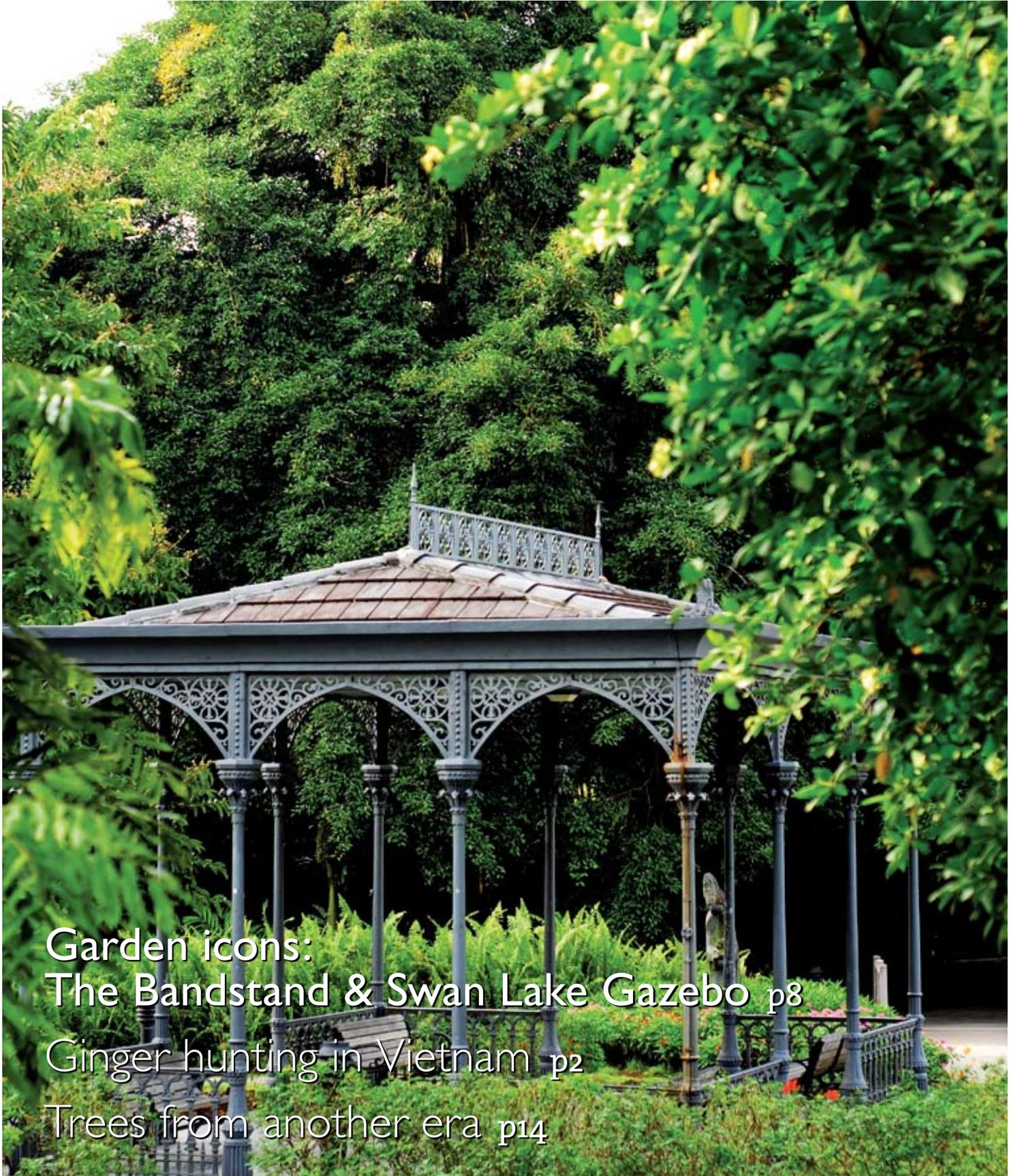


# Gardenwise

THE NEWSLETTER OF THE SINGAPORE BOTANIC GARDENS VOLUME 32, JANUARY 2009 ISSN 0219-1688



Garden icons:  
The Bandstand & Swan Lake Gazebo p8  
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Trees from another era p14



**Cover**  
The Swan Lake Gazebo  
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Chin See Chung

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## Message from the director

This year marks the 150<sup>th</sup> anniversary of the Singapore Botanic Gardens. Coincidentally, 2009 also marks another auspicious date, the 250<sup>th</sup> anniversary of the Royal Botanic Gardens Kew. To celebrate our long partnership and anniversaries, joint celebratory events are being planned.

At the height of the Victorian era that ended in 1901, Kew was the centre of a network linking over 100 colonial gardens that spanned the globe. The first three directors of the Singapore Gardens were appointed from Kew and our close links continue today. The evolution of the Gardens followed similar pathways. Both began as pleasure grounds, Kew as a domain for royalty and SBG for members of the Agri-Horticultural Society that established and managed the Gardens, before they were given to the public. Both Gardens evolved and developed as centres for the study and distribution of plants. They now play key roles in plant diversity research, conservation, education and nature recreation.

At the Singapore Botanic Gardens, we share general information on plants and conservation with readers and friends through *Gardenwise*, our newsletter. It is also a medium through which we record important activities and developments in the Gardens. It provides a platform for all who work in the Gardens to express their passion about their work and about the plants they work with.

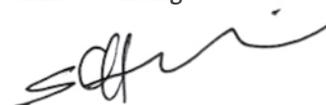
This year marks the 20<sup>th</sup> anniversary of *Gardenwise*. In a small way its development reflects the growth of the Gardens, its visitor amenities, activities, educational programmes, research, plant collections and displays. The first five issues were published annually, from 1989 to 1993. From 1994 two issues were published a year, although there

were no issues in 1995 and 1996. It grew from the 12 pages of the early issues to its current 35–40 pages with a rich and diverse offering from many members of the Gardens. These are to some extent, representations of the different areas of specialisation in the Gardens.

The current issue (Volume 32) is a good reflection of how contributors share their knowledge and enthusiasm in the subjects they deal with. Citing just one example; in the article on *Dioscorea sansibarensis*, we read that Thereis Choo is waging war with a vengeance on this most noxious weed in the Gardens. This plant from West and Central Africa was introduced into the Gardens before 1928, probably for experiments as a potential food crop. It is an amazingly persistent plant with an incredible tenacity for life and a prolific vegetative reproductive capacity. Despite not flowering and fruiting in Singapore, it has since gone wild and invaded forest fringes in many areas of the island. It threatens to gradually smother our patch of forest and is only somewhat held in check by a constant effort of weeding. In 1996 the largest tuber unearthed was 16 kg. There is recently recorded a 22 kg tuber:

Her determination and dedication to the task is typical of those who work in the Gardens. Their collective energies and passion drive the success of *Gardenwise* and the Gardens as an institution. I would like to thank all my colleagues for making possible an eventful and exciting 2008 and we look forward to an even more rewarding 2009. And we hope you will all enjoy this issue.

**Chin See Chung**




# Ginger hunting in Vietnam



I was lucky enough to participate as an external expert for a Sud Expert Plantes project (SEP) funded by the French Institute of Research for Development (IRD), which focuses on exploring the Gingers of Indochina. The project will last for three years, starting in Vietnam and continuing in Laos and Cambodia.

Before heading to the field with students from Vietnam, Cambodia and Laos, we conducted two days training at the Department of Botany and Ecology, University of Sciences, Ho Chi Minh city with Dr. Mark Newman from the Royal Botanic Garden Edinburgh. The curriculum was specifically prepared to introduce the history of ginger research, address difficulties connected to the intricate taxonomy gingers, the art of proper photographic documentation as well as the basics of collecting high quality herbarium vouchers and herbarium management techniques. Our training ended with a delicious dinner hosted by Prof. Le Cong Kiet in a restaurant with local food from the Hue province. We found out only after the meal that the yummy lentil-like salad was in fact prepared out of thousands of tiny freshwater snails. In spite of our initial worries, this adventure ended to our surprise without any stomach-related consequences.

On Wednesday morning 11th June we have stuffed plant presses, spirit bottles, newspapers and other expedition equipment into a minibus, plus 13 people and their bags (do not ask how we managed that!) and then traveled for more than 7 hours in Tay Ninh province to the Lo Go Xa Mat National Park. The next four days were spent exploring the deciduous dipterocarp forests, which are a good habitat for several ginger genera like *Curcuma* and *Kaempferia*.

Such genera go dormant during the dry season and re-appear once the rains start. On the way back to Ho Chi Minh we visited Duong Minh Chau Forest, a dipterocarp nursery. This plantation had almost no ginger species except *Zingiber zerumbet* spread all over the plantations in the undergrowth and *Alpinia galanga* cultivated in the gardens of local people.

A one-day break in Ho Chi Minh City gave us just enough time to wash all our dirty clothes, visit VNM herbarium to see all their ginger specimens, back-up all the data and prepare once again all the expedition equipment. Our second trip had only eight people on board, but lasted 10 days. Our first 2 day stop was in Tan Phu Protected Forest. We found gingers in flower from the genera *Kaempferia*, *Zingiber*, *Amomum*, *Etingera* and *Globba*. The tiniest, but the most exciting, find was *Curcuma gracillima*. It is one of the species described about hundred years ago from Cambodia by French botanist François Gagnepain, but as I have long suspected, the distribution of this species reaches further to Thailand and Vietnam.

After Tan Phu we ventured to a hilly region in the Madagou area located in Lam Dong province. Our first exciting find was not a ginger, but its close relative – *Orchidantha vietnamica*. This interesting plant from the family Lowiaceae (one of the families of the Ginger order) is endemic to Vietnam. As most of the other *Orchidantha* species, this one also emits rather unpleasant smell similar to rotten meat in a bid to attract dung beetles as pollinators. Their flowers are fascinating, resembling orchids and hence the name. During the three days we found numerous species from the genera *Amomum*, *Alpinia*, *Elettariopsis* and

*The tiniest, but the most exciting, find was Curcuma gracillima. It is one of the species described about hundred years ago from Cambodia by French botanist François Gagnepain.*

*Zingiber* as well as several interesting plants from other families.

Visiting Pongour Waterfall was a journey back in time. It is one of the historically well explored localities whose name often appears on herbarium specimens from the end of 19th and the beginning of 20th century, and thus walking the grounds of this locality inevitably makes us wonder what the place looked like 100 years ago. Currently, there is not much vegetation left, as it was cleared to give

Page 3:

*Top:* Plants collected are pressed in the field and each collection is assigned a unique collection number.

*Bottom left:* *Curcuma alismatifolia* – the Siamese tulip, is one of the most commercialized *Curcuma* species on horticultural market. It was very exciting to see this plant growing in the wild, in its characteristic habitat of dry dipterocarp forest.

*Bottom right:* *Zingiber collinsii* is a species which has been described from Vietnam rather recently, in 1999.





way to agriculture and hydroelectricity generation at the upper reaches and as a result, the whole place looked rather dry, with the waterfall barely running.

The base camp for the last two days was in Buon Me Thuot – a capital city with coffee production. From there we made day-trips to Gia Long waterfall, Dray Sap waterfall and Ban Don village. The finds of the last day in Ban Don village surpassed our expectations. As we stopped in the dipterocarp forest, we found immediately *Curcuma thorelii*, *Curcuma plicata*, two species of *Kaempferia*, two species of *Stahlianthus* and one species of *Globba*. That truly was a busy day for all of us, as we had to document, photograph and collect all these gingers knowing we have no time to come back.

By 27th June our field trips were over. We all survived and were back in Ho Chi Minh City with the bags and boxes containing the fruits of our expeditions. All we had to do was to process our specimens, sort the spirit and living material and prepare data for the labels during the next 5 days. No matter how simple 'processing specimens' sounds, the task proved to be enormous. To ensure that each participating country gets a set of specimens, these had to be collected

in six sets. However, gingers are not the tiniest plants in the world and some larger specimens take up three or four herbarium sheets. That makes up to 24 sheets per one collection! It is not feasible to dry the specimens in large amounts directly in the field, so we used a wet collecting method. We pressed all collections in the field in between newspapers, tied them in the bundles at the end of each day and thoroughly wetted them with a generous dose of spirit. As such, they take much less space and can travel with the expedition for long periods without fear of them rotting. So now was the time to dry them all, even though the drying machine at the University was not designed to cater to such massive collections and was far too small to accommodate all specimens. So, we had to improvise and set up three additional dryers constructed from ordinary hair driers and huge plastic bags. They worked well and on the last day, we were finally able to separate collections into six sets. Each of them will be deposited in different herbaria with the top set staying in Vietnam, other two going to Laos and Cambodia, and the last three sent to Paris, Edinburgh and Singapore.

This trip was fruitful and exciting, and we had lots of fun with colleagues from

the various countries. Thanks are due to Dr. Tran Triet, who was coordinator for this project in Vietnam, and though he unfortunately could not attend this trip due to unforeseen reasons the trip was perfectly organised. The spirit of collaboration and interest in gingers was present throughout the whole project and we truly look forward to ginger-hunting together again next year in Laos!

Left to right:

*Orchidantha vietnamica* is so far the only member of the family Lowiaceae (one the eight families forming the Ginger order) known from Vietnam. It stinks like other *Orchidantha* species to attract its pollinators - dung-beetles!

*Curcuma pierreana* – the pink tips of lateral staminodes gives this small *Curcuma* a particularly cute look!

Rhizomes of various ginger species are a major part of local medicinal plant markets.

**Jana Leong-Škorničková**  
Herbarium

**Dang Tran Huu**  
Department of Botany & Ecology,  
University of Natural Sciences,  
Ho Chi Minh City, Vietnam

Photos by Jana Leong-Škorničková

# *Liparis ferruginea*: A terrestrial orchid pioneer

According to the recently released Singapore Red Data Book published by the Nature Society of Singapore in 2008, *Liparis ferruginea* is listed as one of our critically endangered species. This species is the only surviving member of its genus in Singapore, and is found only in a single location in the eastern part of the island.

## The species

*L. ferruginea* is a lowland species and is quite widely distributed from Brunei, Sabah, Sarawak, Java, Sumatra, Singapore, Peninsular Malaysia, Thailand, Cambodia and Hong Kong to the southern Chinese island of Hainan. The species is rare in Singapore, and is only known from a few

collections. Information gathered from specimens in the Singapore Herbarium shows that the plants were typically found in swampy soils such as at a "reservoir's siltation pond," "in swamp along watergaps" and from the earliest collection dated 1889 by H.N. Ridley, in "Ang Mo Kio marsh". On that site, 118 years ago, two forms of this species were found growing near each other: one 'dark flowered form' and a 'yellow flowered form'. The most recent herbarium record of the species was collected in 2005. The plant is a small herb with a very short, swollen stem sprouting about five thinly succulent bright green plicate leaves of unequal sizes, the youngest leaf arising

towards the centre of the plant. The longest leaf measures about 30 cm long by 2.5 cm wide at the broadest part. The inflorescence is racemose and arises from the centre of the plant, growing to about 50 cm. Flowers open from the base towards the tip, as many as four opening at a time, initially green but ageing ochre yellow. The flowers are not scented. In the purple form, the dorsal sepal, petals and the lip are purplish, whilst the lateral sepals are green with purple margins.

## Pollination Biology

Most orchids cross-pollinate, which means they require biological agents such as insects or birds, etc. for their pollination.



*Liparis ferruginea* grows in swampy areas.

*This species is the only surviving member of its genus in Singapore, and is found only in a single location in the eastern part of the island.*



The yellow flowered form of *Liparis ferruginea*



An infructescence (the fruiting stage of the inflorescence) with flowers still forming at the tip and with fruits already well developed below.

Now, it is estimated that less than five per cent of Singapore is covered by natural vegetation, with only a fraction of this being the original vegetation of the early days.

Without them, orchids cannot reproduce sexually and seeds will not form.

Fortunately, some orchids are flexible and can switch from cross-pollination to self-pollination, enabling them to produce viable seeds in the absence of pollinators. One example is species of *Spathoglottis* which in cultivation don't usually form seed capsules until they are pollinated by insects. However, certain varieties of *Spathoglottis plicata* found at some wild areas in Singapore form seed capsules by selfing. Self pollination occurs even before the flowers fully open and therefore the flowers don't look as beautiful as the other varieties as the flowers start to wilt after pollination.

Another self-pollinating species is *Galeola nudifolia*. Careful observation of opened flowers revealed a very interesting phenomenon: the pollen masses were bent down towards the stigma. With further observation, we found that this process begins even before the flowers open. This mechanism probably explains what happens in the case of *L. ferruginea*. Almost as if it seems to understand its ephemeral existence, this species can self-pollinate and quickly set seeds in the absence of pollinators. It is not uncommon to see an infructescence (the fruiting stage of the inflorescence) with fruits already well developed at the bottom with flowers still forming at the tip. Most of the opened flowers form a seed capsule, which is one of the signs of a self-pollinating species. Closer observations revealed that by the time a flower fully opens, the pollinia have already protruded out of the anther cap. If the flowers were cross-pollinated, one would expect the anther cap to have been removed by a pollinator, but in this case, the anther cap was intact while the pollinia inside had disappeared. When some of the fading flowers with slightly swollen ovaries were examined under the microscope, the pollen cap was found to be intact whereas the pollinia were observed to have moved to the stigma, i.e. the flowers have been pollinated. These observations lead us to suggest that *L. ferruginea* self-pollinates.

#### Habitat and ecology

All orchids are myco-heterotrophic i.e., at some point in their life cycle they rely

on fungi for their nutrients and growth. This relationship between the roots of orchid plants and a variety of fungi is known as an orchid mycorrhiza. Orchid seeds are dustlike, consisting of a tiny spherical embryo with no endosperm and a thin seed coat. The fungi are very important during germination, as orchid seeds have almost no energy reserves and obtain their carbon from the fungal symbiont. Seed may or may not germinate in the presence of a suitable mycorrhizal fungus, but cannot grow until a fungus has infected them. Once fungal contact has been made, orchid seedlings grow into a small lump of tissue known as a protocorm, which derives all of its nutrients and energy from the fungus. Seeds of *L. ferruginea* are very tiny, and they probably arrived here on the wind and germinated with the help of a fungal symbiont in their preferred rather harsh and open habitat. Only a few other species of plants grow in this habitat, and are restricted largely to pioneer herbs that can take full exposure to the tropical sun. Other plants found here include *Eriocaulon*, *Utricularia*, *Fimbristylis dichotoma*, *Scleria sumatrensis*, *Xyris complanata*, *Stylosanthes hamata* and especially the club moss *Lycopodiella cernua*, which forms beautiful stands. Shrubs such as *Dillenia suffruticosa* and *Melastoma malabathricum* as well as saplings of the leguminous tree *Acacia auriculaeformis* are present as scattered individuals. The ground, which is sandy-clay, was quite often waterlogged, with pools of stagnant water that inundated many of the plants for days. Here, *L. ferruginea* ekes out a living, a stones throw from the modern high-rise buildings of the town. Prior to the 1970s this area was covered by forest, plantations and villages, before being converted to a sand quarrying area leaving tracts of land pitted and devoid of vegetation. Due to the coarse-textured parent material, the soil here is characterised by high sand content in the surface horizons with clay content increasing with depth. In addition, the rate at which water infiltrates such soil tends to be relatively low. All these characteristics possibly explain the waterlogged conditions we encountered at the site where *L. ferruginea* and its

companion plants naturally grow. The scene, however, is transient. In just a few years, presuming the site remains untouched by re-development, an *Acacia* forest may form which would shade out most of the herbs thus transforming the landscape. Then, *L. ferruginea* must spread to colonise a new area or perish.

### Conservation

Much of Singapore was covered by forest and other forms of vegetation at one time. In fact, historical accounts state that when Sir Stamford Raffles arrived in 1819, the island had the “unvarying aspect of one continuous forest with no marked elevation from a distance”, and was home to only a few hundred inhabitants with homes by the sea. Now, it is estimated that less than five per cent of Singapore is covered by natural vegetation, with only a fraction of this being the original vegetation of the early days. Not surprisingly, a great number of our native plant species are also vanishing together with the primary forest, which is home to a vast bulk of our native flora. It may seem that Singapore’s native flora is in the twilight years of its existence with more than ninety percent of species approaching extinction or already extinct.

Although recorded in the 1994 edition of the Singapore Red Data Book as being “Extinct”, staff of the National Biodiversity Centre and nature enthusiasts from the Nature Society of Singapore had long suspected that *L. ferruginea* could still be found. Then in 2004, the orchid was indeed sighted! Colleagues from the Botanical Research Branch wasted no time in trying to propagate this rare orchid, but alas, were unsuccessful in their efforts. Early this year, the Plant Conservation Strategy kicked off, with Joyce Foo in the National Biodiversity Centre leading the project, its objectives including the monitoring of endangered plants in-situ, as well as the enhancement of conservation through propagation. Naturally, one of the monitored species had to be *L. ferruginea*. A monitoring trip made in early April 2008 by Joyce finally led to a breakthrough, during which a small population of the species was found fruiting. As part of an ongoing

reintroduction project undertaken by the Gardens’ Orchid Breeding and Micropropagation laboratory, capsules were collected and brought back to the laboratory for propagation. Early results indicate that some of the seeds have germinated! Two plants were also collected from the field and are growing in our nursery. Care was certainly taken to collect only what we needed, leaving ample seeds and plants at site to grow and propagate naturally.

### Lessons

In the course of studying this species, we have discovered how fragile and sensitive wild orchids are. *L. ferruginea* was found to grow among other herbaceous plants. When we first saw the plant, we were so excited and wanted to capture as many good photos as possible. In order to take photographs without any obstructions, we cleared away some of the vegetation growing around the orchid and proceeded to get some good shots. We went back to the same site weekly, and observed that the leaves of the plant which was photographed had begun to turn pale green, and eventually turned almost white. This indicates that the plant was scorched by the hot sun. Other plants at the same vicinity did not show such symptoms as long as their habitats were not disturbed. From this, we realized how fragile the species is. It can be wiped out easily if we are not careful to ensure that the microhabitat around the plants is not disturbed. It is therefore very important that when we take pictures of wild species, we don’t sacrifice the orchid for the sake of good pictures!

**Yam Tim Wing**  
*Orchid Breeding and Micropropagation*

**Paul Leong**  
*Herbarium*

**Joyce Foo**  
*National Biodiversity Centre*

*Photos by Yam Tim Wing*



*L. ferruginea* can get scorched by the hot sun in disturbed areas.



The dark flowered form of *Liparis ferruginea*



The Bandstand

# Garden icons: The Bandstand & Swan Lake Gazebo

## Garden Icons

Two much-loved structures in the Gardens are the Bandstand and the Swan Lake Gazebo. These are timeless icons which are etched in the memories of millions of visitors to the Gardens over the decades. Together with other memorable structures, scenes and ancient trees, they give our visitors a sense of place and permanence as they make repeat visits to their favourite outdoor space.

## The Bandstand

This grand old lady dates back to 1860 when she was first built. Sturdy as a rock, she was crafted to perfection with tropical hardwoods. Painted a pure white, she has withstood the test of time and most of all, culture. At that time, Superintendent Mr. Niven Junior was at the helm, with a staff of only a mandore, ten coolies and ten convicts to landscape the entire Gardens. The area surrounding the bandstand area was carefully paved with flower-beds under his instruction.

The Bandstand was home to a host of performing bands from 1861, with military bands being the most frequently heard, and one of the Gardens most popular attractions. Playing twice a month, music from the concerts would carry on the warm air as the subscribers to the Gardens watched on.

She has since been able to witness the numerous transitions that have taken place. From a zoo back in 1875 – 1905 where we had a two-horned rhinoceros, a sloth bear, two orang-utans, an emu, a tiger, a leopard and even a great kangaroo, to the current green oasis in the middle of our city. Through it all, she has withstood the test of time and emerged serene as if she was built only yesterday. The Bandstand currently sits under the glow of yellow rain trees (*Samanea saman*) giving a rare autumnal feel in almost seasonless Singapore, while



The Swan Lake Gazebo

wedding couples photograph themselves amongst their beauty. Little does she know that she will be a talking point in each photograph, evoking fondest memories as she basks in the morning dew and glow of the sun.

## Swan Lake Gazebo

The Swan Lake Gazebo is a much more recent arrival to the Gardens, and first found her home here in 1969. Made of cast iron with a wooden roof, this shelter with wonderfully detailed etchings on her beams, stands proudly at the edge of the lake, guarding it like a centurion.

Although a recent arrival, the Gazebo was first built next to a house in Grange Road back in the 1850s. Today she plays home to visiting families who picnic under her roof, sheltered from the blazing sun. The

tranquility of Swan Lake coupled with her simplicity creates for a peaceful day in the Gardens. Her brown wooden roof gives her an air of warmth, inviting you to spend moments with her as a breeze flows through. The etched details on her rails and sturdy build have withstood much weathering from the harsh sun and pattering rain. The tranquil pale green of a bank of *Nephrolepis* ferns surrounds her, complimenting her serene nature.

With such a graceful resident, we are confident that your visit will be most pleasant as you spend some time in her company.

**Benjamin Aw**  
Visitor Services

*Photo by Benjamin Aw  
unless otherwise stated*

# Award-winning orchids at the Singapore Orchid Show 2008

As part of the second Singapore Garden Festival, the Singapore Orchid Show 2008 was organised by the Orchid Society of South East Asia and the National Parks Board. It was held on Level 4 of the Suntec Singapore International Convention and Exhibition Centre from July 25 to August 1, 2008. The Gardens participated in the individual plants competition and won a total of 35 prizes.

## Cup winner

1. *Grammatophyllum* Kiat Tan - Seng Heng Challenge Cup for the best *Cymbidium*, *Grammatophyllum* and alliance species or hybrid
2. *Cynoches* Jumbo Puff - Chan Sing Cheung Challenge Cup for the best *Catasetum* and alliance species or hybrid
3. *Ridleyara* Fascad - Yeoh Bok Choon Challenge Cup for the best *Arachnis* species or hybrid (excluding *Aranda* and *Mokara*)
4. *Vanda* Tan Hoon Siang - Tan Hoon Siang Challenge Cup for the best *Vanda* Tan Chay Yan or similar hybrid

## Cup runner-up

1. *Arachnis hookeriana* - Runner-up Yeoh Bok Choon Challenge Cup for the best *Arachnis* species or hybrid (excluding *Aranda* and *Mokara*)
2. *Christieara* Ngee Ann - Runner-up Sum Lai Woh Memorial Challenge Trophy for the best *Aerides* or allied hybrid

## 1st (Gold Medal)

1. *Grammatophyllum* Kiat Tan
2. *Cynoches* Jumbo Puff
3. *Ridleyara* Fascad
4. *Vanda* Tan Hoon Siang
5. *Trichoglottis philippinensis* var *brachiata*
6. *Pararenanthera* Dhanabalan
7. *Arachnis hookeriana*
8. *Christieara* Ngee Ann
9. *Dendrobium* Adele William
10. *Brassolaeliocattleya* Pink Diamond × *Brassocattleya* Maikai

## 2nd (Silver Medal)

1. *Doritis pulcherrima*
2. *Vanda* (Josephine van Brero × Darres' Golden Heritage)
3. *Dendrobium* Singa Kagoshima
4. *Dendrobium* Aussie Chip

5. *Dendrobium* Pam Tajima
6. *Renantanda* Alice Shih-hou Huang
7. *Paraphalaenopsis* Kimmy × *Renanthera* Kalsom
8. *Paravanda* Leo Tan
9. *Paravanda* Istana
10. *Paravandrum* Kiyoshi Hikawa xx Ascda. (Fuchs Gold × Pralor)
11. *Mokara* Singa Gold
12. *Aranda* Majula
13. *Brassavola perrinii*

## 3rd (Bronze Medal)

1. *Vanda* Hongkong and Shanghai Bank
2. *Renantanda* Jane McNeill
3. *Paranthera* Ahmad Zahab
4. *Spathoglottis* Joyce Stewart
5. *Rhynchovanda* Alexander Choo Weiwen
6. *Catasetum pileatum*

## We would like to highlight four of the award winners here:

*Grammatophyllum* Kiat Tan (*Grammatophyllum scriptum* × *Grammatophyllum stapeliiflorum*) won the Seng Heng Challenge Cup for the best *Cymbidium*, *Grammatophyllum* and alliance species or hybrid. This unusual hybrid bears pendulous sprays with many flowers, each measuring 4.5 to 5 cm across. All floral parts are light green with intense dark chocolate spots. The hybrid was named after Dr. Tan Wee Kiat, the former Chief Executive Officer of the National Parks Board, in 2005.

*Ridleyara* Fascad (*Aranda* Eileen Addison × *Trichoglottis fasciata*) won the Yeoh Bok Choon Challenge Cup for the best *Arachnis* species or hybrid (excluding *Aranda* and *Mokara*). This was the first trigeneric hybrid with *Arachnis*, *Vanda* and *Trichoglottis* in its background. The inflorescence of this unusual plant can reach a length of 50 cm, bearing up to 14 flowers. The form and colour of the flower resembles the female parent, with each flower being 7 cm across; the petals and sepals are yellow with brown spots which intensify towards the tips. Like the *Trichoglottis* parent, this hybrid has a short tongue-like structure present at the junction of the lip and column. To date,

this plant is still the only registered hybrid of this artificial genus which was named after the former Director of the Singapore Botanic Gardens, Mr. H. N. Ridley.

*Vanda* Tan Hoon Siang (*Vanda* Josephine van Brero × *Vanda* Somsri Pink) won the Tan Hoon Siang Challenge Cup for the best *Vanda* Tan Chay Yan or similar hybrid. The flower sprays of this robust and free-flowering hybrid are 40 to 45 cm long, each bearing 10 to 15 flowers. This cross produced several outstanding cultivars. The flower colour ranges from a captivating royal maroon to salmon-pink with a tinge of peach-orange, to light purplish-lilac. The eye-catching lip is dark red. Mr. Tan Hoon Siang was the breeder of the famous *Vanda* Tan Chay Yan which won a First Class Certificate (FCC) at the Chelsea Flower Show in England in 1954. This hybrid was the best semi-terete hybrid at the 19th World Orchid Conference in Miami, USA, 2008.

*Christieara* Ngee Ann (*Ascocenda* Fuchs Harvest Moon × *Christieara* Jiad) was the runner-up for the Sum Lai Woh Memorial Challenge Trophy for the best *Aerides* or allied hybrid. The arching spray of this showy hybrid bears 15 to 20 well-arranged flowers. Individual flowers range from 5 to 5.5 cm across. The petals and sepals are light orange colour with dark red streaks that resemble fireworks. They are complemented by an attractive, bright-red lip. This orchid was named after Ngee Ann Polytechnic in 2003 to commemorate the 40th anniversary of the institution.

Yam Tim Wing  
Peter Ang

*Orchid Breeding and Micropropagation*

Whang Lay Keng  
David Lim  
*National Orchid Garden*

Photos by Tim Yam Wing

*Grammatophyllum* Kiat Tan



*Vanda* Tan Hoon Siang



*Christieara* Ngee Ann



*Ridleyara* Fascad



# Morning glories in Japan: an enigma and a cultural icon



Inside back cover end papers from *Shipu Keigu*, vol. 1 (1804).

If one were to consider the importance of morning glories in contemporary cultures around the world today, there is one that stands out above all others. This is Japan. While morning glories are grown as ornamentals and esteemed for their beauty in many parts of the world, the Japanese have elevated this plant to the status of a cultural icon. And yet the species grown there, *Ipomoea nil*, is not considered to be native to Japan by botanists. How did this come about? In a culture that is remarkable for how closed it is to outside influences, how is it possible for an alien plant species to become so beloved by an entire society that it is enshrined in art, folklore, and daily life? In order to understand the significance of the morning glory for Japanese people in everyday life, it is necessary to look back at the history of this plant in the islands.

## An enigma

There is a disconnect in published information about the morning glory—or *asagao* (morning face) in Japanese—between scientific articles and those

written from a cultural perspective. When reading about flowers and their cultural significance in Japan, it is typically stated that *asagao* has been an important part of Japanese culture for centuries, if not millenia; when stated explicitly, the authors of such works claim *asagao* is native to Japan. Yet in the botanical literature, *Ipomoea nil*, the species known in Japan as *asagao*, is stated with equivalent assurity to be native in the American tropics. Based on that belief, botanists have long claimed that *I. nil* did not exist in Asia until after Europeans opened trade routes across the Pacific, in the years post-1500. And therein lies the enigma: how and when did *Ipomoea nil* reach Japan, if the species is not native there?

There is no clear answer to this question. The earliest records to show morning glory flowers in Japan appear in a set of scrolls produced in 1164 AD that are preserved in Itsukushima Shrine, Miyajima Island; the morning glory flowers depicted in these scrolls have long been identified

as *Ipomoea nil*. Certainly they are unlike the flowers of any Asian native morning glory. Even if one were to accept a currently popular theory that the Chinese, and not the Europeans, were the first to circumnavigate the globe, transporting many plant and animal species around the world en route, this would push back the date of first contact between tropical America and China by, at most 70 years, and the scrolls date from 250 years before that. Botanists have long claimed that *I. nil*, and its closest relatives, are native in tropical America, and recent molecular analyses corroborate that. So how a tropical American morning glory species came to be present in Japan at an early date, well before humans are thought to have transported it across the Pacific, and later became a cultural icon there, remains unknown.

## A tea-house tale

Morning glories were cultivated in Japan for a very long time, mainly as a medicinal plant, but there was a peak in their popularity in the early decades of the nineteenth century. Kakuzo Okakura, in his elegant essay *the Book of Tea*, recounts a famous morning glory encounter that took place in the 16th century between the master of the tea ceremony, Rikiu, and the Taiko (military ruler). At that time *asagao*

*While morning glories are grown as ornamentals and esteemed for their beauty in many parts of the world, the Japanese have elevated this plant to the status of a cultural icon.*

*asagao* were still rare in Japan and Rikiu had planted his entire garden with them. His plants drew a great deal of public attention and their fame eventually reached the Taiko, who wished to see them. Accordingly, Rikiu invited the

Japan (mid-1850s) and these mutant flower types have all but disappeared today, save for a dedicated group of Japanese growers who maintain some of them. These remarkable plants are virtually unknown to the Western world, but were highlighted

of fabrics for clothing and home decor: In literature, morning glories are popular subjects for poetry—in 1824 an entire book, *Asagao Hyakushu* (translation: One hundred poetic aspects of morning glories) was devoted to them.

While the fast pace of life in Japan means that many traditional festivals and folk celebrations have disappeared, the enduring fascination with morning glories is embodied in the Iriya morning glory fair, held in the Tokyo suburb of Iriya each year in the first week of July. During this brief period, the streets of Iriya around the Kishimojin Temple are crammed with thousands of potted morning glory plants, sold as seasonal decoration for the home. These plants have been commercially grown by nurseries that specialise in morning glory cultivation. Unlike the Western approach, just planting seeds in the ground and letting the plants grow as they will, cultivation of Japanese morning glory is meticulous, with shoot tips being pinched out and light levels manipulated so that the plants remain compact and produce flowers of exceptional size. There are many cultivars of *Ipomoea nil* grown in Japan that simply do not exist outside that country and the level of horticultural excellence the Japanese bring to bear on these plants is unequalled elsewhere.

#### Suggestions for further reading –

- Austin, D. F., Kitajima, K., Yoneda, Y., & Qian, L.-F. 2001. A putative tropical American plant, *Ipomoea nil*, in pre-Columbian Japanese art. *Economic Botany* 55: 515–527.
- Enbutsu, S. 2007. *A flower lover's guide to Tokyo*. Kodansha International, Tokyo.
- Makino, T. & Oka, G. 1938. *Floral calendar of Japan*. Tourist Library #20. Board of Tourist Industry, Japanese Govt. Railways.
- Menzies, G. 2003. *1421, the year China discovered the world*. Bantam Books, London.
- Okakura, K. 1906. *The book of tea*. G. P. Putnam's Sons, New York. [many reprint editions of this classic are available]

**George Staples**  
Herbarium

Photos by  
Museum Volkenkunde,  
Leiden, Netherlands.



Centerpiece from the book, *Asagao Hyakushu* (1824).

supreme ruler to visit his garden. On the appointed morning the Taiko arrived at Rikiu's house only to find the entire garden had been cleared and there was nothing to be seen but neatly raked bare soil. Initially displeased, the Taiko entered Rikiu's tea house to find there in the alcove a rare vase in which a single elegant bloom had been placed. The tea master had chosen to sacrifice his entire collection of morning glory plants, leaving only the one flower that came closest to perfection for the Taiko to admire. Such stories reached legendary proportion and helped fuel the popularity of morning glories as garden plants that culminated in the early 19th century. From about 1800–1830, soon after mutant flower types (*henka asagao*) were discovered, cultivation of morning glories for their flowers reached the status of pop culture—it swept Japan and was practiced at all levels of society.

However, the fad for growing *henka asagao* was brief and it diminished in popularity soon after the coming of Westerners to

recently during an exhibition held in the Leiden Hortus, the Netherlands, in 1999. In a future article I will write at more length about the *henka asagao* and how modern genetics was advanced by Japanese efforts to understand their many variations.

#### A cultural icon today

Whatever the truth behind morning glories' presence in Japan, the plants have become an integral part of everyday life there. For example, the Japanese associate particular plants or flowers with seasons and months of the year. Thus cherry blossoms signify spring and irises indicate summer; while camellias blossom during winter cold and snow. In this floral pantheon, the morning glory flower has become indelibly associated with the heat and humidity of high summer (late July to early August). Morning glory flowers in paintings would indicate to the viewer that the scene is set in midsummer. The blossoms also decorate folding screens, fans, lacquerware, greeting cards, scroll paintings to decorate the *tokonoma* alcove in a home, and all types

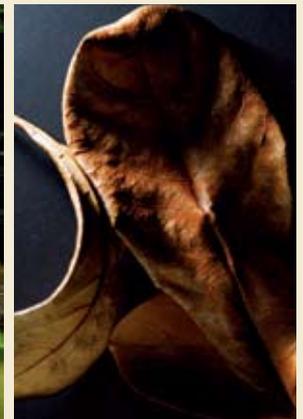
# Trees from another era

I must have passed Liane Road a thousand times over the last decade, yet each time is like transporting myself to another era. The place is filled with gigantic trees that existed long before I was born. At one time, I saw a worker sweeping up dead leaves and putting them in a sack, and I thought about a botanist matching leaves with herbarium specimens, fascinating as the means to identifying these big trees are so small.

I think that was how this came about. I wanted to make small statements about these big species that seemed to belong to another era, a time when things seemed to move more slowly, before the world counted time with a stopwatch. This then, is a condensed version of these observations:

## 'Centre stage', *Terminalia subspatulata*

A fine tree of this species occupies a prominent position at the beginning of Liane Road, and was designated a National heritage tree in August 2002. Long leads of lightning conductors are efforts to preserve this indigenous giant, which is identified by its tall, spreading plank buttresses, long branchless bole and conical crown of blunt-tipped leaves shaped like short spatulas. Tufts of weevil-wort (*Molineria latifolia*) with lance-shaped leaves add a decorative quality at the base. It is a promising plantation species but the quality of the timber is unknown. Holttum observed between 1927-1930 that this deciduous tree had a leaf period of about a year, but is not so constant in its behaviour as some other species.



## 'Head and shoulders above', *Koompassia malaccensis*

An emergent tree known as *Koompassia malaccensis* is the tallest tree species in Singapore, and may grow to a height of 60m with an almost perfectly cylindrical trunk around 150cm in diameter. It is identified by grey bark with fine, closely-spaced fissures and by sharp, narrow buttresses. It is tolerant of a wide range of soil conditions, and is the most widely distributed tree species in Peninsular Malaysia. *Kempas* is a strong, tough wood, not easy to fell with the axe, difficult to work by hand and difficult to saw especially radially, because of the interlocked grain. Hence it was initially not considered of much value, but now it is possible to impregnate the wood with preservatives, and it is in demand for heavy construction and flooring; thus is the mighty subjugated. Because of the value of this fine wood for craft work, it is often found with pieces hacked out to make knife handles and tops.



**'Natural gifts', *Millettia atropurpurea***

A handsome evergreen tree, native of poor, stony laterite soils, slow growing at first but growing quite rapidly once established. Held by a buttressed and crooked trunk, the neat, densely cylindrical and dark glossy green crown of pinnate leaves that is often low to the ground provides a deep shade. Resembling *Dracontomelon* from a distance but with less leaflets and better known as an ornamental, it is an excellent avenue tree or for planting in gardens and parks. It blooms after long dry periods, and the tree crown is then dotted with large, very dense inflorescences of dark purple flowers. Spent blooms carpet the ground below the tree, testimony to its hidden beauty. The fruits are large and brown in colour when ripe, and somewhat irregular in shape.

**'Misfit', *Castilla elastica***

An aggressive exotic species introduced into the East in 1876 that has run wild in the Rainforest. From Central America and known as the Panama rubber tree, this is a monopodial tree to 30-40m tall with horizontally spreading branches, low buttresses and abundant white sap. The leaves are distinctive, hairy, finely serrate, and rather oblong with a prominently cordate base and the bark is characteristic with narrow, horizontal, reddish, raised pustules. It makes a handsome shade tree in cacao and coffee plantations and furnishes rubber of a good quality. As a plantation tree it has not proved so remunerative as the Para rubber, *Hevea brasiliensis*, which can be tapped at an earlier age, for which reason its cultivation has been rather restricted.

**'Revelation', *Nothaphoebe kingiana***

This tree bears a puzzling similarity to *N. umbelliflora*, but I realised it was something different when I saw it fruiting one day. It differs in having bigger and longer fruits and boat-shaped leaves with less ascending secondary veins, and hence appears to be *N. kingiana*. Although not remarkable in stature, this tree is notable as it represents the first record for Singapore, if it is not introduced.

**'The lazy old dipterocarps'**

It comes as a surprise to most people to know that it is sometimes sixty years before a dipterocarp tree flowers for the first time, and that then, having flowered, it is likely to take a rest for three, seven or even eleven-odd years before flowering again – or perhaps longer! "A botanist studying dipterocarps has to be very patient and persistent if he is not to work only with leaves and bark and the appearance of the wood under the microscope, rather than with flowers and seeds."

– W.Veevers-Carter.

'Last of the good old-fashioned boats and planes', *Shorea ovalis* ssp. *sericea*

A large tree with prominent, sharp buttresses, the crown usually greyish green and somewhat drooping. Vertical cracks in the bark allow for new growth; horizontal cracks are visible but weak. The vertical cracks in this species are shallow and more or less parallel, allowing the bark to be peeled off in sheets, for making the walls of forest shelters. The leaves are more or less concave and boat-shaped, the lower surface roughly hairy. Saplings have larger leaves which are not concave, and the nerves sunken on the upper surface, thus giving the leaves a quilted appearance.



'Freak', *Shorea leprosula*

This magnificent dipterocarp is named for the elliptical leaves which are stellate yellow-tomentose on the lower surface, giving a light brownish appearance to the tree. With not very prominent buttresses and a deeply fissured grey-brown bole, the top of its crown can reach 65m or more above ground. Trees of this stature are probably not less than 150 years old, and are thought to have a life-span of 300 years or more. Immature leaves usually have linear-oblong elevations in the axils of the nerves beneath, which are the nests of mites (domatia). Young plants also have a great variety of galls on them, the most characteristic ones are globose covered with processes like a *Castanopsis* fruit, and others are cone-shaped and perfectly smooth brown, about one inch long.



'Face in the crowd', *Shorea smithiana*

This *Shorea* was first collected in Sabah by A.D.E. Elmer in 1922, but it was not until 1934-35 that adequate material was available for purposes of description. The Gardens' specimen is interesting to note because very few people knew about the occurrence of this 40-45m tall emergent species here, partly because it is known as a Bornean endemic and partly because it was obscured from view by lianas. Its chief diagnostic characters are the large, broadly obovate leaves, which are scabrid below feeling like sandpaper, drying roughly grey, and the yellowish-brown bole with shallow, broad fissures.

*S. smithiana* is threatened by habitat loss; the tallest tree known is 82.3m high in the Tawau Hills National Park, in Sabah. It is the major source of light red meranti timber from north-east Borneo; the bark sometimes used as floor covering.

It's at times like these, when I'm approaching the Liane Road side-gate, that I think about the rumble of traffic and the man-made financial crisis on one side and the tranquility with the rare antiquities he did not create on the other; and as I watch the motor-cars go flashing past, I would turn around and go back if I could only find a way.



# Waging war against *Dioscorea*

It's Friday 1:30pm, and a motley crew consisting of Gardens staff and contract workers and Ngee Ann Polytechnic cadets assemble at the forest edge along Liane Road. Armed with only 2 small changkols and a stack of black garbage bags, this army of 6 might not look much, but our quest is formidable – to rid our precious primary rainforest of one of its most invasive and damaging weeds - *Dioscorea sansibarensis*.

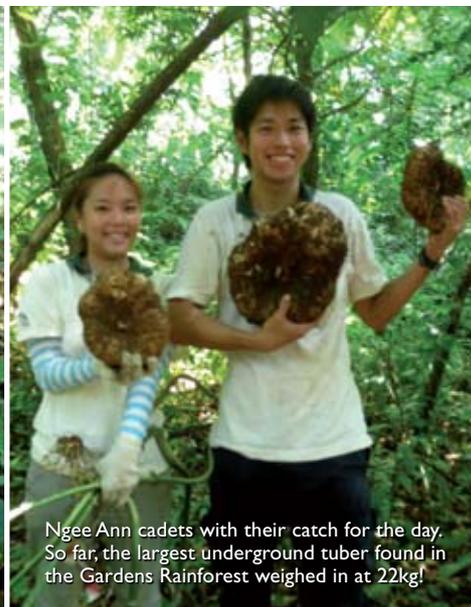
## Profiling the enemy

Originally from Africa, *Dioscorea sansibarensis*, also known as Zanzibar yam, is a climbing plant that forms large starchy underground tubers and propagates vegetatively through the production of aerial bulbils. Although some tribes in Africa are known to treat and consume these large underground tubers or 'yams', the entire plant is so toxic that its much more widespread use in central and eastern Africa is as a hunting poison, or as a poison to commit murders or suicide. Other *Dioscorea* species have similar biological and chemical characteristics (and hence a similar weedy nature in introduced environments) and besides being used as a poison, are also used in some traditional African medicines. Interestingly, *Dioscorea* also contains the steroid diosgenin, which is easily converted into progesterone and was used as an oral contraceptive in the 1940s.

In the Gardens, *Dioscorea sansibarensis* has managed to get a foothold in many areas of the forest, in particular, disturbed areas such as along paths and roads, as well as clearings due to tree fall. When left unchecked, this fast-growing climber spirals up tall trees and completely smothers the canopy with its characteristic 'bat-like' foliage. It showers the ground with thousands of aerial bulbils, and once it has established in an area, the forest has little chance of recovery without human intervention. *Dioscorea sansibarensis* has never been recorded to flower or fruit in Singapore – so without any form of seed dispersal, its invasion is wholly dependent on the physical spreading of aerial bulbils. Moreover, these bulbils do not stay dormant for long, and will germinate in a matter of weeks. Taken together, these facts



The characteristic lobed leaves of *Dioscorea sansibarensis*



Ngee Ann cadets with their catch for the day. So far, the largest underground tuber found in the Gardens Rainforest weighed in at 22kg!

expose the vulnerability of *Dioscorea*, and make the notion of eradication possible.

## Operation Die Dioscorea

Although there have been efforts to curtail the spread of *Dioscorea* in the Gardens Rainforest in the past, these weeding exercises were not done frequently or thoroughly enough to fully eradicate the bulbils. As a result, *Dioscorea* still runs rampant. So with the aim of restoring the forest to its former health, we optimistically decided to launch a full-on attack in a project fondly referred to as Operation Die Dioscorea. The plan itself was simple - continuously remove all *Dioscorea* from each area of the forest until the 'bank of bulbils' in the ground has been completely exhausted. In reality however, this has proved to be very challenging as *Dioscorea sansibarensis* has an indomitable will to live. We have learnt in the course of this operation that: underground tubers must be completely removed because even the smallest sliver of tuber will re-sprout; large plants produce bulbils; small plants produce bulbils; even plants in the treetops that we supposedly 'killed' by hacking away their lower halves and removing the tuber continue to produce aerial bulbils for at least a month as their final act of defiance!

## Light at the end of the tunnel?

Fortunately, time is on our side as no

matter how hard it tries, *Dioscorea* bulbils cannot grow above 'grabbing' level (1.5m) in a matter of days. This is certainly true for aerial bulbils as they are generally no larger than a small potato; however, large tubers left in the ground produce new thick stems at an alarming speed. We noted that within a week, a record 22kg tuber had already sprouted two large stems 3cm in diameter and 4m in height. This just highlights the importance of removing all the large tubers as soon as they are detected. We have found that returning to the same area every 2 to 4 weeks is ideal as it allows sufficient time for new bulbils to germinate, but not enough time for them to grow out of reach. Three months and 760 man-hours into the campaign, and we have removed a total of 513 garbage bags (about 3.7 tonnes) of *Dioscorea* from roughly one third of the forest. Progress is slow, as old areas constantly have to be re-visited, but it is encouraging to find the amount of *Dioscorea* in each area drastically reduced with each visit. At this rate, it will take another year of tri-weekly *Dioscorea* removal sessions before we've finally removed this scourge from the forest, but for the sake of the forest, we are certainly determined to do so.

**Thereis Choo**  
Living Collection

Photos by Thereis Choo

Green Baron (*Euthalia adonia pinwilli*)

# Butterflies of the Singapore Botanic Gardens

Plain Tiger (*Danaus chrysippus chrysippus*)Painted Jezebel (*Delias hyparete metarete*)Peacock Royal (*Tajuria cippus maxentius*)

The Gardens is one of my favourite sanctuaries when I need to get away from stressful situations at work, and a walk amongst the lush greenery and abundance of nature is very often a therapeutic stress-reliever. The Gardens hosts one of the largest collections of plants – both native and exotic, in Singapore. The bird life (see *Gardenwise* 30 (2008) 14-19) is healthy, with over a third of the total number of species seen in Singapore occurring here. Amongst the plants and flowers of the Gardens, insect life is equally abundant. A casual observer will surely encounter a number of butterflies frolicking in the sunshine, busily feeding at flowers or just lurking around in the shaded understorey of the Rainforest at the Central Core of the Gardens.

This is the first attempt at compiling a checklist of butterflies of the

Gardens. Whilst there have been many observations and personal checklists made by enthusiasts and visiting experts, it would be ideal to maintain a repository of sightings, preferably with photographs. Over the years, I have kept a personal checklist of the butterflies that I've observed whenever I visit the Gardens, and also sightings made by other enthusiasts and observers, some of whom have kindly sent photographs of butterflies that they have encountered. The list will, undoubtedly, keep growing as new species are found.

Butterflies can be rather choosy about their habitats, and being rather plant-specific, many butterfly species are usually found more often in the vicinity of their caterpillar host plants. For example, the recent cultivation of *Aristolochia acuminata* and *Passiflora foetida* has brought in showy species like the Common Birdwing,

Common Rose (and its subspecies, the Black Rose) as well as recent immigrants like the Leopard Lacewing and the Tawny Coster. The collection of Zingiberaceae and Palmae in the Gardens has attracted the skippers – Hesperidae, of which a few species are rare and not often seen elsewhere. The caterpillars of the Hesperidae create leaf shelters out of their host plants, and hence can often be easily spotted (and dispatched) by a sharp-eyed gardener who would consider these pests!

Two rare species which are noteworthy enough for special mention are the Orange Tail Awl (*Bibasis sena uniformis*) and the Blue Nawab (*Polyura schreiber tisamenus*). The former was a recent discovery for Singapore where it was found in the forested areas of the Central Catchment Reserves. Hence it came as a surprise to me when a



Leopard Lacewing (*Cethosia cyane*)



Black Rose (*Pachliopta aristolochia antiphus*)



Common Imperial (*Cheritra freja frigida*)



Courtesan (*Euripus nyctelius euploeoides*)



Contiguous Swift (*Polytremis lubricans lubricans*)



Common Bluebottle (*Graphium sarpedon lucatius*)



Tawny Coster (*Acraea violae*)



Common Grass Yellow (*Eurema hecabe contubernalis*)



Orange Tail Awl (*Bibasis sena uniformis*)

small colony of caterpillars was found in the Gardens feeding on a common 'wild' shrub near the Tanglin Core. I have personally not seen an adult butterfly of this species in the Gardens, but upon breeding the caterpillars to adulthood, it was confirmed that the species is indeed the Orange Tail Awl. The Blue Nawab is another curious resident of the Gardens. A rare species in Singapore, the caterpillar of this species was originally recorded on rambutan (*Nephelium lappaceum*) but subsequently recorded by ButterflyCircle members on the red saga (*Adenantha pavonina*), a *Bauhinia* species (along the trellises near Les Amis Au Jardins), and on the exotic but common Australian wattle (*Acacia auriculiformis*). It has been sighted regularly in the Gardens, and some years ago I was having a meeting on the 2nd storey of one of the bungalows

when a Blue Nawab decided to stop and rest on a tree branch just outside the window!

Another species to look out for is the Bamboo Tree Brown (*Lethe europa malaya*) which was spotted at the bamboo collection at the Bukit Timah Core. It is a rare species which is usually active only in the early hours and late hours of the day.

A surprising find in the Gardens was the Courtesan (*Euripus nyctelius euploeoides*) of which a male was spotted some time back by Dr Ian Turner who emailed me a photo taken whilst on a routine walk around the Gardens. Even the parasitic plant *Dendrophthoe pentandra* which grows innocuously on its hosts' branches way up in the treetops supports a number of beautiful butterfly species like the Painted Jezebel (*Delias hyparete*

*metarete*), Green Baron (*Euthalia adonia pinwilli*) and a number of beautiful Hairstreaks like the Peacock Royal (*Tajuria cippus maxentius*).

The other species in the checklist are predominantly urban butterflies that are relatively common in Singapore, but nonetheless contribute life and variety to the Gardens. As butterflies are mobile and some species can fly long distances in search of both nectaring and caterpillar host plants, it is beyond doubt that more species will be added to the checklist as time goes by, adding to the biodiversity and colour of the Gardens.

**Khew Sin Khoon**  
[www.butterflycircle.blogspot.com](http://www.butterflycircle.blogspot.com)

Photos by Khew Sin Khoon

## Checklist of butterflies found in the Gardens

**Family: Papilionidae****Subfamily: Papilioninae**

1. *Troides helena cerberus* (Common Birdwing)
2. *Pachliopta aristolochiae asteris* (Common Rose)
3. *Chilasa clytia clytia* (Common Mime)
4. *Papilio demoleus malayanus* (Lime Butterfly)
5. *Papilio polytes romulus* (Common Mormon)
6. *Papilio memnon agenor* (Great Mormon)
7. *Graphium sarpedon luctatus*  
(Common Bluebottle)
8. *Graphium agamemnon agamemnon* (Tailed Jay)

**Family: Pieridae****Subfamily: Pierinae**

9. *Delias hyparete metarete* (Painted Jezebel)
10. *Leptosia nina malayana* (Psyche)
11. *Appias libythea olferna* (Striped Albatross)

**Family: Pieridae****Subfamily: Coliadinae**

12. *Catopsilia pyranthe pyranthe* (Mottled Emigrant)
13. *Catopsilia pomona pomona* (Lemon Emigrant)
14. *Catopsilia scylla cornelia* (Orange Emigrant)
15. *Eurema hecabe contubernalis* (Common Grass Yellow)

**Family: Nymphalidae****Subfamily: Danainae**

16. *Danaus chrysippus chrysippus* (Plain Tiger)
17. *Danaus genutia genutia* (Common Tiger)
18. *Parantica agleoides agleoides* (Dark Glassy Tiger)
19. *Ideopsis vulgaris macrina* (Blue Glassy Tiger)
20. *Euploea mulciber mulciber* (Striped Blue Crow)
21. *Euploea phaenareta castelnaui* (King Crow)

**Family: Nymphalidae****Subfamily: Satyrinae**

22. *Elymnias hypermnestra agina* (Common Palmfly)
23. *Lethe europa malaya* (Bamboo Tree Brown)
24. *Mycalesis mineus macromalayana* (Dark Brand Bush Brown)
25. *Orsotriaena medus cinerea* (Nigger)
26. *Ypthima baldus newboldi* (Common Five Ring)

**Family: Nymphalidae****Subfamily: Morphinae**

27. *Amathusia phidippus phidippus* (Palm King)

**Family: Nymphalidae****Subfamily: Nymphalinae**

28. *Hypolimnys anomala anomala* (Malayan Eggfly)
29. *Doleschallia bisaltide bisaltide* (Autumn Leaf)
30. *Junonia hedonia ida* (Chocolate Pansy)
31. *Junonia almana javana* (Peacock Pansy)
32. *Junonia orithya wallacei* (Blue Pansy)

**Family: Nymphalidae****Subfamily: Heliconiinae**

33. *Acraea violae* (Tawny Coster)
34. *Cethosia cyane* (Leopard Lacewing)
35. *Phalanta phalantha phalantha* (Leopard)

**Family: Nymphalidae****Subfamily: Limenitidinae**

36. *Phaedyma columella singa* (Short Banded Sailor)
37. *Tanaecia pelea pelea* (Malay Viscount)
38. *Tanaecia iapis puseda* (Horsfield's Baron)
39. *Euthalia aconthea gurda* (Baron)
40. *Euthalia adonia pinwilli* (Green Baron)
41. *Lexias pardalis dirteana* (Archduke)

**Family: Nymphalidae****Subfamily: Apaturinae**

42. *Euripus nyctelius euploeoides* (Courtesan)

**Family: Nymphalidae****Subfamily: Charaxinae**

43. *Polyura hebe plautus* (Plain Nawab)
44. *Polyura schreiber tisamenus* (Blue Nawab)

**Family: Lycaenidae****Subfamily: Lycaeninae**

45. *Zizina otis lampa* (Lesser Grass Blue)
46. *Zizula hylax pygmaea* (Pygmy Grass Blue)
47. *Zizeeria maha serica* (Pale Grass Blue)
48. *Chilades pandava pandava* (Cycad Blue)
49. *Nacaduba berenice icena* (Rounded 6-Line Blue)
50. *Prosotas dubiosa lumpura* (Tailless Line Blue)
51. *Anthene emolus goberus* (Ciliate Blue)
52. *Arhopala centaurus nakula* (Centaur Oak Blue)
53. *Iraota rochana boswelliana* (Scarce Silverstreak)
54. *Tajuria cippus maxentius* (Peacock Royal)
55. *Cheritra freja frigga* (Common Imperial)
56. *Hypolycaena erylus teatus* (Common Tit)
57. *Rapala pheretima sequeira* (Copper Flash)

**Family: Hesperidae****Subfamily: Coeliadinae**

58. *Bibasis sena uniformis* (Orange-Tail Awl)
59. *Hasora vitta vitta* (Plain Banded Awl)

**Family: Hesperidae****Subfamily: Pyrginae**

60. *Odontoptilum angulatum angulatum*  
(Chestnut Angle)

**Family: Hesperidae****Subfamily: Hesperinae**

61. *Iambrix salsala salsala* (Chestnut Bob)
62. *Ancistroides nigrita maura* (Chocolate Demon)
63. *Notocrypta paralysos varians* (Banded Demon)
64. *Udaspes folus* (Grass Demon)
65. *Suastus gremius gremius* (Palm Bob)
66. *Potanthus omaha omaha* (Lesser Dart)
67. *Pelopidas mathias mathias* (Small Branded Swift)
68. *Polytremis lubricans lubricans* (Contiguous Swift)

# Chopin sculpture unveiled

The music of Frederic Chopin floated on the evening breeze as the orchestra of the Nanyang Academy of Fine Arts played his compositions with much gusto on the Gardens Shaw Foundation Symphony Stage. The evening of 6 Oct 2008 heralded a new resident in the Gardens as well – a sculpture featuring Chopin himself. Come 2010, there will be events worldwide to mark the bicentenary of his birth, and the unveiling of the sculpture in the Gardens is only the start of celebrations for this great Polish composer.

Sculpted by Mr. Karol Badya, an award-winning Polish artist and lecturer at the

Academy of Fine Arts in Krakow, Poland, this fine piece now sits along Heliconia Walk, overlooking Palm Valley. Measuring 3m in girth and with a height of 1.7m, this bronze statue weighs a hefty 500kg.

A gift from to the people of Singapore from the people of Poland, initiated by the Embassy of Poland, this beautiful gift signifies more than just a piece of art

in a lush setting. It heralds the forging friendship between two countries. The embassy also hopes to introduce yearly concerts in the Gardens featuring the music of Chopin, similar to the famous summer concerts held in Lazienki Royal Park, Warsaw, Poland.

**Benjamin Aw**  
Visitor Services



Donors Mr. & Mrs. Miroslaw Pienkowski during the unveiling of the sculpture along Heliconia Walk.

NParks archive

# Volunteer tea reception 2008

Words can never express our heartfelt thanks to the dedicated volunteers who consistently spread the joy of visiting our Gardens with educational tours and through their personal insights into its huge variety of plants. One small way to pass on our gratitude is through our annual tea sessions, which are always filled with smiles and banter.

This year they were taken to the newly launched Southern Ridges, which comprises a 9-kilometre chain of green walks, including the rolling hills of Mount Faber Park, Telok Blangah Hill Park Kent Ridge Park and finally ending at West Coast Park. We kicked off at Hort Park at Alexandra Road, where our guides were engrossed with the vantage point that the bridge offered. Encountering species such as *Ficus benjamina*, *Fagraea fragrans* and the call of the Greater racket-tailed Drongo, Lahiru Wijedasa, Senior Arborist with the Gardens, guided them on the 3km walk.

Lim Pek Kuan, a regular guide for the Rainforest Tour every second Saturday of the month, commented on how beautiful the walk was and that it was thoroughly enjoyable. Avid volunteer for the National Orchid Garden Tour every third Saturday of the month, Ms Wong Siew Kwun, commented that she did not even know we had such a nice place on our tiny island! Through our yearly

volunteer tea sessions, we hope to let our volunteers let their hair down and enjoy the greenery instead of doing all the hard work themselves!

**Benjamin Aw**  
Visitor Services

Photo by Nick Tang



Our dedicated volunteers with their smiles just after their tour and lunch.



8000 visitors came to enjoy the carnival atmosphere in the Children's Garden

Terri Oh

# Carnival fun at the Jacob Ballas Children's Garden

Visitors to the Jacob Ballas Children's Garden soaked up the fun on 9 November 2008 at the Garden's second carnival. Held to mark the first anniversary of the Children's Garden, the carnival played host to some 8,000 visitors. Aimed at raising funds to develop new programmes and amenities at Asia's first children's garden, the carnival involved the participation of over 30 sponsors and organisations who contributed products, food and their time.

Visitors were spoilt for choice with over 30 stalls offering a wide array of activities and games. From cookie decorating to plant treasure hunts and yoga lessons, families took the opportunity to bond over activities while contributing to a good cause. Over 450 visitors from six charities such as Children's Society and

Marine Parade Family Service Centre also had a fun-filled day at the carnival. This was made possible by generous donations from supporters of the Gardens.

The carnival also brought together over 200 staff and volunteers who contributed their time and effort. For Wong Mun Ping, 14, the Carnival provided a wonderful opportunity to volunteer her time while picking up a new skill. The secondary two student who helped run the cookie decorating stall said, "I had a smashing time today. I've always been interested in baking so this was a great way to learn something new and do my bit for the Botanic Gardens".



Sunny Ho

Decorating gingerbread men proved to be a very popular activity

Terri Oh  
Singapore Garden Festival

# A benefit for plant conservation: the Gardens plays host to the BGCI “Plants for Life” Gala

The balmy evening of the 6<sup>th</sup> of December saw the Gardens playing host to the Botanic Gardens Conservation International (BGCI) Plants for Life Gala Benefit. Sponsored by Standard Chartered Bank, the event was aimed at raising funds to support vital plant conservation efforts in botanic gardens across Asia. Commenting on this partnership, Mr Ajay Kanwal, Regional Head, South East Asia, Consumer Bank, Standard Chartered Bank, said, “This cause resonates very well with Standard Chartered Bank as we believe very strongly in protecting the environment and to have a broader positive impact on the societies in which we live and work”. The occasion was graced by The Honourable Baroness Joan Walmsley, Chair of BGCI, who was accompanied by BGCI Trustees Beth Rothschild and Alicia Crawford, as well as BGCI Secretary General Sara Oldfield. BGCI is the leading international organisation working to save the world’s imperilled flora. In

partnership with Botanic Gardens and other concerned organisations around the world, BGCI aims to secure the future of plant diversity for the well-being of people and the planet. BGCI’s programmes in Asia involve partners in all Southeast Asian countries as well as China, Korea and Japan.

Addressing the 200-strong crowd at the event, Baroness Walmsley highlighted the need for action to ensure the survival of plants threatened with global extinction and climate change. “Plant conservation is not a luxury but a necessity. BGCI takes action working with botanic gardens and other partners around the world - we are helping to ensure that 60% of globally threatened plants are safe in botanic gardens as an insurance policy against extinction in the wild”, she said. Baroness Walmsley also paid tribute to the Singapore Botanic Gardens. Describing the Gardens as a sincere friend of BGCI, she said, “Singapore Botanic Gardens will

be celebrating its 150th anniversary in 2009 and I applaud the good work that is carried out here. Singapore Botanic Gardens is truly a world-class botanic garden - internationally renowned for its science, its unsurpassed expertise in orchid cultivation and its dedication to conservation”.

**Terri Oh**  
*Singapore Garden Festival*

Baroness Joan Walmsley, Chair of BGCI, addressing the guests



200 guests attended the BGCI “Plants for Life” Gala Benefit



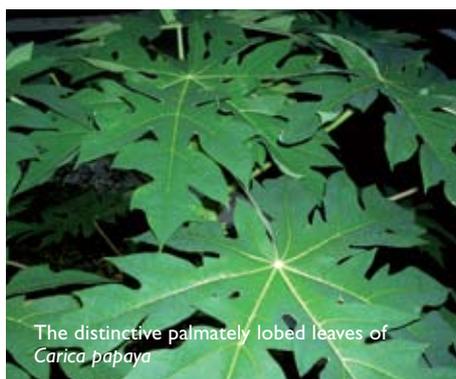
# Introducing an international superstar...

*Carica papaya* (commonly known as papaya in English, *mù gua* in Mandarin pinyin, *betik* in Malay, and *pappali* in Tamil) is widely cultivated throughout the tropics and subtropics. Although it is best known for its sweet, succulent fruit, the papaya has myriad uses and is truly an international superstar of tropical ethnobotany!

The exact origin of the papaya is unclear, but it is thought to be a naturally occurring hybrid that originated in the lowlands of southeastern Mexico or neighbouring Central America. In the 16<sup>th</sup> century Spanish colonial explorers introduced the papaya through the Caribbean and the Philippines; from there it was brought to the Malay Peninsula, Indonesia, India, the Pacific, and Africa. Today it is cultivated and naturalized (escaped from cultivation) pan-tropically. Commonly grown as an easy and prolific dooryard fruit, papaya is also a major international fruit crop, with Brazil, Nigeria, India, Mexico, and Indonesia leading global production. There are numerous cultivars, which vary considerably in the appearance and flavour of the fruit.



A 'perfect' *Carica papaya* flower, with both male and female parts.



The distinctive palmately lobed leaves of *Carica papaya*

While we tend to think of papaya plants as trees, they do not produce true woody tissue and are therefore classified by botanists as large perennial herbs. When injured all parts release a milky latex, which is especially copious in the green fruit. Like its relatives the moringas, nasturtiums, capers, and cabbages, papaya plant tissues also contain mustard oils, which give them a distinctive pungent flavour. The average lifespan of individual plants is 5-10 years but in commercial orchards plants are typically replaced every 2-3 years. Unlike many other tropical fruit crops, which can take a decade or more to mature and yield a respectable harvest, papayas are fast growers and usually bear fruit within the first year after planting.

The papaya plant is typically erect with a single unbranched stem, though damage to the growing tip may induce branching. The stem is cylindrical and hollow, with prominent leaf scars. The leaves are spirally arranged and clustered at the apex of the stem. Borne on long petioles, the leaf blades are palmately 5-9-lobed and prominently veined. The mildly fragrant, creamy-white to yellow flowers are born in the leaf axils. The species is typically dioecious, with separate plants bearing either carpellate (female) or staminate (male) flowers. However monoecious plants (with single plants bearing both carpellate and staminate flowers) and hermaphroditic plants with perfect/bisexual flowers (individual flowers bearing both male and female reproductive parts) are not uncommon amongst papaya cultivars. Environmental and cultural factors, especially temperature and nitrogen availability, apparently influence sexual expression—the sexuality of a staminate or hermaphroditic papaya plant may change once or repeatedly

during its lifespan. Carpellate and bisexual flowers are typically larger and are solitary or borne in short-stalked, few-flowered clusters. Staminate flowers are much smaller and are borne in many-flowered, long, pendant panicles. The fruit, which take 5 to 6 months to mature, are remarkably variable in shape (from globose to ellipsoid to pear-shaped) and size (ranging from 0.3 to 10 kilos in weight). The skin of the fruit is thin and somewhat waxy, and may be green yellow, or orange at maturity. The flesh is yellow, orange, or red, with a central cavity containing numerous small black seeds, each surrounded by a transparent, gelatinous aril.

Rich in vitamin C, vitamin A, potassium, and dietary fiber, the ripe fruit is eaten raw and used in salads, preserves, chutneys, candies, and deserts. It is also canned, juiced, and dried. The green fruits may also be prepared in a salad (especially popular in Thailand), pickled, or cooked as a vegetable. The flowers are prepared as a sweetmeat in Java. The tender leaves, roots, and even the pith may be cooked and consumed. The seeds, which have a spicy flavor, are sometimes used in commercially prepared salad dressings, may be dried and used as an adulterant in black pepper, and are eaten raw. Oil extracted from the seeds is used in skin and hair care products, and extracts of papaya leaves and green fruit are used in skin lightening soaps, and both leaves and green fruit can be used as a laundry stain remover. The fibrous stem of the papaya plant may be used to make rope.

In some areas, papayas are cultivated primarily for latex, which contains the proteolytic enzymes papain and chymopapain. Papain is best known and

widely used as a meat tenderiser; in traditional cultures, tough cuts of meat are tenderised by wrapping them in bruised papaya leaves or stewing with slices of green fruit. Commercially extracted papain has many industrial uses including the production of toothpaste, cosmetics, chewing gum, beer, hides, silk, wool, and rubber. Both papain and chymopapain are used in a variety of pharmaceutical products. Applications include the treatment of herniated vertebral discs, digestive ailments, and the removal of necrotic tissue from chronic wounds, burns, and ulcers.

Papaya is highly esteemed in the folk medicine of cultures throughout the tropics. The roots, leaves, flowers, fruit, seed, and latex are all used in traditional medicines to treat an astounding array of maladies including arthritis, asthma, bronchitis, cancer, colic, constipation, dysentery, fever, flu, headache, hypertension, indigestion, infections, intestinal worms, kidney and liver ailments, respiratory problems, rheumatism, scorpion bites, tonsillitis, toothache, tuberculosis, tumors, ulcers, urinary difficulties, venereal disease, and warts. The unripe fruit and seeds are also used as an abortifacient and have been shown to reduce fertility in male laboratory animals. In veterinary medicine, papaya latex and seeds are used to treat worms and other parasites in livestock. The antimicrobial and anti-parasitic properties of papaya extracts are well documented by laboratory studies. It may even have uses for disease control in horticulture—recent studies have shown that extracts from papaya leaves were effective in controlling powdery mildew disease in commercial pepper fields.

At the Gardens, papaya plants may be viewed in the Jacob Ballas Children's Garden and are soon to be reintroduced to the fruit crops section of the Economic Garden. Of course they are also a common sight in residential neighborhoods throughout Singapore.

**Marc S. Frank**  
*Living Collections*

*Photos by Marc S. Frank*

# An amazingly long bloom – *Metroxylon salomonense*

## The origin

In March 1994, an expedition from the Gardens visited the Solomon Islands. From a forest grove on the small island of Kira Kira, a few large seeds were collected of the palm *Metroxylon salomonense*, the Solomon ivory nut palm. Alan Tan, a member of that expedition, recalled, "We saw this beautiful palm from a distance and made a beeline for it. The ground was marshy and soft. We searched the ground and found these large and beautiful fruits some distance from the tree. They could have floated to where we found them."

Planted in the Gardens, five plants that germinated from those collected seeds grew steadily, three at EcoLake edge and two in Palm Valley. *Metroxylon salomonense* is a solitary palm, unlike the more common clump forming Sago palm (*Metroxylon sagu*).

This small genus *Metroxylon* with seven species is distributed from the Pacific islands of Fiji, Samoa, Solomon Islands to New Guinea and South East Asia. It belongs to a minority of palms whose reproductive strategy depends on putting all their energy into one big show, following which the plants die; palms that flower and fruit once and then die are called monocarpic. This is unlike other palms that, when matured, will flower and fruit continually throughout their life. In monocarpic palms, flowers may number in the millions, and fruits are produced in very large numbers. Other monocarpic palms include the talipot palm (*Corypha umbraculifera*), whose terminal inflorescence may reach six to seven metres tall and bear over 20 million flowers (see *Gardenwise*, volume 24, cover and pages 22-24), the giant mountain rattan (*Plectocomia elongata*) and all species in the genus *Metroxylon*.

## A starch staple

Palms with this strategy will need energy in the form of a large store of starch, so that the enormous terminal inflorescences can be produced. Starch that is stored in the trunk is often exploited by humans, and the palms are harvested just as the blooming begins. The trunk will have a thin hard woody outer layer, while the inside is pithy and rich with starch. This starchy pith is chopped up or rasped and washed, and the heavier starch grains settle in water. A commercial palm starch produced is 'sago', from the Sago palm (*Metroxylon sagu*). Each stem of the palm may produce in excess of 300 kg of starch.

Such starch-rich palms are a starch staple in many traditional communities, with *Metroxylon* being by far the most important group in the Asia-Pacific region. *Metroxylon sagu* is more important from Malaysia to Indonesia, while *Metroxylon salomonense* is more common further east in the Pacific islands. And as the common name suggests, the seed of the latter is used for carving as a vegetable ivory.

## The flowering

Two talipot palms flowered in the Gardens after 79 years of growth. The inflorescences appeared in September 2004, and by early 2006, the fruits had ripened and all had fallen from the palm. This is a long one and a half years for the flowering and fruiting process.

Our *Metroxylon* however, outdid this. The three plants at EcoLake and the two in Palm Valley flowered in early 2004, within a few months of each other. Another two at EcoLake started flowering in mid 2006. From the emergence of the massive flowering shoot in April 2004 to the production of matured flowers took 12 to 15 months. The fruits took another 3



Three and a half years after the flowers appear, the fruiting is almost over. Most of the fruits have dropped with the vast majority being sterile. Many that remain are the larger fruits that bear a seed each.

to 3.5 years to ripen and by mid 2008, fully developed fruits started to fall. By December 2008, some fruits were still hanging on one of the two plants at Palm Valley. The flowering and fruiting took a total of about 4.5 years, an amazingly long bloom. The palm will die after fruiting; in fact even as the fruits are ripening, the palm is gradually dying, a little every month.

## The fruits

Tens of thousands of fruits were produced, but over the years the bulk aborted in a steady rain of immature fruits. The sterile fruits that finally ripened were ovoid to globose, usually taller than wide, with a diameter of 4 to 6.5 cm. They were light, weighing 50 to 80 gms and filled with pithy tissue and no seed. A much smaller number of fruits grew larger, heavier, fuller and rounder with most having a diameter of 7 to 9 cm and weighing 250 to 400 gms each. The weight was largely from the single large and extremely hard seed found in each fruit. The seed with its pure white endosperm constitutes the vegetable ivory. Fruits that germinated took only 2 to 3 weeks to do so, a quick start for the next generation of this wonderful palm.

**Chin See Chung**  
Director

Photos by Chin See Chung & Benjamin Aw



2 months



12 months



3 years



*Top left:*  
The massive terminal inflorescences, about two months after emergence from the apex of the palm.

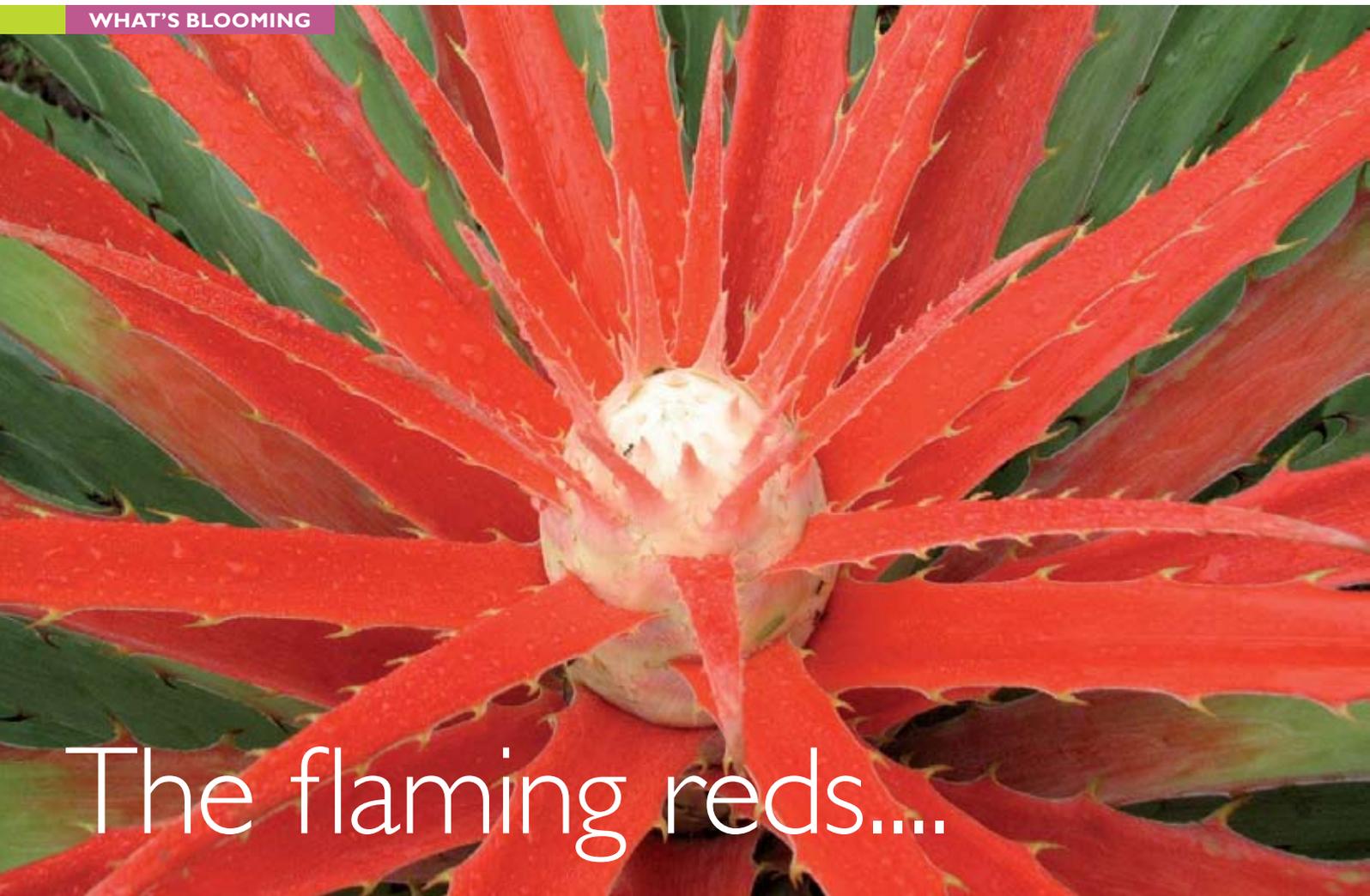
*Top middle:*  
About a year after emergence, the inflorescence is fully formed though the flowers are not visible yet.

*Top right:*  
Two years after the flowers appear, the flowering shoot is loaded with thousands of fruits. It became apparent that some fruits are growing larger than the others.

*Left:*  
About 15 months after the inflorescence first emerged, tiny flowers rain from the tree. A pencil lead is used for scale in the picture.

*Bottom:*  
Close-up of the fruits showing the sterile ones containing only pith (left), and the fertile ones (right) with a core of vegetable ivory.





# The flaming reds....

## ***Bromelia sylvicola***

A stunning terrestrial bromeliad, *Bromelia sylvicola*, recently burst into 'flames' at the Sun Rockery. The plant belongs to the Bromeliaceae (Pineapple) family, and originates from Brazil. This large and handsome bromeliad, resembling the pineapple plant, is a gorgeous sight when in full bloom; due to its brilliance it is commonly referred to as 'heart of flame' – a very apt name.

The genus *Bromelia* consists of approximately fifty species. The name was coined by the French explorer and botanist, Charles Plumier, in honour of a Swedish physician and botanist, Olf Bromelius (1636-1705). This same name also gave rise to the name of the family, Bromeliaceae.

*Bromelia sylvicola* forms a large spreading rosette about 2 m in diameter. The long, rigid green leaves are armed with very vicious, strong hooked thorns along the edges. The large area of central leaves turns a brilliant scarlet when it is ready to flower. This is contrasted by the compact cylindrical to capitate felted

inflorescence, which bears pretty flowers that are maroon with white edging. The plum-size fruits ripen yellow and are said to be edible. This bromeliad requires full sun and a large space to become fully developed.

In rural areas of South America, this plant, and similar-looking bromeliads, serve as an effective living fence or hedging to properties, since the strong curved spines will cause deep and painful wounds to any animals or humans attempting to penetrate the areas. A natural substitute for metal barbed wire!

## ***Mucuna bennettii***

In the historical Plant House in Lawn L, another plant erupted in massive flaming blooms. It is the vigorous climber known commonly as the New Guinea Creeper or Scarlet Jade Vine, introduced into the Gardens in 1939. An absolutely spectacular vine from Papua New Guinea, it thrives well in our high humidity and rainfall tropical climate. In its native habitat, this liana climbs high into the rainforest canopy and makes an unforgettable sight as it covers the forest

with colour. To botanists, this plant is called *Mucuna bennettii* and belongs to the Leguminosae (bean) family. The genus name, *Mucuna*, was derived from the Brazilian vernacular name for these plants, mucunã. The species name, *bennettii*, was in honour of a naturalist and surgeon, Dr. G. Bennett of Sydney (1804-1893), who had studied the Papuans.

*Mucuna bennettii* has dark glossy trifoliate green leaves and long pendulous inflorescence sprays of up to 30 cm long. The sprays hold many showy orange-red flowers that are claw-like in shape, each being about 7 cm long. This *Mucuna* is among the showiest of climbers and grows well in the sun, given rich soil and ample water. This climber is a great addition to any large garden and does best when there is room for it to flourish. The vine at the Plant House attests to the vigorousness of its growth form. Visitors will notice that this climber has grown beyond the pergola of the Plant House onto an old *Syzygium grande* tree in the nearby Fernery, smothering the tree. Tracing the liana to its base, one



will notice the thick massive convoluted woody stem and be assured of its age. The spectacular reds of these blooming plants, the *Bromelia sylvicola* and *Mucuna bennettii*, can definitely stop traffic in the Gardens anytime!

**Nura Abdul Karim**  
Living Collections

*Photos by Nura A. Karim unless otherwise stated*

*Page 30:*  
The scarlet central area of the inflorescence.

*Top Left:*  
Close-up of the flowers of *Bromelia sylvicola*.

*Top right:*  
The inflorescence of *Bromelia sylvicola* fades to green during fruit set.

*Left:*  
Close-up of the gorgeous flowers of *Mucuna bennettii*.

## *Kopsia singapurensis* – Always blooming!

*Kopsia singapurensis* is a shrub or treelet native to Singapore, with a conical crown reaching 2-4 m in height. It has elliptic, leathery leaves, which taper gently to a sharp point. When in full bloom, it takes on a very delicate appearance with its white petalled flowers sporting a crimson 'eye'. Beneath the tree, often you see petals strewn like confetti in the wind.

Like other species of *Kopsia*, it requires moderate watering and full sun to semi-shaded conditions. It flowers freely but never seems to fruit here in the Gardens; however we do have a record of the plant in fruit from a collection made by Nathaniel Cantley's collector M.V. Alvins in Singapore in the late 1880s, when Nathaniel Cantley was superintendent of the Singapore Botanic Gardens. As it is a native plant, it is odd why it does not set fruit currently. It is a possibility that there is a specific pollinator which is no longer found in the Gardens. Another scenario could be that all plants in the Gardens'

grove are clonal, leading to sterility if the species is self-incompatible, or perhaps the environmental conditions are too different to those in swamp forest where it is naturally found.

From the Gardens' Herbarium records, the name *K. singapurensis* was 'upgraded' by H.N. Ridley, the Gardens' first director from a variety of *K. fruticosa* var. *albiflora* (originally described King and Gamble) to a unique species of its own. Ridley also collected specimens from Chan Chu Kang. Chan Chu Kang no longer exists but lies buried partly within the Upper Seletar Reservoir near the dam, around Track 3-7/Nee Soon area, and is part of the Nee Soon Swamp Forest as we know it today. Today, thriving clusters of this plant can still be found in this vicinity. With help from our colleagues from the Central Nature Reserves, we will monitor these plants to watch for seed set and also arrange to take cuttings to add to our Gardens' prunation as an act of

ex-situ conservation. According to the Red Data Book (1994, *The Singapore Red Data Book*), *K. singapurensis* is considered as 'vulnerable'. It has been found to be perfect as a park plant as it needs little maintenance and is not particularly prone to insect attack. It is a feature of the planting in many areas of Singapore, such as Mt. Faber Park, Telok Telok Blangah Hill Park, Bishan Park, Ponggol Park, East Coast park and Pasir Ris Park.

It is interesting to note that in *A Dictionary of Economic Products of the Malay Peninsula* by I.H. Burkill, the roots of *Kopsia* were used in traditional Malay medicine as a poultice for soothing ulcerated noses caused by tertiary syphilis.

**Serena Lee**  
Herbarium

Photo by Hassan Ibrahim

# The genus *Gagnepainia* – orchids or gingers?

*Gagnepainia* species are highly unusual plants. Indeed many people, including specialists, might mistake them for green-flowered terrestrial orchids when they see them for the first time. Yet, once the leaves fully grow and unfold, the secret will spill out – they are gingers!

Three species are currently recognised in the genus *Gagnepainia*: *G. godefroyi*, *G. harmandii* and *G. thoreliana*. So far the genus is known to occur in Cambodia, Vietnam and Thailand, but it is also likely to be found in Laos. These small herbs, rarely exceeding 60 cm, grow in deciduous forests, often near streams and go into a dormant phase during the dry period of the year. They produce the flowers at the beginning of the rainy season, sometimes just before the leaves appear or simultaneously with the young leaves.

In spite of the small number of species in the genus, the identity of all three species is not well known. Two of the species, *G. godefroyi* and *G. harmandii*, are known from a small number of collections, and published photographs of them have both names interchangeably attached. Even though living material looks fairly different (see pictures), the type specimens now deposited in the Paris Herbarium look similar and even drawings of flowers made from dried material are confusing, and hence it is difficult to decide which is the correct name. Unfortunately the original collections do not mention any colour characters to give us further clues. However based on certain floral details like the shape of epigynous glands and the position and shape of lateral staminodes,

the green-flowered species is more likely to be *G. harmandii*, while the species with creamy-orange flowers is most likely *G. godefroyi*. The third species, *G. thoreliana*, still remains even more of a mystery.

Henri Ernest Baillon, a French botanist, originally described all of them in 1895 as members of the genus *Hemiorchis* (the name is derived from Greek and means 'half orchid') and he named them after his colleagues actively working in Indochina during that time, namely Alexandre Godefroy-Lebeuf, François Jules Harmand and Clovis Thorel.

Originally, the genus *Hemiorchis* contained six species. However, in 1904 the German botanist Karl Schuman separated three of the species based on a few morphological characters and established for them the new genus *Gagnepainia* – honouring yet another French botanist based in the Paris herbarium François Gagnepain, who studied and described almost 130 new ginger species and varieties mainly from in Indochina. Whether these two genera will remain separate or be re-united is currently open to question. Schuman during his time had access only to dried herbarium specimens, which are often incomplete. Recent examination of living material, which is an essential part of work on gingers, suggests that the morphological characters used to separate *Hemiorchis* and *Gagnepainia* are greatly overlapping. Unless there are any strong clues from other disciplines like molecular analysis or cytology, it might be unnecessary to keep these genera apart.



▲ We were lucky last year to observe the formation of fruit in *Gagnepainia harmandii* – a rather unusual event, as most flowers fall shortly after flowering. The green, unevenly ovoid, ridged capsule opened by bursting and exposed a few, rather unripe-looking green seeds with translucent white arils. To our joy all successfully germinated.



▲ *Gagnepainia godefroyi* has flowers reminiscent of tiny butterflies (photographed from the living collections at RBG Edinburgh).



▲ *Gagnepainia harmandii* has greenish flowers with extended and exposed anthers and with intriguing white gland-like structures on the labellum. This is probably a highly specialized adaptation for pollination, but the true pollinators of all *Gagnepainia* species remain a mystery.

Jana Leong-Škorničková  
Herbarium

Photos by Jana Leong-Škorničková

# Stage programmes & the Clarins Learning Garden at the Singapore Garden Festival 2008

The biennial flower & garden event The Singapore Garden Festival returned in 2008 after a successful inaugural run in 2006. Spread over eight days from 25 July to 1 August 2008 at Suntec Singapore International Convention & Exhibition Centre, amidst beautiful floral and landscape displays, the SGF Stage Programme team proudly presented an ambitious repertoire of 63 enriching talks, demonstrations and performances. Also added into the mix this round were two competitions, the "PAassion Terrarium Making Competition" and "FairPrice's Fruit & Vegetable (Floral) Arrangement Competition".

Captivating 6,250 audience members over the eight days, trends show that the most popular categories were the floral demonstrations ("Nanyang Floral Harmony", "International Floral Designer Hour" and "Floral Art for Occasions"), the "International Garden Designer Hour", the "Cooking with Plants" and the "Gardening Guru" talks and demonstrations. For the "Nanyang Floral Harmony", past and present students, parents and teachers

had arrived in full force to support the three floral demonstrations by students of Nanyang Primary School. The other categories had their own set of very loyal supporters.

Stage programme audience numbers gradually increased during the day, significantly peaking between 2 to 4pm in the afternoons. At a glance, the audience profile showed working adults (probably taking time off from work to visit the show), homemakers, retirees and senior citizens. Noteworthy to mention though, is a second peak between 7 to 8pm; likely the after-office hours, 'catch-the-show-before dinner' crowd. The weekends, especially Sunday, pulled the biggest crowds.

The twelve sessions of "International Floral and Garden Designer Hour" attracted 1,234 people. Singapore's own home-grown but internationally recognised talents, Damien Koh and Irene Hee, also impressed the audience with their own signature brand of floral arrangements through the "Floral Art for Occasions", attracting 770 people over four sessions. The eight sessions

of "Cooking with Plants" saw a loyal following of 1,032 attendees. The ten sessions of "Gardening Guru" drew a crowd of 948, while the seven "Time with an Orchid Expert" sessions, represented by speakers from Orchid Society of South East Asia (OSSEA), Nanyang Orchid Association and NParks, attracted 547 people. To cater to the audience better, as many talks as possible were held bilingually, in both English and Mandarin. Other features included a talk on "Great Botanic Gardens of the World" and book signing by Sara Oldfield (102 people); five performances by Hwa Chong Institution (College) Chinese Orchestra, Black Forest Band & 4-Thirty Band which attracted 431 people; two talks on "Nature Photography" (125 people) and ten "Retailer's Special" (584 people).

In response to feedback from the inaugural festival in 2006, the "Clarins Learning Garden" was added to SGF 2008 to cater especially to our young visitors. This garden, in a thematically focused landscape setting, aimed to expose students to the appreciation of



nature and the importance of how our actions affect our environment. SGF 2008 saw the debut of the "Carbon Footprint Game", created jointly by Cicada Tree Eco-Place (CTEP), Clarins and NParks. The game, brought to life by the passion, commitment and enthusiasm of the Clarins facilitators, attracted much participation from schools and members of the public. At least 25 facilitators from Clarins were trained to run this game by CTEP co-founder Vilma D'Rozario. Another activity offered over the eight days in the Learning Garden was the new tour called "Hug A Tree: Sara Goes Carbon Footprinting". This one-hour tour-cum-storytelling session introduced young visitors to the many little but important things that all of us can do to make a difference for our home, Planet Earth! Through the latest book *Sara goes Carbon Footprinting*, young participants were also acquainted with some useful and multi-purpose trees. The book, written by the director of the Singapore Botanic Gardens, Dr. Chin See Chung, and assistant director of visitor management, Yap Siow Hong, is the fourth in the *Sara the Dinosaur* series. The Clarins Learning Garden attracted close to 6,500 visitors - junior and senior. More than 1,600 Primary 1 to 4 students from Nanyang Primary School took part in the Carbon Footprint Game. Close to 700 children had participated in both the board game and "Hug a Tree" tour, through their childcare centres and kindergartens.

There was also a visit by 36 special-needs students from Pathlight School. Aside from the above school groups, we registered a total of 4,176 walk-ins to the Learning Garden, with Sunday peaking at close to 900 visitors.

The excitement of young visitors was unmistakable when they were introduced to the many fruits trees used in the landscaping of the Learning Garden. Children were also given the chance to (literally) hug the three mature and fruiting coconut palms in the Learning Garden. Exhibition posters produced by CTEP on Eco-Living, embracing our natural heritage and good eco-habits were also on display. These posters are part of a comprehensive set of exhibition panels which will be making their way round to schools all over Singapore.

The Learning Garden became a comfortable zone for parents to leave their children for an hour or two, so as to allow them to complete their walk and enjoy SGF 2008 and shop around the Marketplace - just next door to the Clarins Learning Garden. Some children were so engrossed while playing the carbon footprint board game that they forgot all about their parents!

Last but not least, the success of the SGF Stage Programmes and Clarins Learning Garden would not have been possible without the dedication, commitment and enthusiasm of our wonderful team of 30 duty officers, the

ever professional and supportive PICO and audio-visual team.

*Page 32, left:*  
National Development Minister, Mah Bow Tan (in tie), joining students of Nanyang Primary School, having a go at the Carbon Footprint Game.

*Page 32, right:*  
PAssion Terrarium Making Competition. (a bird's eye view).

*Page 33, left:*  
Proud winners of the PAssion Terrarium Making Competition.

*Page 33, right:*  
Participants hard at work (Fairprice's Fruit & Vegetable Arrangement Competition).

**Koh-Low Neok Chein**  
**Seri Hayuni Hadi**  
**Janice Yau**  
*Education*

*Photos by Winnie Wong unless otherwise stated.*



Part of the work of the researchers at the Gardens is to think of names for new species, subspecies, varieties (and less commonly genera) of plants whenever they come across them in the herbarium. Since the form of a latin binomial name created by Linnaeus was formally adopted by botanists, it is necessary to try and sum up the essence of a new plant taxon in a single epithet after the genus name, or in the case of a subspecies or variety after the species name. In many cases, plant names are of relatively straightforward derivation, often referring to the gross morphology of the plant (e.g., *Begonia longifolia*) or where it was found (e.g., *Magnolia singaporensis*). Another common way of deriving an epithet is through the commemoration of the collector, such as *Dendrobium ridleyi*, one of 215 species named after the first director of the gardens, H.N. Ridley, or *Monophyllaea chinii* named after our current director.

# Name calling...

Other names are of slightly more roundabout or even frivolous derivation. Forever destined to be the first in any alphabetical list of plants is the orchid genus *Aa* coined by Reichenbach, whose etymology is obscure but is possibly derived from the first and last letters of the genus name *Altensteinia* from which *Aa* was separated. Another possibility is that it honours the Dutch publisher Mynheer Pieter van der Aa, but many think the name is purely the result of Reichenbach's whimsy. At the opposite end of the scale is the rather jarring *Zyzyxia*, a genus of Asteraceae from Guatemala. Guatemala is also the source of inspiration for another genus name, *Guamatela*, an anagrammatic derivation for a genus of Rosaceae found in that country. Another whimsical genus name is *Hebejeebie*, described in 2003 as a new genus allied to *Hebe* and so called because of the anxiety caused to taxonomists in placing this taxon satisfactorily into a higher classification.

Sometimes what appears at first sight to be a simple name can hold a long story of love, hardship or rivalry, and often

also more than a little humour. The delicate-sounding term '*isabelline*' turns out to have a rather sordid derivation; although of somewhat questionable validity, the story is too good to resist. The Archduchess Isabella was daughter to the Spanish King Phillip II, and she married the Austrian Archduke Albert in 1598. In 1601 Spanish troops led by Albert laid siege to the Dutch-controlled Ostend. Isabella vowed not to change her undergarments ('linens') until Ostend fell into Spanish hands, but as the siege lasted three years one questions the wisdom of her decision. Eventually, Albert and Isabella were able to enter Ostend in triumph, but the town was in ruins and Isabella wept at the desolation. One wonders if Albert wept also, if for entirely different reasons. The Archduchess' name is now forever associated with the colour of soiled calico; *isabelline* is used to refer to a dingy, tawny yellow, such as in

*Tournefortia isabellina*, a plant covered in dull yellowish brown hairs.

The airplant genus *Tillandsia* was named by Linnaeus after the Finnish botanist Tillandz. However that was not his original name, or so the story goes. On a sea voyage across the Gulf of Bothnia between Finland and Sweden, Elais Tilliander was so "harrassed by Neptune" that he made the return journey on land, a distance of 2000 rather than 200 miles. As a result of his harrassment, he changed his name to Tillandz, meaning 'by land' in his native tongue. Linnaeus named the genus *Tillandsia* in recognition of the plants intolerance of wet and waterlogged conditions.

Naming a plant after someone is not always an honour for the recipient, as taxonomists can also make gentle digs via the names they create. The genus *Sigesbeckia* was named by Linnaeus for a group of rather noxious, creeping weeds after his critic and rival Johan Siegesbeck, who later denounced Linnaeus' sexual system of classification (see Gardenwise

30, p. 33) as a 'licentious method', and worse. A more direct insult was intended by Werner Greuter working in Berlin when he coined *Trifolium infamia-ponertii*, in response to what he saw as sloppy and inaccurate work by the Czech botanist Ponert. In a footnote he explained '*Nomen inventorum rationis plantas nunquam visas denominandas commemorat*', meaning he created the name as a reminder of what happens when botanists (specifically Ponert) name plants they have not seen.

However, in the world of etymology it would seem that entomologists definitely have more fun, as testified by the names of the wasp *Aha ha* and the beetles *Agrava* and *Ytu brutus*...



**Mark Hughes**  
Herbarium

Above:  
A specimen of the weed *Sigesbeckia*, named after Linnaeus' bitter rival Johan Siegesbeck

Page 35:  
*Tournefortia isabellina*, a reminder of the determination of a Spanish Archduchess. Image taken with permission from Miller, J.S. (1999). *Novon* 9: 233.



*Trichocentrum stacyi.**Masdevallia peristeria.**Brassavola cordata.*

## Tropical American orchids in the Gardens

We are often so overwhelmed by the large number of showy orchid species found here in South-east Asia that we almost forget that the orchid family is also astoundingly diverse in the American tropics. In fact, the species number there is even higher than here in tropical Asia. By far the greatest diversity is found in the cloud forests on the slopes and in the valleys of the Andes mountain range which are among the richest orchid habitats in the world. There are several large orchid groups in tropical America which are not found in other parts of the world, like the *Epidendrum–Laelia–Cattleya* group, the *Pleurothallis–Masdevallia* group, the *Maxillaria* group or the *Oncidium* group, all of them with one to several thousand species. Some of the American orchids have become very desirable objects in horticulture; noteworthy examples are the species and hybrids of *Cattleya*,

*Laelia* and *Oncidium*. The collections of the Gardens are obviously specialised in South-east Asian orchids, with *Paphiopedilum*, *Spathoglottis*, *Arundina* and the showier species of *Dendrobium*, *Coelogyne*, *Phalaenopsis*, *Vanda*, *Renanthera* plus their hybrids featuring most prominently. Nevertheless, a number of tropical American orchids can be seen in the National Orchid Garden especially at the Orchidarium and in the Coolhouse, and some of these continue to amaze visitors.

*Sobralia decora*, growing abundantly in the Orchidarium, has attractive pink flowers on top of reed-like stems that can grow to nearly a metre tall. This species can grow on the ground (terrestrial) or on trees (epiphytic), and occurs from Mexico southwards to Brazil. The flowering is much like that of our South-east Asian Pigeon Orchid *Dendrobium*

*crumenatum*, in that the flowers seldom last for more than a day but appear all at the same time on different plants in an area, and it is thought that in this species mass flowering is also stimulated by a drop in temperature.

The *Epidendrum–Laelia–Cattleya* group is well represented in the Gardens. In this group, *Brassavola cordata* is a common epiphyte in the Orchidarium and comes from Jamaica. Its large greenish-white flowers with white lip are in sharp contrast to the tree bark and look striking in poor light conditions. An interesting feature of this genus are the thick-fleshy and often pencil-like leaves. Also in this group are *Encyclia cochleata* and *E. chacaoensis* (both now in the genus *Prosthechea*), growing in the Orchidarium close to the waterfall. There are also a few plants of *Epidendrum* on display. *Cattleya* and *Laelia* are not very popular in our Singaporean climate, as they require low temperatures to be able to flower.

Due to their origin in the cooler forests of the Andes the plants of the *Pleurothallis–Masdevallia* group can only



*Maxillaria tenuifolia.*



*Trigonidium egertonianum.*



*Encyclia chacaoensis.*



*Gongora quinquenervis.*



*Oncidium ornithorhynchum.*



*Encyclia cochleata.*



*Sobralia decora.*



*Maxillaria luteoalba.*

be grown in the Coolhouse. The group comprises well over three thousand species, and the number is still growing as new discoveries are made frequently. The plants are usually rather small and are epiphytes or less commonly terrestrials and lack pseudobulbs. By far the most popular genus is *Masdevallia* (570 species) with often long-caudate (tail-like) sepals. An example is *M. peristeria*.

In the Orchidarium one can find *Trigonidium egertonianum* with its unusual flowers, made up by a brownish-yellow sepal tube and two similarly coloured petals with bluish-purple eye spots. The species occurs naturally in Central America and the northern part of South America. The related *Maxillaria tenuifolia*, native to Central America, grows well next to the cold-air inlets in the Coolhouse. Its red flowers are mottled with yellow or white, and are quite fragrant. Another species in this large genus is *M. luteoalba*. The related *Promenaea xanthina* is an attractive little orchid native to Brazil. Its flowers are yellow and fade to white when older. *Gongora quinquenervis* from Colombia

to Peru and Brazil has bizarre looking fragrant flowers on thin and hanging inflorescences, and does not really look orchid-like at first sight.

The *Oncidium* group is rather popular here in Singapore, as several species and their hybrids grow well outdoors. The group is distributed in all parts of South America, the Caribbean Islands, Central America and the southern USA. It comprises epiphytes and exhibits great diversity in its pseudobulbs and leaves. Such a popular group in horticultural circles has obviously attracted lots of attention also among botanists. Following recent molecular research at Kew Gardens, UK, the entire group was newly classified and the large genus *Oncidium* was split into several different genera. In the Singapore Botanic Gardens a large display of yellow-flowered *Oncidium* hybrids, *Oncidium Gouldiana* or more recently replaced by *Oncidium Golden Wish*, form a mass display near the entrance to the National Orchid Garden and have become a major tourist attraction. Apart from these showy hybrids there are also a few species on display, like *Trichocentrum*

*stacyi* (*Oncidium stacyi*), growing in a big clump in the Orchidarium. This species, which is native to Bolivia, has interesting pencil-shaped hanging leaves growing to a metre in length. *Oncidium ornithorhynchum* grows in the Coolhouse and comes from Central America.

**Hubert Kurzweil**  
Herbarium

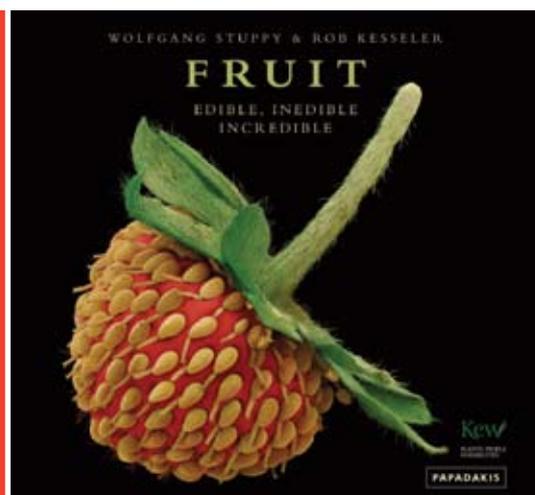
**Yam Tim Wing**  
Orchid Breeding and  
Micropropagation

Photos by Hubert Kurzweil

# FRUIT - Edible, Inedible, Incredible

by Wolfgang Stuppy & Rob Kessler

Published in 2008 by Papadakis Publisher, London in collaboration with the Royal Botanic Gardens, Kew ([www.papadakis.net](http://www.papadakis.net)); ISBN 978-1901092-74-5; 264 pages in full colour. Price GBP 35 (approx. 80 SGD)



After the successful debut of visual artist Rob Kessler and pollen specialist Madeline Harley with *Pollen – The Hidden Sexuality of Flowers*, featuring the intriguing structure of pollen, Rob Kessler approached seed morphologist Wolfgang Stuppy and produced another award-winning book *Seeds – Time Capsules of Life*. Now the latter duo is back to complete the circle of plant reproductive secrets with the third (and last?) book *Fruit – Edible, Inedible, Incredible*.

One might expect that the same artistic idea presented third time around might affect the book's appeal. The good news is that it does not. It is once again a book when seen on someone's coffee table one can't really help it but to reach for it and give oooohhs and aaaahs, and that will last until reaching the last page. The high definition pictures from a scanning electron microscope look simply marvellous with the careful colouration applied. The paper is of wonderful quality and so is the print. The smooth pages with text printed in colors tastefully matching the color of the photographs makes you wonder what is on the next one. But, obvious beauty aside, what exactly is in this book?

Achieving continuity in their life cycles and the ultimate survival of their species is all that plants worry about – getting pollinated, producing fruits with seeds and getting them to a suitable locality in a favourable time of year so they can grow into new plant. Then the whole circle starts all over again. The meaning of the word 'fruit' seems to be heavily loaded in our everyday life to mean something edible, often sweet and juicy, but the true nature of fruit lies in embedding the seeds. Fruits can in fact be pretty dry, full of thorns, inedible or even poisonous. The main goal of fruit is to protect the seeds and ensure their dispersal. With tens of thousands of plants inhabiting various environments of the Earth, hundreds of different strategies to disperse seeds with the help of water, wind, animals and humans or even the plant's own mechanisms are reflected in the way the fruits have evolved.

This book reveals the whole range of the incredible diversity of shapes, colours and various unique structures associated with fruits, and is accompanied with extensive text explaining in great detail the evolution of the various types

of dispersal. It will most likely answer everything one may start wondering about, e.g. how and why fleshy fruits evolved and why some fruits are poisonous for humans and certain animals while others feed on them. The accompanying pictures showcase structures evolved to perform each strategy. The facts are presented in a historical context clearly showing that botanists were interested in diversity of fruit morphology and their classification early on in their attempts to understand plant kingdom.

It is fascinating to see the shapes of fruits one never imagined existed, but similarly intriguing is also the close look at the most familiar fruits we often pop into our mouth without giving much thought. I am sure that after reading this book, eating strawberries, grapes or bananas will become to be an even more exciting event!

Jana Leong-Škorničková  
Herbarium

# Monocot meeting in Denmark



The Fourth International Conference on the Comparative Biology of the Monocotyledons (commonly known as Monocots IV), combined with the Fifth International Symposium on Grass Systematics and Evolution, was hosted between 11-15<sup>th</sup> August 2008 by the H.C.Ørsted Institute, University of Copenhagen, in Denmark.

The event attracted more than 250 botanists from all over the world. Their common passion for monocotyledonous plants was clearly visible not only from the good attendance of the talks, but particularly from vivid conversation sometimes turning into heated debates during the coffee and lunch breaks. During the symposium, most of the monocot groups such as Palms, Grasses, Gingers, Ariods, Orchids, Sedges, Commelinids, Asparagales and Alismatales had their own sessions with talks communicating the latest progress in systematics, evolution, ecology and diversity. As well as the plant

group oriented sessions, there were a few sessions aimed at particular methodological approaches, so one could indulge in the latest progress in monocot genomes and genomics or hot issues being currently discussed in E-taxonomy. One session was dedicated to the systematics and evolution of plants which have developed special kind of parasitic relationships with fungi called mycoheterotrophy.

Nearly 80 posters were displayed throughout the symposium, and as time was assigned to a poster session everyone was able to meet the authors of the posters and discuss their work. Thanks to financial support from NParks, I was able to represent Singapore Botanic Gardens during the ginger session with a talk *Go with flow: genome size as a tool for untangling the evolutionary history of polyploid gingers*, co-authored with my cytology colleagues from Charles University and National Museum in Prague, Czech Republic.

The last day of the symposium was closed with a talk by Dr. Mark W. Chase. *Phylogenetics and evolution of monocots: a review and prognosis*, which wrapped it all up. After the official closing of the conference, the meeting venue for the Monocot V symposium was announced, so we can start looking forward to getting together again in 2012 at the New York Botanic Gardens.

The symposium was well organised and went without a hitch. I am sure everyone who attended Monocots IV would join me in saying a big thank you to the Danish organisers.

Above:  
Reception hosted by the Natural History Museum of Denmark in the glasshouses of the Botanical Garden in Copenhagen.

**Jana Leong-Škorničková**  
Herbarium

Photo by Jana Leong-Škorničková

# Singapore Garden Festival goes to Ellerslie International Flower Show

Singapore Garden Festival's (SGF) Best of Show award-winner will be wowing crowds in New Zealand come March 2009. Multiple gold award-winning Singapore designer Peter Cheok has been invited by the Ellerslie International Flower Show to recreate his award-winning 'Seeking Shangri-La' garden in the show's 2009 presentation on 11-15 March.

'Seeking Shangri-La' also won the People's Choice Award at SGF, which was successfully held from 25 July to 1 August 2008. The only show in the world to gather the world's top award-winning garden and floral designers under one roof, SGF 2008 attracted over 300,000 visitors, with an estimated 30% coming from overseas countries such as Australia, India, Indonesia, Malaysia and the United Kingdom. The 2008 Festival featured 18 show gardens and 14 floral displays by 35 designers from 17 countries, and some 40 orchid displays. Bringing with them their incandescent energy and passion for design and all things green and floral, the world's leading garden luminaries transformed Suntec Convention Centre into a veritable feast for the eye. The Festival was winner of six awards at the prestigious Pinnacle Awards held at the 53rd International Festivals and Events Association and Expo in the USA in September 2008.

Said Ellerslie International Flower Show Exhibition Manager Kate Hillier, "Seeking Shangri-La' has a real wow factor; it is both theatrical and at the same time horticulturally challenging. It will be a key feature of the show and we expect it to be a real showstopper."

'Seeking Shangri-La' highlights the issues of global warming and climate change, the

theme for the garden coming from the fictional place of Shangri-La created by British author James Hilton in the 1933 novel *Lost Horizon*. The garden illustrates the dramatic impact global warming can have on the environment and how nature will need to adapt to climate change. It uses an artistic combination of lighting and special effects to create a city submerged underwater, beneath a retreating glacier.

Only 28 years of age, Peter was also Best of Show Award and Gold winner at the SGF's inaugural presentation in 2006. His entry in 2006 was also highly acclaimed for its strong environmental message. In 2006, he won the Gold Award in the Retail Nursery category of the Landscape Industry Association (Singapore) (LIAS) Awards of Excellence.

Peter's team of designers were in Christchurch last month to scope out the site for the exhibition garden, talk with the project team and source plants for their exhibit. Ellerslie will be the first time Peter Cheok has exhibited internationally and says he is honoured to have been invited to exhibit at the prestigious garden show.

Dr Wong Wei Har, Festival Director, Singapore Garden Festival, said, "This is a significant milestone for Singapore Garden Festival, once again putting us on the world map among the world's top garden and flower shows. SGF is aimed at helping to promote industry development and horticultural excellence. This achievement is also an affirmation of the calibre of local talent we have in Singapore"

Terri Oh  
Singapore Garden Festival

'Seeking Shangri-La', created by local designer Peter Cheok, was awarded Best of Show at the Singapore Garden Festival 2008.



Benjamin Aw





Above:  
Dr. Tan addressing the meeting

Left  
Aquascape designed by Takashi

# The American Aquatic Gardeners Association Convention 2008

The American Aquatic Gardeners Association (AGA) held its 2008 convention in Atlanta City in the USA from 14-17 November. It was an informative, educational and fun gathering, attended by close to 200 people from diverse backgrounds, including aquarium plant collectors, aquascapers, fish hobbyists, plant growers, commercial sellers, and plant scientists. Some participants came a long way, such as from Mexico, the UK, Australia and Japan. For four days, the meeting was a lively forum for discussion on how to grow exotic species of aquatic plants, the latest aquarium plants in cultivation, and the art and science of aquascape design from invited speakers.

There were a total of six invited speakers who spoke on a wide range of topics, from iron uptake in aquatic plants, tissue culture techniques for aquarists, modern design in aquascape, to the dos and don'ts in building a large aquarium tank. Representing the Gardens, I was invited to give a talk on the taxonomy of aquarium mosses sold commercially in Singapore and Malaysia. Not known to many people, Singapore has become a

hot spot for the introduction and trading of aquarium mosses in recent years. My presentation illustrated the microscopic leaf characters used in the identification of aquarium mosses and discussed the problems encountered in the correct use of scientific and common names in aquatic moss plants. I also reported on the results of a preliminary study made by Ms Chishio Hidaka at the National University of Singapore in using DNA markers to identify of aquarium mosses.

The highlight of the meeting was a demonstration given by another invited speaker, Mr. Takashi Amano, who showed step by step how to design and build a large fish tank using drift wood, white and black pebbles, fine white sands, and a variety of aquatic plants, including mosses. Mr. Amano is the recognised master of aquascape design in Japan today.

In between meeting programmes, there were family and group oriented activities offered, such as a guided tour to see the famous Georgian Aquarium in downtown Atlanta, a cheered competition of members for the title of "The Iron

Aquascaper" in building a medium-sized aquarium tank under a time constraint, and an evening banquet with an interesting talk on collecting aquatic plants in Thailand by Ms K. Randall.

The last day of the meeting saw an open auction sale of aquarium plants and fish tank equipment and accessories brought by the participants and commercial shop owners. The meeting room suddenly became a noisy market place where a large selection of different aquatic plants were shown and called for the highest bidder.

The 2008 convention of the AGA was both memorable and extraordinary because it highlighted the need for a close interaction between science and art in the field of aquascaping and gave full recognition to the non-flowering plant groups bryophytes and ferns as bona fide ornamental plants, particularly suited for aquarium tank decoration.

**Benito C. Tan**  
*Herbarium*

*Photos by Karen Randall*

# Publications by Gardens staff in 2008

## Articles

- Buck, W.R. & **Tan, B.C.** (2008). A review of *Elmeriobryum* (Hypnaceae, Musci). *Telopea* 12: 251–256.
- Hughes, M.** & Hollingsworth, P.M. (2008). Population genetic divergence corresponds with species-level biodiversity patterns in the large genus *Begonia*. *Molecular Ecology* 17: 2643–2651.
- Kurzweil, H.** (2008). *Habenaria mandersii* (Orchidaceae) newly recorded from Thailand with notes on the *H. hosseusii* group. *Gardens' Bulletin Singapore* 60: 55–61.
- Kurzweil, H.** (2008). Studies in the *Peristylus tentaculatus*-complex (Orchidaceae) in Thailand. *Gardens' Bulletin Singapore* 60: 45–54.
- Kurzweil, H.** (2006; publ. 2008). The orchid genus *Disperis* in Thailand. *BGO Newsletter (Chiang Mai)* 14: 12–13.
- Kurzweil, H.** & Lwin, S. (2008). *Coelogyne ecarinata*. *Orchid Review* 116: 321–323.
- Leong-Škorničková J.** (2008). Order out of chaos: Linnean plant names and their types. *Edinburgh Journal of Botany* 65: 349–350.
- Leong-Škorničková J.**, Šída, O., Wijesundara, S. & Marhold, K. (2008). On the identity of turmeric: the typification of *Curcuma longa* L. (Zingiberaceae). *Botanical Journal of the Linnean Society* 157: 37–46.
- Leong-Škorničková J.**, Šída, O., Sabu, M. & Marhold, K. (2008). Taxonomic and nomenclatural puzzles in Indian *Curcuma*: the identity and nomenclatural history of *C. zedoaria* (Christm.) Roscoe and *C. zerumbet* Roxb. (Zingiberaceae). *Taxon* 57: 949–962.
- Lim-Ho, C.L., Khoo-Woon, M.H. & Quek-Phua, L.K.** (2008). In vitro propagation of Orchids through flower buds and flower stalk buds. In: *Proceedings of the Fourth Asia Pacific Orchid Conference*, pp. 106–112.
- Staples, G.W.** & Traiperm, P. (2008). New species, new combinations, and new records in Convolvulaceae for the Flora of Thailand. *Thai Forest Bulletin (Botany)* 36: 86–108.
- Thomas, D.C. & **Hughes, M.** (2008). *Begonia varipeltata* (Begoniaceae): A new peltate species from Sulawesi, Indonesia. *Edinburgh Journal of Botany* 65: 369–374.
- Yam, T.W.** (2008). A new Orchid hybrid registration scheme for Southeast Asian countries. In: *Proceedings of the Fourth Asia Pacific Orchid Conference*. Pp 208–211.
- Yam, T.W.** (2008). Conservation and re-introduction of the tiger orchid and other native orchids of Singapore. In P.S. Soorae (ed.), *Global Re-introduction Perspectives. Re-introduction case-studies from around the globe*. IUCN/SSC Re-introduction Specialist Group in conjunction with the Environment Agency-Abu Dhabi, UAE and the Denver Zoological Foundation, USA. Pp. 261–265
- zanthorrhiza Roxb.**, Bogor, Indonesia, May 2008.
- Leong-Škorničková, J.**, Šída, O. & Suda, J. Go with the flow: genome size as a tool for untangling the evolutionary history of polyploidy gingers. *Monocot IV Symposium*, Copenhagen, Denmark, 14 August 2008.
- Leong-Škorničková, J.** The amazing world of Gingers. *8th Annual National Biological Convention (ANBC) of Singapore Institute of Biology*, Singapore, 18 October 2008.
- Staples, G.** Some taxonomic problems in Indochinese Convolvulaceae. *1st Symposium of the Flora of Cambodia, Laos and Vietnam*, Phnom Penh, Cambodia, 8–14 December 2008.
- Yam, T.W.** Breeding of Vandaceous Orchid hybrids at the Singapore Botanic Gardens. *19th World Orchid Conference*, Miami, USA, 24 January 2008.

## Posters

**Kurzweil, H.** 2008. The genus *Habenaria* Willd. (Orchidaceae) in Thailand. *14th Flora of Thailand Meeting*, Copenhagen, Denmark, 18–21 August 2008.

**Staples, G.** & Traiperm, P. New discoveries in Thai Convolvulaceae. *14th Flora of Thailand meeting*, Copenhagen, Denmark, 18–21 August 2008.

Thomas, D.C., **Hughes, M.** & Richardson, J.E. Infrageneric relationships and character evolution of SE Asian *Begonia* L. *Young Systematists Forum*, London, U.K., 2 December 2008.

Tran, H.D., **Leong-Škorničková, J.** & Newman, M. The diversity of Zingiberaceae in SE Vietnam. *1st Symposium of the Flora of Cambodia, Laos and Vietnam*, Phnom Penh, Cambodia, 8–14 December 2008.

## Books

**Hughes, M.** (2008). *An annotated checklist of southeast Asian Begonia*. Royal Botanic Garden Edinburgh, 164 pp.

**Tan, B.C.** & Boon-Chuan Ho. (2008). *A guide to the mosses of Singapore*. Science Centre, Singapore, 149 pp.

## Electronic publications

**Kurzweil, H.** (2008). *Orchidaceae*. In: Snijman, D.A. et al. *Monocotyledons, ferns and quillworts of the Namaqualand-Namib Succulent Karoo, Tanqua-southern Great Karoo and Western Mountain Karoo, southern Africa*. Published on the internet ([www.sanbi.org](http://www.sanbi.org)).

## Papers presented

Ardiyani, M. & **Leong-Škorničková, J.** The Origin of *Curcuma zanthorrhiza* Roxb. – where is it native? *1st International Symposium on Temulawak (Curcuma*

## Botanical Research Fellows in the Gardens 2007-2008

The Herbarium (acronym SING) at the Gardens is the second largest herbarium in Southeast Asia, with about 650,000 specimens and over 7,000 type specimens. The Gardens annually offers several grants to botanists and PhD researchers in plant taxonomy from research institutions and universities around the world to carry out part of their research at the Gardens' Herbarium as SBG Research Fellows. In addition to giving the Herbarium access to global experts to curate the collections, the Fellowships also contribute to our understanding of the biodiversity and conservation of the regional flora, and highlight the role of the Herbarium as a research resource of global significance.



**Mr Ch'ien C. Lee** is affiliated with the Forest Research Center, Sarawak, and is a regional authority on *Nepenthaceae*. During his Fellowship visit to the Gardens' Herbarium (18<sup>th</sup> – 31<sup>st</sup> July 2007), a total of 498 *Nepenthes* specimens came under his gaze and were carefully re-annotated. He also gave a delightful talk on the Pitcher Plants found in Singapore and the adjacent region,

reporting on his sighting of a new species of *Nepenthes* from Sumatra, *Nepenthes jamban* – the species epithet being an Indonesian word for toilet, as the shape of the leaf pitcher of the new species remarkably resembles the toilet facility indicated, much to everyone's glee at the talk.



**Dr. Don R. Reynolds** (13<sup>th</sup> Oct – 04<sup>th</sup> Nov 2007) from University of California, Berkeley, visited to study epiphyllous *Ascomycota* (fungi that grow on leaves). He gave an enriching talk on "Tropical Canopy Fungi" describing in detail this group of little-known organisms. While in Singapore, Dr Reynolds made a number of collections from our nature reserves and the Gardens. The

collected material, together with the preserved herbarium specimens at SBG, will form the basis of a review and an annotated checklist of epifoliar species of ascomycetes from Singapore.



**Ms Rosario Rivera Rubite** (5<sup>th</sup> – 14<sup>th</sup> November 2007) is a PhD candidate from the University of the Philippines researching *Philippine Begonia* in collaboration with one of our research staff, Dr. Mark Hughes. Whilst at SING, she examined 690 *Begonia* specimens, and amongst these several new species were found. These will be the subject of a forthcoming paper; highlighting the biodiversity of

this group of plants in the Philippines and stressing their conservation importance.



**Dr. Zhang Li** (18<sup>th</sup> February – 2<sup>nd</sup> March 2008) from Fairy Lake Botanical Garden in Shenzhen of China came to the Herbarium to work on the bryophyte diversity of Hainan Island and its phytogeographical relationship with the bryophyte floras of the Philippines and Peninsular Malaysia. A very friendly chap, Dr Zhang Li examined 60 specimens and found two genera and nine species representing new

records for the bryoflora of Hainan Island. A publication is in preparation to announce these findings, and Dr Zhang Li also gifted the Gardens' Herbarium with 125 packets of well curated Hainan moss specimens.



**Dr. Duong Duc Huyen** (10<sup>th</sup> – 30<sup>th</sup> March 2008) from the Institute of Ecology and Biological Resources in Vietnam was here to study species of *Dendrobium* orchids for the Flora of Vietnam. His taxonomic revision of *Dendrobium* in Vietnam has now been completed after building on his past research using the Gardens' herbarium and library.

Dr. Huyen examined and studied 168 dried specimens of *Dendrobium* orchids collected from the region, 42 spirit specimens and 9 type specimens. He also kindly gifted a number of new publications on the Vietnam flora to the Gardens' Library.



**Ms Melanie P. Medecilo** (4<sup>th</sup> – 17<sup>th</sup> May 2008) is a professor at the Department of Biology at the De La Salle University–Dasmariñas in the Philippines. A two-week fellowship allowed her to research the complex Philippine *Alocasia*, in preparation for a taxonomic revision of this genus for the Philippine flora. She studied and annotated 289 of our herbarium specimens of *Alocasia* from the

Philippines, Peninsular Malaysia and Borneo, plus several spirit collections. Ms. Medecilo remarked that her Research Fellowship experience will strengthen the scientific quality of her revision work on Philippine *Alocasia*.



**Ms Kanjana Wongkuna** (11<sup>th</sup> – 28<sup>th</sup> June 2008) from Chiang Mai University was here to work on her dissertation project – "A Taxonomic Revision of *Fissidens* in Thailand". In collaboration with Dr. Benito C. Tan, the Keeper of the Herbarium, they identified some 50 packets of newly collected Thai specimens of *Fissidens* mosses brought by the visitor and discovered several new species

records as well as three new species of *Fissidens* endemic to Thailand. Together, they are preparing two manuscripts to report these new records and species. Ms Wongkuna also gifted the Gardens' Herbarium with 53 packets of Thai bryophytes.



**Dr. Ian M. Turner** (25<sup>th</sup> July – 4<sup>th</sup> August 2008), is a Research Associate of the Gardens and once held the post of Assistant Director of Living Collections, and hence is no stranger to the Herbarium. He received a Research Fellowship to return to the Gardens to work on a taxonomic account of the family Annonaceae for the Tree Flora of Sabah and Sarawak. A hardworking researcher, Dr:

Turner examined and annotated nearly all the huge amount of Bornean Annonaceae specimens kept in the Gardens' Herbarium.



**Dr. George Argent** (27<sup>th</sup> Nov – 10<sup>th</sup> Dec 2008) came from the Royal Botanic Garden Edinburgh in the UK to study and annotate the large collections of Ericaceae from Southeast Asia kept at the Gardens' Herbarium. He gave a colourful and inspiring talk on his many years of collecting and studying the group of *Vireya Rhododendrons* in tropical SE Asia. Like many other awarded SBG Research Fellows,

he also discovered several unmarked type specimens among the general herbarium collections, as well as several potential new species which are the subject of ongoing investigation.

## Key visitors to the Gardens (July to December 2008)

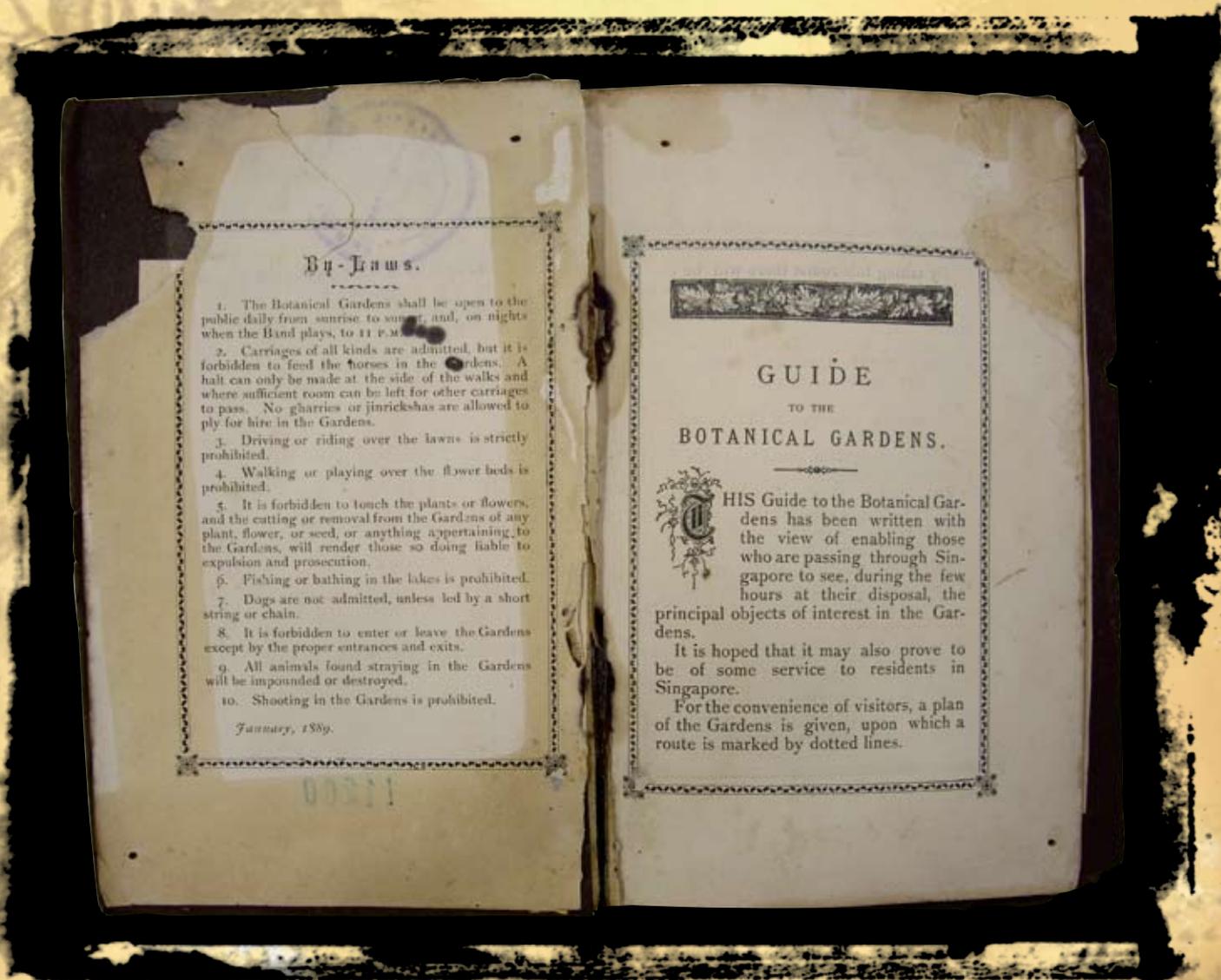
Name	From
Mr Albert Pintat and Mdm Carme Rossell	Prime Minister, Andorra
Dr Anne-Elizabeth Wolf	Museum National d'Histoire Naturelle, France
Ms Ariadna L. Burgos	Museum National d'Histoire Naturelle, France
Dr Benoit Carre	Museum National d'Histoire Naturelle, France
Mr Bian Zhi Qiang and delegation	Counsellor, Ministry of Foreign Affairs, People's Republic of China
Ms Chanida Sanguansab	Chulalongkorn University, Thailand
Mr Cui Guangzhi	Eco-city Administrative Committee, Vice-Chairman, Tianjin, People's Republic of China
Dr David Middleton	Royal Botanic Garden Edinburgh, UK
Mr Ebihara Kuniko and delegation	Miyazaki City, Japan
Dr Ed de Vogel	Nationaal Herbarium Nederland, The Netherlands
Dr Enki Tan	Board Member, Conservation International
Mr Flavio Fonseca	Ambassador, Embassy of Angola
Dr George Argent	Royal Botanic Garden Edinburgh, UK
Dr Gilles Thebaud	Institut des Herbiers Universitaires de Clermont-Ferrand Herbiers (CLF Herbarium), France
Dr Heike Culmsee	Georg-August-Universität Göttingen, Germany
Mr Huang Xingguo and delegates	Mayor of Tianjin, People's Republic of China
YB Dato' Ishak Bin Hj Ahmad and delegates	Director of Selangor Local Authority Institute, Malaysia
Dr Jill Cowley	ex Royal Botanic Gardens, Kew, UK
Dr Jiri Kvacek	National University, Prague, Czech Republic
Eng Jumaa Mubarak Al Junaibi and delegation	Head of Parks & Gardens, Abu Dhabi Municipality
Mr Khoo Ming Sheng	Center for Tropical Forest Science, Singapore
Dr Leonardo L. Co	Conservation International, Philippines
Mr Li Te-Chuan and delegates	Chairperson of the Research, Development and Evaluation Commission, Taipei, Taiwan
Dr Lillian Chua	Forest Research Institute of Malaysia, Malaysia
Ms Lisa Tsai	University of Phoenix, USA
Dr Margaret Johnson	ex Royal Botanic Gardens Kew, UK
Dr Marpha Telepova	Museum National d'Histoire Naturelle, France
Dr Martin Callmander	Missouri Botanic Gardens, USA
HRH Princess Mathilde	Belgium
HE Mrs Meritxell Mateu	Foreign Minister, Andorra
Dr Mike Pole	Queensland Herbarium, Australia
Ms Natasha bte Jamil	University of Malaya, Malaysia
HE Mr & Mrs S. R. Nathan	President & First Lady, Singapore
HE Dr Navinchandra Ramgoolam and Mrs Veena Ramgoolam	Prime Minister, Mauritius
Dr Peter O'Byrne	United World College, Singapore
Mr Peter Seligmann	Founder & Chairman of Conservation International
HE Quentin Bryce & Mr Michael Bryce	Governor-General and spouse, Commonwealth of Australia
Mr Robert Johns	Botanical Research Institute of Texas, USA
Mr Ronnie Liu and delegates	Selangor State Executive Member, Selangor, Malaysia
Dr Rosarin Pollawatn	Chulalongkorn University, Thailand
Dato Seri Mohammad Nizar bin Jamaluddin	Chief Minister of Perak, Malaysia
Datin Seri Jeanne Abdullah and delegation	Malaysia
Mr Shin Geon Gyu	Kyeongki Province, South Korea
Dr Sovanmoly Hul	Museum National d'Histoire Naturelle, Paris Herbarium, France
Dr Stuart Lindsay	Royal Botanic Garden Edinburgh, UK
Dr Thaweesakdi Boonkerd	Chulalongkorn University, Thailand
Mr Tran Huu Dang	University of Sciences, Ho Chi Minh City, Vietnam
Ms Yoshita Nathi	Chulalongkorn University, Bangkok, Thailand
HE Mr Wang Yang and delegation	Member of the Political Bureau of the Communist Party of China (CPC) Central Committee and Secretary of the CPC Guangdong Provincial Committee



Her Royal Highness Princess Mathilde of Belgium with *Spathoglottis* Philippe 'Mathilde', named to mark her visit to the National Orchid Garden on 27 November 2008.



HE Dr Navinchandra Ramgoolam, Prime Minister of the Republic of Mauritius and Mrs Veena Ramgoolam with *Dendrobium* Navinchandra Ramgoolam 'Veena', commemorating their visit to the National Orchid Garden on 9 October 2008.



## 1889 guide to the Gardens

In 1859 the colonial government of Singapore offered the Agri-Horticultural Society 24 hectares in Tanglin to set up a new garden as a pleasure park for its members. The Society ran into financial difficulty and in 1875 the government took over the Gardens and financed its operations. On 1 January 1875, the Garden was opened to the public. The Garden must have been quite a pleasant place to visit as it proved to be popular among visitors to Singapore as well as local residents. There were regular performances by the military band as well as periodic flower shows.

A Mr. Walter Fox, who was appointed as Head Gardener in

1879, prepared a little guide book, entitled *Guide to the Botanical Gardens*, in 1889. This 44-page historic guide gave an account of the conditions of the Gardens at the age of 30. A map of the Gardens was provided together with a plan of the Plant House. The latter was erected in 1884 and was the location for all the flower shows in the Gardens. The guide appears to have been written for visitors to Singapore, though it is, "...hoped that it may also prove to be of some service to residents in Singapore."

Ten By-Laws of the Gardens are listed at the start of the Guide. They can be read in the illustration provided and are of considerable interest; most of these still stand today although we

have never been called to enforce No. 10! In line with its target audience, the guide also gives a brief account of the climate, population as well as the import and export trade of Singapore. The guide takes the reader on a loop through the Gardens starting from the Main Gates and on to the various lawns where plants and objects of interest are highlighted, and lists of plants grown at that time are given in the appendices.

Christina Soh  
Library

Photos by Jassy Phua