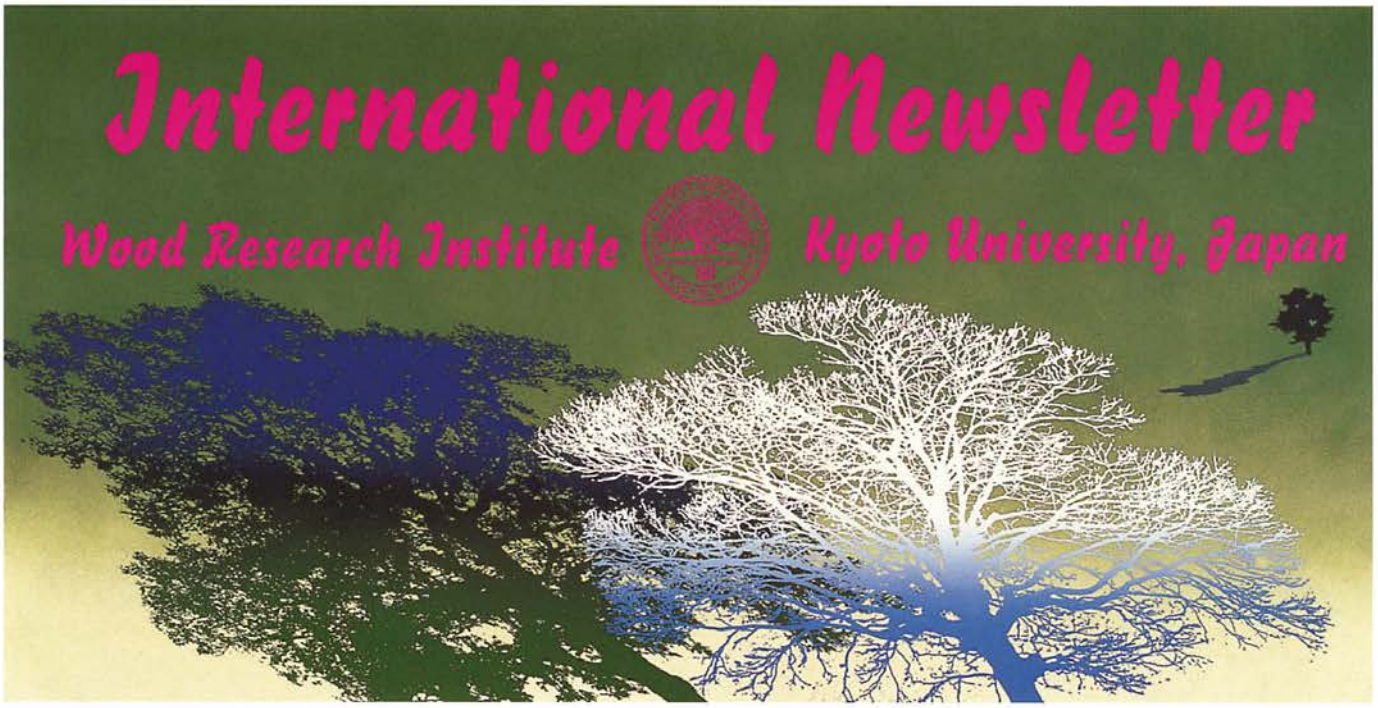
No. 6 March 2000

JSPS Core University Program in the Field of Wood Science



Call for Papers

The Third International Wood Science Symposium

1st – 2nd November, 2000

Wood Research Institute, Kyoto University

The Third International Wood Science Symposium sponsored by JSPS as the Core University Program will be held in November 1-2, 2000 at Mokushitu Hall (Wood Composite Hall) of the Wood Research Institute (WRI), Kyoto University.

The Committee of International Academic Exchange of WRI and the R & D Center for Applied Physics of LIPI are pleased to welcome not only the members of the program but also all those who are interested in participating in the symposium.

The objective of this symposium is to promote the research activities by sharing the up-to-date information among scientists from Japan and South-East Asian Countries. In the symposium, papers will be presented either in the introductory session (5 min for each presentation) or in the full-paper session (20 min for each presentation).

Those who intend to present papers are requested to inform of the title and the author(s) the organizing committee before 31 July, 2000. An abstract (for introductory session) or a full paper (for full-paper session) should be submitted not later than 31 August, 2000.

The Symposium Venue (Mokushitsu Hall)

Contact Address

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Letters from Indonesia

Advantages of Visiting Wood Research Institute, Kyoto University

Paimin Sukartana

Forest products Research Centre, Bogor, Indonesia

The Forest Products Research Centre (FPRC) in Bogor, Indonesia is a government research institution under the Ministry of Forestry and Estate Crops. The institution was originally a part of ìBosbow Proef Station Voor Het Boswezenî (Forestry Investigation Institute) that was officially established by the Dutch Colony in 1913. FPRC is the recent name. Within the last two decades the name of the institution has been changed several times to adjust to many bureaucratic structures.

The changes sometime cause confusion in our international relationship. However, the main duty of the institution still exists. The FPRC duties are mainly to perform research in the field of forest products science and technology. The deterioration of wood caused by insects, particularly termites, is my research field since I was hired in 1977. This field is quite challenging in Indonesia because, as a humid tropical country, there are more problems with wood deterioration caused by these insect infestations than in temperate regions.

Arranged by the Program of JSPS-LIPI, I had an opportunity to visit the Wood Research Institute (WRI) at Kyoto University in Japan. It was in early 1998, when Indonesia was initially hit by a multidimensional crisis. The economic and political circumstances were uncertain and changing so fast that even the near future was unpredictable. Because of the countryís situation, I formerly had doubts whether I would go or not. Finally I accepted the JSPS offer. I considered that it was one of the best opportunities I would ever have during my service as a researcher in this institution. Before leaving I had intensive communications with Prof. Munezoh Takahashi and Dr. Tsuyoshi Yoshimura from the WRI.

I left for Kansai International Airport from Jakarta Cengkareng International Airport on the evening of January 16, 1998. I arrived in the morning the next day. Even though I could not speak Japanese, I did not face any serious problems because most airport officers could communicate in English well. All written information was also in English, which was very helpful.

I traveled by train to Uji, where the WRI is located. In Kyoto Station, Mr. Nemoto, a WRI student, waited for me and showed me to get to Uji, arrange a hotel room, and go to the WRI Laboratory. The next day, Sunday, January 18, I rested.

I spent three days in Kyoto, from January 19 to 21. Prof. Takahashi and his staff from the Laboratory of Deterioration Control, Dr. Kunio Tsunoda, and Dr. Yoshimura were my hosts. They showed me interesting experiments on termites, especially the Formosan subterranean termite, *Coptotermes formosanus,* one of the most important species in the Northern Hemisphere. Colonies of the termite species have been maintained in this laboratory for years. It was the first time I saw a termite being reared in a laboratory. It might be rather difficult to rear this pest in Japan because it was originally from a warmer zone in the south. However, since the laboratory is well equipped, it seems there is no problem to maintain the termite colonies in the laboratory for years.

Some discussions were also conducted and many references were obtained. The collection of references is very important because, in some cases, it is very hard, and therefore time consuming, to get the necessary information in Indonesia. On the evening of January 21, a welcome party (as well as a farewell party, because I would be leaving for Kagoshima field experimental station with Dr. Yoshimura on January 22) took place in the Laboratory of Deterioration Control. It was attended by all laboratory staff and students.

Dr. Yoshimura and I left for Kagoshima from Osaka National Airport on January 22. We spent approximately one and half days there. Dr. Yoshimura showed me some field experiments either done by laboratory staff or students. It seemed similar to our field experimental station in Cikampek, some 70 km away in eastern Jakarta.

On the next day, January 23, Dr. Yoshimura showed me a fantastic tourist sight, the remains of a volcano explosion of Mount Sakurajima. I could not imagine, how powerful the eruption at that time was. Unfortunately we could not drive to the mountain peak because the road was covered by snow.

We went back to Kyoto that evening. I stayed in Kyoto for two more days, January 24 and 25. Some preparations were made before going back to Indonesia. On January 25, Dr. Yoshimura took me for a drive to look at the beautiful scenery of Kyoto City. It is a nice city with many very old buildings still well maintained. Finally, on January 26, I left for Jakarta using JAA airline. This airline stopped over in Bali, a famous tourist destination in Indonesia that I have never visited before.

My visiting to WRI was over. It was a very short visit but there were so many experiences that I obtained. I have studied how to handle termite colonies in a laboratory and how to do field research. If termite colonies can be successfully maintained in a laboratory in Japan, where the climate is not so suitable for this insect pest, the same method should be able to be used in Indonesia. Maintaining termite colonies in Indonesia should be much easier because most termites are from the tropic zone.

The congenial welcome and acceptance by WRI experts, particularly Prof. Takahashi and his staff who were my hosts, is another positive aspect of my trip. This situation made my visit more fruitful. Furthermore, this has strengthened our relationship, not only on a professional level but also on a personal level. More intensive communications have been come out afterward to make the visit more meaningful. Further discussions are still carried out following the visit because we are more familiar with each other. The internet also makes our communication easier and less costly. The transfer of knowledge has occurred. Indeed, there are many advantages that were obtained from the visit. Hopefully, they can be implemented in Indoneasia to accelerate our research achievements.

Sayonara, sampai jumpa.

Mr. Paimin Sukartana

First Impression of Japan

Euis Hermiati
R & D Center for Applied Physics in Serpong

I am very glad that I had the opportunity to visit Japan as well as to participate in the Scientist Exchange JSPS-Core University Program in the Field of Wood Science from July 1 to July 14, 1999. It was my first time to join the program and also my first visit to Japan. I was quite lucky because during my stay, there were four other scientists who joined the same program. Even though none of us can speak Japanese, we felt comfortable, because we were able to talk to each other in our own language and go sight seeing together. For people who cannot speak Japanese, communication is difficult.

During my short visit, I realized that Japan is densely populated, which is reflected by so many apartment and housing complexes. However, those complexes as well as the alleys in villages and residential areas look very neat and clean. The land is also used effectively. The Japanese people grow vegetables, flowers and other food crops in their yards. Most Japanese people are friendly, very courteous and helpful. They are also disciplined and hard working people, which is why Japan is one of the developed countries of the world. The uniqueness is that we still can see, feel and experience so much traditional culture, such as tea ceremonies, Kabuki Theatres and other traditional festivals among the modern technology and modern facilities.

The food is also interesting. It is arranged and packaged very nicely, and tastes delicious. Since I am a Muslem, I had to be careful what I ate when I was in Japan. There were lots of buta niku. The display of the types of food sold, which were labeled with drawings of animals like the one at the shokudo at Kyoto University, Uji, really helped me a lot in deciding what kind of food to buy.

Concerning science, I got the impression that science in Japan is well developed. The atmosphere at the universities and research institutions is very supportive. There are good research facilities, enough funds to research, as well as qualified and hard working people. Almost all Indonesian researchers and students can maintain this good atmosphere when they work or study in Japan. However, when they go back to Indonesia, there is usually not much they can do because the atmosphere is different. It is not easy to change this kind of atmosphere, but from our experiences in doing research in Japan and other developed countries, hopefully, little by littel, we can make a betterresearch atmosphere in our country. Therefore, the JSPS-Core University Program and other joint research programs are very important for Indonesia and may be for Japan as well. By participating in these programs, research scientists from Indonesia get to experience different kinds of research environment, which can be applied to research activities in our country.

That is my general impression of Japan from my short visit. The impression of course may be different if I stay for a longer period in Japan, donít you think so?

Ms. Euis Hermiati

My First Visit to Japan: Supporting My Lecture at the Winaya Mukti University

Rudi Dungani
Faculty of Forestry, Winaya Mukti University

The faculty of Forestry, Winaya Mukti University, is one of four faculties at Winaya Mukti University (UNWIM). Five years ago, I was accepted as a lecturer at the Department of Forest Products Technology, Division of Wood Protection in Laboratory Forest Products Processing.

In 1991, UNWIM changed to a university and s ince then it has had an important role in developing West Java. The present location of UNWIM is at Jl. Winaya Mukti No. 01 Jatinangor, Kabupaten Sumedang. The new campus with laboratories and facilities including an arboretum occupies about 50 hectares of land.

I graduated from the Faculty of Forestry, UNWIM in December 1994. In 1999, I got my masters from Bogor Agri-

Main campus of Kyoto University

cultural University. Using my educational background, I would like to start a career. My first visit to Japan will give support and guidance for me to give lectures. It is very important to attend a private college that has quality. Visiting Kyoto last September was my first trip to Japan. My visit period was fourteen days (September 12 to September 25, 1999). During that time, I visited the Wood Research Institute (WRI) at Kyoto University, Kyoto Prefectural University (KPU) and the Faculty of Agriculture, Kyoto University. In addition, I visited Nara City and Koshii Preserving Co. Ltd, Osaka.

I was given the opportunity to visit Japan as an exchange researcher under the JSPS-Core University program on Wood Science. My research objective was to focus on wood protection. In addition to the research, I also got to know many aspects of Japanese culture. First of all, I have had intensive discussions with my host scientist (Prof. Munezoh Takahashi) regarding my experiments in Indonesia, i.e. resistance of wood and wood-based products to termite attack. There is a lot of valuable information related to this topic which I have received from Dr. Tsuyoshi Yoshimura. He also provided me with some additional references about the topic. Moreover, he explained to me about the Wood Research Institute and showed me the laboratory facilities at WRI.

Dr. T. Yoshimura took me to the Faculty of Agriculture, Kyoto University. At the Laboratory of Forest Products Engineering, I was shown the non-destructive testing of wood, such as AE (*Acoustic Emission*) for detecting termite attack in construction buildings.

At WRI, Dr. Bambang Subiyanto escorted me to many laboratories, e.g., Laboratories of Gene Expression, Biochemical Control, Cell Structure and Function, Biomass Conversion, Property Enhancement, Wood Composite, and Structural Function.Ms. Yann Sudiyani, my friend from Indonesia, took me to Kyoto Prefectural University. I met Prof. Hiromu Kajita, and he showed me the laboratory facilities. I would like to express my special gratitude to Prof. Kajita who gave me a special short lecture about wood based material. We discussed this subject extensively and I received a lot of new information from Prof. Kajita. Similarly, I would like to thank Dr. U. Watanabe, who gave me a short lecture about property enhancement of wood and bamboo and the opportunity to discuss this subject.

My visit to Naraís temples was unforgettable. Nara has a large temple called Horyuji. The grounds of Horyuji (Horyu Temple) house the worldís oldest surviving wooden structures, portraying as image of Japan as it existed more than 1,300 years ago. Horyuji is a tourist site in Nara, with a temple and an image of a praying Buddha.

The Koshii Preserving Co. Ltd, is one of several industries in Osaka. The products of this industry preserve particleboard, plywood, and other wood products.

I was impressed after my first visit of the scientific efforts in wood research in Japan to overcome future problems due to the inevitable diminishing availability of natural woods. Highly dedicated scientists, such as those at WRI, have to a great extent, provided much scientific knowledge in Japan.

The advancement of sciences in Japan, the support and dedication of the scientists are of a human force. In my opinion, the advancement of science in Japan is comparable to that of other developed countries.

Finally, I would like to thank JSPS for sponsoring my visit to Japan. I enjoyed this golden opportunity and I will do my best in the future, and I only hope I can stay longer next time. Also, I would like to thank Dr. Bambang Subiyanto, Mr. Subyakto, Mr. Dede Hermawan, Ms. Anita Firmanti, Ms. Yanni Sudiyani, Mr. Yoshiyuki Yanase, and Mr. Yoshinobu Hikawa, for their kindness in providing assistance so that my visit to Kyoto was unforgettable.

Mr. Rudi Dungani with Todaiji Temple, the biggest wooden construction in the world

Letters from Japan

The Visiting Report of Indonesia

Ikuho Ilda

Kyoto Prefectural University

As a new member for the exchange of scientists in the JSPS-Core University Program in 1999, I was given the chance to visit Indonesia with Dr. Nobuaki Hattori (Tokyo University of Agriculture and Technology). The plan was to visit the R & D Center for Applied Physics in Science and Technology Research Center at Serpong , Bogor Agricultural University, the Forest Products Research and Development Centre in Bogor and Bogor Botanical Garden. Furthermore it was to observe the forest plantation in Subulu, the many plywood companies along the lower reaches of S. Yahakamu River in Samarinda and the natural mangrove forest on Bali Island.

Dr. Ikuho IIda and Bali dancers

Compared with our university, Science and Technology Research Center at Serpong had a large campus. The guesthouse was situated in a thick-wooded area near the complex. In Indonesia, the damage caused by termites is considerable. For example, the closet of the research institute was becoming the termite house, and the biting noise was audible.

For the presentation, we had to give lectures pertaining to our work. Dr. Hattori presented wood processing by laser incising, and I spoke of dyeing wood by utilizing the sap flow in the living tree and the improvement of liquid penetration into the wood by pre-compression treatment. I would like to thank the many listeners for their kindness.

We made a mistake regarding the visiting day and caused trouble for the staff of the Forest Products Research and Development Centre and Bogor Agricultural University. The utilization of Oil Palm and the many problems of the wood machines were discussed with between the staff and Dr. Hattori. Dr. Hattori got a husky voice the next day because of the previous enthusiastic discussion. In the Bogor Botanical Garden, we were able to observe the circus-tree and the giant fruit bat etc. In addition, we observed a bamboo gathering with a large diameter which differed from that of Japan.

The test plantation had an area of approximately 3,000 ha in Subulu. For approximately four days, we went to observe tropical forest. The strong sunshine and temperature (40℃) did not have a good effect on our body. One should not forget to have drink water and wear a hat. If this rule is forgotten, one will not have good memories of the large tropical forest. Though it was very difficult to observe the living of an anthropoid ìOrang-Utanî, their bedroom could be seen easily. Regarding the forest products, because I do not often enter the forest, I took a great interest in the tropical forest, namely, the speed of the tropical tree growth, the kind of trees and insects, the shape of the root, the state of weeds and so on.

There are approximately twenty plywood companies in the lower reaches of the S. Yahakamu River in Samarinda. Most of these companies were founded by the Japan-Indonesia joint project, and introduced the plywood, LVL, Sawing etc.

I donít know if mangrove has a specific gravity of over 1.0 and I want to study the various properties of mangrove lumber in the future. This lumber is interesting from the idea of wood utility. I watched Bali dance and observed the beautiful carving of elephants, houses etc. My visit to Indonesia was a very significant event.

I would like to thank Dr. Sulaeman Yusuf and the other members of Laboratory of Composite Materials in the R & D Center for Applied Physics of LIPI for their kindness and for the heart-warming reception. I also thank the many scientists of the Forest Products Research and Development Centre and Bogor Agricultural University for their kind assistance.

Natural mangrove forest in Bali Island

Plantation forest in Subulu

My First Visit to Indonesia

Shinso Yokota
Utunomiya University

I visited Indonesia from November 11 to 19, 1999, as part of the scientist exchange JSPS-Core University Program. I was in very anxious before going there because it was my first visit to Indonesia. Fortunately, I was able to go with Dr. Shingo Kawai, Gifu University, who was visiting there for cooperative research of the same program for the first 3 days. My first host scientist was Dr. Myrtha Karina, R&D Center for Applied Physics, LIPI. I have known her since I was a graduate student of the Wood Research Institute, Kyoto University; she was an Indonesian student at that time.

Dr. Setiadi, Mr. Prematuri and Dr. Shinso Yokota (from right to left)

On the second day in Bandung, Dr. Kawai and I gave presentations on our research work at R&D Center for Applied Physics, LIPI. There were about 20 people in the audience, and Dr. Karina introduced us to many researchers, some of them from Bogor. We had good discussions with them on our research after the presentations. For the first 3 days, she took us to many institutes of LIPI and to many laboratories of universities, e.g., in Bandung, the R&D Center for Applied Physics of LIPI, the Institute of Technology Bandung, and the R&D Center for Applied Chemistry of LIPI; in Bogor, the R&D Center for Biology of LIPI and Bogor Herbarium; and in Cibinong, the R&D Center for Biotechnology of LIPI. I met many researchers and discussed their studies. I found many more female students and research staff members compared to those in Japan. When I asked a student why there were so many female students at the Institute of Technology Bandung, she answered that women tend to major in biology fields, while men tend to major in technological fields.

Dr. Yadi Setiadi, Inter-University Center for Biotechnology, Bogor Agricultural University, was my second host from Nov. 15 to 18. I attended the First National Seminar of Mycorrhiza with him, which was held on Nov. 15-16 in Bogor and organized by him. To attend this seminar was one of my main purposes for this visit to Indonesia. After arriving and finishing registration, I met Mr. Ir. Ricksy Prematuri, who is a research member of Dr. Setiadiís laboratory. He was very kind to me during my visit to Dr. Setiadiís laboratory for the rest of 3 days. Before the opening ceremony of the seminar, I looked around the poster session area. Since most of the posters were prepared in Indonesian, I tried to find the ones written in English and took pictures of them. The mist system for growing *Shorea* nursery trees and two kinds of fertilizer tablets containing mycorrhizae came to my attention. I took a seat in the front, and waited for the start of the opening ceremony. A person next to me spoke to me in Indonesian. I replied that I did not understand Indonesian, and then he started to speak in English. His name was Ridwan A. Pasaribu, and it turned out that he was also involved in the same JSPS Program. In addition, he told me that he had been working at the laboratory of Dr. Ryuhichiro Kondo, Kyusyu University, for the project.

The opening ceremony started after nine, and Dr. Setiadi, director of the Indonesian Forestry Agency, and a representative of the British Council, delivered the addresses. After the ceremony, Professor Sally Smith (Adelaide University, Australia) gave a keynote lecture entitled ìRecent Advances and New Challenges in International Mycorrhizal Research.î Although Dr. Setiadi also gave a keynote lecture afterwords, its title and contents were in Indonesian, and I could not understand most of the contents. Because the rest of the lectures were also made in Indonesian, I could not understand most of them either. During the poster session after lunch, I discussed many topics with Dr. Khaswar Syamsu, Inter-University Center for Biotechnology, Bogor Agricultural University. The seminar finished around six in the evening on that day. Unfortunately, I could not attend the seminar on the second day because I had terrible diarrhea, so I stayed and rested at the hotel.

On Nov. 17, I visited Dr. Setiadiís laboratory with Mr. Imanuel Manege, whom I met at the seminar. He is studying the application of mycorrhizae for planted trees in a copper mine area. A graduate student showed us the laboratory. She showed us isolated mycorrhizae growing on media in Petri dishes and a leguminous plant inoculated with those mycorrhizae. In addition, we observed the preparations of roots from plants infected with mycorrhizae through a microscope. After that, Mr. Prematuri showed us around the building of Inter University Center for Biotechnology. After the tour, we discussed applications of mycorrhizae with Dr. Setiadi at his office.

On the final day in Bogor, I visited Dr. Setiadiís laboratory again with Dr. Miroslav Vosatka, University of Praha, Czech Republic, who also attended the seminar. At the laboratory, I discussed many topics with Dr. Vosatka and a student until Dr. Setiadi came back to his office from a faculty meeting. Dr. Vosatka discussed characters of soil and stones capable of receiving mycorrhizae with Dr. Setiadi. He strongly recommended to Dr.

The opening ceremony of the First national Seminar of Mycorrhiza

Setiadi to start a venture business on mycorrhizae in Indonesia, based on his experience in the Czech Republic. In the afternoon, I gavea presentation on my research work entitled ìChemical and Biochemical Reactions of Birch Plantlets infected with Fungiî. I discussed my research work with Dr. Setiadi and other members of the audience after the presentation. Then, I said good-bye to Dr. Setiadi and other members, and headed to Jakarta to leave for Japan.

In this visit to Indonesia, I met many scientists in different fields and discussed many topics with them. In addition, I found possibilities for collaborative work. Moreover, I was impressed with the real applications of mycorrhizae to forestry through the seminar on mycorrhizae and my visit to Dr. Setiadiís laboratory.

Finally, I greatly appreciate the kind hospitality of Dr. Karina, Dr. Setiadi, and other people who took care of me during my stay in Bandung and Bogor. In addition, I would like to acknowledge the Japan Society for the Promotion of Science for giving me this opportunity to visit Indonesia.

From the Editorial Board

Proposals for Future Projects FY2000 - 2002

Under the JSPS Core University Program between Wood Research Institute of Kyoto University and the R & D Center for Applied Physics of Indonesian Institute of Sciences in the field of wood science, two new projects will begin in FY 2000 .

Title:

Biochemical Analysis of Organic Acid Metabolism of Symbiotic and Saprophytic Basidiomycetes Occurring in Forest Ecosystem (FY 2000-2002)

Principal Investigators:

Prof. Mikio SHIMADA
Wood Research Institute, Kyoto University

Dr. Yadi SETIADI
Faculty of Forestry, Bogor Agricultural University

Research Organization:

Fukumi SAKAI
Wood Research Institute, Kyoto University
Hiroyuki KURODA
Wood Research Institute, Kyoto University
Takefumi HATTORI
Wood Research Institute, Kyoto University
Erman MUNIR
Sumatera Utara University
Ricksy PRIMATURI
Bogor Agricultural University
Asmarlaili S. HANAFIAH
Sumatera Utara University
T. SABRINA
Sumatera Utara University
D. H. GOENADI
Biotech. Res. Inst. E. Crop
Darmono TANIWIRIYON
Biotech. Res. Inst. E. Crop
H. WIDIASTUTI
Biotech. Res. Inst. E. Crop

Purpose of the Research Project:

Some mycorrhizal fungi enhance growth of its host plants. The organic acids secreted from the fungi have been reported to play an important role in supplying phosphate to the host. The purpose of this project is to elucidate the role of glyoxylate cycle in the production of organic acids in mycorrhizal fungi and wood-rotting fungi. Furthermore identification of growth promoting substances from mycorrhizal fungi is also conducted in order to enhance mycorrhizal infection to the host plants in the field experiments.

Significance and Expected Results:

The elucidation of the role of glyoxylate cycle in mycorrhizal fungi and wood-rotting fungi in the production of organic acids, and the identification of the growth promoting substances derived from mycorrhizal fungi would contribute to improve the growth of the woody plants infected by the mycorrhizal fungi for the global production and protection of woods.

Title:

Behaviors of Extractives during Pulping and Bleaching of Tropical Plantation Woods

Principal Investigators:

Prof. Gyosuke MESHITSUKA
Graduate School of Agricultural and Life Sciences, The University of Tokyo

Dr. Wasrin SYAFII
Faculty of Forestry, Bogor Agricultural University

Research Organization:

Yuji MATSUMOTO
Graduate School of Agricultural and Life Sciences, The University of Tokyo
Akira ISOGAI
Graduate School of Agricultural and Life Sciences, The University of Tokyo
Masahiro SAMEJIMA
Graduate School of Agricultural and Life Sciences, The University of Tokyo
Deded NAWAWI
Faculty of Forestry, Bogor Agricultural University

Purpose of the Research Project:

Because of increasing production of pulp and paper industry, tropical plantation woods, namely *Eucalyptus* spp. and *Acacia mangium,* have become quite important as their raw materials. However, some of these wood species have been reported to have troubles for pulping and bleaching mainly because of their extractives. In this project, we will try to characterize those extractives, especially their behaviors during pulping and bleaching. Behaviors of those extractives against oxygen and related bleaching chemicals will be one of the main research targets of the project.

Significance and Expected Results:

It is important to note that pulping and bleaching technologies for the tropical plantation woods can be modified based on the results of the project so as to remove their problems as pulp and paper raw materials. This must be useful for the better utilization and eventually for the saving of wood resources.

On－going Research Projects

Formation of Wood and Its Quality Control of Fast-Growing Trees in Tropical Forests
Principle Investigators:
Prof. Takao ITOH
Wood Research Institute, Kyoto University
Dr. Sri Nugroho Marsoem
Gadjah mada University

Development of Optimum Machining and Drying Methods for Fast-Growing Trees and Less-Using Species
Principle Investigators:
Prof. Kazuo HAYASHI
School of Agriculture, Ehime University
Dr. Edi S. BAKAR
Faculty of Forestry, Bogor Agricultural University

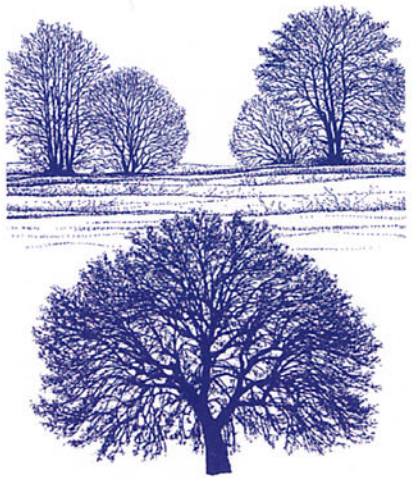
Softening Behavior of Bamboo and Its Practical Application
Principle Investigators:
Prof. Misato NORIMOTO
Wood Research Institute, Kyoto University
Dr. Wahyu DWIANTO
R & D Center for Applied Physics, LIPI

Development of Integrated Technology on High-Performance Utilization of Tropical Forest Resources
Principle Investigators:
Prof. Yuji IMAMURA
Wood Research Institute, Kyoto University
Dr. Wiwik S. SUBOWO
R & D Center for Applied Physics, LIPI

Composing of Organic Wates into Multifunctional Recyclates
Principle Investigators:
Prof. Minoru TERAZAWA
School of Agriculture, Hokkaido University
Dr. Neni SINTAWARDANI
R & D Center for Applied Physics, LIPI

Studies on the Effects of Silvicultural Conditions to the Wood Qualities of Plantation Teak
Principle Investigators:
Prof. Takashi OKUYAMA
Graduate School of Bio-agricultural Sciences, Nagoya University
Prof. Yusuf Sudo HADI
Faculty of Forestry, Bogor Agricultural University

Zero Emission Processes for Oil Palm Utilization
Principle Investigators:
Prof. Shuichi KAWAI
Wood Research Institute, Kyoto University
Dr. Bambang SUBIYANTO
R & D Center for Applied Physics, LIPI



The Committee of International Academic Exchange
M. Shimada (Chair), T. Itoh, T. Morooka, T. Yoshimura, T. Hata and M. Inoue

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目次にもどる