THE BOTANICAL GARDEN ORGANIZATION
PRIME MINISTER'S OFFICE

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THE BOTANICAL GARDEN ORGANIZATION

NEWSLETTER

QUEEN SIRIKIT BOTANIC GARDEN

In May 1994, the Botanical Garden Organization, Prime Minister's office, has received the highest honour from Her Majesty Queen Sirikit of Thailand. Maesa botanical garden, which is also the Headquarters of the Botanical Garden Organization, where locating in Maerim, Chiang Mai, received Royal permission to use the new name as "**QUEEN SIRIKIT BOTANIC GARDEN**". This Royal name now becomes an official name for the garden and has brought tremendous joy to the people in Chiang Mai and Thailand.

Number 02 **October, 1994**

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10.	Dr. Weerachai Nanakorn	Committee & Secretary

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10.	Professor Bertil Nordenstam	Sweden

MR. PRIME MINISTER VISITS THE BOTANICAL GARDEN.

The Prime Minister, Mr. Chuan Leekphai, paid a visit to see the progression and the development of the Botanical Garden Organization on July 16, 1994. In honour of the Garden and his visit, he has planted 2 trees of "Xaa kue" (Khaya senegal ensis). The trees were about 1 m. high and were offered to him from the Vietnamese government during his visit in early this year to Hanoi, Vietnam. The Xaa kue tree is originally from South-America and has was introduced to Vietnam several decade ago to plant as roadside trees.

Moreover, Mr. Chuan has offered 6 more trees of "Pae kaoi" (Ginko biloba) trees for the Garden. The plants are about 40 cm. high, and obtained from South Korea during his recent visit in June 1994. The trees are now well taken care of in the nursery at the Garden. During the 2 hours visit, Mr. Prime Minister walked around the front part of the Garden to see the development and Thai plants and some collection of rare plants in the Nursery. He is very pleased with the establishment and activities of the Garden and has shown his keen interest in the local Thai plants and propose more support for the activities of the garden in the future. Unfortunately, the weather that late afternoon was rather poor, heavily cloudy with slight rain, so that Mr. Chuan could not visit other major parts of the garden.

MINISTER TO THE PRIME MINISTER'S OFFICE VISITS THE GARDEN

Mr. Surasak Tiemprasert, Minister to the Prime Minister's Office who is incharge of the Botanical Garden Organization policy, paid a visit to see the development of the Garden in June 1994. He planted a Ficus tree in the area that the garden has arranged for the fig family (Moraceae). The tree also marks for the garden in honour of his visit.

THE BOTANICAL GARDEN DEPUTY-DIRECTOR

Mr. Nattavood Prasertsuvan (Dec. 28, 1953) was appointed Deputy-Director of the Botanical Garden Organization and Queen Sirikit Botanic Garden, effective August 1,1993. He graduated B.Ed. from Srinakarinwirot University, Bangsaen, Cholburi, Thailand in 1980; and M.P.A. from Roosevelt University, Chicago, Illinois, the United States, in 1990.

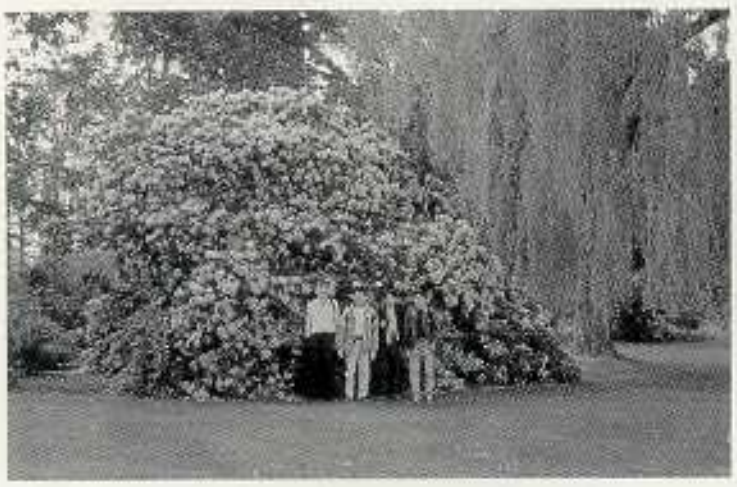
Some of his Experience are:

1993-Present	Deputy-Director, the Botanical Garden Organization and Queen Sirikit Botanic Garden
1992-1993	Manager, P. Punya Company Ltd., Bangkok
1992-1992	Advisor to Deputy Speaker of the House of Representative
1990-1991	Secretary to the Secretariat of the Prime Minister's Office
1982-1985	Personnel Officer, Vocational Department, Ministry of Education.

Visiting Abroad:

1990	Office of the Educational Affair, Royal Thai Embassy, Civil Service Commission, to Japan, the Philippines, Australia, and Newzealand.
1994	Okinawa Commemorative National Government Park, Japan.
1994	The Royal Botanic Garden, Kew, England.

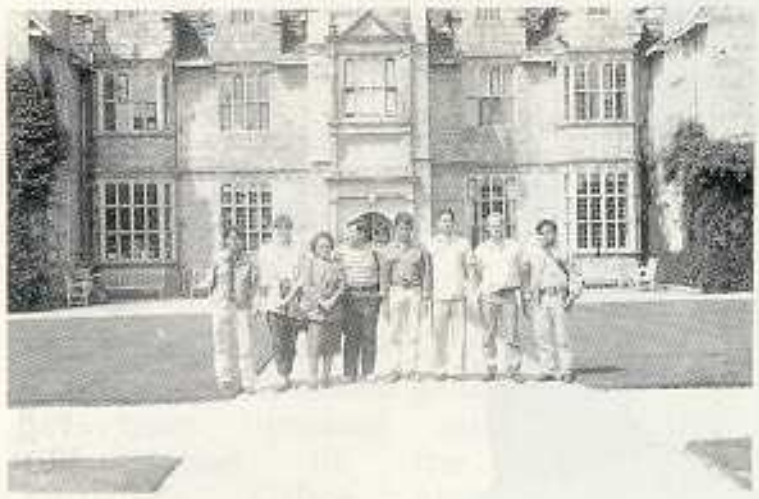
DIRECTOR BGO VISITS KEW, AARHUS AND STOCKHOLM



During 27-30 July 1994, Dr. Weerachai Nanakorn, Director, BGO; paid a visit to attend the Flora of Thailand meeting which was held at the Department of Systematic Botany, Aarhus University, Denmark. This was done to bring up to date and keep on current status of the Flora of Thailand particularly activities in Northern Thailand. In this connection he was invited to visit the Herbarium, at the Swedish Natural History Museum, in Stockholm, Sweden for further collaboration Dr. Nanakorn carried on from Denmark and spent 4 days of the fruitful visit, d iscussion, and plan for future collaboration with the staff, the Swedish Natural History Museum.

On the way back Dr. Nanakorn also took advantage of a few days stop on London visiting the Royal Botanic Gardens, Kew; and Wisley Garden, Royal Horticultural Society, before returning to Thailand.

BGO EXECUTIVE STAFF VISITS KEW



During 25-30 July 1994, executive staff from BGO paid a visit to see the activity at the Royal Botanic Garden, Kew, England. Member from Thailand were Mrs. Umporn Lekuthai, committee Board, representative from Ministry of Finance; Mr. Nattavood Prasertsuvan, Deputy-Director, BGO; Mr. Pramuk Pensut, Head, Garden and Maintenance Section. This was to see the overall administration and the garden management system including Herbarium, Library, Laboratory, Gardens and Arboretums on their activities and maintenance.

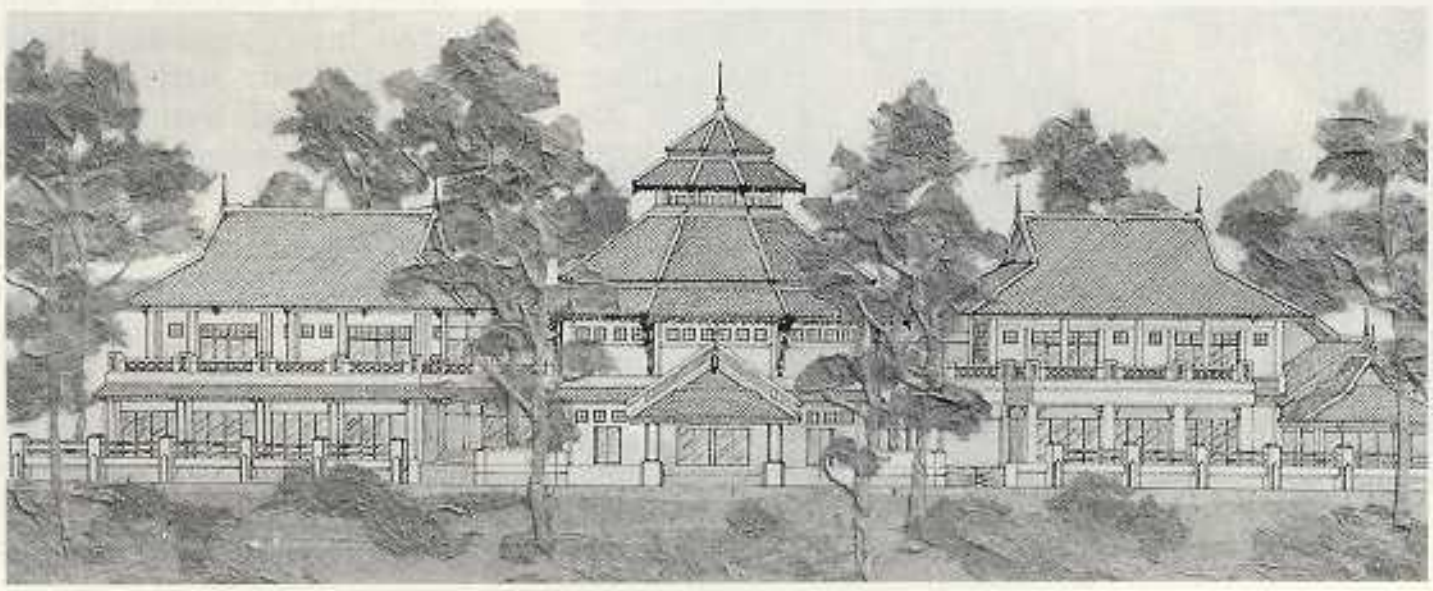
The group has been warmly welcome by Professor Ghillean T. Prance, Director; Mr. J. Simmons, Head, Gardener; Mr. Paul Richards, Head, Wakehurst Place; and Mrs. Caroline Gohler, Landscape Architechture. During the visit the whole group also had a chance to meet the three Thai trainees from BGO at Kew.

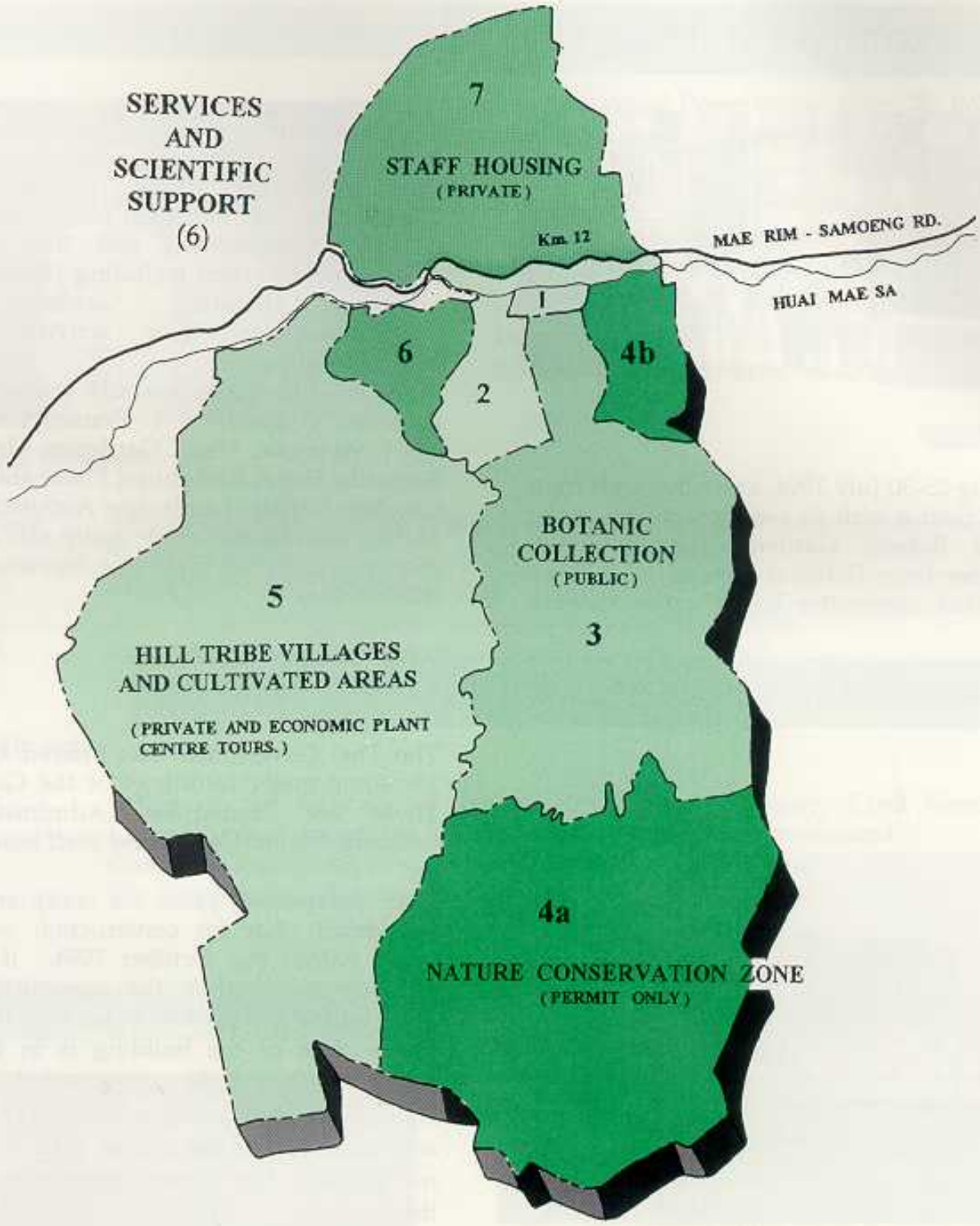
1994-1995 MAJORS CONSTRUCTION OF THE GARDEN

The Thai Government has offered budget for some major buildings of the Garden. These are Herbarium, Administration building, Visitor Center and Staff housings, etc.

Their perspective plans are ready and the full detail plan for construction will be ready within this October 1994. If thing goes on as schedule the construction of these buildings will start in January 1995.

The outline of the building is in typical Northern Thai Style or so called Lanna style. The construction will be made in the area provided in the Master Plan and will not suppress the beautifulness scenery of the Garden.





The area of the Botanical Garden approximately 3,500 rai (1,400 acres) has dividened into 7 zones in the Masterplan for the proper management. The sites are diverse in habitats varying altitudes from 400-900 m. with various types of vegetation from deciduous dipterocarp to hill evergreen forest.

THREE BOTANICAL GARDEN OFFICERS RETURN FROM

KEW

The Botanical Garden Organization is a recently established garden which has been operated under the authorization of the Prime Minister's Office since 1992 Actually the starting of the development of the Garden has been performed from November 1993 when the garden fully transferred from the Royal Forest Department to the Prime Minister's Office. The purpose of the Thai Government is to develope this garden aiming at a regional center for Southeast Asia and at an international level.

The development has been strongly supported by the Royal Botanic Gardens, Kew, England. Dr. Ghillean T. Prance, Director, the Royal Botanic Gardens, Kew; had paid a visit to Thailand in 1993. A few months later, the Master plan team from Kew were sent to Chiang Mai for this purpose and the result has been successfully progressing. His Excellency the British Ambassador to Thailand, Mr. John Adams, has kindly paid a special attention and support to the establishment of the Garden. In June 1994, three officers were sent to Kew for a 45-day training; program Mr. Thanom Horticulture; Mr. Methee Wongnak, in Landscape design; and Mr. Chatthong Chuachan, in Nursery management, funded by a grant through the British Embassy.

This support is indeed given to the right target to develop the Botanical Garden for Thailand and has strenghtened the cooperation between Queen Sirikit Botanic Garden, Thailand and the Royal Botanic Gardens, Kew, England

SEMINARS ON FUTURE OF THE BOTANY IN THAILAND

During 15-16 July 1994, the Botanical Garden Organization has played a key role joining with Chiang Mai University and National Research Council, Thailand, arranging a Seminars on Future of the Botany in Thailand. The Seminar took place at Chiang Mai Orchids Hotel, in Chiang Mai. This is the first meeting in several years that Botanists and scientists involving in Botany field in Thailand has a chance to join their ideas. There were 124 participants from 12 Institutions, and 16 Official Units attend the meeting from all over the country.

The purpose of the meeting are to gather Botanists and scientists in relevant field to be acquainted with others, to express and exchange their ideas, to find the way for solving towards the Botanical problems and new technique to come, and to prepare a proposal and guidelines for the government.

The Seminar has a great success and fruitful result. Trip to visit Queen Sirikit Botanic Garden was arranged the following day of the meeting. The big group has a very joyful and impressive time in the slighly showy day.

MAERIM ELECTRICITY UNIT JOIN A REFORESTATION ACTIVITY WITH THE GARDEN TO CEREBRATE THE QUEEN'S BIRTHDAY

In August 1994, a week prior to the Queen's Birthday, Maerim Electricity Unit in Chiang Mai, contacted the Garden to get the permission to plant trees for their reforestation activity within the garden's area. This is also to celebrate the Queen's Birthday and the Mother's day. The proposal was responsed promptly by the garden which arranged an abandoned area of about 50 rai for this activity. More than 100 officers from the two Organizations joined hands planting trees happily on August 11, 1994 for the whole day.

The small trees will be looked after for 3 years more to garantee that they will survive and successfully reforest that area

CHAO DUANGDUEN NA-CHIANGMAI VISITS THE GARDEN

In August 1994, another outstanding visitors, were the group of 6 members leads by Chao Duangduan Na-ChiangMai, whose her family is one of the long outstanding and well-known families in Chiang Mai; and Mr. Chawalit Chanachanant, President, the IFCT investment, Thailand.

In this special occasion they planted 2 ficus trees in the area where the garden arranged to commemorate the Queen's Birthday and the Mother's Day.

PROGRESSION ON *FLORA* OF THE GARDEN

The ground survey and flora study of the plants in the Garden's area has been comprehensively collected since 1993. The flora study is conducted under the guidance of Dr. W. Nanakorn, Director BGO and by botanical staff of the garden. Since September 1993 to September 1994, based on the collected specimens deposited in the herbarium, 1,600 specimens number each with 6 duplicate have been recorded so far. These specimens all were collected within the garden and surrounding areas. Details of their descriptions and data on habitats, localities, ecology, and distribution are accumulating in the computer data base at the Garden.

Starting next year, the flora activities will be focussed on a larger scale for the whole forested area in Northern and Northeastern Thailand. The expeditions will be regularly arranged at least once a month and targeted to Doi Suthep, Doi Chiang Dao, and Doi Inthanon in the North and Phu Wiang in the Northeast.

A book on Flora of Queen Sirikit Botanic Garden is now in progress their MSS including description and pictures of about 120 species are now ready for correcting by specialists preparing for the publication of which expecting to be ready within this coming December 1994.

BUDGET AND FINANCIAL AID

At the first stage of the establishment of the Garden, budget and fundamental support were provided entirely by the Thai government. In 1993 the Garden obtained a budget of 10 M.Baht and increased to 60 M.Baht for 1994, and for the fiscal year of 1995, a budget of 62.87 M. Baht was approved to support the development and the activities of the Garden. These increasing figures clearly indicate strong support from the Thai government to enable the Garden to effectively progress within a short time frame.

RESEARCH ACTIVITIES

The present research activities at the Botanical Garden Organization in 1994 are Supportted to tally by the government budget. The major research goals at the early stage are to gather all fundamental data about the plants in Northern Thailand, strengthen the capability of the Garden's staff, and to serve the nation's needs and problems; these emphasize multidiciplinary research on plants. The Garden is also attempting to promote a joint research with universities and institutions overseas. At present 6 research topics were granted to the following Institutions:

(1). **"Biodiversity of Lichens at Maesa Botanical Garden"**
conducted by Dr. Kansri Boonprakob, Asst. Prof. Pibul Mongkolsuk and Miss Nattsurang Homchan
Faculty of Science, Ramkamhaeng University.
Period of the study 2 year/ grant 350,000 Bht.

(2). **"A Study and Collection of Rattans in Thailand for Maesa Botanical Garden"**
conducted by Dr. Isara Wongkhaluang
Faculty of Forestry, Kasetsart University.
Period of the study 1 year/ grant 200,000 Bht.

(3). **"The role of Montane Oak Forest in Absorbing CO_2"**
by Dr. Pipat Patanaponpaiboon
Faculty of Science, Chulalongkorn University.
Period of the study 1 year/ grant 250,000 Bht.

(4). **"A Systematical study on Ferns of Doi Suthep-Pui and Doi Chiang Dao, Chiang Mai, for Conservation"**
by Mr. Piya Suksathan
Faculty of Horticulture, Graduate School, Kasetsart University.
Period of the study 2 year/ grant 100,000 Bht.

(5). **"An ecological study on Tree Ferns of Thailand in the genera Cyathea and Cibotium for propagation and conservation"**
by Mr. Thee Havaanon
Faculty of Horticulture, Graduate School, Kasetsart University.
Period of the study 2 year/ grant 100,000 Bht.

(6). **"Computerized Forest"**
by Assistant Professor Tuenjai Koesakul
Department of Botany, Faculty of Science, Chulalongkorn University.
Period of the study 1 year/ grant 100,000 Bht.

The Garden now welcomes cooperation from universities and institutions for joint studies concernning on the Thai floras, especially on Ferns, Orchids in Northern Thailand, and the computerization of the botanical data base.

VISITORS

Although the Garden has just started its development, and is not yet officially opened, from January - September 1994 there were more than 6,000 visitors visit the Garden, most of which were groups of schoolboys and university students. Botanists and scientists from overseas are from i.e., England, the United States, Sweden, Denmark, China, Loas, and India.

The Garden has been very pleased to welcome:

The Swedish delegation from the Royal Swedish Academy of Science,
Stockholm, Sweden.

Professor Xu Zaifu;
Director, Xishuangbanna Tropical Botanyical Garden Academia Sinica;
from Yunnan Province, China.

Miss Sarah Vallis;
Curator, Bermuda Botanical Gardens, Department of Agriculture, Fisheries and Parks;
P.O. Box HM 834 HMCX.

Miss Somsanith Buamanivong;
Institute of the Medicinal Plants, Ministry of Health, Vientiene, Laos.

Dr. S. Suryatman;
Agency for Forestry Research and Development, Ministry of Forestry,
Jarkarta,Indonesia.

COMING VISITORS

During 5-7 September 1994, Professor Sanga Sabhasri, Chairman, the Botanical Garden Organization, has paid a visit to the Royal Swedish Academy of Sciences, Stockholm, Sweden. In this occasion Professor Sabhasri had a warmly welcome by Professor Bertil Nordenstam, Director of the Swedish Museum and a member of Queen Sirikit honourary and advisory board. They have a fruitful discussion at the Academy which Professor Nordenstam is alsothe Vice-President. One of an interesting outcomes is that they will try from both sides to get support from the swedish agencies to establish a Regional Biodiversity Center at Queen Sirikit Botanical Garden, Chiang Mai, Thailand.

Professor Nordenstam has accepted the invitation to visit Chiang Mai, Thailand, during February 27 to March 3, 1995 as the special guest of Queen Sirikit Botanic Garden.

PINEAPPLE GENETIC RESOURCES IN K.U. SAICO RESEARCH PROJECT (1)

BY
M.L. CHARUPHANT THONGTHAM (2) & KAWIT WANICHKUL (3)

GERMPLASM COLLECTION:

Pineapple is one of the most important tropical fruit crops in Thailand. Its commercial production is a main source of income for many growers and laborers in plantations as well as canning factories (8).

Although many cultivars are found throughout the country, only three cultivars are grown commercially. These are 'Phuket' 'Nang Lae' and 'Bathavia' (Smooth Cayenne) cultivar. Only 'Bathavia' is grown for canning purpose, (Fig. 1). While the fresh market is supplied by all three cultivars.

From 1982 to 1989, the Department of Horticulture, Faculty of Agriculture, Kasetsart University, collected *Ananas comosus, A. nanas, A. bracteatus*, and *A. lucidus* (4,5). In 1990, the STDB funded this project on Pineapple Improvement and Multiplication by Aseptic Techniques for Canning Industry in Thailand. Many cultivars are maintained by the Department of Horticulture, Kasetsart University and the Siam - Agro Industry (Pineapple and others) Company Limited (SAICO) In Rayong (9, Fig,2). During the first six months of this project, some 8 cultivars of pineapple were collected from Chiang Rai and Trat provinces. The rest were taken from Taiwan, Australia, Indonesia, Malaysia and the Philippines. This brought the project's total collection to 20 cultivars and three Ananas species (Table 1).

Fifty accessions of the long lost 'Giant Kew' or 'Calcutta' cultivar, which was re-discovered in Trat Province, were planted in the plantation of the Siam Agro-industry Co., Ltd. (SAICO) in Rayong Province for further selection and breeding purposes.

A hundred accessions of 'Singapore Bathavia' which is a Malaysian origin was also established in the same plantation. The plants are being maintained and looked after until they reach a certain size for breeding. The list of cultivars and their characteristics are presented in Tables 2.

PINEAPPLE GROUPS IN THAILAND

Pineapple genetic resources in Thailand can be broadly classified into four group i.e. Cayenne, Spanish, Queen and Perolera. The Cayenne group is the most important group covering several commercial cultivars in Thailand.

Cayenne Group

Several forms of Cayenne have been observed. At least three main distinct groups are cultivated in Thailand, as follows:

1). Bathavia or normal Smooth Cayenne. The largest cultivated Cultivar for both canning and fresh fruit purposes, especially in Prachuab Khiri Khan, Petchaburi, Rayong, and Chonburi.

2). Nang Lae. A distinct type of Cayenne with smooth leaves and small and found. Fruitlets are bigger than normal smooth Cayenne, with thin skin. The flesh is golden yellow and juicy with a pleasant taste.

3). Lakata (Calcutta or Giant Kew). This long-introduced cultivar is planted in Trat province. Its fruit is the biggest of all cultivars and many superior and high-yielding types have been observed (Table 2).

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(1) *Research and Development Project between Kasetsart University and Siam-Anglo Industry (Pineapple and others) Company Limited (SAICO).*
(2,3) *Department of Horticulture, Faculty of Agriculture, Kasetsart University, Bangkok 10900.*

From Table 2, and also from Table 4 'Singapore Bathavia' reign supreme over 'Phuket' (Queen) cultivar from the South both in plant and fruit characteristics. '53-115', 'Monte Lirio' (Perolera Group) and 'Singapore Spanish' can not adapted themselves to the extremely hot and dry condition of eastern Thailand, therefore it was removed from the breeding program all selected clones of 'Smooth Cayenne' (Champaka) from Nambour, Australia performed well to the local condition and they were successfully established themselves in the first ratoon crop. From this study, it was found that 'Nang Lae' which is a sub-variety of 'Smooth Cayenne' performed very poor growth to the local condition. It was susceptible to the high incident of multiple crown and small fruits. 'Singapore' is the local form of 'Phuket' cultivar. 'Lakata' of Trat province is actually Calcutta or Giant Kew of India.

'Indrachit' and 'Khao' Cultivar showed inferior fruit quality and they are in need of crop improvement through selection and breeding in the future 'McGregor' from Australia also performed very poor growth. **Ananas lucidus** adapted well to drought and showed certain degree for resistant to root and heart rot disease.

Two Hybrids from Taiwan namely 'Tainung No 4' and 'Tainung No 11' were not adapted themselves well in the plant crop but they showed adaptation during the ratoon crop, although inferior fruit quality due to the high incident of Collar-of-Slip. 'Wild Pine' from Brazil is considered to be the best table fruit as well as 'Victoria Queen' from Kenya and South Africa. 'White' (Sugarloaf) is the latest cultivar obtained in 1994. The fruit shape is true cylindrical form with square shoulder and flat eyes. Flesh is stronger taste, high acid and high sugar content but dull white color.

Queen Group

The Queen pineapple in Thailand is represented as 'Phuket' or 'Singapore' cultivar or 'Trat Si Thong' in the eastern provinces. This is of the spiny leaf type. The fruit is uniformly cylindrical in shape, with good yellow color and high aroma. However, this cultivar has deep blossom cup and is too small for canning.

Singapore Bathavia was introduced to Thailand in early 1988. All characters resemble 'Phuket' but it is bigger and stronger, and its fruit is also bigger (Fig. 3).

Spanish Group

There are only two local cultivars, namely, 'Indrachit' and 'Khao' belonging to this type. It has inferior fruit and low yield. 'Indrachit' is tolerant to wet soil, heavy clay and high acidity, but the fruit is too small for canning (Fig.4).

Singapore Spanish is another cultivar of the Spanish type in Thailand. The leaves are entirely smooth but the fruit is rather small.

Perolera Group

'Monte Lirio' is the latest cultivar of Perolera Group (6) in Thailand. It was introduced from Costa Rica but performed not so well under the eastern sea coast Thailand (6).

Important characteristics of pineapple cultivars belong to different groups were presented in Table 2.

Germplasm collection of pineapple
at Siam-Agro-Industry (Pineapple and others) Company in Rayong

Table 1. Genetic resources of pineapple in Thailand 1989-1991

Cultivar's Names	Group	Source	Site of planting	Remarks
1. Smooth Cayenne	Cayenne	SAICO, Rayong	SAICO, Rayong	Selected clones for Contact Growers
2. Nang Lae	Cayenne	Chiang Rai	SAICO, Rayong	
3. Del Monte	Cayenne	Philippines	SAICO, Rayong	
4. Great Giant	Cayenne	Indonesia	SAICO, Rayong	
5. Smooth Cayenne Champaka Clone F 200	Cayenne	Hawaii	SAICO, Rayong	
6. Smooth Cayenne Champaka Clone F 180	Cayenne	Hawaii	SAICO, Rayong	
7. Smooth Cayenne Selected Clone No 8	Cayenne	Australia	SAICO, Rayong	
8. Smooth Cayenne Selected Clone No 10	Cayenne	Australia	SAICO, Rayong	
9. Smooth Cayenne Selected Clone No 13	Cayenne	Australia	SAICO, Rayong	
10. Smooth Cayenne Selected Clone No 30	Cayenne	Australia	SAICO, Rayong	
11. Monte Lorio	Perolera	Central America	SAICO, Rayong	
12. Singapore	Queen	Trat, Thailand	SAICO, Rayong	
13. Phuket	Queen	Phuket	SAICO, Rayong	
14. Mc.Gregor	Queen	Australia	SAICO, Rayong	
15. Ripley Queen	Queen	Australia	SAICO, Rayong	
16. Indrachit	Spanish	Chachoengsao	SAICO, Rayong	
17. Khao	Spanish	Chachoengsao	SAICO, Rayong	
18. Singapore Spanish	Spanish	Malaysia	SAICO, Rayong	
19. Hawaiian Hybrid	Hybrid	Australia	SAICO, Rayong	63
20. Taiwan Queen (Tainung No 4)	Queen x Cayenne Hybrid	Taiwan	SAICO, Rayong	

Beside **Ananas comosus** L. other species: *Ananas nanus*, *A. bracteatus* 'Striatus' and *A. lucidus* from Brazil have been collected. These germplasm will be used for pineapple improvement programme.

Table 2. Main characteristics of pineapple cultivars collected and grown in Thailand

Cultivar (or the species)	Group	Main Characteristics
Smooth Cayenne	Cayenne	This cultivar in Thailand only produced no slip, few suckers, broad leaves, spineless except near tip relatively short peduncle. The fruit is large, cylindrical or conical shape, flat and wide eyes, the skin is orange-yelow, or dark green. Flesh more or less translucent moderate fibrous, pale yellow to yellow. The flavour is sweet and low acid. Medium sized core. Susceptible to Marbling disease and nematodes. Best of canning and good for fresh fruit export market. Need more improvement.
Smooth Cayenne	Cayenne	Resemble Typical Smooth Cayenne 'NangLae' without slip to few but the fruit is squat shape, prominent eyes, thin skin but rich yellow flesh, translucent sweet and aroma. Too small for cannery, good for fresh fruit market. Need more improvement.
Indrachit	Spanish	A spiny leave plant, many slips, the leaves are narrow and long, reddish green in color. The fruit is smaller than Cayenne, conical shape, reddish yellow when ripe. The flesh is more or less skin color is bright reddish yellow. The flesh is opaque, crisp, alternate bright yellow and pale yellow. Less acid and less sweet than Cayenne but ascorbic acid is higher than Cayenne.
Phuket	Queen	This queen cultivar in Thailand produced no slip or few, large numbers of suckers the leaves are narrow and short, spiny, reddish pale green in color. The fruit is smaller than Smooth Cayenne and more uniform cylindrical shape, prominent eyes, deep blossom cup. The flesh is crisp, rich yellow, fewer fiber, opaque and strong aroma when ripe, stronger taste than Cayenne. Too small for canning but good for local consumption and need more improvement for future export.
Singapore Bathavia	Queen or hybrid (7)	This is relatively new cultivar introduced to Thailand in early 1988. All characteristic resemble Phuket, except it is bigger and stronger plant susceptible to heart rot disease. More information about fruit characteristic will be obtain in the future.
Monte Lirio	Peroera	The latest cultivar in Thailand, the plant is rosette less open than Cayen Numerous slips of different size. The leaves are broad and long, enormous (piping type) except the distal spine. Tolrant to wet, heavy clay soil and able to grow in the shady area. The fruit is too small for cannery, good for local consumption only and need more improvement.

Table 2. (continue)

Cultivar (or the species)	Group	Main Characteristics
Khao	Spanish	Resemble Indrachit but the leaves are green, the floral bracts are white and the fruit is rich bright yellow when ripe. Possibly a mutant of Indrachit. The fruit is small, need more improvement.
Lakata (Culcutta or Giant Kew)	Cayenne	Resembling Bathavia (Smooth Cayenne) but bigger size and more susceptible to marbling disease. Only found in some parts of Trat province.

Table 3. A comparison of advantage and disadvantage of pineapple cultivar collected in the project.

Cultivar	Group	Advantage	Disadvantage	Source
Singapore Bathavia	Queen (possibly a selected clone	Cylindrical fruit shape. Good growth performance. Well proportioned crown and fruit. Optimum number of suckers.	Deep fruit cavity. Spiny-leaf type.	Trad Province (Introduced from Malaysia)
Bathavia (Selected Clones)	Cayenne	Smooth-leaf type. Big cylindrical fruit, flat eyes firm texture, yellow	Low yield in ratoon crop, conical shaped fruit, low acidity, light colored flesh no restestant to marbling.	Rayong (SAICO)
Monte Lirio	Perolera	Smooth-leaf type.	Susceptible to high temperature and heart rot caused by Phytopthera parasitica.	Costa Rica Central America
Tainung No 4	Hybrid	Fruitlets are easy to separate. Deep yellow. High fiber content. High aroma.	Spiny-leaf type. Deep fruit cavities.	Taiwan R. O. C.
Singapore Spanish	Spanish	Smooth-leaf type. Tolerant to wet soil. Many slips.	Susceptible to drought. Rather small fruit.	Bang Khla, Chachoengsao
C-8	Selected clone of smooth Cayenne	Smooth-leaf type. Good growth performance.	"	Australia

Table 3. (continue)

Cultivar	Group	Advantage	Disadvantage	Source
C-10	Selected clone of smooth Cayenne	Smooth-leaf type. Good growth performance	"	Australia
C-13	"	"	"	"
C-30	"	"	"	"
F-200	"	"	"	Hawaii through Australia
F-180	"	"	"	"
53-116	Hawaiian Hybrid	Smooth papery-like leaf.	Poor performance both growth and development	"
Nang Lae	Possibly a sub-variety of Smooth Cayenne	Smooth-leaf type.	High rate of multiple crown. Poor growth.	Ban Nang Lae Chiang Rai
Singapore	Possibly the same as Phuket cultivar.	Deep yellow skin of fruit. Keeps longer than Smooth Cayenne. Deep yellow, highly aromatic flesh.	Spiny leaves. Too many ground suckers.	Trat Province
Phuket	Queen	Good growth performance. Deep yellow, aromatic flesh. Low marbling incident Long shelf-life after harvest.	Spiny-leaf type. Prominent eyes and deep blossom cup. Deep flesh cavity. Too many ground suckers.	"
Calcutta (also known as "Giant Kew" or "Lakata" in Thai)	Cayenne	Strong growth to tolerant to humid climate. Smooth leaf Bigger fruit than typical "Smooth Cayenne. Strong peduncle.	High incidence of internal fruit cracking and marbling disease.	"
Great Giant (a selected clone from Malaysia	Cayenne	Good growth. Big and well shaped fruit.	-	Malaysia
McGregor	Queen	Spiny-leaf type.	Poor growth	Australia
Ananas Lucidus	-	Smooth leaf type. Tolerant to drought. Resistant to disease.	Sharp and stiff leaf tip. Very small fruit with long and woody peduncle	Brazil

Cultivar	Group	Advantage	Disadvantage	Source
Indrachit	Spanish	Vigorous growth	Spiny leaf type inferior fruit quality. Multiple crown	Bang Khla Chachoengsao
Tainung No 11 (Taiwan Selected Clone)	Hybrid	Fruit cylindrical shaped, shallow eyes, yellow flesh, high acid -sugar	Not adapt to climate in Rayong.	Taiwan R. O. C.
Wild pine	Wild	Fruit squad shaped, shallow eyes, pale yellow, high acid-sugar with aroma a very agreeable taste as table fruit	Spiny leaf type with small fruit	Brazil through Taiwan R. O. C.
Victoria Queen	Selected clone of Queen type	Small and cylindrical shaped fruit, prominent eyes, deep yellow flesh, high aroma, high acid-sugar About 4 fruits per kilogram	Spiny leaf type, prominent eyes, very small fruit	Reunion Island
White (Sugar loaf)	Hybrid	The plant with smooth leaf margin. Big and well cylindrical shaped fruit, flat eyes and with square shoulder, small crown. Big core, white flesh with high sugar acid content, high aroma,	White flesh with large core	Hawaii

Smooth Cayenne
a leading pineapple's
Cultivar in Thailand

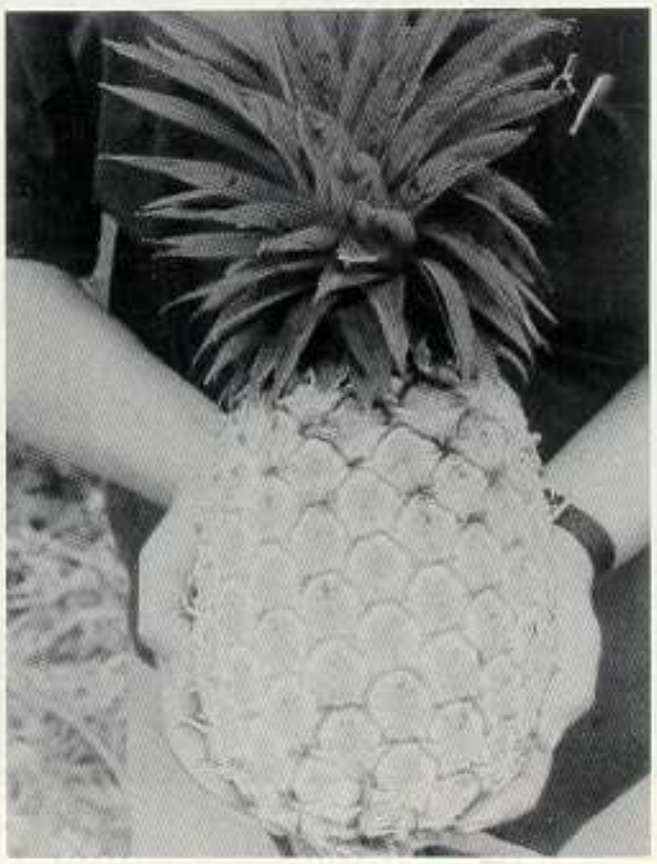

Table 4. Characteristics of the main commercial pineapple's cultivars grown in Thailand

Cultivar	D-leaf weight(g)	Canopy dia(cm)	Stem weight(g)	Fruit weight(g)	Fruit dia(cm)	Core dia(cm)	Total Acidity %	TSS (Brix)
Singapore-Bathavia	52.5	120.2	564.0	1504.5	11.9	3.2	0.7	14.9
Trat Si Thong	70.5	70.5	487.5	1004.5	10.6	2.1	0.6	18.0
Bathavia	42.5	113.2	654.0	2347.7	14.2	3.4	0.6	13.9
	95.0	-	363.9	2018.2	13.0	1.9	0.5	15.5
Lakata (Giant Kew)	74.5	122.25	2227.5	3116.0	15.2	3.5	0.6	14.0
Phuket or Singapore	75.0	90.40	463.5	1496.0	11.7	3.1	0.6	15.8
Indrachit	-	-	450.0	1500.0	12.3	1.8	0.5	10.7
Khao	-	-	-	846.0	8.6	1.6	0.3	12.6

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"Singapore Bathavia"
a selected clone of
Queen type

"Indrachit"
a poor representative of
Spanish type in Thailand

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