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Potential and Limitations of Nodal Explants in *Vitro* Production of *Solanum melongena*

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Abstract
Although we have modern technologies and fast developing industrial sector, gas and electricity are neither available nor affordable for this large section of the population. The predominant trees in these regions are Solanum melongena species. Their roots penetrate deeply up to ground water level and so they do not compete for water with the crop plants (Leaky and Last, 1980). It is because of the dependence on these species that plants have become over exploited. Tremendons pressure exerted by man and animal both, resulting in complete removal of superior germplasm or in some cases plant species have become threatened (Ramawat and Nandwani, 1991). Most of these species are scattered widely throughout tropical and subtropical arid regions. System in plant tissue culture, Hassanein et al (2000) and poisonos plants of southern Eastern Africa Wayne M et al (2011) a model medicinal Solanum nigrum phutochemical activity in Soalanum Surratens Venkateshwarlu M et al (2018).

Key words: ***In vitro Production, Potential, Multiplication, Solanum melongena,***

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I. Introduction:

Most of the *Solanum melongena* species are scattered widely throughout tropical and subtropical arid regions. It is because of the dependence on these species that plants have become over exploited. Development of regenerative system involves use of plant material obtained from selected plants. These plants growing in arid and semi arid conditions are difficult material to handle and manipulate in the culture as they are recalcitrant to growth (Ahuja, 1993). By using *in vitro* techniques, a desired plant selected on the basis of its past performance can be cloned at rapid rate, which by conventional method may take years. If we compare the conventional methods of propagation with those of non-conventional ones using cell culture techniques, the advantages are apparent, like short growth cycle, small space requirement, high multiplication rate easy detection of mutants, stable genetic characters possibility of producing haploids and improvement of plants. It is only after the development of suitable reproducible technology that the improvement programmes can be taken up through tools of genetic engineering (Gupta *et al.*, 1993). Comparative Analysis of Solasodine from *in vitro* and *in vivo* cultures of *Solanum nigrum* Yognath N *et al* (2009) Plant Regeneration and *in vitro* flouring from leaf and nodal explants of *Solanum nigrum* Venugopal *et a*l (2005), large scale transcriptional profiling of lignine tissue in Tectona, Galeano *et al* (2015) Seasonal variation in the shoot regeneration (Rosa) Warhade (2017) protoplast Isolation of Soybean PVD. Venkateshwarlu M *et al* (2018).

II. Material And Methods:

Experiments with *Solanum nigrum* nodal explants using nutrients solution, developed in to normal plants when placed in hormone face MS medium. In brief, present efforts on selected species led to the limited success in these species. Still a large number of species are not amenable by these methods. It because of variation between and within a species that the results obtained with one material are not replicated in another material. Apical bud explants from *solanum nigrum* Venkateshwarlu *et al* (2016) *In Vitro* shoot induction from leaf explants of *Luffa* Venkateshwarlu M (2019). The nodal segments of 2.0 – 3.0 cm long were cultured and surface sterlized with 0.1% $HgCl_2$ for 5-7 minutes and rinsed with sterile distilled water. They were cultured on MS Medium containing 2.5% sucrtose and 0.8% Agar-Agar and different concentrations of BAP, NAA and L-Glumatic acid (Table-1). The pH of the medium was adjusted to 5.8 and later was autoclaved at 120°C for 17 minutes. Cultures were incubated under 16hrs, illumination (250 lux) at 25 ± 2°C temperature raising the level of BAP (0.5 to 2.0 mg/l). Hassan *et al* (2000) plant tissue protoplast culture direct high frequency plant regeneration in *Solanum torvum* Venkateshwarlu M *et al* (2019), Apical bud and Cotyledon cultures Sharma (2010) and Comton (2000).

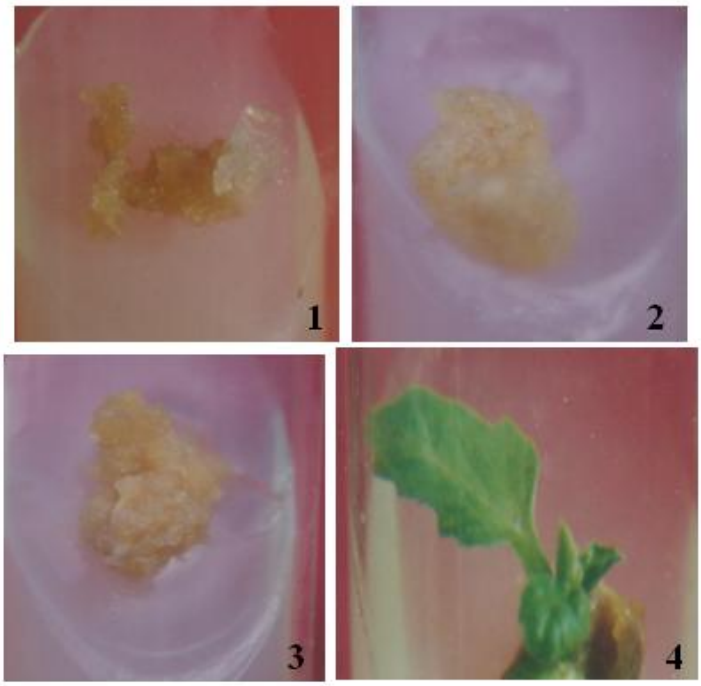
III. Results and Discussion:

Majority of the reports describe development of biotechnology for rapid mass multiplication, a problem of immediate concern as well as a prerequisite for the development of biotechnological methods for the improvement of plants (Table 1, Fig. 1-4). Therefore, basic information generated will be useful on these lines of work for specific and selected cases for developing clones for fodder, fuel and various types of resistance. In want of basic tissue culture regeneration protocols, work on protoplasts culture (Saxena and Gill, 1987), somaclonal variation (Rani *et al., 1995)*, haploids (Gautam *et al.,* 1993) and genetic transformation (Naina *et al.,* 1989) are almost lacking. The punica nodal explants used for initiation of callus were obtained from *in vitro* growan sand were inoculated on MS medium fortified with 1.0 mg/l BAP and 0.5 Kn could initiate white soft callus. Increase in the concentration from 1.0 to 0.5 mg/l BAP, Kn and NAA resulted in the appearance of green globular callus. The percentage of growth response was comparatively more (40-60%) BAP and Kn were efficient in producting shots from proximal ends of the nodal explants with an increase in the hormonal concentrations.

Table – 1: Effect of growth regulators on morphogenetic response on nodal explants of *Solanum melongena*

Growth regulator	Nodal	
	% Frequency of plant let production	Morpogenetic response
0.5 BA P + 0.5 kn+NAA	30	White compact callus
0.5 BA P + 1.5 Kn+NAA	40	White compact callus 4-6 shoots.
0.5 BA P + 1.5 Kn+NAA	35	Callus + shoots
0.5 BA P + 2.0 Kn+NAA	25	Callus + shoots
0.5 BA P + 2.5 Kn+NAA	20	Callus + shoots
0.5 BA P + 3.0 Kn+NAA	10	Small shoot buds
0.5 BA P + 3.5 Kn+NAA	15	Small shoot buds
0.5 BA P + 4.0 Kn +NAA	10	Small shoot buds + Roots

Plate 1. Morphogenetic response on nodal explants of *Solanum melongena*



IV. Conclusion

High rate of success using *Solanum melongena* nodal explant may be attributed to the absence of extrinsic faetor causing permanent changes in the growth. It is imperative that success is high with plants of semi – arid regions maintained under irrigation than those plants of extrement desert (arid region) grown in natural habitat, except *Solanum melongena* species. Efforts are still required to develop highly regenerative systems similar to those developed in *Solanum melongena* species work on protoplasts culture and genetic engineering for the improvement has yet to beginning a major way.

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