



## EFFICIENT *IN VITRO* SHOOT MULTIPLICATION IN *AEGLE MARMELOS*: AN IMPORTANT MEDICINAL TREE

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**ABSTRACT:** *Aegle marmelos* (bael) is an important medicinal tree with multi-purpose utility. All parts of the tree are used for treatment of various diseases like diabetes, jaundice, high blood pressure etc. This study was conducted to study the effect of different concentrations of GA<sub>3</sub> pre-treatments and MS medium strengths for *in vitro* seed germination in *Aegle marmelos*. Further effect of various MS medium strengths and BA concentrations on *in vitro* shoot multiplication was screened out. Full strength of MS medium was more effective than other strengths for number of shoots, number of nodes per shoot and shoot length. In case of BA, medium supplemented with 0.5 µM BA resulted in 3.17 shoot formation with 3.09 cm shoot length after 28 days of inoculation.

**Keywords:** *Bael*, gibberellic acid, *in vitro*, MS medium strengths, pretreatments, shoot multiplication

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*Aegle marmelos* is a scientific name of the fruit tree which is also known as bael, stone apple, wood apple. It is one of the most useful medicinal plants of India. Bael is known in India from pre-historic time and has been mentioned in the ancient system of medicine. It has a great mythological significance also. All the parts of this tree including stem, root, leaves and fruit at all stages of maturity has medicinal value and has been used in traditional medicine for a long time. The bael fruit tree is slow growing, medium sized up to 40-50 ft height (12-15 m) tall with short trunk, thick soft flanking bark and sometime spiny branches.

Bael has a wide therapeutic value in the treatment of diabetes, anaemia, fractures, healing of wound, swollen joints, high blood pressure, jaundice, diarrhoea, troubles during pregnancy and typhoid. Pulp of the ripe fruit is taken during summer to keep the body and mind cool and to sharpen intellect and concentration of mind (Parichha, 2004).

Different parts of *A. marmelos* have been investigated by several workers and found to contain coumarins, alkaloids, triterpenes, sterols and essential oils (Karawya et al., 1989; Tokitomo et al., 1982). Micropropagation of mature trees has been a difficult task due to various factors like exogenous and endogenous infection, presence of phenolic compounds, long complex life cycles, and great genetic variations, etc. (Bajaj, 1997; Zimmerman, 1985). It is well established that *in vitro* propagation of plant species is influenced by various factors, like genotype,

age and source of initial tissue (George, 1993). Seeds of *Aegle marmelos* have short viability and are prone to insect attack. Vegetative propagation through root suckers is slow, difficult and cumbersome (Yadav and Singh, 2011). Therefore, *in vitro* propagation is an effective alternative method for its propagation.

### MATERIALS AND METHODS

#### Plant material collection

The seeds were collected from a healthy tree of *Aegle marmelos* present near of the Mist Chamber of the Genetics and Plant Propagation Division, Tropical Forest Research Institute, Jabalpur (M.P.).

#### Surface sterilization of explants

The collected seeds were thoroughly rinsed with distilled water followed by immersing in 0.1% cetrimide® solution for 20 min. Then it was surface sterilized with 0.1% Streptomycin and 0.2% Bavistin® for 10 min. The seeds were then treated in 0.1 % mercuric chloride solution for 5 min. and subjected to repeated washings in sterile distilled water. These surface-decontaminated explants were soaked on different concentration of GA<sub>3</sub> (0.0, 0.1, 0.2 and 0.4%) for 12 hours.

#### *In vitro* seed germination

After the overnight treatment of GA<sub>3</sub>, the seeds were inoculated on different strengths of MS medium (full, ½ and ¼). The experiment consisted of 12 treatments and three replications. After inoculation, inoculated seeds were kept on dark condition for germination. Nodal segments from germinated seedling were used for further multiplication.