

**EVALUATION OF AGRONOMIC TRAITS UNDER DROUGHT
STRESS OF RICE (*Oryza sativa* L.) IN THE UP-COUNTRY
INTERMEDIATE ZONE OF SRI LANKA**



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ABSTRACT

Drought stress is a major abiotic constraint affecting rice (*Oryza sativa* L.) growth, productivity, and yield stability, particularly in rainfed regions. The present study aimed to evaluate the morphological responses of thirteen rice accessions under drought stress and control conditions to identify tolerant varieties suitable for breeding and cultivation in water-limited environments. The experiment was conducted in a Completely Randomized Design (CRD) with eight replicates per accession. Drought stress was imposed at 50% field capacity, and morphological traits, including plant height, leaf length, leaf width, number of leaves, number of tillers, and number of panicles, were measured. The Standard Evaluation System (SES) developed by IRRI (2002) was employed to assess drought tolerance levels.

Significant varietal variation was observed across all measured traits under drought stress. Among the improved varieties, Bg 251, Bg 381, and Ld 376 exhibited relatively stable growth and higher tolerance to moisture stress, maintaining consistent plant height and leaf morphology. In contrast, Bg 314 and Bg 377 showed reduced growth, indicating higher drought sensitivity. Notably, Bg 252 displayed improved vegetative traits under drought, suggesting possible osmotic adjustment and adaptive responses. Traditional accessions such as *Dahanala* (Ac 627), *Niyamwee* (Ac 1370), *Kahatasamba* (Ac 327), and *Kirimurunga* (Ac 340) reported tolerance, maintaining or increasing leaf area and tiller numbers under drought stress. *Suwandal* (Ac 579) and *Masuran* (Ac 776) showed moderate adaptability, while *Dahanala* (Ac 627) recorded the greatest plant height and panicle number under stress conditions, indicating robust physiological resistance.

Keywords – Breeding, Drought stress, Genotypic variation, Morphological traits, Tolerance, Traditional varieties

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