



Insect vectors

Searching for the vectors of coconut lethal yellowing: a 50 year unfinished journey

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Abstract

The insect vectors of coconut lethal yellowing have proved elusive. Long running studies in the Caribbean, central America and southern USA have implicated some species and made others more likely. Long running surveys in both east and west Africa have identified many planthoppers and some leafhoppers associated with palms. Occasionally some have shown positive for phytoplasmas. But even after such a long period of study are we little further in identifying the vectors and being able to use this information? This review will give an overview of the work carried out in the various regions where coconut lethal yellowing is found.

Keywords: leafhopper and planthopper vectors, lethal yellowing of palms, Auchenorrhyncha

Introduction

Lethal yellowing (LY) disease of coconut has been recognised and known by different names for a very long time, perhaps as early as the late 1800's in the Caribbean and at least a hundred years in both East and West Africa (Eden-Green 1997, Howard, 1997). Many kinds of organisms were suspected as being possible vectors but developments in the 1970's made progress possible (Howard, 1997). In a review by Howard (1997) on LY vector studies in the Caribbean he indicated that in the 1970's knowledge that phytoplasmas are associated with plant diseases was a recent discovery and that they were generally transmitted by Auchenorrhyncha was also becoming accepted (Whitcomb and Davis, 1970).

Materials and Methods

This review is based upon papers by Wilson (1987a, 1987b, 1988, 1997 and 2002) and more recent studies (Kwadjo *et al.*, 2018). The survey areas have been based on east and west Africa as well as literature studies on the Caribbean and Central Americas.

Results

From the early 1970's Howard and colleagues were surveying for potential vectors of LY in Florida and others were beginning studies in the Caribbean (Howard, 1997). Their studies focussed on the abundant cixiid planthopper *Haplaxius crudus* (van Duzee), which was shown to be a

potential vector for this disease by Howard *et al.* (1983).

A wide variety of Auchenorrhyncha families and species may be found on coconut and some may be abundant (Wilson, 1987a, 1987b), however rather a few seem to be dependent on coconut for their whole life cycle. As noted by Wilson (1997) the Auchenorrhyncha faunas of east and west Africa are largely distinct with only one or two common species that overlap.

Discussion

The search for any vector species involves a considerable commitment to sampling and analysis. The wider use of molecular techniques has enabled more rapid assessment of the potential of insect species to be the vectors of LY. Clearly much still needs to be discovered. Any control measures might be much more problematic. The time taken to grow and test coconut palms for resistance does not easily allow for a rapid solution to this long standing problem.

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