International Newsletter
Wood Research Institute Kyoto University, Japan

Announcing The Second Wood Science Seminar and The Fourth Pacific Rim Bio-Based Composites Symposium

The Second International Wood Science Seminar

The Second International Wood Science Seminar is scheduled to be held at the R & D Center for Applied Physics, Indonesian Institute of Science (LIPI), PUSPITEK, Serpong, on November 6-7, 1998. It is estimated that the seminar will draw over 100 papers from Indonesia, Japan, Malaysia, the Philippines, and China. The seminar is divided into two areas, Wood Material Science and Wood Bio-Mass/Wood Bio Science. Full papers and introductories will be reported in the seminar.

Day I: Friday, November 6
8:30 Registration, 9:00 Opening ceremony, 9:30 Keynote address (Indonesia), 10:30 Seminar sessions, 11:30 Lunch, 13:30 Seminar sessions, 19:00 Reception
Day II: Saturday, November 7
8:30 Seminar sessions, 12:00 Lunch, 13:30 Keynote address (Japan), 14:00 Seminar sessions, 15:30 17:00 Closing ceremony

As of August 30, the following full papers have been submitted to the seminar: Affinity of native hemicelluloses for cellulose produced by *Acetobacter*, Bio-conversion of sawdust of five wood species by *Auricularia polytricha*, Boron distribution in rubber (*Hevea brasiliensis*) and sengon (*Paraserianthes falcataria*) woods by soaking process, Consumption rate by subterranean termite, *Coptotermes curvignatus* on pine and rubberwood on several test methods, Decay resistance of three wood species against some wood-destroying fungi, Degradation of chemical pollutants by lignin-degrading fungi, Development of binderless board made from oil palm frond, Development of soil conditioning agents from lignin, Drying technique for *Manilcara sp.*, Dynamic aspects of wood structure under thermal conversion, Enhancement of cellulose deposition by mutant surface synthase, Glucose residues in hemicellulose which are responsible for affinity cellulose in bacterial cellulose composites, Growth mechanism of fast growing species in tropical forest-growth stress and strain of *Acacia mangium*, Predicting the compatibility of some Indonesian bamboos with cement, Processing of small diameter logs for laminated veneer lumber, veneer and plywood production, Production and fire resistant performance of cement bonded particleboard and other wood based materials, Production technology of oil palm cement bonded particleboard , Possible kraft-polysulfide anthraquinone pulping of fast growing tropical Euzalyptus grandis wood, Improvement of weathering properties of chemically modified wood by PF-resin treatment, Impregnation and radiation polymerization of vinyl monomer into lignocellulosic materials, Influence of rice hull ash (RHA) on the properties of cement bonded boards, Management of resorcinol formaldehyde

The Seminar Venue: National Research Council-Convention Hall PUSPITEK Serpong, Tangerang

resin liquid wastes by spray drying, Syringaresinol isolated from *Paraserianthes falcataria*, Surface coating of kamper wood (*Dryobalanops spp.*) profiles, Treatment of seven wood species by full-cell process with-boron -containing preservatives, Tropical hardwood surface deterioration by weather exposure, Thermal analysis of biocellulose composite produced by static and shading cultivations, The simple preservation method of fresh *Dendrocalamus asper* Backer, The combiantion technique of conventional and UV curing for wood surface coating using ultra violet radiation, The improvement of bonding properties resinous woods

The Fourth Pacific Rim Bio-Based Composites Symposium

The Fourth Pacific Rim Bio-Based Composites Symposium will be held in Bogor, Indonesia, in November 2-5. The symposium will provide up to date information on scientific and industrial development in Bio-Based Composites. The symposium will be attended by the experts of the bio-based composites from industries, governments, universities, research institutes and others who are interested in this field.

Day I: Monday, November 2

• Invited Paper "State of The Art and Future Development of Bio-Based Composites Science and Technology" by R.M. Rowell (USDA, FPL, Madison, Wisconsin, USA).

• Chemical modification of lignocellulosic materials • Hybrid composites from lignocellulosic materials • Processing and products improvement

Day II : Tuesday, November 3 : Topics • Property enhancement through raw material treatment • Fast growing tree species as raw material for bio-based composites.

Day III : Wednesday, November 4 : Topics • Innovative and new products from lignocellulose • Composites made from recycling materials • Specialty products of bio- based composites

Day IV : Thursday, November 5 : Symposium will be heid in the campus. Topics • Inorganic bonded bio-based composites • Adhesive for composites .

Research Activities in Indonesia Today

Faculty of Forestry, Gadjah Mada University

An Indonesian university or institute participating in the JSPS-LIPI core university program will be introduced in each issue. We begin with Gadjah mada University, the oldest university in Indonesia.

The Faculty of Forestry Gadjah Mada University (the oldest University in Indonesia with an enroll of about 35,000 students) is one of the finest institutions in the country offering forestry programs leading to the Sarjana degree (Forest Engineer). The programs is designed to produce graduates having the spirit of Pancasila (Five Principles of Indonesia phylosophy) and well-equipped with the sound knowledge in management of forest land, reforestation, forest utilization, forest product technology watershed management as well as nature conservation. It also provides a basis for the development of M.S. and Ph.D. graduate programs in forest science specialties.

Students must meet the following minimum requirements for the completion of their studies with at least a 2.00 gradepoint average:

1. Mandatory courses : 135 - 141 credits
2. Elective courses : 3 - 5 credits
3. Special assignments i.e. field trip, one month field practice in plantation forest in Jawa and two months in natural forest out of Jawa island, extension service, and special problem

Students who enrolled in the Faculty come from all over Indonesia, and some are foreigner from Malaysia, Korea, Europe, and Non Align countries. In 1997, the number of the active undergraduate students enrolled in the faculty are 689 with 2202 alumni, and 191 graduate students with 130 alumni, and 494 non Degree alumni. Two of the alumni were promoted as the Minister of the Ministry of Forestry.

At present the faculty maintains four departemants as follows :

1. Department of Silviculture;
2. Department of Forest Product Technology;
3. Department of Forest Management and
4. Department of Forest Resource Conservation.

Each department is responsible for administering study program to accommodate student needs through the course selection tailored in a curriculum intended for the respective program.

In principal, each study program covers the following areas :

1. Study program of Silviculture : forest establishment, maintenance, protection, tree-breeding and biotechnology;
2. Study program of Forest Product Technology : wood structure and anatomy, wood formation, wood physics, wood chemistry and energy, pulp and paper, wood drying and preservation, wood composite, minor forest products processing
3. Study program of Forest Management: forest planning, biometrics, management and economics;
4. Study program of Forest Resource Conservation: forest ecosystem conservation, wild-life and national park management.

Based on the current curriculum, for the first two semester students are requuired to take basic forestry courses and at the beginning of the third semester students are allowed to choose their desired field of studies.

Research Activities

The Faculty of Forestry Gadjah Mada University is actively conducting various research programs. Annually both the university and faculty offer funds on competitive bases to the staff members to do research on currect forestry problems. The Faculty of Forestry is also conducting joint research and involved in devel-

Main Office of the Gadjah Mada University

opment programs in forestry related areas. Several research programs are funded by other government institutions, state and private forestry companies, and international donors such as CIFOR (Center for International Forestry Organization Research). ICRAF (International Center for Research and Development of Agroforestry), ITTO, Rockefeller Foundation, KEEC (Kansai Environmental Engineering Center), ACFTSC (Asian Canada Forest Tree Seed Center, CGIAR (Consultative Group on International Agricultural Research, CSIRO (Center for Scientific and Industrial Research Organization), SEAMEO BIOTROP, USDA, SEARCA, FAO, UNESCO, IDRC, JICA, etc.

Periodically the Faculty of Forestry publishes a bulletin distributed to various institutions and individuals. The results of research activities may be available in the library of the Faculty of Forestry Gadjah Mada University.

Extension

Since its establishment the faculty has very actively been involved in extension activities to the people living around forest areas. The extension services include agroforestry, social forestry, planting techniques, soil and water conservation, and proper utilization of forest products. The Faculty of Forestry also provides consulting services in forest planning, inventory, silviculture, tree improvement, forest products utilization, and other forestry related areas.

Facilities

To facilitate learning processes and research activities, the Faculty of Forestry Gadjah Mada University is equipped with an excellent library, laboratories in a variety of fields, and computing facilities. In addition, the following facilities are available for forestry instruction :

1. Pardiyan Arboretum located right in front of the Faculty of Forestry Building. It was named after the late Pardiyan a faculty member, to honor his excellent extension services;
2. Wanagama Education and Experimental forest which is internationally known covers an area of 600 ha located in Playen, Wonosari approximately 35 km from the campus. It has excellent training course facilities (class room, convention hall, dormitory) and experimental plots (forest genetics and tree improvement, silviculture, and agroforestry) ;
3. A Modern Wood Processing Laboratory at Klebengan within easy walking distance of the Faculty of Forestry Building;
4. Two field Campuses, namely in Ngawi (East Java) and Jambi (Sumatra) for providing hands on experience in basic forestry practices to the student in teak and tropical rain forests, respectively .

(By Nugroho Marsoem)

Profiles of Ongoing Research Projects

Production of Pulp and Paper by Using Biological Methods from Tropical Wood Resources (FY 1997 - 1999).

Principal Investigators: ***Masaaki KUAHARA****, WRI, Kyoto Univ.,* ***Bambang PRASETYA****, R & D Center for Applied Pysics , LIPI*
Cooperative Researchers:
4 Japanese researchers and 5 Indonesian researchers

Wood Biomass is the most abundant renewable bioresource on the earth and its effective utilization in harmony with environmental safeguard is the urgent task for ensuring human activities in the next century. In paper manufacturing processes, the importance of environmental aspects has also grown dramatically in recent years since production of pulp and paper by current chemical reactions causes global environmental problems due to production of toxic biproducts and emission of high levels of carbon dioxide during the pulping stage at high temperature. Mechanical pulping with disc-refiner or stone-grinder is also extremely high energy consuming processes, leading to the emission of carbon dioxide indirectly at the generation plant for their energy supply. These background has prompted us to develop environmentally-benign deliginification system which can be applied to paper making processes.

Wood is basically composed of three main natural polymers, cellulose, hemicelluloses and lignin. Since the separation of cellulose is hindered by the presence of lignin, biological degradation of lignin is of enormous significance in the utilization of cell wall components of woody plants. Since white-rot fungi are primarily responsible for the lignin biodegradation, screening of strong ligninolytic fungi from tropical rain forest is expected to lead to the development of environmentally-friendly paper making processes. The JSPS project, "Production of Pulp and Paper by Using Biological Methods from Tropical Wood Resources", has begun in 1997 to achieve this purpose. Development of the biological system contributes not only to the global environmental problems but also to the promotion of pulp and paper industry in Indonesia. In this project, strong ligninolytic fungi are first screened from Indonesian forest and the fungal isolates are applied to biopulping and biobleaching processes. During the first financial year, strong ligninolytic fungi, K14, B18, R4, A2, PSM01 and CPN01 were isolated in Indonesia. These isolates were found to be superior to *Phanerochaete chrysosporium* and Coriolus versicolor in delignification extent. In particular, biological treatment with strain K14 reduced 23% of energy consumption in mechanical pulping of Oil palm EFB. Strain CPN01 and PSM01 were also found to be effective for decolorizing UKP from hardwood to a greater extent than the standard fungal strains. Characterization of ligninolytic enzymes produced by these isolates is now in progress to develop enzymatic bleaching system of UKP.

So far, eight research scientists, Dr. B. Prasetya, Dr. D. H. Goenadi, Dr. T. Basuki, Mrs. T. Idiyanti, Mr. D. A. Pasaribu, Mr. S. Muladi, Dr. R. Kondo and Dr. Y. Honda have been exchanged between Japan and Indonesia related to this project and tight international network with mutual reliability has been constructed. Since 1998, Dr. M. Karina has also participated in this project and chemical analysis of pulp components

Biobleaching Experiment at Serpong

after fungal treatment has started. A part of the results obtained in this project were presented at "7th International Conference on Biotechnology in the Pulp and Paper Industry (ICBPPI)" in Canada which is one of the leading international meeting in the field of biotechnology for paper-manufacturing. Presentation is also to be done at "The 2nd Wood Science Seminar in Indonesia" and also at " International Symposium on Emerging Technologies of Pulping & Papermaking of Fast-Growing Wood (ISETPP)" held in China this November. All of the researchers in this project do hope that the new technologies developed in this program will lead to the brilliant future for the next age. (By T. Watanabe)

Survey and Identification of Biologically Active Extractives from Tropical Hardwoods (FY 1997 - 1999)

Principal Investigators: ***Toshiaki UMEZAWA*** *WRI, Kyoto Univ.,* ***Wasrin SYAFII****, Bogor Agric. Univ.*
Cooperative Researchers: 4 Japanese researchers and 2 Indonesian researchers

Paraserianthes falcataria (= *Albizia falcata*) is known as one of the typical fast growing tropical trees. During the last decade, huge numbers of this plant have been planted in Indonesia, and its large-scale utilization as wood-based materials and pulping are now beginning. However, little has been known about wood extractives or secondary metabolites of this species.

The bark of Japanese *Albiz(z)ia julibrissin* (nemunoki in Japanese) has long been utilized as a folk medicine to reduce human stresses, and diglucoside of syringareseinol was found to be, at least, one of the active principles.

Thus it seemed likely that *P. falcataria* (= *A. falcata*) also contained biologically active syringaresinol glycosides. From the viewpoint of wood chemistry, it is important to analyze components of wood extractives of commercially important trees. In addition, if *P. falcataria* contains syringaresinol glycosides, especially biologically active syringaresinol diglucosides, the extracts of the plant might be utilized for tonics. Thus, it is of importance from the viewpoint of total utilization of *P. falcataria*.

The first step of this research was to examine whether *P. falcataria* contains biologically active syringaresinol derivatives or not. In FY 1997, Drs. Wasrin Syafii and Liswidowati stayed for 2 weeks and 2 months, respectively, in WRI, and T. Umezawa visited Bogor Agric. Univ. and LIPI Biology in Bogor for one week. We started to carry out the analysis of methanol extracts of *P. falcataria*, and isolated syringaresinol from the heartwood.

A part of the results was presented in the 48th Annual Meeting of the Japan Wood Research Society, Shizuoka, April 3-5, 1998, and will be presented in the Second International Wood Science Seminar held at Serpong in November, 1998.

In FY 1998, the survey of lignans are being continued. Thus, survey of syringaresinol glycosides, assay of biological activity, and potential utilization of *Paraserianthes* extractives are to be examined.
(By T. Umezawa)

From the editorial board

Exchange of Scientists FY1998

The JSPS Core University program between Wood Research Institute (WRI), Kyoto University and the Research and Development Center for Applied Physics , LIPI in the field of Wood Science allocates travel expenses for exchange of scientists. The following is the list of exchange of scientists in FY 1998.

1)Scientist Exchange

From Japan to Indonesia
Dr. K. Hayashi (Ehime Univ.)
5,Nov.-16,Nov
Dr. M. Morita (Kyushu Univ.)
1,Nov.-14,Nov.
Dr. M. Yoshinobu (Shimane Univ.)
1,Nov-8,Nov.
Dr. T. Hattori (Kyoto Univ.)
2,Nov.-9,Nov.
Dr. K. Minato (Kyoto Univ.)
30,Oct.-8,N
Dr. T. Hayashi (Kyoto Univ.)
1,Nov.-10,Nov.
Mr. O. Ishida (Kyoto Univ.)
1,Nov-8,Nov.
Dr. T. Sakuno (Tottori Univ.)
1,Nov.-8,Nov.
Dr. H. Kajita (Kyoto Prefectural Univ.)
1,Nov.-8,Nov.
Dr. K. Taki (Shizuoka Univ.)
1,Nov.-8,Nov.
Dr. K. Komatsu (Kyoto Univ.)
1,Nov.-8,Nov.

From Indonesia to Japan
Mr. A. A. Idris (Research Institute Human Settlement) 20,Jul-2,Aug.
Mr. S. Juno (R&D Center for Applied Physics) 20,Jul-2,Aug.
Mr. Sutrisno (Winaya Mukti Univ) 20,Jul-2,Aug.
Mr. Y. S. Poerba (R&D Center for Biology) 5,Jul-18,Jul.
Dr. E.S. Bakar (Bogor. Agricultural Univ.) 5,Jul-18,Jul.
Dr. W.S. Subowo (R&D Center for Applied Physics) 1,Sep.-14,Sep.
Dr. N. Hadjib (Forest Products Socioeconomics R&D Center) 15,Feb.-28,Feb
Dr. I.Y. Wardhani (Mulawarman Univ.) 15,Feb.-28,Feb

2) Cooperative Research

From Japan to Indonesia
Dr. S. Kawai (Kyoto Univ.)
27,Jul.-8.Aug.
Dr. T. Hata (Kyoto Univ.)
1,Nov.-8.Nov.
Dr. Y. Imamura (Kyoto Univ.)
4,Nov.-14,Nov.
Dr. T. Morooka (Kyoto Univ.)
4,Nov.-14,Nov.
Dr. H. Yamamoto (Nagoya Univ.)
19,Oct.-7,Nov.
Dr. H. Watanabe (Nagoya Univ.)
19,Oct.-7,Nov.
Dr. T. Watanabe (Kyoto Univ.)
1,Nov.-8,Nov.
Dr. T. Umezawa (Kyoto Univ.)
4,Nov.-10,Nov.
Dr. T. Ito (Kyoto Univ.)
Dr. T. Nobuchi (Kyoto Univ.)

From Indonesia to Japan
Dr. A. N. Lovian (Res. Inst. for Human Settlements) 23,Nov.-20,Feb.
Dr. S. Yusuf (R&D Center for Applied Physics) 1,Jul-28,Sep.
Dr. B. Subiyanto (R&D Center for Physics) 23,Nov.-20,Feb.
Dr. Y. S. Hadi (Bogor Agricultural Univ.) 27,May-5,Jun.
Dr. B. Prasetya (R&D Center for Physics) 20, Jul-17,Sep.
Dr. D.A. Pasaribu (Forest Products and Socio Economics R&D Center) 20,Jul.-2,Aug.
Dr. W. Syafii (Bogor Agricultural Univ.) 5,Jul.-18,Jul.)
Dr. Liswidowati (R&D Center for Biology) 25,Aug.-23,Oct.
Dr. T. Tobing (Bogor Agricultural Univ.) 7,Jul.-19,Jul.

3) Seminar

Dr. M. Kuwahara (Kyoto Univ.)
1,Nov.-8,Nov.
Dr. M. Shimada (Kyoto Univ.)
1, Nov.-8,Nov.
Ms. S. Sakata (Kyoto Univ.)
1,Nov.-8,Nov.

The Committee of Internatonal Academic Exchange
S. Kawai, M. Shimada, Y. Imamura, T. Morooka, T. Umezawa, T. Watanabe and T. Hata

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