

***Ceroplastes japonicus* (Green) (Hemiptera: Coccoidea: Coccidae) AS NEW PEST IN CROATIA AND ITS DISTRIBUTION**

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ABSTRACT

Ceroplastes japonicus (Green) is a new insect species in Croatia. Identification of *C. japonicus* was confirmed for the first time in 2006., but plant material for this identification was collected in 2005. which was slide mounted. First record of *C. japonicus* was in Novigrad in Istria on *Laurus nobilis*, but later we identified species at many other finding places in Istria on many different hosts. We noticed mass outbreaks of *C. japonicus* in 2005. and 2006. During monitoring in 2005. and 2006. this species was found only in Istria, but nowhere else. Along the rest of Adriatic coast, we recorded mass outbreak of species *Ceroplastes rusci* which is present in Croatia for a long time. *C. japonicus* was for a long time misidentified and confused with *C. rusci*. Goal of our investigation was to distinguish this two species, make a list of host plants and a map of its distribution in Republic of Croatia.

IZVLEČEK

***Ceroplastes japonicus* (Green) (Hemiptera: Coccoidea: Coccidae) - NOV ŠKODLJIVEC NA HRVAŠKEM IN NJEGOVA RAZŠIRJENOST**

Ceroplastes japonicus (Green) je nova žuželčja vrsta na Hrvaškem. Prvič je bila ugotovljena leta 2006 v Novigradu v Istri na *Laurus nobilis*. Pozneje so jo našli v številnih krajih v Istri (Bašanija, Buje, Kaštel, Škudelin, Poreč, Brtonigla, Savudrija in Opatija) na več različnih gostiteljih. Med monitoringom v letih 2005 in 2006 je bil torej ugotovljen množičen izbruh le v Istri in vzdolž jadranske obale (od otoka Paga do Dubrovnika, vključno z otokoma Brač in Šolta). Ta vrsta pa je znana na Hrvaškem že dolgo časa. Vrsta *C. japonicus* je bila dolgo zamenjevana z vrsto *C. rusci*. Namen naše raziskave je bil primerjati ti dve vrsti, pripraviti seznam njunih gostiteljev in karto njune razširjenosti na Hrvaškem.

1 INTRODUCTION

C. japonicus is an oriental species (Japan, China and Korea). In the European region it is present in France, Italy, Slovenia, United Kingdom and now Croatia. It was recorded in Russia as well. It is not a selective feeder; it reportedly feeds on over 100 plant hosts in 27 families.

C. japonicus is characteristically hemispherical in shape and completely covered by thick layer of oily wax as other specimens of this genus. Wax is white to greyish colour, very often covered with moulds which is colonized on honeydew produced by the feeding of scales. Colour of the female body under the wax layer is mostly orange.

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It has one generation per year and overwinters as adult females. Life cycle depends on host plant. In general we can say that *C. japonicus* hatches eggs around the middle of May and we can find 1st instars from the middle of June, 2nd instars from the end of July and 3rd instars from the middle of August. From the middle of September we can find adult females (Jančar, Seljak & Žežlina, 1999). In a field is hard to distinguish nymphs of *C. japonicus* from nymphs of *C. rusci*.

2 MATERIALS AND METHODS

In 2005. we started with monitoring of species from genus *Ceroplastes* in open field in all 21 counties of Croatia. We didn't include greenhouses. We enclosed potential host plants of species from genus *Ceroplastes* in all counties which were involved in the program of monitoring.

Surveys of scale insects in general, which include species from genus *Ceroplastes*, have to rely on visual inspections of potentially infested plants. We are emphasizing that no alternative tools (e. g. chemical or visual attractants) are available to assist with survey efforts. As a result, surveys for this insects have likely to involve considerable time and labour. If only a limited effort can be expended, chances of finding low densities are poor. Identification of the most of the scale insects should be done on the base of taxonomic characteristics of adult female, which shouldn't be too old. That presents additional aggravating circumstances, because you have to find and collect adult female just at the right time. Otherwise you can't make proper identification of the species.

Survey was carried out by following methods:

2.1. Visually inspection of potentially infested plant material with the help of magnification (10x magnification). Host plant were identified according key of Domac (1973., 1994.).

2.2. Sampling of host plant material infested with scale insects (leaves and stems) in plastic bags and labeling clearly and the collection data for each was noted (data about country, locality details, host plant, any damage symptoms, collectors name, samples number, and date). One sample consists of 10 infested leaves or 1 infested 15 cm stem.

2.3. Slide mounting was carried out according to methods of Gill (1988); Kosztarab & Kozar (1988); Schmidt (1970) and Watson & Chandler (1999).

2.4. Microscopic identification on the base of morphological characteristics according to keys by Pellizzari & Camporese (1994); Camporese & Pellizzari (1994) and Tang (1986).

2.5. Microscopic slide labeling with all data (data about country, locality details, host plant, collectors name, date and identifier name).

3 RESULTS AND DISCUSSION

During the survey we conducted 256 visual inspections of potential host plants on 61 localities, collected 96 samples of host plant material, slide mounted 82 specimens, identified 82 specimens and labeled 82 microscopic slides. *C. japonicus* was identified on 12 different hosts and 11 different localities and *C. rusci* was identified on 4 different host plants and 10 localities (Table 1).

Results of survey showed that main area of distribution of *C. japonicus* is Istria and main area of distribution of *C. rusci* is Dalmatia. *C. japonicus* hadn't been found anywhere else except Istria, but we found *C. rusci* on island Vanga-part of Brijuni islands in Istria. Distribution of *C. japonicus* and *C. rusci* is showed on figure 1.

Table 1. Recorded host plants, family of host plants, localities and years of findings of *C. japonicus* and *C. rusci* during two years period (2005. and 2006.)

	<i>C. japonicus</i>	<i>C. rusci</i>
<i>Host plants, localities and year of finding</i>	<i>Acer pseudoplatanus</i> L. (Aceraceae) (Buje, 2006.)	<i>Citrus limonium</i> L. (Rutaceae) (Zaklopatica-Lastovo, 2005.)
	<i>Aucuba japonica</i> Thunb. (Aucubaceae) (Volovsko, 2006.; Opatija, 2006.)	<i>Ficus carica</i> L. (Moraceae) (Orašac, 2005., 2006.; Zaklopatica-Lastovo, 2005., Vir, 2006.; Supetar-Brač, 2006.; Vanga-Brijuni, 2006.; Nečujam-Šolta, 2006.; P.Miletići, 2006.; Varsan-Pag, 2006.; Lun, 2006.)
	<i>Citrus limonium</i> L. (Rutaceae) (Bužinija, 2006.; Novigrad, 2006.)	<i>Myrtus communis</i> , L. (Myrtaceae) (Zaklopatica-Lastovo, 2005.)
	<i>Citrus reticulata</i> L. (Rutaceae) (Novigrad, 2005., 2006.)	<i>Pistacia lentiscus</i> L. (Anacardiaceae) (Murter, 2006.; Polače-Mljet, 2006.)
	<i>Diospyros kaki</i> L. (Ebenaceae) (Škudelin, 2006.; Salvela, 2006.; Bašanija, 2006.)	
	<i>Eriobotrya japonica</i> Thunb. (Rosaceae) (Novigrad, 2005.; Škudelin, 2006.; Umag, 2006.; Bašanija, 2006.)	
	<i>Euonymus japonicus</i> Thunb.(Celastraceae) (Novigrad, 2006.)	
	<i>Hedera helix</i> L. (Araliaceae) (Kaštel., 2006.; Buje, 2006.)	
	<i>Laurus nobilis</i> L., (Lauraceae) (Novigrad, 2005.; Opatija, 2006.; Ičići, 2006.; Škudelin, 2006.; Buje, 2006.; Bašanija, 2006.)	
	<i>Magnolia grandiflora</i> L., (Magnoliaceae) (Opatija, 2005.)	
	<i>Malus domestica</i> Borkh. (Rosaceae) (Škudelin, 2006.)	
	<i>Pyrus communis</i> L. (Rosaceae) (Novigrad, 2006.; Škudelin, 2006.)	
TOTAL	12 hosts 9 families of host plants 11 finding places	4 host plants 4 families of host plants 10 finding places



Figure 1: Distribution of *C. japonicus* and *C. rusci* in Croatia

4 CONCLUSIONS

C. japonicus is a new insect species in Croatia, noticed for the first time on *Laurus nobilis* in Novigrad in Istria.

Species from genus *Ceroplastes* in open field are distributed only in coast counties of Croatia (Istarska, Primorsko goranska, Zadarska, Šibensko kninska, Splitsko dalmatinska and Dubrovačko neretvanska). There was no record in any continental part of country. *C. japonicus* was identified on 12 different hosts from 9 different plant families on 11 different localities and *C. rusci* was identified on 4 different host plants from 4 different plant families on 11 different localities.

Results of survey showed that main area of distribution of *C. japonicus* is Istria and main area of distribution of *C. rusci* is Dalmatia. *C. japonicus* hadn't been found anywhere else except Istria, but we found *C. rusci* on island Vanga-part of Brijuni islands which belongs to Istria.

Regard fact in our survey that *C. rusci* was found only on the island Vanga in Istria and in the rest of Istria was identified only *C. japonicus* we can conclude that was made in the past, misidentification when *C. japonicus* was identified as *C. rusci*. We noticed mass outbreaks of *C. japonicus* and *C. rusci* in 2005. and 2006.

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