

Research Communication

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ALLEVIATION OF FLUORIDE-MEDIATED TOXICITY VIA SEED PRIMING WITH CALCIUM OXIDE IN *ORYZA SATIVA* L. CV. KHITISH

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The effect of seed priming with calcium oxide (CaO) in the mitigation of fluoride-mediated stress is not yet explored. The present manuscript highlights the amelioration of fluoride toxicity in an indica rice cultivar, viz., Khitish, by initial priming of seeds for 24 h with two different concentrations of CaO (0.3 mM and 0.5 mM). Fluoride toxicity brought about considerable decrease in the seedling emergence, affecting the overall physiology of seedlings. Chlorophyll degeneration, enhanced endogenous malondialdehyde and H₂O₂, and electrolyte leakage due to higher bioaccumulation of fluoride were observed. While the catalase activity was decreased, the other antioxidants like guaiacol peroxidase, proline and total amino acids were elevated. Seed priming with CaO largely improved plant performance under fluoride stress by enhancing germination efficiency, with better physiology of plants, reducing fluoride bioaccumulation and overall oxidative damages. The protective effect of CaO was also evident from restoration of the catalase activity, and lowering the level of guaiacol peroxidase, proline and total amino acids, even under stressed condition. The decrement in the level of carotenoids and total phenolics as a consequence of stress was also overcome via CaO priming. The lower (0.3 mM) concentration appeared to be more potential in stress mitigation. Thus, CaO priming offers a reliable strategy in amelioration of fluoride-mediated injuries in Khitish by inhibiting fluoride uptake and improving the overall plant growth.
