PROJECTS ONGOING DURING THE YEAR 2008-2009

PLAN PROJECTS

Project 1: Detection of natural and biological defects in timbers by non-destructive testing techniques. (IWST/WPU/X63/2006-2010)

Status: Studied the effect of moisture content on ultrasonic velocity in wood of *Acacia mangium, Grevillea robusta* and *Mangifera indica*. Studied the effect of grain orientation on ultrasonic velocity in wood. of *Acacia mangium, Grevillea robusta* and *Mangifera indica*. Studied the effect of defects (hollowness) on ultrasonic velocity in wood samples of *Acacia mangium, Grevillea robusta* and *Mangifera indica.* Studied the strength properties (MOE, MOR, FS at LP) of *Acacia mangium* and *Grevillea robusta* and *Mangifera indica* by conventional test method. The relationship between hollowness and ultrasonic velocity is being established.

Ultrasonic Wood Tester to detect defects in wood

Project 2: Study on utilization aspects of plantation grown *Acacia mangium* Willd. from Orissa. (IWST/WPU/X57/2006-2010)

Status: The shrinkage study is completed and based on the retention of shape figure, the timber is classified as steady timber and grouped along with *Dalbergia sissoo* and *Adina cordifolia.* The timber took 47 days to reach 18% moisture content from initial moisture content of 80% after drying in dehumidifier kiln. Studies on anatomical properties for 4 trees completed. The physical and mechanical properties like specific gravity, weight, static bending, compression, hardness, shear, tension, nail and screw holding are completed in the green condition. Tests on Air-dry material are in progress. Installation of preservative treated samples at Nallal field station for durability study completed and periodic inspection on the condition of the samples were recorded. Some products like chair, artifacts were made as shown below.

Furniture and carvings made from *Acacia mangium* wood

Project 3: Studies on influence of microwave treatment on drying characteristics and treatability of wood. (IWST/WSP-XI 69/2007-2010)

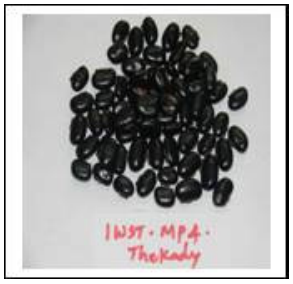
Status: Treatment of silver oak using microwave with varying thickness and time completed. Comparison of drying behaviour of microwave treated and untreated wood evaluated. Experiments with eucalyptus and silver oak drying using MW carried out. Ray cell of silver oak and eucalyptus were found to rupture by MW treatment for 20 minutes. Dehumidification drying characteristics of MW treated and untreated silver oak and rubber wood was studied. Studies on the drying behaviour of Teak and rubber wood completed.

Project 4: Isolation and estimation of L-DOPA from *Mucuna prurines* Linn collected from South India (IWST/CFP/XI 66/2007-2010)

Status: Seeds collected from different MPCA area in Karnataka, Shimoga (Sagara, Barige, Ikkeri), Kerala (Thekady). Savandurga, Devarayanadurga, Chitradurga (Jogi matti, Neerthadi, Devaragudda), Kollur plots were identified where Mucuna population exists for collection of fruits.Preliminary work of standardization of procedures for extraction of L-DOPA carried out. HPLC has been carried out for Standard L-DOPA for comparison of samples from different areas.Isolation and crystallization of L-DOPA has been carried out for seeds collected from Jogimatti (Chitradurga) and Devarayanadurga(Tumkur), Thekady(Kerala), Sagar (Shimoga).

Mucuna pruriens seeds from Barige, Shimoga

Mucuna prurines seed from Ikkeri, Sagara



Mucuna prurines seeds from Sagara

Mucuna prurines seeds from Thekady

Project 5: Laboratory testing for the assessment of the durability of timbers against powder post beetles – standardization and evaluation. (IWST /WBD/ X55 2006-2010)

Status: Using the standardized test methods, adults and larvae of *Lyctus africanus* and *Sinoxylon conigerum* were employed as the test insects for studying the durability of plantation timbers against borers. Natural durability of *Mesopsis eminii, Hevea brasiliensis, Grewilia robusta, Acacia mangium, Melia dubia* and Acacia *auriculaeformis* against the beetles were tested. Wood treated with neem products, CNSL, extractives from *Dysoxylum malabaricum* and insecticides, Chlorpyriphos and Imidacloprid were tested by exposure of adults and larvae of *L.*

africanus and *S. conigerum.* *In-vitro* assays with different concentrations of Phosphine was conducted to prove the susceptibility of life cycle stages of the powder post beetles.

Project 6: Studies on the natural resistance of imported wood against insects and decay fungi in Indian environment (IWST/WBD/XI-74/ 2007-2011)

Status: To study the natural durability of imported timbers, observations up to one year after implantations were taken at Trivandurm, Bangalore, Visakapatanam, Hyderabad, Jodhpur and Jabalpur. Experiment at Dehradun condition has been initiated. Observation on the natural durability of 5 imported timbers against fungus has been completed. Durability observation up to one year after exposure has been taken in marine condition. So far 20 species of termites have been identified.

Project 7: Studies on age related durability of plantation grown timbers- (IWST/WBD/X -50/2005–2012)

Status: Durability studies against decay fungi of plantation grown timbers of low rain fall area are completed. *A. auriculiformis, A. mangium* of 10, 15 & 20 yrs timber can be classified under Class I where as 5 yrs comes under Class II. *E. tereticornis* showed good resistance against decay fungi (Class I) *G. robusta* belongs to class III and *M. dubia* falls under non-resistance class IV. Studies of high rain fall area grown timbers are under progress.

Project 8: Seed infestation by insects among the emergent rainforest canopies at Makutta, Western Ghats (IWST/WBD/XI 68/2007-2010)

Status: Sampling work during the pre-monsoon period yielded seed fall from very few species – *Knema attenuata* and *Dipterocarpus indicus*. Although *Knema* had low infestation by insects (<5%), all the seeds of *Dipterocarpus* were damaged by insects. Data on seedling establishment of the previous year has also been recorded. The seedlings are dominated by those from *Vateria indica*. Germination and regeneration data from 60 one square meter sample plots have been noted. No seeding was recorded during the January to March 2009.

Project 9: Ethnobotanical studies of northern Eastern Ghats in Andhra Pradesh (IWST/WBD (M)/X 170 – 2007-2011)

Status: Conducted seven field tours to tribal areas of Srikakulam, Vizianagaram and Visakhapatnam districts. Recorded ethnobotanical data on wild genetic resources, edible, medicinal, material and social cultural aspects on 137 plant species from the tribes of Savaras, Khonds, Jatapus, Kondadoras, Nukadoras and Porjas. Collected 101 plant species, made into herbarium and Identified. Scrutinized and screened ethnobotanical data with available literature.

The important medicinal plants, namely, *Drynaria quercifolia* (L.) J. E. Sm., *Stemona tuberosa* Lour. and *Trichosanthes tricuspidata* Lour. were collected from the tribal areas and their uses reported for the first time.

Project 10: Studies on genetic fidelity of the micropropagated plants of bamboo- *Bambusa bambos* and *Dendrocalamus stocksii* (ICFRE/IWST/TIP/XI-65/2007-2010)

Status: Established new cultures from the Candidate Plus Clumps of *B. bambos* and *D. stocksii* from germplasm bank. *In-vitro* established cultures were multiplied in MS liquid and agar gelled media with additives + NAA (0.25 mg/l) + BAP (1.0 – 2.5 mg/l). *In-vitro* shoot clumps (2-3 shoots/clumps) rooted in MS/4 basal salts medium with IBA/NAA (1.0 mg/l). Rooted plants were hardened in polytunnel in green house for 3-4 weeks, followed by 2-3 weeks in shade before keeping in open nursery. Established callus cultures of both the species and multiplied in MS medium with additives + 2, 4-D. Callus cultures were used for somatic embryos induction. Standardized DNA isolation, purification and quantification in both the species. Standardized PCR reaction mixture and cycles for DNA amplification of the mother plants and micropropagated plants of both the species for the genetic fidelity studies.