

## Exploration of Leaf Photosynthetic Traits in Selected Lowland Elite Rice Varieties

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### **Abstract**

Photosynthesis serves as the primary source of dry matter production, determining biomass and grain yield in rice. The objectives of this research were to compare leaf photosynthetic traits among six elite rice varieties released by the Department of Agriculture in Sri Lanka and to identify the best-performing variety. A pot experiment was conducted with six rice varieties grown in soil media, arranged in a completely randomized block design, and replicated five times in a plant net house facility. The collected data included chlorophyll content, quantum yield efficiencies, stomatal conductance, and relative water content in rice leaves. The results revealed significant variation in chlorophyll content, with the highest value observed in BW 367 (37.0) and the lowest recorded in BG-310 (29.1) compared to the control variety AT-362. Chlorophyll fluorescence measurements of 0.74 were recorded in BW-360, while the lowest was found in BG-360 (0.67) compared to the control variety AT-362 (0.73). In the 11th week after planting, stomatal conductance showed significance, exhibited highest value was observed in BW-367 (570.38), and the lowest in BG-403 (189.99). Comparing relative water content among the six varieties revealed significant differences between treatments ( $P < 0.05$ ), with the highest value measured in BG-360 (89.66%) and the lowest in BG 379-2 (62.66%). According to these findings, BG 360 and BW 367 exhibited superior performance compared to the control variety AT-362 under net house conditions.

**Keywords:** *Chlorophyll content, Fluorescence, Photosynthetic parameters, Relative water content, Rice (Oryza sativa), Stomatal conductance*