Corythucha ciliata (Say, 1832) (Hemiptera: Tingidae) – Second Record for the Lace Bug Fauna of Romania

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Abstract. In the present study a new Romanian record is given for Corythucha ciliata (Say, 1832) a well-known alien pest species of Platanus spp. Although this species is very common in Europe, it has only once been recorded in Romania until now, in Craiova. Alongside the biology and economic importance of C. ciliata, the damage it produces and pest control methods are emphasized. Keywords: alien species, lace bugs, Corythucha ciliata, Romania

Rezumat. În studiul de față se prezintă o nouă semnalare pentru specia Corythucha ciliata (Say, 1832) din România, dăunător al speciilor de Platanus spp. Deși larg răspândită în Europa, în România specia a fost semnalată doar la Craiova. Sunt prezentate de asemenea date privind biologia, ecologia și importanța economică a speciei C. ciliata, precum și impactul produs și metodele de combatere. Cuvinte cheie: specii invazive, Tingidae, Corythucha ciliata, România

Introduction

Tingidae are members of a rather large family, comprising about 2100 species and 250 genera (Bisson et al. 2003; Henry, 2009). 171 of these species are native to Europe and only six of them are alien (Péricart, Golub, 1996; Streito et al. 2010). The adults, commonly known as lace bugs, due to the lace-like appearance of the dorsum, are small-sized (less than 8 mm in body size), phytophagous and host specific insects that can be identified by examining the head, pronotum and hemelytra (Bisson et al. 2003). One useful distinguishing character is often the host plant (Bisson et al. 2003).

The damage they cause resembles that of certain leafhoppers or mites but it can positively be identified by brown or black patches of excrements on the underside of leaves (Bisson et al. 2003; Rabitsch, 2010). This particular aspect and that of control measures will be discussed further in the article with more detailed information being provided on Corythucha ciliata (Say, 1832).

Corythucha ciliata is one of the six alien species and probably one of the most widespread of alien Heteroptera in Europe (Rabitsch, 2008). It was first described by Say and it is native to the North American Rocky Mountains. The species was introduced in Europe in the 1960s supposedly by ships (Őszi et al., 2005), the first record dating back to 1964 when it was found in Padua (Northern Italy) (Rabitsch, 2008).

Records of Corythucha ciliata in the world

The species quickly spread across Central and Southern Europe with records in Croatia (1970), Slovenia (1972), Serbia (1973), France (1974) - including Corsica, Switzerland (1975), Hungary (1976), Spain (1978), Austria (1982), and Germany (1983), Bulgaria (1987), Greece (1988), Southern Italy (Sicily), Sardinia (Rabitsch, 2008), C. ciliata has also been recorded in Portugal (Grosso-Silva, Aguiar, 2007; Kment, 2007), in the Czech Republic (1995), in Slovakia (1997) (Stehlík, 1997), in Russia (Voigt, 2001), Montenegro (Protić, 1998) and more recently in the United Kingdom (2005), (Malumphy et al. 2006), in Belgium (2006) (Aukema et al. 2007), in the Netherlands (Aukema, Hermes, 2009) and in Poland (Lis, 2009). Records of the species have also been mentioned from Turkey (Mutun, 2009), Eastern Asia, China (Ju et al. 2009), Japan (Tokihiro et al. 2003), Chile (Prado, 1990) and Australia (Domiñak et al. 2008).

The purpose of this study is of course to mention the new record and to provide detailed information based on the study of available literature regarding the biology and economic importance of C. ciliata, the damage it produces and pest control methods.
Corythucha ciliata in Romania

Surprisingly or not, only one record of this lace bug is known so far in Romania. The first record dates to 1990 when Kis collected it in Craiova (Dolj County). It hasn’t been recorded since.

On the 27th of November 2010, we found it in large numbers wintering under the bark of Platanus sp. and other trees in a park in Sibiu (Sibiu County). It was later collected and now deposited at the Natural History Museum Collections of Sibiu.

The species is expected to be widespread in Romania due its host preference for Platanus spp., found in many city parks.

On the basis of our results, two localities are now known for the sycamore lace bug distribution in Romania (Fig. 1).

Biology and ecology

Corythucha ciliata (Fig. 2) feeds on the underside of leaves causing desiccation of tissue, first near the veins and subsequently affecting the entire leaf, which may drop prematurely. They produce droplets of liquid frass, which dry out as black spots on the lower surface of the leaves. Mating pairs of sycamore lace bugs initiate colonies by laying eggs along the leaf veins. A single female can lay up to 350 eggs. There are five immature instars. Nymphs stay close together at first, only moving to new leaves after they reach the fourth instar. First generation adults appear in June and second generation appears around July/August.

They overwinter as adults under loose bark, leaf litter and crevices, and tolerate extreme temperatures as low as -24°C. As the average daily temperature rises above 8 °C in spring, the adults emerge and start wandering. The wandering can strictly be limited by wet weather. The first eggs are laid around the beginning of May; the number of eggs/female is 80–160. The swarming starts about at the end of May, the embryonic state of developing lasts three weeks, or so. Around three weeks after the larvae have developed the second egg-laying-period starts mainly in the second half of July with a number of 80–160 eggs/female. Approximately in the middle of September, the adults of the second generation emerge, and they start wintering at the end of October. The wings of the adults are very delicate, and they rarely fly very far; however, supported by wind they can be blown over many kilometers. Human activity is thought to be the main cause of its spread over long distances (Halbert, Meeker 1998; Öszi et al., 2005; Malumphy et al., 2006).

Economic importance

The main host plant of C. ciliata is the American sycamore tree, Platanus occidentalis Linnaeus (family). Other Platanus spp. host species listed in literature are P. orientalis and the hybrid species P. acerifolia. Furthermore, C. ciliata has also been found on Broussonetia papyrifera (L.), Moraceae, Carya ovata (Mill.), Juglandaceae, Chamaedaphne sp., Ericaceae and Fraxinus sp., Oleaceae (Halbert, Meeker, 1998).

Severe infestations are often associated with ornamental plane trees found in parks and gardens rather than with those of natural settings; they are also known to invade homes in large numbers (Malumphy et al. 2006) and to be passively spread by wind-drift or stuck to clothes, cars etc. (Rabitsch, 2008). It has been noted that they can spread on a distance of 100 km/year (Rabitsch, 2008).

The bug feeds on the underside of the plant’s leaves sucking the cytoplasm, mainly the chloroplasts which may ultimately result in the death of the entire tree due to lack of nutrients (Öszi et al. 2005). On the other hand, Halbert, Meeker (1998) conclude that “despite the spectacular appearance of severe damage, the practical impact of occasional late-season defoliation on otherwise healthy sycamore trees is principally only aesthetic in nature”. Its presence on the lower surface is confirmed by black spots which are actually dried out frass. However, the damage is more apparent on the upper surface, with the leaves exhibiting a white speckle which also leads to premature fall (Malumphy et al. 2006).

The same paper suggests that greater damage is associated with drier weather, that severe infestations may end up with trees defoliating in late summer and that “several consecutive years of severe lace bug damage combined with other stress factors, may kill the trees”. Furthermore, certain types of fungi (e.g., Apiognomonia platani, Val saccae, Ceratocystis fimbrirata f. platani Ceratocystidaceae) and plant pathogens are associated with the presence of C. ciliata which provides the perfect support for infections (Neal, Schaefer, 2000; Rabitsch, 2008).

Pest Control

There is a wide variety of pest control methods listed in literature. Some studies mention the use of insecticides such as petroleum, potassium phosphate, products that contain bifenthrin, deltamethrin (both pyrethroids), plant extracts that coat the insects or just plain water, sprayed to dislodge the larvae as soon as they hatch.
Corythuca ciliata (Say, 1832) (Hemiptera: Tingidae) - second record for the lace bug fauna of Romania

(Malumphy et al. 2006) as well as diverse ways of application: foliar sprays, trunk injections, soil treatments (Halbert, Meeker, 1998). However, C. ciliata is known to tolerate insecticides that contain phosphorus acid ester (Őszí et al. 2005). According to Őszí et al. (2005) a very appropriate method is the use of pyrethroids, which would prove both efficient and harmless for the plant and for the environment.

Other methods are using tree bindings made of jute treating the underside of the bark which is not a harmful process but is hardly efficient or injecting the insecticide straight into the conducting tissue for it to be later sucked by the insect (Őszí et al. 2005). However, this has proven inappropriate for the trees because it facilitates the infection with other pests (Tremblay, 1985).

Methods of biocontrol are not to be ignored. Corythucha ciliata has several known natural enemies: certain types of true bugs, spiders, crickets and locusts, viruses, nematodes and spore plants (Sidor, 1985) and deuteromycete fungi species (e.g., Beauveria bassiana, Clavicipitaceae, Verticillium lecanii Cordycipitaceae, Paecilomyces farinosus, Trichocomaceae) that ravage the populations of wintering adults (Balarin, Maceljski, 1986).

However, some studies have pointed out (Tavella, Arzone, 1987) that although the predation of C. ciliata is effective in laboratory conditions, it does not inhibit its reproduction in natural circumstances (Őszí et al. 2005).

Conclusions
In conclusion, one can only suppose that this potentially dangerous alien lace bug is actually widespread in Romania.

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REFERENCES


Sidor 1985 Sidor Ćiril, *Micro-organisms pathogenic for Insects till now found in Corythuca*
**LIST OF ILLUSTRATIONS**

**Fig. 1.** Currently known distribution of *Corythucha ciliata* in Romania

**Fig. 2.** *Corythucha ciliata* (Say, 1832) (Photo by kind permission of © Stanislav Krejcik, www.meloidae.com)

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**LISTA ILUSTRĂȚIILOR**

**Fig. 1.** Distribuția cunoscută a speciei *Corythucha ciliata* în România

**Fig. 2.** *Corythucha ciliata* (Say, 1832) (Fotografia cu permisiunea © Stanislav Krejcik, www.meloidae.com)
Fig. 1. Currently known distribution of *Corythucha ciliata* in Romania

Fig. 2. *Corythucha ciliata* (Say, 1832) (Photo by kind permission of © Stanislav Krejcik, [www.meloidae.com](http://www.meloidae.com))