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New records and a checklist of Cephidae (Hymenoptera:Insecta) of Turkey with a short biogeographical consideration

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New records and a checklist of Cephidae (Hymenoptera: Insecta) of Turkey with a short biogeographical consideration

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Abstract: Twenty-five species of Cephidae are reported from Turkey based on literature records and specimens collected mainly from Central Anatolia. Of these *Cephus fumipennis* Eversmann, *C. nigrinus* Thomson, *C. pulcher* Tischbein, *C. rjabovi* Dovnar-Zapolskij, *C. sareptanus* Dovnar-Zapolskij, *C. spinipes* (Panzer), *Calameuta (Calameuta) filiformis* (Eversmann), *C. (Calameuta) punctata* (Klug), *Hartigia linearis* (Schrank), and *H. xanthostoma* (Eversmann) are recorded for the first time both in Central Anatolia and Turkey. A checklist of the family, including new records, is provided. Distribution patterns of the species in relation to the last glacial age are discussed.

Key words: Cephidae, Hymenoptera, Central Anatolia, checklist, Turkey, biogeography

Türkiye Cephidae (Hymenoptera: Insecta) faunası için yeni kayıtlar, tür listesi ve kısa bir biyocoğrafik değerlendirme

Özet: Büyük ölçüde Orta Anadolu'dan toplanan örnekler üzerinde yapılan çalışmalar ve önceki kayıtların incelenmesi sonucunda Türkiye'de Cephidae familyasına bağlı 25 tür bulunduğu ortaya konulmuştur. Bu türlerden *Cephus fumipennis* Eversmann, *C. nigrinus* Thomson, *C. pulcher* Tischbein, *C. rjabovi* Dovnar-Zapolskij, *C. sareptanus* Dovnar-Zapolskij, *C. spinipes* (Panzer), *Calameuta (Calameuta) filiformis* (Eversmann), *C. (Calameuta) punctata* (Klug), *Hartigia linearis* (Schrank), and *H. xanthostoma* (Eversmann) hem Orta Anadolu hem de Türkiye'de ilk kez bu çalışma ile kaydedilmişlerdir. Çalışma kapsamında familyanın yeni kayıtlarını da içeren bir Türkiye tür listesi hazırlanmıştır. Türlerin yayılış desenlerinin son buzul dönemleri ile ilişkisi üzerine kısa bir değerlendirme sunulmuştur.

Anahtar sözcükler: Cephidae, Hymenoptera, Orta Anadolu, tür listesi, Türkiye, biyocoğrafya

Introduction

The Cephidae is a small family including over 150 species in two subfamilies worldwide (Taeger and Blank, 2008). Most are in the Northern hemisphere

and belong to the Cephinae (Smith, 1979; Muche, 1981; Goulet, 1993); 13 species occur in North America (Ries, 1937; Smith, 1979) and about 40 in Europe (Gauld and Bolton, 1988). Adults can be differentiated from other member of Symphyta by the

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following characters: fore-wing without rough area, cenchri absent, first abdominal segment with a slight constriction at apex, and fore-tibia with only 1 apical spur (Gauld and Bolton, 1988; Basibuyuk and Quicke, 1995).

The cephids of Turkey have been studied on several different occasions. Benson (1968) was the first author to study the cephids fauna of Turkey by investigating the material collected by Guichard and Harvey (1967) between 1959 and 1962. Wolf (1968) reported 4 species of the family that are already known from Benson (1968). Zhelochovtsev and Zinovjev (1988) reported 9 species of Cephidae occurring in 'Asia Minor' in the Keys to the Insects of European Part of the USSR. The other occasional studies are mostly published on species that are known as pests in grain fields by local researchers (Alkan, 1948; Yürüten, 1969; Tayakısı, 1971; Altınayar, 1975). This is also mostly the case for some neighbouring countries in the region (e.g., Ghadiri, 1994; Gol'berg, 1986). Taeger and Blank (2008) have recently recorded a few other species of Pachycephini from Turkey. However, these putative records are not included in this study as verification is necessary by the ongoing study of Blank (Personal Communication). Studies on cephids of Turkey up to date have collectively reported a total of 15 species within 8 genera. Here, we have studied the material collected between 1999 and 2004 mainly from Central Anatolia and presented 10 new records both for Central Anatolia and Turkey.

Material and methods

Specimens were collected by sweep netting, yellow pans, and Malaise traps by the authors between 1999 and 2004. Several keys were used to identify the specimens (Benson, 1946, 1951, 1968; Muche, 1981; Zhelochovtsev and Zinovjev, 1988). Electronic World Catalog of Symphyta is utilised for the verification of valid names, previous records, and distribution data (Taeger and Blank, 2008). Specimens are housed in the collection of the Department of Biology, Cumhuriyet University, Sivas, Turkey. A checklist of species (Table 1) and distribution data are presented. A list of material examined and locality information are provided for each species collected and identified in the present study.

Table 1. A checklist of Cephidae species of Turkey.

<i>Hartigia nigra</i> (Harris, 1776)
<i>Hartigia linearis</i> (Schrank, 1781)
<i>Hartigia xanthostoma</i> (Eversmann, 1847)
<i>Janus femoratus</i> (Curtis, 1830)
<i>Janus compressus</i> (Fabricius, 1793)
<i>Syrista parreyssii</i> (Spinola, 1843)
<i>Pachycephus smyrnensis smyrnensis</i> Stein, 1876
<i>Pachycephus (Eversmannella) cruentatus konowii</i> Kohl, 1905
<i>Characopygus scythicus</i> Dovnar-Zapolskij, 1931
<i>Calameuta (Calameuta) filiformis</i> (Eversmann, 1847)
<i>Calameuta (Calameuta) haemorrhoidalis</i> (Fabricius, 1781)
<i>Calameuta (Calameuta) idolon</i> (Rossi, 1794)
<i>Calameuta (Calameuta) pallipes</i> (Klug, 1803)
<i>Calameuta (Calameuta) punctata</i> (Klug, 1803)
<i>Cephus brachycercus</i> Thomson, 1871
<i>Cephus fumipennis</i> Eversmann, 1847
<i>Cephus nigrinus</i> Thomson, 1871
<i>Cephus pulcher</i> Tischbein, 1852
<i>Cephus rjabovi</i> Dovnar-Zapolskij, 1926
<i>Cephus pygmeus</i> (L., 1767)
<i>Cephus sareptanus</i> Dovnar-Zapolskij, 1928
<i>Cephus spinipes</i> (Panzer, 1800)
<i>Trachelus libanensis</i> (André, 1881)
<i>Trachelus tabidus</i> (Fabricius, 1775)
<i>Trachelus troglodyta</i> (Fabricius, 1871)

Results

Hartigiini

Hartigia nigra (Harris)

Distribution: Turkey [Benson (1968); Wolf (1968); Zhelochovtsev and Zinovjev (1988)], Europe, Caucasus, Central Asia, northern Africa.

Material examined: Turkey: Ankara, Ayaş [40°0'N 32°31'E] 1190 m, 31.05.2002, 1♀, leg. H.H. Başibüyük.

Hartigia linearis (Schrank)

Distribution: Turkey [*new record*], Central and southern Europe, Transcaucasia, southern Siberia,

Central Asia, southeastern Kazakhstan, northern Africa, Mongolia.

Material examined: Turkey: Kırşehir [39°8'N 34°9'E] 1027 m, 03.06.2003, 2♀♀, 5♂♂; Kırşehir, Mucur [39°3'N 34°22'E] 1100 m, 02.06.2001, 1♂, leg. E.M. Korkmaz; Nevşehir, Ürgüp [38°37'N 34°54'E] 1043 m, 24.04.2001, 1♂, leg. S. Ülgentürk; Niğde-Ulukışla [37°31'N 34°35'E] 1250 m, 05.06.2003, 1♂, E.M. Korkmaz; Sivas, Kampüs [39°N37°E] 1280 m, 19.05.2001, 1♀; Sivas, Taşlıdere [39°39'N 37°2'E] 1230 m, 22.05.2001, 2♀♀, leg. L. Gençer.

Hartigia xanthostoma (Eversmann)

Distribution: Turkey [*new record*], Russia, Ukraine, Europe, northern Africa.

Material examined: Turkey: Ankara, Beynam Forest [39°41'N 32°55'E] 1215 m, 14.06.1999, 1♂, leg. H.H. Başibüyük; Kırşehir [39°8'N 34°9'E] 1027 m, 03.06.2003, 1♀, 2♂♂; Niğde-Ulukışla [37°31'N 34°35'E] 1250 m, 05.06.2003, 1♀, 1♂, leg. E.M. Korkmaz.

Janus femoratus (Curtis)

Distribution: Turkey [Benson (1968); Zhelochovtsev and Zinovjev (1988)], Europe, Russia.

Janus compressus (Fabricius)

Distribution: Turkey [Benson (1968); Zhelochovtsev and Zinovjev (1988)], southern Europe and northern Caucasus.

Syrista parreyssii (Spinola)

Distribution: Turkey [Benson (1968); Wolf (1968)], southern Europe to Caucasus, Cyprus and Israel.

Material examined: Turkey: Aksaray, Güzelyurt [38°15'N 34°24'E] 1770 m, 02.06.2002, 1♀; Aksaray, Güzelyurt [38°16'N 34°25'E] 1785 m, 02.06.2002, 2♂♂, leg. E. Bağda; Çankırı, Ilgaz [40°50'N 33°35'E] 1359 m, 1♂; Kırşehir [39°8'N 34°9'E] 1027 m, 21.06.2001-03.06.2003, 1♂, 1♀; Malatya, Çobandere [39°0'N 38°13'E] 1500 m, 08.06.2002, 1♀, 3♂♂, leg. H.H. Başibüyük; Niğde, Çamardı [37°41'N 37°41'E] 1368 m, 04.06.2003, 1♀, 2♂♂; Niğde, Pozantı [37°32'N 34°56'E] 1315 m, 04.06.2003, 6♂♂; Niğde, Ulukışla [37°31'N 34°35'E] 1250 m, 05.06.2003, 2♀♀, 2♂♂, leg. E.M. Korkmaz; Sivas, Hafik [39°51'N 37°26'E] 1315 m, 12.06.2003, 1♂; Sivas, Haliminhanı

[39°42'N 36°49'E] 1258 m, 18.06.2003, 1♀, 1♂, leg. S.H.Örgen; Sivas, Kampüs [39°N 37°E] 1280 m, 17.06.2003, 3♂♂; Sivas, Karagöl [39°16'N 36°11'E] 1313 m, 02.06.2003, 4♂♂, leg. E. Bağda; Sivas, Suşehri [40°9'N 38°5'E] 921 m, 28.06.2003, 3♂♂; Sivas, Yıldızeli [39°49'N 37°16'E] 1340 m, 15.07.2001, 1♀; Sivas, Zara [39°55'N 37°49'E] 1506 m, 12.06.2003, 5♂♂, L. Gençer.

Pachycephini

Pachycephus smyrnensis smyrnensis Stein

Distribution: Turkey [Benson (1968); Altınayar (1975)], Balkans, Cyprus, Romania, Armenia, Transcaucasus, Russia, Israel Lebanon, Jordan, Syria.

Material examined: Turkey: Ankara, Nallıhan [40°11'N 31°21'E] 733 m, 31.05.2002, 2♀♀, leg. H.H. Başibüyük.

Pachycephus (Eversmannella) cruentatus konowii Kohl

Distribution: Turkey [Benson (1968); Zhelochovtsev and Zinovjev (1988)], Israel, Syria.

Characopygus scythicus Dovnar-Zapolskij

Distribution: Turkey [Benson (1968), Zhelochovtsev and Zinovjev (1988)], Ukraine, southern and southeastern Russia.

Material examined: Turkey: Niğde, Ulukışla [37°31'N 34°35'E] 1250 m, 05.06.2003, 1♀, leg. H.H. Başibüyük.

Cephini

Calameuta (Calameuta) filiformis (Eversmann)

Distribution: Turkey [*new record*], Europe, Siberia, Transcaucasus, northern Iran and Syria, Lebanon, China, Kazakhstan, Kyrgyzstan, Ukraine.

Material examined: Turkey: Niğde [37°58'N 34°40'E] 1214 m, 02.06.2002, 1♀, 1♂, leg. L. Gençer; Sivas, Kampus [39°N 37°E] 1278 m, 05.06.2001, 1♂; 16.06.2003, 5♂♂, leg. S.H. Örgen; Sivas, Divriği [39°19'N 37°52'E] 1760 m, 10.06.2000, 2♀♀, leg. H.. Başibüyük; Sivas, Soğuk Çermik [39°51'N 37°07'E] 1490 m, 23.05.2001, 1♀, leg. E. Bağda.

Calameuta (Calameuta) haemorrhoidalis (Fabricius)

Distribution: Turkey (Benson, 1968), Europe, Austria, Transcaucasus, Syria, Israel, western Asia.

Material examined: Turkey: Aksaray, Güzelyurt [38°16'N 34°25'E] 1785 m, 02.06.2002, 1♀; Ankara, Ayaş [40°0'N 32°31'E] 1190 m, 31.05.2002, 1♂, leg. H.H. Başibüyük; Ankara, Beynam [39°41'N 32°56'E] 1181 m, 06.06.2003, 1♀, 1♂, leg. S. Ülgentürk; Çankırı, Çubuk [40°29'N 33°23'E] 1120 m, 29.05.2002, 3♂♂, leg. E. Bağda; Çorum, Alacahöyük [40°10'N 34°50'E] 1000 m, 28.05.2002, 1♀; Çorum, İskilip [40°55'N 34°16'E] 1510 m, 06.06.2003, 2♀♀, leg. H.H. Başibüyük; Karaman, Çiftahan [37°30'N 34°44'E] 975 m, 06.05.2003, 1♀; Kayseri, Çayıralan [39°15'N 35°23'E] 1142 m, 17.05.2002, 2♀♀, 1♂, leg. L. Genç; Kırıkkale, Büyükyazlı [39°57'N 33°55'E] 934 m, 21.04.2001-29.05.2002, 3♀♀, 1♂, leg. H.H. Başibüyük; Ankara [39°18'N 32°56'E] 1100 m, 06.06.2003, 5♀♀, 3♂♂; Niğde, Çamardı [38°00'N 35°02'E] 1682 m, 04.06.2003, 1♂, leg. E.M. Korkmaz; Nevşehir, Ürgüp [38°37'N 34°54'E] 1043 m, 24.04.2001, 2♀♀, 1♂, leg. L. Genç; Sivas, Durulmuş [39°50'N 37°19'E] 1306 m, 05.05.2001, 2♀♀, 1♂; Sivas, Karaçayır [39°54'N 36°58'E] 1740 m, 20.05.2001, 1♀, 4♂♂; Yozgat, Akdağmadeni [39°49'N 34°48'E] 1250 m, 27.05.2002, 1♀, leg. H.H. Başibüyük.

***Calameuta (Calameuta) idolon* (Rossi, 1794)**

Distribution: Turkey (Benson, 1968), southern Europe, northern Africa, Caucasus, western Asia, Iran, Syria, Lebanon, Israel.

Material examined: Turkey: Ankara, Ayaş [40°0'N 32°31'E] 1190 m, 31.05.2002, 1♀, 1♂; Ankara, Beynam [39°41'N 32°55'E] 1215 m, 30.05.2002 2♀♀, 1♂; 1♂; Ankara, Çubuk Barajı [40°19'N 33°01'E] 1026 m, 30.05.2002, 2♀♀, 1♂; Ankara, Sincan [39°57'N 32°55'E] 920 m, 12.06.2002, 1♀, leg. S. Ülgentürk; Çankırı, Çubuk [40°15'N 33°3'E] 1026 m, 29.05.2002, 2♀♀, 1♂, leg. E. Bağda; Çorum, Alaca [40°17'N 34°47'E] 1029 m, 07.06.2003, 1♂; Çorum, Ortaköy [40°N 35°E] 710 m, 28.06.2003, 1♀, 1♂, leg. E.M. Korkmaz; Eskişehir, Mihaliççık [39°53'N 31°28'E] 1432 m, 31.05.2002, 3♀♀, 4♂♂, leg. L. Genç; Kayseri, Çayıralan [39°15'N 35°23'E] 1142 m, 17.05.2002, 3♀♀, 3♂♂; Kırıkkale, Büyükyazlı [39°57'N 33°55'E] 934 m, 29.05.2002, 1♀, leg. H.H. Başibüyük; Sivas, Durulmuş [39°50'N 37°19'E] 1306 m, 05.05.2001, 1♀; Sivas, Yaraşbeli [39°49'N 34°56'E] 1372 m, 07.06.2002, 1♀, S.H. Örgen.

***Calameuta (Calameuta) pallipes* (Klug, 1803)**

Distribution: Turkey [Benson (1968); Zhelochovtsev and Zinovjev (1988)], Europe, Russia, Ukraine.

Material examined: Turkey: Aksaray, Güzelyurt [38°16'N 34°25'E] 1785 m, 02.06.2002, 1♂; Eskişehir, Mihaliççık [39°53'N 31°28'E] 1432 m, 31.05.2002, 1♂, leg. H.H. Başibüyük; Karaman, Çiftahan [37°30'N 34°44'E] 975 m, 06.05.2003, 1♂; Kayseri, Düver [38°57'N 35°35'E] 1171 m, 17.05.2002, 1♂, leg. L. Genç; Konya, Beyşehir [37°38'N 31°38'E] 1124 m, 08.05.2003, 1♂; Konya, Kulu [39°14'N 33°0'E] 1056 m, 22.04.2001, 1♂, leg. S. Ülgentürk; Sivas, Divriği [39°19'N 37°52'E] 1760 m, 10.06.2001, 1♂; Sivas, Karaçayır [39°54'N 36°58'E] 1740 m, 20.05.2001, 1♂, leg. S.H. Örgen.

***Calameuta (Calameuta) punctata* (Klug)**

Distribution: Turkey [*new record*], southern Europe, Caucasus, Ukraine.

Material examined: Turkey: Aksaray, Güzelyurt [38°16'N 34°25'E] 1785 m, 02.06.2002, 1♂, leg. E. Bağda; Ankara, Beynam Forest [39°41'N 32°55'E] 1215 m, 30.05.2002, 1♀; 06.06.2003, 2♀♀, leg. S. Ülgentürk; Kayseri, [38°59'N 35°51'E] 1144 m, 02.06.2003, 1♂; Sivas, Kampüs [39°N 37°E] 1280 m, 19.05.2001, 1♀, 2♂♂; 21.05.2001, 2♀♀; 15.05.2003, 1♂; 22.05.2003, 1♀, leg. H.H. Başibüyük; 20.05.2004, 2♂♂; 25.05.2004, 1♀, leg. M. Budak; Sivas, Karaçayır [39°54'N 36°58'E] 1740 m, 20.05.2001, 1♀, leg. S.H. Örgen; Sivas, Taşlıdere [39°39'N 37°2'E] 1230 m, 22.06.2001, 1♂; Sivas, Yaraşbeli [39°49'N 34°56'E] 1372 m, 07.06.2002, 1♀, leg. L. Genç.

***Cephus brachycercus* Thomson**

Distribution: Turkey (Benson, 1968), Europe, Crimea, Caucasus, Central Asia, Siberia.

Material examined: Turkey: Ankara, Beynam [39°41'N 32°56'E] 1181 m, 06.06.2003, 2♀♀, 1♂, leg. S. Ülgentürk; Çankırı, Kalecik [40°6'N 33°24'E] 676 m, 29.05.2003, 1♀, leg. E.M. Korkmaz; Eskişehir, Mihaliççık [39°53'N 31°28'E] 1432 m, 31.05.2002, 1♀; Kırşehir, Susuz Köyü [39°N 34°E] 1027 m, 30.04.2002, 1♀, leg. H.H. Başibüyük; Sivas, Ulaş [39°26'N 37°02'E] 1382 m, 30.05.2003, 1♂, leg. E.M. Korkmaz; Sivas, İmranlı [39°57'N 38°40'E] 1600 m, 29.05.2002, 1♀; Sivas, Suşehri [40°9'N 37°54'E] 1730

m, 05.05.2001, 1♀, leg. H.H. Başibüyük; Sivas, Kampüs [39°N 37°E] 1278 m, 13-24.06.2002, 1♀; Sivas, Kampüs [39°N 37°E] 1278 m, 12-17.06.2003, 3♀♀, 4♂♂, leg. S.H. Örgen.

Cephus fumipennis Eversmann

Distribution: Turkey [*new record*], Europe, Russia, Tajikistan, Kazakhstan, China.

Material examined: Turkey: Eskişehir [39°46'N 30°31'E] 794 m, 06.07.2002, 1♂, leg. H.H. Başibüyük; Nevşehir, Zelve [38°27'N 34°42'E] 1443 m, 02.06.2003, 1♂, leg. E.M. Korkmaz.

Cephus nigrinus Thomson

Distribution: Turkey [*new record*], Europe, Russia, Syria.

Material examined: Turkey: Afyon, Bolvadin [38°42'N 31°2'E] 987 m, 01.06.2002, 1♀, leg. L. Gençer; Ankara [39°18'N 32°56'E] 1100 m, 06.06.2003, 1♀; Ankara, Şereflikoçhisar [38°56'N 33°32'E] 1004 m, 22.04.2001, 1♀, leg. S. Ülgentürk; Çankırı, Kalecik [40°13'N 33°27'E] 826 m, 29.05.2003, 1♀, leg. E.M. Korkmaz; Çorum, Alaca [40°16'N 35°5'E] 1020 m, 28.05.2002, 1♀, leg. E. Bağda; Çorum, Alacahöyük [40°13'N 34°E] 1019 m, 07.06.2003, 1♀; Kırıkkale, Büyük Yağlı [39°57'N 33°55'E] 850 m, 21.04.2001, 1♂; Kırşehir, Susuz Köyü [39°N 34°E] 1027 m, 30.04.2002, 1♀, leg. H.H. Başibüyük; Niğde, Çamardı [38°00'N 35°02'E] 1682 m, 04.06.2003, 3♀♀; Niğde, Ulukışla [37°35'N 34°25'E] 1306 m, 05.06.2003, 1♀, leg. E.M. Korkmaz; Sivas, Akıncılar [40°N 38°20'E] 1114 m, 25.05.2002, 2♀♀; Sivas, Kampüs [39°N 37°E] 1278 m, 17.06.2003, 1♀, 1♂; 18.06.2003, 1♂; 24.05.2004, 1♀; 25.05.2004, 1♀, leg. L. Gençer; Sivas, Sızır [39°18'N 35°56'E] 1423 m, 06.05.2001, 1♂, leg. E. Bağda; Sivas, Suşehri [40°9'N 38°5'E] 921 m, 06.06.2003, 1♀; Sivas, Yaraşbeli [39°49'N 34°56'E] 1372 m, 07.06.2002, 1♀; Yozgat, Akdağmadeni [39°49'N 34°48'E] 1250 m, 01.06.2001, 1♀, leg. H.H. Başibüyük; Yozgat, Alaca [39°55'N 34°56'E] 1231 m, 07.06.2003, 2♀♀, leg. E.M. Korkmaz.

Cephus pulcher Tischbein

Distribution: Turkey [*new record*], Austria, Hungary, Czech Republic, Slovakia, Caucasus, Kazakhstan.

Material examined: Turkey: Aksaray, Güzelyurt [38°16'N 34°25'E] 1785 m, 02.06.2002, 1♀, leg. E.

Bağda; Ankara, Beynam Forest [39°41'N 32°55'E] 1215 m, 30.05.2002, 1♀, leg. S. Ülgentürk; Çorum, Ortaköy [40°N 35°E] 693 m, 28.05.2002, 1♀, leg. H.H. Başibüyük; Niğde, Çamardı [38°00'N 35°02'E] 1682 m, 04.06.2003, 1♂; Niğde, Ulukışla [37°35'N 34°25'E] 1306 m, 05.06.2003, 1♀, leg. E.M. Korkmaz; Sivas, Haliminhanı [39°42'N 36°49'E] 1258 m, 07.06.2002, 2♀♀, 2♂♂; Sivas, Kampüs [39°N 37°E] 1278 m, 24.05.2001, 1♂, leg. S.H. Örgen; 09.06.2003, 2♀♀; 25.05.2004, 1♀, leg. M. Budak; 04-13.06.2003, 1♀, leg. S.H. Örgen; Yozgat, Akdağmadeni [39°49'N 34°48'E] 1250 m, 01.06.2001, 1♀, leg. L. Gençer; Yozgat, Saraykent [39°41'N 35°30'E] 1149 m, 27.05.2002, 1♂, leg. H.H. Başibüyük.

Cephus rjabovi Dovnar-Zapolskij

Distribution: Turkey [*new record*], Dagestan, Volga delta.

Material examined: Turkey: Eskişehir [39°46'N 30°31'E] 794 m, 02.07.2001, 2♂♂; 06.07.2002, 1♀, 1♂; Kırıkkale, Yahşihan [39°52'N 33°21'E] 720 m, 28.06.2001, 7♀♀, 1♂, leg. H.H. Başibüyük.

Cephus pygmeus (L.)

Distribution: Holarctic. Turkey [e.g., Benson (1968); Zhelochovtsev and Zinovjev (1988)]

Material examined: Turkey: Afyon, Bolvadin [38°42'N 31°2'E] 987 m, 01.06.2002, 9♀♀, 3♂♂, leg. E. Bağda; Aksaray [38°21'N 34°0'E] 960 m, 03.06.2003, 8♀♀, 18♂♂, leg. E.M. Korkmaz; Ankara, Beynam [39°41'N 32°56'E] 1181 m, 30.05.2002, 21♀♀, 21♂♂, leg. S. Ülgentürk; Çankırı, Kalecik [40°13'N 33°27'E] 826 m, 29.05.2002, 9♀♀, 5♂♂; Çorum, Alaca [40°17'N 34°47'E] 1029 m, 07.06.2003, 20♀♀, 14♂♂; Eskişehir, Mihaliççık [39°53'N 31°28'E] 1432 m, 31.05.2002, 9♀♀, 5♂♂, leg. H.H. Başibüyük; Karaman [37°28'N 33°17'E] 1012 m, 07.05.2003, 10♀♀, 8♂♂; Kayseri, Çayıralan [39°18'N 35°38'E] 1348 m, 17.05.2002, 12♀♀, 8♂♂, leg. L. Gençer; Kırıkkale, Büyükyaglı [39°13'N 34°55'E] 1017 m, 29.05.2002, 6♀♀, 3♂♂, leg. E. Bağda; Kırşehir, Kızıközü Köyü [39°1'N 34°17'E] 1150 m, 29.04.2002, 21♀♀, 12♂♂; Konya, Karapınar [38°17'N 33°26'E] 956 m, 05.06.2003, 83♀♀, 28♂♂, leg. H.H. Başibüyük; Nevşehir, Zelve [38°40'N 34°51'E] 1028 m, 02.06.2003, 34♀♀, 7♂♂; Niğde, Çamardı [38°00'N 35°02'E] 1682 m, 04.06.2003, 37♀♀, 41♂♂, leg. E.M. Korkmaz; Sivas, Haliminhanı [39°42'N

36°49'E] 1258 m, 01.06.2001-18.06.2003, 20♀♀, 11♂♂; Sivas, Suşehri [40°9'N 38°5'E] 920 m, 29.05.2002, 26♀♀, 24♂♂, leg. S.H. Örgen; Tokat, Niksar [40°31'N 36°55'E] 267 m, 17.05.2002, 14♀♀, 12♂♂, leg. H.H. Başibüyük; Yozgat, Akdağmadeni [39°49'N 36°18'E] 1290 m, 27.05.2002, 13♀♀, 12♂♂, leg. L. Gençer.

Cephus sareptanus Dovnar-Zapolskij

Distribution: Turkey [*new record*], Russia.

Material examined: Turkey: Eskişehir, Mihaliççik [39°53'N 31°28'E] 1432 m, 31.05.2002, 1♀, leg. L. Gençer; Ankara, Beynam [39°41'N 32°56'E] 1181 m, 06.06.2003, 2♀♀, 1♂, leg. S. Ülgentürk; Çankırı, Kalecik [40°06'N 33°24'E] 676 m, 29.05.2003, 1♀; Kırşehir, Susuz Köyü [39°01'N 34°18'E] 1027 m, 30.04.2002, 1♀, leg. H.H. Başibüyük; Sivas, Ulaş [39°26'N 37°02'E] 1382 m, 30.05.2003, 1♂; Sivas, İmranlı [39°57'N 38°40'E] 1600 m, 29.05.2002, 1♀; Sivas, Suşehri [40°9'N 37°54'E] 1730 m, 05.05.2001, 1♀, leg. E. Bağda; Sivas, Kampüs [39°42'N 37°01'E] 1278 m, 13-24.06.2002, 1♀; 12.06.2003, 2♀♀, 3♂♂; 16.06.2003, 1♂; 17.06.2003, 1♀, leg. S.H. Örgen.

Cephus spinipes (Panzer)

Distribution: Turkey [*new record*], Crimea, Caucasus, Russia, Europe, China.

Material examined: Turkey: Sivas, İmranlı [39°57'N 38°40'E] 1600 m, 29.05.2002, 1♀, leg. H.H. Başibüyük; Çankırı, Kalecik [40°06'N 33°24'E] 676 m, 29.05.2003, 1♀, leg. E.M. Korkmaz.

Trachelus libanensis (André)

Distribution: Turkey [Benson (1968); Altınayar (1975)], Armenia, Cyprus, Georgia, Israel, Lebanon, Russia, Syria.

Material examined: Turkey: Sivas, Yeniçubuk [39°12'N 36°5'E] 1145 m, 02.06.2001, 1♂, leg. H.H. Başibüyük.

Trachelus tabidus (Fabricius)

Distribution: Holarctic. Turkey [e.g., Benson (1968); Altınayar (1975); Zhelochovtsev and Zinovjev (1988)]

Material examined: Turkey: Afyon, Bolvadin [38°42'N 31°2'E] 987 m, 01.06.2002, 4♀♀, 1♂; Aksaray, Gülağaç [38°23'N 34°20'E] 1300 m, 02.06.2002, 2♀♀, 1♂, leg. E. Bağda; Ankara, Nallıhan

[40°11'N 31°21'E] 733 m, 31.05.2002, 10♀♀, 4♂♂, leg. H.H. Başibüyük; Çankırı, Kalecik [40°6'N 33°24'E] 676 m, 29.05.2003, 3♀♀, 2♂♂; Çorum, İskilip [40°34'N 34°38'E] 626 m, 07.06.2003, 2♀♀, 3♂♂, leg. E.M. Korkmaz; Eskişehir [39°28'N 31°29'E] 1300 m, 31.05.2002, 11♀♀, 3♂♂, leg. L. Gençer; Karaman [37°30'N 34°44'E] 975 m, 06.05.2003, 1♀, leg. E.M. Korkmaz; Kayseri, Sarımsaklı [38°53'N 35°43'E] 1336 m, 02.06.2001, 4♀♀, leg. S.H. Örgen; Kırşehir, Tuz Gölü [38°41'N 33°30'E] 1000 m, 03.06.2003, 4♀♀, 1♂; Konya, Cihanbeyli [38°41'N 32°58'E] 934 m, 05.06.2003, 4♀♀, 1♂, leg. H.H. Başibüyük; Niğde, Çamardı [38°00'N 35°02'E] 1680 m, 04.06.2003, 12♀♀, 44♂♂; Sivas, Suşehri [40°N 38°E] 920 m, 12.06.2003, 2♀♀, 1♂, leg. E.M. Korkmaz; Tokat, Almus [40°22'N 36°54'E] 805 m, 17.05.2001, 1♂, leg. L. Gençer.

Trachelus troglodyta (Fabricius)

Distribution: Turkey [Benson (1968); Altınayar (1975); Zhelochovtsev and Zinovjev (1988)], Caucasus, Europe, Russia.

Material examined: Turkey: Sivas, Karasar Geçidi [39°16'N 37°55'E] 1860 m, 13.06.2001, 1♀, leg. H.H. Başibüyük.

Discussion

Previous studies have collectively recorded 8 genera and 15 species of Cephidae from Turkey (Benson, 1968; Altınayar, 1975; Muche, 1981; Zhelochovtsev and Zinovjev, 1988). Investigations on specimens collected from central Anatolia revealed the presence of 22 species in 7 genera. Ten species, *Cephus fumipennis*, *C. nigrinus*, *C. pulcher*, *C. rjabovi*, *C. sareptanus*, *C. spinipes*, *Calameuta (Calameuta) filiformis*, *C. (Calameuta) punctata*, *Hartigia linearis*, and *H. xanthostoma*, are new records for both central Anatolia and Turkey. The total number of cephid species reported from Turkey is now 25 all together with previous and present records.

The Holarctic species *Cephus pygmeus* and *Trachelus tabidus* are the most abundant and widespread species in Central Anatolia. These species are also well known to researchers of plant protection (Tayakısı, 1971; Altınayar, 1975; Yürüten, 1969). The broad distribution of *C. pygmeus* appears to have

resulted in intraspecific variation in some morphological structures and colour patterns. Preliminary investigations have not supported the monophyly of the species and rather suggested the presence of a few lineages within it (Korkmaz, 2006: unpublished MSc thesis; see Figure 1). However, further analyses with more molecular data are necessary for a plausible phylogenetic hypothesis.

The distributions of many *Pachycephus* spp., *Characopygus scythicus*, and *Trachelus libanensis* are

mainly restricted to Anatolia and surrounding areas (Cyprus, Armenia, Israel, Lebanon, and Transcaucasia). This pattern supports the Anatolia being one of the main southern refugia during the last glacial age, as suggested for many other taxa (Tarkhnishvili et al., 2000; Rokas et al., 2003; Çıplak, 2004).

Cephus rjabovi and *C. sareptanus* are found in the eastern Pontic glacial refugium (Turkey, Volga Region, Dagestan, and Russia). However, the range of

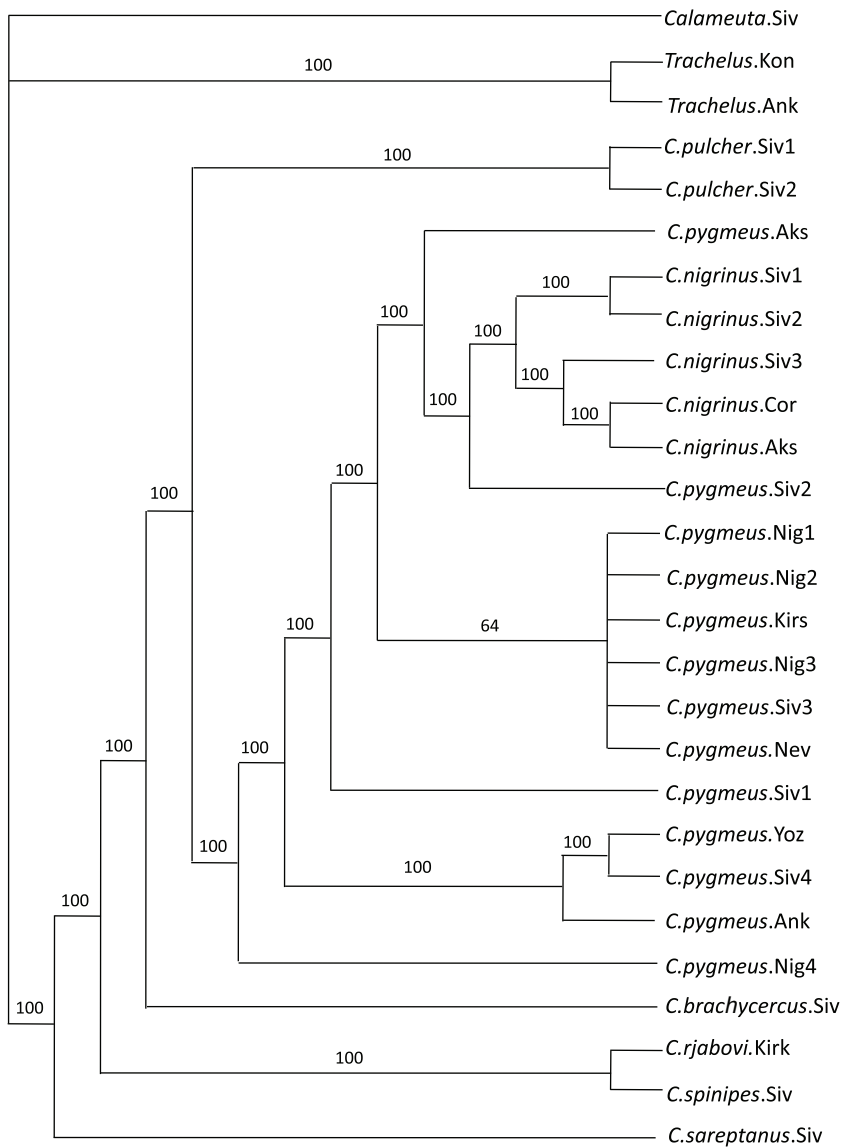


Figure 1. A majority rule consensus tree generated from 95 most parsimonious trees found after successive weighting of 5667 trees with TL: 547; CI: 0.6307; HI: 0.3693; RI: 0.6958; RC: 0.4388. Trees are produced under Heuristic search by simultaneous analysis of 57 morphological characters and a fragment of COI gene with 728 base pairs [Redrawn after Korkmaz (2006)].

C. spinipes and *C. brachycercus* is more expanded including Turkey, Europe, Crimea, Caucasus, Russia, and some adjacent regions. The distribution of *C. pulcher* and *C. nigrinus* is western Palaearctic, but *C. pygmaeus* is Holarctic. The preliminary phylogenetic analysis of Korkmaz (2006), based on morphological and mtDNA data, suggests that the species with restricted distribution are tend to occur basally within *Cephus* (Figure 1). This may indicate that significant populations of many Palaearctic species took refuge in Anatolia during the last glacial age and later expanded towards north during interglacial period (Taberlet et al., 1998; Çıplak, 2003, 2004; Rokas et al., 2003).

Considering that some 40 cephid species occur in Europe, the presence of 25 species in Turkey supports

the argument that Anatolia is one of the most species-rich regions within the Mediterranean Basin due to her important refugium characteristics (Hewitt, 1999; Çıplak, 2004). Furthermore, the presence of 10 new records only from Central Anatolia suggests that the number of cephid species is likely to increase with further studies by surveying the entire province.

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