

In vitro shoot regeneration studies in *Java citronella*

BHAWANA R. BOBADE¹, S.R. KAMD² AND V.S. WADHAI³

¹Department of Biotechnology, Sardar Patel Mahavidyalaya, CHANDRAPUR (M.S.) INDIA

²Anand Niketan College of Agriculture, WARORA (M.S.) INDIA

³Department of Microbiology Sardar Patel College, CHANDRAPUR (M.S.) INDIA

(Accepted : June, 2010)

Java citronella (*Cymbopogon winterianus* Jowitt.) is a aromatic plant of great economic value and also well known throughout the world due to its repellent properties attributed to its essential oil, rich in citronellal. An efficient protocol for rapid regeneration of *Java citronella* through callus was developed by manipulating growth regulators in the culture medium. Shoot tips and leaves were used as explants source for regeneration and callus induction. The best callus induction was achieved on MS medium supplemented with 2, 4-D 2.5 mg/L. The best rate of shoot regeneration was obtained on MS medium supplemented with BAP 2 mg/L. The multiplication of shoots was observed on MS medium supplemented with BAP 4 mg/L.

Key words : *Java citronella*, *In vitro* regeneration.

INTRODUCTION

Java citronella (*Cymbopogon winterianus*) is volatile oil producing plant. A member of the *Poaceae* family, includes more than 10,000 species and covers a great percentage of ecosystems. The *Java citronella* is originally from Sri Lanka and is called Mahapengeri in the local language.

It is also widely grown in India, Guatemala, Honduras, Malaysia and several other countries. It is, basically, a tropical plant. A suitable humid climate is ideal for the growth of this plant. *Java citronella* is the kind that has higher concentrations of citronellal (Laszlo, 2000). Moreover, citronellal, citronella consists of geraniol, *citronella* oil is overlooked in aromatherapy because of its association with insect repellency. Its use in perfumery is also very popular, and used as a starting point for the synthesis of various active ingredients (Castro and Chemale, 1995). The species can also be used to combat soil erosion.

The sheets of *citronella* were used as a poultice for fever and pain and accelerate healing, and can also be used in the treatment of RSI (injury repetitive). Moreover, in China Citronella is also used for pain rheumatic (Laszlo, 2000). In aromatherapy it is used to increase mental acuity, fight themigraines and headaches, besides being a skin conditioner. Properties antidepressant, antiseptic, tonic, stimulant were also analysed (Laszlo, 2000). Despite the price swing, often low, the demand in production

Citronella still have been high and the prices achieved yet allow the cultivation of this species in economic scale (Castro and Ramose, 2003). However, it faces problems due to contamination by a fungus of the genus *Fusarium*, which causes great damage to producers. In the search for alternatives to facilitate the spread of certain species several studies on *in vitro* micropropagation have been made. This is technique that aims to cultivate cells, organs and / or tissues isolated from the mother plant, under controlled conditions. Thus, it becomes an important tool, since advantages such as mass production of plants free of viruses and other pathogens (Grattapaglia and Machado, 1998). The present paper describes large scale propagation of *Java citronella* through shoot tips by tissue culture technology.

MATERIALS AND METHODS

Leaf / Shoot tips were given a sterilization treatment, explants were washed thoroughly in a running tap water for 10-15 min to remove dust and phenols and then were treated 1-2 min each with tween 20 and 0.1% mercuric chloride. The explants were then thoroughly washed (4-5) times with sterilized distilled water. The explants shoot tips (0.5-1 cm) were dissected. The explant were inoculated under aseptic condition on sterile culture medium in test tube on murashige and skoog medium supplemented with 3% sucrose, 0.8% agar and plant growth regulators, like BAP, 2,4-D and adenine sulphate