FIRST RECORDS OF CRAPE MYRTLE APHID (*Sarucallis kahawaluokalani* [Kirkaldy 1906]) AND TULIP-TREE APHID (*Illinoia liriodendri* [Monell 1879]) IN CROATIA

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ABSTRACT

Crape myrtle aphid (*Sarucallis kahawaluokalani*) and tulip-tree aphid (*Illinoia liriodendri*) are new insect species in Croatia. Crape myrtle aphid originates from Southeast Asia but has spread throughout the world. It feeds on ornamental plants from *Lagerstroemia* and *Lawsonia* genera. It causes damage on ornamentals via excretion of honeydew accompanied by sooty mould that decreases ornamental value of the plants. The aphid is recognizable by black markings on the body and wings of an adult aphid and black tubercles on the back. Crape myrtle aphid was first recorded in Croatia in July 2014 on *Lagerstroemia indica* (L.) on the island of Krk. Later investigation showed that it has spread throughout the entire Croatian coast and has since been found in Poreč, Rovinj, Šibenik and Dubrovnik. Tulip-tree aphid is a Nearctic species that originates from North America. It is monoecious holocyclic species that feeds on *Liriodendron tulipifera* (L.). It has been spreading across Europe and Asia with its ornamental host plants and has so far been introduced in the UK, France, Germany, Luxembourg, Italy, Slovenia, Hungary and Greece. The aphid excretes considerable quantities of honeydew accompanied by sooty mould but heavy infestation can cause premature leaves' discoloration and defoliation. Tulip-tree aphid was first recorded in Croatia in August 2014 in Poreč. No further investigation of this aphid was carried out so its real distribution in Croatia is still unknown. Since both species are alien to Europe, further investigations are needed in order to establish their current distribution, possibilities of spread and possibilities of their domestication in Croatian climate.

Key words: first record, *Sarucallis kahawaluokalani*, *Illinoia liriodendri*, Croatia

1 INTRODUCTION

Crape myrtle aphid (*S. kahawaluokalani*) is an alien aphid species originating from Southeast Asia. With exceptions of henna *Lawsonia inermis* (L.) and pomegranate *Punica granatum* (L.) it is host specific, feeding on *Lagerstroemia* (L.) species (Herbert & Mizell, 2008). Crape myrtle *Lagerstroemia indica* (L.) is an ornamental plant originating from Asia that has been introduced worldwide for ornamental purposes. Very few foliar pests of economic importance attack crape myrtle with *S. kahawaluokalani* being one of them (Mizell *et al*., 2002). *S. kahawaluokalani* was first described from specimens collected in Hawaii by Kirkland (Herbert & Mizell, 2006). In Palaearctic region *S. kahawaluokalani* was registered for the first

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time in Italy in 1984 (Patti, 1984), and today its presence is known from France, Germany, Spain, Greece (Kondo & Cortes, 2014), Slovenia (Seljak, 2013) and Croatia.
Tulip-tree aphid (*I. liriodendri*) is an alien aphid species originating from North America. The species feeds on tulip tree *Liriodendron tulipifera* (L.) and has been spreading across Europe and Asia through international trade of its ornamental host plants. It was first identified in San Jose, California in 1974. In Europe it was first registered in France in 1998 (Rabasse *et al*., 2005) and has since been introduced in the UK, Germany, Slovenia (EPPO, 2007), Italy (Limonta 2001), Hungary, Luxembourg and Greece (Boszik, 2012). The species has also been found in Japan in 1999 (Sugitomo, 1999) and South Korea in 2008 (Kim *et al*., 2011).

2 MATERIALS AND METHODS

Faunistic investigations aimed at these aphid species were carried out in 2014 in Istarska, Primorsko-goranska, Šibensko-kninska and Dubrovačko-neretvanska county of Croatia. *S. kahawaluokalani* and *I. liriodendri* were found during inspections in nurseries, garden centres and public greenery along the Croatian coast. Potential host plants were surveyed visually for the presence of immature or adult stages with the help of a magnifying lens of 10x magnification. Host plant material infested with aphids (leaves and stems) was collected and stored in plastic bags, each sample labelled with collection data (locality details, host plant, any damage symptoms, collectors name, samples number, date). Characteristics of collected specimens were observed under the dissecting stereo microscope. Aphids were subsequently slide mounted according to methods of Blackman & Eastop (2000) and microscopic identification was made on the basis of morphological characteristics of adult females according to key by Blackman & Eastop (1994).

3 RESULTS AND DISCUSSION

S. kahawaluokalani was first recorded in Croatia in July 2014 on *Lagerstroemia indica* (L.) in one garden centre in Malinska (45°7’30’’N, 14°31’43’’E; UTM 33 T VK 6397 presented on Figure 1) on the island of Krk. Later investigations showed that the aphid has spread throughout the entire Croatian coast and has since been found in Poreč (45°13’37’’N, 13°35’41’’E; UTM 33 T UL 9009 presented on Figure 1), Rovinj (45°4’52’’N, 13°38’19’’E; UTM 33 T UK 9393 presented on Figure 1), Šibenik (43°44’6’’N, 15°53’42’’E; UTM 33 T WJ 7343 presented on Figure 1) and Dubrovnik (42°39’2’’N, 18°5’39’’E; UTM 34 T BN 6126 presented on Figure 1). Dates of each record of *S. kahawaluokalani* along with finding sites are presented in Table 1.
Colonies of *S. kahawaluokalani* found on *Lagerstroemia indica* were composed of nymphs and winged females. According to Herbert & Mizell (2008), nymphs of *S. kahawaluokalani* are yellow in colour with black, hair-like projections protruding from their abdomen. Adults are yellow, with black spots on body and wings, and have two large black tubercles that project from their dorsum. Alatae are broad-bodied, pale yellow or yellow-green. Many aphids produce winged adults for dispersal, but usually do so in response to overcrowding of the host plant or a sudden drop in host plant quality. Unlike the majority of other aphids, adults of *S. kahawaluokalani* are, except for oviparae, winged and capable of dispersing. *S. kahawaluokalani* produces honeydew that promotes the growth of black sooty mould from the genus *Capnodium* that can turn the entire plant an unsightly black colour, detracting from the visual aesthetic. *S. kahawaluokalani* are attacked by a variety of insect predators, but are not known to harbour any parasitoids. Lacewings (Chrysopidae), flower flies (Syrphidae), lady beetles (Coccinelidae) and other general predators feed on *S. kahawaluokalani*.

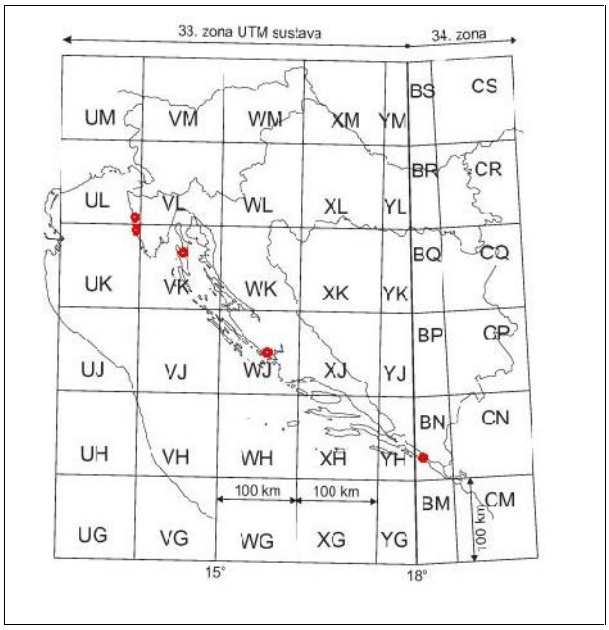

Figure 1: UTM grid of Republic of Croatia and finding places of *S. kahawaluokalani*.

Table 1: Locations and dates for each record of *S. kahawaluokalani* in 2014.

Species	Plant family	Host plant	Locality	Date
Sarucallis kahawaluokalani (Kirkaldy, 1906)	Lythracae	*Lagerstroemia indica* L.	Malinska-Krk	11.7.2014.
			Poreč	22.8.2014.
			Rovinj	3.10.2014.
			Šibenik	20.06.2014.
			Dubrovnik	30.10.2014.

I. liriodendri was first recorded in Croatia in August 2014 on *Liriodendron tulipifera* (L.) in Poreč (45°13’37’’N, 13°35’41’’E; UTM 33 T UL 9009 presented on Figure 2). Further investigation of this aphid is required in order to establish its real distribution in Croatia. Date of the record is presented in Table 2.

According to Van Driesche *et. al*. (2012), *I. liriodendri* is a relatively large aphid (1.7-2.0 mm), spindle-shaped, pale green and lightly dusted with wax. Apterae are spindle-shaped, with black antennae and siphunculi, except at bases. Legs are pale green except for black tibial apices and tarsi. A red colour form also occurs. The aphid excretes considerable quantities of honeydew accompanied by sooty mould but heavy infestation can cause premature leaves’ discoloration and defoliation. Among the natural enemies of *I. liriodendri* are various species of parasitic wasps, lacewings (Chrysopidae) and lady beetles (Coccinelidae).

S. kahawaluokalani and *I. liriodendri* do not cause economic damage to ornamental plants that serve as their hosts but decrease their ornamental value through excretion of honeydew and subsequent occurrence of sooty mould.

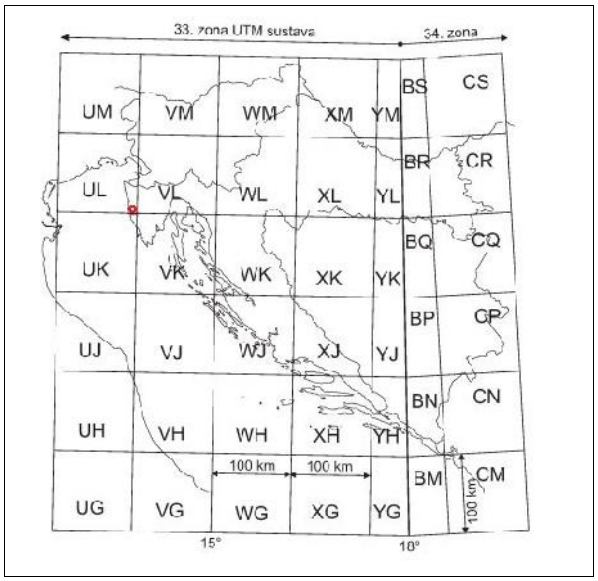

Figure 2: UTM grid of Republic of Croatia and finding places of *I. liriodendri.*

Table 2: Location and date of the record of *I. liriodendri* in 2014

Species	Plant family	Host plant	Locality	Date
Illinoia liriodendri (Monell 1879)	Magnoliaceae	*Liriodendron tulipifera* (L.)	Poreč	22.8.2014.

4 CONCLUSIONS

S. kahawaluokalani and *I. liriodendri* are new insect species for Croatia recorded for the first time in 2014. Both species are alien to Europe. They decrease ornamental value of their host plants through excretion of honeydew and subsequent occurrence of sooty mould. Increase in international trade of commodities as well as constant and ever increasing climate change influence the rate and numbers of introductions of alien species. Since both aphid species are alien to Europe, further investigations are needed in order to establish their current distribution, possibilities of spread and possibilities of their domestication in Croatian climate.

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