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First Records of Inquiline Wasps of the Genus *Ceroptres* Hartig, 1840 (Hymenoptera, Cynipidae, Synergini) from Turkey

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ABSTRACT

Oak galls between March-September in 2007, 2008 and 2009, in the Inner Western Anatolian, Turkey were collected. Inquilines *Ceroptres cerri* Hartig, 1840 and *Ceroptres clavicornis* Mayr, 1872 were reared in laboratory conditions. These species make new records for the Turkish Fauna on both genus and species levels. We provide details on geographical distribution, their developed galls and hosts. We also provide the collecting time of the galls and emergence time of the adult wasps.

Key words: Ceroptres, Cynipidae, inquilines, new record, *Quercus*, Turkey.

INTRODUCTION

About 150 species of oak cynipid gall wasps as well as 38 cynipid inquiline wasps from 5 genera are known from the Western Palaearctic (Melika *et al*., 2000; Tavokoli *et al*., 2006; Pujade *et al*., 2003). Studies of gall wasps and inquiline wasp in Turkey are scarce up until now. Recently Katılmış and Kıyak (2008) listed 81 gall inducing wasps (Hymenoptera: Cynipidae) including a new genus record for Turkey. The other gall inducing wasps on oaks and herbs were recorded as new to Turkey (Katılmış and Kıyak, 2009a, b; Kıyak and Katılmış, 2010, Katılmış and Kıyak 2011 a, b) and one inquiline (*Synergus pallicornis* Hartig, 1843) in a checklist from Turkey was given (Katılmış and Kıyak, 2008).

Members of the tribe Synergini (Hymenoptera; Cynipidae) also known as the inquilines, have lost their gall inducing ability but they are still phytophagous insects, like other gall wasps. Such as, inquiline larvae do not behave like parasitoid (Evans, 1965; Shorthouse, 1973; Shorthouse, 1980; Wiebes-Rijks, 1980) but compete for the food source and/or space (Pujade-Villar *et al*., 2003).

However, if the inquiline larvae develop inside the gall-inducer's chamber they usually cause the death of the gall-inducing cynipid larvae. They are also found feeding in the peripherical tissue of the gall where they may or may not cause the death of the gall-inducing larvae especially when the number of inquilines is high (Ronquist,

1999; Csóka *et al*., 2004). Thus, they can either affect the gall inducer negatively (Wiebes-Rijks and Shorthouse, 1992) or cause them to little harm (Mayr, 1872).

The inquilines are currently divided into eight genera: *Ceroptres* Hartig, *Saphonecrus* Dalla Torre and Kieffer, *Synergus* Hartig, *Synophrus* Hartig, *Ufo* Melika and Pujade-Villar, *Periclistus* Förster, *Synophromorpha* Ashmead and *Agastoroxenia* Nieves-Aldrey, Medianero, (Nieves-Aldrey and Medianero, 2010).

The species of genus *Ceroptres* have been reviewed and only two European species were recognized as valid: *C. clavicornis* and *C. cerri* (Pujade-Villar and Nieves-Aldrey, 1993). These *Ceroptres* species have also been recorded from Iran (Sadeghi *et al*., 2006). Two other species, *C. kovalevi* Belizin and *C. masudai* Abe, have been described from the Eastern Palaearctic, from the Russian Far East as well as Japan and Korea (Belizin, 1973; Abe, 1997). The biology of *Ceroptres* species is poorly known. *C. clavicornis* always develops in galls associated with section *Quercus* oaks, whereas *C. cerri* can be found in galls on oaks of section *Cerris* or on evergreen oaks with circum-Mediterranean distribution such as *Quercus suber* L., *Quercus ilex* L., and *Quercus coccifera* L., (Pujade-Villar *et al*., 2003).

MATERIALS AND METHODS

This study was carried out in 2007, 2008 and 2009 between March and September in the Inner Western Anatolian (Afyon, Denizli, Kütahya and Uşak provinces). In the study area *Quercus spp.* were examined and the found galls were collected. These galls were put in jar bags with a one liter capacity and covered with tulle. We recorded localities and collection time. Speciemens were caried for under laboratory condition and checked for emerergence of adult wasps every week. Adult inquilines were subsequently killed in alcohol and emergence times recorded. Later adults were air dried, fixated on cards (5-10mm in long) 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). The speciemens were then deposited in the Zoology Museum of Gazi University, Turkey.

RESULTS

Ceroptres cerri Hartig, 1840

Material examined: Afyon province, Bayat, surrounding Bayat dam, 38°58'N, 30°53'E, 1139m, collection time of galls: 18.06.2007, galls induced by *Andricus vindobonensis* Müllner, 1901, plant Host: *Quercus cerris* L., emergence time of adults: 10.01.2008, 2♂♂; Emirdağ, below Çatallı village, 38°57'N, 31°07'E, 1078m, collection time of galls: 19.05.2007, galls induced by *Neuroterus saliens* (Kollar, 1857), plant host: *Quercus cerris*, emergence time of adults: 12.06.2007, 1♀, 2♂♂; Sultandağı, above Çobanözü village, 38°28'N, 31°16'E, 1037m, collection time of galls: 17.06.2009, galls induced by *Andricus vindobonensis*, plant host: *Quercus cerris*, emergence time of adults: 01.08.2009, 1♀, 2♂♂; Sandıklı, above Otluk village (Akdağ mountain), 38°26'N, 29°57'E, 1105m, collection time of galls: 07.05.2008, galls induced by *Neuroterus obtectus* (Wachtl, 1880), plant host: *Quercus cerris*, emergence time of adults: 27.05.2008, 1♀; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148m, collection time of galls: 11.06.2008, galls induced by *Andricus vindobonensis*, plant host: *Quercus cerris*, emergence time

of adults: 19.01.2009, 2♀♀; DENİZLİ province, Çivril, Işıklı town, 38°19'N, 29°52'E, 870m, collection time of galls: 07.05.2008, galls induced by *Synophrus politus* Hartig, 1843, plant host: *Quercus ithaburensis* Decne, emergence time of adults: 13.05.2008, 1♂; Honaz, below Karaçay town, 37°41'N, 29°24'E, 1041m, collection time of galls: 22.05.2009, galls induced by *Chilaspis nitida* (Giraud, 1882), plant host: *Quercus cerris*, emergence time of adults: 04.06.2009, 2♀♀; Honaz, Yukarıdağdere village surrounding Saklıgöl lake, 37°46'N, 29°21'E, 372m, collection time of galls: 07.05.2008, galls induced by *Chilaspis nitida*, plant host: *Quercus cerris*, emergence time of adults: 07.08.2008, 3♀♀; Kütahya province, Türkmen mountain, between Söğüt upland-Yumaklı village 2 km., 39°24'N, 30°18'E, 1470m, collection time of galls: 19.06.2009, galls induced by *Andricus multiplicatus* Giraud, 1859, plant host: *Quercus cerris*, emergence time of adults: 01.02.2009, 2 ♀♀; Uşak province, Karahallı, Kırkyaren village, 38°20'N, 29°25'E, 948m, collection time of galls: 13.07.2007, galls induced by *Andricus vindobonensis*, plant host: *Quercus ithaburensis*, emergence time of adults: 11.02.2008, 4 ♀♀.

Ceroptres clavicornis Mayr, 1872

Material examined: Afyon province, Sultandağı, above Yakasenek, 38°32'N, 31°10'E, 1282m, collection time of galls: 19.04.2008, galls induced by *Callirhytis sp.*, plant host: *Quercus infectoria* Olivier, emergence time of adults: 02.05.2008, 1♀; Sultandağı, above Dereçine village, 38°28'N, 31°14'E, 1148m, collection time of galls: 04.03.2009, galls induced by *Callirhytis sp.*, plant host: *Quercus infectoria*, emergence time of adults: 21.04.2009, 2♀♀; KÜTAHYA province, Simav, between Simav-Demirciköy village 2. km, 39°05'N, 28°57'E, 818m, collection time of galls: 21.04.2008, galls induced by *Callirhytis rufescens* (Mayr, 1882), plant host: *Quercus frainetto* Ten., emergence time of adults: 13.05.2008, 3 ♀♀, 26.05.2008, 2♀♀, 06.06.2008, 2♀♀; Simav, Örenli village surrounding lake, 39°11'N, 28°53'E, 832m, collection time of galls: 01.03.2009, galls induced by *Andricus lucidus* (Hartig, 1843), plant host: *Quercus infectoria*, emergence time of adults: 21.04.2009, 2♀♀; Tavşanlı, surrounding Güzelyurt dam, 39°29'N, 29°34'E, 850m, collection time of galls: 05.05.2008, galls induced by *Andricus curvator* Hartig, 1840, plant host: *Quercus infectoria*, emergence time of adults: 27.05.2008, 1♀.

DISCUSSION

Ceroptres cerri is recorded from Andorra, Austria, France, Hungary, Italy, Iran, Jordan, Poland, Portugal, Spain and *Ceroptres clavicornis* from Andorra, Austria, Bulgaria, Denmark, France, Germany, Great Britain, Hungary, Iran, Italy, Netherlands, Poland, Portugal, Romania, Spain, Sweden, Ukraine (Ionescu, 1957; Nieves-Aldrey, 2001; Pujade-Villar *et al*., 2003; Nieves-Aldrey and Massa, 2006; Sadeghi *et al*. 2006). Pujade-Villar *et al*. (2003) estimated that these species are distributed throughout the Western Palaearctic. In 2006 Sadeghi *et al*. recorded these species for the first time from Iran. In the present study we record these *Ceroptres* species for the first time from Turkey. They also represent a new record for Turkey on the genus level. Despite a high species richness in Turkey, the inquilines fauna of Turkey is still poorly known. Until now only *Synergus pallicornis* had been recorded from cynipid galls in Turkey (Katılmış and Kıyak, 2008). We estimate that the number of inquiline species will increase with more rearings of rose and oak galls.

Ceroptres cerri has been recorded from a few sexual generation forms of *Andricus* spp., *Aphelonyx cerricola* (Giraud, 1859), *Chilaspis nitida*, *Dryocosmus nervosus* (Giraud, 1859), *Neuroterus spp*., *Plagiotrochus spp*. and *Synophrus politus* (Pujade-Villar *et al*., 2003). We recorded this species from the galls of *Andricus multiplicatus*, *Andricus vindobonensis*, *Chilaspis nitida*, *Neuroterus obtectus*,

Neuroterus saliens and *Synophrus politus* on *Quercus cerris* and *Quercus ithaburensis* from Turkey. *Ceroptres clavicornis* were recorded some *Andricus* spp (usually asexual forms) and *Callirhytis rufescens*, *Cynips* spp. and *Neuroterus* spp. (Pujade-Villar *et al*., 2003). We recorded this species from the galls of *Andricus curvator*, *Andricus lucidus*, *Callirhytis* spp. and *Callirhytis rufescens* on *Quercus frainetto* and *Quercus infectoria* from Turkey.

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