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First record of the incidence of the coconut mite, *Aceria* (*Eriophyes*) *guerreronis* Keifer in Nigeria

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Abstract

The causes of premature nut fall of coconut palms in Nigeria were investigated. Coconut palms (Chowghat Green Dwarf (Indian), Malayan Yellow Dwarf and Malayan Red Dwarf were surveyed between May to August 2003.The primary cause of nut fall was identified as the attack of mite, *Aceria* (*Eriophyes*) *guerreronis* Keifer in the perianth. All three ecotypes examined were infested with a mean mite population of 187.94 ± 17.92 mites per nut. Mealybugs (*Pseudococcus* sp.) and some unidentified mites were also recorded. The role of these mites in the incidence of premature nut fall of coconut palms is discussed in this paper.

Keywords: Coconut, coconut mite, *Aceria guerreronis,* Nigeria

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Introduction

Three species of eriophyid mites have been found on Florida coconut palms (Keifer 1962a,c; 1965). Two species were described in 1962 as *Acritonotus denmarki* Keifer and *Amrinus coconuciferae* (Keifer) (Keifer, 1962a,c). A third species, *Aceria guerreronis* Keifer (Acari: Eriophyidae) was described in 1965 from coconuts in Mexico (Keifer, 1965) and confirmed in Florida in 1984 (Howard *et al.*, 1990). After its first report in 1960 in Mexico, it was widely noticed in several countries in South America and Caribbean region and parts of Asia and Africa.

The mites suck the plant sap with their needle like mouthparts, living on the tender meristematic region covered by the perianth. The first symptom of mite attack is the appearance of elongated white lines below the perianth. Within a short time these feeding marks appear as pale yellow triangular patches below the perianth and gradually turns brownish in colour. As the nut grows, the injury forms warting and longitudinal fissures on the nut surface. Severe infestation by the mite results in poor development of nuts with reduced kernel weight and poor quality of fiber. Infestation by the mite during early stage nut development results in excessive button shedding. Severe infestation results in 20-25% reduction in copra, along with reduction in fiber content (Nair *et al.*, 2001).

Materials and methods

This investigation was undertaken in continuation of the search for the causes of premature nut fall of coconut palms in Nigeria. Different cultivars of coconut palms (Chowghat Green Dwarf (Indian), Malayan Yellow Dwarf and Malayan Red Dwarf) were surveyed. The button stage nuts fallen on the ground were picked up daily and examined in the laboratory. The perianth (calyx ends) of each nut were split opened into six portions and examined under the microscope at 400,160 or 63 magnification, for presence of mites. The mite population was assessed per nut. The total number of fallen nuts, number of intact immature nuts and number of infested intact nuts on the palm were also assessed with the aid of a binocular.

Results and discussions

Mites were identified by examining the specimens under microscope (400 magnification), matching the morphological characteristics with the original description and also comparing with photomicrographs of *Aceria guerreronis* illustrated in CPCRI Annual Report (2002). The predominant mite was identified as *Aceria guerreronis* Keifer. The mites were mostly found in the calyx end of the nuts. In seventeen coconut palms (1 nut/palm) examined between May to August 2003, all three ecotypes (Chowghat Green Dwarf (Indian), Malayan Yellow Dwarf and Malayan Red Dwarf) were infested and each nut harbored a mean mite population of 187.94 ± 17.92. Fig.1 depicts some fallen premature nuts with visible symptoms (pale brownish-yellow triangular patches just below the perianth, which gradually turn brownish in colour). Fig. 2 shows intact nuts with symptoms of attack on one of the coconut palms sampled.

Fig.1. Fallen nuts with visible symptoms of mite attack (pale-yellowish triangular patches)

Fig. 2. Some intact nuts with symptoms of attack

Other unidentified mites of the family Tetranychidae and Pyemotidae, in addition to some mealybugs (Pseudococcidae) were also observed. Up to 67% natural mortality of *A. guerreronis* was recorded.

Though Howard *et al.* (1990) reported that the coconut mite, *A. guerreronis* damages floral bracts and scars developing on coconuts in West Africa, Brazil and throughout the Caribbean region, including Mexico, Colombia, and Venezuela; this is the first record of the occurrence of the mite in Nigeria. Reports on the destructive effects of mites at Kayangulam, India, indicated that infestation by the mite during early stages of nut development results in excessive button shedding, reduction in copra and reduction in fibre content (CPCRI, 2001). Findings made in India have indicated that there are some successes in the management of this pest. These measures could be validated in Nigeria.

There are possibilities for the biocontrol of the mite using predacious mites, insects and entomopathogenic fungus, like *Hirsutella thompsonii*. A mycoacaricide formulated from *H. thompsonii* ("mycohit") has been found effective in providing up to 80% mortality of mite population depending on various environmental factors. Spraying of affected palms with a mixture of 2 percent neem oil, garlic and soap mixture has been found effective (Kumar and Singh, 2002a,b). Azadirachtin (a botanical) 0.004 percent was found useful and gave a good control of the pest in the field.

Various chemical pesticides including carbosulfan have also been found effective for mite management in studies undertaken at CPCRI. The pesticides should be applied only on the perianth region of nuts to ensure its penetration into the perianth lobes and inner surface through capillary action. Before spraying, the mature bunches should be harvested, and care taken to avoid spraying unpollinated bunches.

After this first record of the coconut mite, *A. guerreronis* in Nigeria, further investigations on the population dynamics and field ecology of this pest for 2-3 years will help in the analysis of the key factors governing the occurrence and distribution of this pest in Nigeria.

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