

MITIGATION OF CHROMIUM TOXICITY ON GREEN GRAM (*Vigna radiata* L.) BY USING SALICYLIC ACID AS A SOIL DRENCH

Bandara P. W. G. M. B. S. and Safeena M. I. S.*

Department of Biological Sciences, Faculty of Applied Sciences, South Eastern University of Sri Lanka, Sammanthurai, Sri Lanka.

**safeenim@seu.ac.lk*

Chromium toxicity is considered when Chromium content has surpassed the safe soil level. Normally chromium has been released to the environment by volcanic activities. However, as the Industrial Revolution arose, utilization of Chromium in the form of pesticides and weedicides were increased. In addition, due to poor waste management practices, it has accumulated everywhere and ended up in plants. In terms of plants, chromium toxicity leads to some aspects such as accumulation in plant tissues, affecting biomass, germination, chlorophyll content, enzyme activity, and root and shoot growth negatively. It has been revealed that the use of salicylic acid can significantly reduce the effects of chromium toxicity in plants. Salicylic Acid is a well-known endogenous plant hormone due to its versatility in various crop plants including perishables and pulses. The present study was carried out to select the most effective salicylic acid concentration and observe the alleviation of Chromium toxicity in different levels (0 mg/Kg, 100 mg/Kg, 125 mg/Kg, 150 mg/Kg) at the reproductive stage of MI 5 green gram variety. The experiment was conducted under a complete randomized block design and effective salicylic acid concentration (0.5 mM) was selected by a germination test. Prepared 24 garden bags were contaminated with Chromium at 0 mg/Kg, 100 mg/Kg, 125 mg/Kg, and 150 mg/Kg for 5 days before planting and salicylic acid was applied as a soil drench 14 days after planting (DAP). 43 days after planting, data were collected for plant height, chlorophyll content, no. of leaves, leaf area, fresh weight, dry weight, and root length as parameters. It was found that adverse effects from Cr stress were successfully alleviated in no. of leaves, dry weight, and root length of the plant by showing increase of parameters by 4.88%, 0.25%, and 2.07% percentages respectively. For the height and fresh weight of the plant, Cr stress didn't show a significant effect but SA did. Chlorophyll a, total chlorophyll content, and leaf area show considerable adverse effects from Cr stress but SA did not show alleviation action. Moreover, neither SA treatment nor Cr stress had a discernible impact on chlorophyll b level in the MI 5 cultivar.

Keyword: *Chromium toxicity, Green gram, Salicylic acid, Soil drench.*