Project 1: Studies on isolation and characterization of polysaccharides of abundantly available seeds of trees/shrubs, leaves, bark and exudate gums [FRI-51/Chem-1]

Sub-project (vii): Chemical investigation of Prosopis juliflora seed polysaccharide [2000-2006]

Findings: Seeds of P. juliflora are a waste and not being utilized properly. Endosperm adhered to the interior part of the seed was separated manually from the seed coat. Two polysaccharides were isolated from the endosperm, namely hot water-soluble polysaccharide (hws) (yield~3.3%) and cold water soluble polysaccharide (cws) (yield~81%). Molecular weight of the cws polysaccharide was determined by Mark-houwink equation using ubbelohde viscometer, and was found to be 10.7 x 105. Complete hydrolysis of polysaccharide produced a mixture of monosugars D-galactose and D-mannose. The polysaccharide partially hydrolysed with dilute sulfuric acid (0.05N), furnished mixture of oligosaccharides along with monosaccharides. Oligosaccharides and polysaccharide were completely methylated by Hakomori and Purdie methylation reactions. GLC of the polysccharide indicates nonreducing end of the main backbone and shows that the nonreducing single galactose units are attached to the branched mannose units through ? - (1> 6) glycosidic linkages, 2, 3-di-O-methyl- D-mannose and 2, 3, 6-tri-O-methyl-D-mannose indicate that the main chain is composed of ? - (1> 4) glycosidic linkages. The structure of polysaccharide was further confirmed by 1H NMR, 13C NMR and periodate oxidation. The abundant availability of the seed as waste material makes the seed polysaccharide a potential cost effective natural thickener.

Project 2: Inventorisation of multipurpose trees and shrubs for domestication and introduction in agroforestry for socio-economic upliftment of rural sector of Dehradun [FRI-199/SF-5/2002-2007]

Findings: Experimental work has been completed; data and final report is being prepared.

Project 3: Bio-ecology of insect pests of Paulownia and enumeration of their natural enemies [FRI-196/FED- 11/2002-2007]

Findings: Paulownia nursery and plantations at New Forest, Devipur, Sahaspur in Uttarakhand and Saharanpur in U.P. were surveyed. Light to moderate intermittent infestation of Helicoverpa armigera, Hyposidra talaca, Orgyia postica, Spodoptera litura, Acherontia styx, Ceryx godarti, Euproctis sp., Mimastra cyanura, Dolycoris indicus, Nezara viridula and Pingasa chlora was observed.

Studies on nutritional behaviour of an important defoliator of Paulownia and Spodoptera litura indicated that the insect could consume as much as 9245.50 mm2 of Paulownia foliage during its entire larval stage.

Project 4: Identification and updating of Braconid parasites (Hymenoptera) of major insect pests in National Insect Reference Collection (NIRC), and Doon Valley [FRI- 234/FED-17/ 2003-2007]

Findings: Taxonomy of Parasitic Braconid Parasites (Hymenoptera) - 2

species of braconids genus Apanteles, 1 spp. of Chelonus, some braconid parasites of subfamily Hormiinae and 2 parasites of subfamily Rogadinae were collected and identified. Study of parasitoids of Stauropus alternus known as Apanteles taprobanae on Acacia catechu has also been done.

Updating of Parasitic Braconid Parasites (Hymenoptera) - Updating of sub familyMicrogastrineanae, Doryctinae and Hormiinae (housed in NIRC) and family Braconidae was completed.

Project 5: Bio-ecological studies on insect pests of bamboos and their management[FRI-144/FED-8/2001-2007]

Findings: Chemical control of bamboo ghoon was carried out at bamboo depot Kotdwar (PauriGarhwal). Efficacy of various stickers with Cypermethrin 0.4% in diesel was tested. Stickers used wereNeogenpin, Neogen PAN, Teepol, Triton and molasses. Best protection of felled bamboos wasachieved for one year with the application of 20 ml. of molasses per litre of emulsion of Cypermethrin 0.4% in diesel followed by 20 ml. Neogen PAN, when used as prophylactic treatment.

Project 6: Studies on effect of plank width on drying rates and seasoning degrades with special references to low girth plantation species [FRI-313/FPD (WS)/58/2005-2007]

Findings: Data on cupping, spring and bow of Eucalyptus planks sawn under balanced tangential sawing pattern and radial sawing was compiled. An analytical study shows that there is certain range of length for which spring and bow are minimum. There are also certain ranges of widths for which cupping is minimum. The final project report is under