

Mini data sheet on *Marchalina hellenica*

Added in 2006 - Deleted in 2008

Reasons for deletion:

Marchalina hellenica is a Mediterranean species voluntarily introduced in some areas to enhance honey production. It has posed problems only in this context. In 2008, it was therefore considered that sufficient alert has been given and the pest was deleted from the Alert List.

Marchalina hellenica (Homoptera: Margarodidae)

Why	Between 1996 and 2000, Greek beekeepers were encouraged to artificially introduce a scale <i>Marchalina hellenica</i> in pine forests to increase their production of honey (it is estimated that 60% of honey produced in Greece is made from pine). The honeydew produced by the scale is used as a significant source of food by honey bees. At the same time, severe decline and significant tree mortality were observed in infested pine forests. A strong debate is currently taking place in Greece about the exact role of <i>M. hellenica</i> . Very different opinions are expressed, as for some the insect only causes cosmetic damage and for others it is the primary cause of pine mortality. It is also argued that <i>M. hellenica</i> could be a factor among many others involved in the decline of pine forests (e.g. ozone and soil pollution, drought, urban development and reduction of growth space for trees). But despite the lack of scientific information on the exact impact of <i>M. hellenica</i> on pine forests, the EPPO Secretariat added <i>M. hellenica</i> to the Alert List to draw countries' attention to the possible risks of moving this pest to new areas where it may escape control.
Where	EPPO region: Italy (only in the island of Ischia, Campania), Greece (spreading on the mainland and several islands including Crete, Rhodos), Turkey (at least in the Aegean region, data is lacking for other regions). In Italy, it was officially reported on the island of Ischia (Campania) in 1984 but it is suspected that it was introduced in the 1960s. <i>M. hellenica</i> is thought to originate from the eastern Mediterranean region.
On which plants	<i>Pinus</i> species: especially <i>P. brutia</i> , <i>P. halepensis</i> and to a smaller extent, <i>P. sylvestris</i> , <i>P. nigra</i> , <i>P. pinea</i> . After artificial infestations studied at Mount Helmos in Greece, <i>M. hellenica</i> was also able to develop and establish on <i>Abies cephalonica</i> .
Damage	<i>M. hellenica</i> is a sap-feeding insect. It produces large amounts of honeydew on which sooty moulds develop. It prefers the lower part of the tree and mainly nests on the main trunk, but infestations can be also observed on branches and even exposed roots. Large populations cause branch dieback, gradual desiccation eventually followed by tree death. So far, pine mortality is mainly observed in Southern Greece and Crete. In Italy, on the island of Ischia, <i>M. hellenica</i> was found damaging <i>Pinus</i> trees on the coast and in urban environments (streets and parks). In Turkey, a study was done to assess the impact of <i>M. hellenica</i> on <i>P. brutia</i> growing in the forests near Muğla (Aegean region). It showed that infestations could present a significant negative impact on trees (e.g. with up to 3.4% loss of volume increment in tree stands). But no tree mortality was mentioned in this study. <i>M. hellenica</i> can be found in bark crevices, covered by white waxy secretions. The insect has 1 generation per year (although in some cases 2 generations have been observed). It is considered that <i>M. hellenica</i> mainly reproduces through parthenogenesis, as males are rarely found. Females are apterous and lay approximately 200-300 yellow, oval-shaped eggs covered by waxy secretions (in April, in Greece). 1 st instar larvae (antennae with 6 segments) hatch approximately 20 days after egg-laying. They are light yellow, ellipsoid in shape and they start feeding and secreting a waxy cotton-like substance (from May to October). 2 nd instar larvae (antennae with 9 segments) with an ellipsoidal shape are found from October to March. Each larval instar lasts approximately 6 months

	and the insect overwinters as 2 nd instar larvae. Bright yellow adult females (antennae with 11 segments) covered by waxy secretions are then observed (body is approximately 7-11 mm long and 3-5 mm large). Male have rarely been found in Greece. The immature male stages have spindle-shaped, yellowish bodies (5.3 mm long, 3.6 mm large) and adults are winged (wingspan of approximately 11 mm).
Dissemination	<i>M. hellenica</i> has a low mobility, females are apterous and winged males are rarely observed. Results of genetic studies done on different Greek populations of the insect were also consistent with a very low mobility of this species. Artificial and intentional infestations done by man have obviously been very efficient in disseminating <i>M. hellenica</i> into new areas in Greece, where its populations reached high levels.
Pathway	<i>Pinus</i> plants for planting, cut branches.
Possible risks	Although scientific data is lacking about the impact of <i>M. hellenica</i> on <i>Pinus</i> forests, there is indication that large populations of the pest are damaging trees. In urban environments, insects producing large amounts of honeydew are always considered as a nuisance. Pines are widely present in the EPPO region, in forests but also in parks and gardens. Treatments against <i>M. hellenica</i> are being studied but most of them are difficult to apply in natural environment. The possible action of natural enemies, such as <i>Neoleucopis kartliana</i> (Diptera: Chamaemyiidae) or <i>Chartocerus</i> sp. (Hymenoptera: Signiphoridae) is being studied. In Italy, phytosanitary measures have been put in place to contain the pest within the island of Ischia (e.g. movements of host plants from the island of Ischia are prohibited, new outbreaks must be reported, pruning material should be destroyed). Although the risk presented by <i>M. hellenica</i> to <i>Pinus</i> trees is still being debated, it is advisable to avoid the introduction of <i>M. hellenica</i> into new areas.
Source(s)	Personal communication with Mr Melas, Philodassiki, Athens, 2006-02. Personal communication with Dr P. Milonas, Benaki Phytopathological Institute, Kifisia, Greece, 2006-06. Anonymous (2005) Linee guida per interventi urgenti nelle pinete dell'isola d'Ischia, finalizzati al contenimento delle infestazioni in atto di coleotteri corticicoli (<i>Tomicus destruens</i> ed <i>Orthotomicus erosus</i>) e di omotteri fitomizi (<i>Marchalina hellenica</i>). Servizio Fitosanitario Regionale Campania. http://www.sito.regione.campania.it/AGRICOLTURA/difesa/linee-guida-pinete.htm Bacandritsos N, Saitanis C, Papanastasiou I (2004) Morphology and life cycle of <i>Marchalina hellenica</i> (Gennadius) (Hemiptera: Margarodidae) on pine (Parnis Mt.) and fir (Helmos Mt.) forests of Greece. <i>Annales de la Société entomologique de France (nouvelle série)</i> , 40(2), 169-176. Bacandritsos N (2004) Establishment and honeydew honey production of <i>Marchalina hellenica</i> (Coccoidea Margarodidae) on fir tree (<i>Abies cephalonica</i>). <i>Bulletin of Insectology</i> 57(2), 127-130. Erllinghagen F (2001) Portrait of an insect: <i>Marchalina hellenica</i> Genn. (Sternorrhyncha: Coccinea: Margarodidae), important producer of honeydew in Greece. <i>Apiacta</i> 36, 131-137. Kosta H, Chondros A (2006) What ails the pines of Greece? <i>The American College of Greece Magazine</i> , no. 1, 34-35. http://www.acg.edu/acg/Acgmagazine1.pdf Margaritopoulos, JT, Bacandritsos N, Pekas AN, Stamatis C, Mamuris Z, Tsitsipis JA (2003) Genetic variation of <i>Marchalina hellenica</i> (Hemiptera: Margarodidae) sampled from different hosts and localities in Greece. <i>Bulletin of Entomological Research</i> 93, 447-453. Petraakis P, Roussis V, Vayias C (2006) Scientists are testing what could prove the definitive way to save pine trees from a slow and certain death. <i>Ekathimerini</i> . (on-line version of a Greek newspaper - 2006-16-03) http://www.ekathimerini.com/4dcgi/news/content.asp?aid=67533 Yeşil A, Gürkan B, Saraçoğlu Ö, Zengin H (2005) Effect of the pest <i>Marchalina hellenica</i> Gennadius (Homoptera, Margarodidae) on the growth parameters of <i>Pinus brutia</i> Ten. in Muğla region (Turkey). <i>Polish Journal of Ecology</i> 53(3), 451-458.
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