Preliminary analysis of association of wilt disease resistance gene in banana

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Materials and Methods

- We chose some typical 32 banana germplasms.
- The genotype of germplasms of banana were identified by SSR marks.
- Banana population was evaluated using the STRUCTRE software.
- Correlation analysis is calculated by using TASSEL software.
Introduction & Objectives

• Correlation analysis is the analysis method of identification of the relationships between the target traits and genetic markers or candidate gene.

• The Banana fusarium wilt has brought a devastating disaster to the production of banana. The germplasm resources in banana are richer and some disease-resistant germplasms have been brought more attention to the scientist.

• The progress of association of wilt disease and its resistance gene on banana was poorly reported, which may cause the partial failure of breeding by using germplasms of banana.

• In this paper, banana germplasms were analyzed on the association in order to find the loci closely associated with resistant gene of FW.
Results of structure

- The 32 germplasms are divided into three groups which are domestic plantain group, ABB group, and AAA group.

Figure 1 The group structure analysis by using $\Delta K$

Figure 2 Clustering results of Triangle group
Results of Association analysis

• Linkage disequilibrium analysis showed that the $r^2$ among markers are in the range of 0-1 and the average is 0.06. D' is in the range of 0-1 and the average is 0.52.

• A total of 22 loci out of 358 were detected to relate with the resistant traits.

• Four loci were significantly correlated (p<0.001) with FOC race 1, which are mw48-2, mw48-8, mw49-3 and mw81-3.

• Seven loci were associated with resistant trait to FOC race 4, of them one loci was significantly correlation.

Figure 3-4 SSR locus related significantly with the resistant trait for FOC race 1 and race 4
Conclusions

• The genomic diversity among the varieties of the dwarf banana and plantains groups are richer.

• The method of this experiment will provide the foundation in future for Association analysis of banana germplasm.

• In this study an association analysis of linkage disequilibrium dig out some SSR loci linked with disease resistant traits.