No. 35 February 2021

=Foreword=

International Research Activities at RISH in 2020

Professor Kazufumi Yazaki
Chair of the International Academic Exchange Committee of RISH, Kyoto University

The year 2020 has been an extraordinary year in human history. In January, the emergence of a new corona virus named SARS-CoV-2 was a trigger point for the rapid worldwide dissemination of the correspondent disease, COVID-19. The infection rate was truly amazing: in only a couple of months the disease was recognized as a pandemic, and the whole world was completely changed. Due to the COVID-19 pandemic, almost all academic meetings, both domestic and international, were canceled worldwide, and thus scientific interactions were strongly hampered, a situation which continues to the present.

Despite COVID-19, RISH has made efforts to continue its research activities and scientific interactions among multilateral communities. At present, RISH has 27 memoranda of understanding (MOUs) with numerous institutions abroad. In the year 2020, eight of these MOUs reached the end of their 5-year contracts—i.e., LAPAN of Indonesia, Andalas University (Indonesia), the College of Northeast Forestry University (China), National Cheng Kung University (Taiwan), Tanjungpura University (Indonesia), Southwest Forestry University (China), National Atmospheric Research Laboratory (India), and Indonesian Institute of Sciences (LIPI)—and we have decided to extend all these MOUs for 5 more years. It is to be emphasized that these institutions encompass a wide variety of disciplines, including atmospheric sciences, mathematics, engineering, natural sciences, material sciences, and biological sciences, including biochemistry and genome sciences. This wide range of multidisciplinary philosophies is a hallmark of our Institute.

The hottest topic this year was our conclusion of a new MOU contract with Université de Lorraine of France. In fact, the Graduate School of Agriculture of Kyoto University (Prof. Yoshiko Kosugi of the Laboratory of Forest Hydrology is the representative) has maintained an MOU contract with the Université de Lorraine for 10 years, and RISH was invited to participate in the MOU at the extension procedure this last summer. Coincidently, a new Assistant Professor of RISH, Dr. Ryosuke Munakata, who was hired in March 2020, has been working in the Université de Lorraine in Nancy (INRA, Picture) for a couple of years under a postdoctoral fellowship sponsored by JSPS. The host of Dr. Munakata was Professor Alain Hehn, who is a specialist in plant secondary metabolism. Upon the renewal of the MOU, the Graduate School of Agriculture and RISH decided to work together to extend the MOU for 5 more years. It is our sincere hope that this MOU will strengthen future scientific collaborations between France and Japan.

Université de Lorraine in Nancy (INRA)

=Internaitonal Activity Report=

The 4th Asia Research Node Symposium on Humanosphere Science at Nanjing, China

Professor Junji Sugiyama
Chair of the 4th ARN, RISH, Kyoto University
(currently Division of Forestry and Biomaterials Science, Graduate School of Agriculture, Kyoto University)

To begin, I would like to thank our friends and colleagues at Nanjing Forestry University (NFU) for organizing the local executive committee. NFU has been a cooperative partner institution since 1996. I also thank the Nanjing Forestry University and Kyoto University for their special financial support of this symposium. We have been quite fortunate to proceed with the 4th ARN Symposium despite the emergence of COVID-19 in December 2019 and its fast ascension to global pandemic status in March 2020.

The symposium was the cooperative effort of both institutions, and was held at the Nanjing International Conference Hotel in China, on December 26 and 27 of 2019. The conference site was located in the famous Zhongshan Mausoleum scenic area, which provided an exceptional location in a beautiful forest environment. The symposium aimed to share the recent advances in humanosphere science, thereby fostering students and young researchers who will sustain future development in this area. The symposium featured 35 oral and 153 poster presentations.

At the opening ceremony of the symposium, Prof. Takashi Watanabe, Director of RISH, and Prof. Hao Wang, President of NFU, gave the opening addresses. After that, a series of “elevator” speeches were made, in which the poster presentations were orally summarized within one minute. This program was essential to encourage mixing among the attendees and to create a friendly atmosphere. Afternoon sessions were divided into four topics: biodiversity; the new horizon of humanosphere science and humanity; research in space electromagnetic environments in Asia; and cellulose nanofiber materials. After learning about advancements on specific topics, all participants enjoyed a delicious Chinese meal at a banquet in the hotel.

On the second day, the main event, the poster session in which many students and young researchers discussed their research results, was a great success. Afternoon sessions were focused on 4 topics: wood information: climatology and tree ring science; bioenergy and biochemicals; space weather in Asia; and timber architectures. Many of these subjects were new to the ARN conference. The best poster awards were presented to 15 participants at the closing ceremony. After a closing address by Prof. Changtong Mei, Dean of the College of Materials Science and Engineering of NFU, we visited the city wall from the Ming dynasty and the Confucius Temple as an excursion, during which friendships among participants deepened.

A total of 237 participants, including 151 students, attended the symposium, which was deemed a great success. Last but not least, I would like to sincerely thank the staff of the Administration Assistance Office at RISH, Kyoto University for their tremendous effort and support in the realization of this special event.

=Overseas Visiting Scholar=

The Study on Transmitting Behavior of Termite Treated by "*Dusting Method*" in Extra Colony Interaction

Professor Sulaeman Yusuf
Indonesian Institute of Science, Indonesia

Dusting method for termite control was firstly introduced 40 years ago in Asia. However, the root of this method can be traced since 1915 in Australia by the use of arsenic powder as anti-termite agent. The success of dusting treatment depends on how much chemical powders stick to the surface of termite's body and on the percentage area of termite's body that are covered with chemicals. The ratio between the treated termites and untreated ones (control) will be affecting the outcome of colony elimination. Two important eusocial behaviours of termite colony members, i.e., "grooming" and "trophallaxis", are expected to be the key procedures for the success of dusting treatment. Another termite behaviour called "cannibalisms", which termites eat their dead colony mate, is also expected to contribute for the success of this approach. With those three distinct behaviours, the chemical powders from termite's body will be spread throughout the colony.

The application of dusting method usually uses treated termites from the same colony to release the chemical agent into a targeted colony (intra colony interaction). However, in this study we employed dusting treatment to be carried out on the workers of *Coptotermes formosanus* from a colony (Colony B1 at termite rearing laboratory – RISH) to be released in another colony (Colony B2). We would like to observe how effective the dusting treatment by experimenting extra colony interactions of the Formosan subterranean termite.

The application of Nile Blue A for marking C. *formosanus*

Nile Blue A was dissolved into distilled water to prepare dyeing solutions at concentration of 0.05%. Filter papers (55 mm in diameter, Whatman No. 2, Whatman BioSystem Ltd.) were dipped into one of the dyeing solutions for 10 seconds. Stained filter papers were air-dried overnight and served for forced-feeding by termite. Approximately 1000 termites (workers) were separated from a laboratory colony of *C. formosanus* and were put into a petri dish containing a moist-dyed filter paper. Undyed filter papers ware used as control. After three or five days, few of stained workers were randomly selected and transferred into another petri dish with two moist unstained filter paper. Five percent of soldiers were added to the stained workers group and daily observation was made to record the number of stained termites and survivors after few days.

The exposure set-up

We put 50 mg of fipronil into 4 cm of aluminium petri dish and shake it so that the fipronil spread evenly. Hundred workers of coloured termites (Colony B1) were put into a petri dish containing the fipronil and leave them for 5 minutes. After the exposure, the termites were removed and transferred into a filled petri dish termite control without staining from other colonies (Colony B2). Comparison between coloured termites that have been infected with fipronil and untreated termites (control) were 1:9, 2:8, 3:7, 4:6 and 5:5. Each treatment (Figure 1) were prepared in 3 replications. The mortality was calculated from each treatment and control.

Results

The experiment showed interesting results, as it had been thought that mixing two different termite colonies generate a fight and unrest behaviour between colonies, even if they were from one species. But in the current experiment, we found that two different colonies did not fight, instead they lived side by side. This phenomenon was unexpected outcome and inter-colonies termite behaviours need further studies to understand the dynamics and complexity. The question arises, is it possible that the two colonies from same species can live side by side, or event merging the colonies?

However, viewed from the mortality results, the data is as expected, the higher ratio of the treated termite the faster the mortality was (Figure 2). The results indicated that the fipronil chemical can spread or be transmitted through extra colony termite interactions (Figure 2).

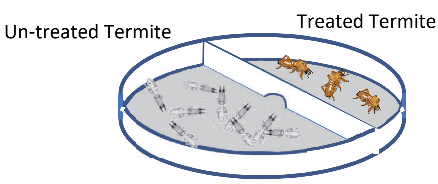


Figure 1. The exposure test of extra colony interaction

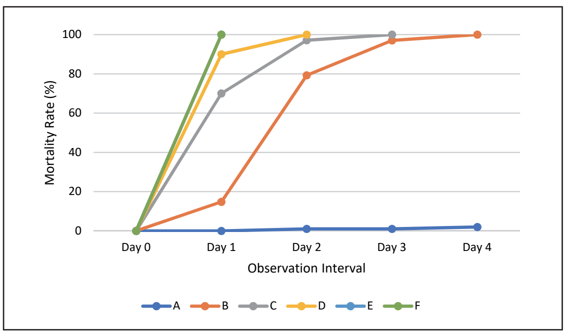


Figure 2. The mortality of termite after exposure to the Fipronil with different ratio between treated termites and untreated ones (control).

Note: A: Control; B: 1:9; C: 2:8; D: 3:7; E: 4:6 and F: 5:5

=Overseas Visiting Scholar=

Continued Analysis of Data from ShUREX Campaigns

Professor Lakshmi Kantha
University of Colorado, USA

I have had the pleasure of being associated with RISH, since my first visit as a Visiting Professor in 2013. Subsequently, I organized three multi-national (Japan, USA and France) field campaigns at the MU Observatory in Shigaraki in 2015, 2016 and 2017. These 3 to 4 week long ShUREX (Shigaraki UAV Radar Experiment) campaigns involved flying a fixed wing, Unmanned Aerial Vehicle, University of Colorado DataHawk, in the vicinity of the MU radar to collect simultaneous in-situ and radar data on turbulence in the lower moist troposphere. Nearly a dozen papers have been published on the rich dataset collected during these campaigns, but there still remain much more data to be analyzed. I took the opportunity of my sabbatical in the spring of this year to come to RISH once again as a Visiting Professor for six months. My principal task during the visit was to conduct a month-long ShUREX 2020 campaign in June 2020. Unfortunately, Corona virus intervened, and the resulting worldwide lockdowns in April and May of 2020, the restricted International travel between Japan and other countries (especially USA) and the mandatory quarantine made it impossible to carry it out. I had to postpone the campaign to June 2021 and after resigning from my post one month earlier than contracted, I returned to USA in June after a long journey involving 2 trains, Shinkansen and 2 flights. All domestic and international flights from Osaka Kansai airport were cancelled and only Tokyo Narita was open.

While at RISH, I continued analysis of ShUREX data from earlier campaigns. I also had the pleasure of participating in Hanami Festival in April. Sakura offset my disappointment in having to cancel the ShUREX 2020 campaign. I have visited Japan about a dozen times starting in 1990's, but never had an opportunity to come at the right time to witness Sakura. I attach a photo of Sakura I took at the Daigoji temple in Kyoto.

Confinement to my apartment during most of my visit enabled me to take up portrait drawing again for the first time in the last 25 years. Attached is one of the many drawings I made of my favorite Japanese actress Akari Hayami-san. I hope your readers enjoy it. More such portraits of her can be found at my instagram account lk_7491.

As for my work, I attach below, a plot of MU radar echo on June 9, 2015 (Figure 1), showing oscillatory motions in the atmospheric column below, due to strong convective motions induced below the cloud base by the evaporation of ice particles falling from the cloud into the intruding dry air layer below. This was the only time we saw such motions during the three campaigns. I have developed a theoretical model for such motions.

I also worked on the evolution of a turbulent layer, sandwiched between two sharp high humidity-gradient sheets, we saw on May 30, 2016 (Figure 2). What is enigmatic is the sandwiched layer produced by intrusion of a dry layer above the saturated, cloudy layer. The transition from a saturated layer to dry layer occurs across two sheets separated by a turbulent layer, rather than a single sheet. The dynamical cause of such a structure remains unknown. More details can be found in my RISH Atmospheric Sciences Seminar presentation on November 20, 2020.

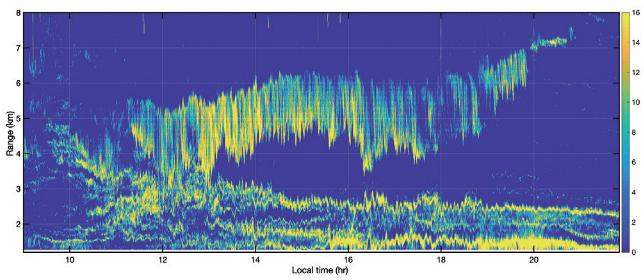


Figure 1. MU radar echo on June 9, 2015.

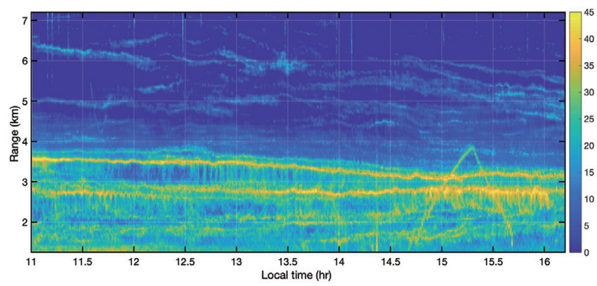


Figure 2. MU radar echo on May 30, 2016.

=Overseas Visiting Scholar=

Collaborative research on biogenesis of grass cell walls for biorefinery applications

Associate Professor Laura Bartley
Washington State University, USA

To reduce reliance on fossil fuels, economical biorefinery systems that convert plant stems and leaves into valuable fuels and chemicals are urgently needed. Such lignocellulosic biomass from cereal crops and other grass species shows great potential due to superior productivity and processability compared to woody biomass feedstocks.

RISH's Dr. Toshiaki Umezawa and Dr. Yuki Tobimatsu are world leaders in measuring and improving the biogenesis and structure of grass lignocellulose for biorefining. My research as a visiting associate professor at RISH from August 2019 to April 2020, hosted by Dr. Tobimatsu, advanced two projects—one illuminating cell wall changes caused by altering expression of grass-specific genes and the other probing the physiological consequences to plants with altered cell walls to severe water restriction.

Absent from woody feedstocks and the reference plant species, Arabidopsis, grasses add phenolic acids to lignocellulosic components (Figure 1A). The presence of these modifications can decrease the efficiency of biofuel production, but the compounds are themselves convertible to useful chemicals. Thus, knowledge of the genes responsible for phenolic acid incorporation into grass lignocellulose is an important question with various practical applications.

My and others' previous work revealed genes present in the grass genomes but absent from Arabidopsis for so-called "acyltransferases" that can add phenolic acids to lignocellulose. However, the function of one highly expressed acyltransferase in rice has remained untested. Working with Kyoto University graduate student, Senri Yamamoto, we used nuclear magnetic resonance spectroscopy to detect increases in phenolic acids upon increasing expression of this gene in rice (Figure 1B). This result provides a new avenue to manipulate abundance of ferulic acid in lignocellulose. Furthermore, while at RISH, I created additional genetic constructs that I am using to probe the function of other acyltransferases in an on-going collaboration between my group at Washington State University and the RISH group.

During my stay, we also probed the plant physiological consequences of reducing or altering lignin of the bioenergy crop, switchgrass. Lignin is a key polymer that crosslinks plant cell walls and alters biofuel processing. Lignin is also a hydrophobic polymer that surrounds the circulatory system of plants, providing structural support and aiding with water transport. Thus, we hypothesized that reducing or altering lignin would diminish switchgrass tolerance to drought. Though we got the expected result in some cases, in others we were intrigued to find that under drought, some alterations improved drought tolerance. We are continuing to work with RISH scientists to characterize the lignin of plants from this experiment.

In addition to advancing knowledge for improving grasses for biorefining in collaboration RISH scientists, the opportunity to work and live at Kyoto University-Uji led to career and personal growth. While at RISH, I wrote two successful grants, published a paper, and made good progress on two other manuscripts. I was often impressed by the deep knowledge of the literature and excellent work ethic of my RISH colleagues. I remain deeply grateful for the friends and acquaintances who made my family's stay more pleasant. I look forward to our continued collaboration.

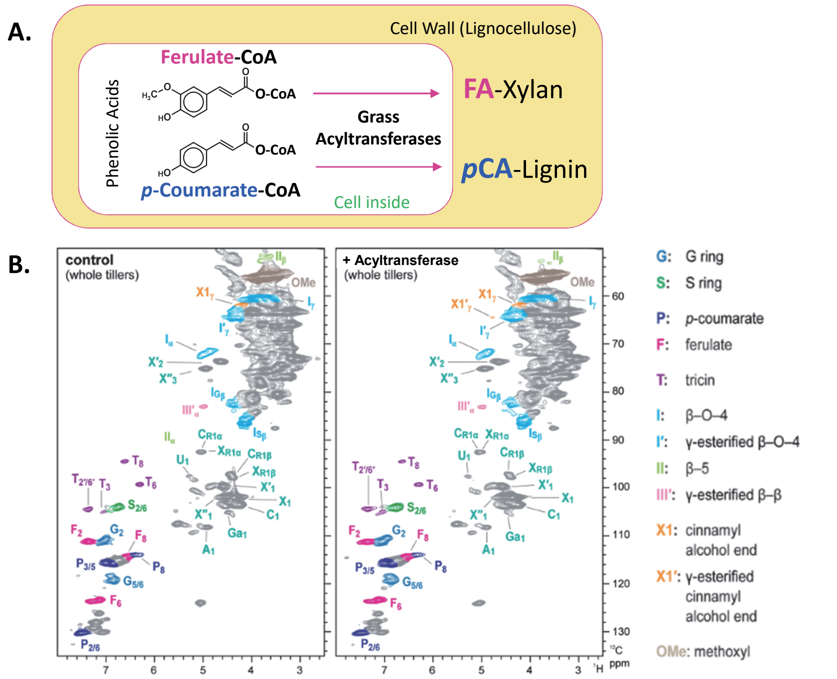
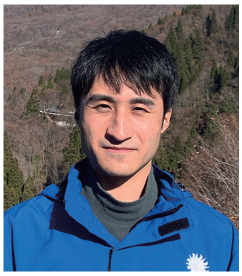


Figure 1. A) Grass lignocelluose (i.e., cell wall) acyltransferases add phenolic acids, ferulate and *para*-coumarate, to lignocellulose components, xylan and lignin.
B) Nuclear Magnetic Resonance data by Yamamoto show an increase in ferulate (pink signal) with greater acyltransferase expression.

=RISH Mission Research Fellow=

Microbial decomposition ability in cool-temperate forests of contrasting soil types in Japan

Dr. Ryosuke Nakamura



There is wide consensus that forest ecosystems are key to climate change mitigation efforts due to their ability to store large quantities of carbon. However, we still have much to learn about how plant-microbial-soil interactions contribute to the self-sustainability of forest ecosystems. Serpentine soil that results from weathering of serpentine rock (ultramafic rock < 45% silica) is characterized by a low calcium/magnesium ratio, large amounts of heavy metals (e.g., nickel and cobalt), low nutrient content, and dryness due to high drainage of water. The soil derived from limestone also exhibits low water availability and poor nutrient conditions for plants. These soil types are sporadically distributed around the world and are normally harsh for plants and microorganisms (Figure); however, some organisms show adaptive strategies and form a unique ecosystem in terms of species composition and ecosystem functions. Decomposition of plant dead bodies plays an important role in supporting ecosystems by regulating the cycling of various elements necessary for organisms. However, little is known about the decomposition processes in the soils of serpentine rock and limestone.

My ongoing research project at RISH focuses on cool-temperate deciduous broadleaf forest ecosystems of serpentine and non-serpentine sites on Mount Oe, Kyoto and those of karst and non-karst sites on Mount Ibuki, Shiga in Japan. I used commercially available non-woven bags composed of polyethylene and polypropylene, and placed a substrate for decomposition into each. To evaluate the microbial decomposition ability, I employed three chemically distinct substrates: nutrient-rich green tea leaves, high-quality cellulose filter paper, and unbleached coffee filter paper (see the Figure). In May 2020, I placed a total of 150 bags on the soil of each site. A given number of bags were retrieved for each substrate type every month from June to October 2020. I found that the decomposition speed differed greatly among the sites and substrates. On Mt. Oe, the decomposition speed of green tea and cellulose filter was higher at the non-serpentine site than at the serpentine site, while that of the coffee filters did not differ between sites. On Mt. Ibuki, the decomposition speed of green tea was higher at the non-karst site than at the karst site, whereas that of cellulose and the coffee filters was not different between the sites. The composition of microbes attached to the decomposed substrates will be analyzed to explain the observed patterns of decomposition in the field. These findings provide new insight into how differences in soil types influence the decomposition processes of plant dead bodies and nutrient cycling in forest ecosystems.

Figure. Photos from fieldwork on Mt. Oe, Kyoto. Forest ecosystem established on serpentine rock that is characterized by small trees owing to severe environmental stress (left). Decomposition experiment with various substrates (green tea, cellulose filter, coffee filter) to investigate the ability of microbes to decompose organic matter (right).

=RISH Mission Research Fellow=

Upgrading grass biomass utilization properties by introducing new lignin, flavonoid and stilbenoid features

Dr. Pui Ying Lam

Non-renewable fossil resources have long been serving as the major raw materials for the generation of energy, chemicals and materials. However, their utilization is not sustainable, as it causes numerous environmental and social problems. Shifting to the use of alternative renewable resources, such as plant biomass, may contribute to the development of a more sustainable society. Grass biomass crops, such as *Erianthus*, sugarcane and sorghum, show great potential as sources of lignocellulosic biomass for bioenergy and biochemicals due to their superior biomass productivity and processability. Developing new biotechnology strategies which optimize the productivity and utilization properties of grass biomass for the production of energy, chemicals and materials may therefore facilitate their utilizations in various biorefinery applications.

Lignins in the cell walls are viewed as the major obstacle to the use of plant biomass for various polysaccharide-oriented biorefinery applications. Thus, bioengineering approaches to modify the lignin content, composition and structure are being pursued to reduce the recalcitrance of lignins. On the other hand, plant biomass also serves as a source of phytochemicals, such as flavonoids and stilbenoids, which are important to plant physiology and also beneficial to human health when consumed. However, some of these phytochemicals are only produced in specific species, in specific tissues or under certain conditions. Such scarcity might limit their accessibility. Bioengineering plants to heterologously produce those phytochemicals might improve plant performance in response to stresses while at the same time providing a sustainable source for the supply of these beneficial phytochemicals.

In my project as a RISH research fellow, my team and I are pursuing new strategies to upgrade grass biomass by using rice, a model grass species. By bioengineering the phenylpropanoid metabolic pathways, new flavonoid and stilbenoid features can be introduced into rice in order to (1) improve the biomass utilization properties by changing cell wall lignin features, (2) produce valuable phytochemicals and concurrently (3) enhance plant resistance towards stresses. Overall, the outcomes of this study are expected to contribute to achieving several core missions of RISH: establishment of a sustainable society with reduced dependence on fossil resources through improvements to the production of bioenergy and biomaterials from plant biomass (Missions 5-2, 2 and 1).

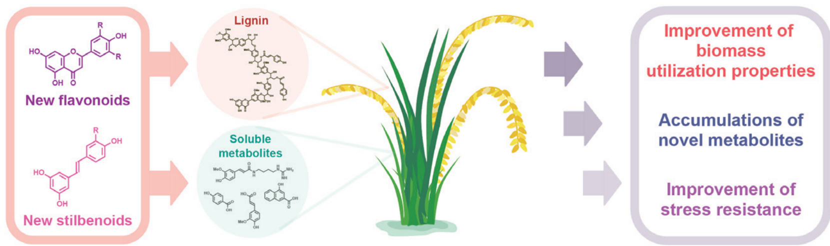


Figure. Concept map of this research study.

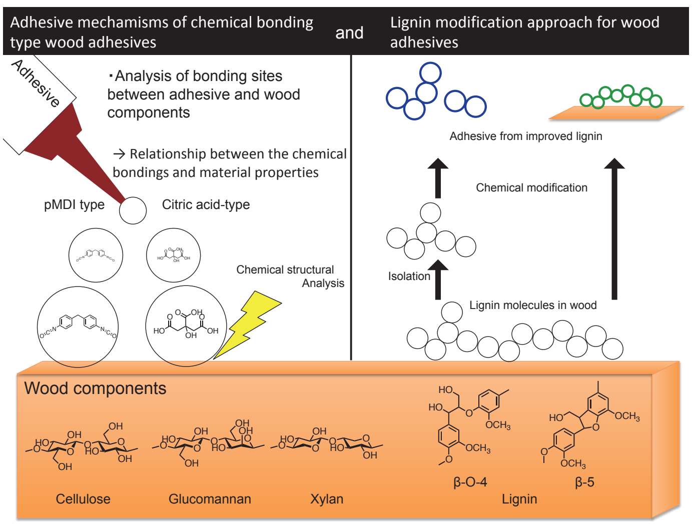
=RISH Mission Research Fellow=

Adhesive mechanisms of chemical bonding-type wood adhesives and a lignin modification approach for wood adhesives

Dr. Daisuke Ando

Petroleum-based wood adhesives have long been required for the efficient utilization of lignocellulosic resources in various contexts. In particular, formaldehyde-based wood adhesives, such as phenol-formaldehyde, account for a large portion of wood adhesives. More recently, various bio-based wood adhesives, such as tannin-based and lignin-based adhesives, have attracted much attention for their potential to resolve the many environmental problems caused by petrochemical use. Among them, citric acid-based wood adhesive is considered one of the chemical bonding-type wood adhesives. Citric acid, having three carboxyl groups, is contained in fruits and vegetables, such as citrus fruits. Citric acid functions as a wood-modifying agent and binder via esterification with the hydroxyl groups of cell wall components. The covalent bonding between citric acid, as the adhesive, and wood provide the dimensional stability and water resistance. However, the details regarding the specific components that are bonded and the specific positions that undergo reaction remain to be elucidated.

In our research, we have attempted to elucidate the adhesive mechanism by analyzing the bonding structure between citric acid and wood components. Wood components, such as cellulose, hemicellulose, and lig-



nin, have many kinds of hydroxyl groups. It is important for the clarification of the citric acid-based adhesive mechanism to know which components are bonded with citric acid. We are currently examining the structures formed between citric acid and wood by nuclear magnetic resonance (NMR) analysis. Thus far, the results have clarified that citric acid bonds with not only lignin but also polysaccharides, such as galactoglucomannan and cellulose. Therefore, citric acid takes on the function of the binder between the wood components, and then the dimensional stability and other material properties emerge. On the other hand, a portion of the polysaccharides was found to be degraded with citric acid under the adhesive condition. Therefore, to promote the appearance of the desired material properties, it is important to control the pressure and temperature of the adhesive condition to the appropriate levels.

As our results show, we are trying to elucidate from a chemical perspective what exactly takes place under some of the adhesive procedures currently in use. Based on the obtained knowledge, we would like to develop lignin-based adhesives in the future.

Table1: List of International MOU in FY 2020

No.	Institution	Country
1	Nanjing Forestry University	China
2	Centre de Recherches sur les Macromolécules Végétales, Centre National de la Recherche Scientifique (CNRS)	France
3	National Institute of Aeronautics and Space of the Republic of Indonesia (LAPAN)	Indonesia
4	School of Biological Sciences, Universiti Sains Malaysia	Malaysia
5	VTT Technical Research Centre of Finland	Finland
6	Zhejiang A & F University	China
7	College of Atmospheric and Geographic Sciences, University of Oklahoma	U.S.A.
8	National Atmospheric Research Laboratory (NARL), Department of Space, Government of India	India
9	Institute of Mathematics and Informatics, Bulgarian Academy of Sciences	Bulgaria
10	Southwest Forestry University	China
11	College of Planning and Design, National Cheng Kung University	Taiwan
12	Faculty of Forestry, Tanjungpura University	Indonesia
13	Research Center for Biomaterials, Indonesian Institute of Sciences (LIPI)	Indonesia
14	Faculty of Science, Chulalongkorn University	Thailand
15	College of Forest and Environmental Sciences, Kangwon National University	Korea
16	Faculty of Civil Engineering and Planning, Islamic University of Indonesia	Indonesia
17	Material Science and Engineering College, Northeast Forestry University	China
18	Faculty of Mathematics and Natural Sciences, Andalas University	Indonesia
19	Indian Institute of Geomagnetism (IIG)	India
20	National Chung Hsing University	Taiwan
21	Khulna University	Bangladesh
22	National Space Organization, National Applied Research Laboratories of Taiwan	Taiwan
23	National Museum of Taiwan History	Taiwan
24	Faculity of Forestry, Faculty of Mathematics and Natural Sciences, Faculty of Agriculture, Mulawarman University	Indonesia
25	Forest Products Research and Development Center, Forestry Research, Development and Innovation Agency, Ministry of Environment and Forestry	Indonesia
26	Universiti Putra Malaysia	Malaysia
27	Université de Lorraine	France

Table2: Visiting Professor of RISH in FY 2020

	Name and Affiliation	Research Title	Period
1	Laura E. Bartley (Associate Professor, Washington State University, USA)	Collaborative research on biogenesis and bioengineering of grass cell walls for biorefinery applications	16 August 2019–15 April 2020
2	Lakshmi Kantha (Professor, University of Colorado, USA)	Studies of turbulent mixing in the lower troposphere by synergistic use of MU radar and UAVs	16 January 2020–15 June 2020

Table3: International Symposium in FY2020

Theme	Place	Period
The 5th SATREPS Conference, Producing Biomass Energy and Material through Revegetation of Alang-alang (Imperata cylindrica) Fields (438th RISH symposium)	Online	17 November 2020
The 9th VLF/ELF Remote Sensing of Ionospheres and Magnetospheres Workshop VERSIM 2020 (426th RISH symposium)	Online	16–20 November 2020
The 5th Asia Research Node Symposium on Humanosphere Science (436th RISH symposium)	Online	22–23 December 2020

The Committee of International Academic Exchange
Kazufumi Yazaki (Chair), Kenji Umemura, Hiroyuki Hashiguchi, Tatsuhiro Yokoyama, Suyako Tazuru
The Committee of Public Relations
Hiroyuki Yano (Chair), Hirotsugu Kojima, Kenshi Takahashi, Takafumi Nakagawa, Toshimitsu Hata, Kei'ichi Baba, Soichi Tanaka, Hajime Sorimachi, Rika Kusakabe, Yoshimasa Kishimoto, Mayu Takeda
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