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ACCEPTED MANUSCRIPT

Lithium toxicity in plants: reasons, mechanisms and remediation possibilities - A review

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Abstract

Lithium (Li) is a naturally occurring element; however, it is one of the non-essential metals for life. Lithium is becoming a serious matter of discussion for the people who do research on trace metals and environmental toxicity in plants. Due to limited information available regarding its mobility from soil to plants, the adverse effects of Li toxicity to plants are still unclear. This article briefly discusses issues around Li, its role and its essentiality in plants and research directions that may assist in inter-disciplinary studies to evaluate the importance of Li's toxicity. Further, potential remediation approaches will also be highlighted in this review. Briefly, Li influenced the growth of plants in both stimulation and reduction ways, depending on the concentration of Li in growth medium. On the negative side, Li reduces the plant growth by interrupting numerous physiological processes and altering metabolism in plant. The contamination of soil by Li is becoming a serious problem, which might be a threat for crop production in the near future. Additionally, lack of considerable information about the tolerance mechanisms of plants further intensifies the situation. Therefore, future research should emphasize in finding prominent and approachable solutions to minimize the entry of Li from its sources (especially from Li batteries) into the soil and food chain.

Keywords: Lithium, Effects and mobility, Plant growth, Physiology, Research perspectives

Capsule abstract:

Li not only reduces but also stimulates plant growth, depending on its concentration in growth medium.

Li interferes with numerous physiological and metabolic processes to influence plant growth.

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