

## **Effect of Lead (Pb) on Germination and Early Vegetative Development of Selected Traditional and Improved Rice Varieties in Sri Lanka**

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Contamination of soil by heavy metals is a worldwide phenomenon, which has dire consequences on human health, agriculture, and the environment. Among heavy metals, Lead (Pb) is one of the most abundant environmental pollutants. Being readily absorbed by plants, it exerts toxic effects causing altered plant morpho-physiological and biochemical attributes. There is a dearth of research studies in Sri Lanka to elucidate the effect of Pb on rice. Thus, the current study was conducted to assess the effect of Pb on germination and early vegetative development of selected five traditional (*Kuruluthuda*, *Pachchaperumal*, *Godaheenati*, *Suwandel*, and *Sudurusamba*) and two newly improved (Bg 352 and Bg 360) rice varieties. The plants were exposed to 0, 10, 50, and 100  $\mu$ M of Pb concentrations in a completely randomized design, with four replicates. Germination energy, speed of germination, and final germination percentage were taken 7 days after sowing. The average root length and average shoot length were taken 7<sup>th</sup> day after transplanting (14 days after sowing). The data were analysed using SAS 9.1 statistical software and mean separation was done using Duncan's Multiple Range Test at  $p < 0.05$ . The results revealed that the germination of each tested variety was not significantly ( $p < 0.05$ ) affected even at the highest Pb concentration (100  $\mu$ M). However, even at the least Pb concentration (10  $\mu$ M), variety *Kuruluthuda*, *Pachchaperumal*, *Godaheenati*, Bg 352 and Bg 360 showed a significant ( $p < 0.05$ ) reduction in shoot length (10.92 $\pm$ 0.76, 14.77 $\pm$ 0.43, 9.98 $\pm$ 0.69, 8.43 $\pm$ 0.48 and 8.95 $\pm$ 0.63 cm respectively) and Variety *Pachchaperumal*, Bg 352 and Bg 360 showed a significant ( $p < 0.05$ ) reduction in root length (12.08 $\pm$ 0.70, 14.74 $\pm$ 0.92 and 13.3 $\pm$ 0.70 cm respectively) compared to the control. As per the preliminary results, *Suwandel* and *Sudurusamba* were least affected in the parameters tested. Thus, these two varieties have the potential to tolerate Pb toxicity in the early vegetative stages of development.

**Keywords:** Lead toxicity, Traditional rice, Improved rice, Germination, Early vegetative growth

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