EXPRESSION OF STRESS TOLERANCE IN TRANSGENIC CALLUS INTEGRATED WITH OSMOTIN GENE IN *HEVEA BRASILIENSIS*

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Stressful environment is a limiting factor for rubber productivity in the traditional rubber growing areas and limits the expansion of rubber cultivation to newer areas in several rubber producing countries, including India. Conventional methods of *Hevea* breeding take several years to produce plants with desirable traits. Genetic transformation offers a viable approach for producing plants with desired traits within a short period of time. Since osmotin gene is reported to impart tolerance to abiotic and biotic stress, the present study on *Agrobacterium* mediated gene transfer was carried out with the gene encoding osmotin protein. Osmotin gene construct with CaMV 35S promoter and kanamycin as selectable marker was used for the purpose. Transformation frequency of 48 per cent was obtained from anther derived embryogenic calli. Molecular analysis with PCR and RT-PCR could confirm the integration of gene and its expression. The calli were subjected to PEG as well as salt stress for fixed intervals. Higher proline accumulation in transgenic cell lines compared to control was observed under PEG stress. Transgenic cell lines could tolerate higher concentration of salt (150 mM), whereas the control calli showed growth retardation even in lower salt concentration (50 mM). The regenerated plants from these transgenic lines are expected to perform well under stressful environments.

Keywords: Genetic transformation, *Hevea brasiliensis*, Osmotin, Stress tolerance, Proline estimation

INTRODUCTION

Hevea brasiliensis Muell. Arg (Para rubber tree) is the major source of commercial natural rubber (*cis*-1, 4-polyisoprene). Natural rubber (NR) produced in specialized cells called laticifers is one of the most important biological molecules used for the manufacture of about 40,000 products indispensible for the economic and commercial development of a nation. Unpredictable climatic conditions such as prolonged drought and heat period affect plant growth and yield, causing annual loss estimated at billions of dollars. Stressful environment is a limiting factor for rubber productivity in the traditional rubber growing areas and limits the expansion of

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