CALLUS INDUCTION OF SELECTED TOMATO (*LYCOPERSICON ESCULENTUM* L.) VARIETIES USING ANTHER CULTURE TECHNOLOGY

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Abstract: The study aimed to expedite plant breeding programs in Solanaceae through double haploid plant production using anther culture in selected tomato varieties. The experiment involved callus induction in culture bottles using a Complete Randomized Design with three treatments and three replicates. Unopened flower buds were harvested five days after emergence, sterilized with alcohol and Clorox, and incubated in darkness for 14 days at 25°C to induce callus. Three Kinetin concentrations (1 mg L^{-1}, 2 mgL^{-1} and 3 mgL^{-1}) were tested on different tomato varieties, and data was collected on the number of anthers planted and the number of calli produced. The results showed no significant difference between 1 mg L^{-1} and 2 mg L^{-1} Kinetin for callus induction. The highest callus induction (26.66%) was observed with 2 mgL^{-1} Kinetin in the HT-5 variety. Callus induction efficiency varied among tomato varieties, with significant differences in Lanka Sour and Bhathiya for Kinetin concentrations 1 mg L^{-1} and 2 mgL^{-1}. Treatment three exhibited high callus contamination (30%), while Lanka Sour variety displayed the highest callus greening (24.44%) with 2 mgL^{-1} Kinetin. Varietal differences were significant for Kinetin concentrations 1 mgL^{-1} and 2 mgL^{-1} in Lanka Sour and Bhathiya, but not in other varieties. Regarding the number of days for callus induction, 2.0 mgL^{-1} Kinetin required a shorter period compared to other concentrations. In conclusion, the experiment's findings on callus initiation using MS medium supplemented with 2 mgL^{-1} Kinetin, particularly with the distinct responses with displaying the highest callus greening observed in HT-5 and Lanka Sour varieties. This microcosmic study in plant biology aligns with the practices promoting plant health and biodiversity not only benefit agricultural productivity but also play a crucial role in maintaining the delicate balance of Cascade Ecology, ultimately influencing the well-being of human societies.

Keywords: Anther culture; Callus induction; Kinetin; Tomato