

# Reports on International Symposia on Research Towards Green Innovation: Chiang Mai, Thailand, January 12-13, 2014

## Symposium on Chemical Sciences Contributing to Green Innovation<sup>\*</sup>

## And

## Symposium on Multidisciplinary Aspects of Miang and Goishi-cha (fermented tea): ASEAN-Japanese Experiences<sup>\*\*</sup>

Gary D. Christian,<sup>\*</sup> Hiroyuki Ukeda<sup>\*\*</sup>

<sup>\*</sup> Department of Chemistry, University of Washington, Seattle, WA 98195-1700m USA

<sup>\*\*</sup> Faculty of Agriculture, Kochi University, Mononobe B-200, Nankoku 783-8502, Japan

The symposia were held in parallel at the Chiang Mai Orchid Hotel. They were held in celebration of the fiftieth anniversary of Chiang Mai University. We also celebrated the 60<sup>th</sup> birthday of Professor Kate Grudpan. The symposia were organized by the Center of Excellence for Innovation in Analytical Science and Technology (I-ANALY-S-T) of Chiang Mai University (CMU), chaired by Kate Grudpan and his colleagues.

The first day was devoted to scientific presentations, and the second day, we had a semi-academic excursion to Miang local production sites. There were 150 participants for the two symposia.

### Social Events

On Sunday evening following the symposia presentations, we were treated to a traditional Thai banquet. Special activities were arranged to celebrate Kate Grudpan's diamond birthday, including karaoke by participants. It was a fun evening.

On Monday, we had the excursion to Mea Kampon, Mea On District, Chiang Mai Province, where we learned the unique governing and village life of the mountain village where Miang is produced. We were treated to Thai blessing ceremony, and hiked up to Maekampong waterfall, viewing tea plants and coffee bean plants on the way.

### Opening Ceremony

The symposia were opened by greetings from the Dean of Faculty of Science, CMU (Associate Professor Dr. Sampan Singnarajwarapan), on behalf of the organizing committee, the head of I-ANALY-S-T (Professor Dr. Kate Grudpan) on behalf of the hosts, the Vice President of Kochi University (Professor Dr. Hiroyuki Ukeda) on behalf of the co-hosts, and the Vice President of CMU (Associate Professor Dr. Rome Chiranukrom) on behalf of the President of the University. We were then treated to a traditional colorful Northern Thailand (Lanna) dance performance before beginning sessions.

### Opening Lecture

Gary Christian from the University of Washington gave the opening lecture for the two symposia with a lecture on University Curriculum: Academic and Social Responsibility. The concept of social responsibility in analytical chemistry was introduced, demonstrating it has been important since biblical times and how it is ever important today. Emphasis was on the importance of the proper transmission and interpretation of analytical data, including what the results represent and how well we know them, important for the end user and for reporting to the public and regulators. Details are available in *Anal. Chem.* **85** (2013) 6152.



## Symposium on Chemical Sciences Contributing to Green Innovation

Chairs: *Ian McKelvie* (University of Melbourne), *Shoji Motomizu* (M&G Chematech, and Aichi Institute of Technology) and *Sharifuddin Md Zain* (Chair, University of Malaya)

Co-chairs: *Jaroon Jakmunee* (CMU), *Rattikarn Chantiwas* (Mahidol University) and *Duangjai Nacapricha* (Mahidol University)

There were 14 invited speakers for the symposium from Thailand, Australia, Malaysia, and Japan.

*Shoji Motomizu*, M&G Chematech and Aichi Institute of Technology, described a computer-controlled universal system for fluid-flow chemistry toward green innovation, used for chemical analysis and synthesis. *Toshihiko Imato*, Kyushu University, reported on the use of electrochemical detection on a compact disk-type fluidic device for minimizing sample and reagent use.

*Sharifuddin Md Zain*, University of Malaya, reported on two research project themes dealing with green chemistry in the Department of Chemistry. One was the use of palm oil based polymers, replacing petrochemicals to develop environmentally friendly polymers, lead by Professor S. N. Gan. The second project involves the establishment of the UM Center for Ionic Liquids. *Vannajan Sanghiran* from the same department described computational aided antibody design based on molecular docking and molecular dynamics simulation, in order to provide conditions to significantly reduce chemical waste.

*Ian McKelvie*, University of Melbourne, and colleagues developed paper-based analytical devices ( $\mu$ PADs) for measurement of nutrient species in natural waters, in particular reactive phosphate and ammonia, with minimal reagent use. *Malyn Chulasiei*, SJI Company and Mahidol University, described green innovation for beauty and health products, to provide safer products from having more natural derived ingredients. *Kheng Soo Tay*, University of Malaya, developed magnetic particle assisted dispersive liquid-liquid-microextraction.

*Winita Punyodom*, Chiang Mai University, described innovation in production of biodegradable polymers for use as bioplastics and biomaterials, again to minimize use of petrochemicals. *Sit Foon Cheng*, University of Malaya, described the use of qCNMR for regiospecific analysis of oils and fats to overcome the tedious conventional methods which involve multiple chemical steps. *Mhd Radzi Abas*, University of Malaya, described the cloud point extraction of parabens using non-ionic surfactant with cyclodextrin functionalized ionic liquid as a modifier to enhance extraction efficiency.

*Norio Teshima*, Aichi Institute of Technology, determined gaseous isoprene in indoor air by a flowinjection method. *Hideyuki Itabashi*, Gunma University, developed all-injection analysis as a simple flow injection system to reduce reagent consumption. *Keiro Higuchi*, Ogawa & Co. Ltd. and Kochi University, developed standard flow injection methods for environmental chemical analysis that utilize less reagent than classical standard methods.

*Kate Grudpan* concluded the symposium by reviewing unique developments during the first half century of Chiang Mai University leading to novel and innovative developments in analytical science and technology that were extended to various fields, including multidisciplinary approaches and local wisdom based innovation.



## Symposium on Multidisciplinary Aspects of Miang and Goishi-cha (fermented tea): ASEAN-Japanese Experiences

Chair: *Hiroyuki Ukeda* (Kochi University, Japan)

Co-Chairs: *Apinpus Rujiwattra* (CMU),  
*Lalida Shank* (CMU), *Thaneeya Chetianukornkul* (CMU).

There were 11 invited speakers for the symposium from Thailand and Japan.

*Hiroyuki Ukeda*, Kochi University, introduced the history of Goishi-cha, its unique manufacturing process, and the industry-university-government collaboration for Goishi-cha promotion. Also he emphasized the special relationship between Miang and Goishi-cha.

*Masao Oishi*, Ootoyo-cho in Kochi Prefecture, explained the present situation of Ootoyo-cho. This area has depopulation and aging problems now. In addition, he presented the manufacturing process of Goishi-cha in detail using VIDEO. In this presentation, Serika Kurita, Kochi University, translated the content in English.

*Saangkham Jangyod*, Lanna Wisdom School, introduced the tea production and daily life in Shan State, Myanmar. With his experience, he explained that tea is an important resource for people in Shan State, and production process is a daily activity to those living in the local area.

*Sanan Thammathi*, The Center for the Promotion of Arts and Culture of CMU, talked about the interview research of Miang's producer.

*Narumol Thongwai*, CMU, investigated the antimicrobial and antioxidative activity of Miang's leaves in order to find the new Miang's characteristics. In further trial, the Miang ethanolic extract was developed into a deodorant.

*Pornchai Preechaoanya*, Chayada Farm in Chiang Mai, talked about ecological aspects of tea plantation. With the wisdom of the local farmers, tea farming is recognized to play the important role in the environmental system, which leads to a new understanding of tea production that is different from conventional way.

*Kenji Yamamoto*, Suntory Beverage and Food Limited, introduced the present state of beverage and tea market in Southeast Asia. He explained in detail about the company's new functional tea product which was recognized as food for specified health use (Tokuho) by Consumer Affairs Agency in Japan.

*Masahiro Ichikawa*, Kochi University, talked about "Rural life of Kochi, Japan under depopulation and aging". He said this problem would affect both of human life and environment living



in rural areas. At the end of presentation, he asked participants whether this problem is also happening in Thailand now or not.

*Tomoko Shimamura*, Kochi University, showed the data on antioxidative activity of Goishi-cha. It was clearly suggested that the compound generated in the aerobic fermentation process was mainly responsible for the antioxidative activity of Goishi-cha.

*Mitsuhiro Miyamura*, Kochi University, talked about “Medical aspects of Goishi-cha”. The several functional effects against life-style diseases were revealed in the animal experiments. The clinical test on the protective effect of Goishi-cha against influenza infection was also introduced.

*Panee Sirisa-ard*, CMU, investigated the antioxidative activity and microorganism profile in fermented leaves and fresh leaves. Main microorganisms found in the fermented leaves of *Camellia sinensis* were either probiotic or non-pathogenic, indicating the safety and health-promoting property of fermented tea leaves.

*Hirofumi Ukeda* concluded the first symposium on the microbial fermented tea based on ASEAN-Japanese experiences was quite significant in order to share the information and the possibility and proposed that the second symposium should be planned in the near future, maybe 2015 in Kochi, Japan.

### Posters

There were 41 posters for the symposia, representing Japan, Malaysia, and Thailand, covering a variety of microanalytical techniques and methodologies for green applications, chemical and related sciences devoting to green innovation, and researches and information on fermented tea-Miang and Goishi-cha.

### Exhibitions

There were exhibitions: Goishi cha (by Otoyoko-cho Go-ishi-cha Cooperative, Japan), Madi tea (by Amazing Tea Ltd, Chiang Mai ), Miang Salad preparations, Northern Thailand and Myanmar Shan State styles (by Saangkham Jangyod's team), and Animation Games developed from Lanna Folk dance called Ging-Ga-Lha (by Supara Grudpan of I-ANALY-S-T).

### Sponsors

The symposia were sponsored by Chiang Mai University, through the Center of Excellence for Innovation in Analytical Science and Technology (I-ANALY-S-T), in collaboration with the Faculty of Science, Center for the Promotion of Arts and Culture, Kochi University, University of Malaya, and the Japanese Association of Flow Injection Analysis (JAFIA).

