Research Paper :

Shoot induction from leaf explants of *Capparis zeylanica* L.

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SUMMARY

Micropropagation involves multiplication of genetically identical individuals by sexual reproduction within a short span of time with tremendous potential for the production of high quality plant based medicines. The present study established reliable and reproducible protocol for rapid multiple shoot induction from node explants of *Capparis zeylanica* using different concentration and combination of cytokinins. Murashige and Skoog (1962) medium supplemented with 0.5 to 2.0 mg/l BAP was found to be optimum to induce shoots directly from the node explants. Since very scarce information is available about micro propagation of this important medicinal plant, an attempt was made to develop a reproducible protocol for multiple shoot induction form nodal explants of one the culture. Significant increase in the number of shoots per explants was found ion M.S. medium supplemented with 2.0 mg/l BAP and 14 mg/l adenine sulphate. All the tested combinations have effect on increasing the number of shoots. Leaf explants derived shoot cultures were sub cultured to M.S. medium fortified with same concentration of hormone for shoot elongation. The percentage of explants exhibiting shoot induction was found to be between 50-60 i. most of the concentrations of benzyl amino purine. Several workers in past have micro propagated. Some of the important Asclepiadaceae members such as *Ceroegia bulbosa* (Britto *et al.*, 2003), *Holostemma ada – kodien* (Martin, 2002-2003).

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The present study was undertaken to explore the immune-modulatory activity of ethonolic and water extracts of *Capparis zeylanica* Linn (family Capparidaceae). Immuno-modulatory activity was also assessed by serological haematological tests. The study comprised the acute toxicity and preliminary phytocemical screening of the ethano land water extracts. Pre-treatment of water extract (300 mg/kg, oral) of *Capparis zeylanica* evoked a significant increase in neutrophyil adhesion to nylon fibers. Theaugmnetaton of humoral immune response to sheep red blood cells by athanolic and water extracts (150-300 mg/kg) is evidenced by increase in antibody titres in mice. Oral administration of ethanolic and water extracts of *Capparis zeylanica* leaves, at doses of 150 and 300 mg/kg in mice, dose dependently potentiated the delayed type hyper sensitivity reaction induced by sheep red blood cells. A dose related increase in both primary and secondary antibody titre was observed. Large climbing shrubs with hooked spines, stems woody, rough broon tomentose. Leaves ovate or elliptic – oblong, 3.5-6.5X2.3-4 cm, rusty tomentose when young glabrous at maturity, cuneate, entire, apex mucronate. Flowers 3-5 cm across white, turning pink. Berries 2.5-6 x 2-4.5 cm; ripe red, globese. *Cappparis zeylanica* extracts prevented myelo suppression in mice treated with cyclophosphamide drug.

MATERIALS AND METHODS

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 the interspecific species that the results obtained with one material are not replicated for another material. Experiments with *Capparis zeylanica* leaf explants using nutrients medium developed in to normal plants when placed in hormone MS medium.

RESULTS AND DISCUSSION

Majority of the reports describe development of biotechnology for rapid mass multiplication, and the improvement of trees. Though a considerable progress has been made in tissue culture of tree species, the methods is not widely applicable in its presene state for cloning, improvement, somaclonal variation, disease resistance, protoplasts culture and genetic useful on these lines of work for

Table 1: Effect of BAP + NAA + Kn on differentiation of *Capparis zeylanica* L. leaf explants

Growth regulators	Leaf	
	% Frequency of growth response	Morphogenetic response
0.5 BAP + 0.5 NAA + 0.5 Kn	50	Small nodules
1.0 BAP + 1.0 NAA + 1.0 Kn	45	Small shoot buds
1.5 BAP + 1.0 NAA + 1.5 Kn	40	Regeneration + Rooting
2.0 BAP + 1.0 NAA + 2.0 Kn	35	Normal callus
2.5 BAP + 1.0 NAA + 2.5 Kn	30	Small shoot buds
3.0 BAP + 1.0 NAA + 1.0 Kn	20	Small shoot buds
3.5 BAP + 1.0 NAA + 1.0 Kn	15	Small buds + Roots

specific and selected cases for developing clones for fodder, fuel and various types of resistance. The *Capparis zeylanica* leaf explants used for initiation of callus were obtained from *in vitro* grown sand were inoculated on MS medium fortified with 1.0 mg/l BAP and 0.5 Kn could initiate callus. 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.,* 1995), are almost lacking. Increase NAA resulted in the appearance of green globular callus. Most of the tree species are grown from seeds and are wild population with interspecific variation. So far no detailed selection procedures have been adopted to select the superior material leaving aside the cloning and propagation of such species except a few like *Capparis zeylanica* in which such selection and graft led to the multiplication of superior materials and development of the established varieties. The percentage of growth response was comparatively more (40-60%) BAP and Kn were efficient in producting shoots and roots from proximal ends of the leaf explants with an increase in the hormonal concentrations.

The effect had evoked different morphogenetic responses. The addition of 1.0 BAP mg/l + 1.0 Kn mg/l + 0.5 NAA mg/l to MS medium resulted in while soft and hard copact callus. The percentage frequency of growth response was high and is 50% at 1.5 BAP mag/l + 1.0 Kn mg/l + 0.5 NAA mg/l. development of regenerative system involves use of plant material obtained from selected trees. 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. By using *in vitro* techniques, a desired tree 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 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 (Table 1). 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).

While increased nitrate nitrogen was effective in increasing the number of adventitious shoots in *Z. mauritiana* (Mathur *et al.*, 1995) medium manipulations were not helpful in achieving high frequency multiplication from mature explants. Rooting of shoots obtained from nodal explants on a high cytokinin medium was uncertain with low frequency in *Capparis zeylanica* species varied responses in terms of number of roots, with or without callus and time required were obtained by different groups on rooting behavior of these species, except two examples 70% in *Capparis zeylanica* species per cent rooting in shoots of nature explants origin remained low. It is imperative that success is high with plants of semiarid regions maintained under irrigation than those plants of extrement desert (arid region) grown in natural habitat, except *Capparis zeylanica* species. High rate of success using *Capparis zeylanica* explants may be attributed to the absence of extrinsic factor causing permanent changes in the growth. Explants obtained from matured tree are recalcitrant to regenerate and inherent problems like contamination and browning are associated with these explants. Use of antioxidants and absorbents (PVP, Cystiene, ascorbic acid and dithiothreitol) was effective to control the browning in *C. pendulus*.

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