BOOK of ABSTRACTS

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Effects of lithium chloride on germination, growth, genotoxicity and antioxidant response in *Brasicca oleracea* var. *capitata* seedlings

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The extensive and growing application of lithium as a preferred energy source in batteries for electric vehicles and various electronic devices as well as mining operations has elevated its status as a significant environmental pollutant. Despite recent investigations, the effects of lithium on plants remain largely unknown and ambiguous. We investigated the effects of lithium at concentrations up to 1000 mg L^{-1} on seed germination, micronucleus frequency, seedling growth, photosynthetic pigment content and antioxidant enzyme activities in cabbage. At high lithium concentrations, the germination rate was slightly lower (>80 %) compared to the control. Lithium exhibited a dose-dependent regression in seedling growth, affecting both radicle length and root hair development. Seedlings grown hydroponically survived lithium in concentrations up to 100 mg L^{-1}. Plants cultivated in nutrient solutions containing up to 50 mg Li L^{-1} achieved good biomass and showed no apparent symptoms of Li toxicity. Higher Li concentration resulted in significant deterioration in seedlings growth. Lithium accumulated in cotyledons at concentrations several fold higher than in roots and stems. It differentially affected the accumulation and translocation of calcium, magnesium, copper, manganese, zinc, and iron, while showing no significant impact on potassium content. There was a strong negative correlation between lithium and the levels of photosynthetic pigments, indicating that excessive lithium disrupts their homeostasis in the cell. Evidence that elevated lithium cause disturbance in oxidant/antioxidant balance includes significant changes in the activities of ascorbate peroxidase and guaiacol peroxidase (POD) in roots, as well as superoxide dismutase, catalase, and POD activities in leaves.

Keywords: LiCl, metal antagonism, metal tolerance, oxidative stress

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