Tropentag, September 17-19, 2018, Ghent

"Global food security and food safety:
The role of universities"

Genetic Diversity and Population Structure of Red Pericarp Rice from Madagascar and Togo Using SSR Markers

Claudine Razanaboahirana[1], Martina Kyallo[2], Moussa Sie[3], Yao Nasser[2]

[1]*FOFIFA / Institut Polytechnique UniLaSalle, Rice Research / Plant Breeding, France*
[2]*International Livestock Research (ILRI), Biosciences eastern and central Africa (BecA), Kenya*
[3]*Africa Rice Center, Breeding Task Force, Madagascar*

Abstract

Red pericarp on rice (*Oryza* spp) is one of the traits which interests breeders and farmers in Madagascar. However, there are no genetic diversity studies done on this specific rice in Madagascar. Research reporting of traditional varieties are a source of variation. Understanding the genetic diversity in the available genotypes is very important for the crop improvement. The objectives of this study are to assess the genetic diversity and relationship of rice accessions from Madagascar and AfricaRice genebank, and to build a core collection of these accessions for conservation and for starting point of a breeding program.

20 SSR markers were used to characterise 238 genotypes from FOFIFA (National Center for Applied Research and Rural Development), AfricaRice genebank and also from farmers preferred varieties.

A total of 192 alleles were detected among the 238 genotypes. The number of alleles varied from 4 (RM21) to 20 (RM11 and RM164) with an average of 11.29 per locus. The mean PIC value per locus was 0.64 with a maximum value of 0.81 recorded for SSR marker RM 001 and lowest value of 0.15 observed for SSR marker RM215. Heterozygosity varied from 0.01 (RM168 and RM 256) to 0.27 (RM205 and RM222) with an average of 0.12. The principal coordinate plot showed two distinct clusters, African rice genotypes grouped in cluster I and Madagascar genotypes in cluster II, and the cluster II subdivided into three subgroups A, B, C. The analyse of molecular variance (AMOVA) revealed that 38 % of the variation was attributed by difference among individuals, 47 % among population and 15 % of variation was associated with individuals. 61 genotypes were assembled to present the core collection, 17 are African genotypes. Genotypes from Madagascar are very diverse, however those from AfricaRice can be source of private alleles.

Keywords: Genebank, genetic diversity, *Oryza* spp, red pericarp, traditional variety

Contact Address: Claudine Razanaboahirana, FOFIFA / Institut Polytechnique UniLaSalle, Rice Research / Plant Breeding, 19 Rue Pierre Waguet, Beauvais, France, e-mail: jeanne.razanaboahirana@etu.unilasalle.fr