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HIGH-THROUGHPUT GENOTYPING OF VCGs FUSARIUM OXYSPORUM PATHOTYPES FOR POTENTIAL SELECTION OF BANANA RESISTANT MUTANTS

Fusarium wilt of banana (Panama disease), is a lethal fungal disease caused by the soil-borne fungus *Fusarium oxysporum* f. sp. *cubense* (Foc). Development of stable forms of resistance to this disease depends upon identification of resistances effective against the prevalent Foc populations in banana growing areas. Yet, many methods are not suitable for developing countries with varying levels of laboratory infrastructure. Here, we optimized low cost method for genotyping vegetative compatibility groups (VCGs) Foc pathotypes for selecting banana mutants to ensure durability of the resistance. An enzymatic mismatch cleavage assay for the haploid *F. oxysporum* was developed. It was optimized in different Foc VCGs to detect allelic variants of target pathogenicity genes (SNF1 and FOW2). Enzymatic mismatch cleavage using PCR primers specific for SNF1 and FOW2 genes has detected different allelic mutations among the VCGs. Differences of band patterns among the digested products of different isolates were clearly observed by agarose gel electrophoresis. Novel nucleotide variation was detected among Foc "Tropical Race 4" VCG 300, 194, and 1036 strains. This method is potentially of great value in the characterization of the banana fusarium wilt VCGs pathotypes. For example, in laboratories without sequencing facilities and where VCG testers of Foc cannot be used because of national quarantine regulations, this low-cost method can be used to rapidly and accurately detect Foc "Tropical Race 4" VCGs 300, 194, and 1036 strains. This may be especially important in new geographical regions where this pathogen is introduced, and immediate management practices are needed. In principle, the strategy proposed here might be suggested to be widely applied to a variety of necrotrophic and biotrophic plant pathogens to be used for selection disease resistant mutants.

Country or International Organization

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