

Scale Insects (Hemiptera: Coccoidea) on *Pistacia* spp. in Croatia

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Abstract: During eight years of faunistic research on scale insects in Croatia (2006-2013), eight scale insect (Hemiptera: Coccoidea) species of two families were found on *Pistacia* spp. (Anacardiaceae): Coccidae: *Ceroplastes rusci* (L.), *Coccus hesperidum* L., *Lichtensia viburni* (Signoret), *Saissetia oleae* (Olivier) and Diaspididae: *Chrysomphalus dictyospermi* (Morgan), *Epidiaspis gennadii* (Leonardi), *Lepidosaphes ulmi* (L.) and *Sahasaspis ceardi* (Balachowsky). This is the first record of *S. ceardi* in Croatia. The localities where scale insects have been collected are listed.

Key words: Diaspididae, Coccidae, *Pistacea* sp., Croatia

Introduction

Croatia, which lies at the northern end of the Adriatic Sea, is part of the Mediterranean basin and has a very suitable climate for scale insect development. It has a rich Mediterranean flora but the scale insect fauna has been relatively poorly studied and only 132 species are currently known from this country, mainly Coccidae (27), Diaspididae (57) and Pseudococcidae (22) (MASTEN MILEK 2007). For its neighbour country, Italy, there are records of 390 scale insect species (PELLIZZARI, RUSSO 2004). According to Flora Croatica (ANONYMOUS 2012), Croatia has 4 species of *Pistacia* (Anacardiaceae): *Pistacia lentiscus* L., *P. terebinthus* L., *P. vera* L. and *P. x saportae* Burnat. Of these, *P. lentiscus* and *P. terebinthus* are the most common, particularly near the coast, and *P. lentiscus* appears to be the most preferred host for scale insects.

Material and Methods

A survey of scale insects was carried out throughout Croatia over an eight year period (2006 – 2013) by visual inspections of various potentially infested plant species using a 10x magnification lens. Samples were taken from host plants showing signs of infes-

tation (such as sooty moulds, presence of ants, die back, leaf loss). Host plant material found to be infested with scale insects was collected in plastic bags. Sum total of 944 plant samples were collected, fifteen of which were *Pistacia* spp. Each sample was labelled with details such as host plant, damage symptoms, collector, sample number, date and the locality. The specimens were slide mounted under the dissecting stereo-microscope, according to the methods of WILKEY (1990) and BEN-DOV, HODGSON (1997). The specimens were then identified using the keys in MACGILLIVRAY (1921), BORCHSENIUS (1949), BALACHOWSKY (1951; 1954), GILL (1988; 1997), KOSZTARAB, KOZÁR (1988), WILLIAMS, WATSON (1988), and MILLER, DAVIDSON (2005).

Results and Discussion

A total of eight scale insect species in two families were identified on *Pistacia* spp. (Table 1). All of these species are more or less cosmopolitan apart from *Sahasaspis ceardi* Balachowsky, which appears to have a rather limited distribution and this is the first record for Croatia. Previously, it had been

Table 1. Scale insects of the families Coccidae and Diaspididae collected on *P. lentiscus* and *Pistacia* sp. in Croatia in 2006-2013

Host plant	Family of scale insect	Scale insect species	Locality	Date
<i>Pistacia lentiscus</i>	Coccidae	<i>Ceroplastes rusci</i>	Polače-Mljet	28.09.2006
		<i>Coccus</i> sp.	Dubrovnik	18.09.2011
	Diaspididae	<i>Chrysomphalus dictyospeni</i>	Krka	25.06.2013
		<i>Lepidosaphes ulmi</i>	Dubrovnik	29.04.2007
	Coccidae	<i>Lichtensia viburni</i>	Veliki Ston	14.12.2006
			Primošten	10.04.2008
			Podvrške	20.07.2008
			Vinik	30.07.2008
			Dubrovnik	08.10.2008
			Jadrija	23.09.2009
			Krka	25.06.2013
	Diaspididae	<i>Sahasaspis ceardi</i>	Ratac	10.07.2008
			Zablaće	26.07.2012
Coccidae	<i>Saissetia oleae</i>	Murter	27.07.2010	
<i>Pistacia</i> sp.	Diaspididae	<i>Epidiaspis gennadii</i>	Fažana	02.05.2006.

recorded from just Algeria, Morocco, Sardinia and Sicily (BEN-DOV *et al.* 2013). The most frequently recorded species was *L. viburni*, which was found on about half of the samples of *Pistacia* spp. collected. Most species of scale insects were found only once.

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