Iron Toxicity-Related Morphological and Biochemical Variations of Selected Rice Varieties (*Oryza sativa* L.) in Sri Lanka

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Iron (Fe) toxicity is recognized as one of the widely observed soil nutritional disorders, which lowers rice yield, especially in the low country wet zone (LCWZ) of Sri Lanka. This experiment was conducted to study the morphological and biochemical characteristics of selected rice varieties, recommended to be grown in LCWZ, under variable Fe concentrations in the growing media. The experiment was conducted at the Regional Rice Research and Development Center at Bombuwala, Sri Lanka (6°57'' N, 80°.01'' E) as a hydroponic system from September to December 2022. This trial was laid out in a Completely Randomized Design. There were two factors. Factor one was the iron concentration with 4 levels; 0 mg L^{-1}, 100 mg L^{-1} (1.79×10^{-3} mol L^{-1}), 300 mg L^{-1} (5.372×10^{-3} mol L^{-1}), and 500 mg L^{-1} (8.953×10^{-3} mol L^{-1}). The second factor was varieties with 4 levels; Bw 267-3, Bw 272-6b, Bw 372, and Bg 359. There were 15 plants from each treatment combination. Iron toxicity of plants was scored on 0 to 9 scale according to the standard evaluation system. Bw 372 and Bw 267-3 did not show bronzing symptoms in any iron concentration. When increasing Fe concentration in the growing medium, concentrations of Fe and Co were increased in the shoots of all varieties. However, the concentrations of Cd and Mn were decreased in all varieties. Reduction in shoot dry weight (SDW) and root length (RL) was the lowest in Bw 372 (33% for SDW and 40% for RL), and highest in Bw 272-6b (64% for SDW and 52% for RL). When comparing varieties, the concentration of Fe in Bw 372 was the lowest and Bw 272-6b was the highest. These traits have contributed Bw 272-6b to be susceptible, and Bw 372 to be tolerant to Fe toxicity.

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