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Research article

Asian Chestnut Gall Wasp, *Dryocosmus kuriphilus*Yasumatsu, 1951 (Hemiptera: Cynipidae), First Record and Damage Ratio in Sinop Province, Black Sea Region of Turkey

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ABSTRACT

Asian chestnut gall wasp, *Dryocosmus kuriphilus*Yasumatsu (Hymenoptera, Cynipidae), is the most dangerous insect pest of the chestnut worldwide. Adults lay eggs immediately after emergence in summer. Its populations can reach outbreak levels in a couple of years after the first introduction. The galls induced by the larval feeding in the chestnut buds cause severe decrease in chestnut flower and fruit production under high population densities. The pest was first recorded in Europe in 2002 in Italy. It was first recorded in April 2014 in Yalova Province, Marmara region, north-western Turkey and it rapidly invaded both surrounding and some distant regions. During field trips in chestnut stands in 18.05.2021 in Sinop Province, Black Sea region, Turkey, we found that the chestnut stands of the province has been invaded by a large population of the Asian chestnut gall wasp. This is the first record of the pest from Sinop Province, where chestnut fruit is among the most important non-wood forest products in the region and the chestnut variety of the area has its own fame in the country. We also detected the damage ratio of the pest in the region. We found that the average number of galls per 50 cm chestnut twig was 17 in the study site, which is a higher ratio that the economic damage threshold and necessitates pest management measures to be taken as soon as possible.

Keywords: *Castanea sativa*, range expansion, new record

Araştırma makalesi

Türkiye'nin Karadeniz Bölgesi Sinop İli'nde Kestane Gal Arısı, *Dryocosmus kuriphilus* Yasumatsu, 1951 (Hemiptera: Cynipidae) İstilası

ÖZ

Kestane gal arısı, *Dryocosmus kuriphilus* Yasumatsu (Hymenoptera, Cynipidae), dünya genelinde kestanenin en önemli böcek zararlısıdır. Erginler yazın çıkışlarının ardından hızlıca yumurta bırakır. Popülasyonları yeni bir alana girişlerini takip eden birkaç yıl içerisinde epidemi seviyelerine ulaşır. Larvaların kestane tomurcukları içerisinde beslenmeleri sonucu oluşan galler, yüksek popülasyon yoğunluklarında, kestane ağacının çiçek ve meyve üretiminde ciddi düşüşe neden olur. Zararlı, Avrupa'da ilk olarak 2002 yılında İtalya'da tespit edilmiştir. Türkiye'de ise 2014 yılında Türkiye'nin kuzey batısında, Marmara Bölgesi'nin Yalova İli'nde tespit edilmiş ve hem civar bölgelere hem de bazı uzak bölgelere hızlı bir şekilde yayılmıştır. Sinop İli'nde 18.05.2021 tarihinde yapılan arazi ziyaretleri sırasında kestane gal arısının bölgeye ulaştığı ve büyük bir popülasyon oluşturduğu tespit edilmiştir. Bu makale, kestanenin en önemli odun dışı orman ürünleri arasında olduğu ve kestanesi ülke genelinde tanınırlığa sahip Sinop İli'nde kestane gal arısının ilk kaydıdır. Bu çalışmada ayrıca bölgede gal arısı kaynaklı zarar oranı da tespit edilmiştir. Çalışma sahasında kestane ağacı başına 50 cm'lik bir sürgünde bulunan gal sayısı 17 olarak bulunmuştur. Bu, ekonomik zarar eşiğinin üzerinde bir oran olup, bölgede mücadele çalışmalarının ivedilikle başlatılmasını gerektirmektdir.

Anahtar Kelimeler: *Castanea sativa*, yayılış alanı genişletme, yeni kayıt

Introduction

The Asian chestnut gall wasp, *Dryocosmus kuriphilus* Yasumatsu (Hymenoptera, Cynipidae), causes significant decrease in the density of chestnut flower and fruits (Battisti et al, 2013; EPPO, 2005), which eventually affects chestnut growers and beekeepers negatively. Being native to China, it was accidentally introduced to Italy in 2002 (Brussino et al. 2002) and to Turkey in 2014 (Çetin et al. 2014). Turkey is the genetic center of origin of *C. sativa* (Mattoni et al. 2013; Villani et al. 1994) and one of the most important chestnut producers, ranking the fourth in the world and second in Europe (50.000-70.000 x 103 kg/year) (FAO, 2002).

The Asian chestnut gall wasp spread to the entire Marmara Region, a part of the Aegean and Black Sea Region during the last seven years (İpekdal et al. 2014; Mıcık et al. 2021). We recently detected the pest in the state forests of Sinop Province, Black Sea Region, Turkey. Chestnut is an important non-wood forest products in the province. Moreover, Sinop chestnut is a variety that is country-wide known as "Erfelek kestanesi" and has a significant place in the chestnut market in Turkey. The Asian chestnut gall wasp seems to be the major threat for the local economy of the chestnut collectors in the region in the upcoming years.

Material and Methods

During regular trips in in 18.05.2021 Ayancık-Aliköy and Erfelek-Şerefiye forest villages in Sinop Province, Turkey, we detected galls on chestnut trees. We collected 10 gall samples from the site (coordinates: 41° 56’ 24.1’’ N; 34° 39’ 39.3’’ E) for the identification in the laboratory. We inspected and identified the larvae in the larval chambers of the chestnut galls under a dissecting microscope. In order to determine the damage ratio, we randomly selected 10 chestnut individuals in the study site, and we counted the number of the galls per 50 cm of randomly selected 10 chestnut twigs on each chestnut individual selected.

Results and Discussion

We identified the examined larvae in the collected galls as *Dryocosmus kuriphilus* Yasumatsu (Hymenoptera, Cynipidae). Thus, this is the first record of the pest in Sinop Province, the northernmost edge of the chestnut range in Turkey (Figure 1).

The damage ratio on the study site was 17 galls per 50 cm chestnut twig on average. This is a ratio higher than the economic threshold level (6 galls/twig) that necessitates control practices (Battisti et al. 2013).

Chestnut stands in Sinop are distributed mainly in Ayancık, Centrum, Erfelek and Türkeli districts. Chestnut covers almost 12.000 ha in the province, where the total number of chestnut individuals in Sinop was 157.350 and the total amount of the chestnut yield of the province was 3.676 tons per year, which corresponds to 5% of the total chestnut production of Turkey, according to 2019 surveys of the Turkish Chamber of the Agricultural Engineers. Chestnut honey production also constitutes an important income for the local beekeepers. Sinop chestnut honey has been registered with a geographic indication certificate in 31.12.2020 with the name SINATE. Total chestnut honey production of the province is ca. 120 tons per year. Considering the importance of the chestnut production in the province, classical biological control should be started to implement as soon as possible.

Figure 1. Sampling locality, Sinop, Turkey (above) and chestnut galls collected from the study site (below).

Conflict of Interest

No known or potential conflict of interest exist for any author.

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