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Coconut Cadang-cadang Viroid Infection of African Oil Palm*

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Cadang-cadang is an uncontrollable quarantinable lethal disease reported to have killed over 40 million coconut palms in the central Philippines since first being described in 1914. It spreads naturally by unknown means, attempts at eradication have never been successful, and in the absence of genetic resistance, it is managed only by removal of affected palms and replanting. Extraction, fractionation, physical characterisation, expression of symptoms in inoculated coconut seedlings, recovery of viroid, and sequencing, have confirmed that Coconut cadang-cadang viroid (CCCVd; Cocadviroid, Pospiviroidae) is the causal agent of cadang-cadang disease.

CCCVd has been detected in oil palm plantations derived from DxP hybrids in Oceania and SE Asia. There is a close association between the detection of the viroid and the presence of a specific type of orange spotting (OS) of oil palm leaflets. Oil palms containing CCCVd and showing OS are markedly stunted, and there is evidence for horizontal and vertical spread of the viroid and OS in commercial plantations.

Viroid molecules isolated from a Malaysian oil palm have been shown to be closely related in sequence and structure to type CCCVd isolates. Scaling up of the detection and sequencing of the oil palm viroid molecules is needed to study their incidence, transmission, spread, pathogenicity, replication and host response to infection. Viroids are molecular plant pathogens which cause economic losses in many species. The oil palm industry needs to determine the effect of viroid infection on yield and quality, and to evaluate the benefits of excluding infected germplasm from future oil palm plantations.

Keywords: *Oil palm, Elaeis guineensis, coconut palm, cadang-cadang disease, CCCVd, cocadviroid, sequence variants, molecular diagnostic methods.*