



Table of Contents

Programme.....	3
Abstracts of presentations.....	4 -19
Abstracts of posters.....	22-31
Index.....	32
Sponsors.....	33-34

Western Cape Branch

SYMPOSIUM

03 April 2023

Neethlingshof Wine Estate

Programme

Abstracts

INDICANTS project : Innovative Diagnostics for banana pathogens Surveillance

I Robène^{1,2,*}, S Bothma², V Maillot-Lebon¹, Y Pecrix¹, B Fenelon¹, M Matthews², B Reynaud¹, B Coetzee², M Arietta-Salgado³, E. Wicker³, Y Chilin-Charles⁴, C Gianinazzi⁵, D Mostert², A Viljoen²

¹CIRAD, UMR PVBMT, F-97410 Saint-Pierre, Réunion Island, France.

²Department of Plant Pathology, Stellenbosch University, Stellenbosch 7602, South Africa.

³CIRAD, UMR PHIM, F-34398 Montpellier, France.

⁴CIRAD, UMR PHIM, F-97130 Capesterre-Belle-Eau, Guadeloupe, France.

⁵Qualiplante SAS, Cap Alpha, 34830 Clapiers, France.

*Email: Isabelle.robene@cirad.fr

Abstract. Banana is a major staple in developing countries and the most-eaten fruit in Europe. Global banana production is constrained by several diseases responsible for yield losses and low productivity which may compromise food security. Four vascular diseases are of particular concern: Fusarium wilt disease of banana caused by the fungus *Fusarium oxysporum* f.sp. *cubense* (Foc TR4), Moko and banana blood diseases, caused by *Ralstonia solanacearum* and *R. syzygii* subsp. *celebesensis*, respectively and Xanthomonas wilt of banana caused by *Xanthomonas vasicola* pv. *musacearum*. Efficient surveillance and plant disease management require the availability of Point of care (POC) diagnostics that can be operated directly on-site. The main objectives of the INDICANTS project were to (i) develop low-cost multi-pathogens LAMP (Loop-mediated isothermal amplification) assays that will be further processed into ready-to-use kits by a private company; (ii) compare different simplified DNA extraction methods for field application; (iii) validate the LAMP protocols via interlaboratory tests and field surveys. Specific DNA targets were selected for the bacterial pathogens using in silico comparative genomic analysis of target and non-target genomes. LAMP primer sets were designed for each pathogen and showed 100% specificity when assayed on a wide range of target and non-target strains. A limit of detection of 104 CFU/ml was obtained for the LAMP assays. A simplified DNA extraction method from banana tissue was developed and successfully validated in a banana plantation infested with FocTR4 using several candidate LAMP primer sets. Ready-to-use kits based on these protocols are currently being developed by a private company. These POC rapid diagnostic tools will allow rapid identification of the different diseases in the field and improve disease management.

Keywords: LAMP; diagnostics; banana; bacterial and fungal diseases