



New distributional record of red palm weevil, *Rhynchophorus ferrugineus* (Olivier) infesting arecanut in Assam, India

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The incidence of red palm weevil (RPW), *Rhynchophorus ferrugineus* F., in coconut plantations is a worldwide problem causing devastating damage to the plant and production. The first information on the red palm weevil was published in 1891 in Indian museum notes. This was supplemented by Lefroy (1906). It is a lethal pest of palms distributed in diverse ecological habitats and is reported to attack 17 species of palms in nearly 30 countries (Faleiro, 2006). RPW is a dreadful pest that attacks coconut palm in India and many countries in South and South East Asia (Nair, 2000). This pest is a native of Southern Asia and Melanesia locally called Asian palm weevil (Malumphy and Moran, 2007). The species is highly polyphagous. The pest attacks various palm species such as coconut (*Cocos nucifera*), date palm (*Phoenix dactylifera*), palmyrah palm (*Borassus flabellifer*), oil palm (*Elaeis guinensis*), talipot palm (*Corypha umbraculifer*), sugar palm (*Arenga sacharifera*), sedang palm (*Livistonia cochinchinensis*), etc. (Vidyasagar, 2007). Of late, the pest has shown its presence in other non-traditional areas of Assam, Meghalaya and Bihar. Survey conducted by Central Plantation Crops Research Institute (CPCRI), Kahikuchi across different districts of Assam revealed that the incidence of RPW on coconut was as high as 1.7 per cent in some parts of the state. In India, for the first time Dutta *et al.* (2010) reported RPW on a new host, arecanut, from Meghalaya state. In Southern India, the pest has been reported to be of minor importance with negligible decrease in arecanut production. The present study is the first report of occurrence of red palm weevil on arecanut from Assam.

Assam is the central part of North East India and extends between the latitudes of 24°8' N-28°2'N and longitudes of 89°42'E-96°E. The climate is warm and humid. The mean maximum temperature varied between 15-34 °C and the mean minimum temperature ranged from 6-22 °C with a relative humidity of 60-99 per cent. Assam receives typical monsoon rains, with the south west monsoon during May-August constitutes about 80 per cent of the total rainfall of 2000-2500 mm. The incidence of RPW was noticed for the first time during May, 2008 in bud rot affected arecanut palm. Later the RPW incidence has also been observed in basal stem rot affected arecanut palms. Bud rot and basal stem rot are important diseases of arecanut in Assam and Meghalaya. Survey undertaken by CPCRI, Kahikuchi described the incidence of basal stem rot in arecanut ranged between 20-45 per cent and incidence of bud rot with a range of 5-40 per cent, in different parts of states. Bud rot is more confined to younger palms (2-10 years) whereas, basal stem rot is comparatively more severe in older palms. Their mode of attack and physical symptoms are different in the case that lower and older leaves show the symptoms of basal stem rot whereas, the spindle and adjoining leaves show the symptoms of bud rot. The infested palms show signs of wilting, yellowing and drooping of leaves. The crown topples down and emits rotten foul smell. The RPW affected palm showed the symptom of some small circular holes (sometimes with dried frass) on the stem of bud rot affected palm with oozing out of brown viscous fluid and this could be seen about 1-3 ft below the crown (Fig. 1). In case of basal stem rot affected palms, circular holes are found near the base of the palm



Fig. 1. RPW affected palm

with oozing out of brown viscous fluid. After splitting the symptomatic stem, all the stages of RPW *i.e.* eggs, larvae, cocoons and adults, were observed within the palm (Fig. 2 A-D). The average infestation was recorded to be 0.3-1.3 per cent (n=2790) in the observed experimental plots of the garden.

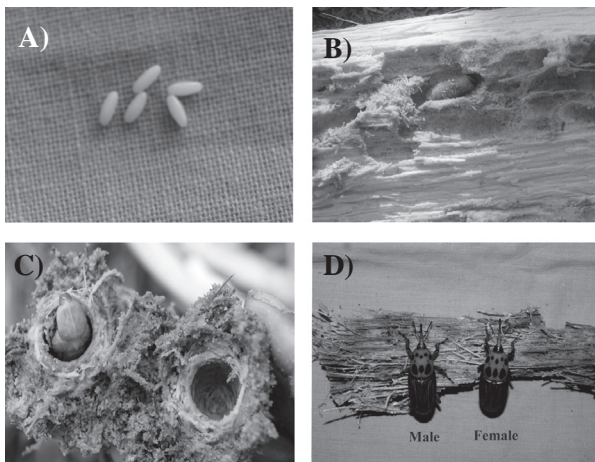


Fig. 2. Different developmental stages of red palm weevil: (A) Eggs, (B) Larva, (C) Pupa and (D) Adult

Infestation of RPW was observed in few of the basal stem rot affected arecanut palm. In case of bud rot affected palm, RPW enter through the rotten cabbage portion of the palm whereas in the basal

stem rot affected palm, RPW enter through the basal portion of the palm. On split opening the trunk, zigzag tunnels were seen with full of frass and larvae of RPW. The eggs, larvae, cocoons and adults collected from the infested arecanut palms were reared in the laboratory under room temperature artificially on finely ground arecanut frass for supplementary information. Fecundity, egg period, egg laying capacity, larval period, pupal period and adult longevity of RPW on arecanut was worked out. The same was compared to the published reports on the bionomics of RPW in coconut. All these observations were found to be in line both in coconut and arecanut. Adult lays whitish oblong eggs singly inside the inner tissues of the palm. The fecundity of single female was ranged between 50-160 eggs. Eggs hatch within 5-7 days. Larval period lasts for 60-78 days. Larvae are creamy with dark head measuring 3.5-3.8cm in length and are apodous in nature (Fig. 3). Fully matured larvae starts pupation by covering itself with fibres of palm (cocoons) which last for 15-18 days. Adult remain inside the cocoon for 8 days and thereafter, they comes out. Adult measures 2.5-3.5 cm (average 3.15 cm) long, 1.0-1.5 cm wide and weighed 0.64-1.28 g (average 0.94 g). The adult longevity in arecanut was 40-57 days. Adults are reddish brown to black in colour with 2-6 black spots of variable size on the pronotum (Fig. 4). The snout in males (0.6-0.9 cm) appears smooth and slender with a hairy pad at the apex; in females the snout (0.7-1 cm) is slightly longer without hairy pad.

There is no published record of the incidence of RPW either in arecanut or coconut in this state



Fig. 3. Fully grown larva

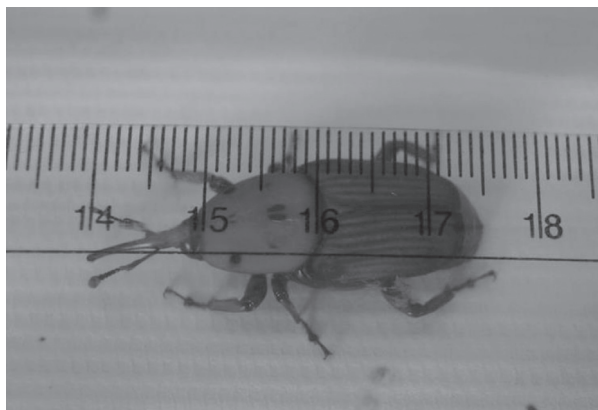


Fig. 4. Adult red palm weevil

and it is the first record of RPW in Assam on arecanut. As, the pest is mostly seen to attack the palms already infested with either bud rot or basal stem rot, it is highly pertinent to follow management practices against these diseases. Considering the pest status and the economic loss, adequate management strategies with insecticide and phytosanitation are greatly emphasized for managing the pest including prophylactic practices of filling the leaf axils with Chlory dust mixed with sand. A survey is needed to get information regarding RPW in different locations of the state and an action is required to prevent the spread of the pest to other areas of states.

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References

- Dutta, R., Thakur, N.S.A., Bag, T.K., Anita, N., Chandra, S. and Ngachan, S. 2010. New record of red palm weevil, *Rhynchophorus ferrugineus* (Coleoptera: Curculionidae) on Arecanut (*Areca catechu*) from Meghalaya, India. *Florida Entomologist* **93**(3): 446-448.
- Faleiro, J.R. 2006. Insight into the management of red palm weevil *Rhynchophorus ferrugineus* Olivier: Based on experiences on coconut in India and date palm in Saudi Arabia. In: *Fundacion Agroalimed* (Ed.). I Jornada, Internacional sobre el Picudo Rojo de las Palmeras (November, 2005). Fundacion Agroalimed. Valencia. Spain, pp. 35-57.
- Lefroy, H.M. 1906. The more important insects injurious to Indian agriculture. Govt. Press, Calcutta.
- Malumphy, C. and Moran, H. 2007. Red palm weevil *Rhynchophorus ferrugineus*. Plant Pest Notice, Central Science Laboratory **50**: 1-3.
- Nair, S.S. 2000. Integrated pest management of Red palm weevil- A ubiquitous enemy of coconut. *Indian Coconut Journal* **31**(3): 56-63.
- Vidyasagar, P.S.P.V. 2007. A brief report on red palm weevil research in India. RPW in India. http://www.redpalmweevil.com/RPW_Report/India.html.
- Zhang, R.Z., Ren, L., Sun, J.H., Wu, J. and Zeng, R. 2003. Morphological difference of the coconut pest insect, *Rhynchophorus ferrugineus* (Oliv.) and its related species (Coleoptera: Curculionidae). *China Forest Insect Pests and Diseases* **22**(2): 3-6.

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