BGO NEWSLETTER

THE BOTANICAL GARDEN ORGANIZATION
Ministry of Natural Resources and Environment

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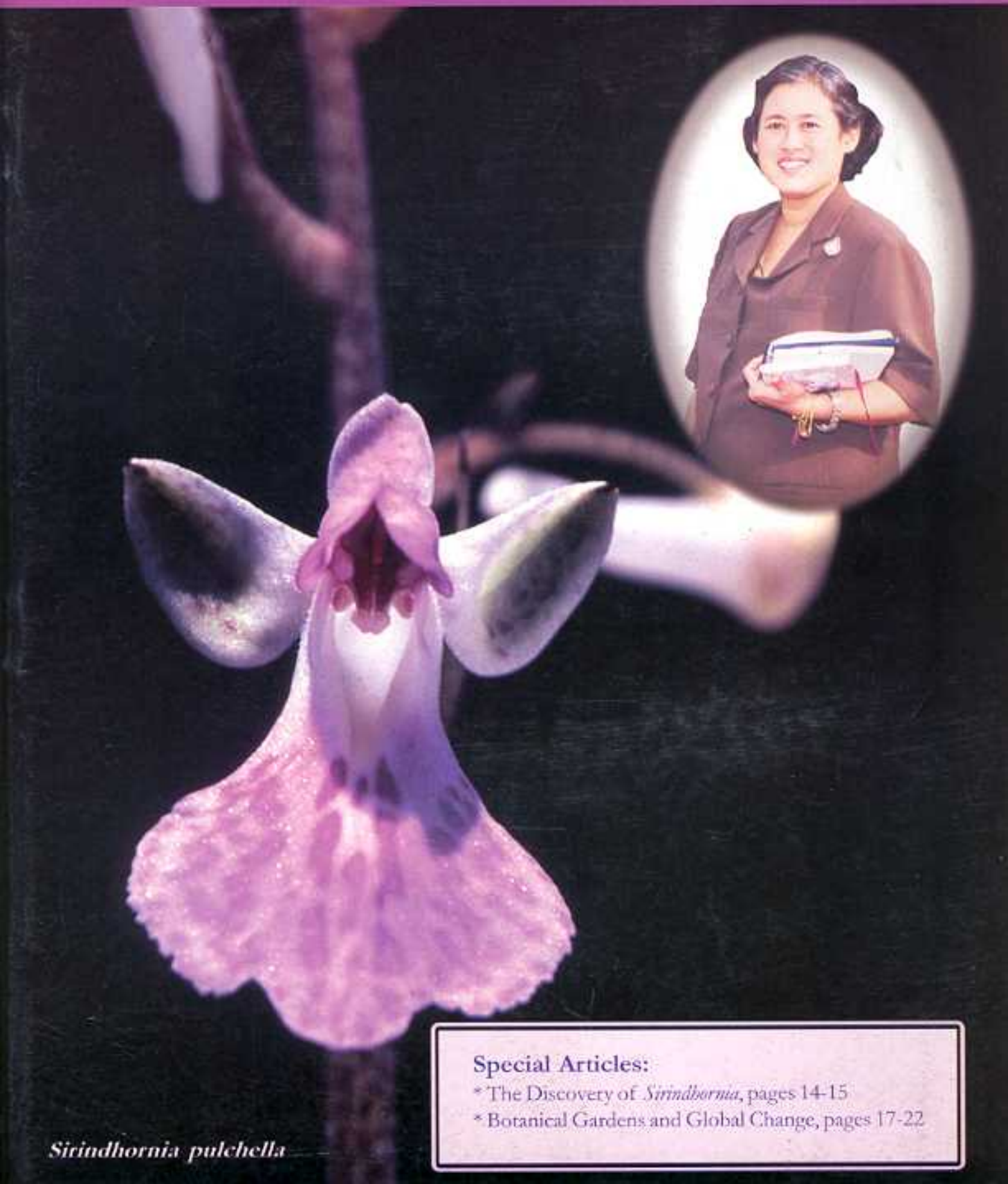

Special Articles:

Sirindhornia pulchella

Director's Message

The Botanical Garden Organization of Thailand has been developed quite extensively and is almost nearing the final stages to fulfill its necessary requirements and obligations. The areas which have been fully developed are: the Thai plants collection, botanical research, along with the community and youth educational activities. By achieving these three objectives we have become well-known to the general public. The garden itself, has become and established a biodiversity center in the northern region and a popular ecotourism attraction. The business development plan, in regards, to plants and there respective by-products needs to be urgently established to cope with the rapidly increasing number of daily visitors and outside inquiries.

The sister gardens, at Phitsanulok, Khon Kaen; and Rayong are developing very well with the support received from the government and local communities. The prognosis is quite good that they will be very beautiful gardens with solid activities in the near future. The master plan of the three gardens will be ready within the year and will serve as a dynamic model for other new botanic gardens for the country.

International cooperation among major botanical gardens in Asia and overseas is excellent with regular visits by exchange scientists, plant material, joint research programs, and international courses in biodiversity and conservation. These aforementioned programs have both, contributed and have been conducted with great success.

I would like to sincerely thank all QSBG staff members who have devoted their work tirelessly to make our gardens one of value to the younger generations.

Weerachai Nanakorn

Weerachai Nanakorn, Ph. D.

The BGO Executive Board

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Editorial

This issue commemorates the 48th birthday anniversary of HRH Princess Maha Chakri Sirindhorn, who is a patron of plant conservation in Thailand. Moreover, HRH the Princess has long been interested in biodiversity conservation in relation to sustainable development of the country. HRH Princess Maha Chakri Sirindhorn encourages cooperation between relevant institutes to enhance efficient management of natural resources.

The theme of this issue is "*linkage*". It was through a joint effort between QSBG and the Botanical Museum, University of Copenhagen, Denmark; that led to the discovery of the new orchid genus *Sirindhornia*, named in honor of HRH the Princess.

From 1 to 4 April 2003, the BGO and DANIDA - Capacity Building in Biodiversity Project organized a regional conference, entitled: "*The Role of Botanical Gardens in Biodiversity Conservation*" to celebrate HRH's 48th birthday anniversary. There were many informative presentations from various overseas botanical gardens. Our feature article for this issue is the keynote presentation by the Representative of the Botanic Gardens Conservation International, UK.

I hope that you will find the contents of this publication useful and inspiring.

Suyanee Vessabutr, Ph.D.

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BGO News

New Affiliation of the Botanical Garden Organization

In October 2002, the BGO's affiliation was changed from the Prime Minister's Office to Ministry of Natural Resources and Environment (MoNRE), as a result of the government reform.

Mr. Prapat Panyachatraksa, a strong advocate of biodiversity conservation, has become the first minister appointed to the newly established ministry.

Mr. Prapat Panyachatraksa
Natural Resources and Environment Minister

"***The Botanical Garden Organization has the important role of rendering services for public education, especially on the value of Thailand's plant resources***".

[Mr. Prapat's remarks to the BGO Executive Board, 12 May 2003, MoNRE, Bangkok].

New Executive Board Chairman

Prof. Dr. Thawatchai Santisuk
Chairman of the BGO Executive Board

Professor Dr. Thawatchai Santisuk, Senior Specialist, Department of National Parks, Wildlife and Plant Resources, MoNRE; became the 5th Chairman of the BGO Executive Board. Prof. Thawatchai has been serving as a member of the BGO executive board since the establishment of the organization.

Farewell

With sincere gratitude, we bid farewell to former Chairman, General Montri Supaporn, and the outgoing executive board members; as well as members of various sub-committees whose devotion and commitment were remarkable.

HRH Princess Maha Chakri Sirindhorn's Visit:

Her Royal Highness Princess Maha Chakri Sirindhorn leading the team of professors from Johns Hopkins University to see plant collections at QSBG on 16 January 2003.

HRH Princess Chulabhorn's Visit:

From 21 to 31 October 2002, HRH Princess Chulabhorn paid a private visit to QSBG.

HRH Princess Chulabhorn being greeted upon arrival by Mr. Prapat Panyachatraksa, Minister of Natural Resources and Environment.

HRH Princess Chulabhorn paying interest to the exhibition on "Wine from Thai Fruits" displayed at the Visitor Center.

HRH Princess Chulabhorn graciously attending a banquet organised by the Executive Board during her stay at The Botanic Residence (left), *and performing her musical talent on the "Guzheng", one of the most ancient Chinese musical instruments (above).*

On behalf of the Botanical Garden Organization, Dr. Weerachai Nanakorn, QSBG administrators and some staff members receiving the "Plant Conservation 2002 Award, Organization Category" granted by the National Identity Promotion Office, on 16 September 2002 at "Thai Khu Fa Building", Government House, Bangkok.

Former prime minister Anand Punyarachun, during his visit to the Garden on 7 October 2002, being presented with QSBG Flora Vol. 1-6 by Mr. Vallobh Sukont, Deputy Director.

Mr. Sonthaya Kunplerum, Tourism and Sports Minister, visited QSBG on 29 November 2002.

Some 400 Swedish scouts visited QSBG on 23 December 2002 before joining over 30,000 international scouts at the *"20th World Scout Jamboree"* in Sattahip, Chonburi.

Mr. Krister Nilsson, State Secretary of the Ministry of the Environment, Sweden visited QSBG on 8 March 2003.

Ms. Leela K. Ponappa, Ambassador of India and Permanent Representative to ESCAP, Thailand, visited QSBG on 26 August 2003. Mr. Pramook Benyasuth (center), Head of the Garden Department, serving as a guide at the Native Orchid Nursery.

QSBG Activities

Commemoration of HM Queen Sirikit's Birthday

From 3 to 4 August 2003, the BGO organized "The Third Symposium on HM Queen Sirikit and Biodiversity Conservation of Thailand" to commemorate HM the Queen's 71st birthday.

Dr. Plodprasob Surassawadi, Permanent Secretary, MoNRE; was one of the invited speakers.

The symposium, held at the Lotus Pang Suan Kaew Hotel, was well received by more than 300 participants from various government and private sectors.

Vanda coerulea Griffith ex Lindl.

The 8th Parataxonomist Training

The 8th Parataxonomist Training was held from 2 to 4 June 2003. A special activity - "Return Orchids to the Forest" - was organized as part of the training program.

Native orchids were propagated from seeds using the tissue culture technique. Once plantlets became big enough, they were taken out from *in vitro* conditions and acclimatized in a nursery until ready to be reintroducted to the wild.

"The Blue Vanda", Vanda coerulea, was included in the reintroduction program. This orchid once grew abundantly in northern forests, but now it is listed as an endangerd species on Appendix 1 of the Convention in International Trade of Endangered Spees of Wild Fauna and Flora (CITES).

The arrival of *Amorphophallus titanum* and *Nepenthes* spp., from Leiden

In August 2003, Dr. Weerachai Nanakorn received two tubers of *Amorphophallus titanum*, and 96 living specimens of *Nepenthes* (pitcher plants) from Leiden University Botanical Garden, the Netherlands. Many thanks go to Mr. Art de Vogel, Senior Curator of the Leiden Botanical Garden who kindly arranged the contribution.

Amorphophallus titanum, commonly known as the "Titan Arum", has the largest inflorescence in the world. It is found naturally in Sumatra's forest and locally known as "bunga bangkai" or "corpse flower", for its odor of rotten meat.

Although flowering outside its native Sumatra has been reported as rare, we hope it won't be too long before visitors can view the plant in bloom at the QSBG Rainforest House.

[Picture from http://www.ftg.org/blooms/amorphophallus01.html]

Nepenthes spp. (Pitcher plants)

Nepenthes are commonly known as "pitcher plants" or "monkey cups", as the tips of some leaves are modified into jug-like structures. Inside the pitcher, a digestive liquid is produced for unsuspecting prey to fall into.

Nepenthes come in two distinct types, the highland and the lowland. Generally speaking the lowland types have larger and more colourful 'pitchers' than the highland ones.

The Leiden University Botanical Garden has a large collection of *Nepenthes* from all over the world. One important role of a botanical garden is distribution of plant material for use in education and conservation. We therefore thank the Leiden University Botanical Garden for their generous contribution.

Pitcher plants

Staff Notes

Congratulations!

To the following staff who have recently received their Master's degrees from Chiang Mai University:

Technical and Research Department

Meetee Wongnak
(M.Sc., Geography)

Thesis title:
Diversity of Native Vegetation for Conservation Planning in Mae Tean Forest, Tak Province.

Technical and Research Department

Duangjan Wutisan
(M.Sc., Geography)

Thesis title:
Application of Geographic Information Systems to Land Use Planning in the Queen Sirikit Botanic Garden, Chiang Mai Province.

Co-ordination Department

Phensilp Thekhaphun
(M.A., Public Administration)
Thesis title:
The Role of Queen Sirikit Botanic Garden in the Promotion of in Chiang Mai Province.

Garden Department

Pailin Kanta
(M.Sc., Horticultural Science)
Thesis title:
Varietal Improvement and Growing Methods of Rosa Hybrids.

Advance congratulations!!

To Mr. Pramook Benyasuth, Head of the Garden Department and Ph.D. candidate at Suranaree University, Nakorn Rajasima province. He conducted his thesis on *"Petrified Wood of Northeastern Thailand and Its Implication on Biodiversity and the Ecosystem during the Cenozoic Era"*. Mr. Pramook has fulfilled all the requirements for a doctoral degree in Environmental Biology, and is expected to receive the degree in the next convocation.

To the proud parents:

☺ Chaiyudth Glamwaewwong, Botanist, Technical and Research Department; and his wife Pornpimon, Coordination Department, proudly announce the birth of their beautiful baby girl – Piempeeti, born on 10 April 2003.
Congratulations and best wishes from all of us!

Obituary

QSBG staff convey sincere sympathies to the family of Mr. Surachai Jirakit, Coordination Department; who passed away in a motorcycle accident in Chiang Mai, last July.

Volunteers

During 14 July –23 August 2003, Dr. Linda Wiener from St. Santa Fe Botanical Gardens, New Mexico, USA, shared her extensive experience in planning and designing a museum of exhibits with the staff of QSBG Natural Science Museum.

Linda also carried out a survey on butterflies in the Garden. Please see her butterfly list on page 11 and 12.

Linda, Alec (son) and Vicky (daughter)

Warren with a certificate and a gift from QSBG

Warren Townsden was with the Garden Department for over two years. He finished his volunteer job as Foreign Consultant in Horticulture in March 2003, and has returned to the Botanic Estate of Taronga Zoo, Sydney, Australia.
Thanks for your remarkable commitment while you were with us, Warren.
You are missed by many people!!!

There have been requests from many readers to see our editorial team. So here we are! From left to right: Porntipa, Soraya, Suyanee, Pichsinee, Somkual, and Chaiyudth.

BUTTERFLY LIST
Queen Sirikit Botanical Garden

July – August, 2003
Dr. Linda Wiener
St. John's College
Santa Fe, New Mexico 87505 USA

Family	Scientific Name	Common Name
Papilionidae	*Graphium eurypylus*	
	Graphium sarpedon	Common Bluebottle
	Papilio demoleus	Lime Butterfly
	Papilio demolion	Banded Swallowtail
	Papilio memnon	Great Windmill
	Papilio helenus	Red Helen
	Parides dasarada	Great Windmill
	Troides aeacus	Golden Birdwing
	Troides helena	Common Birdwing
Pieridae	*Appias albina*	Common Albatross
	Appias lyncida	Chocolate Albatross
	Catopsilia pomona	Lemon Emigrant f. crocale f. hilaria f. pomona
	Delias pasithoe	Red Based Jezebel
	Eurema andersonii	Anderson' Grass Yellow
	Eurema brigitta	Small Grass Yellow
	Eurema hecabe	Common Grass Yellow
	Gandaca harina	Tree Yellow
	Hebomoia glaucippe	Great Orange Tip
	Leptosia nina	Psyche
	Pareronia anais	Common Wanderer
Danaidae	*Danaus genutia*	Common Tiger
	Euploea mulciber	Striped Blue Crow
	Euploea sylvester	Double-Branded Blue Crow
	Ideopsis gaura	Smaller Wood Nymph
	Tirumala limniace	Pale blue Tiger
	Tirumala gautama	Scarce Blue Tiger
Satyridae	*Elymnias hypermnestra*	Common Palmfly
	Lethe confusa	Striped Treebrown
	Lethe verma	Straight Treebrown
	Mycalesis intermedia	Intermedia Bushbrown
	Mycalesis perseus	Common Bushbrown
	Neope muirheadi	
	Orsotriaena medus	Nigger
	Ypthima huebneri	Common Four Ring
	Ypthima baldus	Common Five Ring
Nymphalidae	*Cethosia biblis*	Red Lacewing
	Charaxes kahruba	Variegated Rajah
	Chersonesia risa	Common Maplet
	Cirrochroa surya	Little Yeoman
	Cirrochroa tyche	Common Yeoman
	Cupha erymanthis	Rustic

	Cyrestis cocles, f. cocles	Marbled Map
	Doleschallia bisaltide	Autumn Leaf
	Euthalia phemius	White-edged Blue Baron
	Euthlaia recta	Redtail Marquis
	Junonia almana	Peacock Pansy
	Junonia iphita	Chocolate Pansy
	Junonia lemonias	Lemon Pansy
	Lebadea martha	
	Lexias pardalis	Common Archduke
	Neptis clinia	Clear Sailor
	Neptis hordonia	Common Lascar
	Neptis hylas	Common Plain Sailor
	Paduc fasciata	Little Banded Yeoman
	Phalanta phalantha	Common Leopard
	Polyura jalysus	Indian Yellow Nawab
	Taneaecia lepidea	Grey Count
	Vagrans egista	Vagrant
	Vindula erota	Common Cruiser
Lycaenidae	*Abisara fylla*	Dark Judy
	Caleta roxus	Straight Pierot
	Castalius rosimon	Common Pierot
	Catochrysops panormus	Silver Forget Me Not
	Cheritra freja	Common Imperial
	Heliphorus ila	Restricted Purple Sapphire
	Jamides alecto	Metallic Cerulean
	Logania massalia	
	Miletus mallus	
	Nacaduba kurava	Transparent Sixline Blue
	Rapala asopia	
	Zemeros flegyas	Common Punchinello
Hesperiidae	*Ancistroides nigrita*	Chocolate Demon
	Bibasis vasutana	
	Bibasis harisa	Orange Awlet
	Celaenorrhinus aurivittatus	Dark Yellow-banded Flat
	Pelopidas agna	
	Potanthus trachala	Lesser Bident Dart

SSRF News

From 1 to 4 December 2002, Queen Sirikit Botanic Garden and the Sanga Sabhasri Research Foundation (SSRF) organized the "International Seidenfaden Orchid Symposium" to honor the late Gunnar Seidenfaden - Danish diplomat, explorer, and world renowned orchidologist.

Gunnar Seidenfaden
(24 February 1908 - 9 February 2001)

Keynote Speaker: Dr. Phillip Cribb
Royal Botanic Gardens, Kew, U.K.

This successful symposium had a wide assembly of orchid experts and enthusiasts who shared their most up-to date knowledge of Southeast Asian orchids in commemoration of one of the greatest explorers in orchidology.

The conference had 20 technical papers and more than 20 poster presentations. After the symposium, field trips were organized to QSBG Native Orchid Collection, and Doi Inthanon National Park.

Distinguished international speakers included Phillip Cribb, RBG, Kew, UK; Henrik Pedersen, Botanical Museum, Univ. of Copenhagen, Finn Rasmussen, Botanical Institute, Univ. of Copenhagen, Hanne Rasmussen, Danish Forest & Landscape Research Institute, Denmark; Ed de Vogel, National Herbarium of the Netherlands; Art de Vogel, Leiden Univ. Botanic Gardens, the Netherlands; Sathish Kumar, Tropical Botanic Garden & Research Institute Pacha Palode, Thiruvananthapuram; R.C. Upadhayaya, National Research Center for Orchids, Sikkim, India; J.J. Vermeulen, Singapore; Faridah Zaman, Universiti Putra Malaysia; and Leonid Averyanov, Komarov Botanical Institute of the Russian Academy of Sciences, Russia.

On 30 November 2002, the above orchidologists and some distinguished guests, e.g. Prof. Kai Larsen, Aarhus University, Denmark; Dr. Chantravipha Dhanasobhon, BGO Executibe Board Member, Dr. Weerachai Nanakorn, QSBG Director, and Dr. Suyanee Vessabutr, Head, Technical and Research Department; received the great honor of a tea reception at the royal residence of HRH Princess Maha Chakri Sirindhorn, "Wang Sra Prathum" in Bangkok.

Botanical News

The Discovery of *Sirindhornia*

Story by Suyanee Vessabutr

Between 1994 and 1997, Piyakaset Suksathan, then a Master's degree student of Kasetsart University, conducted his research on the taxonomy and ecology of ferns of Doi Chiang Dao, Chiang Mai province. He made scheduled visits to Doi Chiang Dao during the rainy season to study ferns at different altitudes. Near the summit of this limestone mountain, he noticed ground orchids with spotted leaves which were somewhat similar to *Hemipilia calophylla*. "But not quite the same", thought Piyakaset "the habitat is especially different". This species grows in rock crevices in a vegetation recognized as 'open hill evergreen forest', while *Hemipilia* spp., are shade-loving orchids. However, Piyakaset had never seen the flower of this spotted leaf orchid, because the times he had spent on Doi Chiang Dao were not in the flowering season of this species.

In 1998, he joined QSBG as a botanist. There, he met Metee Wongnak and Somkual Suk-ieam, who showed him pictures of flowers of plants on Doi Chiang Dao including this attractive orchid. The spirit-preserved specimens of the orchid in question were collected by Surangrat Indhamusika, and identified as *Hemipilia* sp. Piyakaset started his investigation by checking on more specimens from local herbaria, as well as references such as "*The Orchids of Thailand*", and "*Contributions to the Orchids of Thailand,*" prepared by Gunnar Seidenfaden during 1959-1977. He believed that the species from Doi Chiang Dao was different from the genus *Hemipilia,* especially by its floral morphology. It was at least a new record for Thailand.

However, he had not got the answer yet. The species from Doi Chiang Dao had a striking resemblance to a species originally found in the Shan State of Myanmar, which was described as *Habenaria monophylla*. Over the years, different authors assigned this species to other different genera, such as *Orchis*, *Peristylus*, *Chusua*, and *Ponerorchis*.

Sirindhornia pulchella

In 2001, Piyakaset had the opportunity to meet Associate Professor Dr. Henrik AE. Pedersen, from the Botanical Museum, University of Copenhagen, Denmark.

Henrik had come to QSBG to participate in a symposium on the *Centenary Celebration of Thai-Danish Co-operation in Biodiversity*, in which the opening ceremony was presided over by HM Queen Margrethe II of Denmark, and HRH Princess Maha Chakri Sirindhorn of Thailand.

As a specialist on the orchid genus *Orchis* and other closely-related genera, Henrik took up this investigation with great enthusiasm. Henrik's hypothesis was that it could be even a new genus!! While Henrik was conducting an intensive morphological comparison study overseas, Piyakaset continued to conduct more plant expeditions in northern Thailand with his colleagues.

Sirindhornia monophylla

During one trip to Khao Hua Mot, Tak province, our photographer-Somkual Suk-ieam spotted a pretty looking bloom by the roadside. "*Hey Ek!* (Piyakaset's nickname), *come and have a look*!", called Somkual. Piyakaset came to observe and realised that this species had some similarity to *Habenaria monophylla,* but differed from the species found at Doi Chiang Dao by some floral characteristics.

While Somkual was taking photos of the plant, Piyakaset climbed up to the mountain ridge. He spotted another terrestrial orchid, bearing some similarity to the one Somkual found. Specimens of both species from Khao Hua Mot were shown to Henrik. After a thorough taxonomical study by morphological comparisons, Henrik was convinced that there was enough supporting evidence to establish a new genus.

To commemorate the 48th birthday anniverasy of HRH Princess Maha Chakri Sirindhorn, whose interest and support in plant conservation are prominent, they requested permission to use her royal name for the new genus.

Earlier this year, HRH Princess Maha Chakri Sirindhorn granted permission to name the new genus "Sirindhornia" which comprises three species: *Sirindhornia pulchella* (a new species, and endemic to Doi Chiang Dao), *S. mirabilis* (a new species, and endemic to Khao Hua Mot), and *S. monophylla* (a new combination based on *Habenaria monophylla*, with a wide distribution including Khao Hua Mot, Tak province, Thailand).

For specialised taxonomic information, please see:

Pedersen, H. AE., Suksathan, P. & Indhamusika, S. 2003. *Sirindhornia*, a new orchid genus from Southeast Asia. Nord. J. Bot. 22 (4): 391-403.

Our native plants are valuable. Please help to conserve them!!

Sirindhornia mirabilis

Special Event!!

H.E. Ulrik Helweg-Larsen, Danish Ambassador to Thailand addressing an opening speech.

Regional Botanical Gardens Conference at QSBG

During 1-4 April 2003, Queen Sirikit Botanic Garden hosted a regional conference entitled *"The Role of Botanical Gardens in Biodiversity Conservation"*, sponsored by the DANIDA Capacity Building in Biodiversity Project. The conference was organized in part to celebrate HRH Princess Maha Chakri Sirindhorn's 48th birthday.

It was the first Botanical Garden Conference held in Thailand, and was well received by distinguished international organizations concerned in conservation activities as well as regional botanic gardens.

Keynote Speakers included Dr. Mark Richardson, Director, Asia Office, Botanic Gardens Conservation International (BGCI), UK; and Dr. Kingsley Dixon, Vice President, The Australian Network for Plant Conservation, Perth, Australia.

The conference included oral presentations, poster sessions, panel discussions and field trips to QSBG and Doi Chiang Dao.

This sucessful conference provided an excellent opportunity to discuss collabration between QSBG and other institutes actively involved in plant conservation.

Proceedings of the conference are available upon request. Please contact:
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at: (6653) 268-332
or: <vessabutr@yahoo.com>

Limestone orchid display at QSBG

Participant registration

Left: *Poster Sessions*

Right: *Field trip at Doi Chiang Dao*

Botanic Gardens and Global Change

Mark Richardson, Ph.D., and Peter Wyse Jackson, Ph.D.
Botanic Gardens Conservation International (BGCI), U.K.

We all recognise that the world's 400,000+ plants are a vital part of the world's biological diversity and an essential resource for human well-being. Plants play a key role in maintaining the planet's basic environmental balance and ecosystem stability and provide habitats for the world's animal life. They provide our basic food and fibres, and many thousands of wild plants have great economic and cultural importance and potential, providing food, medicine, fuel, clothing and shelter for vast numbers of people throughout the world. Traditional Chinese medicine alone uses over 5,000 plant species. And traditional medicines in India are based on 7,000 different plants.

Yet, despite our reliance on plants, a crisis point has been reached. Although much work remains to be carried out to evaluate the status of the world's plants, it is clear that between 60,000 to 100,000 plant species are threatened worldwide.

The disappearance of such vital biodiversity is one of the greatest challenges for the world community; and specifically it has become a key component of the botanic garden global mission - to halt the destruction of the plant diversity that is essential to meet the present and future needs of humankind.

But botanic gardens now operate in an increasingly complex national and international framework for biodiversity conservation and environmental protection. Since 1992, a wide range of new international instruments aimed at addressing the world's environmental crisis have been developed – including the Conventions on Biological Diversity, Climate Change, Desertification, Agenda 21 as well as Biodiversity Strategies and Action Plans at national levels in most countries. Whether one is cynical or not about if these can deliver all that they promise, there is no doubt that the international scene for environmental policies has been transformed over the last decade.

However, let us go back for a moment and review the way in which botanic gardens have evolved to become the pivotal institutions they are today. Many of the earliest botanic gardens had their origins in universities. The Padua Botanic Garden, which recently had its 450th anniversary, is one. The primary role of such botanic gardens was and still is to provide students with a range of living specimens for their studies in plant classification. Reminders of this origin are seen in botanic gardens throughout the world in the form of garden beds devoted to particular families or genera.

At a time when the world was being actively explored, botanic gardens also provided places for newly discovered plants brought from round the world to be cultivated and introduced into

horticulture, agriculture and commerce. Many plants, such as Eucalyptus, were known in cultivation before we even had scientific names for them. This activity has brought both wealth in the form of new crops and woe in terms of seriously invasive weeds. Being a place to see plants from different parts of the world is still an objective that many botanic gardens seek to achieve. In some ways they have been the worlds 'plant menageries' employing the same interest in the unusual that has been used to draw visitors to the world's zoos. The development of such collections has been greatly assisted by the exchange of seed lists from botanic gardens throughout the world. However, this previously unchecked exchange of genetic material is now, like intellectual property, a question of international debate and subject to increasing control.

As leisure time became a reality for many more people during the 1800s, botanic gardens also took on the role of recreation parks. In a recent survey that was conducted in Australia by the Bureau of Statistics, it was found that that 90% of the people visiting botanic gardens in Australia do so for recreation. Only 10% went there to deliberately learn anything about the plants. It is highly likely that a similar situation exists for most of the other botanic gardens of the world.

Since the 1950s many of the world's new and existing botanic gardens have placed a greater emphasis on their indigenous flora. This interest in indigenous plants has also been recognition of the uniqueness of each country's flora. Excellent examples of botanic gardens that have emphasized their country's or local regions' flora can now be found throughout the world. Such 'botanical nationalism' has been greatly supported more recently by such global agreements as the Convention for Biological Diversity, which emphasizes the need for countries to safeguard their national biodiversity, by developing and implementing specific national biodiversity strategies and action plans. The Convention also seeks to ensure that benefits derived from the exploitation of the biological resources are fairly and equitably shared and available to support conservation measures in countries that are rich in biodiversity.

But, since the 1970s we have, perhaps seen the greatest changes in the world's botanic gardens and, those changes appear to be increasing at a similar rate to all other areas of science and technology. The thinking in the botanic garden community is undoubtedly developing, with the wider community's realization that the environment is important, and as more holistic sciences such as ecology is over-shadowing taxonomy.

Botanic gardens have long operated in a very isolationist manner. Except those being sources of new material for their collections, they were largely oblivious of the activities of others. However, with the information revolution we are being increasingly made aware of what else is happening in the world, and since the late 1970s, numerous national, regional and international meetings, like this one, have been held by botanic gardens throughout the world. These meetings have helped to highlight, organize and promote interactions between botanic gardens at all levels and have also helped botanic gardens to reach out to co-operate more effectively with other sectors. Having become aware of the benefits that could be gained from such co-operative behaviour, networks have flourished, with Botanic Gardens Conservation International now providing the worldwide botanic gardens community with more ready access to the information and contacts needed to run effective botanic gardens at an international standard.

The meetings that eventually created organizations such as the BGCI and numerous meetings since, have most prominently identified the need

for botanic gardens to become actively involved in plant conservation. Initially, this primarily focused on *ex situ* conservation and many gardens developed collections of rare or threatened plants to fulfill their role. However, it has become obvious that while such collections are of value in terms of promoting plant conservation, they are often of limited value to the long term conservation of the species unless they have been constituted following strict procedures to safeguard genetic diversity and unless they are linked or complementary to longer term plans to conserve these species in situ. We would like to congratulate the organizers of this meeting for the important connection they have made between botanic gardens and the conservation of natural areas.

The need for such an understanding of the role of botanic gardens is in fact vital for botanic gardens to be taken seriously by other conservationists. Only too often do other segments of the conservation community dismiss botanic gardens in a similar way that zoos have been dismissed in the past. There is often a poor understanding of what botanic gardens have to offer in terms of germplasm storage, research and as a 'shop front' for plant conservation. With the 200+ million people that visit botanic gardens every year, the opportunity for us to help sway the opinion of people is enormous.

INTERNATIONAL AGENDA FOR BOTANIC GARDEN CONSERVATION

To assist botanic gardens worldwide, which set their own future agendas that coincide with the changes that are impacting on gardens everywhere, the BGCI has prepared the International Agenda for Botanic Garden Conservation.
The International Agenda is a global framework for botanic garden policies, programmes and priorities in biodiversity conservation. It was prepared between 1998 and 2000 and was based on contributions from and consultations with over 300 institutions and individuals throughout the international botanic garden, botanical and conservation communities.

The International Agenda defines the global mission of botanic gardens worldwide in conservation as follows:

* Stem the loss of plant species and their genetic diversity worldwide.
* Focus on preventing further degradation of the world's natural environment.
* Raise public understanding of the value of plant diversity and the threats it faces.
* Implement practical action for the benefit and improvement of the world's natural environment.
* Promote and ensure the sustainable use of the world's natural resources for present and future generations.

As proposed in the International Agenda, botanic gardens may register their contributions to the achievement of the International Agenda by making a written undertaking to work for the implementation of its provisions. It invites botanic gardens to adopt the International Agenda as their (or part of their) institutional policy on conservation. Registering with the International Agenda provides a clear indication of your institution's/organisation's commitment to plant conservation. It allows actions undertaken in support of plant conservation to be recognised and recorded internationally as contributions towards the global effort being made to conserve plant diversity.

INVESTING IN NATURE PROGRAMME

Having prepared the International Agenda, BGCI has sought to assist botanic gardens in many parts of the world in taking the opportunity to play a part in the worldwide effort to conserve our plant diversity. This has been through a partnership with one of the world's largest financial service organizations, HSBC, which has created a US$50 million eco-partnership, entitled "Investing in Nature", to fund conservation projects around the world. It has made the largest ever single donations to several conservation organizations, namely, Botanic Gardens Conservation International, the World Wide Fund for Nature and Earthwatch.

As part of the Investing in Nature partnership, Botanic Garden Conservation International (BGCI) has launched a substantial international programme. The programme operates at the global level, implementing the International Agenda for Botanic Gardens in Conservation as well as at the in-country level with specific national programmes in Argentina, Brazil, China including Hong Kong, India, Indonesia, Japan, the Middle East, North America (including Canada and the USA) and, hopefully, South-East Asia.

Through the Investing in Nature programme, BGCI seeks to achieve the following outcomes:

- The extinction crisis for key plant species around the world will be reversed.
- Gene banks will be developed to conserve the world's plant diversity for future generations.
- Botanic gardens will meet people's needs for public relaxation, recreation and tourism, particularly in urban areas.
- Greater awareness among key public, business and government audiences will be made aware of the importance of plants, the threats they face and action needed to protect them.
- Model and demonstration projects will be conducted to illustrate the role of environmental education in changing public behaviour and the value of plants to local livelihoods, food and medicine.
- Programmes based on plants will be implemented at local levels to support community needs, address local environmental and associated social issues and contribute to sustainable development.
- Botanic gardens' expertise will be pooled through a global website, improved networking among the gardens, improved links with other key organizations and a strengthened BGCI.

In the SE. Asia region, the BGCI is keen to further develop collaboration with botanic gardens and to provide funding for the promotion of and training for plant conservation over the next four years.

GLOBAL STRATEGY FOR PLANT CONSERVATION

As we enter the new millennium, however, the world's botanic garden community has entered a new phase that more fully integrates it into the international efforts to conserve the world's biodiversity. This has come with the development and adoption of the Global Strategy for Plant Conservation, a new and important part of the Convention of Biological Diversity in April, 2002, in which the international botanic garden community has played an extremely important part in creating.

The ultimate and long-term objective of the Global Strategy for Plant Conservation is to halt the current and continuing loss of plant diversity. The Strategy will provide a framework to facilitate harmony between existing initiatives aimed at plant conservation, to identify gaps where new initiatives are required, and to promote mobilization of the necessary resources. It will also provide a tool to enhance the ecosystem approach to the conservation and sustainable use of biodiversity and focus on the vital role of plants in the structure and functioning of ecological systems and assure provision of the goods and services such systems provide.

An extremely important aspect of this Strategy is that it provides a pilot exercise under the Convention for the setting of targets that relate to the ultimate objectives of the Convention. Previously there has been a great reluctance to develop measurable outcome targets for the work of the Convention, so that national sovereignty was not seen to be threatened by international level decisions. But in the case of the plant conservation strategy it was felt that there must be a means of measuring and promoting swift action to ensure its success.

Many of the goals that have been set by the Global Strategy are relevant to botanic gardens. They include:

* A widely accessible working list of known plant species, as a step towards a complete world flora;
* A preliminary assessment of the conservation status of all known plant species, at national, regional and international levels;
* Development of models with protocols for plant conservation and sustainable use, based on research and practical experience;
* 60 per cent of threatened plant species in accessible ex situ collections, preferably in the country of origin, and 10 per cent of them included in recovery and restoration programmes;
* Management plans in place for at least 100 major alien species that threaten plants, plant communities and associated habitats and ecosystems;
* No species of wild flora endangered by international trade;
* The decline of plant resources, and associated indigenous and local knowledge, innovations and practices that support sustainable livelihoods, local food security and health care, halted;
* The importance of plant diversity and the need for its conservation incorporated into communication, educational and public-awareness programmes;
* Networks for plant conservation activities established or strengthened at national, regional and international levels.

A major outcome from the Investing in Nature Programme is that botanic gardens are recognized as an essential part of the Global Plant Conservation Strategy and play their role effectively. Indeed, this has already been achieved with the inclusion of the International Agenda as an important component of the Strategy and BGCI's on-going involvement in assisting the implementation of the Strategy. In February 2003 BGCI and the CBD Secretariat signed an agreement whereby BGCI will assist in co ordinating and supporting the development and implementation of the Strategy.

BEYOUND THE GLOBAL STRATEGY

The future that faces botanic gardens is perhaps one that also faces zoological gardens and natural history museums throughout the world. In several cases the latter two are already addressing the challenge, which is the integration of the various aspects of the environment so that it can be more appropriately displayed and interpreted in a holistic fashion. The name that has been coined for such institutions is the 'biopark' which is a combination of the botanical, zoological, geological and anthropological aspects of our environment. The Sonora Arizona Desert Museum in the USA and more recently the Alice Springs Desert Park in Australia have gone a long way towards portraying the natural environment in their immediate localities in its entirety. For the botanical aspect of any such organization, there is of course the challenge of ensuring that it maintains the same level of significance as the animals. Despite this, there must come an acceptance that plants nor animals nor people live in isolation from each other, and in the same way as the national parks hold a complete sample of the environment in situ, so the biopark of the future will view it similarly *ex-situ* and will further assist people to develop a greater appreciation of why both biological and cultural diversity is so vital.

However, there are a few steps to be taken before the biopark ideal is realised, and the Global Strategy for Plant Conservation is the major issue on which botanic gardens must currently focus. While as public facilities our recreation role is important, we must as botanic gardens also meet the education and conservation roles that are now viewed as such vital aspects. It is not in the interest of any of us for botanic gardens to become, like museums, the last places on earth that people can view what once was.

Clearly the new Global Strategy for Plant Conservation lays down a challenge and task for us over the coming years. We have no doubt that botanic gardens will be amongst the leaders in helping to achieve many of its targets. Let us keep in our minds therefore through this conference the need for a target driven approach to our work in the future. What do we want to achieve over the coming years up to 2010? How can botanic gardens in Southeast Asia help to deliver the Global Strategy for Plant Conservation and its targets? What roles are our national governments in Southeast Asia expecting from botanic gardens and what can be delivered? How can we measure our achievements and so be sure that we are really bringing about change?

Never before have botanic gardens received such high international recognition of their roles as they enjoy today. Let us work together to achieve our potential and to justify the trust that has been placed in us by the world community.

This meeting will provide a new starting point for Southeast Asian botanic gardens to work in a co-operative way among themselves, with BGCI and with other gardens in the region to assist in the effective conservation of your botanical heritage. We look forward to working with you to further a close partnership to help ensure that botanic gardens throughout Southeast Asia are strengthened and developed to face the increasingly challenging tasks that face us all - to protect the biodiversity that is essential to our existence and for the use of future generations.

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