



Genotype x Environment Interaction and stability analysis of agronomic performance in aromatic rice accessions in Benin

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ABSTRACT

Objectives: Aromatic rice accessions are playing a vital role in global rice trading. The present study aimed to assess agronomic performance and evaluate the genotype by environment interaction in aromatic rice accessions from Benin in order to select agronomically stable genotypes.

Methodology and Results: the plant material was composed of a collection of 28 aromatic rice accessions evaluated in two different locations based on 11 quantitative traits. Through descriptive statistics, the results revealed that the 28 individuals presented good agronomic performance across the two environments. Genotypic effect assessed based on ANOVA showed high significant difference between the varieties for almost all traits indicating the existence of wide phenotypic variability in the collection. The effect of Genotype x Environment interaction evaluated by using data from the two locations in an ANOVA showed significant effect on five traits out of the 11 studied. By considering the three factors (genotype, environment and Genotype x environment) it was identified that the characters PH, NFeT and CSM were the traits mostly influenced. Therefore, based on the variability observed in these traits, specific adaptability was performed through AMMI and enabled to identify the genotypes, which present some adaptability to the different locations. Based on genotypic superiority calculated for the three most variable traits as stability index, the genotypes ARA01, ARA16, ARA17 and ARA18 are the most stable aromatic rice accessions.

Conclusion and application of results: The results of this study indicated that the environment did not influence the grain yield performance while the GxEI contributed the least phenotypic variation in PH, NFeT and CSM. The different stable genotypes identified in present study could serve as parent in a breeding program of aromatic rice.

Keywords: Aromatic rice; Genotype x Environment interaction; agronomic performance; Stability index; Benin