

First Record of *Rhynchophorus ferrugineus* on *Phoenix canariensis* in Tunisia

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ABSTRACT

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Samples of insect adults, larvae and cocoons with pieces of infested declining palm leaves of *Phoenix canariensis* were collected in mid-December 2011 in Carthage Township, Tunis. Observations based on classical taxonomy using morphological identification characters and examination of male genitalia allowed the identification of the pest responsible of the damage as *Rhynchophorus ferrugineus*, the Red Palm Weevil. This is the first record of this pest in Tunisia with a description of its morphological characters.

Keywords: Red palm weevil, *Phoenix canariensis*, *Rhynchophorus ferrugineus*, Tunisia

Red Palm Weevil (RPW), *Rhynchophorus ferrugineus* (Coleoptera, Dryophthoridae), is originating from India, where it is a serious pest of coconuts (5). It has been advancing westwards very rapidly since the mid 1980's. It had reached the Gulf countries in 1985, Egypt in 1992, then most of Mediterranean countries such as Spain (1996), Italy (2004), France (2006), Libya (2009), and Morocco (2010). RPW is a polyphagous insect (6) which can infect many species of fruit and ornamental

palms, including date palms. Presently, there is no doubt that RPW is becoming the most important pest of the date palm in the world (4). It is the most dangerous and deadly pest of this palm. It is still difficult to assess the actual loss caused by this pest, but certainly it deeply affects the production of date palm. The larvae are the main stage involved in palm damage and once they gained access, the death of the palm generally ensues. The larvae are concealed inside the palm and therefore, neither the damage nor the larva can be seen until symptoms appear later (2).

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Following a claim received in mid-December from the City Hall of Carthage Township, Tunis, by the *Direction Générale de la Protection et du Contrôle de la Qualité des Produits Agricoles*, the Quarantine specialists moved to the site in order to establish a diagnostic. The first

observations allowed noting that among tens of ornamental palm trees, 30 to 40 of Canary palm trees (*Phoenix canariensis*) were dried and the apexes of these declined trees were seriously affected (Fig. 1a,b). The rest of the observed palm trees (*P. canariensis* and *Washingtonia filifera*) were symptomless. Careful observations of heavily infested trees showed fallen cocoons and crushed fibers around the trunk. Moreover, on the infested palms we noted holes (Fig. 1c) in the apexes with oozing brown liquid and larval chewed fibers, notches on the leaves, small mounds of brown milled fibers that punctuate the holes punched by the last larval developmental stage. Most of cocoons were inserted into the base of the attacked leaves, an unpleasant odor of rotting vegetation emerged and brown viscous liquid oozed out from wounds. The central growth bud is completely dried and destroyed. Palm leaves which were severely attacked at their base, were barely attached to the apex and the mechanical resistance of the whole trunk is extremely reduced.

A number of samples of infested palm parts, larvae at various stages, cocoons (Fig. 2a) and adults were collected in sealed bags and transferred to the Quarantine Laboratory for analysis and pest identification. Adults were observed under binocular incident-light for their morphological criteria; male genitalia dissection was performed with the aim to examine the aedeagus (Fig. 2,b,c,d) which is an important criteria to confirm the species identification. The genus *Rhynchophorus* currently contains nine species; six of them are known to attack palms. Two species, *R. ferrugineus* and *R. palmarum* are EPPO listed pests, with *R. palmarum* in the A1 list* and *R. ferrugineus* in the A2 list**.

Under light episcopic stereomicroscope, the insect identification was confirmed on the basis of the following morphological characteristic details which distinguish *R. ferrugineus* from another curculionid species: mandibles tridentate distally (Fig. 2e), scutellum tapers broadly (Fig. 2f), gular suture with elongate-oval shape before narrowing to base (Fig. 2g), submentum bowed, procoxae strongly globose, widely separated, mesocoxae covered with soft, reddish- brown setae, pro- and meso-femora not strongly curved ventrally, with setae on ventral side of profemora in males only, tarsi pseudotetramerous (Fig. 2h), pygidium sparsely and minutely punctured posteriorly and dorsolaterally (Fig. 2i) and pronotum (Fig. 2j) gradually narrowed anteriorly and eventually curved posteriorly (3). The identification of the genus and the species is achieved using dichotomous keys developed by Wattanapongsiri (1). The following description was strictly verified:

- Eggs: Creamy white, oblong, narrower at the anterior end, shiny, average size 2.62×1.12 mm (Fig. 2k).

- Larvae: Up to 35 mm long, brown head, white body composed of 13 segments, mouthparts well developed and strongly chitinized, average length of fully grown larvae 50 mm, and width (in middle) 20 mm (Fig. 2l).

- Pupae: Pupal case $50-95 \times 25-40$ mm, pupae cream colored, and then brown, with shiny surface, greatly furrowed and reticulated, average size $35 \text{ mm} \times 15 \text{ mm}$ (Fig. 2m).

- Adults: Reddish brown (Fig. 2 n,o), about 35×10 mm, with long curved rostrum, dark spots, head and rostrum

* A1 List: pests are absent from the EPPO region

** A2 List: pests are locally present in the EPPO region

comprising about one-third of total length. In male, dorsal apical half of rostrum covered by a patch of short brownish hairs (Fig. 2p), in female, rostrum bare, more slender (Fig. 2q), curved and a little longer than in male.

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RESUME

Chebbi H. 2011. Premier signalement de *Rhynchophorus ferrugineus* sur *Phoenix canariensis* en Tunisie. Tunisian Journal of Plant Protection.

Des échantillons d'adultes, de larves et de cocons d'insecte et des morceaux de feuilles infectées et déperies du palmier *Phoenix canariensis* ont été collectés dans la Commune de Carthage, Tunis. Des observations basées sur la taxonomie classique en utilisant des caractères morphologiques d'identification et l'examen du genitalia male ont permis l'identification du ravageur responsable des dégâts comme étant *Rhynchophorus ferrugineus*, le charançon rouge du palmier. C'est le premier signalement de ce ravageur en Tunisie avec une description de ses caractères morphologiques.

Mots clés: charançon rouge du palmier, *Phoenix canariensis*, *Rhynchophorus ferrugineus*, Tunisie

ملخص

شابي، حمدة. 2011. أول تسجيل لحشرة سوسة النخيل الحمراء (*Rhynchophorus ferrugineus*) على النخيل الكناري (*Phoenix canariensis*) في تونس. Tunisian Journal of Plant Protection.

تم جمع عينات من بالغات و يرقات و شرانق حشرة مع أجزاء من السعف المصاب والمتضرر لنخيل الكناري (*Phoenix canariensis*) من منطقة بلدية قرطاج، تونس. مكنت الملاحظات المرتكزة على التصنيف الكلاسيكي عن طريق التشخيص المورفولوجي وفحص الأعضاء التناسلية الذكرية من تحديد الآفة المسؤولة عن الأضرار على أنها سوسة النخيل الحمراء (*Rhynchophorus ferrugineus*). يعتبر هذا أول تسجيل للآفة في تونس مع وصف لخصائصها المورفولوجية.

كلمات مفتاحية: تونس، سوسة النخيل الحمراء، *Phoenix canariensis*، *Rhynchophorus ferrugineus*



Fig. 1. Appearance of severe damages caused by the Red Palm Weevil (RPW, *Rhynchophorus ferrugineus*) on *Phoenix canariensis*. a, b: Total collapsing of the tree apex, c: cross section at the base of a palm showing the holes dug by the larvae.



Fig. 2. Description of *Rhynchophorus ferrugineus*. a: Cocoon, b,c,d: Male genitalia, e: Mandible tridentate, f: Scutellum (tapering broader), g: Pregelular suture elongate oval shape, h: Pseudotetramerous tarsus, i: Pygidium punctation, j: Pronotum (marked gradual curvature), k: Eggs, l: Last larval developmental stage, m: Nymph, n: First exit of an adult from the cocoon, o: Adult male, p: Male rostrum, q: Female rostrum.

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