

DETERMINATION OF LETHAL (LD₅₀) AND MASS IRRADIATION DOSES ON ⁶⁰CO GAMMA IRRADIATED CUTTING TYPES OF *Ixora chinensis*

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Ixora chinensis is an ornamental plant used for enhancing the aesthetic appeal of gardens and landscapes with its vibrant blooms and lush foliage. Among the three experiments of this study, experiment 1 was designed to assess the efficacy of softwood, semi-hardwood, and hardwood cuttings treated with different concentrations of IBA for rooting success using a two-factor factorial completely randomized design. There was an insignificant interaction ($p > 0.05$) between IBA and cutting type; however, a significantly greater effect based on cutting type alone was observed, with hardwood cuttings exhibiting the highest survival rate at 40%. In experiment 2, using a ⁶⁰Co Gamma Chamber, seven gamma-ray doses (0Gy, 12.5Gy, 16.5Gy, 20.5Gy, 24.5Gy, 28.5Gy, 32.5Gy) were tested to determine the LD₅₀ of the gamma irradiance, by exposing the hardwood cuttings. Irradiated cuttings were placed under a propagator using a completely randomized design layout with three replicates, which consisted of 30 cuttings per replicate. Survival percentage, number of leaf buds, leaf length, and number of fresh leaves emerged were recorded eight weeks after exposure. After the fourth week of planting, cuttings treated with 0Gy, 12.5Gy, 16.5Gy, and 20.5Gy demonstrated survival. The LD₅₀ dose determined through a lognormal curve based on the survival percentage of the cuttings was identified as 15.8Gy. At the 8th week measurements, a significant reduction ($p < 0.05$) in the average numbers of leaf length, leaf buds, and leaves was recorded as gamma doses increased. In experiment 3, three gamma radiation doses including the LD₅₀ dose of 15.8Gy and ± 0.5 Gy deviations to LD₅₀ were applied to cutting from experiment 1 and the survival percentage was recorded. In this experiment, a significantly higher ($p < 0.05$) survival rate (28.3%) was observed with the application of 15.3Gy. In conclusion, 15.3Gy gamma dose was identified as a suitable choice for the mass irradiation of hardwood cuttings of *Ixora chinensis*.

Keywords: Cuttings, Gamma irradiation, IBA (Indole-3-butyric acid), Rooting success