

**EFFECT OF DIFFERENT EXPLANTS AND CULTURE
MEDIA ON MORPHOGENIC RESPONSE OF
TURMERIC (*Curcuma longa* L.)**



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ABSTRACT

Turmeric (*Curcuma longa* Linn.) is a herbaceous perennial plant belonging to the family Zingiberaceae. It is an important medicinal plant and also one of the most important spice crop that is highly valued for its underground rhizome. The experiments were conducted to induce the shoot buds from rhizome bud explants and study the morphogenic response from aerial stem explants for the mass *in vitro* propagation of *Curcuma longa* Linn. All experiments were arranged according to a completely randomized design with three replicates

First experiment was aimed to study the morphogenic response of the different explants of turmeric. Therefore, the different explants were excised from the aerial stems and rhizome buds and washed with running tap water for 1 hour followed rinsed with 70% ethanol for 1 minute. Rhizome buds were treated with 0.3% Captan and surfaced sterilized with 25% Clorox meanwhile aerial stem explants were sterilized with 20% Clorox prior to culture on MS (Murashige and Skoog) medium. The sterilized explants were cultured on MS medium fortified with 2.0 mg/l BAP. From the survived aerial stem explants, 0.5 cm long vertical half of the aerial stem explants exhibited somatic embryogenic response (69.7%). The highest morphogenic response (74%) of shoot bud initiation was observed from the top slice of the surviving rhizome bud explants.

Second experiment was done to develop a cost-effective basal medium for micropropagation as an alternative to MS medium replacing macronutrients,

micronutrients and iron source. In this experiment, Yara Mila complex fertilizer, which is an ideal granular fertilizer mixture was used. Three different concentrations of Yara Mila complex fertilizer (1.0, 3.0, and 5.0 g/l) fortified with 2.0 mg/l BAP each were tested with the control MS medium fortified with 2.0 mg/l BAP for *in vitro* embryo establishment from aerial stem explants and shoot bud formation from top slice of the rhizome bud explants. The higher performances were observed in 1.0 g/l concentration of complex fertilizer incorporated medium with 51% embryogenic response from the aerial stem explants and 52.3% shoot bud formation response from the top slice of the rhizome bud. The cost of 1 kg complex fertilizer was Rs. 182. It could be concluded that complex fertilizer is a cost-effective alternative medium for MS medium for *in vitro* propagation reducing the cost of the substituted ingredients by 99.87% in the tissue culture of turmeric.

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