

Report on ICSU/IUPAC Southeast Asian Workshop on Molecular Basis of Biodiversity: Conservation and Sustained Innovative Utilization, 26–28 November 1999, Bangkok, Thailand

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Thirty-seven participants from Southeast Asia (China, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand, and Vietnam) and Europe were invited to this workshop, which was jointly organized by the International Council for Science (ICSU); IUPAC; the United Nations Educational, Scientific, and Cultural Organization (UNESCO); and the National Center for Genetic Engineering and Biotechnology (BIOTEC)/NSTDA.

Program

The program at the Siam City Hotel in Bangkok consisted of the following activities:

Keynote Addresses

- “Global risk/benefit sharing in pharmaceutical innovation”, A. E. Fischli, IUPAC
- “Biotechnology–biodiversity, two sides of the same coin: A Thai context”, S. Bhumiratana, Director of BIOTEC
- “Role of international networks in cooperative research and development”, D. StC. Black (Australia)

Discussion

- Bioresources: “To share or not to share”, led by Y. Thebtaranonth (Thailand)
- Biodiversity: “Enhancing biodiversity value for securing future human needs”, led by S. Sastrapradja (Indonesia)
- Biodiversity: “International perspectives on biodiversity, conservation, and sustained innovative utilization”, led by J. A. McNeely (Switzerland)
- Bioresources: “Recommendations for future cooperation”, led by Y. Yuthavong and A. E. Fischli

Field Trip to “Five-Province-Junction” Forest, Chacheongsao

- “Introduction to Khao Ang Ru Nai Wildlife Sanctuary”, T. Prayurasiddhi (Thailand)

- “Study of Biodiversity in Khao Ang Ru Nai Wildlife Sanctuary Nature Trail”, led by T. Prayurasiddhi and P. Polsena, Natural Resources Conservation Center, Royal Forest Department (RFD)

Recommendations Document

The workshop resulted in the drafting of the following Recommendations for Global Cooperation on Sustainable Prospecting for Molecular Systems and Information at the Molecular Level from Natural Resources:

Introductory Remarks

Biodiversity is a complex issue requiring global coordinated attention from various fields of the physical, biomedical, and social sciences. One salient aspect of biodiversity is chemical in origin. The unique and diverse molecular libraries provided by the planetary flora and fauna have been a source of immense practical value to mankind. As a corollary, bioresources serve as a treasure house of as yet to be identified molecular templates whose potential significance cannot be conceived at the present time. This treasure must be held in trust for future generations.

Different parts of the globe have different degrees of complexity of their biological resources. International cooperation is, therefore, required to ensure that the benefits of global bioresources can be equitably and fairly distributed. Not all regions are in an ideal position today to obtain the maximum benefit from those assets. The necessity for mutually advantageous global cooperation in the utilization of bioresources is obvious. An essential element of such a common effort is the equitable benefit-sharing between the partners. This topic was the subject of several declarations [including the Manila Declaration (February, 1992); the Bukit Tinggi Declaration (October, 1992); the Melaka Accord (June, 1994); and the Phuket Declaration (November, 1997)]. It was also addressed on a broader international level at the United Nations Conference on Environment and Development in Rio de Janeiro in June, 1992, and it has been enshrined in international law through the Convention on Biological Diversity.

Innovative utilization of bioresources links society, governments, academia, and industry. They are the main stakeholders in both the preservation and utilization of bioresources, investing in and, at the same time, benefiting from the products and services originating from those assets. Any activity that adds value to a biological resource can help to support its conservation by making its sustainable use more relevant to society, and increasing public awareness of this relationship should be promoted. Because molecular systems or information at the molecular level is used in the chain of value enhancement, the chemical community is called upon to contribute to the discussion of the various scientific, economic, and ethical issues that are associated with

this type of international cooperation. To this end, IUPAC, the only independent global association of scientists responsible for chemistry, can and must play a crucial role in developing suitable recommendations [see IUPAC Recommendations on the Preservation of Natural Biodiversity in Context of Search for Economically Valuable Medicinal Biota, *Pure and Applied Chemistry*, Vol. 68, No. 12, pp. 2325–2332, 1996]. This effort should be carried out in close collaboration with the International Council for Science (ICSU).

Aspects of Global Cooperation

Three overlapping areas of international cooperation can be distinguished:

- exchange and generation of new scientific knowledge, resulting finally in rapidly published data accessible to everybody at no cost (academic exchange),
- selection of new knowledge generated, which by decision of the parties involved must be protected by patents prior to eventual later publication (early steps in innovation), and
- cooperation of partners focusing on the development of new products or services with an expected economic output (commercial cooperation).

It is important to emphasize at the outset, that in developing international guidelines for cooperation, an approach that is anchored in the recognition of mutual interest and mutual trust is absolutely essential. Personal collaboration is essential for teaching and research, and should be facilitated. The truism that we live in a global village is certainly valid in this context. Working together for the benefit of society and the environment must be the main objective of all parties. Once the basic common values are recognized, the first step in initiating the process toward formulating any guidelines requires the assemblage of parameters that define the authority, interest, investments, and obligations of the interacting partners. Subsequently, a phalanx of parameters should be identified that will constitute the functional framework acceptable to either side. Whereas ICSU/IUPAC have the mandate and responsibility to furnish the stakeholders with scientific input and the proposed form of any recommendations, legislative aspects must be addressed by appropriate governmental bodies.

Recommendations

Preamble

The parties involved

- recognize the sovereign rights of states over their own natural resources and the authority of national governments to determine access to biological and

- genetic resources, subject to national legislation;
- are dedicated to the conservation of biomolecular resources for future generations;
- recognize the vital role of science worldwide in education, research, and innovation;
- recognize the contributions that the molecular diversity of natural products from the biome have made to the health and welfare of humankind;
- affirm their commitment to cooperate fairly and equitably with stakeholders for the benefit of humankind in the sustainable utilization and development of biomolecular resources;
- acknowledge the interests of other stakeholders from the country or from abroad, including indigenous and local communities and farmers, in natural and genetic resources and associated information;
- are determined to honor the spirit of international, regional, national, and subnational laws and policies concerning biological and molecular diversity;
- are committed to ensure fair and equitable sharing of benefits arising from the sustainable utilization of natural resources;
- are dedicated to the fostering of research, accumulation, and dissemination of knowledge at the molecular level; and
- are dedicated to the enhancement of the scientific and technological expertise and resources of less-developed countries.

The parties have agreed to the following guidelines.

Authorization

- All academic exchange, cooperative early steps in innovation, and commercial cooperation have to be conducted under the auspices of appointed authorities.
- All countries should facilitate the rapid and efficient formulation of contracts between interacting partners.

Interests

- Academic interaction is directed at generating fundamental scientific knowledge in the first instance. Such basic knowledge may be translated into commercial products and services when this process becomes economically beneficial.
- There is a genuine interest of all partners in the translation of scientific knowledge into commercially viable products and services, and in the equitable sharing of benefits ensuing from them.
- Commercial cooperation aims to develop marketable products and services and to guarantee an optimal return on investment.
- All cooperating partners desire fast and simple regulations that govern activities of their common undertaking. A slow and complex bureaucracy would negatively influence cooperation.

- Bioresource-rich countries have an interest in enhancing their technical training and improving their facilities, as well as in ensuring the sustainable management of their natural resources and harnessing biodiversity for economic development.
- Partners from regions with advanced technology are motivated by the search for novel molecular structural templates, the underlying biomolecular chemistry, and the development of their economic potential made available by the partnership.
- All partners should appreciate each other's genuine interests and work in a spirit of mutual understanding, common accountability, and trust.

Investments

- Authorities in bioresource-rich countries should invest in infrastructure facilitating the emergence of small- and medium-sized R&D enterprises (SMEs), as they will become the potential main business partners of global innovation.
- Bioresource-rich countries offer the biota within their jurisdiction for scientific investigation. They also contribute traditional information on empirical correlations between biocomponents and their potential use.
- The partners from countries with advanced technology provide modern technical expertise for the isolation, identification, evaluation, and eventual generation of molecular libraries of biocomponents judged to be of value. They are bringing in their share of financial commitment as well, from both private and public sources.
- Bioresource-rich countries contribute technical manpower and field labor to the project. The technical manpower is a contributor, as well as a receiver, of enhanced technical training.
- All cooperating parties should contribute appropriately to the financial investments supporting the project.

Obligations

- The terms of any contract constitute the basis of the formal obligations for all parties.
- The partners should ensure the free flow of scientific information between themselves and with the scientific community. They should collaborate in the publication of scientific results, if needed, after due protection of economic interests of any partner, and be guided by the clauses of eventual patent laws.

Benefit Sharing

- Partners will assure that the benefits arising from the utilization of bioresources are shared fairly and equitably.

This workshop is part of the ongoing activities of the IUPAC Division III project "Molecular Basis of Biodiversity: Conservation and Sustained Innovative Utilization" (Project Leaders: A. E. Fischli and U. K. Pandit).

Report on International Bureau of Weights and Measures (BIPM)— Consultative Committee for Amount of Substance (CCQM) Working Group Meeting and Workshop on Measurement Uncertainty, 29 November–3 December 1999, Paris, France

Dr. Ales Fajgelj [Quality Assurance Supervisor, International Atomic Energy Agency (IAEA) Laboratories, A-2444 Seibersdorf, Austria; E-mail: A.Fajgelj@iaea.org], Chairman of the IUPAC Interdivisional Working Party on Harmonization of Quality Assurance Schemes for Analytical Laboratories, has submitted the following report:

As a successor to Prof. Folke Ingman in the position of IUPAC representative to the Consultative Committee for Amount of Substance (CCQM), International Bureau of Weights and Measures (BIPM), Paris, France, I attended a working group meeting and a workshop on measurement uncertainty held 29 November–3 December 1999 at BIPM.

General Information and Observations

CCQM is a technical committee that operates as a part of BIPM, a central international metrological organization. CCQM was established in 1993 to support the BIPM mandate in

- establishing fundamental standards and scales for measuring principal physical quantities and maintaining international prototypes,
- carrying out comparisons of national and international standards,
- ensuring coordination of corresponding measurement techniques, and
- carrying out and coordinating measurements of fundamental physical constants relevant to these activities in the field of chemical measurements.

Working Groups (WGs) carry out the technical work of CCQM. Present WGs are grouped in two fields, as follows: i) primary methods, such as isotope dilution mass spectrometry, coulometry, static and dynamic analysis of gas mixtures, titrimetry, determination of freezing point depression, and NMR spectroscopy as a