

COST Action FA0807
Integrated Management of Phytoplasma Epidemics
in Different Crop Systems

Workshop WG1-WG4

Phytoplasma Classification

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COST ACTION FA0807 WORKSHOP WG1-WG4 PROGRAM

Friday July 16, 2010

14:00-18:00	Phytoplasma Classification Convenors: Saskia Hogenhout and Bojan Duduk
14:00-14:30	Minimum Standards to Name New Species of <i>Mollicutes</i>: Deposition of reference Strains Daniel R. Brown
14:30-14:50	Phylogenetic Diversity of Phytoplasma Proteins Suggested by Phylogenetic Analysis Using the Whole Genomic Information Kenro Oshima, Hiromi Nishida, Kyoko Sugawara, Nobuko Kojima, Yutaro Neriya, Misako Himeno, Ayaka Hoshi, Yoshiko Ishii, Shigeiuki Kakizawa, Shigetou Namba
14:50-15:10	Apple Proliferation Taxonomy and Molecular Genetics Michael Kube, Bernd Schneider, R. Reinhardt, Eric Seemüller
15:10-15:30	Combined Actual Gel and Virtual RFLP Analyses for Identification and Classification of Phytoplasmas Ing-Ming Lee, Yan Zhao, Wei Wei, and Robert E. Davis
15:30-15:50	Identification of Phytoplasmas Using DNA Barcodes of Selected Genes Nicoletta Contaldo, Olga Makarova, Samanta Paltrinieri, Assunta Bertaccini, Mogens Nicolaisen
15:50-16:10	Break
16:10-16:30	Taxonomy of Phytoplasmas Associated with Coconut Lethal Yellowing-Type Diseases Matt Dickinson, Michel Dollet, Nigel Harrison
16:30-16:50	Insight into the Genetic Diversity among Phytoplasmas in the Stolbur Group Fabio Quaglino, Nicoletta Contaldo, Bojan Duduk, Davide Pacifico, Cristina Marzachi, Xavier Foissac, Yan Zhao, Piero A. Bianco, Wei Wei, Paola Casati, Robert E. Davis, Assunta Bertaccini
16:50-17:10	Genetic Diversity of Flavescence Dorée and Closely Related Phytoplasma Strains of the 16SrV Taxonomic Group in Europe Assunta Bertaccini, Elisa Angelini, Patricia Carle, Bojan Duduk, Luisa Filippin, Xavier Foissac, Marta Martini, Samanta Paltrinieri, Pascal Salar, Sylvie Malembic-Maher
17:10-18:00	Discussion

Taxonomy of Phytoplasmas Associated with Coconut Lethal Yellowing-Type Diseases

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A major factor that impacts on coconut productivity in Africa, the Caribbean, Florida and Central America, is disease, and in particular, lethal yellowing-type diseases caused by phytoplasmas. Lethal Yellowing (LY) was the first name used to denote the disease in Jamaica, where a second epiphytotic, in which an estimated 3 million palms have been killed, has been underway since the late 1980s. The resistance of both the Malayan Dwarf (MD) ecotype and hybrid MayPan that were introduced to combat the disease following the first epiphytotic in the early 1970s has, for as yet unknown reasons, apparently broken down. Syndromes of LY are characterised by premature fruit drop, blackening of new inflorescences, a progressive yellowing of leaves followed by death of the stem apex leaving bare trunks or 'telephone poles'. In Florida and the Caribbean 16SrIV phytoplasmas are associated with the coconut LY syndrome. Based upon RFLP profiling there are several sub-groups of strains that affect numerous palm species (e.g. date palm, Mexican fan palm and Queen palm) besides coconut. In Africa, coconuts can also be affected by lethal syndromes similar to LY and referred to as Lethal Yellowing-Type Diseases (LYTD). Whilst these have historically been considered as members of 16SrIV, studies based on the 16S-23S rDNA and genes such as *secA* suggest they should be classified into other groups. In Tanzania and Kenya, the resident strain is referred to as Lethal Disease Tanzania (LDT), which is sufficiently different to those in the Americas to warrant assignment to a new 16Sr group although this has not been formally proposed so far. Strains occurring in the West African countries of Nigeria (Lethal Disease Nigeria LDN, known locally as Awka Disease), Togo (Maladie de Kaïncopé) and Ghana (Cape St Paul wilt disease) are very similar to each other, but sufficiently different from all others according to virtual RFLP analysis to represent yet another distinct group. As such, they have recently been assigned to group 16SrXXII. Surprisingly, the strain identified in Mozambique (East Africa) belongs to the same group as West African isolates, despite the fact that Mozambique borders Tanzania. So far, none of the African strains have been detected in any palm species other than coconut although the syndromes they incite are virtually indistinguishable from those associated with LY in the Caribbean. Recently, phytoplasmas have been implicated with coconut diseases in India (e.g. Kerala wilt), Indonesia (e.g. Kalimantan wilt), Malaysia (Coconut yellow decline) and Sri Lanka (Weligama wilt). However, symptoms indicative of these diseases are less severe than those of LY-type diseases, and the phytoplasmas involved belong to different taxonomic groups (16SrXI and 16SrXIV); two groups commonly associated with diseases of grasses, rice and sugarcane.