

Study of Burkina Faso rice landraces diversity and breeding for resistance to Rice Yellow Mottle Virus (RYMV)

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Introduction

In Burkina Faso, rice is the 4th staple food after sorghum, millet and maize. It is cultivated mainly in lowland ecosystems (1), rainfed (67%) or irrigated (23%), where Rice Yellow Mottle Virus (RYMV) is an important threat. Two types of resistance to RYMV have been reported: a high-resistance in *Oryza sativa* (2) and *O. glaberrima* and a partial-resistance in *Oryza sativa* (3). They are controlled respectively by a single recessive gene (*rymv*) and several genes. Unfortunately, these resistances were recently overcome by some new RYMV isolates. New sources of resistance are needed. We are reporting here the first steps of search for new resistance alleles and genes undertaken among the Burkina Faso rice genetic resources.



Fig. 1: Burkina Faso map highlighting the collection area



Fig. 2: Woman Collecting rice seed sample in a granary

Material & methods

> Collect and field characterisation

Five hundred twelve rice accessions, including 50 *O. Glaberrima*, were collected in 59 villages in 2008 and were phenotyped in an augmented design layout using 7 checks repeated in 18 blocks, using 24 qualitative and 23 quantitative traits (4). Data were analysed by using GENESTA 9th edition and XLSTAT 2009.

> screening for RYMV

Four hundred and twenty five accessions were screened for resistance to RYMV with normal and resistance breaking isolates at WARDA.



Fig. 3: Collection characterization in the field

Results

> **Field characterisation** : Ascendant Hierarchical Clustering (AHC) analysis of quantitative and qualitative traits, undertaken separately, identified 3 groups. The qualitative traits had the best discriminating power between *O. sativa* and *O. glaberrima* (Figure 4). The qualitative trait that most contributed to determining the groups were the ligule shape, the pericarp colour, panicle secondary branching, flag leaf angle.

> **Screening for resistance to RYMV**: Greenhouse screening at WARDA revealed that 44% of the *O. glaberrima* accessions were resistant against only 1.42% for *O. sativa* confirming the hardness of *O. glaberrima* the African rice in presence of local constraints.

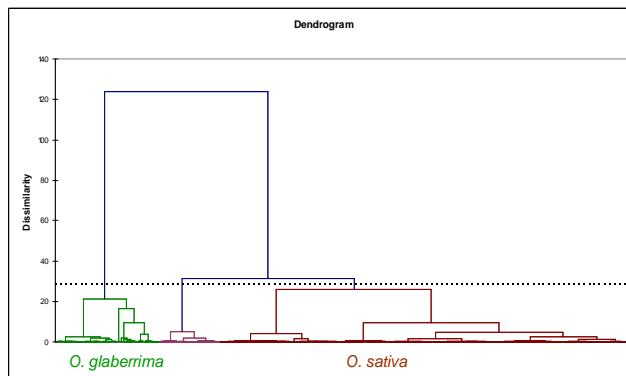


Figure 4: AHC analysis of 340 rice accessions based on 24 qualitative traits

Perspectives

Analysis of the genetic diversity of the collected accession is undertaken at CIRAD-Montpellier, using 26 polymorphic SSR markers. The gels running is finished and the data scoring is ongoing. They should help establishing a core collection of local rice varieties of Burkina Faso.

The resistant accessions identified in greenhouse are being double checked at IRD-Montpellier, and genotyped for *rymv-1* gene to look for new allele at this loci. The process may lead to identification of new loci involved in resistance to RYMV.



Fig. 5: Accession resistant to the three RYMV strains

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