

***RICANIA SHANTUNGENSIS* CHOU & LU 1977 (HEMIPTERA: FULGOROMORPHA: RICANIIDAE) A NEW INVASIVE INSECT SPECIES IN EUROPEAN TURKEY**

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ABSTRACT

As a result of human activities invasive insect species are spreading rapidly in new territories. Turkey doesn't make an exception to this process. One of the most important invasive species belongs to Ricanidae family. In Turkey there are probably two native species: *Ricania ayle* Dlabola, 1983 and *Ricania hedenborgi* Stål, 1865. *Orosanga japonica* Melichar, 1898 and *Ricania simulans* (Walker, 1851) are reported as introduced species but after recent data the record of *R. simulans* concerns *O. japonica*. This report presents a new invasive insect species for Turkey and Europe – *Ricania shantungensis* Chou & Lu 1977. In this study *Ligustrum lucidum* W.T. Aiton (Oleaceae) and *Liquidambar styraciflua* L. (Altingiaceae) were identified as new host plants.

KEYWORDS:

Alien species, invasive species, Turkey, Europe, Ricanidae, Fulgoromorpha

INTRODUCTION

As a result of human activities (cargo shipments and containers, transport of infested plant material, wood products) invasive insect species are spreading rapidly. These species compete with native insect species for habitats and food [1]. The activity of such species may lead to genetic pollution, as well as have in ecological (e.g. changing ecosystem functions), economic (e.g. decrease in agriculture and forest production) and health (e.g. Zika viruses) impact.

Invasive insect species have begun to appear frequently in Turkey in recent years (e.g. [2, 3]). One of the most important alien species is *Orosanga japonica* Melichar, 1898. It was first recorded in Turkey in Rize province in 2007 [4], and after that in Akcakoca / Duzce, in the Western Black sea region of Turkey [5]. The family Ricanidae is a large Fulgoromorpha family distributed mainly in the tropics of Eastern Hemisphere. There are more than

450 species in the family, belonging to 64 genera [6, 7]. *Ricania* Germar, 1818 is the biggest genus in the family. It contains 84 species [7] mainly distributed in the temperate zones of Afrotropical, Oriental, East Palearctic and Australasian regions.

This study indicate that a new invasive insect species, belonging to the family Ricanidae (Hemiptera: Fulgoromorpha) has been introduced in European Turkey.

MATERIALS AND METHODS

This study is based on 7 specimens (5 ♀, 2 ♂) collected in Sariyer district (Istanbul-Turkey). The specimens were collected by insect net. The dried specimen photographs are taken by Canon 70D DSLR body and Canon MP-E 65mm f2.8 1-5x Macro lens. The eggs photographs are taken by Leica EZ4D Stereo Microscope. All the measurements were carried out with Stereomicroscope Zeiss Stemi 2000. Currently the specimens are deposited at the Department of Forest Entomology and Protection (Istanbul University- Cerrahpasa) and Sofia University Zoological Collection (BFUS). The identification was performed using the original description of the species [8] and more recent literature [9, 10]. The plant identification was carried out by Dr. Hatice Yilmaz (Istanbul University-Cerrahpasa, Faculty of Forestry, Vocational School of Forestry, Ornamental Plants Cultivation Program, Istanbul, Turkey).

RESULTS AND DISCUSSION

Material examined. Turkey, Marmara Region, Istanbul, Sariyer, Camlitepe, 41°07'48.39" N, 29°01'30.77" E, 20.09.2018, 2 ♀ and eggs (on *Ligustrum lucidum* - Oleaceae), same place, 24.09.2018 1 ♂+1 ♀ and eggs (on *Liquidambar styraciflua* - Altingiaceae), 16.10.2018, 2 ♀ and eggs (on *Liquidambar styraciflua*), 1 ♂ (on *Ligustrum lucidum*) (Fig. 1).



FIGURE 1

On the left – location of collected specimens. On the right – photo of a living specimen, Turkey, Marmara Region, Istanbul, Sariyer, Camlitepe, 16.10.2018



FIGURE 2

Ricania shantungensis adult (♀). Turkey, Marmara Region, Istanbul, Sariyer, Camlitepe, 16.10.2018

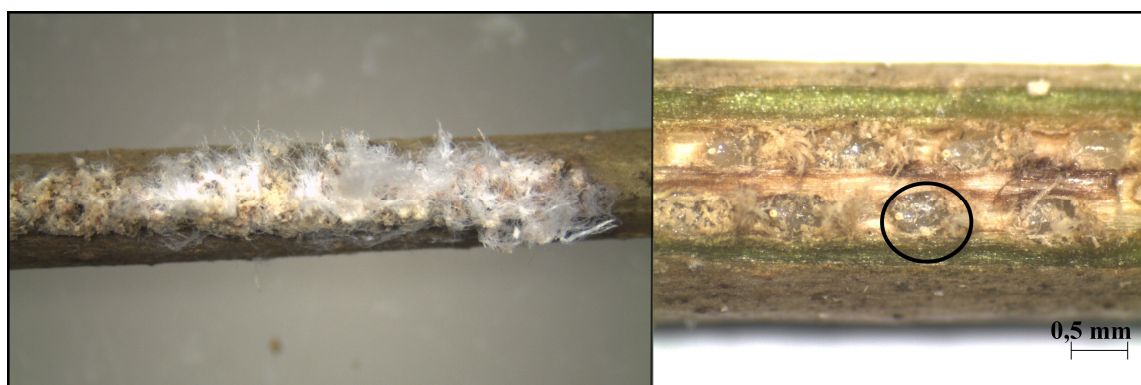


FIGURE 3

Ricania shantungensis eggs. Turkey, Marmara Region, Istanbul, Sariyer, Camlitepe, 16.10.2018

Description. Our specimens body length are male (N=2): 7.5-7.8 mm (from vertex to tip of genitalia), 14.0-14.4 mm (from vertex to tip of forewings); female (N=5) : 8.3-8.8 mm (from vertex to tip of genitalia), 15.0-15.3 mm (from vertex to tip of forewings).

General color dark brown to black. Vertex, frons, clypeus, rostrum and eyes brown to dark brown. Ocelli brown. Pronotum and mesonotum

black. Thorax black ventrally. Forewing dark brown to black with an elliptical-shaped white spot on costal margin at about two-thirds from base. Hind wing dark brown. Legs brown. Abdomen dark brown except posterior margin of each segment, which is yellow. Genital segment dark brown to black (Fig. 2) [10].

Ricania shantungensis lay eggs in zigzag rows and covers them with white wax filaments (Fig. 3).

Ricania shantungensis Chou & Lu 1977 has been described in orchards in Shantung province, China on *Diospyros* (Ebenaceae) and *Crataegus* (Rosaceae). According to the original description the external morphology of this species is very close to *Ricanula sublimata* [11]. Detailed morphological description is given from Rahman et al. [10] under the name *Pochazia shantungensis* (Chou & Lu 1977) together with the first record of the species in Korea. We did not found any formal nomenclatural act for the replacement of the species from *Ricania* to *Pochazia*, even in our opinion morphological the species should belong to the genus *Pochazia*. After recent molecular data the belonging of the species to the genus *Ricania* has been confirmed [12].

The species is polyphagous on very wide range of plants Kim et al. [13] reports about 113 species of host plants from 53 families. In this study *Ligustrum lucidum* W.T. Aiton (Oleaceae) and *Liquidambar styraciflua* L. (Altingiaceae) were identified as new host plants.

In Korea the species is considered as invasive [12] and important pest [14]. In Korea *R. shantungensis* produces two generations per year [14].

In Europe from the family Ricaniidae only *R. hedenborgi* is possibly a native species. The other two species known in Europe – *Orosanga japonica* in Bulgaria [15, 16] and *Ricania speculum* in Italy [17] – are considered introduced species.

In Turkey there are two probably native species *R. ayle* Dlabola, 1983 and *R. hedenborgi* [4]. *O. japonica* is recorded for the first time in Rize [4] under the name *Ricania japonica* and than in Duzce: Akcakoca, Turkey [5]. It was recorded after under the name *R. simulans* (Walker, 1851) in the coastal areas of Eastern Black Sea Region of Turkey [18, 19]. All the alien ricaniids in Europe are polyphagous and have a potential to be invasive pests [4, 20].

The recording of *R. shantungensis* is the first in Turkey and Europe. It is the third invasive species from the family introduced from East Asia. As a wide polyphagous species we expect that the species will expand its area in Europe and Anatolia fast in all the regions where the climate conditions allow it. This hypothesis is supported by the experience of the speed of the spreading of the previous two alien species of Ricaniidae in Europe and also some other planthoppers as the North American *Metcalfa pruinosa* (Say, 1830) (Flatidae) distributed now throughout all Southern Europe – in Italy [21,22], France [23], Slovenia [24, 25], Austria [26], Czech Republic [27], Serbia [28], Bulgaria [29], Russia (Kasnodar) [30], Romania [31, 32] and Turkey [33]. The flatid species *Acanalonia conica* (Say 1830) in Italy [34], Switzerland [35] and Romania [36].

In the future it is very important to monitor the population trends and distribution area of this species as a potential pest.

ACKNOWLEDGEMENTS

We are grateful to Dr. Adam Stroński (Museum and Institute of Zoology, Polish Academy of Sciences, Warsaw, Poland) for the provided literature and Dr. Hatice Yilmaz (Istanbul University-Cerrahpasa, Faculty of Forestry, Vocational School of Forestry, Ornamental Plants Cultivation Program, Istanbul, Turkey) for host plant identification.

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Received: 25.02.2019

Accepted: 23.09.2019

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