RESEARCH PAPER

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Germplasm conservation of patchouli (*Pogostemon cablin* Benth.) by encapsulation of micropropagated buds in calcium alginate

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Encapsulation of *in vitro* derived nodal segment explants of patchouli (*Pogostemon cablin* Benth.) was done successfully by using 4 per cent sodium alginate gel for storage and germplasm conservation. Various concentrations of sodium alginate were tried to optimize the strength of the bead, which can give maximum conversion frequency. Various-growth regulators, and natural extracts were tested for their efficiency to regenerate healthy sprouts from encapsulated explants without vitrification. The highest frequency of shoot emergence and maximum number of shoots per bud were recorded on media supplemented with 0.5 mg/1 6- benzylaminopurine (BA). Among the natural extracts tried, 10 per cent coconut water exhibited equally good response with high frequency of shoot multiplication and broader leaves. Regenerated shoots were rooted on half strength Murashige and Skoog (MS) medium devoid of growth regulators. Plants retrieved from the encapsulated buds were hardened and established in soil. The effect of storage period and temperature on the conversion frequency of encapsulated buds was studied. This technology can be adopted for *ex situ* germplasm conservation of high yielding varieties of patchouli

Key words : Essential oil, Growth regulators, Natural extracts, Multiple shoots, Somaclonal variations, Propagation

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INTRODUCTION

Patchouli (*Pogostemon cablin* Benth.), belonging to the family Lamiaceae is an aromatic crop. The essential oil obtained by steam distillation of its shade-dried leaves is commercially used in perfumes and cosmetics (Hasegawa *et al.*, 1992; Maheswari *et al.*, 1993). It also possesses anti insecticidal activities (Sharma *et al.*, 1994). The conventional method used for propagating this herb is only through vegetative cuttings. Vegetative propagation under natural conditions is season dependent and is subjected to loss due to diseases, pests and environmental disasters. Apart from being expensive, somaclonal variations are associated with *in vitro* culture maintenance. Under these conditions, synthetic seed technology offers excellent scope for propagation and ex situ conservation of rare hybrids, elite genotypes and genetically engineered patchouli plants. Encapsulation and storage of the buds at freezing temperatures offers long-term storage capability, maximal stability of phenotypic and genotypic characteristics, minimum space and maintenance requirement.

The present report describes the encapsulation of nodal explants of micropropagated patchouli in calcium alginate hydrogel. The evaluation of *in vitro* response of encapsulated micropropagules to various concentrations of growth regulators and the effect of temperature and storage period on conversion rate is also reported in this study.

RESEARCH METHODOLOGY

Healthy patchouli plants were selected from greenhouse of College of Agricultural Biotechnology, Loni. Nodal segments and shoot tips of these selected plants were surface sterilized with 0.1 per cent (w/v) $HgCl_2$ for 10 min and washed thoroughly with sterile distilled water. Later, the explants were implanted on Murashige and Skoog (MS) medium supplemented with 0.5 mg/l 6-benzylaminopurine (BA). The pH of the medium was