



## Short PRA

### BATOCERA RUFOMACULATA, Mango Tree Stem Borer

#### 1. Reason for performing the PRA

Finding of one infested *Ficus* bonsai (naturally or artificially dwarfed tree) originating from China in a glasshouse nursery in February 2005. One larva was found in a stem. Other *Ficus* plants at the nursery did not show any signs of larval or adult feeding damage.

#### 2. Scientific names and taxonomy

Class: Insecta

Order: Coleoptera

Family: Cerambycidae

Genus: *Batocera* (also: *Cerambyx*)

Species: *rufomaculata* de Geer, 1775

Common names: Mango stemborer, Mango tree borer, tropical fig borer

#### 3. Key aspects of biology

- Large insect, adult size 3-5 cm
- Stem/wood borer, eggs and larvae difficult to detect
- Needs stems of at least 7.6 cm diameter to successfully develop to an adult (in figs in Israel (Bytinski-Salz, 1952)).
- Nocturnal, attracted to light traps
- Good dispersal ability, can travel considerable distances (Avidov & Harpaz, 1969); long lifespan adults (4 months)
- Long development time: 6 months (India), 1 year (Israel)

Main source: CABI, 2007.

#### 4. PRA-area

The Netherlands

#### 5. Host plant range (Worldwide)

*B. rufomaculata* is polyphagous and about 50 host plant species (of 18 different plant families) are known. Main host plants mentioned in the literature are Mango, Figs and Avocado (CABI, 2007).

Major host plants listed by CABI (2007) are:

*Anacardium occidentale* (cashew nut), *Artocarpus heterophyllus* (jackfruit), *Ceiba pentandra* (kapok), *Dyera costulata* (hill jelutong), *Ficus carica* (fig), *Hevea brasiliensis* (rubber), *Mangifera indica* (mango), *Morus* sp.(mulberrytree), *Spondias* sp.(purple mombin).

#### 6. Host plant range (NL)

*Ficus* spp

In 2004, the total glasshouse area with *Ficus* spp. was 74 ha and the number of glasshouse nurseries with *Ficus* spp. 80 (Anonymous, 2005). About 15 glasshouse nurseries in the Netherlands grow *Ficus* plants imported from China (estimate by Dutch growers in: Van der Gaag et al., 2006). In Israel, the pest can only develop in fig plants with a stem diameter of 7.6 cm or more (Bytinski-Salz, 1952). Most

Ficus plants that are grown in the Netherlands have a much smaller diameter and *Ficus* plants with a stem diameter are grown on a limited scale, probably less than 10 ha. *F. carica* is incidentally present in private gardens in the Netherlands.

#### *Morus spp (Moerbe)*

*Morus* species (e.g. *Morus alba* and *Morus nigra*) are grown on a small scale as part of the assortment of tree in nurseries. *Morus spp* are grown in private and public gardens but are uncommon.

### **7. What is the current area of distribution of the pest?**

CABI (2007) lists the following countries:

**Asia:** China (Hainan, Xinjiang), India, Indonesië (Java, Sumatra), Iran, Iraq, Israel, Malaysia (Peninsular Malaysia), Maldives, Myanma, Oman, Pakistan, Sri Lanka, Thailand, Vietnam, Yemen.

**Africa:** Madagascar, Mauritius, Réunion, Seychelles

**Central America:** Barbados, Virgin Islands

The pest was recently introduced in Turkey (Tozlu-Goksel, 2000)

### **8. Does the pest occur in the PRA-area?**

No

### **9. Probability of entry: preliminary pathway analysis**

The pest can enter the PRA area with import of ornamental host plants. The pest can be present as larvae or pupae in tunnels of woody host plants.

The NPPO of the Netherlands has found *B. rufomaculata* twice in imported *Ficus* plants from China in 2005 and 2008.

### **10. Probability of establishment**

(a) Outdoors – Very unlikely.

*Morus spp* and *Ficus ssp.* could serve as suitable host plants. However, *B. rufomaculata* is reported from countries with warm climates. It is very unlikely that it can develop successfully in the outdoor climate in the Netherlands. Furthermore, the known host plants are incidentally present outdoors. It can probably establish in Mediterranean countries: it is present in Israel since about 1950 and has been introduced in Turkey in 2000 (see also the answers to questions 7 and 12).

(b) In protected cultivation – Very unlikely

The pest might establish in *Ficus* nurseries. However, the development time is very long (6-12 months) and the number of individuals on single plants is very low (single eggs). Moreover, plants are usually sold within several months after import. Successful mating and population build-up in (Bonsai) nursery is, therefore, very unlikely.

### **11. How likely is the pest to spread in the PRA-area? (naturally and by human assistance)**

Very unlikely

The pest is a stem borer and can be present in plants without any clear symptoms. Infested (*Ficus*-Bonsai) plants may be sold to end-consumers and placed inside buildings. If the plant is infested the tree may grow badly or even die. It is, however, very unlikely that the pest will establish sustainable populations in buildings where the *Ficus* plants are placed.

### **12. What is the potential damage when the pest would become introduced? (without the use of control measures)**

Infested trees with tunnelling *B. rufomaculata* often die. Economic loss can be high if it involves fruit trees. In NL, individual naturally or artificially dwarfed *Ficus* trees that have been infested in the country of origin may die.

**13. What is the expected damage when the pest would become introduced? (with the use of available control measures);**

The Netherlands: individual naturally or artificially dwarfed *Ficus* trees that have been infested in the country of origin may die. No control measures are available that will kill the larvae inside the trees. The systemic insecticide imidacloprid when applied by drip irrigation may kill the young larvae feeding in the phloem of the plant; it will possibly not kill older larvae feeding in the wood.

EU: The pest can probably establish in southern Europe and may kill *Ficus* trees and other host trees in public and private areas. Attack by *B. rufomaculata* often leads to the death of the tree. Tree death has been recorded in the Virgin Islands, Israel, Mauritius, India and Malaysia. "Economic loss can follow when the tree attacked bears fruits or yields another product" (CABI, 2007).

In Israel, the pest has caused much damage in fig plantations since its introduction: The pest was found in Israel for the first time in 1950 (Bytinski-Salz, 1952). Within 10 years after its introduction, the pest had destroyed much of the fig plantations. Between ca. 1960 and 1990, the pest did not cause significant damage but since about 1990 it causes again serious damage to fig plantations (Ben-Yehuda et al., 2000). Peretz and Avigdorov (1956) reported that in some parts of Israel more than 50% of fig trees were killed by the pest.

**12. Conclusion**

*Batocera rufomaculata* is considered a pest with low phytosanitary risk for the Netherlands for the following reasons:

- The pest can probably only survive in protected cultivation;
- Incidental introductions (from e.g. China) may occur, but establishment and significant economic damage is very unlikely.
- The endangered area is limited to glasshouse nurseries that grow *Ficus* spp. with a stem diameter of about 8 cm or more and the total endangered area is probably less than 10 ha.

The phytosanitary risk for southern EU-countries will be larger as the pest can probably establish outdoors in those countries and cause damage to fig plantations.

**14. References**

- Anonymous, 2005. Land- en tuinbouwcijfers 2005. LEI, Wageningen UR, CBS, Voorburg, the Netherlands
- Avidov, Z. & Harpaz, I. (1969). Plant pests of Israel. Israel University Press.
- Ben-Yehuda, S., Dorchin, Y., Mendel, Z., 2000. Outbreaks of the fig borer *Batocera rufomaculata* and other cerambycids in fruit plantations in Israel. *Alon Hanotea* 54: 23 – 29.
- Bytinski-Salz, H., 1952. *FAO Plant Protection Bulletin* 1: 38-39.
- CABI, 2007. *CABI Crop protection compendium*
- Peretz, I., Avigdorov, A., 1956. Experiments on the control of the tropical fig borer in Israel. *Plant Protection Bulletin FAO* 4: 132-135.
- Tozlu-Goksel (2000). The tropical fig borer, *Batocera rufomaculata*, new for Turkey. *Zoology in the Middle East* 20: 121-124.
- Van der Gaag, D.J., Dijkstra, Lammers, J.W., Meijer, A., Scholte, 2006. *Pest Risk Analysis Horidiplosis ficifolii*. Plant Protection Service, the Netherlands.

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