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In vitro protocol standardization for turmeric nultiplication in Jammu Division

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Abstract **:** A protocol for the *in vitro* multiplication of turmeric (*Curcuma longa* L.) has been developed using rhizome bud as explants. The explants were surface sterilized with a combination of sterilants (Bavistin 2% and $HgCl_2$ 0.1%). Maximum per cent of aseptic cultures were obtained when 0.1% $HgCl_2$ was used for 3 minutes. The sterilized explants were inoculated on MS medium with or without growth regulators. The cultures kept in dark (2 weeks) responded well in comparison to those kept in light. Sprouted shoots sub cultured on medium with different concentrations and combination of growth regulators resulted in varying degrees of multiple shoots. Maximum proliferation of shoots was observed in MS medium augmented with BAP (2.5 mg l^{-1}) and NAA (0.5 mg l^{-1}) within 2 weeks and average number of shoots per explant was 5.6.

Key words **:** Yield, BAP, NAA, Turmeric multiplication, *In vitro*

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Turmeric (*Curcuma longa* Linn.) belongs to the monocot family Zingiberaceae and consists of more than 70 species. It is an important medicinal plant and is also used as spice. It is a necessary ingredient of curry powder. Turmeric has multifarious medicinal properties such as anti-inflammatory and anti-bacterial properties and is found in most pharmacopoeias. It has been used for centuries in the Indian traditional system of medicine, the Ayurvedics. The rhizome is bitter, carminative, mutrant, diuretic, useful in liver problems, urinary discharges, scabies, bruises etc. It improves complexion and is useful in curing some blood diseases, leucoderma, inflammations, ozoena, bad taste in mouth, biliousness, dyspepsia, ulcer, elephantiasis, snake-bite, small-pox, swellings, boils, sprains etc. Recently genus *Curcuma* has been recognized as an important ingredient for anti-HIV, anti-cancerous drugs and also a powerful antioxidant.

Turmeric is usually propagated vegetatively through rhizomes since flowering is very rare and if occurs hardly any seed is produced. Moreover, its rhizome multiplication is quite low and preservation of rhizome seeds is a hard job. They are prone to damages due to some insects and pathogens. Therefore, there is a need to develop a protocol for its mass propagation. In recent years tissue culture is being profitably used to accelerate plantation development, to shorten the breeding cycle and to rapidly multiply and disseminate limited materials even for the slow-to-propagate species (Evans and Sharp, 1982).

RESEARCH METHODS

Rhizomes of turmeric (*Curcuma longa* L.) were obtained from local farm in Jammu. These rhizomes were thoroughly washed in running tap water for half an hour to remove traces of mud and dirt. The buds which emerged on rhizome were excised using sterile scalpel blade. The buds were sterilized with tween-20 for 20 minutes followed by rinsing in tap water to remove traces of detergent. Further aseptic surface sterilization was carried out with 0.1% $HgCl_2$ and 2% bavistin under the laminar flow chamber followed by three times washing with autoclaved distilled water. The sterilized explants were then prepared by removing the outer leaf sheaths and cultured on modified MS medium (Murashige and Skoog, 1962) supplemented with various combinations of different growth