

Severe infestations of the jumping plant-louse *Macrohomotoma gladiata*, a new species for Italy in urban *Ficus* plantations

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Abstract

Macrohomotoma gladiata Kuwayama, a tropical Asian psyllid, has been found for the first time in Italy on ornamental *Ficus* planted in several avenues of Naples (Campania). The species is diagnosed, illustrated and nomenclature is briefly discussed. Preliminary observations carried out during the period July-November 2011 indicated that this species has overlapping generations. Generalist predators, such as Anthocoridae and Chrysopidae, have been found associated with several colonies. *M. gladiata*, already present in both insular and mainland Spain, appears to be easily overlooked during phytosanitary inspections and has the potential to establish in the countries of the Mediterranean Basin.

Key words: psyllid, Italy, new record, *Ficus*, invasive species.

Introduction

Macrohomotoma gladiata Kuwayama (Rhynchota Psylloidea Homotomidae) belongs to a small Indo-Australian genus of jumping plant-lice, which includes 14 mostly poorly diagnosed species developing on species of *Ficus* (*Urostigma*) section *Conosycea* (Hollis and Broomfield, 1989). *M. gladiata* has been reported from Taiwan, Japan (Ryuku Is.) and Hong Kong (Kuwayama, 1908; Miyatake, 1965; Hollis and Broomfield, 1989). Recently, Li (2011) and Martin and Lau (2011) synonymised *Macrohomotoma sinica* Yang et Li (Yang and Li, 1984) from China (Fujian) with *M. gladiata*. The host plant of *M. gladiata* is *Ficus microcarpa* L.f. (many records as *Ficus retusa* L.). There are also questionable records from *Ficus benghalensis* L. (Hollis and Broomfield, 1989) and *Ficus microphylla* Salzm. ex Miq. (Yang and Li, 1984).

Two years ago the species was introduced into Europe with extensive infestations reported from the Balearic Islands (Anonymous, 2009; SPCAN, 2009). Several technical reports of Spanish municipalities and forums state that the species is also well established on the Spanish mainland (Provinces of Murcia, Valencia and Alicante) (La opinion de Murcia, 2010; Biodiversidad virtual, 2010; Ajuntament de la Vila Joiosa, 2010). Recently, Mifsud and Porcelli (2011) reported *M. gladiata* from Alicante, as what they considered a first record for the EPP0 region.

Here we report *M. gladiata* for the first time from Italy, provide information on its biology and discuss nomenclatorial issues, damages caused and natural enemies.

Biology, description and nomenclatorial issues

From July to end of November 2011 colonies of *M. gladiata* were found on urban plantations of *F. retusa* (identification according to information from the

Municipality of Naples - Servizio Gestione Grandi Parchi Urbani). The development of this species involves five nymphal instars, which is usual for psyllids. Colonies develop on new shoots, which are covered in white waxy secretions (figures 1a, 1b). These secretions are both in form of compact, irregular flakes, under which the well-protected younger instars develop, and loose flakes, largely produced by the more mobile last nymphal instar (figure 1c). As a consequence of the attack, the shoots become deformed, stop developing and finally die. Eggs, which are pale yellow, are generally laid in tightly-packed clusters of 10-20 both on the new leaves of the twigs and on the withered bracts (figure 2a). The younger instars are orange-brown (figures 2b, 2c), while the final instar is largely pale green with brown wing pads and dorsal sclerites (figure 2d). During the sampling period, all immature stages were always found simultaneously, suggesting that the development is continuous with largely overlapping generations. When mature, the nymphs leave the colonies and move, in groups, to the lower leaf surface from where the adults emerge (figure 2e). Adults are 4.5-5.4 mm long (measured from anterior head margin to tip of the folded forewings), with the head and thorax brown, and abdomen green (figure 2f). The distal acute forewings are transparent, have a characteristic large, oval pterostigma and possess a brown spot on the distal portion of the pterostigma, a larger dark spot is at the end of vein Cu_{1b} and three smaller spots around the radular spinules (figure 2g).

Kuwayama (1908) introduced the name *Macrohomotoma gladiatum*, suggesting that the gender of the genus is neuter. This was not followed by other workers (Hollis and Broomfield, 1989) who used the name as feminine noun, until Li (2011) treated it again as neuter. The suffix 'toma' is derived from the Greek noun τομή = to cut, which is feminine and Latinized with the suffix -a according to the article 30.1.3 of the code of

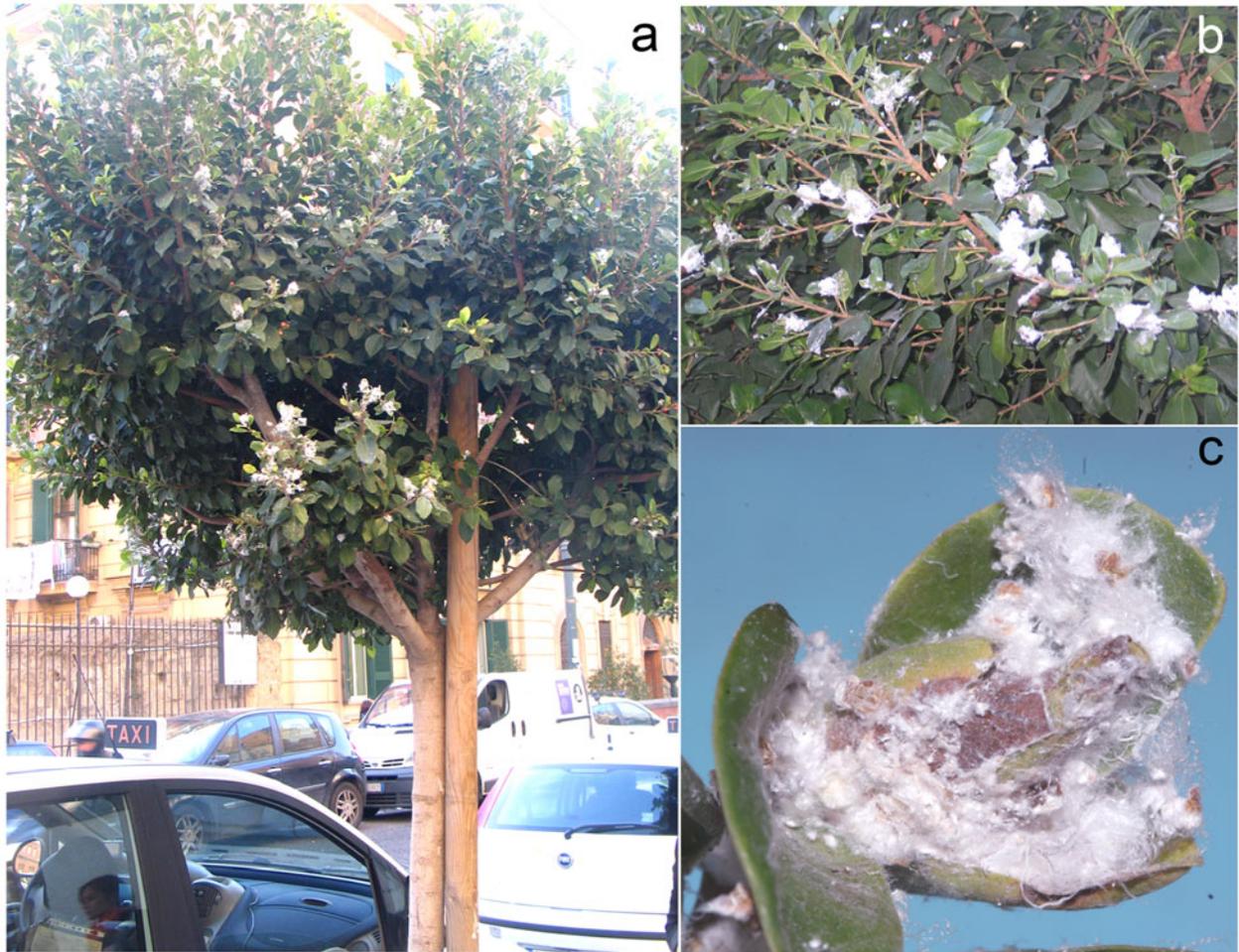


Figure 1. Damage caused by *M. gladiata*: a) infested *Ficus* tree in late November, b) heavily infested branch with abundant colonies, c) colony on shoot.

International Commission of Zoological Nomenclature (ICZN). Hence *Homotoma* and *Macrohomotoma* are feminine nouns corresponding to the current use (Hollis and Broomfield, 1989).

Damage and natural enemies

In its native range *M. gladiata* is generally not considered to be a pest. An exception is the report by Maki (1915) from Taiwan that recorded occasional serious damages, especially in the lower part of the plant. The situation is different in Spain, where the species was recently introduced and severe infestations of *M. gladiata* on ornamental *Ficus* trees planted in avenues required chemical control with products such as mineral oil, pyrethroids and chlorpyrifos (Olmo and Nieto, 2010).

In Naples infestation of *M. gladiata* is to date highly restricted, having been detected only in young plantations in two avenues, set very far apart. However, in the course of a few months, infestations in one of the two sites (a two year old plantation of twenty plants) have reached levels which seem comparable to those found in Spain, passing from an average of about 10 colonies per

plant on only half of the trees in July to hundreds of colonies per plants on all the trees at the end of November. In the other site, with plants less than one year old, only a few colonies were detected. In all the other sites examined no sign of infestation was observed. This pattern is similar to what is reported for Spain, where *M. gladiata* has progressively colonised new avenues starting from a few isolated places.

In Spain, honeydew has been sometimes reported as furthering the damage. However, in Naples no trace of honeydew was observed under the attacked trees, but waxy flakes easily get detached from the shoots bothering pedestrians.

Cases of defoliation, such those caused by severe infestations of the allied Moreton Bay fig sucker, *Mycopsylla fici* (Tryon) which attacks *Ficus macrophylla* Desf. ex Pers., have not been reported.

Several predators such as pirate bugs (Rhynchota Anthocoridae) and lacewings (Neuroptera Chrysopidae) were found feeding on the psyllid colonies. These predators are well known to feed both on indigenous and introduced phytophages.

At the moment it is not possible to develop an *ad hoc* biological control programme against this psyllid as no specific natural enemies are known.

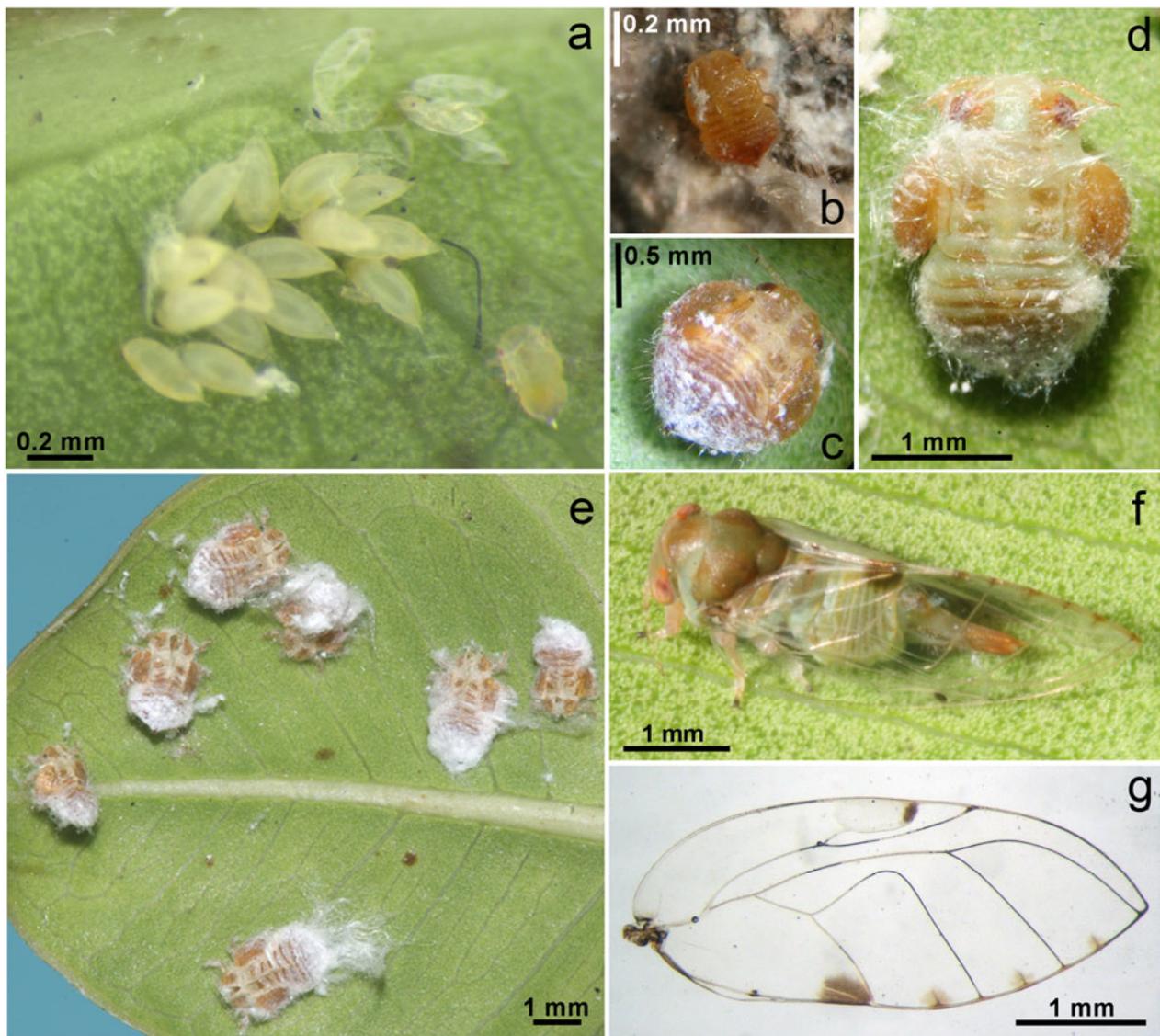


Figure 2. Life stages of *M. gladiata*: a) egg cluster with a freshly eclosed nymph, b) first instar nymph, c) fourth instar nymph, d) final instar nymph ready to moult into adult, e) exuviae of final nymphs dispersed under leaf, f) adult female, g) forewing.

Concluding remarks

In recent years, several species of *Ficus* such as *F. retusa* have been widely used as ornamental trees in urban environments in several Mediterranean countries, mostly for their rapid growth. Other considerations, such as associations with harmful pests, which can be easily overlooked at phytosanitary inspections and introduced into new habitats, should be added to the choice. For example, *F. microcarpa* has been implicated in the accidental introduction of a highly noxious pest, the thrips *Gynaikothrips ficorum* Marchal which causes serious foliar deformations (Laudonia and Viggiani, 2005). The risk of introducing additional exotic pest along with ornamental *Ficus* trees is not negligible and should be considered in planting strategies.

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