 leaf beetle specimens were collected, representing 46 species in 26 genera, and 6 subfamilies. The total number of individuals, relative abundances and the activity periods of all species collected from the area are given in Table 1. Also, 38 of 46 identified species are reported for the first time from Afyonkarahisar (see, (*) in Table 1). In addition, short notes about each species are presented.

Table 1. Leaf beetle species of 26 Ağustos Nature Park, total number of collected specimens, relative abundance, activity periods and host plants. The asterisk (*) refers to the species registered for the first time from Afyonkarahisar Province.

Species	Total Number	Relative Abundance (%)	Activity Periods	Host Plant
Subfamily: Criocerinae				
Tribe: Lemini				
*Oulema rufocyanea**	37	3,49	APR, MAY, JUN, JUL, AUG, NOV	-
Subfamily: Cassidinae				
Tribe: Cassidini				
*Cassida nobilis**	3	1,89	APR, MAY, JUN, JUL	*Amaranthus* sp.
*Cassida pannonica**	26	0,28	APR, MAY, AUG	-
*Cassida rubiginosa**	1	2,45	APR, MAY, JUN	*Cirsium* sp.
*Cassida seraphina**	11	0,09	APR	-
*Hypocassida cornea**	10	1,04	APR, JUN, AUG, SEP	-
Subfamily: Chrysomelinae				
Tribe: Chyrsomelini				
*Chrysomela populi**	4	0,38	APR, JUL	*Populus nigra* L.
Colaphellus sophiae	27	2,55	APR, JUN	*Descurainia sophia* (L.)
Entomoscelis adonidis	2	0,19	JUN	*Papaver* sp.
*Gastrophysa polygoni**	109	10,28	APR, JUN, JUL, AUG, OCT, NOV	*Polygonum* sp.
Leptinotarsa decemlineata	1	0,09	MAY	-
*Plagiodera versicolora**	18	1,7	APR, MAY, JUN	*Salix* sp.
Subfamily: Galerucinae				
Tribe: Alticini				
*Altica carduorum**	138	13,01	APR, MAY, JUN, JUL, AUG, OCT, NOV	-
*Altica oleracea**	26	2,45	APR, MAY, JUN, JUL, AUG, NOV	-
*Aphthona pygmaea**	1	0,09	APR	*Euphorbia* sp.
*Chaetocnema concinna**	190	17,92	APR – NOV	*Lycopus europaeus* L.
*Chaetocnema coyei**	10	0,94	APR, JUN, AUG, NOV	-
*Chaetocnema mannerheimi**	119	11,22	APR – NOV	-
*Chaetocnema obesa**	2	0,19	APR, JUN	-
*Crepidodera aurata**	25	2,36	APR, MAY, JUN, AUG	*Populus nigra* L., *Salix* sp.
*Longitarsus bertii**	4	0,38	APR, NOV	-
*Longitarsus fallax**	20	2,36	APR, JUN, NOV	-
*Longitarsus fuscoaeneus**	4	0,38	APR, JUN, NOV	-
*Longitarsus kutscherae**	17	1,6	APR, MAY, JUN, JUL, OCT	*Plantago* sp.
*Longitarsus longipennis**	16	1,51	APR, JUN, SEP, NOV	-
*Longitarsus lycopi**	28	2,64	APR	*Amaranthus* sp.

Table 1. Continued.

Species	Total Number	Relative Abundance (%)	Activity Periods	Host Plant
*Longitarsus pellucidus**	37	3,49	JUN, AUG, SEP, OCT, NOV	-
*Neocrepidodera ferruginea**	1	0,09	JUN	-
Phyllotreta atra	6	0,57	APR, JUN	-
Phyllotreta corrugata	13	1,23	APR, AUG	*Diplotaxis tenuifolia* (L.)
*Phyllotreta nemorum**	20	1,89	APR, MAY	-
*Phyllotreta ochripes**	25	2,36	APR, MAY, JUN, NOV	-
*Phyllotreta procera**	1	0,09	APR	-
*Phyllotreta vittula**	2	0,19	APR	*Cardaria draba* (L.)
*Psylliodes circumdata**	1	0,09	JUL	-
*Psylliodes napi**	1	0,09	JUL	-
*Psylliodes tricolor**	20	1,89	APR, JUN, JUL, NOV	-
Tribe: Galerucini				
*Galeruca interrupta**	1	0,09	APR	-
Tribe: Luperini				
*Luperus xanthopoda**	29	2,74	APR, MAY, JUN, JUL, NOV	*Betula* sp., *Prunus* sp., *Salix babylonica* L.
Subfamily: Cryptocephalinae				
Tribe: Clytrini				
*Labidostomis cyanicornis**	1	0,09	JUL	-
*Labidostomis oertzeni**	7	0,66	JUN	*Populus nigra* L.
Tribe: Cryptocephalini				
Cryptocephalus connexus	20	1,89	JUL, AUG	-
*Cryptocephalus duplicatus**	2	0,19	JUN, JUL	-
Cryptocephalus moraei	1	0,09	JUN	-
Pachybrachis fimbriolatus	18	1,7	MAY, JUN, JUL	-
Subfamily: Eumolpinae				
Tribe: Bromiini				
*Pachnephorus villosus**	5	0,47	APR, MAY, JUN, JUL	-
TOTAL	1060			

Subfamily: Criocerinae Latreille, 1804

Tribe: Lemini Gyllenhal, 1813

Oulema rufocyanea (Suffrian, 1847)

Material examined: 15.04.2017, 5♂♂, 5♀♀; 29.04.2017, 1♂; 13.05.2017, 7♂♂, 4♀♀; 07.06.2017, 3♂♂, 2♀♀; 01.07.2017, 5♂♂, 3♀♀; 06.08.2017, 1♂; 11.11.2017, 1♀.

Notes: This species was known only from Ankara in Turkey (Bezděk & Baselga, 2015). It was common in the study area and active from April to November. This species

is morphologically very similar to *Oulema melanopus*. It can easily be misidentified as *O. melanopus*. It is very likely that some records of *O. melanopus* in Turkey refer to *O. rufocyanea*.

Subfamily: Cassidinae Gyllenhal, 1813

Tribe: Cassidini Gyllenhal, 1813

***Cassida nobilis* Linnaeus, 1758**

Material examined: 15.04.2017, 3♂♂; 29.04.2017, 2♂♂; 13.05.2017, 1♂; 07.06.2017, 1♀; 21.06.2017, 1♂, 1♀; 01.07.2017, 1♂.

Notes: A very common and widely distributed species throughout Turkey (Ekiz, Aslan & Gök, 2013). It was found in small numbers in the park during April-July and collected on *Amaranthus* sp.

***Cassida pannonica* Suffrian, 1844**

Material examined: 29.04.2017, 1♂; 13.05.2017, 1♂; 27.08.2017, 1♂.

Notes: A very common and widely distributed species throughout Turkey (Ekiz et al, 2013), but not abundant in the park. It was a rare species represented with only three specimens collected on herbaceous vegetations dominated by Asteraceae in April-August.

***Cassida rubiginosa* Müller, 1776**

Material examined: 15.04.2017, 4♂♂, 1♀; 29.04.2017, 8♂♂, 1♀; 13.05.2017, 4♂♂, 2♀♀; 07.06.2017, 3♂♂, 2♀♀; 21.06.2017, 1♂.

Notes: A very common and widely distributed species throughout Turkey (Ekiz et al, 2013). It was also common in the park and found in large numbers on *Cirsium* sp. during April-June.

***Cassida seraphina* Ménétriés, 1836**

Material examined: 15.04.2017, 1♂.

Notes: A very common and widely distributed species throughout Turkey (Ekiz et al, 2013). It was a very rare species in the park, represented with only one male specimen in April. The specimen was collected on herbaceous vegetation.

***Hypocassida cornea* (Marseul, 1868)**

Material examined: 15.04.2017, 1♂; 07.06.2017, 7♂♂; 06.08.2017, 1♂, 1♀; 30.09.2017, 1♂.

Notes: Known from only Artvin province, in Turkey (Gök & Turantepe, 2019). It was found in relatively small numbers in the park during April-September. It was a species often confused with *Hypocassida subferruginea* morphologically.

Subfamily: Chrysomelinae Latreille, 1802

Tribe: Chrysomelini Latreille, 1802

***Chrysomela populi* Linnaeus, 1758**

Material examined: 15.04.2017, 1♂, 1♀; 01.07.2017, 2♂♂.

Notes: A very common and widely distributed species in Turkey (Ekiz et al, 2013); however, it was a rare species represented with only four specimens in the park during April and July. It was collected from leaves of *Populus nigra*, one of its main hosts.

***Colaphellus sophiae* (Schaller, 1783)**

Material examined: 15.04.2017, 14♂♂, 12♀♀; 21.06.2017, 1♂.

Notes: A very common and widely distributed species in Turkey, except southeast Anatolia region (Ekiz et al, 2013). It was found in large numbers in the park during April-June and collected on *Descurainia sophia*.

***Entomoscelis adonidis* (Pallas, 1771)**

Material examined: 07.06.2017, 1♂; 21.06.2017, 1♀.

Notes: A very common and widely distributed species in Turkey (Ekiz et al, 2013); however, it was a rare species represented with only two specimens in the park. It was collected on leaves of *Papaver* sp.

***Gastrophysa polygoni* (Linnaeus, 1758)**

Material examined: 15.04.2017, 3♂♂, 5♀♀; 29.04.2017, 14♂♂, 12♀♀; 07.06.2017, 2♂♂, 2♀♀; 21.06.2017, 22♂♂, 10♀♀; 01.07.2017, 7♂♂, 3♀♀; 23.07.2017, 8♂♂, 4♀♀; 06.08.2017, 2♂♂; 27.08.2017, 3♂♂; 21.10.2017, 3♂♂, 5♀♀; 25.11.2017, 3♂♂, 1♀.

Notes: A very common and widely distributed species throughout Turkey (Ekiz et al, 2013). It was also one of the most common species in the park and found from April to November. The specimens were collected on *Polygonum* sp.

***Leptinotarsa decemlineata* (Say, 1824)**

Material examined: 13.05.2017, 1♂.

Notes: This species was restricted to western North America: Colorado and surroundings. Because it feeds on *Solanum* sp. it has been introduced accidentally to all regions of the world where potatoes are grown. Outside potato plantations it is found on other species of *Solanum*, but generally rare. It is a cosmopolitan species throughout the world (Winkelman & Debreuil, 2008) and similarly widespread in Turkey (Ekiz et al, 2013). But it was rarely found in the park and represented with only one male specimen.

***Plagiodera versicolora* (Laicharting, 1781)**

Material examined: 29.04.2017, 4♂♂, 7♀♀; 13.05.2017, 2♂♂; 07.06.2017, 4♂♂, 1♀.

Notes: A very common and widely distributed species throughout Turkey (Ekiz et al, 2013). It was found in large numbers between April-June. Adults have been collected on *Salix* sp., one of the main host plants.

Subfamily: Galerucinae Latreille, 1802

Tribe: Alticini Spinola, 1844

***Altica carduorum* Guérin-Méneville, 1858**

Material examined: 15.04.2017, 2♂♂, 13♀♀; 29.04.2017, 21♂♂, 21♀♀; 13.05.2017, 15♂♂, 32♀♀; 07.06.2017, 3♂♂, 1♀; 21.06.2017, 1♂, 3♀♀; 01.07.2017, 4♂♂, 7♀♀; 06.08.2017, 1♂, 4♀♀; 21.10.2017, 2♀♀; 11.11.2017, 1♂, 2♀♀; 25.11.2017, 1♂, 4♀♀.

Notes: A widely distributed species in Turkey, especially in central Anatolian parts (Ekiz et al, 2013). It was one of the most common and abundant species of the park and found from April to November.

***Altica oleracea* (Linnaeus, 1758)**

Material examined: 29.04.2017, 1♂, 7♀♀; 13.05.2017, 6♀♀; 07.06.2017, 5♀♀; 01.07.2017, 2♀♀; 06.08.2017, 2♀♀; 11.11.2017, 1♂, 2♀♀.

Notes: A very common and widely distributed species throughout Turkey (Ekiz et al, 2013). It was found in large numbers from April to November.

***Aphthona pygmaea* (Kutschera, 1861)**

Material examined: 29.04.2017, 1♀.

Notes: Known from Edirne, İzmir, Aydın, Sakarya, Isparta, Antalya, Mersin, Adana, Erzincan and Erzurum in Turkey (Ekiz et al, 2013). Although it was a common species on *Euphorbia* spp., the main host plants, it was rarely found in the park and represented with only one female specimen in April.

***Chaetocnema concinna* (Marsham, 1802)**

Material examined: 15.04.2017, 24♂♂, 22♀♀; 29.04.2017, 30♂♂, 29♀♀; 13.05.2017, 9♂♂, 5♀♀; 07.06.2017, 5♂♂, 4♀♀; 21.06.2017, 2♂♂, 5♀♀; 01.07.2017, 1♂, 3♀♀; 23.07.2017, 1♂; 06.08.2017, 14♂♂, 17♀♀; 27.08.2017, 1♂, 1♀; 30.09.2017, 4♀♀; 21.10.2017, 1♂, 8♀♀; 11.11.2017, 2♀♀; 25.11.2017, 1♂, 1♀.

Notes: Known from Edirne, Kocaeli, Eskişehir, Isparta, Antalya, Ankara, Nevşehir, Samsun, Amasya, Bayburt and Erzurum in Turkey (Ekiz et al, 2013). It was one of the most common and abundant species of the park and found from April to November. It was collected frequently in moist open areas on various species of Poaceae.

***Chaetocnema coyei* (Allard, 1864)**

Material examined: 15.04.2017, 2♂♂; 07.06.2017, 4♂♂, 1♀; 27.08.2017, 1♂, 1♀; 11.11.2017, 1♀.

Notes: A very common and widely distributed species in Turkey (Ekiz et al, 2013), but not abundant in the study area.

***Chaetocnema mannerheimi* (Gyllenhal, 1827)**

Material examined: 15.04.2017, 8♂♂, 8♀♀; 29.04.2017, 24♂♂, 8♀♀; 13.05.2017, 3♂♂, 10♀♀; 07.06.2017, 2♂♂, 12♀♀; 21.06.2017, 3♀♀; 01.07.2017, 4♂♂, 1♀; 23.07.2017, 3♂♂, 4♀♀; 06.08.2017, 3♂♂, 11♀♀; 30.09.2017, 2♂♂, 3♀♀; 21.10.2017, 4♂♂, 3♀♀; 11.11.2017, 1♂; 25.11.2017, 2♂♂.

Notes: Known from Edirne, Eskişehir, Ankara and Konya in Turkey (Ekiz et al, 2013). It was one of the most common and abundant species of the study area and found from April to November. Specimens were collected on *Phragmites australis* and various herbaceous plants.

***Chaetocnema obesa* (Boieldieu, 1859)**

Material examined: 29.04.2017, 1♂; 07.06.2017, 1♀.

Notes: This species generally occurs in central parts of Turkey (Ekiz et al, 2013). It was very rare in the area, and only two specimens were found during April-June.

***Crepidodera aurata* (Marsham, 1802)**

Material examined: 15.04.2017, 3♂♂, 5♀♀; 29.04.2017, 5♂♂, 2♀♀; 13.05.2017, 1♀; 07.06.2017, 3♂♂, 4♀♀; 27.08.2017, 1♂.

Notes: A very common and widely distributed species throughout Turkey (Ekiz et al, 2013). It was collected on leaves of *Salix* sp. and *Populus* sp., the main host plants, between April and August.

***Longitarsus bertii* Leonardi, 1973**

Material examined: 29.04.2017, 1♂, 1♀; 21.10.2017, 1♂, 1♀.

Notes: Known from Aydın, Isparta, Antalya, Konya, Aksaray, Gümüşhane and Erzurum in Turkey (Ekiz et al, 2013). It was a rare species in the park, represented with only four specimens in April and October.

***Longitarsus fallax* Weise, 1888**

Material examined: 29.04.2017, 5♂♂, 7♀♀; 07.06.2017, 2♀♀; 11.11.2017, 5♂♂, 1♀.

Notes: A common species in Turkey (Ekiz et al, 2013). It was found in large numbers in the park in April, June and November.

***Longitarsus fuscoaeneus* Redtenbacher, 1849**

Material examined: 29.04.2017, 1♀; 07.06.2017, 1♀; 11.11.2017, 1♂, 1♀.

Notes: Known from Burdur, Antalya, Ankara, Mersin, Kayseri, Adana and Erzurum in Turkey (Ekiz et al, 2013). It was a rare species in the park, represented with only four specimens in April, June and November.

***Longitarsus kutscherae* (Rye, 1872)**

Material examined: 15.04.2017 1♂, 4♀♀; 29.04.2017, 2♂♂, 2♀♀; 13.05.2017, 1♀; 07.06.2017, 2♂♂; 01.07.2017, 1♂, 2♀♀; 21.10.2017, 2♂♂.

Notes: A species with restricted distribution in Turkey and known only from Isparta and Erzurum (Ekiz et al, 2013). It was found in small numbers in the park during April-October and collected on leaves of *Plantago* sp.

***Longitarsus longipennis* Kutschera, 1863**

Material examined: 29.04.2017, 2♂♂; 07.06.2017, 3♂♂, 3♀♀; 30.09.2017, 1♂, 1♀; 25.11.2017, 2♂♂, 4♀♀.

Notes: A species with restricted distribution in Turkey and known only from Isparta, Antalya and Erzurum (Ekiz et al, 2013). It was found in small numbers in the park from April to November. Specimens were collected on various herbaceous vegetation.

***Longitarsus lycopi* (Foudras, 1860)**

Material examined: 15.04.2017, 3♂♂, 2♀♀; 29.04.2017, 9♂♂, 14♀♀.

Notes: A common species in Turkey (Ekiz et al, 2013). It was found in large numbers in the park only in April and collected on *Amaranthus* sp.

***Longitarsus pellucidus* (Foudras, 1860)**

Material examined: 07.06.2017, 2♂♂; 06.08.2017, 4♀♀; 27.08.2017, 2♂♂, 4♀♀; 30.09.2017, 1♀; 21.10.2017, 10♂♂, 2♀♀; 11.11.2017, 2♂♂, 2♀♀; 25.11.2017, 2♂♂, 6♀♀.

Notes: A very common and widely distributed species throughout Turkey (Ekiz et al, 2013). It was a common species in the park, found in large numbers on herbaceous plants from April to November.

***Neocrepidodera ferruginea* (Scopoli, 1763)**

Material examined: 21.06.2017, 1♂.

Notes: Known from İstanbul, Sakarya, Isparta, Antalya, Ankara, Konya, Kayseri, Artvin and Erzurum in Turkey (Ekiz et al, 2013). It was a very rare species represented with only one male specimen in the study area in June.

***Phyllotreta atra* (Fabricius, 1775)**

Material examined: 15.04.2017, 2♂♂, 2♀♀; 29.04.2017, 1♂; 21.06.2017, 1♂.

Notes: A very common and widely distributed species throughout Turkey (Ekiz et al, 2013). It was found in small number in the park during April-June. It was collected on herbaceous vegetation of Brassicaceae, the main host family of the genus.

***Phyllotreta corrugata* Reiche & Saulcy, 1858**

Material examined: 15.04.2017, 5♂♂, 2♀♀; 29.04.2017, 3♂♂, 1♀; 27.08.2017, 1♂, 1♀.

Notes: A widespread species in Turkey (Ekiz et al, 2013) but not common in the park. It was found in small number in April and August only, and collected on *Cardaria draba*, one of the main host plants.

***Phyllotreta nemorum* (Linnaeus, 1758)**

Material examined: 15.04.2017, 3♂♂, 6♀♀; 29.04.2017, 4♂♂, 5♀♀; 13.05.2017, 2♀♀.

Notes: Generally, a species occurring in central and eastern Turkey (Ekiz et al, 2013). It was a rare species in the park, found in small number during spring season. The specimens were collected on herbaceous vegetation of Brassicaceae, the main host family of the genus.

***Phyllotreta ochripes* (Curtis, 1837)**

Material examined: 15.04.2017, 1♂, 1♀; 29.04.2017, 7♂♂, 4♀♀; 13.05.2017, 1♂, 2♀♀; 07.06.2017, 7♂♂, 1♀; 25.11.2017, 1♀.

Notes: Known only from İstanbul, Niğde and Giresun, with a restricted distribution in Turkey (Ekiz et al, 2013). It was found in relatively large numbers in the park from April to November. The specimens were collected on herbaceous vegetation of Brassicaceae, the main host family of the genus.

***Phyllotreta procera* (Redtenbacher, 1849)**

Material examined: 15.04.2017, 1♂.

Notes: Generally, a species occurring in central and east parts of Turkey (Ekiz et al, 2013). It was a very rare species in the park, represented with only one male specimen in April. The specimen was collected on herbaceous vegetation of Brassicaceae, the main host family of the genus.

***Phyllotreta vittula* (Redtenbacher, 1849)**

Material examined: 15.04.2017, 1♂, 1♀.

Notes: Known from Edirne, İzmir, Aydın, Isparta, Antalya, Ankara, Sivas and Erzurum in Turkey (Ekiz et al, 2013). It was a very rare species in the park, represented with only two specimens in April. The specimens were collected on herbaceous vegetation of Brassicaceae, the main host family of the genus.

***Psylliodes circumdata* (Redtenbacher, 1842)**

Material examined: 01.07.2017, 1♀.

Notes: Known from İzmir, Aydın, Eskişehir, Antalya, Ankara, Konya, Amasya, Erzincan and Erzurum in Turkey (Ekiz et al, 2013). It was a very rare species in the park, represented with only one female specimen in July. It was collected on herbaceous vegetations.

***Psylliodes napi* (Fabricius, 1792)**

Material examined: 01.07.2017, 1♂.

Notes: Known from Manisa, Isparta, Antalya, Ankara, Mersin, Kayseri, Adana, Ordu, Artvin and Erzurum in Turkey (Ekiz et al, 2013). It was a very rare species in the park, represented with only one male specimen in July. It was collected on herbaceous vegetations.

***Psylliodes tricolor* Weise, 1888**

Material examined: 29.04.2017, 2♀♀; 07.06.2017, 1♂, 2♀♀; 21.06.2017, 4♂♂, 2♀♀; 01.07.2017, 6♂♂; 25.11.2017, 2♂♂, 1♀.

Notes: A very common and widely distributed species throughout Turkey (Ekiz et al, 2013). It was a relatively common species in the park, found in large numbers from April to November. The specimens were collected on herbaceous vegetations belonging to Brassicaceae.

Tribe: Galerucini Latreille, 1802

***Galeruca interrupta* Illiger, 1802**

Material examined: 29.04.2017, 1♂.

Notes: Generally a common species occurring in central and eastern Turkey (Ekiz et al, 2013). It was a very rare species in the park, represented with only one male specimen in April.

Tribe: Luperini Gistel, 1848

***Luperus xanthopoda* (Schrank, 1781)**

Material examined: 15.04.2017, 4♂♂, 1♀; 29.04.2017, 4♂♂; 13.05.2017, 2♂♂, 1♀; 07.06.2017, 4♂♂, 2♀♀; 21.06.2017, 1♂, 1♀; 01.07.2017, 5♂♂, 1♀; 21.10.2017, 3♂♂.

Notes: Generally, a very common species occurring in central and eastern Turkey (Ekiz et al, 2013). It was relatively common in the park, found in large numbers from April to October. The specimens were collected on *Prunus* sp., *Betula* sp. and *Salix* sp.

Subfamily: Cryptocephalinae Gyllenhal, 1813

Tribe: Clytrini Kirby, 1837

***Labidostomis cyanicornis* (Germar, 1822)**

Material examined: 01.07.2017, 1♂.

Notes: Only known from Düzce, Konya and Adana in Turkey (Ekiz et al, 2013). It is a rare species represented with only one male specimen in the park in July.

***Labidostomis oertzeni* Weise, 1889**

Material examined: 07.06.2017, 4♂♂, 3♂♂.

Notes: Widely distributed species in Turkey (Ekiz et al, 2013). It was found in small numbers in the park in June.

Tribe: Cryptocephalini Gyllenhal, 1813

***Cryptocephalus connexus* Olivier, 1807**

Material examined: 01.07.2017, 1♂, 4♀♀; 23.07.2017, 4♂♂, 1♀; 06.08.2017, 5♂♂, 2♀♀; 27.08.2017, 3♂♂.

Notes: A very common and widely distributed species in Turkey (Ekiz et al, 2013). It was found in large numbers in the park in July-August.

***Cryptocephalus duplicatus* Suffrian, 1847**

Material examined: 21.06.2017, 1♂; 01.07.2017, 1♂.

Notes: A common and widespread species in Turkey (Ekiz et al, 2013); however, it was represented with only two male specimens in the park during June-July.

***Cryptocephalus moraei* (Linnaeus, 1758)**

Material examined: 21.06.2017, 1♂.

Notes: A very common and widely distributed species in Turkey (Ekiz et al, 2013); however, it was a rare species represented with only one male specimen in the park in June.

***Pachybrachis fimbriolatus* (Suffrian, 1848)**

Material examined: 13.05.2017, 3♂♂; 07.06.2017, 5♂♂, 6♀♀; 21.06.2017, 3♂♂; 01.07.2017, 1♂.

Notes: A common and widely distributed species in Turkey (Ekiz et al, 2013) and found in large numbers in the park between May-July.

Subfamily: Eumolpinae Hope, 1840

Tribe: Bromiini Baly, 1865

***Pachnephorus villosus* (Duftschmid, 1825)**

Material examined: 15.04.2017, 1♂; 13.05.2017, 1♂; 07.06.2017, 1♂; 21.06.2017, 1♀; 01.07.2017, 1♂.

Notes: A widely distributed species in Turkey except eastern regions (Ekiz et al, 2013). We found a total of only five specimens in the park between April-July.

Faunistic and taxonomic evaluations and abundance

During the studies conducted in 2017, a total of 1060 specimens belonging to 46

species in 23 genera from 6 subfamilies were collected. All species were recorded for the first time in 26 Ağustos Nature Park.

The distribution and percentage ratios according to subfamilies of 46 species identified in the study were given in Fig. 1. Galerucinae, with 27 species, was the most abundant subfamily comprising about 59% of all species collected from 26 Ağustos Nature Park. It was followed by Chrysomelinae and Cryptocephalinae with 6 species each (13%), Cassidinae with 5 species (11%), Criocerinae and Eumolpinae with 1 species each (2%).

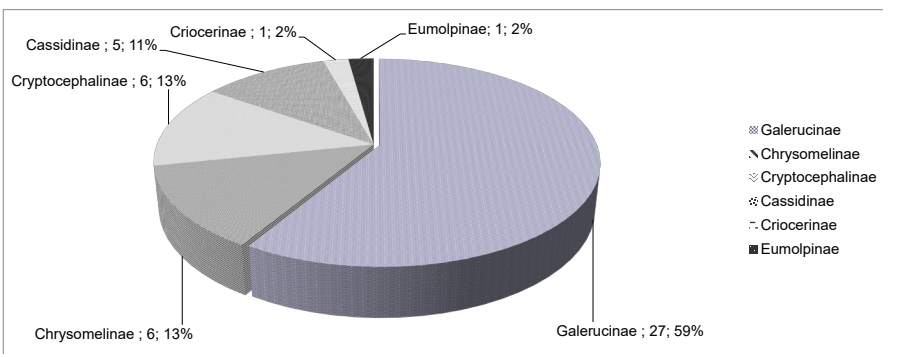

Fig. 1. The distribution and percentage ratios of the species according to subfamilies.

Chaetocnema concinna (17.92%), *Altica carduorum* (13.01%), and *Chaetocnema mannerheimi* (11.22%) were the three most dominant species in the park. The rarest species in the study area were *Labidostomis cyanicornis*, *Cryptocephalus moraei*, *Leptinotarsa decemlineata*, *Aphthona pygmaea*, *Neocrepidodera ferruginea*, *Phyllotreta procera*, *Psylliodes circumdata*, *Ps. napi*, *Galeruca interrupta* and *Cassida seraphina* (0.09%).

Alticini is one of the most diverse groups in Chrysomelidae (Nadein, 2012; Korotyaev, Konstantinov, & Volkovitsh, 2017). The most dominant and abundant three species were members of the tribe Alticini (Galerucinae). Considering the species richness of the group, it was an expected result that the members of this tribe were most dominant and abundant in the field.

Thirty-nine species in the study area were very common and widely distributed species throughout Turkey. Afyonkarahisar is located at the intersection point of Aegean, Central Anatolian and Mediterranean regions and both temperate and cold continental climate types are seen in there. The geographical position and climatic characteristics of the area created a suitable distribution area for these common species.

Two species should be re-evaluated in terms of taxonomy and zoogeography throughout Turkey. *Oulema rufocyanea* is morphologically very similar to *O. melanopus*, and these two species are generally confused with each other. It is highly probable that *O. rufocyanea* is distributed in some of the provinces where *O. melanopus* is distributed in the checklist published by Ekiz et al (2013). Therefore, taxonomic and zoogeographical situation of these two species in Turkey should be

re-evaluated. Accordingly, *Hypocassida cornea* is very similar to *H. subferruginea*, and the situations of these two species in Turkey are needed to be reconsidered in taxonomic and zoogeographic terms.

Host-plant evaluation

Leaf beetles are one of the most important phytophagous beetle families in terms of species diversity and relationships with their host plants (Jolivet & Verma, 2002; Clark et al, 2004). The high species diversity of this group is associated with the preference of various plant families as hosts (Fuss, Geiser & Patzner, 2005). It is not always easy to establish host plant preferences of leaf beetles except some species. Therefore, leaf beetles and host plant preferences require a special effort in field studies.

Host plant preferences of the leaf beetles in the study area, and host plant families and preference percentages by leaf beetles are presented in Fig. 2. The host plant of 23 species (50%) out of 46 leaf beetles in 26 Ağustos Nature Park was identified at genus and species level (Table 1). It was observed that most of the leaf beetles in the study area preferred members of the Brassicaceae (27%). Other preferred plant families are Salicaceae (19%), Asteraceae (11%), Amaranthaceae (8%), Poaceae (7%), Rosaceae (4%), Betulaceae (4%), Plantaginaceae (4%), Lamiaceae (4%), Euphorbiaceae (4%), Polygonaceae (4%), and Papaveraceae (4%) (Fig. 2). Most of the identified host plants were compatible with the host plant preferences given in the literature (Kısmalı & Sassi, 1994; Fuss et al, 2005; D'Alessandro & Biondi, 2008; Rozner & Rozner, 2008; Aslan, Gök, Gürbüz & Ayvaz, 2009; Gavrilović & Ćurčić, 2013; Gavrilović, Gavrilović, Ćurčić, Stojanović, & Savić 2014; Baviera & Biondi, 2015; Bezděk & Baselga, 2015; Petitpierre, Sacares, & Jurado-Rivera, 2017). However, *Longitarsus kutschera* was collected while feeding on *Plantago* species. This data is interesting because there are some signs that this species has been feeding on *Plantago* species recently (Rheinheimer & Hassler, 2018). So this data confirms the literature of Rheinheimer & Hassler (2018). It was observed that *Labidostomis oertzeni*, *Chrysomela populi*, *Plagiodera versicolora*, *Crepidodera aurata* and *Luperus xanthopoda* were related with the ligneous vegetations in the area. These species prefer mainly species belonging to Salicaceae, Betulaceae and Rosaceae.

Phenological evaluation

The highest species numbers of leaf beetles were observed in the late spring and at the beginning of summer, while the least species numbers were registered in autumn (Fig.3). The most active period of the leaf beetles was generally the spring season because the increase in diversity of the host plants with rich nutrient content in this season leads to an increase in leaf beetle species diversity (Aslan et al, 2009). The results obtained from the fieldwork confirm these data.

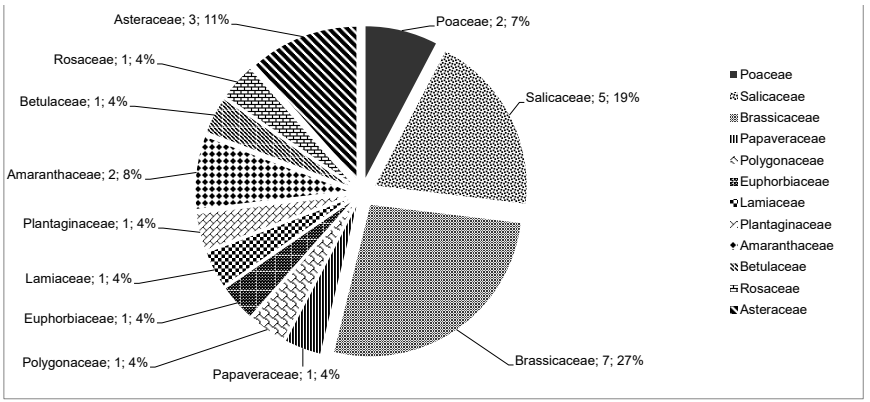

Fig. 2. Host plant preferences of the leaf beetles and their families and preference percentages.

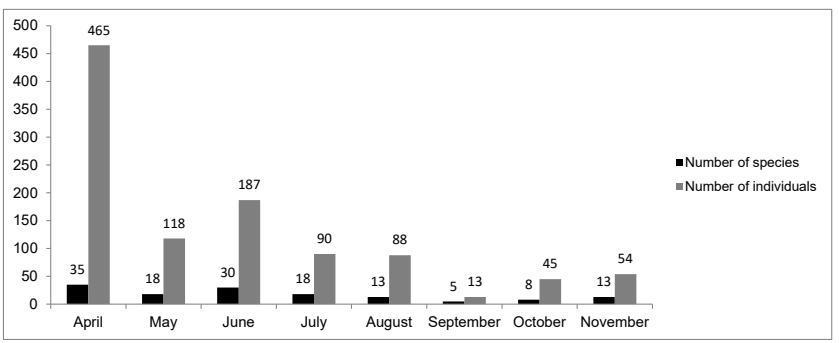

Fig. 3. Species and individual numbers according to months.

CONCLUSION

Consequently, the present study is important as it is the first faunistic study performed in the field. As a result, a total of 46 species were recorded; however, this number is low for a nature park. Possible reasons may be the lack of rich plant diversity, the cutting of the existing vegetation occasionally, the arrangement of the majority of the park as a picnic area and intensive human activities in the area. In addition to these, another reason is that the sampling includes a one-year period. The species number can rise with further collections trips. But the lack of rich plant biodiversity, especially of plants which occur on nutrient-poor grassland is the main factor for the restriction of the species number there. These are serious pressures for leaf beetles and other species. As a conclusion, this study will contribute to the understanding of leaf beetle fauna in a small Nature Park. Also, this study could be used as a first step to make suggestion for landscape management.

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