

Gardenwise

THE NEWSLETTER OF THE SINGAPORE BOTANIC GARDENS VOLUME XXI, JULY 2003 ISSN 12-1688



Message from the Director

The tourism industry in Singapore has been given multiple blows. It started with the haze problem in the second half of 1997 and the Asian economic downturn of 1997/98, the 2001 September 11 Twin Tower blast, the Bali bombs in October 2002 and the Iraq war in March 2003 followed immediately by the Severe Acute Respiratory Syndrome (SARS) outbreak. These all but knocked the bottom off the industry.

The worst blow to tourist arrivals was caused by the SARS scare. Arrivals to Singapore for April, May and the first half of June 2003 compared to the same periods the previous year, dropped 67%, 70% and 56%, respectively. Tourist numbers to the Gardens declined in tandem, directly affecting receipts of the National Orchid Garden, our only charged attraction.

Amidst this gloom, the Gardens' popularity continues to grow with increasing numbers of locals putting the Gardens on their social map. While our visitor

counters may give overall numbers, the best evidence is the strain and emotions displayed at our congested car parks during peak hours of the day and during weekends.

Economic downturn, while it appears to bring more locals to parks unfortunately translates into reduced spending, lower international visitor numbers and poorer overall business for our concessionaires. We were obliged to give rental rebates to help them over this difficult period. Overall, the Gardens' income declined.

In contrast to reduced revenue, efficiency and productivity increased. The "Year in Focus" section of this newsletter illustrates this achievement. There

were more tours, exhibitions and other events; educational outreach provided programmes for a record 8,442 participants and our publications continue to grow. The Gardens' redevelopment, separately funded from capital grants, also proceeded full steam. New horticultural, botanical and garden displays continue to be added. The Ginger Garden completed in mid 2001 is now fully matured adding colour and spice.

In the past year, the reconfiguration of Symphony Lake and improvements to the surrounding landscape were completed. The Lake now has a larger storage capacity with cleaner water. A marsh garden complete with waterlilies and lotus was added and the surrounding landscape made greatly more attractive. The new shelter built over the water at the marsh garden provides a grand new vista for our visitors. The Lake is now a popular destination for many visitors.

At the southern end of the Gardens (Tanglin Core), the Frangipani collection has been consolidated and added to. Elsewhere in this Core our major redevelopment continues on schedule. The required facilities and amenities are all being carefully designed around large trees which will be integrated into the landscape. Outdoor spaces and views will give prominence and take advantage of these magnificent trees. In March, the diversion of Cluny Road, which now takes a slight curve away from the Gardens, was completed.

In a restructuring, the School of Horticulture was reorganised into the Training and Certification Branch of the Gardens with the implementation of the National Skills Recognition System (NSRS) its main focus.

New activities, the additional intensified landscapes and new plant displays, however, mean additional operating costs, a trend certainly inconsistent with declining income.

The Gardens must address these issues by looking at all possible options. It will identify and develop new revenue streams and it will have to expand its strategic and collaborative partnerships with friends, volunteers, community and corporations.

Chin See Chung

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A peach-blossomed *Hedyclium* in the Ginger Garden
Photo by:
Ian Turner

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Year in FOCUS

Research Projects

The Diversity and Conservation of the Singapore Flora

Ruth Kiew, Samsuri Ahmad, Gwee Aik Teck & Paul KF Leong in collaboration with staff from Biodiversity Centre and Pulau Ubin

Changes in land use in Singapore are continual and often rapid so it is necessary for the Singapore Herbarium to monitor changes in the Singapore flora. To this end, all specimens collected in Singapore (about 30,000 specimens) are databased using the BRAHMS (Botanical Research and Herbarium Management Systems) software. This provides an historic record from the earliest collections in the 1870s until present.

The Herbarium also runs a collecting programme for nature areas to ensure there are recent representative collections. A survey of Pulau Tekong has been completed and one of Chek Jawa, Pulau Ubin, is currently underway. It is surprising that new species records are regularly being added to the flora of Singapore illustrating that even in a small island the flora is still not completely known.

Because we can now sort data by locality, species and date, we can identify localities that are particularly biodiverse and can produce species lists for any locality. For species, we can identify those that are rare (very few collections) or are endangered either because there are no recent collections or the locality where they grew is being degraded. This enables conservation action to be taken.

Plant Diversity Research – the Type Project

Ruth Kiew & Gwee Aik Teck

The Singapore Herbarium holds a historic collection of local, regional and international importance. The collection includes a large number of type specimens. Types are an essential element in biodiversity research. It is therefore important to make them as widely available as possible. To this

end the Singapore Herbarium is carrying out a project to verify the type status of the specimens (which involves researching into the literature), databasing them, and then making a digital image, which will be posted on the Web. It not only makes the types available but also provides a visual record which can serve as a backup should the specimen be damaged or destroyed.

The project has the added advantage that, because in most cases the digital image is sufficient to examine the characters required, it will reduce the need to send types specimens on loan by post during which they may be damaged or lost.

A grant of S\$82,000 was received from the ASEAN Regional Centre for Biodiversity Conservation for this project.

The Usun Apau Expedition, Sarawak, Borneo

Ruth Kiew & Paul KF Leong

This expedition, organised by the Sarawak Forestry Department for the Tree Flora of Sabah and Sarawak project, carried out a basic plant inventory of the proposed Usun Apau State Park. The area has not been botanically explored before. The area of the Park includes the headwaters of three major rivers including the Sungai Rajang, the largest river in Malaysia, as well as the Julang Fall, the highest waterfall in Malaysia. The proposed park covers several forest types, such as lowland and hill mixed dipterocarp forests and *kerapah* and *kerangas* forests. Our focus of collection was on herbaceous plants.

Monograph of the Begonias of Peninsular Malaysia

Ruth Kiew

Field work continued on this project and has resulted in the rediscovery of several more species that had not been recollected for between 80 to 120 years, the discovery of two new species, besides providing

material to solve problems of variation and species limits in poorly known species.

The Herbaceous Flora of the Kuching Limestone, Sarawak

Ruth Kiew in collaboration with the botany staff of Sarawak Biodiversity Centre, Kuching, Malaysia.

This project continued into its second year seeing the field survey of the 20 hills in the area completed. The work now involves the identification of specimens collected, the assessment of conservation status of individual species and individual hills with a view to writing the final report and scientific papers.

The Biosystematics of Species and Sections of the Banana, *Musa*

Ruth Kiew and Oon Set in collaboration with Carole Wong and Gan Yik Yuen, National Institute of Education, Nanyang Technological University and George Argent, Royal Botanic Garden Edinburgh, U.K.

Amplified Fragment Length Polymorphism (AFLP) has proved an effective method for assessing the genotype of subspecies, species and sections in the banana genus, *Musa*. Research in the past year concentrated on subspecies of *M. acuminata* in New Guinea, the placement of enigmatic species into sections, and a reassessment of the five sections resulted in the recognition of only three.

In Vitro Multiplication of *Alocasia melo*

Lim-Ho Choo Len, Jassy Phua, Andrea Kee, Ruth Kiew

In 2000, a plant of *Alocasia melo* was collected from the forest of Sabah during a field trip. *Alocasia melo* is a relatively rare plant, and this turned out to be the only living specimen available in Singapore. It has a slow growth rate. After one year, the plant grew a young shoot, and this young shoot was used for an attempt at tissue culture, in the hope of producing a good stock of this attractive rare plant.



Multiple shoots formed from axillary buds of *Alocasia meib.*

Jenny Phang



Tissue-cultured plants of *Alocasia meib.* potted out in the open.

Jenny Phang

From the young shoot, two single nodes each bearing a bud and a stem apice about 5 mm in length were excised and cultured in full strength Murashige and Skoog (MS) media supplemented with benzylaminopurine (BAP) and indole-acetic-acid (IAA).

After 20 days, multiple shoots formed from the stem apice culture. (No growth was observed from the nodes.) The shoots formed directly on the base of the stem apice with no prior formation of callus. These shoots were divided and used as explants for multiplication subculture. Such subculturing can be repeated as often as required to achieve the production target. Larger shoots with roots were selected for planting out.

Genetic Variability in the Coat Protein Genes of Two Orchid Viruses: *Cymbidium* Mosaic Virus and *Odontoglossum* Ringspot Virus

Ltm-Ho-Chee Len and Woon-Mui Hwang in collaboration with P.A. Ajikumar, CS Loh, S.M. Wong, Department of Biological Sciences, National University of Singapore, K.H. Rye, Plant Virus Genbank, Department of Horticultural Science, Seoul Women's University, Seoul,

Korea and C.A. Chang, Taiwan Agricultural Research Institute, Wafeng, Taichung, Taiwan

The variability in coat protein gene sequences of *Cymbidium* mosaic virus (CymMV) and *Odontoglossum* ringspot virus (ORSV) that naturally infect orchids worldwide was investigated. Samples were collected from Korea, Singapore and Taiwan. The sequence data were compared with available published coat protein gene sequences of CymMV and ORSV, including those from Japan and Thailand. Among CymMV isolates, the homology was 89.1% - 99.7% and 93.2% - 100% at the nucleotide and amino acid levels, respectively. No particular region of variability could be defined in either of the viruses. In deduced amino-acid sequence, the N-terminal was more conserved than the C-terminal in both CymMV and ORSV. By comparing all sequences determined in this study and those that are published in the GenBank databases, we did not find clustering based on geographical distribution or sequence identity. Such high sequence conservation suggests that both CymMV and ORSV coat protein genes are suitable candidates to provide resistance to orchids cultivated in different geographical locations.

Orchid Hybrid Research

Yam Tim Wing and Aung Thame

We flowered many interesting orchid hybrids during 2002 with some of them named after visiting dignitaries. Three notable examples are *Kagawara* Megawati Soekarnoputri, named after President Megawati Soekarnoputri of Indonesia. *Vanda* Nambaryn Enkhbayar 'Tsolmon', named after Madam Onon Tsolmon, the wife of HE Nambaryn Enkhbayar, Prime Minister of Mongolia and *Dendrobium* Mari Alkatiri, named after His Excellency, Dr Mari Alkatiri, Prime Minister of the Democratic Republic of Timor-Leste.

We continue our efforts to producing tetraploid orchid hybrids. Two more hybrids flowered for the first time. The plants produce stronger inflorescences that have more lasting and bigger flowers, and appear to be superior in all other ways to their diploid counterparts.

Orchid Cryo-Seed Bank

Yam Tim Wing and Aung Thame

More than 90% of the native orchids in

Singapore are either endangered, vulnerable, rare or extinct. In 2002, we purchased a liquid nitrogen tank to begin our Orchid Cryo-Seed Bank Project. When plant tissues are stored at ultra-low temperatures, such as that of liquid nitrogen (-196°C), metabolism is effectively stopped and cells are preserved without deterioration until such time as they are thawed for use. During the last 18 months, we carried out a series of experiments to investigate the optimal conditions for storing seeds of some native orchids. The experiments were carried out by several school students from the Science Research Programme (SRP) and Science Mentorship Programme (SMP) under our supervision. Both of these programmes are conducted in collaboration with the Gifted Education Branch of the Ministry of Education.

We are happy to report that seeds of four native species have been successfully stored, including those of *Dendrobium anosmum* gathered from plants growing in the Gardens. This species is now extinct in the wild in Singapore. Experiments are underway to fine tune the storage procedure and see if we could apply the technique to store seeds of other species and hybrid orchids.


Revision of the orchid genus *Bulbophyllum*

J.J. Vermeulen

Revision of *Bulbophyllum* sect. *Sestochilus* is in progress. This section includes a series of large-flowered species that are popular with orchid amateurs, such as *B. lobbiai*, *B. uniflorum* and *B. virescens*. Quite coincidentally, all these species display extensive variability. This variability will be studied and translated into taxonomic decisions. Nevertheless, the publication of the revision is expected in the year 2004. After this, a revision of a large group of assumedly related sections (sect. *Leptopus*) is planned.

The Phylogenetic Structure of the Orchid Genus *Bulbophyllum*

J.J. Vermeulen in collaboration with B. Groenendael, Leiden Branch, National Herbarium of the Netherlands

The aim of this project is to unravel the phylogeny of this genus using molecular techniques. During the year 2002, more samples have been gathered. The first results are expected in the year 2003. 

Developments

The programme of developments in the Gardens has been going full swing over the past year. Visitors have gotten use to quite large parts of the Gardens becoming inaccessible behind hoardings. These temporary reductions in space and some facilities are the price we all have to pay for new attractions and improved amenities.

The major project that was completed in the past year was the reconfiguration of Symphony Lake. The old lake, with its concrete edge and two little islands, was rapidly silted up. In order to improve the landscape and provide a supply of high-quality water for our irrigation needs, it was decided to deepen the lake and soften part of the edge with a marsh garden. The lake was drained and hundreds of lorry loads of mud and silt were removed. The construction work was completed at the end of 2002, and the heavy rains soon filled the lake. Instead of an overflow pipe, the lake drains into a stone-lined channel giving the effect of a rocky stream. A wooden shelter built over the water provides fine views across the lake. Water lilies and lotus have established fast and are now blooming freely. The lake that was formerly rather ignored by visitors is now a favoured route for morning or evening walks for many of our regulars.



View across Symphony Lake from the new shelter.



The marsh garden edging Symphony Lake with new shelter visible behind.



Amazon waterlilies (*Victoria* 'Longwood Hybrid') growing in front of the Shaw Foundation Symphony Stage.

The biggest on-going project in the Gardens is the redevelopment of the Tanglin Core complex which includes the Main Gate area and the diversion of Cluny Road. In March 2003, the road diversion was completed, and now traffic is flowing across the area formerly occupied by the Taman Serasi Food Centre and car park. NParks went to considerable expense and effort to save a row of mature angsa trees that grew at the back of the old car park. As the new road level is several metres higher than the car park, the trees had to be protected from burial under the backfilling on site. Concrete retaining walls were built around the trees and grated air wells have been provided for six trees. These are now the centrepiece of the roadside planting for the new Cluny Road on the Taman Serasi side.

Work within the Gardens for this project has completed the destruction phase, with demolition of the old herbarium and library block complete. The construction phase will soon begin with excavation for the large underground car park beneath the new buildings. Much effort is being put in to constructing the complex without effecting the large trees on site, notably the huge Birtangor Laut (*Calophyllum inophyllum*).

The Evolution Garden is located behind the National Parks Board Headquarters building. Works commenced in September 2002 and considerable effort and a lot of soil have gone in to recontouring the site. The planting of some zones of the garden began recently with large cycads and granite boulders being lifted in to position under the direction of Mr Jun-ichi Inada, the landscape architect for the project. Completion is anticipated for the beginning of 2004.



The overflow stream for the reconfigured Symphony Lake.



Roadside planting at the newly diverted Cluny Road. The large angsa trees (*Pterocarpus indicus*) have been preserved by constructing air wells around their bases.




The relocated and renovated gazebo on Lawn H.

Following the successful renovation and relocation of the gazebo to Swan Lake, the large gazebo on Lawn H was moved from obscurity to a prominent position commanding views over the lake. The structure was improved by adding a new copper roof. The origins of this shelter are not clear. Possibly it is the Tea Kiosk mentioned in some of the pre-war Annual Reports. It looks old enough to date from the 1920s or 30s.

In the year ahead development work will continue at a fast pace. The Children's Garden has reached the detailed planning stage and work is scheduled to begin in the middle of 2004. A site has been identified on land adjacent to the Gardens at the corner of

Bukit Timah Road and the entrance road to the Singapore Management University. Swan Lake will be the second water body to get the desilting treatment. While this lake already has excellent water quality and teems with aquatic life, the silt accumulation has

made the lake very shallow making it easy for rooted waterweeds to proliferate. Desilting will allow more open water, greatly improving the landscape views of the lake. 

Ian Turner
Living Collections

Events

The popular Rainforest Tour, conducted by volunteers, continues to attract over a hundred participants each weekend it is run. Positive press reviews enticed many to leave their couch and to don walking shoes to discover our rainforest. This tour has now expanded to include one conducted in Mandarin as well. A National Orchid Garden Tour, also conducted by volunteers, was started in November 2002. Visitors are brought into the National Orchid Garden to learn more about tropical orchids and enjoy its sweeping floralscape.

The Gardens' revamped Volunteer Programme unveiled in March 2003, saw an expansion of volunteer opportunities. Gardening enthusiasts now have the opportunity to work side-by-side with our horticultural staff to grow and maintain the Gardens' living collection. For those preferring to work in the Herbarium, there are opportunities to repair, mount and database plant specimens. Those keen to learn about plants and botanic garden database management can now assist in the stock-taking of the Gardens' plant inventory and updating our plant database. Guiding opportunities, volunteer patrol and information services are other areas where volunteers can contribute. We look forward to forging an enriching and fulfilling partnership with our volunteers and to building up a dedicated group of supporters.

The Shutterbug Safari in the Gardens, a series of photography walks and talks focused on nature photography, was organised in conjunction with the Nature Photographic Society. The Gardens served as a living classroom as experts led photography enthusiasts in the delightful experience of capturing on film, nature at its candid best.

Our Public Exhibition Programme expanded with the strategic partnership of ExxonMobil Asia Pacific Pte Ltd as a sponsor. Held at the Visitor Centre, the changing exhibition features various nature-themed photographic exhibits ranging from festive offerings such as Christmas and Chinese New Year Plants to Nature Photography. Designed to educate and engage the visitor, the Public Exhibition Programme has received very positive feedback from visitors.



Volunteer Lau Teck Seng introducing the Orchid Garden to a group of enthralled visitors.

The Gardens staged its first Christmas Fiesta on 1 December 2002. The Visitor Centre was decked out with wreaths made from fruits and pine cones picked from the Gardens. Mistletoe (*Viscum album*) was strategically hung at the Visitor Centre entrance and a Douglas Fir Christmas tree took centrestage. Workshops on Christmas Dish Gardening and Christmas Terrariums were organised. Carolling filled the air leading to a festive mood as visitors shopped and feasted at the stalls lining Lower Palm Valley Road.

Several major events were held in the beautiful setting of the Gardens. The (National) Heritage Trees Programme was inaugurated on 23 September 2002 by Minister of State for National Development, Dr Vivian Balakrishnan, on Lawn E against the picturesque backdrop of the majestic Tembusu tree. This programme highlights the historical and cultural importance of trees and identifies individual majestic specimens for conservation. The Gardens is proud to be home to 11 of the 35 Heritage Trees currently identified.


The Singapore Botanic Gardens Calendar 2003 was launched at the Visitor Centre on 25 October 2002 by Mr Lim Boon Heng, Minister (Prime Minister's Office). The 2003 calendar features familiar and well-loved scenes from the Gardens. From the vibrant colourful hues of the National Orchid Garden to evocative Ecolake at dusk and the timeless bandstand, the essence of the Gardens is encapsulated in this calendar.

The National Skills Recognition System for the landscaping and horticultural industry was launched at Corner Green on 28 April 2003 by Associate Professor Koo Tsai Kee, Senior Parliamentary Secretary, Ministry of National

Development and Ministry of Defence. Corner Green was transformed into demonstration grounds for various horticultural and arboricultural skills that included tree climbing, potting and pruning.

The Gardens continued to be the natural amphitheatre of choice for event organisers and concert-goers. Notably, the National Arts Council - Mobile 1 (NAC-M1) World Rhythm Series continued to thrill with stellar performances from Singapore's Tang Quartet with their soothing strains of classical music, exuberating jazz by Jennifer Ryan and Cash Cow from Canada and neo-ethnic world music by Pinkpikan from Philippines.

Key visitors hosted by the Gardens in the year included His Excellency Dr Mari Alkatiri, Prime Minister of the Democratic Republic of Timor Leste, Mdm Onon Tsolmon, wife of His Excellency Nambryn Erkhbayar, Prime Minister of Mongolia, and Mrs Aleksandra Miller, wife of His Excellency Leszek Miller, Prime Minister of the Republic of Poland. These dignitaries toured the National Orchid Garden and a new orchid hybrid was named after each of them. Other notable visitors included Sir Richard Carew Pole, President, Royal Horticultural Society, Madam Li Yongqing, spouse of His Excellency Hu Jintao, Vice President of the People's Republic of China, Madam Zhang Suzhen, wife of the Vice Premier of the People's Republic of China, Mrs Barbara Cimoszewicz, wife of the Polish Foreign Minister, and Dame Mary Richardson, CEO, Hongkong and Shanghai Banking Corporation, UK Education Trust.

Our Prime Minister Mr Goh Chok Tong presented a new orchid hybrid named Kagauszn Megawati Soekarnoputri to the President of Indonesia, Her Excellency Megawati Soekarnoputri, on the occasion of his visit to Indonesia. Another of our new orchid hybrid was also presented by Prime Minister Goh to the City of Nagoya on the occasion of his visit there. The orchid was named *Dendrobium Nagoya Singapore*. 

Camille Foo
Visitor Management & Education



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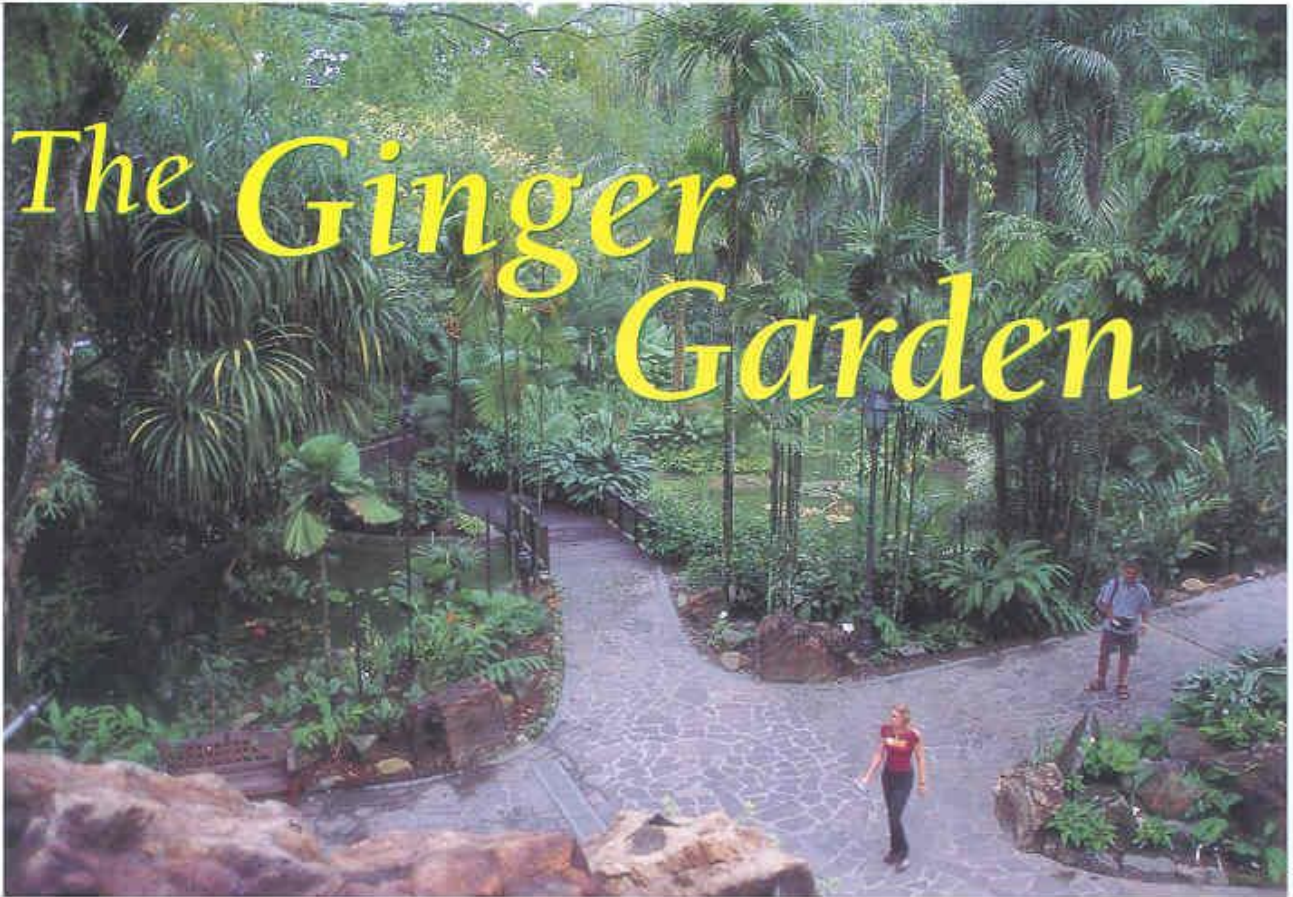
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The Ginger Garden



The Ginger Garden viewed from the top of Waterfall Hill.

Joe Turner



A weeping fig tree (*Ficus celebensis*) is one of many large trees and palms that add grandeur and maturity to the Ginger Garden.

Joe Turner



Some school children enjoying the main waterfall and cave in the Ginger Garden.

Joe Turner

of the old orchid enclosure. Nestled adjacent to the National Orchid Garden, the Ginger Garden comprises about 1 hectare (2.5 acres) and already contains more than 250 species of gingers and their relatives.

In designing the Garden, four main themes were followed throughout:

- **Beauty and aesthetics.** To capture visitors' attention through flowers and foliage as an initial impact.

- **Ethnobotany.** To provide information on the usefulness of gingers, such as foods, spices, medicines, and in jamus.
- **History.** The Botanic Gardens has a rich and important historical connection to this special group of plants through collecting and taxonomic research.
- **Conservation.** Ginger biodiversity and the role that gingers play in the ecology, and their significance in rainforest conservation.

The main entrances to the Ginger Garden are via the Tyersall Avenue Coach drop off

Singapore can now boast a world class Ginger Garden. From an initial concept formed in 1999, three years later we can see a luxurious garden growing in the site



The Information Kiosk with its colourful interpretive panels.



The bamboo ginger (*Costus tenuiphyllus*) with its mottled brown stems and bright red and yellow inflorescences is highly ornamental.



The beehive ginger (*Zingiber spectabile*).

point and via Orchid Plaza. One may also enter via the lawn to the north of Swan Lake or from the Bandstand hill.

In preparation for the major pre-planting works many of the original mature trees and palms were saved. They provided the framework of a canopy, which with significant additions now mimics how many gingers are actually found in nature. A small water pond was greatly expanded to create a double water feature divided by a bridge and containing a wide variety of aquatic plants.

The most prominent feature within the Ginger Garden is Waterfall Hill. This artificial rock massif has three separate

waterfalls, and a walk-through cave behind the main waterfall which provides for great photo opportunities. Waterfall hill conceals an inner sanctum of water storage tanks, pumps and filters. It also provides special planting niches for some of the rarer and more difficult to grow gingers like the epiphytes and rheophytes.

Opposite the main waterfall is the information kiosk which provides informative and educational panels which highlights some of the plants and themes of the Garden. It is a convenient place to pause when the rain pelts down.

The Ginger Garden has been divided into special zones where one may find gingers organised by themes such as beauty or usefulness, or in the biogeographical regions of their origins such as South East Asia, the Americas, Africa, and the Pacific. Descriptive signages have been placed at strategic positions to highlight important aspects of particular plants and their uses.

At the entrance adjacent to Orchid Plaza, two shops have been provided. Ginger Villa is a quality gift shop, and Halia Restaurant (named after *Halia*, the vernacular name for *Zingiber officinale*) provides fine dining and a take-away counter.

Pathways wind through and around the Ginger Garden and visitors who venture off the main central path will find just how rich and diverse these plants are.

Gingers are part of a larger order of plants called the Zingiberales, and the eight families of this order are all represented.

As well as the true gingers they include important plants such as bananas, heliconias, prayer plants, cannas, birds of paradise, spiral gingers and a little known family called the Lowiaceae with vaguely orchid-like flowers.

One of the underlying considerations in plant selection was to represent all of the families in the Zingiberales, as many of the genera as possible, and then important and significant species from each of the different biogeographic regions of the tropics. This design not only captures the range of diversity and form of this group of plants but also adds to the value of the display as an educational and research resource.

The eight families and some of the groups of plants represented follows:

Zingiberaceae, the true gingers.

The signature plant of the Ginger Garden is *kantan* or *Etilingera elatior*. This magnificent plant reaches five metres in height and produces the most spectacular flowers at eye level. Colour forms have been sourced from throughout South East Asia and included various reds, pinks and even pure white. The young inflorescences of *kantan* are utilised in Asian cooking whilst the blooms are popular cut flowers. Other species of *Etilingera* you may see in the garden include the 'tulip' gingers, *Etilingera horaisphaerica*, *E. venusta*, and *E. corneri*. *Etilingera fimbriobracteata*, *E. metrochilus*, and *E. littoralis* all have spectacular flowers at ground level.





The velvet pink banana (*Musa velutina*) has bright pink fruits with a furry skin.

Ken Terence



Variegated canna (*Canna x generalis* 'Striatus').

Alan Clark



Bird of paradise flowers (*Strelitzia reginae*).

Alan Clark

Halia (*Zingiber officinale*) is the most widely used ginger, and provides an important spice, flavouring and medicine. Two distinct forms occur within the garden, *halia padi*, and *halia bara*. Other economic species of *Zingiber* include *lemboyang* (*Zingiber zerumbet*) and *bonglai* (*Zingiber cassumunar*) which are mainly used in traditional medicines, and *Zingiber ottensii* with a distinctly purple rhizome or underground stem. Numerous other species of *Zingiber* make lovely landscape plants, most notably, *Zingiber spectabile*, commonly known as the beehive ginger.

The genus *Curcuma* provides us with turmeric or *kunyit* and is another important genus of useful gingers. This group grows best in the more monsoonal areas of the Asian tropics including Thailand, Burma and Cambodia which have many species, primarily used in medicine. In one species, *Curcuma mangga*, the edible portion tastes like green mangos, hence its latin name. Other curcumas, such as *C. allsmatifolia*, the Siam tulip, are popular cut flowers.

There are approximately 30 genera of Zingiberaceae in the Asian region, some from very localised areas and range from Northern India and China into New Guinea and Australia.

Costaceae, the spiral gingers.

This family contains four genera, *Costus*, *Monocostus* (1 species), *Dimerocostus* and *Tapinochilos*. While predominately a Neotropical and African family, both *Costus* and *Tapinochilos* are found in the Asian and Western Pacific region. *Tapinochilos*, sometimes called wax gingers, occurs mainly on the island of New Guinea, but range from the Solomons and Australia to Sulawesi. *Costus* is the largest genus, of more than 100 species; many of which are grown in the Ginger Garden. Containing some wonderful ornamentals, some *Costus* species also provide food, medicines and beverages.



A kantan (*Edingeria elatior*) inflorescence opening out. This is one of the red forms.

Jo Ann Lee



Two beautiful prayer plants – in the foreground the pink inflorescences of *Calathea leosneri* and behind the exquisitely marked velvety leaves of *Calathea ecuadoriana*.



Orchidantha flowers are hidden down at the base of the leaves.



Heliconia orthotricha one of the more unusual heliconias to be seen in the Ginger Garden.

Musaceae, the banana family.

The banana family contains not only a most prominent food of the tropics, the bananas and plantains, but numerous other species, some of which are highly ornamental, e.g. *Musa coccinea*, *M. velutina*, and *Ensete glaucum*. *Musella lasiocarpa* from Southern China, in particular is highly ornamental with its bright yellow inflorescences. It is also used for stock and as a famine food.

Most visitors from temperate climates will acknowledge just one or two different varieties of edible bananas, yet more than 300 distinct forms exist; from giant starchy plantains (for cooking) to miniature

varieties like *pisang mas* or the 'thousand fingers'.

Cannaceae, the canna family.

The cannas are an attractive group of flowering ornamentals, that are often grown as far away as North America and Europe where hardy varieties can withstand periods of freezing weather by going dormant. Their colourful and large showy blooms alongside their large bold and sometimes coloured leaves can make for a tropical look in most gardens. They are often very tolerant to water and can be used as aquatic or bog plants. One species, *Canna discolor* produces large underground rhizomes which are used as a starchy food, notably in Vietnam and southern China.

Marantaceae, the prayer plant/ arrowroot family.

Plants of this family provide the Ginger Garden with superbly patterned and textured leaves and stunning landscape plants. Many different species of *Calathea* have been planted as understorey bedding plants, and others with their large silver-backed leaves reflect at the edges of the garden pond. *Maranta arundinacea* is the source of arrowroot starch.

Strelitziaceae, the bird of paradise or strelitzia family.

The bird of paradise or strelitzia family is based in Africa and Madagascar with the exception of a giant *Phenakospermum* which occurs in northern South America. One of the most prominent and recognised members of this family is the

so-called 'travellers' palm; (*Ravenala madagascarensis*) with its leaves arranged in one plane. Despite its common name it is not a true palm.

Heliconiaceae, the heliconia family.

The heliconia family represents both the boldness of the bananas in their leaf form, and the beauty of the rainforest by their striking and colourful flowers. From pendant blooms that may reach two metres or more in length to the smaller 'parakeet' type flowers that sit atop the foliage, heliconias invariably captivate not only the birds and butterflies, but humans as well.

Lowiaceae, the orchidanthas.

Orchidanthas represent the smallest Asian family of the Zingiberales. They can provide a surprise for those that make the effort to locate their flowers. Arising at ground level below the leafy foliage, these orchid-like flowers may reach 250 millimetres from tip to tip. While this is a small group of highly specialised plants, researchers have recently discovered new species that have doubled the size of the family. 🌿

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Alan Carle, plant enthusiast, field botanist and grower was the landscape consultant for the Ginger Garden.

Across the Generations: Plant Collectors and their Careers at the Botanic Gardens

Becoming a botanist is not something that can be achieved in a hurry. Skill in identifying plants cannot be learned only from books, but is built up over years of hands-on experience. It takes determination, too, to memorise hundreds of complicated Latin scientific names! A fascinating but little-known part of the Gardens' history is the deep continuities across the generations in several of the families whose members have worked there. Several of them became highly skilled plant collectors who accompanied the Gardens' directors and other international botanists on dozens of botanical expeditions to the Malay Peninsula, Borneo and other parts of South East Asia. Where a child in the family showed promise and inclination, the skills were passed from father to son in long apprenticeships, the individuals concerned often serving the Gardens for decades-long careers. Since several of these older staff members have now reached retirement, this is a fitting moment to honour them by recalling some of their achievements.

While this article was in press, we were saddened by the unexpected news that Encik Mohamad Shah, who was one of those who generously shared his memories to help me write this, had passed away peacefully on 18 June 2003. This piece had been intended not least to celebrate his long record of contributions to the Herbarium, the Gardens and the Board, where he will be greatly missed.

In colonial times, the Botanic Gardens' workers were housed in quarters within the Gardens. These were situated at the northern

end of the Gardens, near the present NParks Headquarters building. Originally, separate quarters were provided for the clerks, foremen, gardeners and 'coolies', reflecting the hierarchical mentality of the British era. The buildings resembled the 'labour lines' that are still the standard accommodation for estate workers in Malaysia. They were made up of a line of ten family apartments, each consisting of a single room with a front 'hall' and verandah, with shared bathing facilities at the rear. The families also added their own structures behind to provide space for cooking. The quarters had their own *sarau* (or prayer room) to serve the Muslim families in the community. This became a focal point on festival days, and was where the children learned to read the Quran. One very practical reason for occupational continuity among the families working in the Gardens was that without it, they would have lost the housing. Before independence, and the rapid development of Singapore's economy, job opportunities were much more limited, so work at the Gardens represented a secure and specialised economic niche. The Quarters were ultimately demolished in 1979, at which time their occupants moved into Housing Development Board flats.

Encik Mohamad Shah began his career in the Gardens in 1955, at the age of 20. His father, Haji Mohamad Nur bin Mohamad Gous, was himself a highly skilled plant collector who had started work as a Label Printer in 1911, at the age of 12 or 13. He eventually became Herbarium and Museum Assistant, gaining experience on many plant-collecting expeditions, and was so good at finding new species that he had five of them named in his honour. He encouraged his son to pursue the same career, and in 1958, when his father passed away, Mohamad Shah took over his post as Herbarium Assistant. When he started out, Mohamad Shah recalls, J.W. Purseglove (Director, 1954-1957) encouraged him to go around the Gardens collecting small specimens of different groups of plants starting with humble grasses and ferns, and learning their names. He accompanied Purseglove on a botanical expedition to Sarawak. The next Director, H.M. Burkill

(1957-69) sent him out on expeditions alone, first to Malacca, and then to other destinations in Malaysia, to help him gain experience. 'I went by train, by taxi, all sorts of transport... I would collect about 30-40 specimens in one day'. In the course of his career, he took part in nearly fifty expeditions to the Malay Peninsula, Sabah and Sarawak, as well as collecting locally in Singapore. 'My father taught me always to bring a mosquito net, because it can protect you against centipedes and scorpions, even snakes. One night on Gunung Tahan (in Pahang), about nine or ten o'clock, I was lying under my net and I saw a very big cobra going up and over the top of the net. One of the porters got a pangolin, but I told him not to kill it. Because the second thing my father taught me about the jungle was never to kill any animals. Sometimes I met some very big snakes in the daytime, but I would just tell them in my heart, 'I am not going to disturb you', and they would go away. On Gunung Rabung, in Kelantan, there were tigers; we met a very big one, but the *kampung* people assured us they were not man-eaters and had never hurt anybody.'

In 1961, Mohamad Shah took part in the Royal Society expedition to Mount Kinabalu, led by E. J. H. Corner, spending six months continuously on the mountain. About 15 botanists and zoologists took part in this



Mohamad Shah sorting specimens in the Herbarium. (April 2003).



Samsuri Ahmad on a collecting trip to a mangrove forest, a vegetation type in which he has a particular interest. He is seen here on a recent trip to Pulau Ubin amongst the the roots of *Rhizophora apiculata*. (February 2003).

Growing up in the Gardens

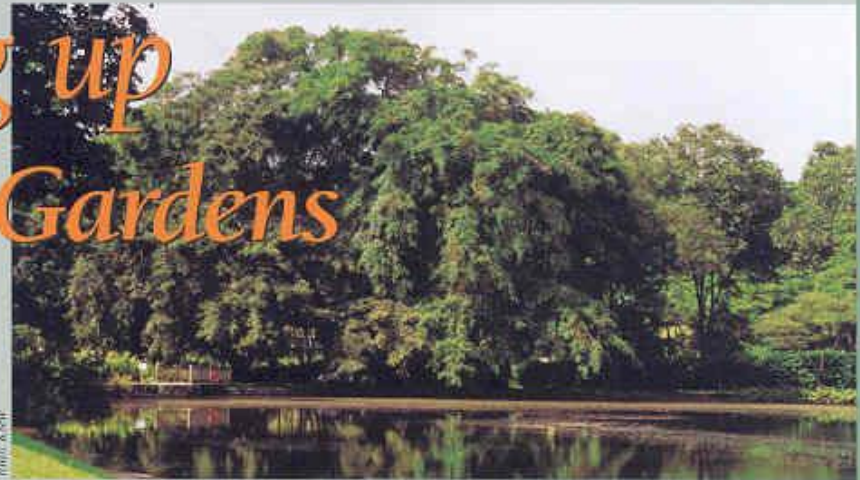
Growing up in the Gardens provided a unique place to play. Although playing football on the lawns was out of the question, there were plenty of other opportunities for active boys. Just outside the staff quarters located behind Corner House on what is now called Corner Green is a handsome *jejawi* fig whose lower branches were bendy and afforded hours of fun for exuberant boys to bounce on. There was quite a gang of boys who lived in the quarters in those days (1950s), Mohd Shah bin Mohd Noor, Samsuri bin Ahmad, Sidek bin Kiah, Kadim bin Tassim and Mahmud bin Awang all of whom followed in their father's footsteps and went on to work for the Gardens.



The jejawi fig, *Ficus microcarpa*.

More daringly, they could play at being Tarzan by using the dangling aerial roots from a low branch of the Burmese fig that grew over Swan Lake. The thin wiry roots are surprisingly strong and easily bore the weight of the small boys, who could hold tight and swing out over the lake, let go and enjoy a big splash, only to scramble out and repeat the process again!

The wild mangosteen in Palm Valley



The Burmese fig, *Ficus kuzchi*.



Mohd Shah with the aerial roots.



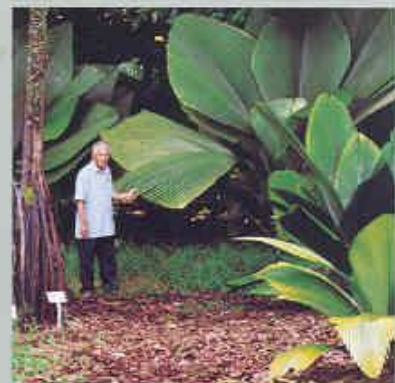
Wild mangosteen, *Garcinia dulcis*.

provided a climbing frame, its ladder-like branches inviting the boys to climb it. Mohd Shah remembers that its mangosteen-like fruits were not at all sweet. Today its lower branches have been neatly pruned.

Then as now, the low branch of the tembusu tree featured on the five-dollar currency note was a favourite tree to climb, sit and walk on.

Mohd Shah and Samsuri, who grew up to become veteran plant collectors in the Herbarium, have left a living legacy in the Gardens in the form of the grove of umbrella leaf palms. Mohd Shah vividly remembers collecting about 200 fruits on a field trip to the Seruntum Forest Reserve, Pahang, in 1975. In those days, the umbrella leaf palm, remarkable for its large undivided diamond-shaped leaves, was extremely rare in cultivation.

Ruth Kiew
Herbarium



The umbrella leaf palm, *Johannesteijsmannia altifrons*.

expedition. They came from Britain and Malaya, from Sabah (then still known as British North Borneo) and Sarawak, and from the Herbarium Bogoriense at Bogor, Java. 'All the equipment and food was provided by the Royal Society ... We hired about 60 porters to carry everything, including presses and poisons for preparing the specimens. We had to make a very big bonfire every day for drying the specimens. They are dried on a rack, and every half hour or so we have to check whether the specimens are dry or not ... We were collecting 80-100 specimens per day. We established four or five camps; our highest camp was at 10-11,000 feet, and there we felt short of breath because of the altitude. It was very cool at night. We didn't take a bath for two or three months; the water was too cold, even the cooking oil was frozen solid!'

Encik Samsuri bin Ahmad learned from his father, who worked as a gardener. His parents originally came to Singapore from Semarang, Java, in the 1930s. Slowly and patiently he began to memorize plant names; and eventually became extremely proficient at plant identification. From 1952 he worked in the Herbarium, and at the young age of 16, when his father passed away, Samsuri took over his post. He later worked at the National University of Singapore's Botany Dept for some years. Having retired from there in 1996, he agreed to resume work at the Herbarium, in order to assist the training of younger staff members in plant identification. He too has been on many collecting expeditions. Still vigorous at the age of 66, until his second retirement this year he continued to make weekly collecting trips to forest areas of Singapore. He can name any local plant with ease, and has a particular interest in mangrove species. On a recent trip to Pulau Ubin, I watched him collect and identify samples of more than a dozen different mangroves in a matter of minutes.



Encik Kiah bin Haji Mohamed Salleh on Mount Kinabalu at 11,000 feet, photographed by Eric Holttum in November 1931. *Gardens' Bulletin Singapore* 35 (1982) 228.



Sariyah bte Zelani at work in the Herbarium from *Visions of Delight*, 1989.

Encik Sidek Kiah is still another person who had a long career at the Gardens. Starting as a labourer in 1950, he moved to the Herbarium in 1966, and worked there until his retirement in 1987. He took part in a number of botanical expeditions, including another one to Mount Kinabalu, with Mr Alfonso, in 1966. After leaving the Gardens, he moved on to work for a private nursery; and later for a pharmaceutical research company, the Centre for Natural Product Research, which was formerly part of the National University of Singapore's Institute of Molecular and Cellular Biology. He, too, was following in the footsteps of his father, Encik Kiah bin Haji Mohamed Salleh, who worked for the Gardens as a plant collector from 1920 until 1957. When Encik Kiah passed away in 1982, Eric Holttum (Director of the Gardens, 1925-49) published an obituary in the *Gardens' Bulletin*, praising him as 'a very observant collector' with 'a very wide knowledge of local plants'; indeed, three newly recorded species of palm were named after him. Recalling the many expeditions they had been on together, he wrote: 'Kiah was an excellent colleague, always at hand when needed. He was an expert in drying specimens over an open fire without burning them, often under trying conditions. He had a very even temperament and I never saw him put out by trying circumstances.'


Two generations ago, many Singapore parents saw little point in educating their daughters, and it was more difficult for women to have careers. So perhaps it is not surprising that the women of these botanically inclined families apparently were not being recruited as potential plant collectors. None the less, many of them, too, have contributed their skills to the gardens in different capacities. Puan Sariyah binte Zelani was born in 1940. Her father started work in the gardens as a driver and orchid gardener when he was 12 years old, and her mother did housework for



Juriah bte Sabudin with her mother, Rutiah bte Sukarman. (April 2003).

the Directors. She has pleasant memories of her childhood years in the gardens. After her marriage she too worked here, first tending cacti, then flowering plants, and later in plant sales, and the supply of decorative plants for official functions. She then worked in the Herbarium for fifteen years, from 1988 until her retirement this year. Her grandfather, uncle, three of her siblings, and a brother-in-law have all been employed in the Gardens at different times.

Puan Juriah binte Sabudin was born in the Gardens Quarters in 1958, and many of her family have also worked here. Her mother, Puan Rutiah binte Sukarman, now retired, worked for many years in the Herbarium, as did her great-uncle, Juralmi Samsuri, who was a talented flower painter. These days, Puan Juriah is busy with the painstaking task of computerising the Herbarium collections.

Between them, all of these families have become a great repository of accumulated botanical knowledge, and have contributed tremendously to the ongoing research work of the Herbarium, which as readers will be aware, is an internationally important botanical centre. It will be a long time before a new generation can rival their expertise. They have maintained a tradition, across the generations, which we might trace back to Henry Ridley's own Javanese plant collector, Encik Ahmad bin Hassan, who was known as a walking dictionary of plants and whose skills in locating unusual forest species was legendary! 

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¹ Like Ridley himself, Encik Ahmad lived to be a hundred, and his descendants are still living in Singapore. In fact, if any readers can put the author of this piece in touch with them, I should be happy to hear from them, in the hope of gathering a little more of this history. I can be contacted at socroxan@nus.edu.sg or tel: 68743723.

Casting Light on the History of the Sundial Garden

The Sundial Garden of the Singapore Botanic Gardens is a unique place. Enclosed yet open to the sky, its rectangular form sets it apart from the rest of the Gardens' meandering and circular landscapes. Visitors to the Sundial Garden are drawn in particular to the old sundial itself at its centre. There, a simple apparatus sits atop an aged pedestal upon whose crudely painted relief figures and mystical quote, *What thou seekest is a shadow*, stand in contrast to the Gardens' more contemporary sculptures that are scattered across the rest of the grounds.

Curious about the origins of this weathered sundial, I asked Dr. Ruth Kiew of the Botanic Gardens Library and Herbarium about its history. Dr. Kiew combed through the Gardens' archival material for an answer, and found a reference to the sundial's creation in the *Annual Report* of 1929. The following entry was made by R. Eric Holtum, the Director of the Botanic

Gardens at that time:

The lower terrace on the southern side of the hill was returfed and laid out with paved walks at right angles across it. At the intersection of the walks a hemispherical sundial was erected; the sundial pedestal was designed and modeled by Mrs. Holtum, and cast in concrete by the bricklayer employed in the Gardens. Steps were made leading from the terrace to the lawn below, giving easy access to the Main Gate Road and lake.

Thus it was the late Ursula Holtum, wife of Eric Holtum, who designed the sundial, and an unknown Botanic Gardens bricklayer who cast it.

To further pursue information about the sundial, Dr. Kiew wrote to Ursula Holtum's daughter Deborah Holtum in England about the sundial and received a letter from her in reply with some accompanying photos:

My mother, Ursula Holtum, attended Goldsmiths School of Art, in London, in her student days. She would have studied the great masters of classical art and design. Her main study was in sculpture, modelling clay figures and busts, from life classes; learning mould making, and casting from her work. She also made numerous plaques in bas relief - like the sundial in the Gardens.

Dr. Kiew was also able to obtain some shots of the Sundial Garden dating from the late 1950s and 1960s from the Burkill Collection. Together, these photos permit a comparison of the sundial and its garden across time.



The Sundial Garden in the Botanic Gardens.



Ursula Holtum.

Eric Holtum, 1929



The artist at work.

Eric Holtum, 1929



Eric Hobson, 1929

Note the detailing of the fingers and toes on the hands and feet of the unpainted figure of Father Time.



Eric Hobson, 1929

In one of the earliest available photos of the sundial, the wording on the pedestal has either not yet been carved, or is not visible.



Eric Hobson, 1929

The Sundial Garden in 1929.



Barrett Collection, 1968

The Sundial Garden in 1968.



Maurice Kellan, 2002

Today, the only detailing still visible on this same figure is on the section of the beard where the paint has chipped off. The visible layers of paint indicate that various colour combinations have been used on the base over time.

Whereas the charm of the sundial today lies in its weathered condition and crudely fashioned figures, photos taken around the time the sundial was first put up in the late 1920s reveal a very different impression.

If we step back from the sundial and focus on changes to the garden as a whole, we can see that its layout has remained the same, but the accents and textures have changed over time.



Barrett Collection, 1988

However, a later photo shows the "What thou seekest" lettering in black, while the figures themselves are still unpainted and clearly detailed.



Eric Anderson, 1979

In this early photo of the Sundial Garden, large trees around its perimeter cast long shadows across its neatly squared lawns.

The Sundial Garden looked almost the same between the time it was first laid out and some 40 years later.

Major changes were introduced sometime in the 1970s or early 1980s when the Sundial Garden lawns were dug up and replaced by four brick-sided lily ponds. The time-oriented theme of the area was enhanced when a large Seiko Clock was installed on a nearby grassy slope in 1982. A photo from Bonnie Tinsley's book *Visions of Delight* (1989) gives a bird's eye view of the entire layout. The Sundial Garden and its lily ponds sit next to the Seiko Clock hillside on which a sunburst design is visible, made up of orange-flowered hedges extending outwards from the clock. The complementary landscaping of that time nicely symbolised both time and the sun.

Today the sundial and its garden share a kind of well-worn tranquility, as conveyed by one visitor to the Garden who wrote the following in his internet travel journal in 1997:

One of our favourite parts of the garden is a section of formal water lily beds, laid out around an old sundial on a pedestal. Around this carved base are the words, "What thou seekest is but a shadow." How truly foolish to try to determine the time of day in such a beautiful setting! Let the shadows drift past as they will.
(Matt Donath, Singapore Journal Part 2)

Steady through all these changes, the sundial apparatus itself has remained intact and continues to perform its mission of telling time. Two bisecting metal crescents make up the main part of the apparatus. A



Burial, Colburn, 1968

The sundial apparatus in 1968 was a free-standing affair with multi-lingual plaques that admonished visitors, "Do not touch."

thin metal rod inserted through the top of one of the crescents casts a shadow upon the base of the other crescent, upon which are carved numbers representing the time of day. The shadow cast by the rod upon the number indicates the time.



Kay Mohlman, 2002

A place for reflection.

Today the metal crescents have two metal crutches as additional supports, and the plaques are gone.

While much of the Sundial Garden's development can be traced through old photos, a few aspects of the sundial remain a mystery. One is the identity of some of the carved figures on its base. Two figures can almost certainly be said to represent Father Time and Death, but the identities of a mysterious robed woman and a turbaned male figure holding a candle or lantern, remain a puzzle.

A further mystery is the source of the sundial's evocative quote, *What thou seekest is a shadow*. Neither a classics scholar, nor a specialist in English literature, nor various sundial enthusiasts whom Dr. Kiew and I contacted about the quote could verify its origins. One contemporary artist whom we queried suggested that the words might have come from Ursula Holtum herself. Perhaps the pedestal's inscription is simply an



Marian Kiefer, 2002

Death.



Marian Kiefer, 2002

The robed woman.



Marian Kiefer, 2002

The turbaned man.

elegantly phrased instruction for reading time on the sundial.

We invite any readers who may have further insights on either the identity of the sundial figures, or the source of the quote, to get in touch.

The Sundial Garden continues to charm visitors as it approaches its 75th year. Perhaps it is now worth considering whether some form of public recognition could finally be given to its designer, Ursula Holtum, and to the unknown bricklayer who did the concrete casting. Sadly, it appears that much of Ursula Holtum's artistic legacy during her years in Singapore has been subjected to the ravages of time and history, according to Deborah Holtum, who notes:

[My mother] created many things during her years in Singapore and some of those that were photographed I have included on the disks. She also made a plaque of Prof. E. J. Corner's monkeys who were trained to collect specimens for him from the tops of trees. Unfortunately, I can find no photos of this, and the original, which I have, is badly damaged. I also have the bust of myself, aged three and a half years, which mother found on a rubbish tip when she returned to Singapore in 1947, and which she rescued and restored.



Ursula Holtum 1929

A bust of Deborah Holtum created by her mother Ursula, as it appeared prior to being damaged in the war.

How fitting it would be, then, for Ursula Holtum to be recognized in a plaque or other permanent form of acknowledgement for her one artistic creation that remains such an enduring part of the Botanic Gardens. 🌿

Kay Mohlman

Acknowledgement: I am extremely grateful to Deborah Holtum for providing and giving me permission to use photographs from her family's collection.

Kay Mohlman is a Singapore-based writing consultant and editor, and a frequent visitor to the Botanic Gardens.

The main entrance to the Gardens, which shows architectural influence from the Royal Botanic Gardens at Kew.

The Royal Botanic Gardens of Peradeniya, Sri Lanka

Basilio Ran

Located on hilly terrain at 460 m above sea level and adjacent to the University of Peradeniya in the District of Kandy, the Royal Botanic Gardens of Peradeniya is one of the many beautiful tourist attractions of Sri Lanka. It is also one of the larger botanic gardens in the Asian tropics, with a total of land area of 150 acres (about 67 hectares).

The Botanic Gardens was formally established at its present location in 1821 when the resident Scottish superintendent, Mr. Alexander Moon, moved the garden from Kalutara to Peradeniya. The name Peradeniya literally means 'valley with guava trees', suggesting its suitability as a fruit garden. Before 1821, the Peradeniya site was a royal garden and residence during the reigns of King Kirithi Sri and King Rajadhi Rajasinghe.

The Gardens has seen its fortunes rise and fall over its 181 years of existence. Several well-known British botanists of the colonial era who contributed much to our knowledge on the floras of South Asia have come to be associated with the Gardens, including W. Kerr, A. Moon, G. Gardner,



The beautiful landscape of the Gardens with mountains in the background. The road leads to the Gardens' administration building.

Basilio Ran



A corner of the Japanese Garden.

Basilio Ran

G.H.K. Thwaites, H. Trimen and J.C. Willis. The imposing Gardner Memorial, built in 1855, stands prominently at one corner of the Gardens reminding visitors of the long history of this tropical botanic garden.

Like the Singapore Botanic Gardens, one of the early functions of this botanic garden under Colonial administration was to serve as an experimental station for the introduction of exotic agricultural crop plants such as coffee, rubber and cinnamon into the region. Plant exchanges between these two Gardens go back a long way. The early introductions of African oil palm and Brazilian rubber to Singapore, for instance, came from Ceylon.

Today, the Gardens is complemented by three small satellite gardens, Hakgala,

Henaratgoda, and Amuradhapura Gardens, all under the administration of the current director, Dr. D.S.A. Wijesundara (dirnbg@sltnet.lk).

At present, no vehicles are allowed entry into the Peradeniya Gardens. The entire Gardens, which is surrounded on three sides by the Mahaweli River, is beautifully landscaped and partitioned into many specific areas, such as the Medicinal Herbal Garden, Spice Garden, Fruit Garden, Begonia House, Orchid House, Cactus House, Japanese Garden, Anthurium and Canna Gardens, Pinetum, etc., and boasts a live collection of more than 2,000 species of local and exotic plants. The Arboretum alone, which occupies about 55 acres, claims about 1000 trees, some of which have been there since 1821. Indeed, a very old



The Orchid House.



The very impressive avenue of *Lodoicea* palms leading to the Gardner Memorial.



A view inside the Orchid House showing orchids displaying vibrant hues.



The largest *Ficus benjamina* tree in the Gardens with its vast shady crown.

ironwood tree planted in 1891 by the Russian Czar has survived till this day and attracts tourists posing for souvenir pictures. Another notable is a giant Javan fig tree growing on one side of an open lawn that

has attained an immense canopy of about 1,600 square metres.

For a visitor from Singapore, the most impressive features of the Gardens are the three avenues, one of *Araucaria*, one of Royal Palms and the third of Double Coconut Palms. Along the last-mentioned, rows of *Lodoicea* palms with their massive leaves and equally imposing odd-shaped fruits like giant twin coconuts at various stages of maturity are a sure attraction. An unusual experience is the sight of several large trees decorated with thousands of hanging flying foxes (gigantic fruit bats) that roost and rest here during the day.

The herbarium in the Gardens with an international acronym, PDA, is the national herbarium of Sri Lanka. It was founded in 1850 and possesses a wealth of more than 130,000 specimens of historical plant collections and duplicates of types accumulated since the times of Gardner, Thwaites, Trimen and Willis. Considerable additions to this collection were more recently acquired during the Flora of Ceylon Project under the joint auspices of the Ceylon Department of Agriculture, University of Ceylon, the Smithsonian Institution and Royal Botanic Gardens Kew. Unfortunately, because of resource constraints, this trove of Ceylonese botanical treasure still awaits adequate curation.

Visitors to Sri Lanka should not miss the opportunity to see the Royal Botanic Gardens at Peradeniya for all its past glories and the present large living collections of tropical and subtropical plants. The Gardens charges an admission fee of Sri Lankan Rs. 300 (approx. Singapore \$5.30) and is open



Trees with thousands of roosting flying foxes forming a spectacular sights for the visitors to the Gardens.



The Sri Lankan National Herbarium (PDA) housed inside the Botanic Gardens.



The wooden cabinets of preserved plant specimens on the second floor inside the herbarium. Notice the open central part of the building.

to public daily from 7 am to 5:30 pm. To get to the Gardens, one can take the daily intercity non-stop train leaving Colombo at 7 am arriving Kandy at 9.45 am, and leaving Kandy at 2.55 pm and returning to Colombo at 5.35 pm. For those who wish to stay overnight in Kandy to explore the nearby historical relics and old Buddhist temples, there are good hotels nearby. 🌐

Benito C. Tan

Department of Biological Sciences
National University of Singapore 119267
And Associate Curator, Herbarium (SING)

I.A.U.N. Gunatilleke

Department of Botany,
University of Peradeniya,
Peradeniya 20400,
Sri Lanka

An Exciting **New Mango Species for Singapore**

A very large *Mangifera magnifica* tree was recently discovered on St John's Island. We came across the tree on 10 March 2003 when visiting the island to inspect individual trees that have been nominated as Heritage Trees. In form, the tree resembles the commoner *Machang* (*Mangifera foetida*). However, the vegetative features (the tree was without flowers or fruit) looked different enough to merit further investigation. Research of the literature and herbarium specimens with the leads provided by the Singapore Herbarium's staff eventually determined its true identity.

The tree on St John's has a dbh (diameter at breast height) of 128 cm (girth of 4.1 metres), is of excellent form and in good health. It is characterised by very leathery leaves with pointed tips. As a species, *Mangifera magnifica* is fairly new to science having only been described and published by the late Mr. K.M. Kochummen in the *Gardens' Bulletin Singapore* in 1984 (Vol. 36 Part 2, pages 187-196, "1983"). It was recorded from lowland and hill forests and is endemic to the Malay Peninsula. Its vernacular names of *Machang pulasan* and *Machang hutan* reflect its similarity to *Machang*.

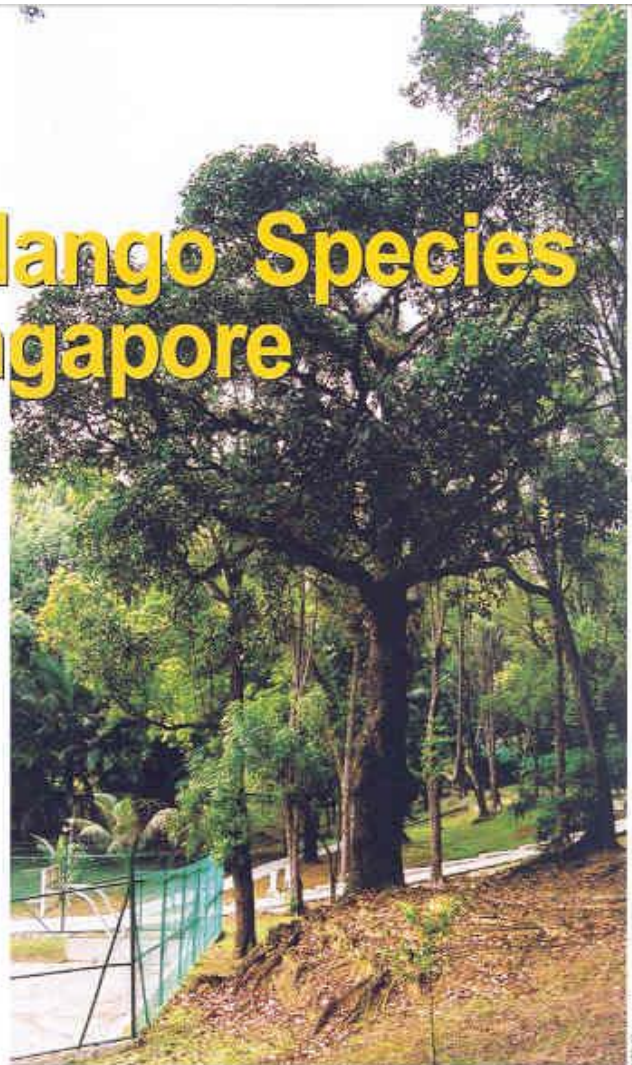
In the herbarium there are at least two other collections of *Mangifera magnifica* from Singapore. These however were identified in the past as other species. The first was a collection in 1892 from Changi that was recorded as a *Magnolia* of unknown species. The second was a collection from Mandai in 1940 that was recorded as *Mangifera rigida*.

The tree at St John's Island is of an exceptional size for the species. This shows that all around us, even in urban Singapore, there are discoveries waiting to be made. What we need is the knowledge and will to be able to seek these out. The scientific name of the tree, *Mangifera magnifica* can be translated to mean 'Magnificent Mango.' This old, handsome tree of St John's Island is truly worthy of this name. I would like to close with the following verse from an English translation of an ancient Sanskrit book of children's stories called the *Panchatantra* that I think has a bearing on tree valuation. 🌿

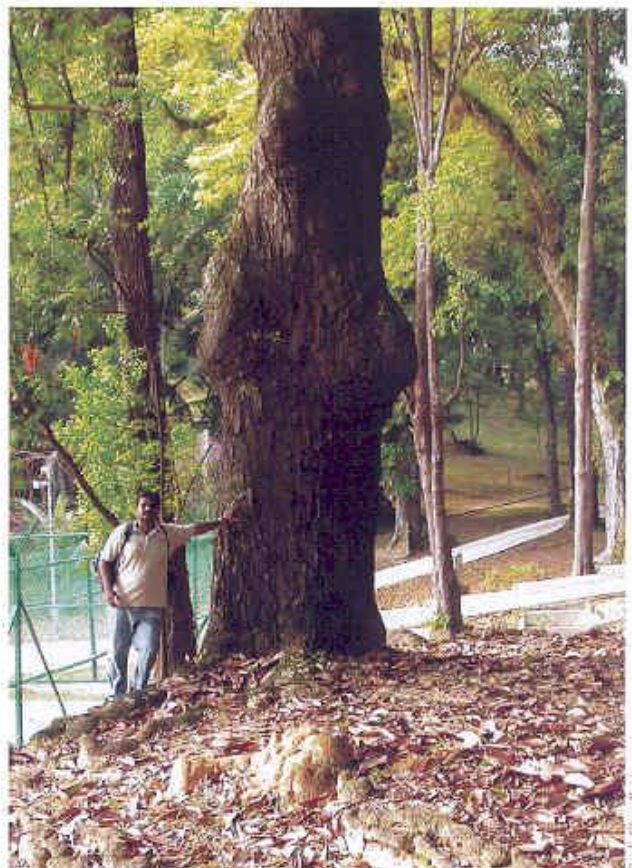
Blest be the tree whose every part
brings joy to many creature's heart;
its green roof shelters birds in rows,
while deer beneath its shadow doze;
its flowers are sipped by tranquil bees,
and insects throng its cavities,
while monkeys in familiar mirth
embrace its trunk.
That tree has worth.

(Reference : Panchatantra, translated from the Sanskrit by Arthur W. Ryder 1925. Printed in India by arrangement with the University of Chicago).

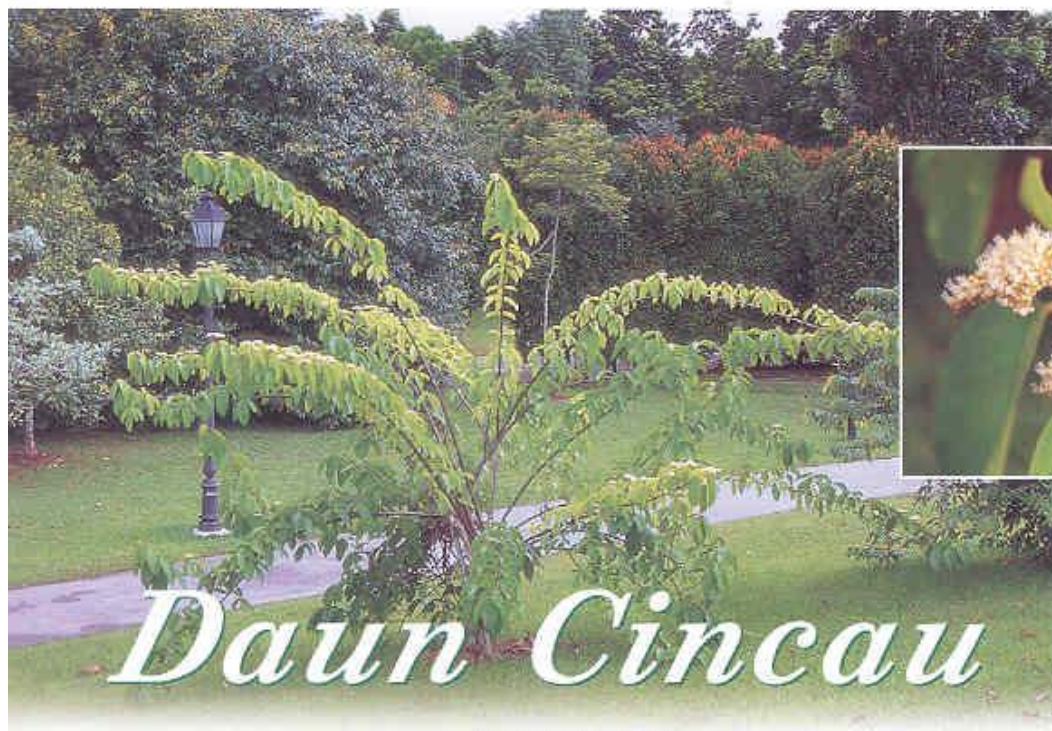
S K Ganesan
Assistant Director (Arboriculture)
National Parks Board



The tree on 15th June 2003.



The author at the base of tree for scale, 15th June 2003.



Flowers of the cincau shrub.

Daun Cincau

The cincau shrub, a *Premna*

At Singapore Botanic Gardens we quite often get calls from people with plants they want to donate to our collection. One such message came in saying that an American couple were moving to a smaller house after many years and were looking for a home for some of the more unusual plants they had accumulated in their large garden. I duly arrived at the house and was given a tour of the garden by Mrs Judith Pigossi. She and her husband lived in Indonesia before Singapore and had many interesting plants in their collection. One was a sprawling shrub used to make *cincau hijau*. This surprised me because I only knew of the climber *Cyclea barbata* used to make the green jelly and Mrs Pigossi's plant was definitely not this. Its opposite leaves seemed to indicate that it was not even in the Menispermaceae family that the *cincau* plants come from. Mrs

Pigossi's Indonesian cook showed me how she made the *cincau* and some left over from the last batch she had made. It is a very simple process – leaves are plucked from the plant and then crushed by hand in a minimum amount of water. The whole lot is then strained through a muslin cloth and the green liquid left in a cool place to set. The soft green jelly is cooling and reputedly beneficial to health.

We obtained a plant of the *daun cincau* from Mrs Pigossi and also took some cuttings. These proved to strike very easily. But the identity of the plant remained a mystery. Based on the sterile material it seemed to be a member of the Verbenaceae possibly a species of *Premna*. Gregori Hambali from Indonesia, a frequent visitor to the Gardens, knew the plant and agreed it was a *Premna*. Oddly there was no mention of *Premna* being used for making jelly in Burkill's *Dictionary of Economic Plants of the Malay Peninsula* or the recent PROSEA publication on medicinal plants, even though *Cyclea barbata* and other Menispermaceae are included. I did finally track down a brief mention in Heyne's *De Nuttige Planten van Nederlandsch-Indië*, a second-hand report (in Dutch) under the name *Premna lucidula*. As a last resort I tried the Internet and was surprised to turn up a couple of leads. An article from the

Indonesian Daily, *Kompas*, reporting an Indonesian scientist claiming *cincau hijau* to have anticancer and detoxification properties and the website of a research lab in Germany where some workers are studying the anatomy of *daun cincau*.

Just recently the plant in SBG flowered which provided final proof that it was indeed a species of *Premna*. Unfortunately this is a particularly difficult genus that has not received much attention from taxonomists in recent years. In fact one really has to go back to the doctoral thesis of the Dutch botanist H.J. Lam, published in 1919, for the last attempt to deal with a large portion of the genus. Lam recognised a group of four very similar species (*Premna oblongata*, *P. oblongifolia*, *P. parasitica* and *P. trichostoma*). The material in the Singapore Herbarium of these species is not extensive enough to give a conclusive answer as to which species the SBG plant belongs. It certainly matches the Malay Peninsula material named as *Premna trichostoma* quite well. Both the names *Premna oblongata* and *P. oblongifolia* have been used in the internet reports on *daun cincau*. Clearly more work is needed to sort this group out and to determine the correct name for *daun cincau*. 🌿



"Green Jelly" made from this plant.

Ian Turner
Living Collections

Protecting our Magnificent Trees



A typical plant label for trees installed with a lightning protection system.

A climber working on installing a lightning protection system on the *Parkia timoriana* next to the Shaw Foundation Symphony Stage. His partner is on the ground.

Tall, mature trees define and set the tone for the Gardens as a special place. They provide a unique ambience with their commanding presence and association with pleasant memories. Unfortunately these mature trees are frequent targets of lightning strikes. Installation of lightning protection systems for our trees was started in 2000. So far 60 of our landmark trees have been protected with most of the systems installed in the past year.

The lightning protection system for a tree is made up mostly of copper materials. It consists of copper cables that are attached to the trunk and the main branches, terminating at the highest accessible point where the cables are connected to air terminals. At the base of the tree the cables are connected to a grounding system. When properly installed and maintained, the system will safeguard the tree from damage due to lightning. It does so by safely providing an alternative path to the ground for a lightning strike.

Saiful Anuar
Living Collections

Plant Sales

In March 2003, plant sales were started in the Gardens' Visitor Centre. Held every first Sunday of the month, the popular Visitor Centre is transformed into a hive of activity and a multitude of colours as quality orchids and other plants are put on sale. The National Orchid Garden, selected nursery vendors, and the Singapore Gardening Society make up the small but attractive mix of plant stalls.

The National Orchid Garden stall is ablaze with colours of tropical orchids ranging from red *Stamariaara* and *Kagawara*, maroon *Bokchoonara*, orange *Epidendrum*, and purple *Vanda* hybrids. These orchids selected for their free-flowering qualities are used to create the mass displays of our Orchid Garden.

Nursery vendors' offerings include exotic imported orchids from South East Asia, Taiwan and even Holland. The fashionable *Phalaenopsis* hybrids, especially the unique mottled ones, are popular purchases. Exotic *Paphiopedilum* hybrids, commonly known as the slipper orchid are another favourite. *Grammatophyllum*, *Oncidium* and *Dendrobium* hybrids all vie for the visitor's attention. Lush foliage plants, the perfect complement to any garden, are sold by the Singapore Gardening Society.

The plant sales are a treat for avid orchid-growers and gardeners. Even non-gardeners have an enjoyable time browsing through the various stalls and soaking in the beauty of the plants and the convivial atmosphere.

These sales are held to raise funds and generate interest for the Singapore Orchid Festival, which will be held in the Gardens on 18 – 21 September 2003. Organised by the Singapore Botanic Gardens and the Orchid Society of South East Asia, it promises to be a beautiful fun-filled event, with a large section of the Gardens transformed into a showcase for orchids. Activities scheduled include a display of award-winning orchids, cut-flower displays, an orchid photography competition, an exhibition on our orchid heritage, talks, sale of orchid plants and gardening materials and much more. Do mark out the dates in your diary so as not to miss this orchid extravaganza.

Camille Foo
Visitor Management & Education



Plant sales at Palm Court.



The Gardens' Card Series

Archival materials of the Gardens have always been a valuable source of reference for botanical research and education. These treasures recently found themselves 'centre stage' on two series of writing cards that we have produced.



Garcinia atroviridis from the Classic series.

The Woodprint series, springs from drawings made from a set of wood blocks. These wood blocks are set with beautiful metal engravings carved in relief with images of plants with their scientific names, and were used to print the book, *Illustrations of Useful Plants of the Southern Regions* during the Japanese Occupation (Gardenwise 18:24). The editor of the publication was Lieutenant Kiyo-Hiko Watanabe who was said to roam the Gardens in full military uniform complete with a sword. If you look at some of the cards carefully, you will see his signature under some of the drawings.



Derris elliptica from the Woodprint series.

The writing cards are now available at the Gardens' pushcart at the Visitor Centre at \$2 each and \$8 for a set of the same series (five designs). Purchase will help fund the Gardens' research, education, conservation and recreation works. Look out for the third series of cards which will feature watercolour paintings of flower dissections by the late Professor E.J.H. Corner!

Yap Siow Hong
Marketing & Commercial Activities

Training UPDATE

In the re-structuring of the National Parks Board (NParks), the School of Horticulture was re-organised into the Training & Certification Branch of the Gardens. Its public outreach component was moved to the Visitor Management & Education Branch. While the Trade Certificate in Horticultural Practices and the Diploma in Horticulture and Landscape Management, a joint programme with the Ngee Ann Polytechnic, remain relevant, implementation of the National Skills Recognition System (NSRS) for the landscaping/horticultural industry has taken centre stage. In 2001, NParks joined the NSRS and established the Landscaping/Horticultural Industry Skills Standards Committee (ISSC) with the Standards, Productivity and Innovation Board (SPRING) and industry partners to set work performance standards for upgrading skills of the workforce. The Training & Certification Branch plays a secretarial and coordinating role in the ISSC.



A trainee undergoing assessment on the Skills Standard "Maintain plants".

The NSRS was officially launched for the industry by Associate Professor Koo Tsai Kee, Senior Parliamentary Secretary for National Development and Defence, on 28 April 2003. Ten skills standards complete with relevant manuals for skills competency training were presented. At the launch, NParks was accorded status of "NSRS Approved Training Centre (ATC)" and "NSRS Approved Assessment Centre (AAC)" and 118 NParks daily-rated employees and horticultural assistants received NSRS certification through SPRING's "Recognition of Prior Learning" scheme. Our hearty congratulations go to them for having their years of horticultural experience formally recognised.

In conjunction with the NSRS launch, an exhibition was staged at "Corner Green" of the Gardens. In line with NSRS' focus on skills training, the exhibition took the form of skills demonstrations, for example, on arboricultural skills required for maintaining our maturing tree population and other skills for plant and grounds maintenance. Private exhibitors supported the event by showcasing new horticultural wares and technology. The occasion was attended by some 250 guests, including landscaping/horticultural contractors who were present to glean first-hand knowledge about NSRS. As the hiring of NSRS-certified horticultural workers may soon be a contractual requirement, contractors will need to have their workforce trained and certified.

The Diploma in Horticulture and Landscape Management saw 36 graduates while the Trade Certificate in Horticultural Practices added another 23 graduates.

Foong Thai Wu, Choo-Toh Get Ten
& Nashita Mustafa
Training & Certification

The NSRS was officially launched for the industry by Associate Professor Koo Tsai Kee, Senior Parliamentary Secretary for National Development and Defence, on 28 April 2003. Ten skills standards complete with relevant manuals for skills competency training were presented. At the launch, NParks was accorded status of "NSRS Approved Training Centre (ATC)"



NParks' Chairman, Professor Leo Tan (left) presenting a copy of the Industry Blueprint to the Guest-of-Honour, Associate Professor Koo Tsai Kee, Senior Parliamentary Secretary for National Development and Defence.



NParks' CEO, Dr Tan Wee Kiat (left) receiving the plaques for NSRS Approved Training Centre and Approved Assessment Centre from Associate Professor Koo Tsai Kee.

Educational *Outreach*

We had a fruitful year, conducting a total of 60 programmes for adults and 170 for children. A record 8,442 participants (6138 the previous year), 76% of whom were students and children, attended our educational programmes.

In our bid to achieve a 30% increase in participant numbers in the coming year, training and development for current and newly recruited guides and instructors are essential. With this in mind, training was carried out in February, March and April 2003, with more in the pipeline. The training sessions conducted were for programmes that included "Terrarium Workshop", "National Orchid Garden Tour", "Heritage Tour", and "EcoGarden Tour."

In the "Terrarium Workshop" training session, participants were taught creative ways to design their terrariums with *Pittonia*, *Pilea*, *Torenia*, *Selaginella*, mosses and other decorative items in bottles that they brought along. This is a one of our programmes that has proved to be very popular. We would

like to thank Mr Tee Swee Ping, an Assistant Director in Arboriculture and the guru in this art for sharing his skills and expertise in helping us to popularise this "miniature garden form."

In all cases, training concluded with a discussion in which all participants provided feedback on the programmes, shared their teaching experience, and exchanged ideas and knowledge.

We look forward to seeing our trained guides and instructors offering their services to our visitors and participants in our expanding range of programmes.

Winnie Wong, Janice Yau
& Seri Hayuni Hadi
Education



A training session for potential guides and instructors.



EcoGarden Tour: Cannas at the EcoLake.



Flowering branch of *Kopsia singapurensis*.

THE SINGAPORE CONNECTION *Kopsia singapurensis*



The type specimen of *Kopsia singapurensis*.



A painting by Charles de Alwis of a specimen grown in the Gardens. The picture probably dates from the early 1900s.

This is one of the less than 20 currently recognised vascular plants species that commemorate Singapore in the specific epithet, and one of only four that uses the Malay name, *Singapura*, as the root rather than the anglicised Singapore. *Kopsia singapurensis* is a large shrub or small tree relatively common in swamp forests in the Malay Peninsula. It has pure white flowers with a small red central eye. In Singapore wild plants are now restricted to Nee Soon swamp forest, but it has been grown in the Botanic Gardens as an ornamental for many years. Currently plants are displayed at Lawn F and near the entrance to the Rain Forest. Local nurseries sometimes offer the Singapore kopsia for sale, but the plants are usually hybrids between *Kopsia singapurensis* and *K. fruticosa*. The hybrids can be spotted by a tinge of pink in the petals and the absence of any scent to the flowers. *Kopsia singapurensis* flowers have a faint but distinctive scent that has been likened to fried bacon. The species was described in 1923 by Henry Ridley, the first Director of the Gardens. The type specimen is in the collection of the herbarium of the Botanic Gardens.

Ian Turner
Living Collections



NEW & EXCITING

Dillenia alata (Red Beech; Golden Guinea Tree)



The striking, bright yellow flowers



Dillenia alata with its distinctive reddish-orange coloured bark.

Dillenia is a genus of about 60 species distributed mainly in Asia. *Dillenia alata* is found from New Guinea down to the Australian coastal rainforests of the Northern Territory and Queensland.

This genus is named after a German botanist, John James Dillenius (17-18th C). The specific name *alata* is from the latin *alatus*, meaning winged, and refers to the flattened leaf-stalks. The common name is aptly derived from its reddish-orange coloured bark. This peels in translucent papery flakes.

Red Beech is a small tree usually about 6 - 10 metres tall with glossy, dark green oval leaves about 20 cm long by 12 cm wide. The young leaves are reddish-brown while old leaves turn yellow before falling. The flower buds resemble young green figs, bursting into striking, bright yellow flowers 6 - 8 cm across. Each flower has five delicate, frilly petals and a central cluster of reddish stamens.

This tree is free-flowering and blooms throughout the year although each flower lasts only a day.

Its decorative red fruit when ripe, splits open and are often mistaken as another form of flower on the same tree. It has eight bright crimson-red segments. On each segment are seeds enclosed in waxy white pulp. Birds readily feed on these seeds.

This handsome tree is a good candidate for coastal planting as well as for parks or along streets. It prefers open and sunny conditions. It can be found in the Gardens by Eco-Lake in a grove with other species of *Dillenia*. It was purchased in February 1995, from Cairns, Australia.

Andrea Kee
Living Collections

FROM THE ORCHID SPECIES COLLECTION

Bulbophyllum foetidum

Some plants in our species orchid collection grow well for years but never produce flowers. The more fastidious ones apparently find the growing conditions less than optimal, others however are naturally slow growers and appear to flower only after they have grown to a certain size.

A *Bulbophyllum foetidum* from New Guinea in our collection is one of those slow growers. It only recently produced flower buds. These were observed with a great sense of anticipation by the attending staff who were pleasantly rewarded when the plant finally opened its flowers. Although not exactly glamorous, they certainly are fascinating. The flowers are adapted to fly pollination, with purple and greenish

colours coupled with a sharp, fishy smell.

To the orchid taxonomist the flowering of this plant was a particularly welcome event, because the group of *Bulbophyllum* to which it belongs, is presently under revision. The few herbarium and spirit-preserved specimens in our collection that have been identified as *B. foetidum*, display such variability in the shape of the lip and the column of the flower that there is a possibility of three different species



A plant of *Bulbophyllum foetidum* showing the compact, nodding inflorescence.



A closer look at the flowers.

represented. The flowering plant is a representative of a form known from Irian Jaya only, and had been described as *B. foetidum* variety *grandiflorum* by the orchid specialist J.J. Smith in 1929. So far, only two incomplete herbarium specimens of this form are available for study. The present plant will definitely add to the information needed for a revision of the group.

Jaap Vermeulen & Paul Leong
Herbarium

TAXONOMY CORNER

250th Anniversary of *Species Plantarum*

Species Plantarum is the baseline for the scientific naming of plants because the International Code of Botanical Nomenclature states that when two names exist for one species, then the older name takes priority with Linnaeus's *Species Plantarum*, published in 1753, being taken as the starting point. For example, turmeric was called *Curcuma domestica* by Valetton in 1918 but the correct name is *Curcuma longa* that Linnaeus recorded in *Species Plantarum* in 1753,

The Swede, Carolus Linnaeus (1707–1778) was a prodigious cataloguer of not only plants but also animals and minerals. He systematically recorded all the species then known. *Species Plantarum* included 1105 genera and 7700 species of plants. It was his system of naming species that proved so convenient that it is still in use today. Each species is given a binomial (two names) in latinised form that consists of the name of the genus, which is unique, and the species epithet, which is often descriptive, and can be used more than once. This is necessary because while there are less than 2000 genera of flowering plants, it is estimated that there are 420,000 species. For example, the Singapore durian belongs to the genus '*Durio*' (the latinised form of durian) and the species epithet is '*singaporensis*' (which

in Latin means 'relating to Singapore') giving the binomial of *Durio singaporensis*. About 20 other species also use '*singaporensis*' as their species epithet but in combination with the unique genus name, the binomial is also unique. You can see the native palm *Rhopaloblaste singaporensis* in the Gardens' Rain Forest.

The advantage of having the scientific name is that it is used throughout the world irrespective of the language spoken, whereas a species often has many different local names.

Besides providing the binomial system of naming, Linnaeus's encyclopaedic work clarified the status of genera and species by providing a short description (usually about 12 words long), earlier references including other names that had been used for the species, the habitat where it grew and its country of origin. *Species Plantarum* was in fact a one-stop



Species Plantarum.



The genus name is in capitals and the species epithet is in italics in the margin.

reference and set the scene for an orderly and stable system of naming species.

The value of his work is indeed seen by it still being relevant after 250 years and its ability to accommodate the ever increasing number of names as new species continue to be named and described. 🌿

Ruth Kiew
Herbarium & Library

STAFF NEWS

New Staff



Photo: Leong

We warmly welcome five energetic individuals to the Gardens.

Back left. Chng It Soh, joined the Gardens in Feb 2003 as Head, Marketing & Commercial Activities. She has previously worked for General Electric, the Television Corporation of Singapore and Mediaworks. It Soh graduated with a degree in Arts & Social Sciences from National University of Singapore.

Back centre. Chua Siok Sin, joined May 2003 as a Horticulture Officer. She comes to us with a Diploma in Horticulture and Landscape Management from Ngee Ann Polytechnic.

Back right. Ivan Lake Wai Ying, came aboard in June as Research Officer under a grant from the Asean Regional Centre for Biodiversity Conservation (ARCBC) for work on our herbarium type specimens (see page 3). He has a Diploma in Instrumentation and Control Engineering from Singapore Polytechnic and is now pursuing a part-time degree in computing, majoring in multimedia technology.

Front left. Serena Lee Mei Lyn, joined as Herbarium Manager in May 2003. Degree in Science with an honours in Botany from National University of Singapore.

Front right. Jenny Chua, has a Diploma in Horticulture and Landscape Management from Ngee Ann Polytechnic and worked with a landscaping firm before joining us in May 2003 as Horticulture Officer. 🌿



STAFF NEWS

Excellent Service

Visitor Services Coordinator Jimmy Liew was the proud recipient of the STAR Service Award. This award is a Public Service wide recognition scheme with the aim of identifying officers who consistently provide excellent service to their customers. Recipients of this award form the top 0.5 % of over 164,000 public service officers. The Gardens is indeed proud to have Jimmy's efforts recognised and rewarded.

Chin See Chung
Director

KEY VISITORS TO THE GARDENS

(JAN-JUN 2003)

NAME	FROM
Mr Abdul Haim	City District Government, Pakistan
Mr Abolfazl Somalo	Chairman, Housing and Urban Development, Iran
Mrs Aleksandra Miller	Spouse of the Prime Minister of the Republic of Poland
Ms Chen Ying	Vice Mayor, Jiling Municipality, Shandong, China
Prof David M Johnson	Ohio Wesleyan University, USA
Prof David Maberly	Royal Botanic Gardens, Sydney, Australia
Ms Daw Mie Mie Tin	Department of Human Settlement and Housing Development, Myanmar
Mr Ghulam Murtaza Malk	Capital Development Authority, Pakistan
Mr Heang Chhoeun	Municipality of Phnom Penh, Cambodia
Mr Ibrahim Rafeeq	Housing and Urban Development Board, Maldives
Mr Ir Rayendra	City Planning Authority, Riau Province, Indonesia
Mr John Lonsdale	Royal Botanic Gardens, Kew, UK
BG(NS) Lam Joen Khai	CEO, National Environment Agency, Singapore
Mr Lim Neo Chian	DyChairman and CEO, Singapore Tourism Board
Mr Low Tien Soh	Deputy Chief Executive, Land Transport Authority of Singapore
Mr Luc Willemse	National Herbarium of Netherlands, Leiden, The Netherlands
Mr Mak Viseth	Municipality of Phnom Penh, Cambodia
Mrs Marala Mara Ubitau	Ministry of Local Government, Housing and Environment, Fiji Islands
Mr Masami Tashiro	Managing Director-Secretary General, Keizai Koho Centre, Japan
Mr Melvin Cruz	City of Marikina, The Philippines
Mr Mochamad Agus Subardono	Department of City Planning, Jakarta Provincial Government, Indonesia
Ms Nara L Diaz	Housing and Land Use Authority Board, The Philippines
Mr Ram Sherchand	Ministry of Physical Planning and Works, Nepal
Mr Roshihari Arsyad	Governor, South Sumatra, Indonesia
Dato Salamon bin Selamat	Mayor of Shah Alam, Malaysia
Mr Stephen J Ruddy	Royal Botanic Gardens, Kew, UK
Mr Sumio Takeshita	Domestic Affairs Department, Keizai Koho Centre, Japan
Mr Sun Aiming	Tourism Bureau, Jiling Municipality, Shandong, People's Republic of China
Mr Suresh Kumar Nembang	Ministry of Physical Planning and Works, Nepal
Mr Ty Dory	Municipality of Phnom Penh, Cambodia
Mrs Virginia C Mabute	National Economic and Development Authority, The Philippines
Mr Weerawardana Gunarathne	Ministry of Western Region Development, Sri Lanka
Mr Wong Woon Liang	Director General, Civil Aviation Authority of Singapore

A new *Dendrobium* hybrid was named after Mrs Aleksandra Miller, the wife of HE Leszek Miller, Prime Minister of the Republic of Poland on the occasion of her visit to the Gardens on 14th Feb 2003.

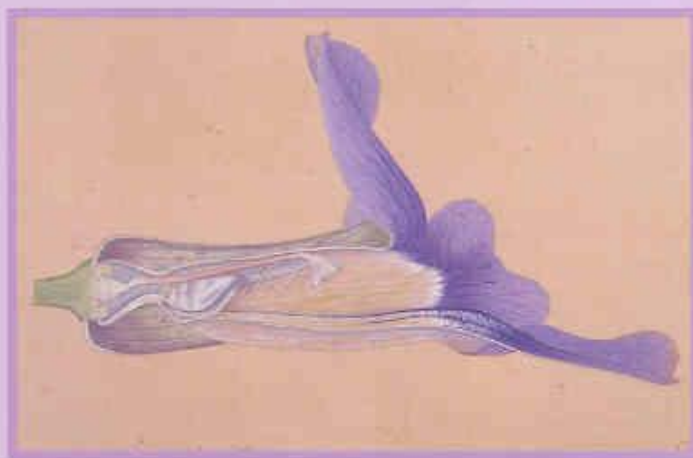


Wong

Watercolour Paintings by E.J.H. Corner



Indian Laburnum,
Cassia fistula (Leguminosae).



Blue Trumpet Vine, *Thunbergia grandiflora* (Acanthaceae).

E.J.H. Corner, Assistant Director of the Gardens from 1929-1945, was a man of many talents. One of these was watercolour painting, a very useful skill in his chosen field of mycology (the study of toadstools) where the wide range of colours defies description in words. His own watercolours illustrate his book on *Boletus in Malaysia*, for example. Corner's book on *The Life of Plants* includes several of his paintings of fruits and seeds and three plates that show longitudinal sections of flowers.

When I found two unsigned watercolours in our archive collection with the same subject matter and delicate style, I immediately recalled the paintings in *The Life of Plants*. A comparison with them leaves no doubt that the paintings are his and this is confirmed by their scientific names being written on the paintings in

his handwriting. One illustrates the Indian Laburnum; the other the Blue Trumpet Vine. The Indian Laburnum painting is dated '26.VI.29.'

As the flowers are painted very large, the Indian Laburnum measuring 32 by 47 cm and the Blue Trumpet Vine 27 by 39 cm, it is probable that these longitudinal sections were prepared to illustrate the classes on botany that he gave to student teachers in the King Edward VII College of Medicine before the Second World War.

The delicacy and finesse of the watercolour technique make them outstanding among our collection of botanical artwork.

Ruth Kiew
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