INDUCED MUTATION AND DEVELOPMENT OF MEDIA PROTOCOL FOR PLANT REGENERATION FROM MUTATED CALLI OF LILY

(*Lilium longiflorum L.*)

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ABSTRACT

The study was carried out to create novel types of *Lilium longiflorum* by using irradiated calli to cater the increasing demand for *Lilium* as one of the most important bulbous flower commercially grown in Sri Lanka.

The calli were induced from lower half of the bulb scales and the basal part of the *in-vitro* plants in MS medium supplemented with three different combinations of BAP, IBA and 2, 4-D in the first experiment. Data were recorded on callus induction frequency, minimum days taken to appear callus, percentage of calli without direct organogenesis, growth rate and diameter of calli. In the second and third experiments, the calli were subjected to irradiation with different exposure time (10, 20, 30 and 40 minutes exposure) of UV (254 nm) and ^{60}Co gamma (2.5, 5 and 10 Gy) and cultured on MS medium with three different hormone combinations of BAP, NAA and GA_3.Observations were made on mortality percentage of calli after irradiation, number of calli producing shoots, total number of shoots and shoot height. All experiments were conducted as Complete Randomized Design with two factors. Each treatment of experiment 1 was consisted with 20 replicates and treatments of experiment 2 and 3 were consisted with 15 replicates. MINITAB was used to analyze the data.

Lower half of bulb scales cultured on MS supplemented with 0.022 mgl^{-1} BAP and 0.22 mgl^{-1} 2,4-D recorded least number of days (22 days), highest frequency of callus induction (85%), highest percentage of calli without direct organogenesis (82.35%), diameter (1.8±0.12 cm) and growth rate (3.3±0.30) at $P<0.05$. In experiment 02 and 03 interaction effect of media and irradiation source was not significant at $p<0.05$. Irradiation levels with reduced plant height, mean no of shoots and mortality less than 50 %, considered as an indicators for mutations, UV with 30 minutes exposure time and 10 Gy of gamma can be selected as effective sources of mutation which recorded the lowest values for above parameters at $p<0.05$. At the same time mutated calli from above irradiation levels in the MS supplemented with 0.5 mgl^{-1} NAA and 0.6 mgl^{-1} BAP recorded the significant growth than other media ($p<0.05$).