

4-Characterization and diagnostic of Yam virus X (YVX) and Yam necrosis virus (YNV), two novel viruses infecting yams in Guadeloupe

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Several viral species infecting cultivated yams (*Dioscorea* spp.) are known. They include viruses belonging to the families *Alphaflexiviridae* (genus *Potexvirus*), *Betaflexiviridae* (genus *Carlavirus*), *Caulimoviridae* (genus *Badnavirus*), *Cucumoviridae* (genus *Cucumovirus*) and *Potyviridae* (genera *Macluravirus* and *Potyvirus*). However, it is widely acknowledged that yet uncharacterized viral species are present in yam germplasm collections worldwide and could be propagated through the distribution of infected germplasm. Therefore, viruses are currently the major constraint for much needed exchanges and distribution of yam germplasm.

In order to promote the safe exchange of yam germplasm conserved in the Guadeloupe Biological Resources Center of Tropical Plants (CRB-PT), searches for new virus species in yams were undertaken. *In silico* analyses of ESTs of *Dioscorea alata* were performed and unveiled the existence of sequences corresponding to several known genera of yam viruses, such as *Badnavirus* and *Macluravirus*, and also to families of unknown yam-associated viruses, including *Geminiviridae* and *Secoviridae*. RT-PCR were performed on crude extracts of symptomatic yams (*D. alata*, *D. trifida*) following direct binding of viral particles and using degenerate primers. Amplification products were cloned and sequenced. Some of them displayed significant levels of homology with potexviruses and with viruses of the family *Secoviridae*. The 3' ends of the corresponding viral genomes were successfully amplified by 3' RACE, cloned and sequenced. Phylogenetic analyses confirmed the existence in yams of one new viral species within the genus *Potexvirus* (tentatively named Yam virus X, YVX) and one within the family *Secoviridae* (tentatively named Yam necrosis virus, YNV). The experimental host range of both viruses was explored through mechanical inoculation on various herbaceous plants.

Molecular diagnostic was developed for both YVX and YNV using direct binding reverse transcription PCR (DB-RT-PCR) and used to perform a prevalence study of both viruses in the Guadeloupe CRB-PT yam germplasm collection.

Keywords: yams; *Potexvirus*; *Sadwavirus*; diagnostic