

# New Records of the Oak Lace Bug *Corythucha arcuata* (Say, 1832) (Hemiptera: Tingidae) in Southern Romania

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**Abstract:** The North American oak lace bug *Corythucha arcuata* (Hemiptera: Tingidae) is considered a serious pest on *Quercus* spp. Since its first arrival in northern Italy in 2000, *C. arcuata* has been still spreading in Europe and Asia. In 2015, the species was newly recorded for western Romania. Here, we report the first record of *C. arcuata* for the southern part of this country. The species was detected in the urban area of the city of Bucharest and in the area of the village of Moara Domnească, Ilfov County. From summer to autumn 2016, numerous eggs, nymphs and adults of *C. arcuata* were detected on the lower surface of the oak leaves, and typical symptoms of discolouration were observed on the upper leaf surface of the oaks *Quercus cerris* and *Q. robur*. From July to November 2016, large amounts of adults (1513 specimens) were captured on yellow sticky traps used in field surveys for early detection of invasive alien species.

**Key words:** Field survey, non-native insect species, oak lace bug

## Introduction

The oak lace bug *Corythucha arcuata* (Say, 1832) (Hemiptera: Tingidae) is native to North America, found for the first time in Europe in northern Italy in spring 2000 (BERNARDINELLI & ZANDIGIACOMO 2000). Later, the bug was reported in southern Switzerland in 2002 (FORSTER et al. 2005) and in north-western Turkey, the Asiatic part, in 2003 (MUTUN 2003). After 2010, the species was detected in Iran in 2011 (SAMIN & LINNAVUORI 2011), in Bulgaria in 2012, which was the first report from the region of the Balkan Peninsula (DOBREVA et al. 2013), then in Hungary and Croatia in 2013 (CSÓKA et al. 2013, HRAŠOVEC et al. 2013), and in Serbia in 2015 (PAP et al. 2015).

Since its first record in north-western Turkey in 2003, *C. arcuata* has spread in many provinces along the northern part of the country, which resulted in a significant damage to the oak trees (MUTUN et al. 2009). In 2016, the insect was detected in north-eastern Turkey, which actually represents the farthest

eastern point in the Palaearctic Region (ÇERÇİ & KOÇAK 2016).

Plants from the genus *Quercus* in forest, urban and rural areas are the main hosts of *C. arcuata* in the European countries and Turkey (BERNARDINELLI & ZANDIGIACOMO 2000, FORSTER et al. 2005, MUTUN et al. 2009, DOBREVA et al. 2013, HRAŠOVEC et al. 2013, PAP et al. 2015). Among them, *C. arcuata* prefers *Quercus alba* (L.), *Q. petraea* (Matt.), *Q. robur* (L.), *Q. pubescens* (Willd.), *Q. cerris* (L.), *Q. rubra* (L.), and *Q. macranthera* (Fisch. & C. A. Mey. ex Hohen.). In addition, *C. arcuata* was found on *Rubus idaeus* (L.), *R. ulmifolius* (Schott.), *Rubus* spp., *Castanea sativa* (Mill.), *Rosa canina* (L.), *Crataegus* spp., and *Platanus orientalis* (L.) (BERNARDINELLI 2006, KUCUKBASMACI 2014). Trees of *Malus sylvestris* (L.) and *Ulmus minor* (Mill.) were damaged by *C. arcuata* in Croatia (HRAŠOVEC et al. 2013).

In Romania, *C. arcuata* was first reported on oak trees from Macea in the western part of the country

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in 2015 (DON et al. 2016). In the middle of August 2016, a resident in the northern area of Bucharest detected leaves of Turkey oak (*Quercus cerris* L.) with symptoms of white spots discolouration, visible on the upper side and sent them to the Research and Development Institute for Plant Protection for examination. Therefore, the aim of our study was to collect new data about the distribution of *C. arcuata* in Romania.

## Materials and Methods

The Turkey oak tree reported as affected by discoloured white spots, visible on the upper side of the leaves, was visited for observation. It was a centuries-old oak tree stated as an object of natural national heritage, and located in a residence in northern Bucharest (N 44°29'38"; E 26°04'7").

In addition, to confirm the presence of *C. arcuata* and study its population density in the area of Bucharest, we performed observations on *Quercus* plants in the field. Fifteen yellow sticky traps, 2-4 traps per sampling site, were settled as follows: three traps in an apple orchard (*Malus domestica* Borkh.), two traps in a lot of Chinese date trees (*Ziziphus jujube* Mill.), four traps on hawthorn trees (*Crataegus monogina* Jacq.), and two traps in a vine lot, all in northern Bucharest (N 44°30'19"; E 26°04'05"), as well as four traps on a walnut orchard (*Juglans regia* L.) in the Experimental Farm 'Moara Domneasca' of Agriculture University, Ilfov County, 15 km away from Bucharest (N 44°30'12"; E 26°15'49"). The yellow sticky traps were checked regularly for the presence of *C. arcuata* specimens.

The adult insects collected were viewed under an Olympus SZ 61 stereomicroscope and identified after examining their morphological characters and comparing them to *Corythucha* sp. keys (DREW & ARNOLD 1977, DOBREVA et al. 2013, HRAŠOVEC et al. 2013).

## Results and Discussion

*Corythucha arcuata* was recorded in two locations in the southern part of Romania, the city of Bucharest and in the area of the village of Moara Domneasca, Ilfov County, in August 2016. The results in our study represent the second piece of evidence that this species occurs in this country, the first being from western Romania (DON et al. 2016). This is also the first record of *C. arcuata* for the southern part of the country.

On the affected Turkey oak tree in the backyard in northern Bucharest, a great number of eggs, nymphs and adults of *C. arcuata* was observed,

along with numerous nymphal exuviae, clusters of hatched eggs and black spots of excrements on the undersides of the leaves. *C. arcuata* was also detected on pedunculate oak seedlings and other oak trees from street alignments in the same area, with typical symptoms and large amounts of all stages of the pest and their excrements.

A total of 1513 *C. arcuata* adults were captured by all the fifteen yellow sticky traps, sampled from July to November 2016. A distinct peak in the adults' number was observed during the second half of August, when their maximum number was 481. The presence of adults on the traps could be explained by the fact that during the flight of the insect in search of the oak plants, they were attracted by the yellow colour of the sticky traps. This colour has been proved to play an important role in orienting insects, such as white fly, mealy bugs, aphids, psyllids, and leafhoppers to locate their host plants (MAZZONI et al. 2011, SATHE et al. 2015). These results suggest the possibility of using yellow sticky traps as means of sampling in order to detect and monitor the flight activity of *C. arcuata*.

The adults of *C. arcuata* are not good flyers because of that the natural spreading of the bug is slow (KUCUKBASMACI 2014). All stages of the bug (eggs and larvae on foliage and adults under the bark) can travel passively as stowaways on forest planting material or wooden material from their host plants, transported with various vehicles to long-distance. Human mediated dispersal, but also by wind-drift are reported as main pathways for spreading of *C. arcuata* (RABITSCH 2008, ROQUES & LEES 2010, KUCUKBASMACI 2014).

According to DOBREVA et al. (2013), *C. arcuata* entered Bulgaria (Plovdiv and Simeonovgrad), from Turkey, where the species has been detected since 2003 (MUTUN 2003) and has rapidly shown a fulminate spreading in that country (MUTUN et al. 2009). Intensification of the road traffic is considered the main migration pathway of the bug towards Bulgaria. Taking into account this scenario, we must accept that *C. arcuata* has migrated to the southern part of Romania through the southern border of the country, flying from Bulgaria. This assumption could also be supported by the fact that many international road corridors, on which the trade is operated between the Balkan region and the countries from Western Europe, go through the common border between Bulgaria and Romania.

From the practical and research perspective regarding *C. arcuata* in Romania, further research is required in order to evaluate the biology, ecology and measures for effective control of this pest,

as well as its spreading rate and habitat in the country.

## References

- BERNARDINELLI I. & ZANDIGIACOMO P. 2000. First record of the oak lace bug *Corythucha arcuata* (Say) (Heteroptera, Tingidae) in Europe. *Informatore Fitopatologico* 50 (12): 47-49.
- BERNARDINELLI I. 2006. Potential host plants of *Corythucha arcuata* (Het.,Tingidae) in Europe: a laboratory study. *Journal of Applied Entomology* 130: 480-484.
- ÇERÇİ B. & KOÇAK Ö. 2016. Contribution to the knowledge of Heteroptera (Hemiptera) fauna of Turkey. *Journal of Insect Biodiversity* 4 (15): 1-18.
- CSÓKA G., HIRKA A. & SOMLYAI M. 2013. First record of oak lace bug (*Corythucha arcuata* Say, 1832) in Hungary. *Növényvédelem* 49 (7): 293-296.
- DOBREVA M., SIMOV N., GEORGIEV G., MIRCHEV P. & GEORGIEVA M. 2013. First record of *Corythucha arcuata* (Say) (Heteroptera: Tingidae) on the Balkan Peninsula. *Acta Zoologica Bulgarica* 65: 409-412.
- DON I., DON C. D., SASU L. R., VIDREAN D. & BRAD M. L. 2016. Insect pests on the trees and shrubs from the Macea Botanical garden. *Studia Universitatis 'Vasile Goldiș' Arad Seria Științe Inginerești și Agro-Turism* 11 (2): 23-28.
- DREW W. A. & ARNOLD D. C. 1977. Tingoidae of Oklahoma (Hemiptera). *Proceedings of the Oklahoma Academy of Science* 57: 29-31.
- FORSTER B., GIACALONE I., MORETTI M., DIOLI P. & WERMELINGER B. 2005. Die amerikanische Eichennetzwanze *Corythucha arcuata* (Say) (Heteroptera: Tingidae) hat die Südschweiz erreicht. *Mitteilungen der Schweizerischen Entomologischen Gesellschaft* 78: 317-323.
- HRAŠOVEC B., POSARIĆ D., LUKIĆ I. & PERNEK M. 2013. First record of oak lace bug (*Corythucha arcuata*) in Croatia. *Šumarski list* 137 (9-10): 499-503.
- KUCUKBASMACI I. 2014. Two new invasive species recorded in Kastamonu (Turkey): Oak lace bug [*Corythucha arcuata* (Say, 1832)] and sycamore lace bug [*Corythucha ciliata* (Say, 1832)] (Heteroptera: Tingidae). *Journal of Entomology and Nematology* 6 (8): 104-111.
- MAZZONI V., TRONA F., IORIATTI C., LUCCHI A., ERIKSSON A. & ANFORA G. 2011. Attractiveness of different colours to *Scaphoideus titanus* Ball (Hemiptera: Cicadellidae) adults. *OBC/WPRS Bulletin* 67: 281-284.
- MUTUN S. 2003. First report of the oak lace bug, *Corythucha arcuata* (Say, 1832) (Heteroptera: Tingidae), from Bolu, Turkey. *Israel Journal of Zoology* 49 (4): 323-324.
- MUTUN S., CEYHAN Z. & SÖZEN C. 2009. Invasion by the oak lace bug, *Corythucha arcuata* (Say) (Heteroptera: Tingidae), in Turkey. *Turkish Journal of Zoology* 33 (3): 263-268.
- PAP P., DREKIĆ M., POLJAKOVIĆ-PAJNIK L., MARKOVIĆ M. & VASIĆ V. 2015. Forest health monitoring in Vojvodina in 2015. *Topola* 195/196: 117-133.
- RABITSCH W. 2008. Alien True Bugs of Europe (Insecta: Hemiptera: Heteroptera). *Zootaxa* 1827: 1-44.
- ROQUES A. & LEES D. 2010. Factsheets for 80 representative alien species. Chapter 14. In: ROQUES A., KENIS M., LEES D., LOPEZ-VAAMONDE C., RABITSCH W., RASPLUS J.-Y. & ROY D. (Eds.): *Alien terrestrial arthropods of Europe*. *BioRisk* 4 (2). Sofia: Pensoft Publishers, pp. 855-1021. doi:10.3897/biorisk.4.69
- SAMIN N. & LINNAVUORI R. E. 2011. A contribution to the Tingidae (Heteroptera) from north and northwestern Iran. *Entomofauna* 32 (25): 373-380.
- SATHE T. V., GOPHANE A. & SHENDAGE N. 2015. Colour attractivity and occurrence of some cell sap sucking pests on crop plants. *Biolife* 3 (2): 540-546.

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