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Effect of Indole 3-Acetic Acid on seed germination of *Lablab Purpureus* L.

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ABSTRACT

Lablab purpureus L.with its ability to out-yield conventional crops, especially during the dry season, and its enhanced nutritive value, is a fodder crop of great significance for the Tropics. Lablab can be used advantageously as a cover crop. The current investigation was carried out to study in vitro regeneration potential in Lablab bean *Lablab purpureus L*. at various concentrations of plant growth regulator, i.e., Indole 3-acetic acid (IAA) on seed germination. A great deal of information relating to seed germination practices shows that these plant growth regulators were effi cient in overcoming dormancy leading to rapid seed germination. A significant result was obtained for IAA at (4 ppm and 5 ppm) compared to other treatments. Regenerated plants were successfully acclimatized and transferred to the green house with 70% survival rate. All the plants appeared morphologically uniform with normal growth pattern.

Key words: *Lablab purpureus*, Indole 3-acetic acid, Seed germination

INTRODUCTION

Food legumes are crops of the family Leguminosae also called Fabacae. Grain legumes are important sources of significant amounts of proteins, carbohydrates, fiber, vitamins and some minerals. They are used as source of food for animals and human in many parts of the world (Sebastia et al., 2001; Osman, 2007). They are obtained relatively cheap for use as source of proteins in comparison with animal sources. Moreover, they are fairly good sources of thiamin, niacin, calcium and iron (El-Adawy et al., 2000). Legumes are one of the most important groups of crop plants and efforts have been focused to improve the crops, particularly for desirable traits, including their response to in vitro culture manipulation. Since legumes are notoriously recalcitrant to regeneration from tissue culture much effort has been devoted to

developing and optimizing efficient *in vitro* regeneration systems to facilitate a variety of technologies (Geetha et al. 1998). The ability to regenerate plants from cultured cells, tissues or organs constitutes the basis of producing transgenic crops.

Lablab (Lablab purpureus (L.)) is one of those multipurpose legumes known for its great genetic diversity (Karachi 1997; Tefera 2006; Maass et al. 2010; Whitbread et al. 2011). Lablab is an ancient domesticated crop, widely distributed in Africa, the Indian sub-continent and Southeast Asia (NAS 1979; Smartt 1985; Maass et al. 2005; Maass et al. 2006), where it has been used as a grain legume and vegetable for more than 3500 years (Maass et al. 2005). Lablab is now widely distributed throughout the tropics and subtropics (Kimani et al. 2012),. Despite its earlier wide distribution in Kenya (Robertson 1997), today lablab is regarded as a minor and neglected crop; its cultivation area is in steady decline (Maundu et al. 1999; Maass et al. 2010).Recent advances in *in-vitro* culture technologies brought about new techniques for crop improvement. Application of tissue culture techniques to genetic upgrading of economically important plants have been reported (Scowcraft 1977). Shoot and plantlet regeneration from seedling and other explants have been reported in many leguminous pulses like Glycine wigghtii (Pandey and Bansal 1992), Pisum sataivum (Ozean et al. 1992), Phaseolus vulgaris (Zambre et al. 1998) and Macrotyloma uniflorum (Varisai Mohamed et al. 1999). Hence the present investigation was attempted to standardize a protocol for rapid shoot multiplication from seeds of *Lablab purpureus (L.).*

MATERIAL AND METHODS

Seeds of *Lab lab* bean (*Lablab purpureus* (L)) were obtained from Tamil Nadu Agricultural University, Coimbatore, India. The seeds were washed with distilled water 5 times, followed by treatment of 5% sodium hypochloride for 15 min and disinfected with 0.1 % $HgCl_2$ for 3 min. The disinfected seeds were rinsed thoroughly with sterile water 6 times and aseptically placed over sterile moist cotton for germination. Experimental treatment consisted of five concentrations application of IAA (0, 1, 2, 3, 4,5 ppm). Murashigs and Skoog (MS) basal medium was used for

seed germination. Seeds were inoculated in (MS medium with five concentrations of IAA). The samples were incubated in the culture room and maintained at 25 ± 2ºC by regulating the room air conditioner for plantlet regeneration. Light level was maintained by application of fluorescent light of 3000-3200 lux in a 16 h photoperiod.The individual plantlets were transferred to potting mixture containing soil, vermiculite, sand with small hole for air circulation and kept in growth chamber. For the initial 10-15 days high humidity was maintained (>90%) and gradually reduced to the ambient level over a period of 2 to 4 weeks.

RESULT AND DISSCUSSION

The present study observed the propagation efficiency of seed in MS medium at different concentration of Indole 3-Acetic Acid. Among the five different ppm of IAA we observed the significant regeneration rate at 4ppm and 5 ppm effect (Figur:1). Low germination was observed in control compare to other growth regulators. 0 % seed germination was observed in 1ppm IAA treatment. The significant seed germination,5ppm showed shoot length of (8.4 cm) and root length (11.5 cm) where as in 4ppm shoot length was observed (6.2 cm) and root length (8.3 cm). (Table 1).

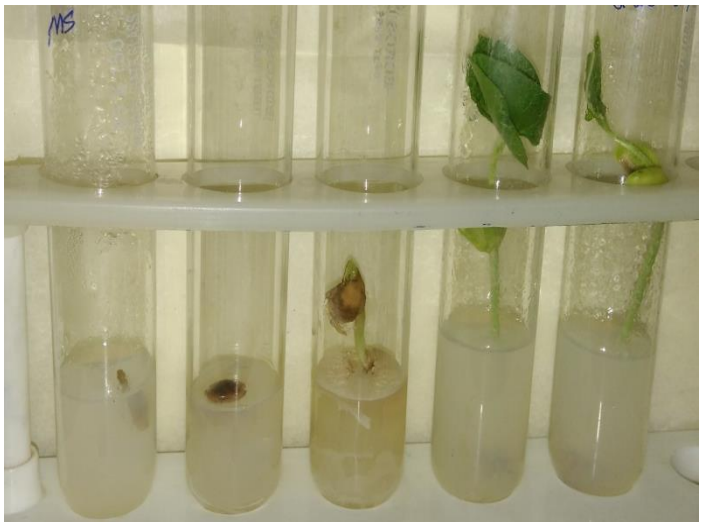

Figure:1 Effect of different concentrations of IAA on the growth of *Lablab purpureus* seedlings

Table 1 : Effect of various concentrations of IAA on seeds of *Lablab purpureus* in MS medium (15 days after inoculation)

Hormone concentration (ppm)	Shoot length (cm)	Root length (cm)
3ppm	3.6	5.1
4ppm	6.2	8.3
5ppm	8.4	11.5

The present study revealed the same interpretation as (De Klerk et al., 1997; Thirunavonkkarasu and Saxena, 1997; Soyler and Arslan, 2000; Boyer and Graves, 2009; Avci et al., 2010). Similar results has been reported that, the higher concentration of IAA had significant effect on seed germination of *Asparagus sprengeri* Regelin in dark condition (Dhoran and Gudadhe, 2012). IAA promotes and regulates pollen tube growth in *Torenia fournieri* by the aforesaid mechanism (Wu et al., 2008). IAA is also reported to promote pollen tube in Pinus roxburghii (Konar, 1958) and vital for pollen germination in Pinus austrica (Smith, 1939). *In vitro* propagation an important alternative to conventional propagation for wide range of plant species. We observed that following effect of IAA on seed generation to shoot at different concentration. The highest shoot regeneration was found in the concentration of 4 ppm and 5ppm.The study revealed by increasing the concentration the plant regeneration also increased.

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