



Redescription of the adult male and description of second-instar male, prepupa and pupa of *Ceroplastes japonicus* Green (Hemiptera: Coccoidea: Coccidae)

ALESSIO RAINATO¹ & GIUSEPPINA PELLIZZARI²

Department of Environmental Agronomy and Crop Production - Entomology, University of Padua, viale dell'Università 16, 35020 Legnaro, Italy. E-mail: ¹Alessio.Rainato@unipd.it; ²Giuseppina.Pellizzari@unipd.it

Abstract

The adult male of *Ceroplastes japonicus* Green is redescribed and illustrated and compared with other known males of *Ceroplastes*. In addition, the 2nd-instar male, male test, prepupa and pupa of *C. japonicus* are also described and illustrated for the first time.

Key words: male morphology, adult males identification key *Ceroplastes cirripediformis*, *C. ceriferus*, *C. berliniae* (= *Waxiella berliniae*), *Ceroplastes* sp. (= *Waxiella* sp.)

Introduction

The genus *Ceroplastes* comprises many widespread and economically important wax scale species, mainly pests of tropical and subtropical fruit trees, citrus, fig, ornamentals (e.g. *C. sinensis* Del Guercio, *C. rusci* (Linnaeus), *C. rubens* Maskell, *C. destructor* Newstead, *C. floridensis* Comstock). This genus includes both bisexual species, where males are known (i.e. *C. sinensis*, *C. rusci*), even if only rarely recorded (i.e. *C. ceriferus* (Fabricius) (Gimpel *et al.*, 1974), and species that can reproduce parthenogenetically. Parthenogenetic reproduction may be either facultative, where males only occur rarely, or obligatory, where males do not occur, as with *C. floridensis* and *C. destructor* (Qin & Gullan, 1994). Differences in the presence or absence of males in populations of a given species living in different geographic areas have also been reported. For instance, according to Kuwana (1923), males of *C. rubens* are present in Japan, but they have not been recorded in the USA (Gimpel *et al.*, 1974), nor in Australia (Qin & Gullan, 1994).

With regard to *Ceroplastes japonicus* Green, males are known in the supposed native area of the species (China, Korea, Japan) (Kuwana, 1923; Jiang & Gu, 1988; Park *et al.*, 1992; Xie *et al.*, 2006), and also in Georgia and Russia (Abkhazia), where it is an introduced species (Borchsenius, 1957; Japoshvili, 2001, *pers. com.*). In Europe, *C. japonicus* was first recorded outdoors in Italy (Kozár *et al.*, 1984), and later in France, Slovenia and Croatia (Pellizzari & Camporese, 1994; Jančar *et al.*, 1999; Masten Milek *et al.*, 2007) In the above recorded countries it is a pest of ornamentals (e.g. *Hedera helix*, *Ilex aquifolium*, *Laurus nobilis* and Citrus) in urban environments. Males of *C. japonicus* were not noticed in Italy for a long time, even though its biology was studied in different areas by several authors (Longo, 1985; Camporese, 1991; Camporese & Pellizzari, 1998; Raspi & Antonelli, 1998). Although populations of this species have been regularly monitored in Padua (Italy) since 1990, males were not observed until 2003, when male tests were noticed for the first time on *Citrus reticulata*. At this time (the end of September), several male tests were empty or had dead specimens inside. Subsequently, many adult males, 2nd-instar male nymphs, prepupae and pupae were observed on 14th October 2007 on *Laurus nobilis*, in the province of Venice.