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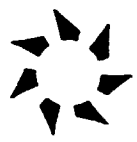
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The Regional Training Workshop

on

**The Use of rDNA Technologies in Biodiversity,
Plant Breeding and Biosafety**

20 November - 1 December 1995

at

**Microbial Genetic Engineering Unit, Mahidol University, Salaya Campus
Nakhorn Pathom, Thailand**

**National Center for Genetic Engineering and Biotechnology (BIOTEC)
National Science and Technology Development Agency (NSTDA)**

December 1995



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**The Regional Training Workshop on
The Use of rDNA Technologies in Biodiversity, Plant Breeding and Biosafety
November 20 - December 1, 1995**

Sponsored by

United Nations Industrial Development Organization (**UNIDO**)
The International Center for Genetic Engineering and Biotechnology (**ICGEB**)
The United Nations Environment Programme (**UNEP**)
The Crawford Fund for International Agricultural Research
National Center for Genetic Engineering and Biotechnology / National Science and
Technology Development Agency (**BIOTEC / NSTDA**)

Venue

The Institute of Science and Technology for Research and Development,
Mahidol University, Salaya Campus, Nakorn Pathom, 73140, Thailand.

The Institute of Science and Technology for Research and Development (ST) Mahidol University was chosen as host institutionally BIOTEC / NSTDA for its well-equipped facilities for research training, qualified personnels, and its affiliation with both of the organizations. The institute is also located in a suburb at Bangkok which is well accessible by various transportation services.

Objective

This workshop was focus on the introduction and utilization of new molecular genetics technology in the assessment and evaluation of indigenous biodiversity. It also provided novel approaches in detecting interactions of transgenic organisms with the eco-system, thus enhancing the ability to access the risk resulting from the environmental applications of biotechnology.

Program of the Training Workshop

Appendix A

List of International Lecturers and Participants

Appendix B

Local Organizing Committee

Dr. Sutat Sriwatanapongse

Dr. Sakol Panyim

BIOTEC Staff's

ST Staff's

Deputy Director, BIOTEC / NSTDA

Head, Microbial Genetic Engineering Unit,

BIOTEC / NSTDA and Director, ST

Physical set up of the facility

Lectures were organized in a carpeted and air-conditioned 180 seat auditorium, equipped with all audio visual equipment. Laboratory training were conducted in the Teaching Laboratories of the Central Equipment Laboratories. Computers (4 with internet access, 1 stand alone) were set up . During the workshop, meals and coffee breaks were provided.

Results of the Workshop

Talking with participants, most of participants expressed their pleasure in attending the workshop and believed what they learned from the workshop would help them in their work.

Some participants from Vietnam, Sri Lanka, Nepal did not have any experiences or any backgrounds so this workshops provided an invaluable basis for them.

Participants attending only lectures were not interviewed and the impact of this workshop on them could not be assessed.

This workshop was successful in providing hand-on training to the participants.

Trip organized for participants free of charge

Bangkok city tour : on Sunday November 26, 1995, ST provided a van to take international participants to the Grand Palace, Jatuchak Weekend Market and Central Department Store.

Medicinal Plant Propagation Project: on Monday November 27, 1995. ST provided 2 vans to take all participants and staffs to visit a medicinal plant propagation project and visit the nearby Sireerukhachart Medicinal Plant Garden, located on campus.

Functions

1. Welcome party, on Sunday November 19, 1995, 5 p.m. at the ST.
2. Reception dinner party hosted by BIOTEC/NSTDA, on Friday November 24, 1995 at the Royal City Hotel, Bangkok

Summary of other Comments by Participants and Organizing Staffs

1. Most participants (12) said their traveling to Bangkok were satisfactory.
2. Most international participants were very satisfied with accommodation at ST.
3. Most people were generally satisfied with organization effort put up by staffs of BIOTEC/NSTDA and UNIDO.
4. Some international participants thought the accommodation cost at MU was expensive. However, some believed that it was cheap.
5. Most participants were satisfied with lecture and program. However, they wished that all the handouts were made and distributed prior to the lectures. Some suggested that lecture should be organized solely in the morning and lab in the afternoon throughout the workshop. Some complained about the changes in lab schedule. Some pointed out that some lecture parts were irrelevant. Some (without background in Molecular Biology) needed more lectures on the techniques.
6. Most people were satisfied with lab program but they believed that they had too much free time. Some believed that part of the lab were not well organized and thus staff had to work too much unnecessarily. There should be lab briefing prior to everyday's experiment and after getting the result.
7. Most participants liked computer training but wished that there could have 1 machine for each participant.
8. Most participants were pleased with the lab handout and notebook.
9. They were satisfied with the trips we organized for them.
10. Comments about topics of future workshops :- The Use of Biotechnology in Agriculture, Tissue culture Techniques in combination with recombination DNA, Cloning and Sequencing workshop, Use of computer in data analysis, PCR Techniques in Biodiversity Assessment.
11. The organizer should have received information about participants from each focal point early hence the arrangement of accommodation could properly made.
12. Handouts from international lectures were requested to give to staff to reproduce before the commencement of the class.
13. Some participants wanted more lab discussion.
14. Certificate of attendance should be provided at the end of the workshop.

Appendix A

PROGRAM OF LECTURES

→ Day 1
Monday 20 Nov

09.00-10.00 WELCOME

INTRODUCTION

- faculty
- participants
- course structure and expectations

George Tzotzos

10.00-12.00 - Evolutionary perspectives on biodiversity

- General concepts
- community
- ecosystems
- scale
- hierarchy
- types and indices of diversity
- global patterns

George Tzotzos/Willy De Greef

13.00-15.00 - Impacts of environmental stressors on biodiversity

- Lessons from past invasions
- Keystone species and community effects of biological introductions
- Recombinant technologies: applications in plant breeding
- Recombinant technologies: applications in ex situ collections
- Recombinant technologies: applications in biosafety

Lindy Spindler

15.00-16.00 - Development and application of molecular techniques to assess and evaluate biodiversity

DNA ISOLATION

Lindy Spindler

16.00-18.00 - DNA Genome Organisation

- DNA Extraction
- methods
- problems and solutions
- purity levels
- isolating genomes

→ Day 2
Tuesday 21 Nov

RISK ASSESSMENT AND MANAGEMENT

George Tzotzos/Willy De Greef

09.00-12.00 - Biotechnology Risk Assessment

- definitions
- theory of risk assessment
- quantifying risk assessment
- regulatory frameworks

→ Day 3
Wednesday 22 Nov

DNA ANALYSIS

Nick Rhodes

09.00-11.00 Structure of DNA

- Recombinant DNA techniques:
 - I Restriction and Electrophoresis
 - action, frequency, specificity of restriction enzymes
 - methylation
 - sequence variation related to restriction site variation
 - agarose/acrylamide gel electrophoresis

Willy De Greef

13.30-15.30 Issues on Biodiversity

- Typology of biodiversity values
- Valuation of biodiversity
- International consultation and agreements in biosafety & biodiversity

Nick Rhodes/George Tzotzos

15.30-17.30

Computing

- Information technology and biodiversity databases-
- Taxonomic databases
- Use of sequences for phylogenetic reconstruction
- Data analysis-RFLP, RAPD, VNTR, AFLP, sequences
- Computer packages

→ Day 4
Thursday 23 Nov

DNA ANALYSIS

Martin Pfosser

10.00-12.30 - Southern Hybridisation and Applications

- detection of genes
- RFLP
- VNTR
- applications to plant breeding, biodiversity, population studies, taxonomy
- making probes
- radioactive/non-radioactive detection methods

→ Day 5
Friday, 24 Nov

DNA CLONING

Lindy Splndler

09.00-11.00 - Recombinant DNA techniques

- II Cloning and Selection strategies
- plasmids
- phage lambda
- lac Z complementation
- antibiotics

→ Day 6
Saturday 25 Nov

ANALYSIS OF CLONED GENES

Nick Rhodes

09.00-12.00

- Recombinant DNA Techniques III: Analysis of Cloned Genes
- restriction
- colony lifts/probes
- PCR (use of)
- sequencing (explain fully - no practical)

PCR

Martin Pfosser

13.00-16.00

- DNA Replication
- PCR
 - theory
 - parameters
 - applications: RAPD, VNTR, AFLP
 - information obtained

→ Day 7
Sunday 26 Nov

Free

→ Day 8
Monday 27 Nov

Lab work

→ Day 9
Tuesday 28 Nov

Lab work

→ Day 10
Wednesday 29 Nov

Lab work

→ Day 11/12
Thursday 30 Nov - Friday 1 Dec 1995

**GENERAL DISCUSSION
PROBLEM SOLVING**

TIMETABLE OF EXPERIMENTS - WEEK 1

Day 1 Monday 20 Nov	Day 2 Tuesday 21 Nov	Day 3 Wednesday 22 Nov	Day 4 Thursday 23 Nov	Day 5 Friday 24 Nov	Day 6 Saturday 25 Nov
Lectures	Lectures	Lectures	Photograph Gel ↓ Set up Southern Blot ↓ Lectures -----	Lectures ----- Wash Southern Blot ↓ Autoradiography Expose filters over weekend -----	Lectures
Lunch →	⋮	⋮	⋮	⋮	⋮
Lectures	DNA Extraction ↓ Load Agarose Gel Run overnight ↘	Photograph Gel ↓ Set up Restriction Enzyme Digests ↓ Lectures ----- Computing ----- Stop Digest Load Agarose Gel Run overnight ↘	Prehybridize Southern Blot ↓ Make Probes ↓ Computing ----- Hybridize Southern Blot overnight ↘	Computing -----	Lectures

TIMETABLE OF EXPERIMENTS - WEEK 2

Day 7 Sunday 26 Nov	Day 8 Monday 27 Nov	Day 3 Tuesday 28 Nov	Day 4 Wednesday 29 Nov	Day 5 Thursday 30 Nov	Day 6 Friday 1 Dec
Free	Use Hind/Bam Digests ex Day 3; Set up Ligation Develop Autoradiograph Transformation	PCR - set up rDNA Amplification - set up RAPDs Score Transformations ↓ Pick and streak Colonies - Growth o'night 37°C Restrict	Pick Colonies Inoculate Cultures Computing 	Finishing/ Repeating Experiments Computing General Discussion Problem Solving	
Lunch →					
	Plate out Transformations on Selective Media Grow 37°C o'night Computing	Load Gel Run approx 2 hrs Computing Photograph Gel	Mini-Preps Restriction Digest Load, Run Gel maybe overnight Photograph Gel		

Appendix B

International Lecturers

Dr. George T. Tzotzos

ICGEB Se. Coordinator
ICGEB Vienna Office
V.I.C. P.O. Box 300
A-1400 Vienna, Austria
Tel : (+43-1) 21131 Ext. 4336
Fax : (+43-1) 230-7355

Dr. Lindy Spindler

CSIRO Division of plant Industry
Clunies Ross Street
Black Mountain, Canberra
ACT 2601 Australia.
Tel : (06) 246 5108
Fax : (06) 246 5249

Dr. Willy De Greef

Lab. Ecology, University of Gent
Ledegamckstraat 35, Good Gent
Belgium
Tel : 32-9-2645258
Fax : 32-9-2645343
E-mail : willy.degreef@RUG.AC.BE

Dr. Martin Pfosser

Institute of Microbiology and Genetics
Vienna University Biocenter
DR. Bohr-Gasse No. 9
A-1030 Vienna
Austria
Tel : 93-1-79515-4501
Fax : 93-1-79515-4114
E-mail : Martin@gem.univie.ac.at

Dr. Nick Rhodes

Department of Information Studies
University of Sheffield, Regent Court
211 Portobello Street
Sheffield, South Yorkshire, S1 4DP
United Kingdom

Participants

Australia

Mr. John Raymond Oliver
NSW Agriculture, Agricultural Research Institute
Pine Gully Road, Wagga Wagga
NSW 2650, Australia
Tel ; + 61 69 381 816, Fax : + 61 69 381 809
E-mail : oliverj@agric. nsw. gov. au

China

Mr. Zou Zhurong
Biotechnology Research Center
Chinese Academy of Agriculture Sciences (CAAS)
30 Baishigu Road, Beijing 100081
China
Tel : 86-10-8315336, Fax : 86-10-2174142

India

Dr. L. M. S. Palni
G. B. Pant Institute of Himalayan
Environment and Development
Kosi-Katarmal, Almora
U. P. 263 643, India
Tel : 91-05962-81111, Fax : 91-05962-22100, 22439
E-mail : gbpihed@shakti. ncst. ernet. in

Indonesia

Mr. Satya Nugroho
R&D Centre for Biotechnology
The Indonesian Institute of Sciences
Jl. Raya Bogor Km.46, Cibinong 16911
Bogor, Indonesia
Tel : 62-021-8754587, Fax : 62-021-8754588

Nepal

Mr. Ashok Mudwari
Agricultural Botany Division
Nepal Agricultural Research Council
Khumaltar, Kathmandu, Nepal
Tel : 977-1-521614, 977-1-521615
Fax : 977-1-521197

Philippines

Ms. Teofila SJ Santos
National Institute of Molecular Biology
and Biotechnology
UP Los Banos College Laguna 4031, Philippines
Tel : 63-94-2724, 63-94-2725,
Fax : 63-94-2721
E-mail : tsjs@biotech. uplb. edu. ph

Mr. Von Mark V. Cruz
National Plant Genetic Resources Laboratory
College of Agriculture
University of the Philippines Los Banos
Collage, Laguna
Philippines
Tel : 63-94 2298, 2512, 3304
Fax : 63-94-3438

Sri-Lanka

Mr. Athula Somukumara Udagama Liyanage
Plant Genetic Resources Centre
P.O. Box 59. Gannoruwa, Peradeniya
Sri-Lanka
Tel : 94-08-88494, 94-08-88490
Fax : 94-08-88490

Vietnam

Mr. La Tuan Nghia
Molecular Biology Department, Institute of
Agricultural Genetics
Tuliem, Hanoi
Vietnam
Tel : 84-4-343196, Fax : 84-4-343196

Ms. Ly Nguyen Thi
Vien Bao Ve Thuc Vat
National Institute of Plant Protection
Chem, Tuliem, Hanoi, Vietnam
Tel : 84-4-362 392
Fax: 84-4-363 563

Ms. Thu Phan Thi Bich
Vien Bao Ve Thuc Vat
National Institute of Plant Protection
Chem, Tuliem, Hanoi, Vietnam
Tel : 84-4-362 392
Fax: 84-4-363 563

Thailand

Dr. Ancharida Svarachorn

Department of Microbiology, Faculty of Science
Chulalongkorn University, Phayathai Road
Phatumvan, Bangkok 10330
Tel : (662) 218-5085, 218-5078
Fax : (662) 252-7576

- Ms. Angsana Akarapisan
 Section of Plant Biotechnology
 Department of Plant Pathology
 Faculty of Agriculture, Chiang Mai University
 Chiang Mai 50200
 Tel : (662) 53-221699 ext. 4021, 4022, 4080
 Fax : (662) 53-225221
- Dr. Chaliow Kuvongkadilok
 Department of Biology, Faculty of Science
 Mahidol University, Rama VI Road
 Bangkok 10400.
 Tel : (66-2) 246 0063 Ext. 2505
 Fax: Z66-2) 247-7051
 E-mail : sckkv@mucc.mahidol.ac.th
- Mrs. Hathairat Urairong
 Pathum Thani Rice Research Center
 Thanyaburi, Pathum Thani, 12110
 Tel : (66) 5771688-9
 Fax : (66) 5771300
- Dr. Hataichanoke Prapaipong
 Department of Chemistry, Faculty of Science
 Chiang Mai University, Chiang Mai 50200
 Tel : (662) 53 221699 Ext 3336, 3338
 Fax : (662) 53 892277
 E-mail : scchi029@chiangmai.ac.th
- Dr. Kanjana Chansa-ngavej
 Department of Microbiology, Faculty of Science
 Chulalongkorn University, Phya Thai Road
 Bangkok, 10300
 Tel : 662-2185077, 662-2185071
 Fax : 662-2527576
 E-mail : fscikes@chulkn.car.chula.ac.th
- Lt. Mallika Imwong
 Department of Biology, Faculty of Science
 Mahidol University, Rama VI Road
 Bangkok 10400
 Tel : (662) 246-0063 Ext. 4412, 2407
 Fax : (662) 247-7050
 cc Dr. Wisut Baimai/ Lt. Mallika Imwong
- Mrs. Nattaporn Uthaimongkol
 Technical Plant Quarantine Sub-division
 Agricultural Regulatory Division
 Department of Agriculture
 Chatuchak Bangkok 10900
 Tel : (662) 579-8516 Fax : (662) 579-4129

- Mrs. Ngarmnij Chuenboon-ngarm** Department of plant science, Faculty of Science
Mahidol University, Rama VI Road, Payathai
Bangkok 10400
Tel : 66-2-248-5963
Fax : 66-2-247-7050
E-mail : headscbo@mahidol.ac.th
- .Ms. Nuchnard Sae- Ung** Plant Genetic Engineering Unit
Kasetsart University, Kamphaengsaen Campus
Nakorn Pathom 73140, Thailand
Tel : (66-34) 351 908
Fax : (66-34) 351-908
- Mrs. Pattama Chanasongram** Sonkhla rubber research center
Hat Yai, Sonkhla 90110
Tel : 66-74-212401
Fax : 66-74-212407
- Dr. Puangpaga Soontornchainaksang** Department of Plant Science
Faculty of Science
Mahidol Unoversity, Rama VI Road
Bangkok 10400, Thailand
Tel : (66-2) 248 5963
Fax: (66-2) 247 7050
- Dr. Sanha Panichajakul** Department of Biotechnology
Faculty of Technology, Khon Kaen University
Khon Kaen 40002
Tel : (66) 043 239329, Fax : (66) 043 239329
- Dr. Sanit Makonkawkeyoon** Department of Microbiology
Faculty of Medicine
Chiang Mai University
Chiang Mai 50200, Thailand
Tel : (66-53) 221122 Ext. 5069,
Fax : (66-53) 217144
E-mail : sanit@cmu.chiangmai.ac.th
- Dr. Siriporn Sittipraneed** Department of Biochemistry, Faculty of Science
Chulalongkorn University, Phayathai Road
Phatumvan, Bangkok 10330
Tel : (662) 218-5434 , Fax : (662) 251-1952
- Miss Tasanee Pradyabumrung** Plant Introduction and Conservation
of Wild Flora Sub-Division
Agricultural Regulatory Division
Department of Agriculture
Chatuchak Bangkok 10900
Tel : (662) 579-8516 Fax: (662) 579-4129



Dr. Sutat Sriwatanapongse, Deputy Director, BIOTEC welcomed the lecturers and participants to the Workshop.



Dr. George T. Tzozos, ICGEB was the international lecturer at the Workshop.



Lecturers and participants at the auditorium, ST



**Reception party hosted by BIOTEC, on Friday November 24, 1995
at the Royal City Hotel, Bangkok**