PROJECT PROFILE

Title: Identification of biochemical marker linked to sex determination in *Casuarina equisetifolia*

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Starts and Completion dates: From 1.4.2008 to 31.3.2010

Objectives

- To identify biochemical markers (isozymes) linked to sex determination

- To develop simple biochemical technique for gender identification.

Funding Agency: ICFRE

Total budget outlay: Rs. 7.85 lakhs

SUMMARY

The study was optimized thirteen different enzyme systems, such as Aspartate Amino Transferase (AAT), Peroxidase (POD), Esterase (EST), Glutamate Dehydrogenase (GDH), SuperoxideDismutase (SOD), Alcohol Dehydrogenase (ADH) Isocitrate Dehydrogenase (IDH), Glucose -6-phosphate Dehydrogenase (G-6-PDH), Malate Dehydrogenase (MDH), Malic Enzyme (ME), Polyphenol Oxidase (PPO) , Lactate dehydrogenase (LDH)] and Aconitase (ACO) in *Casuarina equisetifolia.*

These isozymes were grouped under hydrolase, Oxidoreductase and transferase. The structure of the isoenzymes were monomeric and in dimeric forms. In casuarina clones most of the isozymes expressed with two locus & two alleles.The maximum number of locus was two in six different enzymes. The maximum number of alleles in LDH was eight followed by five in peroxidase (POD), Polyphenol oxidase (PPO), Glucose -6-phosphate dehydrogenase (G_6 PDH).

Five enzymes (Alcohol dehydrogenase (Adh), , Lactate dehydrogenase (Ldh), Peroxidase (Pod), Glucose-6-phosphate dehydrogenase (G-6-Pdh), Aconitase (Aco) were more stable expressions towards gender specific among the thirteen different enzymes which were optimized in this species. Male and female clones specific samples were studied for peroxidase profile through IEF technique and PAGE technique. Very distinct alleles were detected. The study investigated a specific allele which was designated as male specific and it helps to identify gender discrimination in *Casuarina equisetifolia*

Chlorophyll pigment and protein quantification was assessed in ten male, ten female clones. Male clones have higher content of chlorophyll pigment and protein than the female.

Endogenous hormones (IAA, GA3) were estimated for the samples of ten male and ten female clones in the flowering and non flowering stages through HPLC.