

## Investigation on the inquilines (Hymenoptera: Cynipidae, Synergini) of oak galls from inner western Anatolia, Turkey

Yusuf KATILMIŞ\*, Musa AZMAZ

Department of Biology, Faculty of Arts and Science, Pamukkale University, Denizli, Turkey

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**Abstract:** In this study carried out on specimens collected in inner western Anatolia, 13 species belonging to *Synergus* were recorded. Eight species were recorded for the first time from Turkey. Due to the associated oak galls, the highest number (6 species) were observed inside the galls of *Aphelonyx persica*. Data about host oaks, emergence time of adults, and associated oak galls are given.

**Key words:** Cynipidae, *Synergus*, new records, inquiline wasps, Turkey

### 1. Introduction

The tribe Synergini belongs to the inquiline group in Cynipidae (Hymenoptera). The cynipid inquilines have lost the ability to induce galls, but they are also phytophagous insects, like the gall wasps. They can also affect gall inducers negatively (Wiebes-Rijks and Shorthouse, 1992). However, inquiline larvae do not behave like parasitoids (Evans, 1965; Shorthouse, 1973; Shorthouse, 1980; Wiebes-Rijks, 1980), but they compete for food sources and/or space (Pujade-Villar et al., 2003). Forty-eight species of Synergini are known in the Western Palearctic. Thirty species of them belong to *Synergus* (Pénzes et al., 2012).

Two new oak gall species (*Andricus askewi*, *Andricus megalucidus*) have been described from Turkey (Melika and Stone, 2001; Melika et al., 2004). Katılmış and Kıyak (2008) listed 81 gall-inducing wasps (Hymenoptera: Cynipidae), with a new genus from Turkey. Tavakoli et al. (2008) described a new species from Turkey and Iran (*Andricus megalucidus*). Other gall-inducing wasps on oaks and herbs have been recorded as new to Turkey (Katılmış and Kıyak, 2009a, 2009b, 2011a, 2011b, 2011c; Kıyak and Katılmış, 2010). *Andricus moreae* (Graeffe) (Kemal and Koçak, 2010) and *Cynips korsakovi* Belizin (Mutun and Dinç, 2011) were recorded for the first time from Turkey. Mete and Demirsoy (2010, 2012) determined 24 species belonging to 5 genera from Kemaliye, Turkey.

*Synophrus politus* Hartig, belonging to *Synophrus* Hartig, 1843, is known from Turkey (Bodenheimer, 1941). Two new inquiline wasps of *Ceroptres* Hartig, 1840 (*C.*

*cerri* Hartig and *C. clavicornis* Mayr), a new inquiline wasp of *Periclistus* Förster, 1869 (*P. brandtii* Ratzeburg), and 2 new inquiline wasps of *Saphonecrus* Dalla-Torre and Kieffer, 1910 (*S. connatus* Hartig and *S. haimi* Mayr) have been recorded previously from Turkey (Katılmış and Kıyak, 2011d, 2011e; Katılmış and Kıyak, 2012). So far, 5 inquiline wasps belonging to *Synergus* have been recorded from Turkey (Bodenheimer, 1941; Katılmış and Kıyak, 2008; Kemal and Koçak, 2010; Askew et al., 2013).

Studies about gall wasps and their inquilines in Turkey are scarce. Therefore, the subject of this study is the genus *Synergus* in inner western Anatolia, Turkey.

### 2. Materials and methods

All cynipid galls were collected from inner western Anatolian between 2007 and 2009. The coordinates and altitudes were recorded using a Garmin 62S model geographic positioning system. After collection, galls were kept in laboratory conditions and checked weekly for emerged wasps. Adult inquilines were subsequently fixed in ethanol. The adults were then air-dried, fixed on cards (5–10 mm in length), and pinned. Inquilines were identified using available literature sources (Ionescu, 1957; Pujade-Villar and Nieves-Aldrey, 1993; Nieves-Aldrey, 2001; Pujade-Villar et al., 2003; Melika, 2006; Askew et al., 2013). All specimens were deposited in the Zoology Museum of Gazi University, Turkey. Data about host oaks, emergence time of adults, and associated oak galls are given. New records are denoted by an asterisk.

\* Correspondence: ykatilmis@pau.edu.tr

### 3. Results

#### 3.1. Genus *Synergus* Hartig, 1840

##### 3.1.1. *Synergus apicalis*\* Hartig, 1841

###### Material examined

DENİZLİ, Çivril, Beydilli village, surrounding Işıklı Lake, 38°16'N, 29°55'E, 827 m, 25.iv.2007, galls of *Plagiotrochus quercusilicis*, on *Quercus coccifera*, emerged 18.v.2009, 2♀; KÜTAHYA, Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832 m, 28.iv.2009, galls of *Andricus inflator*, on *Quercus cerris*, emerged 18.v.2009, 12♂, 5♀; Türkmen Mountain National Park, between Söğüt upland - Yumaklı village 2 km, 39°24'N, 30°18'E, 1470 m, 19.vi.2009, galls of *Andricus multiplicatus*, on *Q. cerris*, emerged 01.viii.2009, 3♂, 1♀; Simav, between Simav - Demirciköy, 39°05'N, 28°57'E, 818 m, 06.v.2008, galls of *Callirhytis* sp., on *Quercus frainetto*, emerged 26.v.2008, 2♂; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832 m, 06.v.2008, galls of *A. inflator*, on *Q. cerris*, emerged 27.v.2008, 3♀, 06.vi.2008, 2♀; Simav, between Simav - Demirciköy, 39°05'N, 28°57'E, 818 m, 13.vi.2008, galls of *Callirhytis* sp., on *Q. frainetto*, emerged 30.vi.2008, 2♂; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832 m, 06.v.2008, galls of *Biorhiza pallida*, on *Quercus robur*, emerged 20.v.2008, 3♀; between Kütahya - Çavdarhisarı 3 km, 39°21'N, 30°02'E, 958 m, 11.vii.2007, galls of *Aphelonyx persica*, on *Q. cerris*, emerged 20.x.2007, 3♀; UŞAK, Karahallı, Kirkyaren village, old cemetery, 38°20'N, 29°25'E, 948 m, 13.vii.2007, galls of *A. persica*, on *Quercus ithaburensis*, emerged 20.x.2007, 4♀, 3♂; Banaz, Kızılcaşöğüt village, 38°40'N, 29°39'E, 956 m, 11.ix.2007, galls of *A. persica*, on *Q. ithaburensis*, emerged 20.x.2007, 4♀, 1♂.

###### Distribution

Known from Austria, Denmark, France, Germany, Hungary, Israel, Italy, Netherlands, Poland, Portugal, Romania, Spain, Sweden, Switzerland, Ukraine, United Kingdom.

##### 3.1.2. *Synergus crassicornis*\* (Curtis, 1838)

###### Material examined

DENİZLİ, Buldan, between Buldan - Buldan upland lake 6 km, 38°02'N, 28°47'E, 1131 m, 18.vii.2009, galls of *Andricus quercustozae*, on *Quercus infectoria*, emerged 11.viii.2009, 3♀; KÜTAHYA, between Kütahya - Çavdarhisarı 2 km, 39°21'N, 30°02'E, 976 m, 16.ix.2008, galls of *A. persica*, on *Q. ithaburensis*, emerged 20.iv.2009, 5♀; Simav, between Simav - Demirciköy, 39°05'N, 28°57'E, 818 m, 28.iv.2009, galls of *Andricus solitarius*, on *Q. frainetto*, emerged 18.v.2009, 2♂.

###### Distribution

Known from Algeria, Andorra, Austria, France, Germany, Hungary, Italy, Morocco, Netherlands, Poland, Portugal, Spain, Ukraine, United Kingdom. Known also from western Kazakhstan.

##### 3.1.3. *Synergus facialis* Hartig, 1840

###### Material examined

AFYON, Emirdağ, surrounding Çatalı village, 38°57'N, 31°07'E, 1078 m, 19.v.2007, galls of *Pseudoneuroterus saliens*, on *Q. ithaburensis*, emerged 28.v.2007, 2♀; DENİZLİ, Honaz, surrounding Karaçay village, 37°42'N, 29°23'E, 981 m, 03.iii.2009, galls of *Andricus caputmedusae*, on *Q. infectoria*, emerged 21.iv.2009, 3♂.

###### Distribution

Known from Algeria, Andorra, Austria, Bulgaria, Croatia, Czech Republic, Denmark, France, Germany, Greece, Hungary, Italy, Jordan, Netherlands, Poland, Portugal, Russia, Slovakia, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom. Known also from western Kazakhstan.

##### 3.1.4. *Synergus flavipes*\* Hartig, 1843

###### Material examined

AFYON, Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148 m, 04.iii.2009, galls of *Callirhytis* sp., on *Quercus pubescens*, emerged 21.iv.2009, 3♂, 1♀; Emirdağ, Kemer kaya village, 38°54'N, 31°07'E, 1232 m, 10.vi.2008, galls of *A. multiplicatus*, on *Q. cerris*, emerged 10.iii.2009, 1♀; Emirdağ, Yüreğil town, Döneli, 39°01'N, 31°07'E, 1006 m, 23.iv.2007, galls of *A. persica*, on *Q. ithaburensis*, emerged 10.iii.2009, 4♀, 2♂; Bayat, between Gömü town - Bayat 6 km 39°01'N, 31°00'E, 1006 m, 18.vi.2007, galls of *A. persica*, on *Q. ithaburensis*, emerged 25.vi.2007, 2♀; Bayat, between Gömü town - Bayat 6 km 39°01'N, 31°00'E, 1006 m, 18.vi.2007, galls of *Dryomyia circinnans* (Diptera: Cecidomyiidae), on *Q. ithaburensis*, emerged 23.vi.2007, 2♀; Emirdağ, Çatalı village, 38°55'N, 31°08'E, 1235 m, 19.v.2007, galls of *A. persica*, on *Q. ithaburensis*, emerged 27.v.2007, 2♀; KÜTAHYA, Gelinkaya village, 39°19'N, 29°59'E, 971 m, 10.ix.2007, galls of *A. persica*, on *Q. ithaburensis*, emerged 11.iv.2008, 6♀; UŞAK, Banaz, Kuşdemir village, 38°44'N, 29°43'E, 991 m, 15.viii.2007, galls of *Aphelonyx cerricola*, on *Q. ithaburensis*, emerged 25.ix.2007, 3♀.

###### Distribution

Known only from Austria, Hungary, Italy, Ukraine.

##### 3.1.5. *Synergus hayneanus*\* (Ratzeburg, 1833)

###### Material examined

AFYON, between Bayat - Afyon 5 km, Köroğlu, 38°55'N, 30°54'E, 1258 m, 09.ix.2007, galls of *Andricus infectorius*, on *Q. infectoria*, emerged 15.ix.2007, 2♀; DENİZLİ, Çivril, Akdağ, surrounding Çağlayan village, 38°24'N, 29°50'E, 970 m, 02.iii.2009, galls of *Andricus sternlichti*, on *Q. pubescens*, emerged 18.v.2009, 10♀; Honaz, surrounding Aydımlar village, 37°43'N, 29°23'E, 1033 m, 03.iii.2009, galls of *Andricus megalucidus*, on *Q. infectoria*, emerged 18.v.2009, 2♀; KÜTAHYA, surrounding Simav, 39°05'N, 28°57'E, 819 m, 06.v.2008, galls of *Andricus curator*, on *Q. infectoria*, emerged 07.viii.2008, 3♀, 2♂.

### Distribution

Known from Algeria, Andorra, Austria, France, Germany, Greece, Hungary, Italy, Portugal, Romania, Slovenia, Spain, Ukraine.

#### 3.1.6. *Synergus incrassatus*\* Hartig, 1840

##### Material examined

AFYON, Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148 m, 16.viii.2008, galls of *Cynips divisa*, on *Q. pubescens*, emerged 13.x.2008, 2♀, 1♂; Sultandağı, between Yakasenek village - Çığirtkan creek, 38°31'N, 31°09'E, 1733 m, 11.vi.2008, galls of *B. pallida*, on *Q. pubescens*, emerged 30.vi.2008, 2♀; Sultandağı, Yakasenek village, 38°32'N, 31°10'E, 1234 m, 27.vi.2007, galls of *Andricus vindobonensis*, on *Q. cerris*, emerged 26.iii.2008, 2♂; DENİZLİ, Serinhisar, between Yatağan town - Kefe upland 2 km, 37°36'N, 29°23'E, 1199 m, 22.v.2009, galls of *Andricus grossulariae*, on *Q. infectoria*, emerged 04.vi.2009, 2♂; Çivril, Akdağ, surrounding Çağlayan village, 02.iii.2009, galls of *A. sternlichti*, on *Q. infectoria*, emerged 21.iv.2009, 3♀, 2♂; KÜTAHYA, Frig valley, İnli village, 39°29'N, 30°12'E, 1045 m, 18.viii.2008, galls of *Andricus truncicolus*, on *Q. pubescens*, emerged 15.x.2008, 3♂; Frig valley, Sabuncupınar village, 39°30'N, 30°09'E, 984 m, 04.v.2008, galls of *A. quercustozae*, on *Q. infectoria*, emerged 13.v.2008, 3♀, 2♂; Türkmen Mountain National Park, Söğüt upland, 39°23'N, 30°19'E, 1378 m, 27.iv.2009, galls of *Trigonaspis synaspis*, on *Q. infectoria*, emerged 28.iv.2009, 2♀ 2♂; Türkmen Mountain National Park, between Yumaklı village - Kozluca village 2 km, 39°25'N, 30°16'E, 1288 m, 28.iv.2009, galls of *Neuroterus numismalis*, on *Quercus petraea*, emerged 28.iv.2009, 2♀; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832 m, 01.iii.2009, galls of *A. infectorius*, on *Q. infectoria*, emerged 21.iv.2009, 2♀; between Simav - Demirciköy 2 km, 39°05'N, 28°57'E, 818 m, 28.iv.2009, galls of *A. solitarius*, on *Q. frainetto*, emerged 18.v.2009, 2♀ 2♂; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832 m, 06.v.2008, galls of *B. pallida*, on *Q. infectoria*, emerged 06.vi.2008, 12♀, 5♂; Tavşanlı, surrounding Güzelyurt dam, 39°29'N, 29°34'E, 850 m, 05.v.2008, galls of *B. pallida*, on *Q. infectoria*, emerged 28.v.2008, 2♀, 1♂; Aslanapa, between Aslanapa - Kütahya 5 km, 39°15'N, 29°53'E, 1094 m, 10.ix.2007, galls of *Andricus askewi*, on *Q. infectoria*, emerged 30.ix.2008, 5♀; Tavşanlı, Akçaçay village, surrounding Kayaboğazı dam, 39°25'N, 29°36'E, 928 m, 05.v.2008, galls of *B. pallida*, on *Q. infectoria*, emerged 28.v.2008, 5♀, 3♂.

##### Distribution

Known from Andorra, Austria, Denmark, France, Germany, Hungary, Netherlands, Poland, Portugal, Russia, Spain, Sweden, Ukraine, United Kingdom.

#### 3.1.7. *Synergus pallicornis* Hartig, 1840

##### Material examined

AFYON, Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148 m, 04.iii.2009, galls of *C. divisa*, on *Q. pubescens*, emerged 21.iv.2009, 4♀, 2♂; DENİZLİ, Serinhisar, Yatağan town, 37°35'N, 29°23'E, 1046 m, 03.iii.2009, galls of *A. sternlichti*, on *Q. pubescens*, emerged 21.iv.2009, 12♀, 5♂; KÜTAHYA, Türkmen Mountain National Park, between Yumaklı village - Kozluca village 2 km, 39°25'N, 30°16'E, 1288 m, 28.iv.2009, galls of *A. quercustozae*, on *Q. pubescens*, emerged 29.iv.2009, 3♀, 2♂, 18.v.2009, 2♀, 2♂; Türkmen Mountain National Park, between Yumaklı village - Kozluca village 1 km, 39°25'N, 30°16'E, 1288 m, 18.viii.2008, galls of *T. synaspis*, on *Q. infectoria*, emerged 13.x.2008, 3♀; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832 m, 01.iii.2009, galls of *A. infectorius*, on *Q. infectoria*, emerged 18.v.2009, 3♀.

##### Distribution

Known from Austria, Croatia, Denmark, France, Germany, Greece, Hungary, Italy, Netherlands, Poland, Portugal, Romania, Spain, Sweden, Switzerland, Turkey, Ukraine, United Kingdom.

#### 3.1.8. *Synergus pallidipennis*\* Mayr, 1872

##### Material examined

AFYON, Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148 m, 04.iii.2009, galls of *Andricus coriarius*, on *Q. pubescens*, emerged 18.v.2009; 3♀; KÜTAHYA, Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832 m, 01.iii.2009, galls of *A. caputmedusae*, on *Q. robur*, emerged 21.iv.2009, 3♀; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832 m, 01.iii.2009, galls of *Andricus superfetationis*, on *Q. robur*, emerged 18.v.2009, 3♀, 2♂.

##### Distribution

Known from Austria, Croatia, Greece, Hungary, Netherlands, Portugal, Slovakia, Spain, Ukraine, United Kingdom.

#### 3.1.9. *Synergus pallipes* Hartig, 1840

##### Material examined

AFYON, Emirdağ, Yüreğil town, Döneli, 39°01'N, 31°07'E, 1006 m, 27.iv.2008, galls of *A. curator*, on *Q. infectoria*, emerged 21.v.2008, 3♀, 2♂; KÜTAHYA, Gelinkaya village, 39°19'N, 29°59'E, 971 m, 10.ix.2007, galls of *A. persica*, on *Q. ithaburensis*, emerged 13.x.2008, 5♀; Türkmen Mountain National Park, between Yumaklı village - Kozluca village 2 km, 39°25'N, 30°16'E, 1288 m, 28.iv.2009, galls of *A. quercustozae*, on *Q. infectoria*, emerged 18.v.2009, 5♀; Simav, between Simav - Demirciköy 2 km, 39°05'N, 28°57'E, 818 m, 28.iv.2009, galls of *A. solitarius*, on *Q. frainetto*, emerged 18.v.2009, 3♀, 3♂.

##### Distribution

Known from Algeria, Andorra, Austria, Denmark, France, Germany, Hungary, Israel, Italy, Netherlands,

Poland, Portugal, Romania, Russia, Spain, Turkey, Ukraine, United Kingdom.

### 3.1.10. *Synergus thaumacerus* (Dalman, 1823)

#### Material examined

AFYON, Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148 m, 16.viii.2008, galls of *T. synaspis*, on *Q. pubescens*, emerged 13.x.2008, 3♀.

#### Distribution

Known from Andorra, Austria, Bulgaria, Denmark, France, Germany, Hungary, Italy, Netherlands, Poland, Portugal, Romania, Spain, Sweden, Turkey, Ukraine, United Kingdom.

### 3.1.11. *Synergus tibialis*\* Hartig, 1840

#### Material examined

AFYON, Sinanpaşa (Sincanlı), Kırka town, 38°42'N, 30°13'E, 1204 m, 15.viii.2007, galls of *A. cerricola*, on *Q. ithaburensis*, emerged 22.ix.2007, 7♀, 1♂; DENİZLİ, Serinhisar, Yatağan town, 37°35'N, 29°23'E, 1046 m, 03.iii.2009, galls of *A. caputmedusae*, on *Q. pubescens*, emerged 21.iv.2009, 3♀, 2♂; Çivril, Akdağ, above Çağlayan village, 02.iii.2009, galls of *A. sternlichti*, on *Q. infectoria*, emerged 21.iv.2009, 2♀, 3♂; KÜTAHYA, between Tavşanlı - Domaniç 2 km, 39°34'N, 29°27'E, 837 m, 21.v.2007, galls of *Neuroterus quercusbaccarum*, on *Q. infectoria*, emerged 27.v.2009, 2♀.

#### Distribution

Known from Andorra, Austria, Germany, Hungary, Netherlands, Spain, Ukraine, United Kingdom.

### 3.1.12. *Synergus umbraculus* (Oliver, 1791)

#### Material examined

AFYON, Bayat, between Bayat - Gömü 3 km, 38°59'N, 30°58'E, 1027 m, 15.ix.2008, galls of *Andricus seckendorffi*, on *Q. infectoria*, emerged 21.iv.2009, 2♀; Sultandağı, Yakasenek village, Çığirtkan creek, 38°32'N, 31°09'E, 1542 m, 19.ix.2008, galls of *Andricus coronatus*, on *Quercus vulcanica*, emerged 21.iv.2009, 2♂; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148 m, 16.viii.2008, galls of *Andricus lucidus*, on *Q. pubescens*, emerged 21.iv.2009, 3♀, 2♂; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148 m, 04.iii.2009, galls of *A. grossulariae*, on *Q. infectoria*, emerged 21.iv.2009, 2♀; Sultandağı, between Yakasenek village - Çığirtkan creek, 38°31'N, 31°09'E, 1733 m, 11.vi.2008, galls of *A. quercustozae*, on *Q. vulcanica*, emerged 07.viii.2008, 2♀; Sultandağı, Deresenek village, 38°32'N, 31°09'E, 1192 m, 10.viii.2007, galls of *A. caputmedusae*, on *Q. infectoria*, emerged 07.ix.2007, 2♀, 14.ix.2007, 1♀, 2♂; Sinanpaşa (Sincanlı), Kırka town, 38°42'N, 30°13'E, 1204 m, 15.viii.2007, galls of *A. askewi*, on *Q. infectoria*, emerged 20.ix.2007, 4♀, 4♂; Bayat, Bayat pond, 38°58'N, 30°53'E, 1150 m, 18.vi.2007; galls of *A. persica*, on *Q.*

*ithaburensis*, emerged 25.vi.2008, 2♀; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148 m, 19.ix.2008, galls of *A. lucidus*, on *Q. pubescens*, emerged 21.iv.2009, 2♀; DENİZLİ, Honaz, above Aydınlar village, 37°43'N, 29°23'E, 1033 m, 03.iii.2009, galls of *A. megalucidus*, on *Q. infectoria*, emerged 18.v.2009, 4♀, 2♂; Honaz, above Aydınlar village, 37°43'N, 29°23'E, 1033 m, 03.iii.2009, galls of *A. grossulariae*, on *Q. infectoria*, emerged 21.iv.2009, 2♀; Honaz, above Aydınlar village, 37°43'N, 29°23'E, 1049 m, 18.ix.2008, galls of *A. caputmedusae*, on *Q. infectoria*, emerged 21.iv.2009, 3♀; Çivril, Akdağ, above Cumalar village, surrounding Sığır kuyruğu, 38°21'N, 29°56'E, 1302 m, 20.viii.2008, galls of *A. infectorius*, on *Q. infectoria*, emerged 15.x.2008, 2♀, 2♂; Çivril, Akdağ, above Çağlayan village, 38°24'N, 29°50'E, 970 m, 14.viii.2007, galls of *A. caputmedusae*, on *Q. infectoria*, emerged 15.ix.2007, 2♀; Çivril, Akdağ, above Cumalar village, surrounding Sığır kuyruğu, 38°21'N, 29°56'E, 1408 m, 20.viii.2008, galls of *A. coronatus*, on *Q. infectoria*, emerged 15.x.2008, 2♀; Serinhisar, Kefe upland, 37°36'N, 29°23'E, 1301 m, 12.viii.2007, galls of *A. caputmedusae*, on *Q. infectoria*, emerged 30.ix.2008, 3♀, 2♂; KÜTAHYA, between Kütahya - Çavdarhisarı 8 km, 39°19'N, 29°59'E, 1009 m, 28.ii.2009, galls of *Andricus curtisii*, on *Q. infectoria*, emerged 21.iv.2009, 3♀; Türkmen Mountain National Park, between Yumaklı village - Kozluca village 2 km, 39°25'N, 30°16'E, 1288 m, 28.iv.2009, galls of *A. quercustozae*, on *Q. pubescens*, emerged 01.ix.2009, 5♂; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832 m, 16.ix.2008, galls of *A. lucidus*, on *Q. pubescens*, emerged 21.iv.2009, 2♀, 2♂; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832 m, 01.iii.2009, galls of *Andricus lucidus*, on *Q. pubescens*, emerged 21.iv.2009, 2♂; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832 m, 01.iii.2009, galls of *A. coronatus*, on *Q. infectoria*, emerged 21.iv.2009, 2♀; Altıntaş, Genişler village, 38°58'N, 30°06'E, 1064 m, 24.iv.2007, galls of *A. persica*, on *Q. ithaburensis*, emerged 29.iv.2007, 4♀, 3♂; Hisarcık, between Hisarcık-Simav, 39°13'N, 29°12'E, 920 m, 22.v.2007, galls of *A. caputmedusae*, on *Q. pubescens*, emerged 29.v.2007, 3♀; Aslanapa, between Aslanapa - Kütahya 5 km, 39°15'N, 29°53'E, 1094 m, 10.ix.2007, galls of *B. pallida*, on *Q. infectoria*, emerged 11.ii.2008, 2♀; Simav, Örenli village, surrounding lake, 39°11'N, 28°53'E, 832 m, 16.ix.2008, galls of *A. grossulariae*, on *Q. infectoria*, emerged 15.x.2008, 2♀; UŞAK, between Uşak - Gediz 1 km, 38°40'N, 29°14'E, 681 m, 20.vi.2009, galls of *Andricus cecconii*, on *Q. ithaburensis*, emerged 01.viii.2009, 4♀, 1♂; Banaz, Ahad village, surrounding dam, 38°38'N,

29°49'E, 1025 m, 17.ix.2008, galls of *A. coriarius*, on *Q. infectoria*, emerged 20.iv.2009, 2♀, 1♂, 21.iv.2009, 3♀, 2♂, 15.vi.2008, 3♀.

#### Distribution

Known from Algeria, Andorra, Austria, Bulgaria, Croatia, Czech Republic, France, Germany, Greece, Hungary, Italy, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, Turkey, Ukraine, United Kingdom.

#### 3.1.13. *Synergus variabilis*\* Mayr, 1872

##### Material examined

AFYON, Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148 m, 19.v.2009, galls of *Chilaspis nitida*, on *Q. cerris*, emerged 04.vi.2009, 2♀; KÜTAHYA, between Kütahya - Çavdarhisarı 3 km, 39°21'N, 30°02'E, 958 m, 11.vii.2007, galls of *A. persica*, on *Q. cerris*, emerged 15.vii.2009, 2♀.

#### Distribution

Known from Austria, Bulgaria, Hungary, Israel, Italy, Jordan, Romania, Russia, Ukraine, United Kingdom.

#### 4. Discussion

Nine genera of Synergini are known worldwide, of which 5 are known from the Western Palearctic: *Ceroptres*, *Periclistus*, *Saphonecrus*, *Synergus*, and *Synophrus* (Pérez et al., 2012) (Table 1).

In this study, 8 species belonging to *Synergus* are recorded for the first time from Turkey. Thus, the Cynipidae fauna of Turkey includes a total of 13 species of *Synergus*.

Due to the associated oak galls, *S. umbraculus* was reared from 14 different galls and *S. incrassatus* was reared from 12 different galls. Six different species of *Synergus* were reared from the galls of *Aphelonyx persica* (Table 2).

**Table 1.** The species richness of Synergini in Turkey, the Western Palearctic, and the world (WP, Western Palearctic).

Genera	Hosts	Turkey	WP	World
<i>Agastoroxenia</i> Nieves-Aldrey & Medianero, 2010	Oak cynipid galls	-	-	1
<i>Ceroptres</i> Hartig, 1840	Oak cynipid galls	2	2	23
<i>Saphonecrus</i> Dalla Torre and Kieffer, 1910	Oak cynipid galls	2	6	21
<i>Synergus</i> Hartig, 1840	Oak cynipid galls	13	30	109
<i>Synophrus</i> Hartig, 1843	Oak cynipids	1	7	7
<i>Ufo</i> Melika & Pujade, 2005	Oak cynipid galls	-	-	4
<i>Periclistus</i> Förster, 1869	<i>Rosa</i> sp. cynipid galls	1	3	14
<i>Rhoophilus</i> Mayr, 1881	<i>Rhus</i> sp. galls	-	-	1
<i>Synophromorpha</i> Ashmead, 1903	<i>Rubus</i> sp. galls	-	-	6
Total		19	48	186

**Table 2.** Inquiline wasps of the associated oak galls (inquiline cynipid hosts for the Turkish fauna are indicated in a general way, with the following abbreviations: [a] asexual galls and [b] bisexual galls; new records are marked with \*).

Inquiline wasps	Hosts recorded from Turkey
<i>Synergus apicalis</i> *	<i>Andricus inflator</i> [b], <i>Andricus multiplicatus</i> [b], <i>Aphelonyx persica</i> [a], <i>Biorhiza pallida</i> [b], <i>Callirhytis</i> sp., <i>Plagiotrochus quercusilicis</i> [b]
<i>S. crassicornis</i> *	<i>Andricus quercustozae</i> [a], <i>Andricus solitarius</i> [a], <i>A. persica</i> [a]
<i>S. facialis</i>	<i>Andricus caputmedusae</i> [a], <i>Pseudoneuroterus saliens</i> [b]
<i>S. flavipes</i> *	<i>A. multiplicatus</i> [b], <i>Aphelonyx cerricola</i> [a], <i>A. persica</i> [a], <i>Callirhytis</i> sp., <i>Dryomyia circinnans</i> (Cecidomyiidae)
<i>S. hayneanus</i> *	<i>Andricus curvator</i> [b], <i>Andricus infectorius</i> [a], <i>Andricus megalucidus</i> [a], <i>Andricus sternlichti</i> [a]
<i>S. incrassatus</i> *	<i>Andricus askewi</i> [a], <i>Andricus grossulariae</i> [b], <i>A. infectorius</i> [a], <i>A. quercustozae</i> [a], <i>Andricus solitarius</i> [a], <i>A. sternlichti</i> [a], <i>Andricus truncicolus</i> [a], <i>Andricus vindobonensis</i> [b], <i>B. pallida</i> [b], <i>Cynips divisa</i> [a], <i>Neuroterus numismalis</i> [a], <i>Trigonaspis synaspis</i> [a]
<i>S. pallicornis</i>	<i>A. infectorius</i> [a], <i>A. quercustozae</i> [a], <i>A. sternlichti</i> [a], <i>Cynips divisa</i> [a], <i>T. synaspis</i> [a]
<i>S. pallidipennis</i> *	<i>Andricus caputmedusae</i> [a], <i>Andricus coriarius</i> [a], <i>Andricus superfetationis</i> [a]
<i>S. pallipes</i>	<i>Andricus curvator</i> [b], <i>A. quercustozae</i> [a], <i>Andricus solitarius</i> [a], <i>A. persica</i> [a]
<i>S. thaumacerus</i>	<i>T. synaspis</i> [a]
<i>S. tibialis</i> *	<i>A. caputmedusae</i> [a], <i>A. sternlichti</i> [a], <i>A. cerricola</i> [a], <i>Neuroterus quercusbaccarum</i> [b]
<i>S. umbraculus</i>	<i>Andricus askewi</i> [a], <i>A. caputmedusae</i> [a], <i>Andricus ceconii</i> [b], <i>A. coriarius</i> [a], <i>Andricus coronatus</i> [a], <i>Andricus curtisii</i> [a], <i>A. grossulariae</i> [a], <i>A. infectorius</i> [a], <i>Andricus lucidus</i> [a], <i>A. megalucidus</i> [a], <i>A. quercustozae</i> [a], <i>Andricus seckendorffi</i> [a], <i>A. persica</i> [a], <i>B. pallida</i> [b]
<i>S. variabilis</i> *	<i>A. persica</i> [a], <i>Chilaspis nitida</i> [b]

This study was carried out in inner western Anatolia and contributes 8 new records to the Cynipidae fauna of Turkey. We hope that the number of species of the Turkish cynipid fauna will increase following other local faunistic studies in the future.

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