

Micropropagation of *Curcuma amada* (Roxb.)

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ABSTRACT

Rhizome explants of *Curcuma amada* (Roxb.) produced shoots and roots simultaneously when cultured in B₅ medium containing NAA and BAP. This technique would be suitable for field propagation and conservation.

Key words : *Curcuma amada*, rhizome, bud-culture.

Abbreviations

- NAA : alpha-Naphthalene acetic acid
BAP : Benzyl aminopurine
Kn : 6-Furfuryl amino purine (kinetin)
MS : Murashige & Skoog medium

Rhizome of *Curcuma amada* (Roxb.) commonly known as mango ginger is considered as carminative and stomachic and is also used for contusions and sprains. This is mostly used in food as a spice because of its typical mango-like flavour. This plant is also important for its essential oil content, which contain antifungal properties (Ghosh, Gupta & Chandra 1980). It is propagated vegetatively with 'seed piece' of rhizomes, the multiplication rate of which is low. Moreover, many of the *Curcuma* species are susceptible to soft rot disease (Balachandran, Bhat & Chandel 1990). A large part of material is to be spared every year just for seed purposes. Hence, an alternate method such as tissue culture technique was used in this study to find out the rate of multiplication

through tissue culture and the scope of its use for conservation.

In vitro clonal multiplication as well as conservation of ginger and *Curcuma* species were studied by various workers (Hosoki & Sagawa 1977; Pillai & Kumar 1982; Sato, Kuroyanogi & Ueno 1987; Ilahi & Jabeen 1988; Bhagyalakshmi & Singh 1988; Noguchi & Yamakawa 1988; Balachandran, Bhat & Chandel 1990), but no report is available on these aspects with *C. amada*.

Rhizomes of *C. amada* were collected from local growers. Emerging buds of rhizomes were trimmed and soaked with 5.0% Tween 20 solution for 15 min, then surface-sterilized by using 0.2% HgCl₂ solution for 5-7 min and washed thrice with sterile distilled water. Outer leaves

were removed aseptically and explants of 0.3-0.5 mm size were cultured on basic MS (Murashige & Skoog 1962) and B₅ media (Gamborg, Miller & Ojima 1968), supplemented with an auxin NAA (0.5 mg l⁻¹) and two cytokinins BAP (4,5 and 10 mg l⁻¹) and Kn (8 and 12 mg l⁻¹) either singly or in combination. The pH of the medium was adjusted at 5.6-5.8. All cultures were maintained at 28±20°C under 16 h photoperiod of 2000 lux light intensity.

Variations were noted in respect of nutritional status. Explants cultured on basic B₅ medium supplemented with NAA (0.5 mg l⁻¹) and BAP (4 mg l⁻¹) exhibited maximum number of multiple shoots (7-12) with well developed root system within 5-7 weeks (Figs. 1 & 2). Unlike the media composition of present study such a type of simultaneous pro-

duction of shoots and roots was reported on *Curcuma* and ginger species earlier by Kuruvinashetti, Haridasan & Iyer (1982) and Balachandran *et al.* (1990).

All these plantlets when separated individually and subcultured into the same multiplication medium behaved similarly. By repeating this procedure for 2-3 successive cultures, about 1000 plantlets can be produced. The explant on basic medium MS supplemented with Kn or BAP alone or in combination with NAA produced less number (1-3) of multiple shoots. Rooting was also observed in a few cases but its growth seemed to be abnormal in appearance.

In vitro produced plants, on transfer to soil after hardening indicated a survival percentage of 60-70 which was similar to earlier observations recorded in



Figs. 1 & 2. Micropropagation of *Curcuma amada*

1. 5-6 weeks after subculture 2. Shoots with well developed root system before acclimatization

Curcuma spp. (Hosoki & Sagawa 1977). Observations made after 120 days showed proliferation of 7-9 new buds from the underground part during summer season.

Thus the concepts of micropropagation may be profitably utilized for cultivation and conservation of this important spice crop.

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