



Research Paper

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Effect of coconut water and ascorbic acid on shoot regeneration in banana variety Dwarf Cavendish

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ABSTRACT : In this case the effect of coconut water and ascorbic was observed on micropropagation of banana variety Dwarf Cavendish. The shoot tip was inoculated on MS medium containing BAP (Benzyleaminopurine) 5.0 mg L⁻¹ supplemented with coconut water in various concentrations (0, 50, 100, 150 and 200 mL L⁻¹) and with various concentrations (0, 25, 50, 75 and 100 mg L⁻¹) of ascorbic acid, respectively. As the concentration of coconut water and ascorbic acid was increased up to 100 mg L⁻¹ and 50 mg L⁻¹, significant increase in the frequency of explants showing shoot regeneration, number of shoot regenerated per explant and shoot length was observed, respectively.

KEY WORDS : Ascorbic acid, Coconut water, Micropropagation, Regeneration, Banana

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Banana are cultivated in more than 120 countries worldwide with an annual production around 104 million tons. It ranks as the fourth major crop after rice, wheat and maize and is considered as a poor man's crop in tropical and subtropical countries (Swennen *et al.*, 2000; Jain and Swennen, 2004). They are cheap to produce, grow in a range of environmental conditions and produce year round fruits by vegetative propagation. The success of plant tissue culture is highly influenced by the growth regulators and nutrition supplied in the media. Another important component in plant tissue culture media is the carbon source because they supply energy to the plants especially when they are not ready to photosynthesize their own food during the early stage of tissue culture (Al-Khateeb, 2008). Various kinds of organic additives have been used in plant tissue culture to promote the growth of the plants including coconut water, banana pulp, potato homogenate and juice, honey, date palm syrup, corn extract, papaya extract and also beef extract (Islam *et al.*, 2003; Murdad *et al.*, 2010). Organic additives help in producing more PLBs, shoots and leaves (Aktar *et al.*, 2007), increases the size of somatic embryos (Al-Khateeb, 2008), also promotes growth and development of asymbiotic seeds

and regeneration of plantlets (Tawaro *et al.*, 2008). The reason organic additives are added into culture medium besides being a natural source of carbon is because they contain natural vitamins, phenols, fiber, hormones and also proteins (Gnasekaran *et al.*, 2010). Ascorbic acid frequently included in the culture medium to improve the growth of plant cell suspension (Davis *et al.*, 1974) and tissue culture (Slavova, 1982; Gupta, 1986). It is also act as antioxidants / antibrowning agent (Davis *et al.*, 1974; Slavova, 1982; Gupta, 1986). Browning in plant tissue has been attributed to polyphenol oxidase (BARNUN and Mayer, 1983) and form strongly oxidising quinines which cause poor growth and browning inhibited by ascorbate (Wickera *et al.*, 1984). The aim of the study was to observe the effect of coconut water and ascorbic acid on shoot regeneration in banana variety Dwarf Cavendish.

RESEARCH METHODS

Plant materials:

The present study was conducted at Plant Tissue Culture Lab, Department of Genetics and Plant Breeding, Institute of Agricultural Sciences, Banaras Hindu University, Varanasi (U.P.) in the year 2010-2011. A popular banana variety *i.e.* Dwarf