

Red palm weevil *Rhynchophorus ferrugineus* (Col: Curculionidae) and mystery flower chafer cocoons found in a Canary Island date palm stump in the Algarve

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Abstract

Since the red palm weevil (RPW) has escaped from south-east Asia, it has spread worldwide, killing countless palm trees in its path. This weevil was first detected in the Algarve, Portugal, in 2007 and some time after that on the island of Madeira as well. While staying on the island in 2014 I collected RPW cocoons from a relatively tall stump of a Canary Island date palm *Phoenix canariensis*. Four years later, during a holiday in the Algarve, I found RPW and flower chafer cocoons in the remains of a very decomposed Canary Island date palm tree. This is a first report of flower chafers developing in such habitat in the Algarve.

Introduction

Palm trees have been used as ornamental trees in the Mediterranean for a long time, in particular the Canary Island date palm. Unfortunately, these iconic palm trees, which many of us associate with the landscape of some holiday resorts, have been decimated by a South Asian beetle: the red palm weevil. During the last two decades, this weevil has spread outside its native region mainly due to the movement of infested stock to the Middle East, Africa and the Mediterranean (Giblin-Davis et al., 2013). In 1995 it was first detected in south-east Spain and after that it has spread throughout the Iberian Peninsula. The females live just one season during which they can lay about 250 eggs. Generally, they lay their eggs in the crown of a palm tree and the larvae bore their way into the centre of the tree, developing relatively fast. Pupation is inside the trunk and the adults soon become sexually mature. In the Iberian Peninsula, less than one generation per year can be expected in areas with mean annual temperature below 15°C, and almost two where the mean annual temperature is above 19°C (Dembilio & Jacas, 2011). The freshly emerged females may either lay eggs in the same tree or disperse; they are very good flyers. In any case, by the time the tree starts showing signs of distress, the weevil has done far too much damage already. Some consider the RPW to be the most damaging insect pest of palms in the world; indeed, attempts at its eradication have proved problematic. First, expensive treatment needs to be systematically applied,



Figure 1. Photos taken in Calheta, Madeira, April 2014. – a. Row of Canary Island date palms by the seaside; the one in the foreground was killed by the RPW. – b. RPW cocoons, all empty. – c. RPW cocoon with a dead pupa inside, abdomen uppermost. – d. Canary palm tree stump.

ideally before infection sets in; second, infected trees need to be removed and totally destroyed, which is also very expensive.

I do not go to continental Portugal very often, but in 2013 palm trees with wilted fronds and palm tree stumps, were a familiar sight in the Lisbon area; apparently, the RPW had spread there from the Algarve where it was first detected six years earlier. Moreover, when visiting Madeira in 2014, I was shocked to see the same devastation there (figure 1a). The RPW had arrived on the island, most likely from infected stock from abroad. Ironically, this stock was used to give the iconic palm tree look to tourist resorts. While there I talked to someone at the Funchal Jardim Botânico and the consensus was that there was no point in treating their trees unless the same was done to all the trees on the island, which obviously was not the case at the time. Nevertheless, my curiosity was further aroused and I thought it would be nice to see these large weevils and their fat larvae in particular. In fact, they are popular as a food item; in New Guinea, the Asmat people seem to rely on RPW larvae for a source of fat in their diet (Menzel & D'Aluisio, 1998). I can assure you that I am not into entomophagy, just very curious about the RPW immature stage. Below are my findings during a couple of short holidays.



Madeira

A good opportunity arose in Calheta: the promenade was bordered by Canary Island date palms some of which had been killed recently (figure 1a). A quick look at the top of a stump, about 1.5 m. high, yielded a few empty cylindrical cocoons. Afterwards I collected another cocoon in a friend's garden, which had a dead pupa inside (figure 1b-c). All the cocoons were made mostly of fibres rolled along their axes. This fact and the very fibrous interior of the dead palm tree stem baffled me somewhat. Later, after reading about palm trees, I realised that the fibres were vascular bundles (Broschat, 2013). Palm trees have a special trunk. In cross-section it does not have rings; instead it shows hard tissue interspersed with vascular bundles (figure 1d). The vascular bundles carry water and other nutrients to the leaves; the hard tissue is the remains of fibrous leaf stalks, which are regularly pruned, thus leaving characteristic scars on the trunk. Quite possibly the RPW larvae sever the vascular bundles while feeding, causing extensive damage to the tree.

Algarve

In October 2017, during a holiday in the Algarve, I had another opportunity when I found a row of dead palm trees by a garage in Vila Nova de Cacela (figure 2a). They were all rather decomposed and extremely dry; this was not surprising, as the Algarve had been suffering from a drought for several years. I inspected only the stump on the far right, which was about knee high and very crumbly. Great chunks of it separated easily and revealed cross sections of the vascular bundles with RPW cocoons embedded in it (figure 2b). There were other cocoons as well (figure 2c-d); moreover, they were rather familiar to me. They were flower chafer cocoons (Coleoptera: Scarabaeidae: Cetoniinae) – a very exciting find.

The galleries were full of detritus; mostly faecal pellets (figure 2e). The faecal pellets were of two sizes: small ones, almost spherical (on average 2.3 x 1.6 mm.) and cylindrical ones (on average 5.5 x 1.9 mm.), slightly resembling mouse droppings. The latter are characteristic of flower chafers. The others could well have been from the RPW larvae but I could not find any information in the literature about their size.

Altogether I collected six RPW cocoons – all vacated, except for one with a dead imago inside, and four flower chafer cocoons, also empty (figure 2f). The RPW cocoons did not have quite the same aspect as the ones collected in Madeira. The vascular bundles were much thinner, still rolled round the axis, and they contained many other materials, thus reflecting the composition of their surroundings. I could not find anything about the way in which a RPW larva builds its cocoon. However, the procedure is well known with flower chafers; when a larva gets ready to pupate, it stops feeding and forms an



Figure 2. Photos taken in Vila Nova de Cacela, Algarve, October 2017. – a. Row of Canary Island date palm trees killed by the RPW. – b. Sample of the far right stump showing severed vascular bundles (dots) and several embedded RPW cocoons. – c, d. Flower chafer cocoons. – e. Faecal pellets: spherical and elongated. – f. Top row, flower chafer cocoons; bottom row, RPW cocoons, the second from the left has the remains of an imago.

oval-shaped pupal chamber. Inside this it builds a hard, thin-shelled wall by gradually compressing the surrounding materials and, at the same time, plastering the walls with its gut contents and possibly other secretions. Flower chafer cocoons have a much smoother inner surface than the RPW cocoons.

Discussion and conclusion

Given that the RPW's life cycle is shorter than the time that it would take a palm tree to decompose almost to ground level, the presence of their cocoons

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in the Algarve stump confirms that this weevil also targets dead palm trees. Indeed their removal is considered in the RPW eradication programme, but it did not seem to be implemented in that locality.

The most intriguing find was the strong evidence that flower chafers had also developed in such habitat. This raises the question, what species was involved?

As far as I know only two flower chafers have been associated with the Canary Island palm tree; these are *Potosia cuprea branco* Baroud and *P. opaca* F. In Spain, their larvae were found in the organic matter accumulated around the leaf scars in the trunk (Micó & Galante, 2003). *P. opaca* larvae have also been reported recently in Tunisia in the same habitat (Ben Jamâa *et al.*, 2017) but these cases were not associated with mortality. However, in the Iberian Peninsula both species have a very strong affinity for the dead wood of deciduous trees (Micó & Galante, 2002, 2003). *P. cuprea*, which has a very wide ecological range, has been associated with compost heaps and even ant colonies (in Vondráček *et al.*, 2018). This shift in diet from dead wood to humus-rich organic matter is not uncommon with some flower chafer species (Zbyryt & Oleksa, 2018). Therefore, either of these species could have developed in dead palm tree wood. Another species, *Cetonia aurataeformis* Curti, could also be a possibility but is less likely, as it is a slightly smaller species with a correspondingly smaller cocoon.

Larvae of their close UK relative, *C. aurata* L., have been found in all kinds of rich organic matter, from compost heaps to flower pots, as well as in dead wood (Fremlin, 2018). This is just speculation, of course. In practice, we may never find the answer to my question because these big chafers seem to be poorly recorded in the region (Peter Hodge, pers. comm.). More importantly, the opportunity to check palm tree stumps may not arise in the future if eradication programmes are strictly implemented.

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PS: bellow is a letter that appeared in the same issue.





LETTERS

Treating Canary Island date palm trees for the red palm weevil *Rhynchophorus ferrugineus*

Dear Sir,

I was very interested to read that in David Keen's area, El Saucejo, Sevilla, Spain, palm trees were being treated against the red palm weevil *Rhynchophorus ferrugineus* (RPW) (Keen, 2018) and it has stimulated me to write an article on this issue. The problem is, since the RPW was first detected in south-east Spain (Almuñécar, Andalusia) in 1995 it has caused tremendous devastation in the Iberian Peninsula because it has been very difficult to control (Giblin-Davis *et al.*, 2013). Indeed, as far back as 2012, I saw in Granada some palm trees with a telltale pipe running up the trunk. This was to deliver chemicals to the crown, the favourite spot for female RPW to lay their eggs. However, in order for this to work, all the palm trees in the region would have to be treated systematically following a strict eradication programme; by region I mean their range in Europe, as the RPW knows no frontiers – a tremendous challenge.

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A Note from Buckinghamshire

Dear Sir,

On the afternoon of the 1 August 2018 I visited Bacombe Hill near Wendover in Buckinghamshire to observe butterflies. I particularly hoped to see the Silverwashed Fritillary *Argynnis paphia*, which has recently re-colonised the hill after being absent for some decades. Bacombe Hill is a nature reserve on the escarpment of the Chiltern Hills and is an area of typical chalk grassland, scrub and woodland. As I entered the reserve, the first thing I noticed was the abundance of Large White *Pieris brassicae*, Small White *P. rapae* and Greenveined White *P. napi*, something I have noticed elsewhere in Buckinghamshire this year. The other thing of note was that the buddleias at the foot of the hill were bereft of any Peacock *Aglais io*, Small Tortoiseshell *A. urticae* or Red Admiral *Vanessa atalanta*. This came as an unpleasant surprise, because most