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Evaluation of intraspecific morphological diversity of selected short duration rice *(Oryza sativa* L.*)* genotypes in low country wet zone of Sri Lanka

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Abstract
Erratic climatic changes pose a significant threat to rice cultivation, making it challenging to meet the current demand for rice. To overcome this challenge, the adoption of short-duration rice varieties can prove to be an effective solution to sustain rice production. The current study aimed to characterize a germplasm of 39 newly improved short-duration rice genotypes to identify promising lines that can be used for developing high-yielding short-duration varieties, which are better suited for the Low Country Wet Zone of Sri Lanka. The experiment was laid as a randomized complete block design (RCBD) with two replicates at the Rice Research Station, Labuduwa, Sri Lanka. The data were recorded on nineteen different agro-morphological traits. The varietal differences of these thirty-nine rice genotypes were analysed through an ANOVA and mean comparison was carried out using Duncan's Multiple Range Test (DMRT). A hierarchical dendrogram was created to identify the similarities and differences between these genotypes through cluster analysis. The rice germplasm exhibited sufficient morphological variation for most of the qualitative and quantitative traits. Highly significant differences ($p<0.05$) were observed for the traits such as plant height; effective tiller number; days to heading, flowering, and maturity; flag leaf characteristics; internodal length; root characteristics; grains per panicle; grain characteristics such as grain length, grain width; 1000 grain weight; and yield per plant. Based on the cluster analysis, approximately nineteen genotypes formed a cluster of high-yielding rice varieties, characterized by their ability to reach the flowering stage in less than 65 days. Similarly, the rice genotype IRLON 9 stood out by reaching the flowering stage in just 63 days, while producing a higher grain weight (27.9 g) and yielding more per plant (21.9 g). Likewise, IRLON 61 exhibited a higher yield per plant (39.6 g) with a short flowering period of 65 days. These particular genotypes exhibit excellent performance for various traits, which can be utilized for the development of short-duration, high-yielding rice varieties in future breeding programs.

Keywords: Clustering, Flowering, Morphology, Short duration, Yield

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