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SILICON ACCUMULATION AND ITS INFLUENCE ON SOME OF THE LEAF CHARACTERISTICS, MEMBRANE STABILITY AND YIELD IN RICE HYBRIDS AND VARIETIES GROWN UNDER AEROBIC CONDITIONS

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Abstract

Efforts to minimize water use in rice cultivation and stress tolerance are important in the present climate change scenario. Silica solubilizers might help in understanding the tolerance of plants to water deficit conditions or aerobic conditions. Rice cultivation in combination with silica was applied in the form of fertilizers (sodium silicate) and solubilizers (Imidazole and glycine) was studied in experimental farm and also in farmer's field. The varieties used were 'KrishnaHamsa' (KH), 'Rasi', 'Jaya', hybrids 'PA-6201' and 'PHB-71' under aerobic

conditions both in wet (Kharif) and dry (rabi) seasons. Transmission electron microscopy in this study provided evidence that silicon was deposited in the epidermal cell wall and the intercellular space of the silicon-treated rice leaves. The epidermal cell wall accumulation was absent in the control plants. Genotypic variation and treatment influences were observed for relative water content and cell membrane stability. Among the different rice cultivars 'Rasi' followed by 'PHB-71' and PA- 6201, were able to maintain cell membrane stability and chlorophyll content. Leaf rolling, chlorophyll, relative water contents, and dark adapted chlorophyll fluorescence were superior under aerobic conditions with application of solubilizers. However, significant differences in stomatal conductance were seen between seasons and genotypes. The silicon treated plants were able to maintain similar yields under aerobic conditions also as that of irrigated controls.

Keywords: [silica](#), [solubulizer](#), [accumulation](#), [cell wall](#), [membrane stability](#) and [aerobic rice](#)

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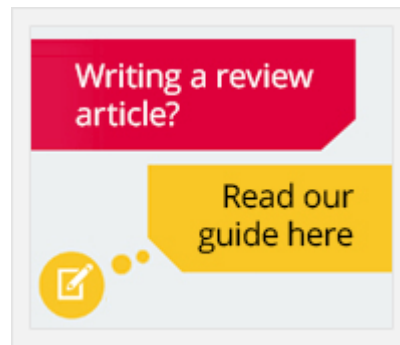
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