WORLD HEALTH ORGANIZATION

ORGANISATION MONDIALE DE LA SANTE

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WHO/DANIDA TRAINING COURSE

THE SELECTION AND USE OF TRADITIONAL REMEDIES IN PRIMARY HEALTH CARE

Report of an Inter-Regional Workshop
held in
Bangkok, Thailand
25 November - 4 December 1985

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PREFACE

The last decade has seen a considerable growth of popular, official and commercial interest in the use of traditional remedies. For the majority of the world's population these have been and in many instances, are still the only forms of treatment readily available. Now, with many Member States responding to the World Health Organization's call for them to give adequate importance to the utilization of their traditional systems of medicine, traditional practices and remedies are being brought increasingly under the purview of the health services. At the same time, commercial interests have not been slow to recognize and capitalize on the potential financial rewards inherent in this official recognition.

There is a widespread belief that remedies of natural origin are harmless and carry no risk to the consumer. Nothing could be further from the truth, for many of these remedies, often of plant origin, contain potent pharmacologically active agents. Even more important may be the use of highly toxic plants, erroneously identified as medicinal herbs.

This document is a report of a WHO/DANIDA* supported workshop held in Bangkok, Thailand from 25 November to 4 December 1985. The participants comprised three from Indonesia, three from Malaysia, three from Nepal, two from Philippines and six participants and twenty observers from Thailand. In addition, there were lecturers and, resources persons from the Department of Medical Sciences of the Thai Ministry of Public Health, and the collaboration of faculty members from the University of Illinois at Chicago, USA, Chulalongkorn and Mahidol Universities, Bangkok, and the World Health Organization. All participants are directly involved in the planning and conducting of clinical and laboratory studies of traditional remedies.

The report describes briefly the design and content of the workshop, gives an account of the situation in the countries represented, with an evaluation by the participants themselves, and concludes with general comments on the workshop as well as the participants' proposals for future activities in the field of traditional medicine and the use of medicinal plants.

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*Danish International Development Agency.

1. INTRODUCTION

An interregional workshop on Appropriate Methodology and Use of Traditional Remedies in National Primary Health Care Programmes, organized by DANIDA and WHO was hosted by the Department of Medical Sciences of the Ministry of Public Health, Thailand. The workshop was the first of a series, intended to address some of the problems of safety and efficacy of traditional remedies used in primary health care, including related issues of standards, stability and dosage formulation.

In his introductory address, Dr Somsak Varakamin, Director-General, Department of Medical Science, Ministry of Public Health, welcomed participants, reminding them that the "practice" of traditional medicine itself is in harmony with the beliefs and customs of the people and thus exerts a considerable influence on health matters within most communities in the regions, especially the rural ones.

His Excellency the Minister of Public Health of the Kingdom of Thailand, Khun Marut Bunnag, in his inaugural address stated that Thailand, in its Fifth National Economic and Social Development Plan, has emphasized the utilization of traditional remedies, as a means of rectifying the unequal provision and distribution of drugs in the rural areas. It was therefore appropriate for WHO and DANIDA to initiate an inter-regional workshop on the safe and efficient utilization of herbal medicine in primary health care. The Minister hoped that there would be more collaborative research work within and between countries.

Dr O. Akerele, Programme Manager, Traditional Medicine Programme, World Health Organization, Geneva, thanked the distinguished speakers that had preceeded him and stated that the purpose of the workshop was to provide an opportunity for participants (Annex 1) from the WHO South-East Asia and Western Pacific Regions to exchange experiences and to develop suitable approaches for the control of medicaments, derived from natural substances and used in primary health care.

2. WORKSHOP DESIGN AND CONTENT

The overall objective of the first workshop was for participants to be able to acquire and use methodological tools pertaining to the introduction and utilization of natural substances, derived from their traditional remedies. (See Annex 2 for the programme of work). This objective was accomplished through field visits plus lecture-discussion sessions as detailed below:

A. Herbal remedies registration and utilization practices in some countries of the WHO South-East Asia and Western Pacific Regions. Participants attending the workshop were invited to prepare brief accounts of the use of traditional remedies in primary health care in their countries. To assist authors of country presentations, a set of guidelines for their preparations was dispatched to participants in an attempt to ensure that information on the subject might be comparable. The workshop provided an opportunity for participants to share their knowledge and experience on the subject.

Traditional medicine varies in these countries from the classical systems such as, the traditional Chinese and Ayurveda systems of medicine as practised in the pluralistic societies of Malaysia and the Kingdom of Nepal, to simple folk remedies that are propagated by oral traditions, as occurs in Indonesia, parts of Malaysia and the Philippines. The middle of the spectrum is occupied by eclectic forms of medicine that are practised in Thailand and parts of Malaysia, which have obviously benefitted from the classical as well as their own local forms of medicine. Nepal is the only country where the Government has, over a number of years, utilized Ayurvedic practitioners and remedies in its national health care system. Other countries, such as the Philippines and Thailand, are at varying stages of the identification and introduction of plant remedies in the national health services systems. The utilization of traditional practitioners in health services has also been attempted in Indonesia, usually after an initial period of orientation of the practitioners in modern medicine. It would appear that the use of plant remedies is most prevalant in

self-care and in the private sector of the health services. All reporting countries have a number of research institutes that are ascertaining the safety and efficacy of the traditional remedies found in their countries. All participating countries import certain types of finished traditional-plant drugs as well as raw material that are not available locally. These are imported from neighbouring countries such as China, Hong Kong and India.

No valid data are currently available describing the extent of the present utilization patterns in most countries. All countries indicated wide and increased usage of plant-derived remedies that vary from traditional preparations such as decoctions to modern formulations in the forms of tablets and capsules. Consumption seems to be more prevalent in the rural areas where primary health care is needed most. In Nepal, the Government has developed a plan for producing herbal drugs on a controlled, scientific basis, and making them available throughout the country, with the aim of reducing imports of other drugs. It is estimated that some 80 varieties, amounting to more than 1000 tonnes of medicinal and aromatic plants are being exported annually in crude form from Nepal.

Indonesia began regulating traditional drugs as early as 1960. Regulations vary from those controlling production and distribution to those concerned with packaging and labelling of traditional medicines. In most other cases, governments are begining to apply regulatory practices toward the preparation and use of traditional remedies. For example, the Philippines and Thailand have Food and Drug Administrations or equivalent establishments that are charged with the responsibility of applying regulations with respect to drugs. Malaysia has regulations that do not discriminate between modern and traditional remedies; here, registration is the sole responsibility of the Drug Control Authority. In Nepal, there is a separate Department of Ayurveda which oversees the use, sale and production of Ayurvedic drugs; whereas Western or allopathic medicines are regulated by a Department of Drug Administration.

The country presentations provided base-line information on the current status of the incorporation and use of traditional remedies in primary health care programmes in participating countries. It also accorded participants the opportunity of knowing how each country was dealing with particular situations, as well as encouraging direct information exchange on a more personal basis amongst each other.

B. The lecture series highlighted the value of information in decision making, identifying the sources and the different ways of accessing them for the decision-making processes. Items covered included the value of multiple versus single or isolated literature reports in decision making and the value of dose response and confirmatory pharmacological reports on plant extracts as a background to decision making. Information sources identified included, (a) literature abstract services, (b) computerized literature databases and their cost-effectiveness, (c) local journals/information sources and (d) current international journals. The NAPRALERT (natural products alert) developed by the College of Pharmacy of the University of Illinois at Chicago, a WHO collaborating centre for traditional medicine, was described in some detail. [1]

The lecture series continued with the question of how predictable is the presence of chemical constituents in medicinal plants in assessing their safety and efficacy. Of the four plants selected as those that were widely used in the regions, the traditional uses of each plant were compared with the known pharmacological effects and these were then related to the chemical constituents of each plant. This was followed by a proposed procedure for the toxicity evaluation of a plant contained in a traditional remedy, prior to its incorporation into national primary health care programmes.

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[1] For scientists from developing countries, data are furnished free if reasonable requests are routed through WHO Representatives and Programme Coordinators and through WHO Regional Offices using the forms shown in Annex 3. If there are difficulties encountered in obtaining responses, such occurences should be addressed to Dr O. Akerele, Programme Manager, Traditional Medicine, WHO, 1211 Geneva 27, Switzerland.

The objective of such an evaluation of the toxicity is primarily to ensure safety. This involves the identification of potential risk through literature searches, retrospective studies and biological testing. The estimation of risk includes the qualitative validation and quantitative estimation of safety margins. The evaluation of toxicity entails the weighing of risk versus benefit, as well as the conduct of clinical trials. With regard to the actual management of risk, regulations and good educational programmes play important roles.

C. Field visits. The Chantaburi Botanical Garden of the Division of Medical Research, Department of Medical Sciences, Ministry of Public Health, in Chantaburi Province, provided an opportunity to see the organization of a medicinal plant garden. The main goals of the garden are to collect known wild medicinal plants, to introduce suitable climatic conditions for their propagation and to distribute seeds and seedings to other echeleons of the health services. The garden has collected over 87 different species of medicinal plants.

The Wang Nam Yen Hospital in Prachinburi Province was started in 1982 with 10 beds and a staff of one physician and 13 others. In 1984 the hospital expanded its services in order to cater for an increasing number of patients. Since primary health care was introduced and adopted as the main strategy for public health development, the Ministry of Public Health has to turn to traditional medicinal herbs as an appropriate alternative to the provision of essential drugs to the community. A survey undertaken in the district (population 59747) revealed that 15% of the population in urban areas and 45% in the rural areas utilized herbal remedies for their ailments. This gave birth to a programme incorporating the use of traditional medicine in the Wang Nam Yen Hospital in 1983. Twelve medicinal plants were recommended for use in treating common conditions such as, dyspepsia, diarrhoea, constipation, malaria, intestinal parasites, headache and scabies.

Promotion of the use of medicinal plants is undertaken by the hospital once a month for the local traditional practitioners, teaching asepsis and better ways of preparation of remedies. Information posters and other audiovisual material are also produced for patients and their relatives. Constraints to the programme development were listed as insufficient financial assistance, lack of experience and discontinuation of treatment regimes prematurely by patients. Recommendation for improvement of service include a positive alteration of staff's attitude to traditional medicine including their education in planting of medicinal herbs, and formulation of remedies.

The visit to Wang Nam Yen Hospital was an experience in the translation of traditional medicine concept as an integral part of the health services into practice. It further demonstrated the correctness of the decision to locate the first workshop in Thailand which has shown consistent efforts in the utilization of traditional medicine in its national primary health care programme in the face of escalating medical costs.

D. For the decision-making component of the workshop, the first step was a meeting of a Committee on Herbal Pharmacopoeias which was convened on 27 November 1985 and which consisted of a representative from each participating nation. Discussions took place on the formulation of a possible herbal formulary, which was essential in order to clearly identify plant products to be evaluated for their safety and efficacy, for further consideration by the entire workshop. A formulary including the following information was suggested:

1. Name of plant (Genus, species, authority, and family). [a]
2. Plant part used. [b]

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[a] If a common name refers to more than one plant species, cross-references need to be included.

[b] Each plant part should be described in a separate monograph.

3. Quality requirement (Percentage of active principle if known).
4. Botanical characteristics:
   a. Macroscopic morphological description including organoleptic tests;
   b. Microscopic description:
      i) Histological character;
      ii) Powdered sample characters.
5. Purity (Foreign matter, adulterant, other contaminants). [c]
6. Physicochemical analysis:
   a. Qualitative (including microchemical tests);
   b. Quantitative (if major active ingredients are known, analytical procedures (e.g. thin-layer chromatography, high pressure liquid chromatography, nuclear magnetic resonance) should be developed to quantify the total and individual constituents). Even if active principles are unknown, one can still obtain characteristic spectral profiles for the plant material.
7. Bioassays:
   a. *In vitro*.
   b. *In vivo*.
8. Pharmacological/Biological category
   For what the herbal product is indicated. [d]
9. Posology (dose and directions for use).
10. Toxicity/countraindications
    With appropriate warning information.
11. Package and storage
    Proper packaging, storage and shelf-life information.

The guideline was later modified and adopted by all participants.

E. To test the decision-making process, participants were divided into four small groups. The three-day group sessions on the decision-making process gave practical expression to the processing of information for initiating safety and efficacy studies prior to the selection and introduction of medicinal plants into national primary health care programmes. All the participants were provided with copies of original articles on each of the four commonly used plants, that had been selected on the basis of "no problems", "needs more work" and "rejection" categories. The following plants were selected:

Group A. *Bupleurum falcatum*.

Group B. *Coptis teeta*.

Group C. *Matricaria chamomilla*.

Group D. *Acorus calamus*.

Each group was provided with pertinent literature that had been published on the chemistry and pharmacology of the chosen medicinal plant, generally not considered to be "approved" for use, but which was widely used by the general public. Using guidelines derived from the series on lecture discussions, each group was able to analyse the data that was given to them on the plant drug provided and were able to prepare a report and recommendations of any further action that ought to be initiated prior to considering the plant for general use in primary health care. The following is a summary of the conclusions of the group presentations. (IT IS STRESSED THAT THESE CONCLUSIONS REPRESENT THE RESULT OF A TRAINING EXERCISE AND NOT A FORMAL EVALUATION)

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[c] Information on ash, acid-insoluble ash, moisture, microbial limits, insecticide/herbicide residue, heavy metal content and any other measure of purity are included as needed in this section.

[d] Indication for use is to be determined by a committee after examining all available information sources.

Group A. - Working on Bupleurum falcatum - did not find much correlation between ethnomedical and toxicological information provided. They cautioned about placing too much emphasis on the active ingredients derived from the plant.

Group B. - Worked on Coptis teeta - and recommended its use in acute cases, but noted that it was banned in Singapore because it is claimed to cause jaundice.

Group C. - Analysed Matricaria chamomilla - which they found to contain known carcinogenic compounds but found no good data to support other claims for toxicity.

Group D. - Acorus calamus - was found to be carcinogenic and so extreme caution was advocated for its use.

3. EVALUATION BY PARTICIPANTS

Evaluation of the workshop by participants was divided into four parts and is summarized below.

With the exception of one participant who noted the relevance of the workshop to his work as only "fair", all other participants considered it "good" or "excellent". Nearly all found the format and content of the workshop to be reasonable and only the more substantiative suggestions were more clearly reflected in their comments and these are summarized in the sections which follow.

A number of participants identified ideas or concepts that they were prepared to advocate upon their return to their country, particularly:

a. The process of toxicity studies for the evaluation of herbal medicine.
b. The need for and the development of a comprehensive approach to the validation of traditional medicine.
c. The requirement of a herbal formulary.
d. The importance of research in plants used in traditional medicine and the need to involve chemists and pharmacologists.
d. The establishment of a regulatory system, such as the system used in Indonesia and Thailand.

Formal lectures

All the participants noted the lecture presentations as a whole to be either "excellent" or "good". Topics identified as being most useful included toxicity testing, laboratory practices, safety assessment, information and decision making and the global status of plants.

Many of the topics should have been covered in greater depth. The majority of these were related to toxicity testing and clinical trials. Other suggestions were the global status of herbal drugs, their registration and control, and the requirement of a herbal formulary.

Proposals for additional topics to be covered in future workshops included:

i) More details on the technology of assessing safety and toxicity, including a laboratory demonstration by an expert in that field;
ii) Approaches to integrating traditional remedies and healers into general hospitals and primary health care;
iii) Identification of plants used in the region, linking the symptom with the traditional therapy; and
iv) Ecological and botanical aspects of the preservation of traditional plants.

Various suggestions were made on the lecture series. The participants would have liked to have written material in advance of the actual presentation. Some recommended incorporating improved audiovisual approaches, colour, slides, films. A few indicated that each lecture should be limited to 45 minutes to allow more time for discussions. Some suggested that the lecture sessions be staggered and interspaced with problems solving exercises.

Field visits

The field trip to the Botanical Garden at Chantaburi and the Wang Nam, Yen Hospital were almost unanimously praised though one participant indicated a qualified yes, as he would have liked to have had more time to discuss and get ideas on the setting up and maintenance of a botanical garden.

Several recommendations were made regarding field visits and these included:

i) Provincial health centres where traditional remedies are in use;
ii) Laboratories that manufacture herbal drug medicines;
iii) Research centres; and a
iv) School of traditional healers.

Country reports

All participants found the country reports to be of value. They emphasized the importance of learning from each other's experiences. Most found the level of the presentations to be appropriate but several indicated that some could have been better prepared. Future presentations should benefit from guidelines distributed to participants indicating which aspects should be covered and also advice on the appropriate use of audiovisual techniques. One participant noted that the seating arrangements did not facilitate a good exchange of views.

Several participants identified information from these reports of immediate utility to them, i.e., registration and regulation approaches, quality control approaches, the setting up of clinical trials, and the incorporation of traditional remedies as part of primary health care.

The seriousness with which the participants addressed the questions posed for evaluation is reflected in the detailed way responses were given. The workshop clearly served a useful purpose in stimulating the participants to develop both a more conceptually comprehensive and a technically detailed understanding of the subject. Many participants expressed interest in holding subsequent workshops that would provide more in-depth training, with Indonesia being cited at least four times as an appropriate location.

4. PROPOSALS FOR FUTURE ACTION

Expressing their appreciation of the initiative taken by WHO and DANIDA in sponsoring the workshop and their thanks to the Royal Thai Government for the facilities provided, participants stressed the need for appropriate follow up action.

(1.) They recognized that much more effort was needed to upgrade the knowledge of health personnel, to enable safety of traditional medicines in participating countries to be validated. All participants would like to urge WHO and DANIDA, as well as other funding agencies, to initiate a series of workshops addressing other aspects of Traditional Medicine as follow-up measures. The aspects to be included were:

i) The development of National and Regional Herbal Formularies for Primary Health Care.
ii) Appropriate Methodology for Toxicological Testing for Reproduction and Carcinogenic Activities for the Selection of Traditional Remedies.
iii) Appropriate Bioassay Techniques for Medicinal Plant Products.
iv) Issues and Problems relating to Clinical Trial of Traditional Remedies.

v) Ecological and Environmental Considerations in the Conservation, Preservation, Cultivation and Use of Medicinal Plants.
vi) National Health Policy on Primary Health Care with particular emphasis to Traditional Remedies and Traditional Health Services.

(2.) Recognizing the need to develop comprehensive and multidisciplinary approaches for the validation of traditional medicine, the participants proposed the development of an inter-disciplinary programme under the sponsorship of WHO, with each participating country identified as a coordinating centre for one or more activities.

(3.) All participating countries urged WHO to continue supporting issues relating to the introduction and use of safe and efficacious traditional remedies in National Primary Health Care Programmes.

(4.) All participants would like their respective National Governments and all Agencies involved in Primary Health Care to give due consideration to the appropriate selection and development of Traditional Remedies as well as training of Traditional Health Practitioners.

All participating countries indicated that their governments were taking positive steps towards the identification and utilization of proved traditional medicinal herbs in their national primary health care programmes. However, most of them agreed that traditional remedies should be examined more carefully using available, modern and scientific techniques to establish safety and when feasible efficacy. The first essential step should be the establishment of the safety of any traditional plant remedy that would be receiving governmental support for its introduction into the health services, especially at the primary health care level.

5. CONCLUSIONS

While folklore information should continue to serve as an indication that a particular plant product is worth investigating, such a claim, no matter how ancient, should not be taken as an absolute guarantee of safety in view of present-day knowledge and technology to assess safety levels. From the deliberations of the workshop, it would appear that most participants were looking to WHO in order to acquire the necessary experience and methodology, that would enable them to positively contribute to their government's efforts, by ensuring that safety became the operational norm, prior to the introduction and use of their traditional remedies in national primary health care programmes.

The workshop alerted all participants to the importance and necessity of incorporating available information sources and modern toxicology testing into a decision-making process to ensure safety in the utilization of traditional remedies in general and in national primary health care programmes in particular.

That many traditional remedies are of therapeutic value, is no longer open to serious doubt. Their use, however, should be governed by the same standards of safety and efficacy as those required for modern pharmaceutical products.

ANNEX 1

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ANNEX 2

PROGRAMME

Sunday, 24 November 1985

	Arrival and registration of participants

Monday, 25 November 1985

08.00 - 09.00 hours	Registration of participants
09.00 - 10.00 hours	Opening ceremony - Inaugural address: Director-General Department of Medical Science - Inaugural address: Minister of Public Health Opening remarks by Dr C. O. Akerele Group photograph
10.00 - 10.30 hours	Tea/coffee break
10.30 - 11.15 hours	Country presentation: Indonesia
11.15 - 12.00 hours	Country presentation: Malaysia
12.00 - 13.30 hours	Lunch break
13.30 - 14.15 hours	Country presentation: Nepal
14.15 - 15.00 hours	Panel discussion
15.00 - 17.00	Welcome reception

Tuesday, 26 November 1985

09.00 - 09.45 hours	Country presentation: Philippines
09.45 - 10.30 hours	Country presentation: Thailand
10.30 - 11.00 hours	Tea/coffee break
11.00 - 12.00 hours	Panel discussion
12.00 - 13.30 hours	Lunch break
13.00 - 15.00 hours	Global status of herbal drugs: Dr H. Fong
15.00 - 15.15 hours	Tea/coffee break
15.15 - 16.45 hours	Requirements for a herbal formulary: Dr H. Fong

Wednesday, 27 November 1985

09.00 - 10.00 hours	Summary of herbal drug registration in the region: Dr C.O. Akerele
10.00 - 10.30 hours	Tea/coffee break
10.30 - 12.00 hours	Information sources and their relative importance to decision making: Dr H.Fong
12.00 - 13.30 hours	Lunch break
13.30 - 14.30 hours	The role of chemistry in determing safety and efficacy of herbal preparations: Dr Vichai
14.30 - 15.00 hours	Tea/coffee break

Annex 2

Thursday, 28 November 1985

09.00 - 10.30 hours	Introduction to safety assement Basic organization of safety assessment Identification of toxicity potential
10.30 - 11.00 hours	Tea/coffee break
11.00 - 12.00 hours	Estimation of toxicity Animal models
12.00 - 13.30 hours	Lunch break
13.30 - 15.00	Estimation of toxicity Animal models
15.00 - 15.30 hours	Tea/coffee break
15.30 - 16.30 hours	Estimation of toxicity Alternative toxicity testing methods Extrapolation to humans: Dr D. Waller

Friday, 29 November 1985

09.00 - 10.30 hours	Evaluation of toxicity Clinical trials
10.30 - 11.00 hours	Tea/coffee break
11.00 - 12.00 hours	Estimation of toxicity Risk versus benefit
12.00 - 13.30 hours	Lunch break
13.30 - 15.30 hours	Management of toxicity Governmental regulations: Dr D. Waller
15.30 - 16.00 hours	Tea/coffee break
16.00 - 16.30 hours	Preparation for group discussion on decision making workshop: Dr H: Fong

Saturday, 30 November - Sunday, 1 December 1985

Excursion to Chantaburi Medicinal Plants Garden, Chantaburi Province via Wang Nam Yen Hospital, Prachinburi Province

Monday 2, December 1985

09.00 - 10.30 hours	Decision making workshop* (Group discussion)
10.30 - 11.00 hours	Tea/coffee break
11.00 - 12.00 hours	Group discussion
12.00 - 13.30 hours	Lunch break
13.30 - 15.00 hours	Group discussion
15.00 - 15.30 hours	Tea/coffee break
15.30 - 16.30 hours	Group discussion

Tuesday, 3 December 1985

09.00 - 10.30 hours	Group discussion
10.30 - 11.00 hours	Tea/coffee break
11.00 - 12.00 hours	Group discussion
12.00 - 13.30 hours	Lunch break
13.30 - 15.00 hours	Group discussion
15.00 - 15.30 hours	Tea/coffee break
15.30 - 16.30 hours	Group discussion

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* Workshop resource personnel: D. Waller, H. Fong, V. Reutrakul. O. Akerele.

Annex 2

Wednesday, 4 December 1985

09.00 - 10.30 hours	Plenary session Group report Discussion and recommendations
10.30 - 11.45 hours	Break
10.45 - 12.00 hours	Plenary session Summary and conclusion: Dr C.O.Akerele
12.00 - 12.30 hours	Closing session: Dr Pracha Emamorn, Deputy Director General, Department of Medical Sciences, Ministry of Public Health
12.30 - 15.00 hours	Farewell party

ANNEX 3

REQUEST FOR NAPRALERT DATA ON PLANTS

Request from: (Name, institution and mailing address)

_____

_____

_____

_____

_____

WHO region: _____

Request for information profile on:

	(Genus)	(Species)	(Authority)	(Family)
1)	_____	_____	_____	_____
2)	_____	_____	_____	_____
3)	_____	_____	_____	_____
4)	_____	_____	_____	_____
5)	_____	_____	_____	_____

Date of request received in Chicago .....

Date NAPRALERT output mailed to REQUESTOR .....

Annex 3

Pharmacological profile on:

1a) _____
(Name of chemical substance)

1b) _____
(Systematic Name)

1c) Give structure clearly in space below:

2a) _____
(Name of chemical substance)

2b) _____
(Systematic Name)

2c) Give structure clearly in space below:

Date of request received in Chicago: .....

Data NAPRALERT output mailed to REQUESTOR: .....

ANNEX 4

Department of Medical Sciences
Ministry of Public Health
Thailand

World Health Organization

WORLD HEALTH ORGANIZATION

AND

DANISH INTERNATIONAL DEVELOPMENT AGENCY

CERTIFICATE

THIS IS TO CERTIFY THAT

HAS ATTENDED THE WORLD HEALTH ORGANIZATION/DANIDA INTER-REGIONAL WORKSHOP ON APPROPRIATE METHODOLOGY FOR SELECTION AND USE OF TRADITIONAL REMEDIES IN NATIONAL PRIMARY HEALTH CARE PROGRAMMES IN BANGKOK, THAILAND.

24 NOVEMBER TO 4 DECEMBER 1985

UNDER THE AUSPICES OF THE MINISTRY OF PUBLIC HEALTH, THAILAND.

SOMSAK VARAKAMIN M.D., Dr.P.H.
Director General
Department of Medical Sciences

OLAYIWOLA AKERELE M.D.
Programmes Manager
Traditional Medicine
WHO, Geneva, Switzerland.

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