RESEARCH ARTICLE | International Journal of Plant Sciences, (July to December, 2009) Vol. 4 Issue 2 : 433-435

Studies on anther culture in tomato (*Lycopersicon esculentum*)

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Accepted : April, 2009

SUMMARY

Anther or pollen culture have been used in mutation and F1 hybrid breeding programme in many plant species. In order to get haploid plants, three tomato varieties were used in this study. Anther were removed from 2-4 mm, 5-6 mm and 8-10 mm length tomato flowers. Two different nutrient media were investigated to get callus. N6 medium + 2 mg/L NAA + 1 mg/L kinetin was most efficient medium for anther callus growth. Calluses were subcultured but calli did not show any response for further callus growth and haploid plantlets were not obtained.

Key words : Anther culture, Callus formation and tomato

Tomato (*Lycopersicon esculentum* Mill.) which belongs to family *solanaceae* is the most abundantly produced vegetable crop in the world (Anonymous, 2002). With wide range of adaptability of soil and climate. It is most popular because of its high nutritive value and diversified uses.

For improvement of any crop, variability in the basic population is important which can be created through hybridization and induced mutation followed by selection. Tissue culture is one of the technique which can be used to create the genetic variability among basic population within short period of time.

The regeneration of plants from pollen grains of angiosperms has a relatively recent history dating back to the discovery by Guha and Maheshwari (1964) of the production of embryo like structures (embryoids) from anthers of *Datura innoxia* culture in a complex medium. In subsequent studies several investigators established the origin of embryoids from pollen grains and their regeneration into plants (Maheshwari *et al.*, 1982; Bajaj, 1983).

Therefore, present investigation has been undertaken on anther culture using three varieties of tomato, Vaishali, Wild (*Lycopersicon khasianum*) and Pusa ruby.

MATERIALS AND METHODS

Present investigation was carried out at Tissue Culture Centre, Marathwada Agricultural Univrsity, Parbhani during 2005-06. The material used for conducting the experiment and methods employed are described by following data.

Three cultivators of tomato namely Vaishali, Wild (*L. khasianum*) and Pusa Ruby were used in the experiment.

Preparation of media:

Basal media used in present study was N6 medium (Nitsch *et al.*, 1969) and DBM 2 medium (Gresshoff and Doy, 1977). The stock solutions of macro and microelements were pipetted out in required proportion and mixed well. The stock solution of vitamins and hormones were also added in required quantities and the volume was made up using double distilled water. Sucrose 4 per cent was used as gelling agent.

Media for callus induction:

– N6 medium+2.0 mg/lit. NAA + 1.0 mg /lit. Kinetin

– DBM2 medium+2.0mg/lit. NAA+5.0 mg/lit. Kinetin

Media for regeneration:

– MS + 2.0 mg/lit BAP + 1.0 mg/lit. NAA

The pH of medium was adjusted to 5.8 by using dil. NaOH or dil. HCl before addition of noble agar. The media was boiled after addition of noble agar to dissolve it. This was distributed uniformly @ 30 ml of media / Petridish. The dishes were autoclaved at 1.06 kg/cm^2 (15 lbs/inch^2) pressure and 121^{O}C temperature for 20 minutes. The dishes are ready for inoculation after cooling.

Preparation and inoculation of explant:

Unopened flowerbud of different sizes *viz.*, 2-4 mm, 5-6 mm and 8-10 mm of each of three cultivars were selected. Surface sterilization of flowerbud was done in the following steps.

– Transferred to 0.1 % Tween 20 solution and kept for 5 minutes then washed four times with distilled water.

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