

ABSTRACT OF THESIS

Thesis title: ABIOTIC STRESS TOLERANCE OF RICE FOR THE DEVELOPMENT OF AEROBIC RICE PRODUCTION SYSTEMS

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Rice cultivation, highly water-intensive, necessitates innovative irrigation methods to enhance yields. In this study, phenotypic data, including biomass, yield, harvest index assessments, drought sensitivity and spectrometry indices (IAD, CCI, CRI1, CNDVI, PRI, WBI, DCNI) were collected for thirty-five rice genotypes, being Irat 109, Marilla and Dáma the parental lines. Fingerprinting using CDDP markers facilitated genetic relationship analysis, highlighting promising markers like ABP1-1, MYB, WRKY, ERF, and KNOX, based on indexes calculated by iMEC: Online Marker Efficiency Calculator. The genetic relationships between the samples were explored through Principal Component Analysis, Jaccard index and a dendrogram. Regarding Drought Sensitivity (DRS), the Hungarian varieties, Marilla and Dáma, were badly affected while Irat 109 showed resistance. The samples that suffered milder effects regarding drought sensitivity were similar to Irat 109. As for the spectrometer data, the analysis revealed significant impacts on chlorophyll and nitrogen levels. Through the fingerprinting several polymorphic alleles were found between the drought sensitive/resistant genotypes. Based on the presence/absence of the score fragment, the genetic similarity of the samples were assessed.