

4th International Congress on Biodiversity
“Man, Natural Habitats and Euro-Mediterranean
Biodiversity”, Malta, 17-19th November 2017

Xylophagous alien invasive beetles (Coleoptera) in the Maltese Islands

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In recent years, the Mediterranean basin has been invaded by a substantial number of alien wood-boring beetles, which represent some of the most destructive economic pests worldwide. The term wood-boring beetles encompasses many species of xylophagous beetles whose larval or adult stages eat and destroy wood. The most speciose Coleoptera families of wood-boring beetles include the Cerambycidae, Curculionoidea, Buprestidae and Bostrichidae. The majority of alien wood-boring species are native to southern Asia with a few records from North America. Most of these introductions take place accidentally mostly via international trade of goods, commodities, wood packaging materials and live plants.

Wood-boring beetles can be ecologically important and economically benign, especially in their native ranges, however on introduction and establishment, some species can become economic pests by attacking relatively healthy trees, threatening natural and agrarian ecosystems. This often results in the destruction of native habitat and the reduction or extermination of populations of native species. Once the species becomes established, it is very difficult or even impossible to remove it.

Despite the fact that the Maltese Islands are surrounded by sea and the closest European territory (Sicily) stands at about 90km, they are not at all immune to alien introductions. In the past, species such as *Rosalia alpina* (Linnaeus), *Cordylomera spinicornis* (Fabricius), *Ropalopus clavipes* (Fabricius), *Callidium violaceum* (Linnaeus), *Morimus asper* (Sulzer) and *M. funereus* (Mulsant) have been intercepted in Malta but their naturalization has never been confirmed. Other species such as *Phoracantha semipunctata* (Fabricius) and *P. recurva* Newman are now well established in the Maltese Islands. Both were first found around the 1990's. The introduction and establishment of these two *Phoracantha* spp. was expected, since both were being found all over Europe and the Mediterranean basin. On the contrary, the introduction and establishment in the late 1990's of *Phrynetta leprosa* (Fabricius), a species native to central Africa, was unexpected and since that time it was the major

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cause of death of hundreds of trees of *Morus nigra* L. and is now also attacking *M. alba* L. trees. A similar scenario was the damage provoked in these last eight years on thousands of trees of *Ficus carica* L. trees via an alien invasive bark beetle, *Hypocryphalus scabricollis* which is now also spreading in southern Sicily. In recent years single records of other potential invasive wood boring beetles were found such as *Hererobostrychus aequalis* (Waterhouse), *Sinoxylon unidentatum* (Fabricius) (both in Bostrichidae), *Lasiotrichius succinctus* (Pallas) (Scarabaeidae) and *Callidiellum villosulum* (Fairmaire) (Cerambycidae) but their naturalisation in Malta cannot be confirmed.

Despite the damage these organisms can induce to their host-trees, plant protection agencies have not always been able to respond to these invasions in a timely and coordinated manner. Precise information and updated lists on the exact identity of alien invasive species worldwide is a prerequisite for the protection of forests and management of the fruit tree industry.