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Diversity of Animal Species, Systematics, and Phylogeny-3

Faunistic Studies on *Dorcadion* Dalman, 1817 (Coleoptera: Cerambycidae) Species of Collected from the Province of Erzurum and EMET Collection*

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ABSTRACT

The faunistic studies were conducted to determine insect species belonging to the genus *Dorcadio*n Dalman, 1817 (Coleoptera: Cerambycidae) collected from some districts of Erzurum province (Aşkale, Aziziye, Çat, İspir, Horasan Oltu, Palandöken, Yakutiye) during the years of 2018-2019 and protected in EMET (Entomology Museum, Erzurum, Turkey) where the insect species were collected from different provinces of Turkey in previous studies. In the result of this study, 25 species and subspecies (*Cribridorcadion* Pic, 1901 (24) and *Maculatodorcadion* Breuning, 1966 (1)) were found. These are: *Dorcadion* (*C.*) *bisignatum* Jakovlev, 1899, *Dorcadion* (*C.*) *mesopotamicum* Breuning, 1944, *Dorcadion* (*C.*) *scabricolle halikesirense* Breuning, 1962, *Dorcadion* (*C.*) *catenatum catenatum* Waltl 1838, *Dorcadion* (*C.*) *mniszechi* Kraatz, 1873, *Dorcadion* (*C.*) *scabricolle shirakense* Lazarev, 2020, *Dorcadion* (*C.*) *catenatum loratum* Thomson, 1867, *Dorcadion* (*C.*) *nitidum* Motschulsky, 1838, *Dorcadion* (*C.*) *scabricolle korbianum* Lazarev, 2020, *Dorcadion* (*C.*) *catenatum mytilinense* Kraatz, 1873, *Dorcadion* (*C.*) *nobile ivani* Pesarini and Sabbadini, 2011, *Dorcadion* (*C.*) *sodale* Hampe, 1852, *Dorcadion* (*C.*) *coiffaiti* Breuning, 1962, *Dorcadion* (*C.*) *oezdurali* Önalp, 1988, *Dorcadion* (*C.*) *subsericatum* Pic, 1901, *Dorcadion* (*C.*) *crux* Billberg, 1817, *Dorcadion* (*C.*) *olympicum* Ganglbauer, 1882, *Dorcadion* (*C.*) *wagneri* Küster, 1846, *Dorcadion* (*C.*) *dimidiatum dimidiatum* Motschulsky, 1838, *Dorcadion* (*C.*) *piochardi* Kraatz, 1873, *Dorcadion* (*M.*) *triste* Frivaldszky, 1845, *Dorcadion* (*C.*) *haemarrhoidale* Hampe, 1852, *Dorcadion* (*C.*) *scabricolle lazistanum* Lazarev, 2020, *Dorcadion* (*C.*) *infernale infernale* Mulsant and Rey, 1863 and *Dorcadion* (*C.*) *scabricolle salhanum* Lazarev, 2020. From these species; *D.* (*C.*) *coiffaiti* is the new report for Kütahya, *D.* (*C.*) *crux* for Isparta, *D.* (*C.*) *dimidiatum dimidiatum* and *D.* (*C.*) *nitidum* for Ardahan, *D.* (*C.*) *haemarrhoidale* for Gümüşhane, *D.* (*C.*) *mesopotamicum* for Diyarbakır and Yalova, *D.* (*C.*) *oezdurali* for Erzincan, *D.* (*C.*) *olympicum* for Kars and *D.* (*C.*) *wagneri* for Diyarbakır, Muş and Yalova provinces. *D.* (*C.*) *wagneri*, *D.* (*C.*) *scabricolle lazistanum, D.* (*C.*) *scabricolle shirakense* and *D.* (*C.*) *nitidum* are having higher population than others species. The great majorty of determined species were collected from under stones and grass plants. In this study, the distribution of *Dorcadion* species were added new localities, too. Useful information has been provided for researchers work on this issue in the following years.

Keywords: *Dorcadion*, Cerambycidae, Coleoptera, Fauna, Turkey

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INTRODUCTION

Cerambycidae Latreille included in Coleoptera, is a rich family constituting approximately 10% of all species in order (Jenis, 2001). It is stated that the number of species in the world is 36.300 (Wang, 2017). Because they are well known for their long and developed antennae, family name means "insects with long antennae" which comes from a Greek word (Lodos, 1998). The genus of *Dorcadion* Dalman, 1817 is located in the tribus of Dorcadionini Latreille, 1825 in Cerambycidae. All of the bodies of the Cerambycidae species, especially the elytra, are covered with very dense, slanting black, brown or gray colored feathers. These feathers form patterns and stripes in different colors, especially in the *Dorcadion* genus. Elytra mostly covers the abdomen, in *Dorcadion* individuals, it is seen as fused in suture and enlarged in the middle (Gül Zümreoğlu, 1975). The researches determine *Dorcadion* species according to narrow rows pits, bands and brown-black ground feathers on the elytra and gray-white-yellowish feathers on the pronotum (Önalp, 1990).

Turkey is a very rich country for *Dorcadion* species. In the Palearctic Region Catalog prepared by Danilevsky (2019), it is recorded that there is 666 *Dorcadion* species in the world and 293 of them is in Turkey. This species represents 43.99% of the Palearctic Region. It is also noteworthy that 258 of this species in Turkey (88.05%) is endemic.

All of *Dorcadion*'s adults cannot fly, because some of them have not a rear wing. *Dorcadion* larvae, which feed on the roots of grass plants, cause damage in most grass areas economically (Kumral *et al.*, 2012). It is recorded that species of this genus give offspring every two years (Baur *et al.*, 1997). Females lay their eggs preferably on the stems of narrow-leaved plants such as *Bromus erectus, Lolium perenne, Festuca indigesta, F. valesiaca, F. iberica, Dactylis glomerata, Poa bulbosa, Psathyrostachys juncea, Nardus stricta, Stipa* spp., *Triticum aestivum, T. durum* and *Zea* mays in late March and April or May (Fabbri and Hernandez, 1996). It is reported that the larvae hatch from these eggs at the end of May or June and feed on the root parts of grass plants. It is stated that after spending the wintering period as mature larvae, they enter the pupal period approximately 13-14 weeks later and adults appear 2-3 weeks later. It is also stated that the new generation adults are not active immediately, and after going through another wintering period, they reach the soil surface in March. It is recorded that adult individuals that emerged to the soil surface reached sexual maturity after 1 month and started to lay eggs by mating (Baur *et al.*, 2002).

Turkey, due to its unique geographical location and different climatic zones, is one of the countries with the richest biodiversity in the West Palaearctic Region. Three quarters of European and Central Asian hot zone (Caucasus, Iran-Anatolia and Mediterranean Basin points) is located partly within the borders of Turkey. Turkey, as well as being the center of many taxa, exceptionally despite having variety of

topography and harsh geological and climatic changes has living space to ensure the survival of many species. Therefore, Turkey has a rich flora and fauna including many endemic species (Myers *et al.,* 2000; Çıplak, 2003, 2004; Konstantinov *et al.,* 2009; Ekiz *et al.,* 2013; Conservation International, 2015). The Cerambycidae fauna, which is an important group in this diversity, has not been fully revealed until today. This study about *Dorcadion* is aimed to contribute to the Cerambycidae fauna.

MATERIALS AND METHODS

Dorcadion adult species collected from districts of Erzurum (Aşkale, Aziziye, Çat, Horasan, İspir, Narman, Oltu, Palandöken and Yakutiye). The collected specimens were protected in Atatürk University, Agricultural Faculty Entomology Museum (EMET, Entomological Museum, Erzurum, Turkey). The adults were caught by pit food traps (for 1 liter of mixture; 900 ml of water, 100 ml of red wine, 25 ml of vinegar and 25 g of sugar) and hand. These samples collected were killed in collection bottles containing ethyl acetate in liquid form and brought to the laboratory with paper cones placed in polyethylene bags or bottles. The altitude of each locality where the species were collected is given.

Adult specimens kept in cotton envelopes were pinned with insect needles suitable for their size in the laboratory or glued individually on appropriate sized insect sticking cards. They were placed in drawers in insect protection cabinets at Atatürk University Faculty of Agriculture Plant Protection Department Entomology Museum (EMET).

The information like the scientific name, the spreading area in the world and Turkey, the host (if it has been determined), the place where collected, the number of male or female individuals etc. is also given.

RESULTS

In the result of study, total 25 species and subspecies were identified from *Cribridorcadion* Pic 1901 subspecies (24) and *Maculatodorcadion* Breuning, 1966 subspecies (1) (Table 1; Figure 1). From these species; *D.* (*C.*) *coiffaiti* is the new report for Kütahya, *D.* (*C.*) *crux* for Isparta, *D.* (*C.*) *dimidiatum dimidiatum* and *D.* (*C.*) *nitidum* for Ardahan, *D.* (*C.*) *haemarrhoidale* for Gümüşhane, *D.* (*C.*) *mesopotamicum* for Diyarbakır and Yalova, *D.* (*C.*) *oezdurali* for Erzincan, *D.* (*C.*) *olympicum* for Kars and *D.* (*C.*) *wagneri* for Diyarbakır, Muş and Yalova provinces. *D.* (*C.*) *wagneri*, *D.* (*C.*) *scabricolle lazistanum, D.* (*C.*) *scabricolle shirakense* and *D.* (*C.*) *nitidum* are having higher population than others species. The determined species are listed below.

***Dorcadion* Dalman, 1817**

Tip tür: *Cerambyx glycyrrhizae* Pallas, 1773

Altcins: C*ribridorcadion* Pic, 1901

***Dorcadion* (*Cribridorcadion*) *bisignatum* Jakovlev, 1899**

Distribution in the World: Turkey (Danilevsky, 2019).

Distribution in Turkey: Artvin (Jakovlev, 1899; Plavilstshikov, 1958; Breuning, 1962; Breuning and Villiers, 1967; Özdikmen, 2010, 2012, 2016; Bernhauer and Peks, 2013).

Material examined: Artvin: Ardanuç, Kutul, 1700 m, 12.VII.2000, 1♀. It is stated in the label information that it was collected from under stone.

***Dorcadion* (*C.*) *catenatum catenatum* Waltl, 1838**

Distribution in the World: Turkey (Danilevsky, 2019).

Distribution in Turkey: Antalya, **Aydın** (Kuşadası, Nazilli), **Balıkesir, Burdur, Bursa, Denizli**, **Eskişehir, Isparta, İzmir** (Bornova, Çiğli, Foça, Karaburun-Mordoğan, Karşıyaka-Yamanlar, Kemalpaşa, Menderes, Menemen, Ödemiş-Bademli, Seferihisar, Selçuk, Urla-Zeytinler), **Kahramanmaraş** (Ahır Mountain), **Konya, Kütahya, Manisa** (Şehzadeler), **Mersin** (Mut), **Muğla** (Bodrum-Aspat) (Küster, 1846; Kraatz, 1873; Ganglbauer, 1884; Pic, 1899, 1917; Breuning, 1946; 1962, 1966; Demelt, 1963; Sama, 1982; Önalp, 1991; Özdikmen, 2010, 2012, 2016; Şenyüz and Özdikmen, 2013; Tezcan *et al.,* 2020; Özdikmen and Tezcan, 2020).

Material examined: Izmir: Bornova-Ege University Campus, 30 m, 15.V.1991, 1♀.

***Dorcadion* (*C.*) *catenatum loratum* Thomson, 1867**

Distribution in the World: Turkey (Danilevsky, 2019).

Distribution in Turkey: Balıkesir (Edremit-Akçay, Elbis, Havran), **Çanakkale**, **Eskişehir**, **İzmir** (Balçova, Bornova, Buca, Çiğli, Karşıyaka-Yamanlar, Menemen, Ödemiş, Selçuk, Urla), **Manisa** (Sarıgöl) (Thomson 1867; Braun 1978; Özdikmen 2010, 2012, 2016; Özdikmen and Tezcan, 2020b).

Material examined: Izmir: Bornova-Ege University Campus, 30 m, 15.V.1991, 1♀.

***Dorcadion* (*C.*) *catenatum mytilinense* Kraatz, 1873**

Distribution in the World: Turkey and Greece (Danilevsky, 2019).

Distribution in Turkey: Aydın (Kuşadası), **Balıkesir**, **İzmir** (Bornova, Menemen, Seferihisar) (Kraatz, 1873; Özdikmen, 2010; Özdikmen, 2016; Varlı *et al.,* Özdikmen and Tezcan, 2020b).

Material examined: Izmir: Yamanlar, 497 m, 30.III.1995, 1♀. It is stated in the label information that it was collected from over grass plants.

***Dorcadion* (*C.*) *coiffaiti* Breuning, 1962**

Distribution in the World: Turkey (Danilevsky, 2019).

Distribution in Turkey: Balıkesir (Atköy, Manyas, Centrum, Demirci) (Breuning, 1962; Pesarini and Sabbadini, 2009; Özdikmen, 2010; 2012; Özdikmen and Tezcan, 2020b).

Material examined: Kütahya: Yemişli env. (20 km N of Simav), 790 m, 23.IV.1997, 1♂, 1♀.

***Dorcadion* (*C.*) *crux* Billberg, 1817**

Distribution in the World: Turkey (Danilevsky, 2019).

Distribution in Turkey: Balıkesir, **Bilecik** (Söğüt), **Bursa**, **Eskişehir**, **İstanbul (Alem Mountain), İzmir** (Bergema, Ödemiş-Bozdağ), **Konya** (Akşehir), **Kütahya**, **Osmaniye** (Bahçe), **Uşak** (Ganglbauer, 1884; Bodemeyer, 1900; 1906; Pic, 1900; Breuning, 1946; 1962; Demelt, 1963; Tuatay *et al.,* 1972; Braun, 1978; Adlbauer, 1988; Önalp, 1991; Özdikmen *et al.,* 2005; Özdikmen, 2010; 2012, 2016).

Material examined: Isparta: Davraz, 1200 m, 01.IV.2000, 1♀. It was collected from under stone.

***Dorcadion* (*C.*) *dimidiatum dimidiatum* Motschulsky, 1838**

Distribution in the World: Argentina, Armenia, India, the Caucasus, Iran and Turkey (Danilevsky, 2019).

Distribution in Turkey: Ağrı, Erzincan, Erzurum, Malatya, (Thomson, 1867; Plavilstshikov, 1958; Villiers, 1967; Gfeller, 1972; Braun, 1978; Özbek, 1978; Önalp, 1991; Özdikmen and Hasbenli, 2004b; Özdikmen, 2010, 2016).

Material examined: Ardahan: Centrum, 1870 m, 8.V.1974, 1♀; **Erzurum**: 9-15 Km S of Çat, 1800 m, 12.IV.2002, 2♂; **Erzurum:** 9-15 Km S of Çat, 1814 m, 12.IV.2002, 2♂; **Erzurum:** Çobandede Mountain, 26.V.2014, 1♂; **Erzurum:** Konaklı, 2150 m, 02.VII.2004, 1♂, 2♀; **Erzurum:** Palandöken Mountain, Tuzcu, 2200 m, 15.V.2005, 2♀; **Erzurum:** Palandöken Mountain, Tuzcu, 1900 m, 21.VI.2004, 1♀. In the label information of the samples, it is stated that they were collected from under stones and on grass plants.

***Dorcadion* (*C.*) *haemarrhoidale* Hampe, 1852**

Distribution in the World: Argentina, Armenia, India, the Caucasus, Iran and Turkey (Danilevsky, 2019).

Distribution in Turkey: Ağrı (Taşlıçay, N of Bayazıt), **Ankara**, **Erzurum** (Aşkale) (Plavilstshikov, 1958; Gfeller, 1972; Braun, 1978; Önalp, 1990; Özdikmen, 2010, 2016).

Material examined: Gümüşhane: Centrum; 02.IV.2002, 1♀; **Erzurum:** Şenkaya, Esenyurt, 19.VI.1997, 1♂; **Erzurum:** İspir, Madenköprübaşı, 6.VI.1980, 1♀; **Erzurum**: Pazaryolu, Kartal Plateau, 3000m, 5.VII.2000, 2♂.

***Dorcadion* (*C.*) *infernale infernale* Mulsant and Rey, 1863**

Distribution in the World: Turkey (Danilevsky, 2019).

Distribution in Turkey: Amasya, **Ankara**, **Antalya**, **Bilecik**, **Burdur**, **Çorum**, **Eskişehir**, **İçel**, **İzmir**, **Konya**, **Kütahya**, **Niğde** (Ulakışla), **Sivas**, **Uşak, Yozgat** (Akdağmadeni) (Ganglbauer, 1884; Aurivillius, 1921; Bodemeyer, 1900, 1906; Daniel, 1900; Pic. 1903; Daniel and Daniel, 1903; Heyrovský, 1932; Breuning, 1946, 1962; Demelt, 1963; Braun, 1978; Önalp, 1990; Adlbauer, 1992; Özdikmen and Hasbenli, 2004a; Özdikmen, 2006, 2016; Özdikmen *et al.* 2009; Sama *et al.,* 2012; Şenyüz and Özdikmen, 2013; Özdikmen and Tezcan, 2020a).

Material examined: Eskişehir: İnönü, 840 m, 27.IV.1996, 1♂, 1♀.

***Dorcadion* (*C.*) *mesopotamicum* Breuning, 1944**

Distribution in the World: Iraq and Turkey (Danilevsky, 2019).

Distribution in Turkey: Mardin, **Şanlıurfa** (Siverek) (Breuning, 1962; Braun, 1978; Özdikmen, 2010, 2016).

Material examined: Diyarbakır: Silvan, 837 m, 17.IV.1995, 6♂, 2♀; **Yalova**: Horticultural Research Institute, 2m, 27.IV.2003, 1♂, 2♀.

***Dorcadion* (*C.*) *mniszechi* Kraatz, 1873**

Distribution in the World: Argentina, the Caucasus (Armenia), Turkey and Iran (Danilevsky, 2019).

Distribution in Turkey: Ağrı (Ağrı Dağı), **Erzurum**, **Isparta**, **İzmir** (Ödemiş-Bozdağ), **Kars** (Kağızman), **Sivas** (Karayün Village), **Kars** (Kağızman), **Ağrı** (Ağrı Mountain), **Erzurum**. (Plavilstshiko, 1958; Danilevsky and Miroshnikov, 1985; Lodos, 1998; Özdikmen and Hasbenli, 2004a; Özdikmen, 2007, 2010, 2016; Lazarev, 2014).

Material examined: Kars: Sarıkamış Karakurt Şeytangeçmez, 2100 m, 2.VI.1999, 1♀. It was collected from under stone.

***Dorcadion* (*C.*) *nitidum* Motschulsky, 1838**

Distribution in the World: Argentina, Guernsey, the Caucasus (Armenia, Azerbaijan) and Turkey (Danilevsky, 2019).

Distribution in Turkey: Artvin (Şavşat- Çengel Plateau, Yalnızçam), **Erzurum** (Centrum and near), **Yozgat** (Yozgat National Park) (Plavilstshikov, 1958; Breuning, 1962; Özbek, 1978; Danilevsky and Miroshnikov, 1985; Adlbauer, 1988; Önalp, 1990; Lodos, 1998; Özdikmen and Hasbenli, 2004a; Özdikmen, 2010, 2016).

Material examined: Ardahan: Centrum, 1870 m, 30.V.1973, 1♂; 7.V.1974, 16♂, 13♀; **Erzurum**: Horasan, 1600 m, 11.V.1973, 1♂.

***Dorcadion* (*C.*) *nobile ivani* Pesarini and Sabbadini, 2011**

Distribution in the World: Turkey (Lazarev, 2019).

Distribution in Turkey: Bingöl, **Muş** (Kardeşler) (Pesarini and Sabbadini, 2011; Özdikmen, 2012; Rapuzzi and Sama, 2012; Özdikmen, 2016.

Material examined: 12 km West, 1330 m, 38° 55' 56"N - 40° 22' 13"E, 06.V.2003, 1♂. It was collected over the grass plant.

***Dorcadion* (*C.*) *oezdurali* Önalp, 1988**

Distribution in the World: Turkey (Danilevsky, 2019).

Distribution in Turkey: Adıyaman (Nemrut Mountain), **Kahramanmaraş** (Ahır Mountain, Göksun-Mehmetbey) (Önalp, 1988; 1991; Rejzek and Hoskovec, 1999; Pesarini and Sabbadini, 1998; 2013; Özdikmen and Okutaner, 2006; Özdikmen, 2010; 2012, 2016; Sama *et al.*, 2012; Özdikmen and Koçak, 2013).

Material examined: Erzincan: Kemaliye-Sandık Village, 950 m, 21.VII.1984, 1♀.

***Dorcadion* (*C.*) *olympicum* Ganglbauer, 1882**

Distribution in the World: Turkey (Danilevsky, 2019).

Distribution in Turkey: Anatolia (no locality) (Winkler, 1924, 1932), **Turkey** (no locality) (Lodos, 1998), **Ankara**, **Bilecik**, **Bursa** (Uludağ, Uluabat Lake), **İstanbul** (Belgrad Forest, Alem Mountain), **Kütahya** (Akdağ) (Ganglbauer, 1884; Bodemeyer, 1906; Aurivillius, 1921; Breuning, 1962; Demelt, 1963;

Breuning and Villiers, 1967; Braun, 1978; Adlbauer, 1988; Krätschmer, 1987; Önalp, 1990; Özdikmen, 2010; 2012, 2016; Özdikmen and Tezcan, 2020a).

Material examined: Bursa: Hürriyet, 5.VII.1991, 1♂; **Bursa**: Uludağ, 7.VII.1991, 1♂, 1♀; **Kars**: Sarıkamış, Karakurt-Şeytangeçmez, 1450 m, 02.V.2000, 1♂; 04.VI.2000, 1♂. It was collected from grass and herbaceous plants around the roots and under the stones.

***Dorcadion* (*C.*) *piochardi* Kraatz, 1873**

Distribution in the World: Turkey (Danilevsky, 2019).

Distribution in Turkey: Amasya (Akdağ, Borabay Lake-Taşova, Merzifon), **Çanakkale**, **Çorum** (Alaca, Centrum, Mecitözü, Yazılıkaya), **Samsun** (Canik-Çayırkent, Havza, Centrum, Ladik-Aslantaş-Karadağ-Akdağ, Vezirköprü), **Sinop** (Boyabat (Bektaş), **Yozgat** (Centrum) (Kraatz, 1873; Ganglbauer, 1884; Jakovlev, 1901; Aurivillius, 1921; Winkler, 1924, 1932; Lodos, 1998; Breuning, 1962; Breuning and Villiers, 1967; Braun, 1978; 1979; Önalp, 1991; Adlbauer, 1992; Özdikmen, 2007, 2010, 2012, 2016; Lazarev, 2011).

Material examined: Amasya: Centrum; 1150 m, 10.IX.1993, 1♀.

***Dorcadion* (*C.*) *scabricolle lazistanum* Lazarev, 2020**

Distribution in the World: Turkey (Lazarev, 2020).

Distribution in Turkey: Gümüşhane, **Erzurum** (Trabzon-Rize between, south foothill of Rize-Gümüşhane Range (Gümüşhane and İspir env.)) (Lazarev, 2020).

Material examined: Gümüşhane: Centrum, 1153 m, 2.IV.2002, 1♂, 1♀; **Erzurum:** Aşkale, 1850 m, 11.IV.2002, 1♂; **Erzurum:** Aşkale; 1600 m, 27.IV.2002, 1♂, 3♀; **Erzurum:** Hamam Stream, 1700 m, 20.IV.2003, 1♀; **Erzurum:** Horasan, 11.V.1973, 3♂; **Erzurum:** Horasan, Aras Valley, Şeytangeçmez, 1425 m, 20.IV.2005, 3♂, 4♀; **Horasan**, Bulgurlu Village, 1870 m, 28.V.2019, 3♂, 2♀; **Erzurum:** Ilıca; 1850 m, 11.IV.2003, 3♀; **Erzurum:** Ilıca, Gülpınar Village, 1825 m, 29.V.2019, 5♂, 2♀; **Erzurum:** Narman Kireçli Pass, 2415 m, 25.V.2019, 1♀; **Erzurum:** Oltu, Çamlıbel, 1750 m, 17.V.2003, 1♀; **Erzurum:** Oltu, Karakaban, 27.V.1995, 1♀; **Erzurum**: Palandöken Mountain, Tuzcu, 2200 m, 15.V.2005, 1♀; **Erzurum:** Tekederesi, 2100 m, 16.VI.2014, 1♂; **Erzurum:** Tortum, Aksu, 1800 m, 18.IV.2004, 1♂. It is reported that the samples collected were obtained from around grass roots and under stones.

***Dorcadion* (*C.*) *scabricolle salhanum* Lazarev, 2020**

Distribution in the World: Turkey (Lazarev, 2020).

Distribution in Turkey: Bingöl (6 km south-eastwards Salhan, Buglan Pass); **Bitlis** (Tatvan Environs, 4 km West Tatwan, Orenlik, West Tatvan, Kolbaşı); **Kahramanmaraş** (Göksun, Mağaraözü, Afşin, Emirilyas Village); **Malatya** (Yukari Ulupinar, 30 km SE Darende); **Tunceli** (Pulumur Env.); **Van** (Kuskum Kiran Pass) (Lazarev, 2020).

Material examined: Bingöl: Hamamlar, 1400 m, 5.VI.2003, 1♂, 1♀.

***Dorcadion* (*C.*) *scabricolle balikesirense* Breuning, 1962**

Distribution in the World: Armenia ad Turkey (Danilevsky, 2019; Lazarev, 2020).

Distribution in Turkey: Balikesir (Centrum and Environs, Yenikoi Environs, Kepsut Environs; Selimaga Environs), **Bursa** (Northwest Harmancik), **Kütahya** (Tavşanli Environs) (Breuning, 1962; Braun, 1978; Özdikmen, 2010, 2012, 2016; Lazarev, 2020).

Material examined: Bursa: Uludağ University Campus; 100 m, 8.III.2002, 2♂, 4♀. It was collected over grass plants.

***Dorcadion* (*C.*) *scabricolle shirakense* Lazarev, 2020**

Distribution in the World: Armenia and Turkey (Lazarev, 2020).

Distribution in Turkey: Ağrı, **Ardahan**, **Artvin**, **Erzurum** (Çat), **Kars** (Karakurt, Kağızman); **Van** (Lazarev, 2020).

İncelenen materyal: Ardahan: Centrum, 1870 m, 7.V.1974, 1♀; 8.V.1974, 3♂; **Erzurum:** Çat, 1814 m, 12.IV.2002, 1♂, 3♀; **Erzurum:** Çat 9-15 km South, 1800 m, 12.IV.2002, 6♂, 8♀; **Kars:** Kağızman, 1.V.1969, 1♂; **Kars**: Kağızman Aydınkavak; 1150 m, 3.VI.2004, 5♂; **Kars:** Kağızman, 1020 m, 4.V.2003, 1♂; **Kars:** Kağızman, 1425 m, 6.V.2019, 1♂, 2♀; **Kars:** Sarıkamış, Karakurt, 1450 m, 16.V.1978, 2♂, 1♀; **Kars:** Sarıkamış, Karakurt, 02.V.2000, 2♂, 5♀; 02.V.2000, 2♂, 1♀; **Kars:** Sarıkamış, Karakurt, Şeytangeçmez; 04.VI.2000, 1♂; **Kars:** Sarıkamış, Karakurt; 1501 m, 17.IV.2002, 3♂, 1♀; **Kars:** Sarıkamış 14 km E of Karakurt, 1400 m, 4.V.2003, 2♂. In the label information, it is stated that the samples were obtained from the grass roots and under the stones.

***Dorcadion* (*C.*) *scabricolle korbianum* Lazarev, 2020**

Distribution in the World: Turkey (Lazarev, 2020).

Distribution in Turkey: Afyonkarahisar (Sultan Mountain), **Isparta** (Barla Environs, Sultan Environs, S Akşehir-Cankurtaran), **Konya** (Akşehir Environs) (Lazarev, 2020).

Material examined: Konya: Southern border, Örenboyalı, 1020 m, 27.II.2002, 6♂, 5♀. It is stated that it is collected over grass plants.

***Dorcadion* (*C.*) *sodale* Hampe, 1852**

Distribution in the World: Turkey (Danilevsky, 2019).

Distribution in Turkey: Turkey (Kolat Mountain) (Breuning, 1962), **Bayburt**, **Erzurum** (Aşkale, Centrum, İspir-Ovacık), **Giresun**, **Trabzon** (Soğanlı Pass, Zigana Mountain) (Plavilstshikov, 1958; Villiers, 1959; Breuning, 1962; Breuning, 1966; Breuning and Villiers, 1967; Demelt, 1967; Gfeller, 1972; Braun, 1978; Adlbauer, 1988; Önalp, 1990; Lodos, 1998; Özdikmen, 2010; 2012, 2016).

Material examined: Erzurum: Palandöken, 2200 m, 29.VI.1980, 1♂, 1♀; **Erzurum:** Tortum, 13.VII.1974, 1♂; **Erzurum:** Yeşilyayla-Radar Road, 2300-2700 m, 30.VI:2001, 3♂; **Trabzon:** Kadırga Plateau, 13.VIII.1993, 1♂. It is stated that some samples were collected from grass plants.

***Dorcadion* (*C.*) *subsericatum* Pic, 1901**

Distribution in the World: Turkey (Danilevsky, 2019).

Distribution in Turkey: Ankara (Bayındır Dam, Ayaş Road-Başayaş Village, Çubuk), **Çankırı**, **Konya** (Kulu-Beşkardeş-Zincirlikuyu Village between), **Karabük** (Safranbolu), **Kastamonu** (Devrekani, Ilgaz Mountain, Tosya-Bürnük Village, Yaralıgöz Mountain, Yılancı Village, 5 km. to Çankır province) (Breuning, 1962; Demelt, 1967; Braun, 1978; Sama, 1982; Adlbauer, 1992; Özdikmen and Hasbenli, 2004a; Özdikmen, 2006, 2010, 2012, 2016; Al-Hamadani and Özdikmen, 2014; Özdikmen and Tezcan, 2020a).

Material examined: Kastamonu: Devrekani, 1100 m, 6.IV.1977, 1♂, 1 ♀.

***Dorcadion* (*C.*) *wagneri* Küster, 1846**

Distribution in the World: Caucasus, Turkey and Iran (Danilevsky, 2019).

Distribution in Turkey: Turkey (no locality) (Lodos, 1998), **Ağrı** (East Beyazıt, Ağrı Mountain), **Erzurum** (Hasankale), **Kars** (Kuster, 1848; Ganglbauer, 1884; Plavilstshikov, 1958; Danilevsky and Miroshnikov, 1985; Önalp, 1990; Özdikmen, 2010, 2012, 2016).

Material examined: Diyarbakır: Silvan, 837 m, 17.IV.1995, 1♂; **Erzurum**: Aşkale, 1600 m, 27.IV.2002, 1♂, 2♀; **Erzurum**: Atatürk University Campus, 1850 m, 21.VI.1994; 14.VI.1996, 1♀; 16.IV.2000, 1♂, 1♀; 18.IV.2000, 4♂, 4♀; 11.V.2000, 1♂; 16.VI.2000, 1♀; 28.IV.2001, 2♂, 1♀; 13.IV.2004, 1♂, 1♀; 17.V.2004, 4♀; 21.V.2004, 3♂, 2♀; 07.VI.2004, 2♀; 29.V.2017, 1♂ (Trap); 30.IV.2019, 1♂ (Trap); 3.V.2019, 1♂ (Trap); 1850 m, 17.V.2019, 1♂; 21.V.2019, 6♂ (Trap); **Erzurum**: Çat, Highways, 1500 m, 18.IV.2002, 1♂, 2♀; **Erzurum:** Eastern Anatolia Agricultural Research Institute, 1850 m, 19.IV.2002, 1♂, 6♀; 20.IV.2002, 1♀; **Erzurum:** Dutçu Village, 1850 m, 04.V.2003, 2♂, 3♀; **Erzurum:** Horasan, Aras Valley, Şeytangeçmez, 1425 m, 20.IV.2005, 1♂, 2♀; **Erzurum:** Ilıca, 1825 m, 11.V.2003, 7♂, 2♀; 29.V.2019, 1♀; **Erzurum:** Palandöken Mountain, Tuzcu; 2150 m, 23.IV.2005, 1♀; 15.V.2005, 1♂, 6♀; **Erzurum:** Tortum, Aksu, 1800 m, 18.IV.2004, 1♀; **Erzurum:** Tortum, 5.V.1974, 1♂; **Erzurum:** Uzundere, Yedigöller, 21.V.1998, 1♂, 1♀; **Erzurum:** Centrum, 1850 m, 5.V.1979, 3♀; 5.VI.1980, 1♂; 16.V.1980, 2♂; 18.V.1980, 2♂, 2♀; 1.VI.1983, 1♀; 9.VI.1983, 2♀; 10.IV.1996, 1♂, 2♀; 11.IV.1996, 2♂, 1♀; 12.IV.1996, 3♀; 13.IV.1996, 2♂, 2♀; 14.IV.1996, 1♀; 15.IV.1996, 1♂; 18.IV.1996, 1♂; 01.V.1996, 1♂, 1♀; 02.V.1996, 1♂; 03.V.1996, 2♂, 1♀; 04.V.1996, 1♀; 06.V.1996, 6♀; 07.V.1996, 1♂, 1♀; 10.V.1996, 4♀; 13.V.1996, 2♀; 14.V.1996, 1♂; 16.V.1996, 1♀; 17.V.1996, 4♀; 17.VI.1996, 1♀; **Erzurum:** 4th Well, 1850 m, 22.IV.2002, 4♂, 3♀; **Kars:** Digor Yeniköy, 1695 m, 04.VI.2004, 1♀; **Kars:** Sarıkamış, Karakurt, 16.V.1978, 8♂, 4♀; 02.V.2000, 6♂, 7♀; 17.IV.2002, 2♂, 2♀; **Muş:** Centrum, 1404 m, 16.VII.1996, 1♂; 24.VII.1996, 1♂; 11.VIII.1996, 1♂; **Yalova:** Horticultural Research Institute, 2 m, 27.IV.2003, 2♀. Some specimens were caught under the stone, some over grass plants and soil, and some with pit fattening traps. It is stated in the label information of some samples that they were collected from under stones.

Altcins: *Maculatodorcadion* Breuning, 1943

Tip tür: *Dorcadion quadrimaculatum* Küster, 1848

***Dorcadion* (*Maculatodorcadion*) *triste* Frivaldszky, 1845**

Distribution in the World: Turkey (Danilevsky, 2019).

Distribution in Turkey: Anatolia (no locality) (Winkler, 1924, 1932), **Turkey** (no locality) (Lodos, 1998), **Antalya** (Ova SE Korkuteli, Bakacak beli N Saklıkent), **Balıkesir** (Balya, Susurluk), **Bursa** (Karacabey, Mustafa Kemal Paşa), **İzmir** (Bornova, Buca, Dikili-Makaron, Kınık), **Manisa** (Turgutlu) (Ganglbauer, 1884; Aurivillius, 1921; Breuning, 1962; Demelt, 1963; Gül-Zümreoğlu, 1972; Braun, 1978; Kratschmer, 1985; Önalp, 1990; Peks, 1993; Özdikmen; 2010, 2012, 2016; Özdikmen and Kaya, 2015; Özdikmen and Tezcan, 2020a).

Material examined: Izmir: Selçuk, 20 m, 17.V.1985, 1♀.

DISCUSSION

In the catalogue called **"Catalogue of Palaearctic Cerambycoidea"** prepared by Danilevsky (2019), it has been recorded that there are 6 genus in the Dorcadionini tribe, namely *Dorcadion* Dalman, *Eodorcadion* Breuning, *Iberodorcadion* Breuning, *Neodorcadion* Ganglbauer, *Politodorcadion* Danilevsky, and *Trichodorcadion* Breuning; and that there are 6 subgenus of the *Dorcadion* species, namely *Acutodorcadion* Danilevsky, Kasatkin and Rubenyan, *Carinatodorcadion* Breuning, *Cribridorcadion* Pic, *Dorcadion* Dalman, *Maculatodorcadion* Breuning and *Megalodorcadion* Pesarini and Sabbadini (Figure 2).

When the catalogue prepared by Löbl and Smetana (2010) is examined, it can be seen that the Dorcadionini family in the Palaearctic Region has 664 species (five genus, 12 subgenus), and that it has 200 species in Turkey. Özdikmen (2010) reported that Turkey has 192 species of the Dorcadionini family (*Dorcadion* genus 186), and that 134 of these is in an endemic state. Later, the same researcher reported the Dorcadionini family's species number to be 278 in Turkey, and the *Dorcadion* genus' number to be 266 (Özdikmen 2016). Danilevsky (2019), stated that there are 666 species belonging to the *Dorcadion* genus in the Palearctic Region (North Africa, Europe to China). This species represents 43.99% of the Palearctic Region. It is also noteworthy that 258 of this species in Turkey (88.05%) is endemic.

In the Danilevsky (2019) catalogue, the ratio of *Dorcadion*'s subgenus in the Palaearctic Region and the number of species is: *Acutodorcadion* Danilevsky, Kasatkin and Rubenyan 9%; *Carinatodorcadion* Breuning 3%; *Cribridorcadion* Pic 81%; *Dorcadion* Dalman 5%; *Maculatodorcadion* Breuning 1%, and *Megalodorcadion* Pesarini and Sabbadini 1%. The highest dispersion rate of 81% belongs to the *Cribridorcadion* Pic subgenus (Figure 3).

In the Danilevsky (2019) catalogue, the ratio in Turkey of *Dorcadion*'s subgenus and number of species is: *Acutodorcadion* Danilevsky, Kasatkin and Rubenyan 2005, no spread; *Carinatodorcadion* Breuning 1943, 1%; *Cribridorcadion* Pic 1901, 95%; *Dorcadion* Dalman 1817, no spread; *Maculatodorcadion* Breuning 1943, 2% and *Megalodorcadion* Pesarini and Sabbadini 1999, 2%. The highest dispersion rate of 95% belongs to the *Cribridorcadion* Pic 1901 subgenus (Figure 4).

In the Danilevsky (2019) catalogue, the ratio in Turkey of *Dorcadion*'s endemic species number and species at the subgenus level are: *Acutodorcadion* Danilevsky, Kasatkin and Rubenyan no spread; *Carinatodorcadion* Breuning 0%; *Cribridorcadion* Pic 96%; *Dorcadion* Dalman no spread; *Maculatodorcadion*

Breuning 2%, and *Megalodorcadion* Pesarini and Sabbadini 2%. The highest dispersion rate of 96% belongs to the *Cribridorcadion* subgenus (Figure 5).

CONCLUSIONS

In the study, a total of 25 species (14 species and 11 subspecies) were identified to belong to the subgenus of *Cribridorcadion* (24) and *Maculatodorcadion* (1) of the *Dorcadion* Dalman, 1817 genus (Table 1; Figure 1). The high endemic rate of the genus reveals the richness of our country's fauna and indicates that there will be new species belonging to this genus. *Dorcadion* species may be important problem for grasses area in golf courses, football fields and parks in Turkey which is a country of tourism in future. Therefore, it is necessary to reveal the biological and ecological characteristics of these species.

Although there are many studies on the *Dorcadion* genus, the fact that there are differences of opinion among researchers working on this subject. The reasons for this are difficulties in identifying species belonging to this genus, existence of many synonyms and subspecies of species (more than one from the same region), different statuses given to a species by different researchers. *Dorcadion (C.) scabricolle* species is an example for this situation: Danilevsky (2019) listed 18 subspecies belonging to the *Dorcadion* (*C.*) *scabricolle* species and reported that eight subspecies of this species is found in Turkey and seven of them are endemic. On the other hand, Lazarev (2020), in the study he conducted on *D.* (*C.*) *scabricolle*, listed 39 subspecies, and noted that 16 subspecies showed spread in Turkey. These species are *Dorcadion* (*C.*) *scabricolle lazistanum* ssp. n.; *Dorcadion* (*C.*) *scabricolle salhanum* ssp. n.; *Dorcadion (C.) scabricolle antonkozlovi* Danilevsky, 2017; *Dorcadion* (*C.*) *scabricolle caramanicum* K. Daniel and J. Daniel, 1903; *Dorcadion* (*C.*) *scabricolle yahyaliense* Bernhauer and Peks, 2011; *Dorcadion (Cribridorcadion) scabricolle apakoyense* ssp. n.; *Dorcadion* (*C.*) *scabricolle hajdajorum* ssp. n.; *Dorcadion* (*C.*) *scabricolle korbianum* ssp. n.; *Dorcadion* (*C.*) *scabricolle crassofasciatum* Özdikmen, 2013; *Dorcadion* (*C.*) *scabricolle balikesirense* Breuning, 1962; *Dorcadion* (*C.*) *scabricolle uludaghicum* Breuning, 1970; *Dorcadion* (*C.*) *scabricolle inonuense* ssp. n.; *Dorcadion* (*C.*) *scabricolle gazii* ssp. n.; *Dorcadion* (*C.*) *scabricolle alucranum* ssp. n.; *Dorcadion* (*C.*) *scabricolle paphlagonicum* Breuning, 1962 and *Dorcadion* (*C.*) *scabricolle shirakense* ssp. n.

It is of great importance for those who will specialize on this genus to examine the collections in prominent museums around the world. This situation, which seems very difficult, can be resolved with the support that researchers give to each other. Increase in these kinds of faunistic studies will certainly contribute to the exposure of the very rich fauna of Turkey and the world.

ACKNOWLEDGEMENTS

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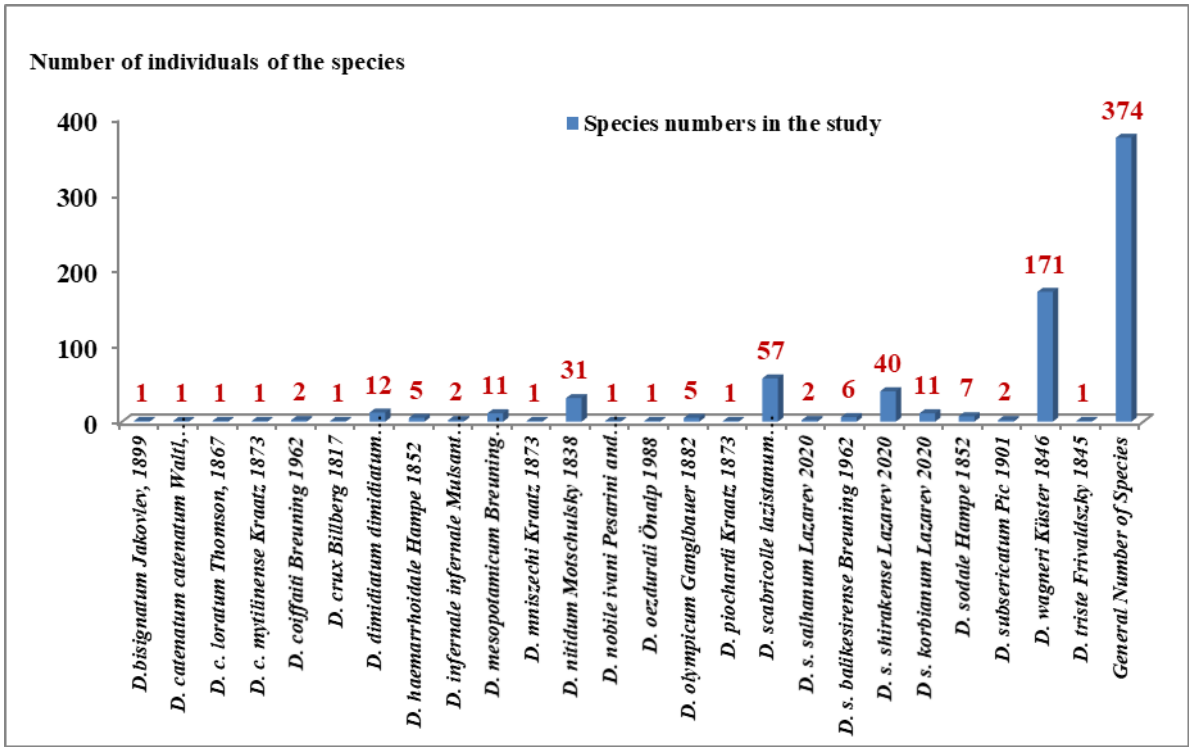

Figure 1. Individual numbers of the species obtained in the study

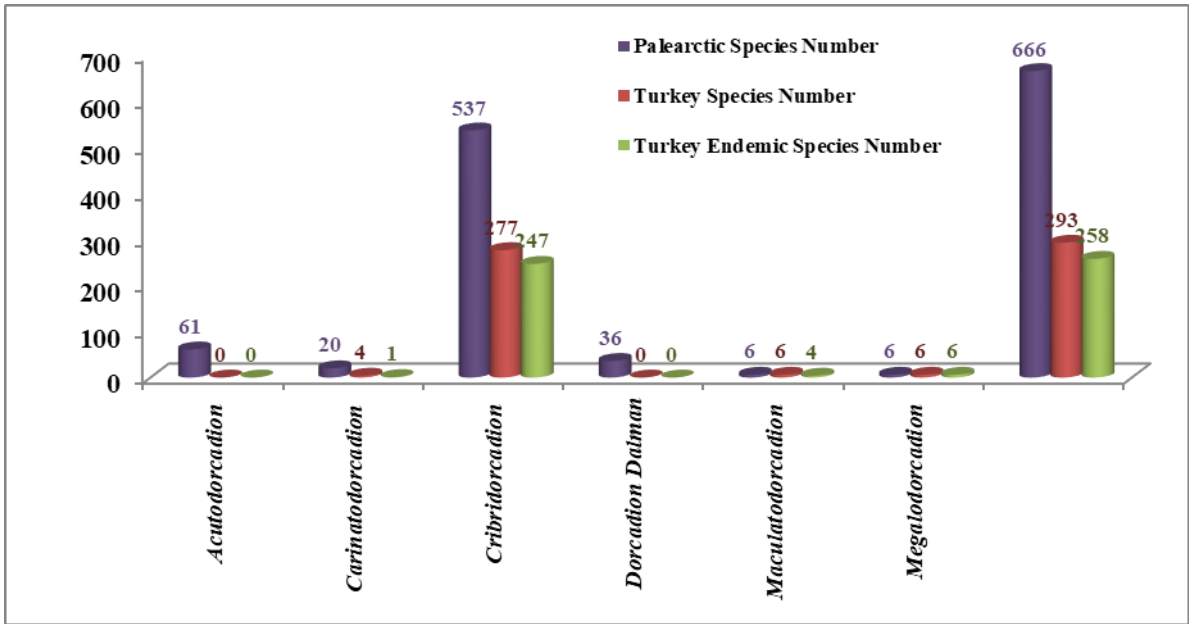

Figure 2. *Dorcadion* species (in Turkey and World) and endemic *Dorcadion* species (in Turkey)

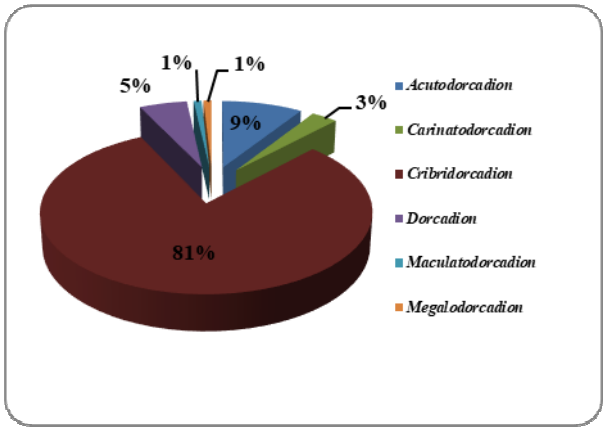

Figure 3. Number of subgenus species of *Dorcadion* in Palaearctic Region

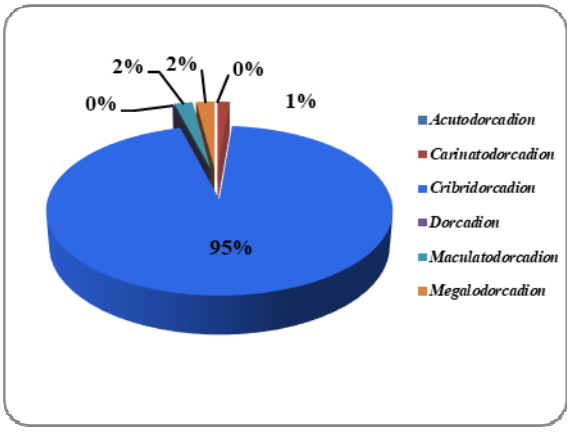

Figure 4. Number of subgenus species of *Dorcadion* in Turkey

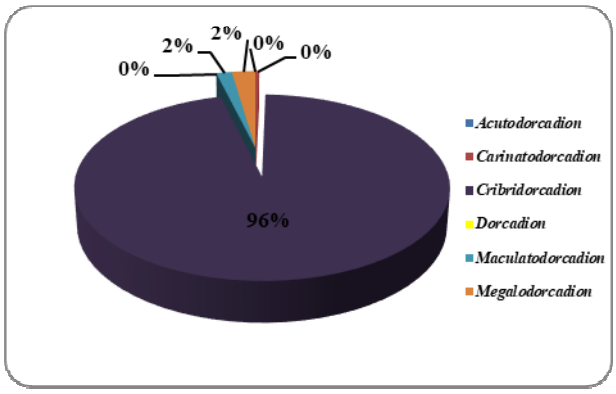

Figure 5. Number of endemic subgenus species of *Dorcadion* in Turkey

The provinces where the species were found are given with the star mark (asterisk) in Figure 6. *D. coiffaiti* Breuning, *D. crux* Billberg, *D. dimidiatum dimidiatum* Motschulsky, *D. nitidum* Motschulsky, *D. haemarrhoidale* Hampe, *D. mesopotamicum* Breuning, *D. oezdurali* Önalp, *D. olympicum* Ganglbauer and *D. wagneri* Küster are marked red, green, purple, yellow, blue, orange, black, brown and pink, respectively in Figure 6.



Figure 6. First records for provinces in Turkey.

Table 1. Species numbers in the study, vertical distributions, collecting monts, habitats, distribution of Turkey and distribution World

Genus: *Dorcadion* Dalman, 1817									
Subgenus	**Species**	**Number of Specimens**		**Total Number of Species**	**Vertical Distributions (Altitude) (m)**	**Collecting Months**	**Habitats**	**Distribution of Turkey**	**Distribution of World**
		Male ♂	**Female ♀**						
Cribridorcadion Pic	*D. bisignatum* Jakovlev	1	0	1	1700	July	Under stone	Artvin	Turkey
	D. catenatum catenatum Waltl	0	1	1	30	May	-	Izmir	Turkey
	D. c. loratum Thomson	0	1	1	30	May	-	Izmir	Turkey
	D. c. mytilinense Kraatz	0	1	1	497	March	On grass plants	Izmir	Turkey and Greece
	D. coiffaiti Breuning	1	1	2	790	April	-	Kütahya	Turkey
	D. crux Billberg	1	0	1	1200	April	Under stone	Isparta	Turkey
	D. dimidiatum dimidiatum Motschulsky	6	6	12	1800-2200	April, May, June	Under stone and on grass plants	Ardahan, Erzurum	Argentina, Armenia, India, Caucasus, Iran and Turkey
	D. haemarrhoidale Hampe	3	2	5	3000	April, June, July	-	Gümüşhane, Erzurum	Argentina, Armenia, India, Caucasus, Iran and Turkey
	D. infernale infernale Mulsant and Rey	1	1	2	840	April	-	Eskişehir	Turkey
	D. mesopotamicum Breuning	7	4	11	2-837	April	-	Diyarbakır,	Iraq and

								Yalova	Turkey
	D. mniszechi Kraatz	0	1	1	2100	June	Under stone		Turkey
	D. nitidum Motschulsky	18	13	31	1600-1870	May	-	Ardahan, Erzurum	Argentina, Guernsey, Armenia, Azerbaijan and Turkey
	D. nobile ivani Pesarini and Sabbadini	1	0	1	1330	May	On grass plants	Bingöl	Turkey
	D. oezdurali Önalp	0	1	1	950	July	-	Erzincan	Turkey
	D. olympicum Ganglbauer	4	1	5	1450	May, June, July	Around the roots of grass and herbaceous plants and under stone	Bursa, Kars	Europe (Greece, Bulgaria, Turkey)
	D. piochardi Kraatz	0	1	1	1150	September	-	Amasya	Turkey
	D. scabricolle lazistanum Lazarev	26	31	57	1153-2000	April, May, June	Around the roots of grass and under stone	Gümüşhane, Erzurum	Turkey
	D. s. salhanum Lazarev	1	1	2	1400	June	-	Bingöl	Turkey
	D. s. balikesirense Breuning	2	4	6	100	March	On grass plants	Bursa	Armenia and

Cribridorcadion Pic									Turkey
	D. s. shirakense Lazarev	30	10	40	1020-1870	April, May, June	Around the roots of grass and under stone	Ardahan, Kars	Armenia and Turkey
	D. s. korbianum Lazarev	6	5	11	1020	February	-	Konya	Turkey
	D. sodale Hampe	6	1	7	2200-2700	June, July, August	On grass plants	Erzurum	Turkey
	D. subsericatum Pic	1	1	2	1100	April	-	Kastamonu	Turkey
	D. wagneri Küster	73	98	171	2-2150	April, May, June, July, August	Uunder stone, on grass and soil ground and pitfall trap	Diyarbakır, Erzurum, Kars, Muş, Yalova	Caucasus, Turkey and Iran
Maculatodorcadion Breuning	*D. triste* Frivaldszky	0	1	1	20	May	-	Izmir	Turkey
	General total of species	188	186	374					

Figures of species determined in the study.



1



2



3



4



5



6



7



8



9



10



11



12

		
13	14	15
		
16	17	18
		
19	20	21
		
22	23	24



25

Figure 7. ***Dorcadion*** **(*C.*)** ***bisignatum*** Jakovlev 2. ***Dorcadion*** **(*C.*)** ***catenatum catenatum*** Waltl 3. ***Dorcadion*** **(*C.*)** ***catenatum loratum*** Thomson 4. ***Dorcadion*** **(*C.*)** ***catenatum mytilinense*** Kraatz 5. ***Dorcadion*** **(*C.*)** ***coiffaiti*** Breuning 6. ***Dorcadion*** **(*C.*)** ***crux*** Billberg 7. ***Dorcadion*** **(*C.*)** ***dimidiatum dimidiatum*** Motschulsky 8. ***Dorcadion*** **(*C.*)** ***haemarrhoidale*** Hampe 9. ***Dorcadion*** **(*C.*)** ***infernale infernale*** Mulsant and Rey 10. ***Dorcadion*** **(*C.*)** ***mesopotamicum*** Breuning 11. ***Dorcadion*** **(*C.*)** ***mniszechi*** Kraatz, 12 ***Dorcadion*** **(*C.*)** ***nitidum*** Motschulsky 13. ***Dorcadion*** **(*C.*)** ***nobile ivani*** Pesarini and Sabbadini 14. ***Dorcadion*** **(*C.*)** ***oezdurali*** Önalp 15. ***Dorcadion*** **(*C.*)** ***olympicum*** Ganglbauer 16. ***Dorcadion*** **(*C.*)** ***piochardi*** Kraatz 17. ***Dorcadion*** **(*C.*)** ***scabricolle lazistanum*** Lazarev 18. ***Dorcadion*** **(*C.*)** ***scabricolle salhanum*** Lazarev 19. ***Dorcadion*** **(*C.*)** ***scabricolle balikesirense*** Breuning 20. ***Dorcadion*** **(*C.*)** ***scabricolle shirakense*** Lazarev 21. ***Dorcadion*** **(*C.*)** ***scabricolle korbianum*** Lazarev 22. ***Dorcadion*** **(*C.*)** ***sodale*** Hampe 23. ***Dorcadion*** **(*C.*)** ***subsericatum*** Pic 24. ***Dorcadion*** **(*C.*)** ***wagneri*** Küster 25. ***Dorcadion*** **(*M.*)** ***triste*** Frivaldszky.

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