HIGH LIGHT AND OSMOTIC STRESS INDUCED FRAGMENTATION OF GENOMIC DNA IN *HEVEA BRASILIENSIS*

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Plant nuclear DNA is an inherently unstable molecule and can be damaged metabolically or by a number of stress factors like extreme temperatures, drought and pathogen attack. In the present study, excised leaf discs harvested from two *Hevea* clones, RRII 430 (relatively drought tolerant) and RRII 414 (relatively drought susceptible) were subjected to water deficit stress *in vitro* using PEG under low and high light conditions in a plant growth chamber and another set of leaf discs kept under sunlight in open field. The integrity of genomic DNA from the leaf discs subjected to the stress conditions indicated a fair degree of DNA fragmentation in drought susceptible clone under high light alone as well as in the combination of high light and PEG stresses. In the drought tolerant clone, DNA was comparatively intact with no visible signs of fragmentation. On the other hand, under very high light conditions in the open field, significant level of DNA fragmentation was observed in both the clones indicating that high light can inflict serious damages to DNA in both drought tolerant and susceptible clones.

Key words: DNA fragmentation, *Hevea brasiliensis*, High light intensity, Osmotic stress

The ideal agro-climate for natural rubber (*Hevea brasiliensis*) cultivation is a wet and warm humid tropical environment with plenty of sunshine. Due to non-availability of land in traditional rubber growing regions, its cultivation is being extended to non-traditional areas where stressful climatic conditions limit growth, development and productivity of *Hevea* (Jacob *et al.*, 1999). Drought is probably the most important factor that limits natural rubber productivity in India. This is also the most important factor that restricts the expansion of its cultivation to newer areas in several rubber growing countries.

Under field conditions excess light also can be a source of stress. Plants are usually exposed to drought and high light conditions at the same time. High light intensity aggravates the harmful effects of drought stress (Chaves *et al.*, 2002; Szechynska-Hebda and Karpinski, 2013). Excess light leads to over production of excited electrons far in excess of what is needed to reduce CO_2 through photosynthesis and this also will lead to production of reactive oxygen species (ROS) (Jacob and Karaba, 1998; Jacob and Lawler, 1993; Sharma *et al.*, 2012). Plant nuclear DNA is an inherently unstable molecule and can be damaged metabolically

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