

PERFORMANCE OF RICE CULTIVARS TO DIFFERENT CONCENTRATIONS OF ARSENIC AT SEEDLING STAGE

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Executive Summary

Heavy metal specially arsenic (As) has a great concern for contamination of soil and water because they are persistent and may affect rice, vegetables and human health. Arsenic stress alters the morpho-physiology, yield contributing characters and yield of agricultural crops. A two factorial experiment was conducted under tray-culture at the net house and the agro-environmental chemistry laboratory of the Department of Agricultural Chemistry, Sher-e-Bangla Agricultural University, Dhaka- 1207 during the Boro season of 2017-18 to evaluate the performance of rice cultivars to different concentrations of arsenic at seedling stage. Factor A: different doses of arsenic [As_0 = No arsenic added (control), As_1 = 3 ppm arsenic, As_2 = 6 ppm arsenic, As_3 = 9 ppm arsenic and As_4 = 12 ppm arsenic (soil water basis)] and Factor B: different rice cultivars/ varieties [V_1 = BINA dhan-8, V_2 = BINA dhan-10, V_3 = BINA dhan-14, V_4 = BINA dhan-18, V_5 = BR 3, V_6 = BR 14, V_7 = BR 16, V_8 = BRRI dhan28, V_9 = BRRI dhan29, V_{10} = BRRI dhan36, V_{11} = BRRI dhan45, V_{12} = BRRI dhan47, V_{13} = BRRI dhan50, V_{14} = BRRI dhan55, V_{15} = BRRI dhan58, V_{16} = BRRI dhan59, V_{17} = BRRI dhan60 and V_{18} = BRRI dhan61]. Different growth parameters varied significantly due to difference in the doses of arsenic. Arsenic toxicity adversely affects the growth of all rice cultivars. BINA dhan-18 produced tallest seedling and BRRI dhan29 produced the shortest. BRRI dhan29 produced highest shoot weight and BR 3 produced the lowest. BINA dhan-18 produced maximum root length and BRRI dhan45 produced the lowest. BRRI dhan29 produced maximum root weight and BR 3 produced the minimum. BRRI dhan29 produced maximum total dry matter and BR 3 produced minimum. BRRI dhan29 contained maximum N in shoot and root where BINA dhan-10 and 8 contained the minimum respectively. BRRI dhan61 contained maximum P & K in shoot and root where BR 3 contained the minimum. From the results it can be concluded that Arsenic toxicity adversely affects all the growth parameters of all rice cultivars.

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