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Effect of cytokinins and auxin on shoot proliferation of cotyledonary nodes derived from axenic seedling of tamarind (*Tamarindus indica* L.)

SATEESH V. PATTEPUR, A.N. MOKASHI AND P. S. AJJAPPALAVARA

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See end of the article for authors' affiliations

Correspondence to :

SATEESH V. PATTEPUR
Krishi Vigyan Kendra,
BIDAR (KARNATAKA)
INDIA

ABSTRACT

An experiment was conducted in the plant tissue culture laboratory of the Department of Horticulture, University of Agricultural Sciences, Dharwad during 2001-03, to standardize concentrations of cytokinins and auxin on shoot proliferation of cotyledonary nodes derived from axenic seedling of tamarind. From the present investigation it was clear that among the various combinations of growth regulators, BAP 0.5 mg/l + NAA 0.1 mg/l was the best combination for shoot proliferation of cotyledonary nodes derived form axenic seedling of tamarind.

Key words : Tamarind, Cytokinine, Auxin

Tamarind (*Tamarindus indica* L.) is one of the arid fruits crops grown widely in the tropical and sub-tropical regions of the Indian sub-continent particularly in central and south India. Tamarind is popularly known as 'Indian date'. It is multipurpose tree having high medicinal, industrial and nutritional values in addition to its main use as food, fodder and timber.

Micropropagation provides a rapid, reliable system for the production of large number of genetically uniform plantlets. It offers a method to increase valuable genotypes rapidly and expedite the release of improved varieties. In addition, micropropagation ensures mass production of elite clones from hybrid or specific parental line. It makes the propagules which have good health status and possessing desirable characters available through out the year.

Micropropagation of tree species offers a rapid means of producing clones, planting stock for afforestation, woody biomass production and conservation of elite and rare germplasm (Bonga and Durzan, 1982; Bajaj, 1986). But woody taxa are generally difficult to regenerate under *in vitro* conditions. Recently, some success has been achieved in few leguminous tree species (Dhawan, 1989), tamarind being one among them. Regeneration of plantlets from shoot tips and cotyledons obtained from seedlings of tamarind have been reported by Kopp and Nataraja (1990) and Jaiwal and Gulati (1991). *In vitro* induction of multiple shoots from axillary buds of tamarind has also been reported (Balkrishnamurthy and Ganga, 1997). However, till date there is no standard protocol available for *in vitro* clonal propagation of this tree. Considering the above facts the present investigation was carriedout to standardize the *in vitro* propagation methodology of tamarind.

MATERIALS AND METHODS

Tamarind seeds were collected from the mature pods of elite tree of DTS-1 situated in the Golden Jublee Block, Kumbhapur Farm, Department of Horticulture, Main Agricultural Research Station, Dharwad. They were thoroughly washed and then treated with a detergent Tween-20 (0.1%) for 10 minutes. After thorough washing with double distilled water, the seeds were surface sterilized with 0.1 per cent (w/v) aqueous mercuric chloride solution for 15 minutes followed by washing in distilled water and soaking in sterile water for 4-5 hours. The seeds were individually cultured on solidified half strength MS medium containing two per cent sucrose and 0.7 per cent agar. The cultures were incubated in dark at 25 ± 2^0C. Within 15 days of culture, germination occurred and seedlings of 5-8 days were used as the source of explant. The cotyledonary nodes of size 1.0 - 1.5 cm were used as explants from axenic seedlings.

In order to standardize the concentration and type of cytokinin on shoot proliferation different cytokinins mainly 6-benzylaminopurine (BAP) (@ 0.5, 1.00, 2.00 mg/l) and kinetin (KIN) (@ 1, 2, 3 mg/l) were added to MS media. To study the effect of cytokinins and auxin combinations on shoot proliferation different auxin concentration *viz.*, 1 napthaleneacetic acid (NAA) (@ 0.1, 0.2, 0.4 mg/l) were added to the MS media containing BAP 0.5 mg/l and kinetin 1 mg/l. All the cultures were incubated in air conditioned room at a temperature of