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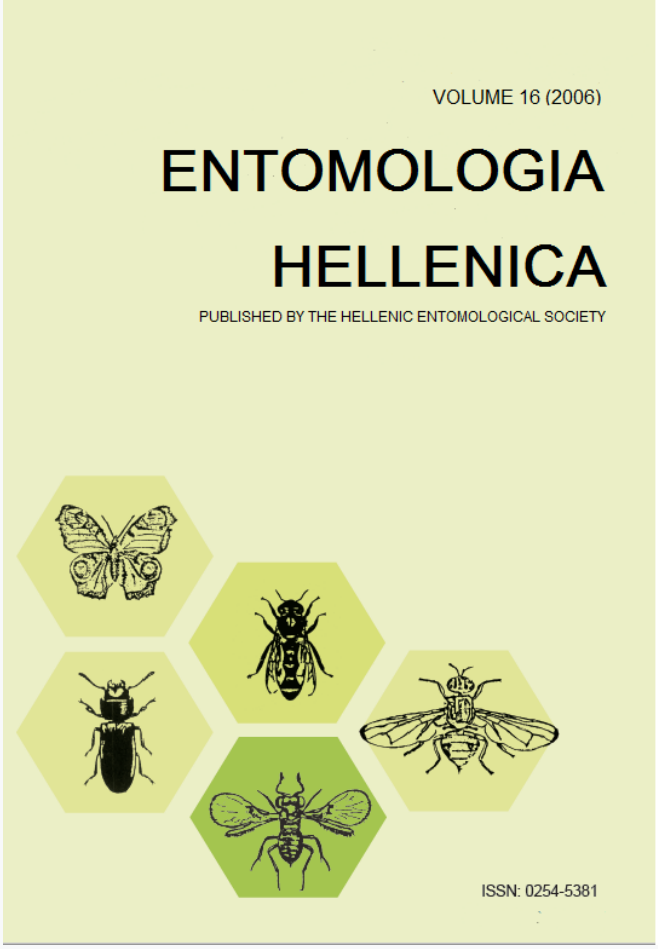

The occurrence of Rhynchophorus ferrugineus in Greece and Cyprus and the risk against the native greek palm tree Phoenix theophrasti

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The occurrence of *Rhynchophorus ferrugineus* in Greece and Cyprus and the risk against the native greek palm tree *Phoenix theophrasti*

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ABSTRACT

The red palm weevil (RPW), *Rhynchophorus ferrugineus* (Coleoptera: Curculionidae), is the most important pest of palm trees in the world. In the last decade *R. ferrugineus* has invaded the Mediterranean basin where it causes severe damage in date palm cultivations as well as in ornamental palm trees. *R. ferrugineus* has been found for first time in Greece in Hersonissos (Heraklion district, Crete) infesting *Phoenix canariensis*, on November 11th, 2005 and for first time in Cyprus in Limassol district on August 20th, 2006, infesting also *P. canariensis*. Afterwards, *R. ferrugineus* has been found in Rhodos island, Greece, on 15/9/2006 and in Oropos and Ellinikon (Attiki district, Greece) on 5/12/2006 and 27/12/2006 respectively, infesting mainly *P. canariensis*. In Cyprus it has also been found in October 2006 in Larnaca, Famagusta and Paphos districts. In laboratory experimentation the susceptibility of the native Greek palm tree *Phoenix theophrasti* in *R. ferrugineus* was proved.

Introduction

The red palm weevil (RPW), *Rhynchophorus ferrugineus* (Coleoptera: Curculionidae), is the most important pest of palm trees in the world. In the last decade *R. ferrugineus* has invaded the Mediterranean basin (Egypt, Israel, Spain, Italy, Greece, Turkey, Syria, Cyprus) causing severe damages in date palm cultivations as well as in ornamental palm trees (Cox 1993, Esteban-Durán et al. 1998a, 1998b, Ferry & Gomez 2002, Kontodimas et al. 2005, EPPO Reporting Services 2006-2007).

The red palm weevil infests almost all palm tree species (*Areca catechu, Arenga pinnata, Caryota* spp., *Cocos nucifera, Corypha* spp., *Elaeis guineensis, Livistona decipiens, Phoenix canariensis, P. dactylifera, P. sylvestris, Metroxylon sagu, Oreodoxa regia, Sabal umbraculifera, Trachycarpus fortunei, Nipa* sp., *Washingtonia filifera etc*). Only *Champerops humilis* and *Washingtonia robusta* are referred to as resistant to *R. ferrugineus*. No data about the native Greek species *Phoenix theophrasti* (common name: cretan palm, palm of Theophrastus) are available, as *R.*

ferrugineus was not present in the areas where this species was planted.

Phoenix theophrasti is planted in several places in the island of Crete as well as in some other Greek islands in the Aegean Sea (Nisyros, Kos, Kithyra). In the northeast part of Crete (Lasithion region) in an area of 30 hectares (coordinates: Latitude 35° 15' 11", Longitude 26° 15' 52") the Vai-forest is situated that consists of *Phoenix theophrasti* and is the biggest and northern forest of this palm tree species. The northest region that a small group of *P. theophrasti* palm trees exists is Epidauros (Argolis region, Peloponnese).

In Greece and Cyprus there are no date palm cultivations (*P. dactylifera*). Palm trees are only used as ornamental plants and the most common palm species found in the two countries is *P. canariensis*. In the present study the dispersal of *R. ferrugineus* in Greece and Cyprus and the risk against *P. theophrasti* are discussed.

Materials and Methods

Dispersal of Rhynchophorus ferrugineus. After the first record of *R. ferrugineus* in Greece in November 2005 (Kontodimas et al. 2005), surveys were conducted in Greece and Cyprus in order to obtain data about the distribution of the infestation. The coordinates of the points of the infestations were recorded with a GPS device Garmine Etrex.

Phoenix theophrasti susceptibility. In Benaki Phytopathological Institute the susceptibility of *P. theophrasti* in *R. ferrugineus* was tested. Six seedlings of *P. theophrasti* were placed separately on six plastic cylindrical cages (1,2 m high, 30 cm diameter with a mesh cover go) in an underground laboratory under constant conditions (26°C, 65% R.H., and 16L:8D photoperiod).

In each cage 12 newly emerged adults (6 males and 6 females, that had been collected from Hersonissos, Heraklion region, Crete) were placed. The cages were observed at two days' intervals.

Results and Discussion

Distribution of Rhynchophorus ferrugineus. R. ferrugineus was found for first time in Greece, on *P. canariensis,* on 5/11/2005 in Hersonissos (Heraklion Region, Crete), (coordinates: Latitude (N) 35° 18' 33", Longitude (E) 25° 22' 11") infesting *P. canariensis.* More than 40 *P. canariensis* palm trees were infested in this area during 2006, whereas only few other palm trees species (*P. dactylifera* and *W. filifera)* were also infested.

After the first record several infestations were found also on *P. canariensis* (Fig. 1):

- in Rhodos island, 15/9/06, N 36° 17' 14" E 28° 10' 23",
- in Oropos (Attiki region), 5/12/06, N 38° 19' 14" E 23° 47' 00" and
- in Ellinikon (Attiki region), 27/12/06, N 36° 53' 15" E 23° 43' 42".)

In Cyprus, *R. ferrugineus* was first recorded on August 20th, 2006 in Limassol district (N 34° 40' 30", E 33° 1' 59") infesting *P. canariensis* (Fig. 1). After the first record several infestations were also found in October 2006:

- in Larnaca district (N 34° 57' 0", E 33° 55' 0"), on P. canariensis and P. dactylifera.
- in Famagusta area (N 35° 19' 59" E 33° 52' 0") on imported P. dactylifera, and
- in Paphos area (N 34° 49' 59" E 32° 34' 59") on imported W. filifera.

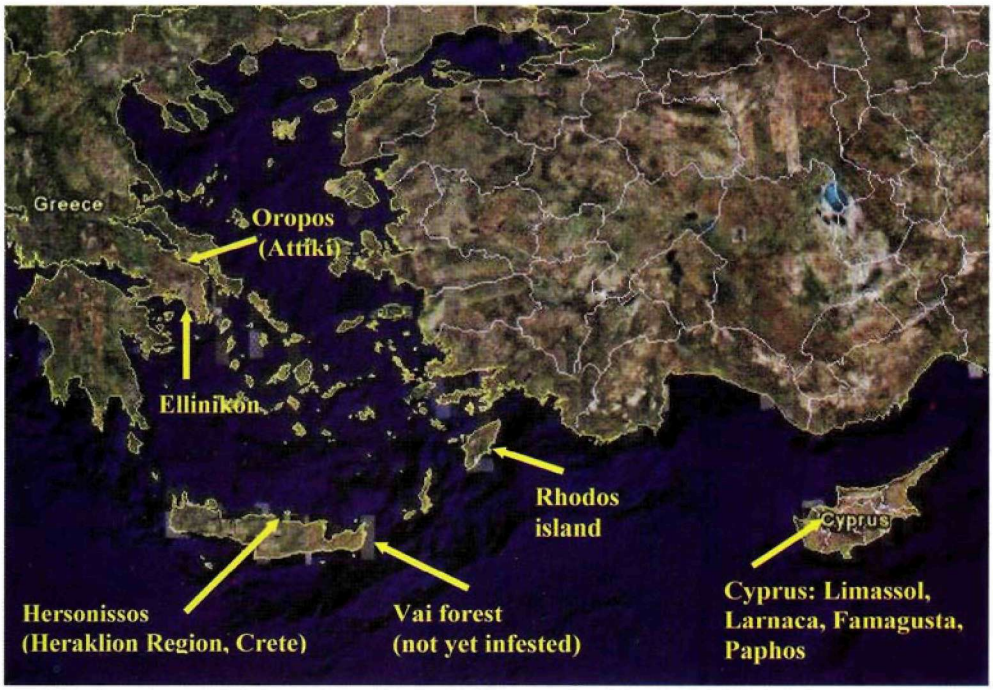

FIG. 1. Distribution of *Rhynchophorus ferrugineus* in Greece and Cyprus.

In Greece the infestations were mainly observed on *P. canariensis* that had been planted more than 10 years earlier. All infestations were observed and recorded near palm tree nurseries (<1000m) that import large quantities of palm trees. The above results are in agreement with the fact that *R. ferrugineus* in general is transferred by palm trees for planting. In addition, the fact that the great majority of palm trees that were found infested belongs to *P. canariensis* whereas, at the same time neighboring species were only found occasionally infested, implies a great susceptibility of *P. canariensis*. A preference in *P. canariensis* is indicated by the fact that other planted palm trees near the infestations (such as *Ch. humilis, W. robusta, W. filifera, P. dactylifera*) were not or were occasionally infested.

In Cyprus it is also believed that *R. ferrugineus* has been introduced in the last few years, with imported date and other palm species. Also, the majority of infestations were recorded on *P. canariensis* and *P. dactylifera*. All damaged *P. dactylifera* were imported during the last decade from Egypt, while *P. canariensis* were of local production. It is important to notice that in all cases all the infested palms were over 10 years old.

Susceptibility of Phoenix theophrasti. After 100 days of the infestation of the six *P. theophrasti* seedlings by *R. ferrugineus* adults, four of them were killed by the feeding activity of *R. ferrugineus* larvae. Only from two seedlings F_1 adults were collected (2 and 3 respectively) and they were smaller in size than the adults collected from *Phoenix canariensis* (Fig. 2). The fact that *P. theophrasti* is infested and killed by *R. ferrugineus* is very important because the population of this palm species in Crete is unique in the world.

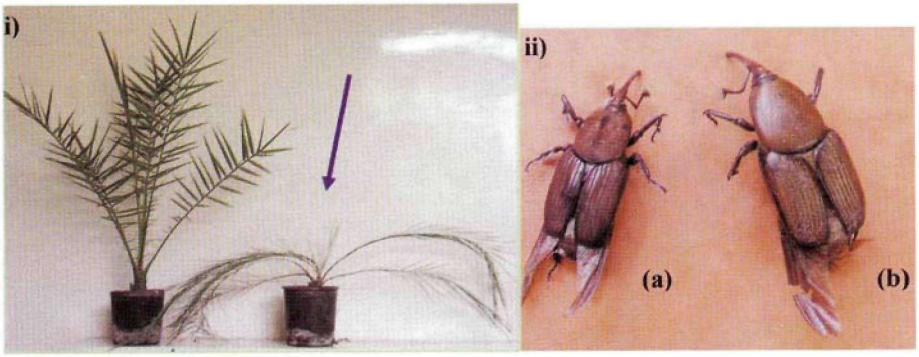

FIG. 2. i) Susceptibility of the native cretan palm *Phoenix theophrasti* to *Rhynchophorus ferrugineus* infestation. ii) Adults of *R. ferrugineus* that emerged from *P. theophrasti* (a) and *P. canariensis* (b).

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KEY WORDS: *Phoenix theophrasti, Rhynchophorus ferrugineus,* infestation

Η παρουσία του *Rhynchophorus ferrugineus* σε Ελλάδα και Κύπρο και η επικινδυνότητά του έναντι του ιθαγενούς είδους φοίνικα *Phoenix theophrasti*

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ΠΕΡΙΛΗΨΗ

Ο κόκκινος ρυγχωτός κάνθαρος των φοινικοειδών, *Rhynchophorus ferrugineus* (Coleoptera: Curculionidae), είναι ο σημαντικότερος εχθρός των φοινικοειδών παγκοσμίως. Την τελευταία δεκαετία εισέβαλε στις Μεσογειακές χώρες προκαλώντας σοβαρές ζημιές σε καλλιέργειες χουρμαδιάς καθώς και σε καλλωπιστικά φοινικοειδή. Το *R. ferrugineus* βρέθηκε για πρώτη φορά στην Ελλάδα το Νοέμβριο 2005 στη Χερσόνησο (Νομός Ηρακλείου, Κρήτη) επί *Phoenix canariensis* και για πρώτη φορά στην Κύπρο στη Λεμεσό τον Αύγουστο 2006 επίσης επί *P. canariensis*. Εν συνεχεία το *R. ferrugineus* βρέθηκε στην Ελλάδα, προσβάλλοντας κατά κανόνα *P. canariensis*, σε Ρόδο (Σεπτέμβριος 2006), Ωρωπό και Ελληνικό Αττικής (Δεκέμβριος 2006). Στην Κύπρο βρέθηκε επίσης τον Οκτώβριο 2006 σε Λάρνακα, Αμμόχωστο και Πάφο. Σε πειραματική δοκιμή στο εργαστήριο, στο Μπενάκειο Φυτοπαθολογικό Ινστιτούτο, διαπιστώθηκε ότι το *R. ferrugineus* μπορεί να προσβάλλει και να καταστρέψει και το ιθαγενές είδος φοίνικα *Phoenix theophrasti*.