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In vitro regeneration of plants from mature nodal segments of *Zizyphus mauritiana.* L.

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One third of India's population is dependent on wood fuel for cooking their daily meals, which generates tremendous pressure on the scanty vegetation. 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 *Zizyphus* tree species can survive well in high temperature, slight frost and low rainfall. Their roots penetrate deeply in to ground water level and so they do not compete for water with the crop plants (Leaky and Last, 1980). Most of species are scattered widely throughout tropical and subtropical arid regions. Several of these are categorized as "multipurpose trees" and are backbone of rural economy throughout the drier plants of the world. It is because of the dependence on these species that plants have become over exploited. Tremendous pressure exerted by both man and animal, resulted in complete removal of superior germplasm or in some cases plant species have become threatened (Ramawat and Nadwani, 1991). The situation has become compounded by various inherent biological problems.

Key words: Limitations, Prerequisite, Somaclonal variation, Protoplast culture, *Zizyphus*.

INTRODUCTION

In view of the limitations of conventional breeding techniques, it may not be possible to achieve breeding objectives prioritized for *Zizyphus mauritiana .L.* The biotechnological approaches for fruit crop plants improvement will have to be *in vitro* selection techniques which have been successfully attempted in mango (Litz *et. al.,* 1991) for recovery of anthranose resistant somatic embryos after dual culture of embryogenic suspensions with culture filtrates of *Collectrotrichum gloeosporiodes* obtained from infected leaves and fruits. The use of *in vitro* techniques for collecting and storing rapidly vanishing fruit crop plant *Zizyphus* germplasm deserves top priority. For production of homozygous breeding lines the potential of haploid regeneration for another cultures or from irradiated ovules should be explored. Although iszyme markers have been identified for taxonomical studies in *Zizyphus* HELP markers need be identified to link with morphological as well as horticultural attributes. The improvement of *Zizyphus* through transformation with the help of selectable marker genes will depend upon advances in research on cloned genes having horticultural importance.

MATERIALS AND METHODS

Experiments with *Zizyphus* nodal, explants using nutrients medium developed in to normal plants when placed in hormone 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. Its because of variation between the interspecific species that the results obtained with one material are not replicated for another material.

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 present state for cloning, improvement, somaclonal variation, disease resistance, protoplasts cculture and genetic 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.,* 1995), are almost lacking. The Zizyphus nodal 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 white soft callus. Increase

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