
INTRODUCTION AND ESTABLISHMENT OF *PHRYNETA LEPROSA* (FABRICIUS) (COLEOPTERA, CERAMBYCIDAE) IN MALTA

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ABSTRACT

The accidental introduction and establishment of *Phrynetia leprosa* (Fabricius, 1775) in the Maltese Islands is recorded for the first time outside of its native distributional range. This species has been reported as a major pest of *Castilloa* and *Chlorophora* in tropical Africa. In the Maltese Islands the species is reported to be well established in the Rabat area, where heavy infestations were observed on trees of black mulberry, *Morus nigra*.

INTRODUCTION

A major factor contributing to the endangering and impoverishment of biodiversity, second only to habitat loss, is the unnatural introduction of organisms into new environments. Through such introduction, both accidental and deliberate, many organisms are transported around the world, a small percentage of which become established in new territories. In their new habitats, alien species that manage to establish themselves may have fewer predators, diseases and natural enemies in general and their population often grows out of control. Such alien species may also have adverse effects on local and regional economy, often involving severe damage in the agricultural, forestry and other related sectors.

Members of the beetle family Cerambycidae, are definitely no exception to introduction and establishment in new territories outside of their native range. The eucalyptus borer, *Phoracantha semipunctata* (Fabricius), is native to Australia, where it occurs throughout Eucalyptus forests with damage usually restricted to dead and dying trees. *P. semipunctata* is now almost cosmopolitan in distribution, and is found in practically all countries where Eucalyptus has been introduced. The main cause for its rapid spread is the transportation of Eucalyptus wood to different regions. In the Mediterranean basin, rapid spread of *P. semipunctata* (Fabricius) was favoured by the poor state of many Eucalyptus plantations, mainly due to drought and poor soils along with the great dispersal capability of the beetle (Cadahia, 1986). The brown spruce longhorn beetle, *Tetropium fuscum* (Fabricius), is native to Eurasia (found in northern and central Europe, from Scandinavia to Turkey, western Siberia and Japan) where it is a relatively innocuous pest. In 1990, the species was reported in

Canada. This was the first established population of *T. fuscum* in North America, where authorities consider this insect as being responsible for the deteriorating condition and subsequent death of apparently healthy red spruce trees (Smith & Humble, 2000). Red spruce is an extremely valuable resource for pulp, paper and lumber production. The Asian longhorn beetle, *Anoplophora glabripennis* (Motschulsky) is native to Japan, Korea, the Malaysian peninsula and south-eastern China. In Asia, this insect develops primarily in dead or diseased elms, poplars, willows and fruit trees. The insect was first discovered in New York, U.S.A. (probably imported in the larval stages mining in the timber of wooden crates and support braces used to transport maritime cargo from Asia) in 1996 and since then, it has been found in shipments of forest products in California, South Carolina and Canada. *A. glabripennis* (Motschulsky) is a major hardwood pest and the effect on the timber and maple syrup industries in North America can be catastrophic (Carey *et al.*, 1998).

The present work is intended to document the introduction and establishment of *Phrynetia leprosa* (Fabricius) in the Maltese Islands. This is the first record of this longhorn beetle becoming established outside its native range.

Phrynetia leprosa (Fabricius, 1775)

Phrynetia leprosa (Fabricius) is a member of the tribe Phrynetini within the sub-family Lamiinae. Currently, some 30 described species are included in the genus *Phrynetia*, with distributions recorded in tropical Africa, Madagascar and Western India (Adlbauer, 1990). *P. leprosa* (Fabricius) is distributed from Sierra Leone to Angola and Tanzania (Breuning, 1937; Adlbauer & Mourglia, 1999). In Africa, the species generally attacks only damaged or unhealthy

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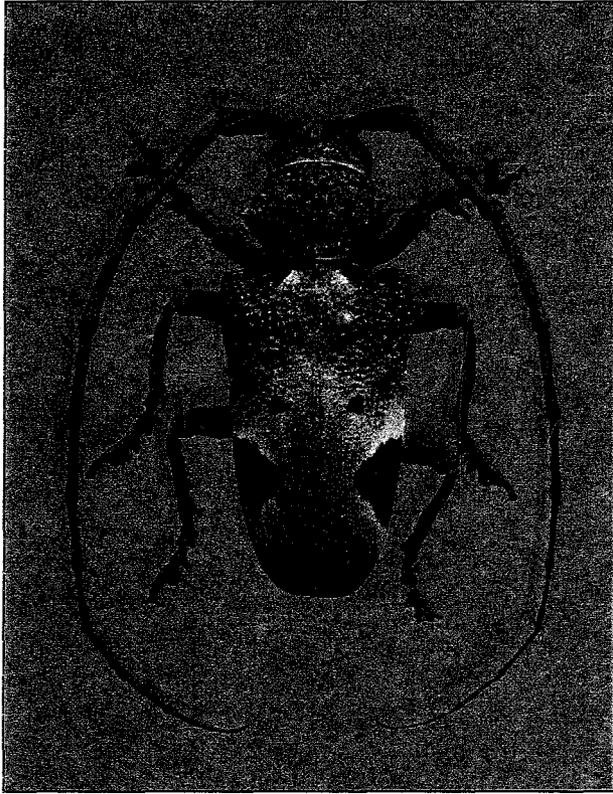


Plate 1: Top left; *phrynetella leprosa*. (x 1.5) Top right: Damage to black mulberry (*Morus nigra*) by larvae of *P. leprosa*.
Bottom: Two specimens on black mulberry branch>

trees. It is a known pest of *Castilloa*, of which entire plantations have often been destroyed; in Cameroon, this tree is now no longer planted (Aulmann, 1913). In Uganda, severe attacks were reported on *Morus* (Hargreaves, 1924). *P. leprosa* (Fabricius) is regarded as a major pest of *Chlorophora* in West Africa, where extensive damage owing to the relatively large galleries which extend deep into the heartwood of these trees was recorded (Duffy, 1957). The adult beetle is known to cause appreciable damage by gnawing the bark of young trees.

Larval development of *P. leprosa* (Fabricius) is reported to occur on a number of different unrelated plant species namely *Chlorophora excelsa*, *Funtimia elastica*, *Hevea*, *Manihot*, *Castilloa elastica*, probably *Ficus elastica*, *Antiaris africana*, *Antiaris toxicaria*, *Celtis africana*, *C. zenkeri*, *C. durandii*, *Bosqueia phoberos*, *Holoptelea grandis*, *Chaetacme aristata* and *Morus* spp. (Duffy, 1957), *Canarium schweinfurthii*, *Cynometra alexandrei*, *Entandrophragma angolense*, *Staudtia stipidata*, *Morus mesozygia*, *Beilschmiedia corbisieri*, *Celtis brieiyi*, *Celtis mildebrandii*, *Mammea africana*, *Millettia drastica*, *Morinda lucida*, *Ompgalocarpum*, *Oxystigma oxyphyllum*, *Parinari holstii*, *Pleiocarpa micrantha*, *P. tubicina*, *Pterocarpus soyauxii*, *Ricinodendron africanum*, *Scorodophloeus zenkeri*, *Strombosioopsis tetranda*, *Synsepalum subcordatum*, *Tetrapleura tetraptera*, *Alstonia* spp. and *Azelia africana* (Duffy, 1980).

RESULTS

In 1998, one of the authors (DD) was given two specimens of a longhorn beetle collected from near an old tree of *Morus nigra* (black mulberry, Maltese *tut*) in the Wied ta' l-Isqof area, between Rabat and Zebbug, Malta. These specimens were subsequently identified by the other author (DM) as *Phryneta leprosa* (Fabricius). Subsequent visits to the area revealed the presence of localised populations which had heavily infested and killed relatively old black mulberry trees.

Material examined -

Malta: Tal-Virtu (limits of Rabat), 16.ii.2000, 1 ex., leg. K. Bugeja; Mosta, 10.xi.2000, 1 ex., leg. A. Catania; Wied ta' l-Isqof, 30.xi.2000, 2 exs., leg. DD; Wied ta' l-Isqof, 23.iii.2002, 1 ex. (found dead), leg. DM & DD; Wied ta' l-Isqof, 26.vi.2002, 1 ex., leg. D. Mifsud; Wied ta' l-Isqof, 16.vii.2002, 4 exs., 2.viii.2002, 2 exs., 25.vi.2002, 6 exs., leg. P. Sammut; Wied ta' l-Isqof, 26.vi.2002, 2 exs., 28.vi.2002, 19 exs., 25 exs., leg. A. Seguna; Wied ta' l-Isqof 16.vii.2002, 5 exs., leg. A. Catania; Wied ta' l-Isqof 12 exs., leg. K. Bugeja; Hemsija (limits of Rabat), 12.vi.2002, 1 ex., leg. P. Scerri; Hemsija, 20.vi.2002, 1 ex., 26.vi.2002, 4 exs., leg. DM; Hemsija 26.vi.2002, 5 exs., leg. P. Sammut; Mdina, 29.ix.2002, 1 ex., leg. A. Catania; Ghammieri (Marsa), 27.x.2002, 1 ex., leg. J. Mifsud; Zebbug, 13.xi.2002, 1 ex., leg. A. Catania.

Damage and control - In the Maltese Islands extensive damage (due to larval mining) was observed on old *Morus*

nigra trees. Locally, *M. nigra* is often cultivated for its fruit, and it is also planted as a roadside tree for ornamental purposes. In exceptional instances, more than 60 exit holes were found on a single tree of *Morus nigra*, inevitably leading to death of the tree. Adults were also observed actively gnawing the bark of young black mulberry shoots. On only one occasion was larval damage observed on a relatively young tree of the closely related white mulberry *Morus alba* (Malt. *catwsi*). Similar damage was also observed on nearby fig-trees, *Ficus carica* (Malt. *tin*).

The control of this pest is rendered difficult by the fact that the larvae mine deep into the heartwood of the trunks and main branches. Larvae may be killed by making an incision with a knife at one of the ejection holes (through which the larval frass is expelled) and then pushing a strong flexible wire along the gallery. However, in cases of heavily infested trees, the best control strategy would be to uproot and burn the trees. Another effective control method involves the detection and removal of the adult beetle at night. Although adults are not attracted to light, they are usually active during the night on the host plant. Insecticides are of little value, and can only be somewhat effective against the adult beetle if applied during the night. In Malta this should be done during the months of June, July and August, when it was observed that the adults are emerging and mating on the host trees.

Notes - Most likely, *P. leprosa* (Fabricius) was accidentally introduced in the Maltese Islands with large tree logs imported from Cameroon and intended for use in the timber industry. This is the fifth confirmed record of an exotic longhorn beetle which was accidentally introduced and established itself in the Maltese Islands, two of the other four species being *Cerambyx nodulosus* Germar, and *C. carinatus* Küster, both eastern elements which are now established pests of stone fruit trees (Sama, 1988; Mifsud & Booth, 1997; Mifsud, 2002). The other two species are *Phoracantha semipunctata* (Fabricius) which was first recorded in the Maltese Islands in the 1990s and *P. recurva* Newman, first recorded in 2001 (Mifsud & Booth, 1997; Mifsud, 2002). The two *Phoracantha* species are associated with *Eucalyptus* plantations.

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