## P12 – 011

DETECTION OF GENETIC DIVERSITY IN TEA [*CAMELLIA SINENSIS* (L.) O. KUNTZE] USING AFLP MARKERS

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Amplified fragment length polymorphism (AFLP) markers have been successfully employed to detect diversity and genetic differentiation among Indian and Kenyan populations of tea (*Camellia sinensis* (L.) O. Kuntze). Shannon's index of diversity was used to partition the total phenotypic variation into between and within population components. On average, most of the diversity was detected within populations. Seventy-nine percent of variation was within and twenty-one percent between populations of Indian and Kenyan tea. A dendrogram constructed on the basis of band sharing distinctly separated the three populations of tea into China type (*sinensis*), Assam type (*assamica*) and Cambod type (*assamica* ssp. *lasiocalyx*), in a manner consistent with the present taxonomy of tea, the known pedigree of some of the genotypes and their geographical origin. Principal co-ordinate analysis grouped Assam genotypes both from India and Kenya supporting the suggestion that the Kenyan clones have been derived from collections made in this region. The China type were more dispersed on the PCO plot which is a reflection of wider genetic variation. As would be expected, clones collected from the same region exhibited less overall genetic variation. AFLP analysis discriminated all the 32 tea genotypes from India and Kenya, even those which cannot be distinguished on the basis of morphological and phenotypic traits.

## P12 – 012

### EVALUATION OF RAPD MARKERS IN *HEVEA* BREEDING

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With the objective of evaluating the applicability of RAPD markers in *Hevea*, a total of 42 decamer oligonucleotide primers were used to screen 24 clones selected/bred in different South East Asian countries. These amplified a total of 220 DNA fragments of size 0.35 - 3.5 kb, of which 111 were polymorphic. Out of these, 80 fragments (RAPD markers) which were repeatable and clearly scorable across all genotypes were used to estimate genetic distances among the tested clones. The estimated genetic distance ranged from 0.05 (RRII 308 and PB 5/51) to 0.75 (RRIC 100 and SCATC 88-13). A mean genetic distance of 0.5 indicates rather high genetic variability among the tested clones. UPGMA cluster analysis and principal co-ordinate analysis indicated the absence of a distinct geographical groupings as expected because of the breeding history of *Hevea*. An understanding of the extent of genetic diversity among different *elite* clones/breeding materials is essential for the selection of clones in recombination and polycross breeding programmes and also for choice of component clones of clonal composites for multiclone planting reccommendations.

## P12 – 013

### GENOME MAPPING AND GENETIC ANALYSIS OF SOUTH AMERICAN LEAF BLIGHT RESISTANCE IN RUBBER TREE (*HEVEA BRASILIENSIS*).

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*Hevea brasiliensis* (2n=36) is a tree widely cultivated in tropical countries for natural rubber production. Cultivated clones are highly susceptible to the South American Leaf Blight disease (SALB), due to the *Microcyclus ulei* fungus, whereas some wild accessions exhibit genetic resistance. This severe disease prevents development of rubber cultivation in Latino America, which account for only 1-2% of the world production, and threaten world rubber plantations. In connection with breeding program, we developed genome mapping approach for genetic and QTL analyses. A linkage map was constructed with RFLP, microsatellite, RAPD and isozyme markers by segregation analysis in 2 mapping populations. Those segregating populations were obtained by hand pollination implying one cultivated clone and one resistant wild clone. The current synthetic map encompass 200 loci clustered in 22 independent linkage groups. Resistance is being evaluated by controlled inoculations, with isolated *Microcyclus* strains, on one of the offspring . The results will serve to characterize the genetic determinism of SALB resistance with the objective to develop marker assisted selection.

## P12 – 014

### BIOTIC AND ABIOTIC STRESS INDUCED FREE RADICAL SCAVENGING ACTIVITIES IN NATURAL RUBBER TREES

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The biotic and abiotic environment of a plant influence the metabolism which in turn alters its physiology. Production of free radicals in response to biotic and abiotic stress is well documented in the literature. In the present study we investigated how a biotic stress (namely, a physiological disorder called tapping panel dryness, TPD) and an abiotic stress (namely, drought) alter the free radical scavenging activities of various tissues of adult natural rubber tree, *Hevea brasiliensis*. In the bark of the plants suffering from TPD there was increased accumulation of phenols and decreased activity of polyphenol oxidase. Peroxidase activity was significantly more, but glutathione was not significantly altered in the bark of the TPD affected trees. However, in plants that were subjected to drought stress there was increased accumulation of glutathione in the leaves, but not in the bark tissue and the peroxidase activity was more in the bark of the drought stressed plants when measurements were made after recovery from drought. Further efforts to investigate the free radical scavenging activity in relation to the above biotic and abiotic stress are in progress.