


New Contributions for Cleridae (Coleoptera: Cleroidea) Biodiversity of Türkiye

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ABSTRACT

This study is based on material from the family Cleridae collected from various localities in Türkiye. The collected specimens were identified, and faunistic records for 16 species belonging to two genera and two subfamilies are provided. Among these, the genus *Trichodes* Herbst, 1792 was found to be the most abundant and widespread. Notably, 94% of the species identified belong to the genus *Trichodes*. Additionally, new localities were discovered for 11 species. The study also presents information on the vertical distribution, phenology, and geographical distribution of all species.

Key words: Coleoptera, Cleridae, *Trichodes*, Türkiye.

Türkiye'nin Cleridae (Coleoptera: Cleroidea) Biyoçeşitliliğine Yeni Katkılar

ÖZ

Bu çalışmanın materyalini Türkiye'nin farklı lokalitelerinden toplanan Cleridae familyasına ait örnekler oluşturmaktadır. Toplanan türler içerisinde iki altfamilyaya bağlı iki cinsten toplam 16 tür tespit edilmiştir. Bunların arasında en fazla türe sahip olan cins *Trichodes* Herbst 1792'tir. Tespit edilen türlerin %94'ü *Trichodes* cinsine aittir. Ayrıca 11 tür içinde yeni lokaliteler verilmiştir. Ayrıca tüm türler için dikey dağılımlar, fenolojiler ve coğrafik dağılımlar verilmiştir.

Anahtar kelimeler: Coleoptera, Cleridae, *Trichodes*, Türkiye.

INTRODUCTION

The family Cleridae is small family of Coleoptera, also known as checkered beetles, is a beetle group comprising approximately 3700 species, primarily predaceous on other insects, especially during their larval stage (Bulak et al., 2012; Gerstmeier, 2000; Opitz, 2002). In the Palearctic Region approximately 350 species occur (Löbl and Smetana 2007). These beetles have been described from all terrestrial zoogeographical realms worldwide, except for the Antarctic region but species are more numerous in tropical and subtropical areas. Checkered beetles commonly engage in feeding on pollen as a supplementary protein source. Additionally, certain genera of these beetles have been found to have associations with carrion and stored animal products (Leavengood, 2008; Gunter et al., 2013; Gerstmeier, 2000). Türkiye is one of the most interesting countries regarding zoogeography and biodiversity. Some faunistic studies about Cleridae have been conducted both some foreign and native researchers in Türkiye (Bulak, 2011; Bulak et al., 2012; Demir, 2008; Dikmen and Özulug, 2018; Löbl and Smetana, 2007; Öncüer, 1991; Sarıkaya and Ibis, 2016; Zimmermann, 1971, 1973).

The aim of this study is to identify the Cleridae species collected of Türkiye, to make this data available to both researchers and interested people. In additional to contribute the biodiversity.

MATERIAL AND METHODS

The material of the Cleridae was collected from various localities of Türkiye between 2001 and 2023. The specimens for this study were collected by sweeping through flowering plants. Provinces of the collected specimens are given in alphabetical order in the following list. The specimens are deposited in the Entomology Museum, Erzurum, Türkiye (EMET).

RESULTS AND DISCUSSION

In this study, a total of 16 samples belonging to two genera of subfamily Clerinae and Tillinae are given. Additionally, new localities were given for 11 species and approximately 62% of the new localities are in the Eastern Anatolia Region.

Subfamily: Clerinae Latreille 1802

Genus: *Trichodes* Herbst 1792

Trichodes affinis Chevrolat, 1843

Material examined: Erzurum: Oltu, Çamlıbel, 1750 m, 15.X.2001, 1 ex., leg. G. Tozlu, Pasinler, Sansar Deresi, 1877 m, 17.VII.2011, 1 ex., leg. Y. Bulak.

Distribution in Türkiye: Konya, Kayseri (Zimmermann, 1971); Ankara, Antalya, Burdur, Karaman, Kayseri, Konya, Manisa, Mersin, Niğde (Demir, 2008).

Remark: New record for fauna of Erzurum province.

Trichodes alberti Escherich, 1894

Material examined: Erzurum: Uzundere, Çamlıyamaç, 1290 m, 07.VIII.2011, 2 exs., leg. Y. Bulak.

Distribution in Türkiye: Ankara, Kırşehir (Demir, 2008).

Remark: New record for fauna of Erzurum province.

Trichodes aparius (Linnaeus, 1758)

Material examined: Ankara: Kızılcahamam, Sipahiler, 975 m, 27.VI.2011, 1 ex., leg. G. Bölük. **Erzurum:** Uzundere, Çamlıyamaç, 1290 m, 07.VIII.2011, 2 exs., leg. Y. Bulak.

Distribution in Türkiye: Yozgat (Demir, 2008); Bayburt, Erzurum (Bulak et al., 2012).

Remark: New record for fauna of Ankara province.

Trichodes crabroniformis (Fabricius, 1787)

Material examined: Antalya: Serik, Kocayatak, 10 m, 30.VI.2012, 1 ex., leg. D.G. Sevinç.

Distribution in Türkiye: Adana, Ankara, Aydın, Bilecik, Bursa, Denizli, Eskişehir, İstanbul, İzmir, İzmit, Kahramanmaraş, Konya, Manisa, Tekirdağ, Tokat (Zimmermann, 1971); Ankara, Antalya, Denizli, Isparta (Demir, 2008); Burdur, Erzurum, Gümüşhane, Iğdır, Konya (Bulak et al., 2012).

Trichodes ephippiger Chevrolat, 1874

Material examined: Bingöl: 5 km East, 1155 m, 30.V.2002, 3 exs., leg. H. Özbek.

Distribution in Türkiye: Artvin, Bingöl, Diyarbakır, Erzurum (Bulak et al., 2012).

Trichodes inermis Reitter, 1894

Material examined: Bingöl: Solhan, Başakköy, 1395 m, 26.VI.2000, 1 ex., leg. M. Kesdek. **Erzurum:** Tortum, Derekapı, 1247 m, 13.VII.2011, 1 ex., leg. Y. Bulak.

Distribution in Türkiye: Adana, Aksaray, Karaman, Kayseri, Mersin, Nevşehir, Niğde (Demir, 2008).

Remark: New record for fauna of Bingöl and Erzurum provinces.

Trichodes insignis Fischer von Waldheim, 1829

Material examined: Erzurum: Narman, Kireçli, 2000 m, 02.VII.2000, 1 ex., leg. C. Güçlü, Olur, Boğazgören, 1155 m, 23.VI.2011, 1 ex., leg. Y. Bulak.

Distribution in Türkiye: Bayburt, Iğdır, Tunceli (Bulak et al., 2012).

Remark: New record for fauna of Erzurum province.

Trichodes longissimus (Abeille, 1881)

Material examined: Erzurum: İspir, Kan, 1316 m, 22.VI.2011, 1 ex., leg. Y. Bulak, **Konya:** Güneysınır, Gurağaç, 1071 m, 04.VII.2000, 1 ex., leg. M. Kesdek.

Distribution in Türkiye: Adana, Aksaray, Antalya, Artvin, Hatay, Isparta, Karaman, Kayseri, Konya, Mersin, Niğde, Osmaniye (Demir, 2008); Ankara, Artvin, Balıkesir, Burdur, Erzincan, Erzurum, Eskişehir, Kars, Konya, Mersin, Muş, Iğdır, İzmir (Bulak et al., 2012).

Trichodes oberthueri (Chanipenois, 1900)

Material examined: Elazığ: Akçakiraz, 893 m, 19.V.2023, 1 ex., leg. Y. Bulak Korkmaz.

Distribution in Türkiye: Diyarbakır (Bulak et al., 2012).

Remark: New record for fauna of Elazığ province.

Trichodes pulcherrimus Escherich, 1892

Material examined: Ankara: Polatlı, 850 m, 25.VI.2011, 1ex., leg. G. Bölük. **Isparta:** Eğirdir, Yukarı Gökdere, 1000 m, 25.V.2004, 1ex., leg. H. Özbek.

Distribution in Türkiye: Bitlis, Hakkari, Konya, Mardin, Tunceli, Van, (Zimmermann, 1971, 1973); Erzincan, Kayseri (Demir, 2008).

Remark: New record for fauna of Ankara and Isparta provinces.

Trichodes punctatus Fischer von Waldheim, 1829

Material examined: Elazığ: Akçakiraz, 893 m, 19.V.2023, 1 ex., leg. Y. Bulak Korkmaz. **Erzurum:** Horasan, Çiftlik, 1546 m, 17.VII.2011, 1 ex., leg. Y. Bulak, Pasinler, Yayla, 1990 m, 1 ex., leg. Y. Bulak, Olur, Boğazgören, 1168 m, 19.VII.2012, 1 ex., leg. Y. Bulak. **Iğdır:** Tuzluca, Eğrekdere, 1295 m, 31.VIII.2013, 1 ex., leg. Y. Bulak Korkmaz.

Distribution in Türkiye: Ankara, Antalya, Isparta, İzmir, Karaman, Manisa, Mersin, Muğla, Nevşehir, Niğde, Osmaniye, Yozgat (Demir, 2008); Artvin, Bilecik, Erzincan, Erzurum, Kars, Iğdır (Bulak et al., 2012).

Remark: New record for fauna of Elazığ province.

Trichodes quadriguttatus Adams, 1817

Material examined: Erzincan: Üzümlü, 1200 m, 25.V.2001, 1 ex., leg. C. Güçlü. **Erzurum:** Kopdağı, 2200 m, 16.VI.2000, 1 ex., leg. Ö. Çalmaşur, Küçükgeçit, 1709 m, 23.VII.2011, 1 ex., leg. Y. Bulak.

Distribution in Türkiye: Adana, Ankara, Antalya, Aksaray, Artvin, Çorum, Denizli, Erzincan, Isparta, Kahramanmaraş, Karaman, Kayseri, Kırşehir, Mersin, Nevşehir, Niğde, Yozgat (Demir, 2008); Antalya, Artvin, Bayburt, Diyarbakır, Erzincan, Erzurum, Iğdır, Rize (Bulak et al., 2012); Malatya (Háva, 2018).

Trichodes sexpustulatus Chevrolat, 1874

Material examined: Erzurum: Narman, Araköy, 1472 m, 23.VI.2011, 1ex., leg. Y. Bulak, Oltu, Çamlıbel, 1750 m, 15.VII.2001, 1ex., 15.X.2010, 2 exs., leg. H. Özbek.

Distribution in Türkiye: Ankara, Antalya, Erzurum, Gümüşhane, Kayseri, Malatya, Niğde, Trabzon, Tunceli, Van (Zimmermann, 1971, 1973); Adana, Artvin, Erzurum (Demir, 2008).

Trichodes sipylus (Linnaeus, 1758)

Material examined: Erzurum: Horasan, Çiftlik, 1546 m, 17.VII.2011, 1 ex., leg. Y. Bulak, Oltu, Toprakkale, 1436 m, 23.VI.2011, 1ex., leg. Y. Bulak.

Distribution in Türkiye: Adana, Ankara, Antalya, Isparta, Kayseri, Nevşehir, Niğde (Demir, 2008); Erzincan, Erzurum, Iğdır (Bulak et al., 2012).

Trichodes suspectus Escherich, 1892

Material examined: Bitlis: Aşağı Kolbaşı, 1700 m, 22.VII.2003, 1 ex., leg. H. Özbek.

Distribution in Türkiye: Antalya, Artvin, Hatay, Osmaniye, Rize (Zimmermann, 1971, 1973); Adana, Kahramanmaraş, Karaman, Konya, Mersin, Niğde, Osmaniye (Demir, 2008).

Remark: New record for fauna of Bitlis province.

Subfamily: Tillinae Leach, 1815

Genus: Tilloidea Laporte de Castelnau, 1832

Tilloidea transversalis Charpentier, 1825

Material examined: Adıyaman: Gölbaşı, 37°44' 25" N, 37°55' 26" E, 600 m, 09.V.2002, 1 ex., leg. H. Özbek.

Distribution in Türkiye: Eskişehir (Bulak et al., 2012); İstanbul (Dikmen and Özulug, 2018).

Remark: New record for fauna of Adıyaman province.

Table 1. The distribution of collected species in Türkiye

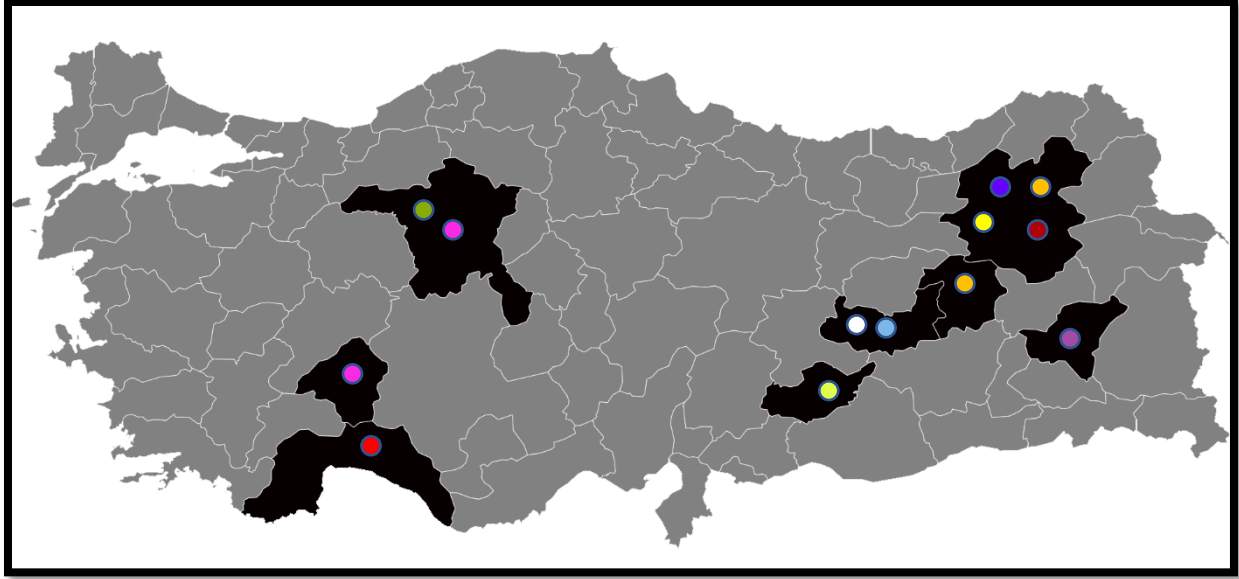
Data of collected species: VD: Vertical distribution, SD: Seasonal dynamics, GR: Geographical regions, DT: Distributions in Türkiye.

Names of Taxa	VD	SD	GR	DT
SUBFAMILY CLERINAE LATREILLE 1802				
<i>Trichodes affinis</i> Chevrolat, 1843	F, G	Jl, O	EAR	Erzurum
<i>Trichodes alberti</i> Escherich, 1894	E	Aug	EAR	Erzurum
<i>Trichodes apiarius</i> (Linnaeus, 1758)	C, E	J, Aug	CAR, EAR	Ankara, Erzurum
<i>Trichodes crabroniformis</i> (Fabricius, 1787)	A	J	MDR	Antalya
<i>Trichodes ephippiger</i> Chevrolat, 1874	D	M	EAR	Bingöl
<i>Trichodes inermis</i> Reitter, 1894	D, E	J, Jl	EAR	Bingöl, Erzurum
<i>Trichodes insignis</i> Fischer von Waldheim, 1829	D, G,	J, Jl	EAR	Erzurum
<i>Trichodes longissimus</i> (Abeille, 1881)	D, E	J, Jl	CAR, EAR	Erzurum, Konya
<i>Trichodes oberthueri</i> (Chanipenois, 1900)	C	M	EAR	Elazığ
<i>Trichodes pulcherrimus</i> Escherich, 1892	C	M, J	CAR, MDR	Ankara, Isparta
<i>Trichodes punctatus</i> Fischer von Waldheim, 1829	C, D, E, F, G	M, Jl, Aug	EAR	Elazığ, Erzurum, İğdır
<i>Trichodes quadriguttatus</i> Adams, 1817	D, F, H	M, J, Jl,	EAR	Erzincan, Erzurum
<i>Trichodes sexpustulatus</i> Chevrolat, 1874	E, F,	J, Jl, O	EAR	Erzurum
<i>Trichodes sipylus</i> (Linnaeus, 1758)	E, F	J, Jl	EAR	Erzurum
<i>Trichodes suspectus</i> Escherich, 1892	F	Jl	EAR	Bitlis
SUBFAMILY TILLINAE LEACH, 1815				
<i>Tilloidea transversalis</i> (Charpentier, 1825)	B	M	SAR	Adıyaman

VD (Vertical distribution) (metre): A: 0-500 m, B: 501-750 m, C: 751-1000 m, D: 1001-1250 m, E: 1251-1500 m, F: 1501-1750 m, G: 1751-2000 m, H: 2001-2500 m. M: May, J: June, Jl: July, Aug: August, S: September, O: October, N: November. CAR: Central Anatolian Region, EAR: Eastern Anatolia Region, MDR: Mediterranean Region, SAR: Southeastern Anatolia Region.

According to Table 1, Although *T. punctatus* collected from five different altitudes, *Trichodes quadriguttatus* collected from three altitude. Seven of the total species collected from only one altitude range. The fact remains that the majority of species were found within the range of 1251-1500 m. *Trichodes crabroniformis*, *Trichodes quadriguttatus* and *Tilloidea transversalis* have been collected from a single altitudinal range respectively (0-500 m), (2001-2500 m) and (501-750 m).

The seasonal activities of insects significant importance. The specimens in the study were evaluated from this perspective as well. These species were generally collected during the months of May, June, and July. However, the populations had more dense in June and July (Table 1). *Trichodes punctatus* and *Trichodes quadriguttatus* collected in three different months in a year. These species have a very high adaptations various altitude and different climate conditions.



<i>Trichodes affinis</i> Chevrolat, 1843	●	<i>Trichodes oberthueri</i> (Chanipenois, 1900)	●
<i>Trichodes alberti</i> Escherich, 1894	●	<i>Trichodes pulcherrimus</i> Escherich, 1892	●
<i>Trichodes apiarius</i> (Linnaeus, 1758)	●	<i>Trichodes punctatus</i> Fischer von Waldheim, 1829	○
<i>Trichodes crabroniformis</i> (Fabricius, 1787)	●	<i>Trichodes suspectus</i> Escherich, 1892	●
<i>Trichodes inermis</i> Reitter, 1894	●	<i>Tilloidea transversalis</i> (Charpentier, 1825)	●
<i>Trichodes insignis</i> Fischer von Waldheim, 1829			●

Figure 1. New locality record of species

With this study, New localities have been identified in Turkey for 11 species. Ten of these species belong to the *Trichodes* genus and one belongs to the *Tilloidea* genus. Moreover, *Trichodes affinis*, *Trichodes alberti*, *Trichodes inermis* and *Trichodes insignis* species are a new record for Erzurum. *Trichodes apiarius* and *Trichodes pulcherrimus* are a new record for Ankara. *Trichodes oberthueri* and *Trichodes punctatus* are a new record for Elazığ. *Trichodes inermis* is a new record for Bingöl. *Trichodes pulcherrimus* is a new record for Isparta. *Trichodes crabroniformis* is a new record for Antalya. *Trichodes suspectus* is a new record for Bitlis. *Tilloidea transversalis* is a new record for Adıyaman (Figure 1).

In summary, it can be said that any new faunistic data discovered that will be found and recorded will be beneficial for future research and scholars focused on the Cleridae.

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