

Gardenwise

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Message from the CEO

The economic downturn has put the skids on development and construction programmes in Singapore. Amidst the gloom that this has occasioned, glints of the proverbial silver lining catch light. In the sustained period of financial growth that Singapore had enjoyed till recently, many Singaporeans have achieved much material success. Maturation in civic, cultural, aesthetic and environmental sensibilities and sophistication has not kept pace. A most obvious testimony to this is the way established residential estates all over Singapore are being re-developed and "up-graded". Older homes designed to suit the local climatic conditions and in proper scale to their lots are being replaced with ostentatious edifices that trumpet the material attainments of the new owners. Since built-up square footage denotes "value", these new structures have expanded to the very boundaries of the individual properties at the expense of previously existing open space and greenery. Looking so much like a fleet of luxury

yachts at dry dock, these properties hopefully serve as markers of a phase rather than an epoch in Singapore's history.

Public buildings in Singapore have not escaped this trend unscathed. Thus much trepidation preceded the planning of the Singapore Botanic Gardens Visitor Centre and NParks HQ complex. A team, equipped with the professional skills of an architect, botanist, landscape architect and horticulturist was formed to work on the project. The concept they produced had to be sensitive to the site, respect the concerns and tradition of a venerable botanic garden, and preserve the ambience of the original environment.

Some major groundwork had been put in place to help the planning process. The segment of Cluny Road which cut across the middle of the Botanic Gardens was expunged and the two halves rejoined, thereby facilitating the development of the central core in the Gardens' Master plan. At this site, the demolition of a three-storey apartment block, which used to house the day labourers of the Gardens, as well as the removal of some old buildings along the stretch of Dalvey Road which intersected Cluny Road freed up the site for planning. A grand old rain-tree (*Samanea saman*), formerly tucked away in a backyard, now gains dominance of the valley.

Flanked by the Gardens' patch of original forest rising on one side, and a hillock with the historic E.J.H. Corner House on the other, this tree has become the focal point and centerpiece of the subsequent development. It sets the scale for the project and frames the complex housing the new Visitor Centre for the Gardens and corporate headquarters for the NParks Board. The architect, with heightened sensitivity to the site, has tucked the corporate block into the hillock at right angles to the Visitor Centre, orienting the side of the office block to the visitor entering the complex to further de-emphasize its presence. The forest is unconstrained, and allowed to sweep into the site through the careful choice of species and placement by the botanist, landscape architect and horticulturist.

Mr. Lim Hng Kiang, Minister for National Development and Second Minister for Finance, launched the development of the project in 1995 when he was Acting Minister for National Development. It was thereby fitting that he was the Guest of Honour for the opening ceremony on 10 December 1998. Now, time will test and assess the prowess of the team in getting the feng shui of the National Parks Board Headquarters and the Singapore Botanic Gardens Visitor Centre right.

Dr Tan Wee Kiat

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Front Cover : A view of the new Visitor Centre



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BONSAI

Bonsai originated in China, as far back as the Tang Dynasty over 1,200 years ago. It was introduced to Japan some 700 years ago, where the art was refined to perfection. Subsequently, it spread from Japan to the West and other parts of the world in the 19th century.

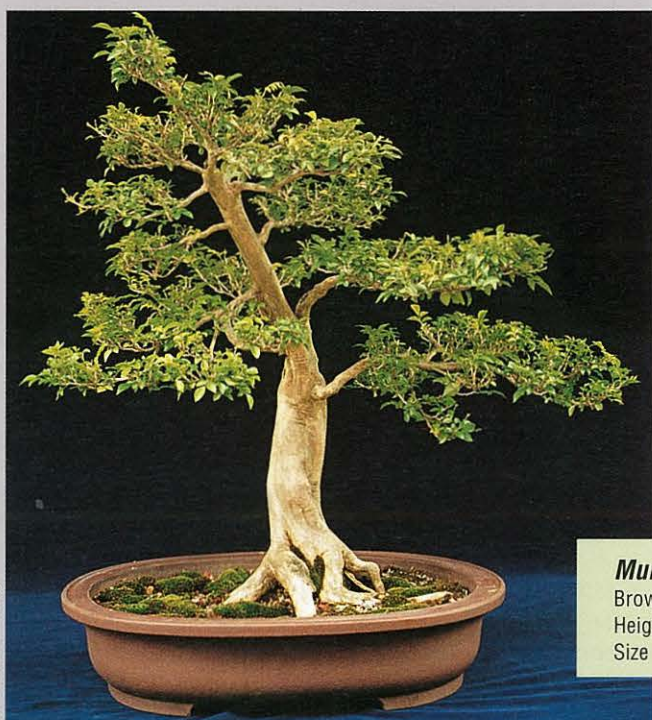
plant and a bonsai plant is very distinct. In the case of an ordinary plant, the grower concentrates on getting a lush healthy plant often with flowers and fruits, whereas in bonsai, the emphasis is on styling and shaping of the trunk and branches. In addition, one needs to carry out pruning constantly to control the size of the

leaves. The art of bonsai aims to re-create nature and bring out the charm and beauty of miniature plants, yet showing no trace of human touch.

Recent trend favours training through the process of pruning rather than wiring in order to

achieve an even more natural and realistic appearance. The “Lingnan” School of China has developed a special technique of pruning, whereby eliminating all wiring work. Tree specimens chosen should be based on their genetic characteristics, such as growth rate and habit, size and shape of leaf, density of growth and branching arrangement, etc. It is advisable to select plant species that have small leaves, small flowers and compact growth. Another major factor for consideration is the plant’s ability to sustain growth within a restricted container. The container should be chosen to match the characteristics of the plants to create a harmonious effect.

The bonsai collection of the Singapore Botanic Gardens had been on public display at the “Bonsai House” from

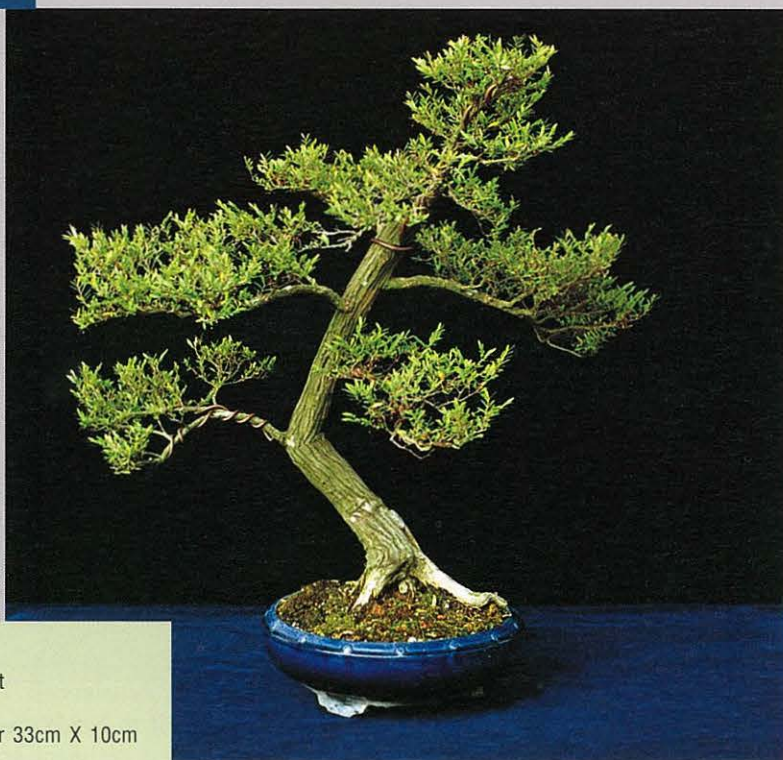


Murraya paniculata

Brown oval unglazed Chinese pot
Height of plant : 54cm
Size of pot : 54cm X 40cm X 10cm

Bonsai is a Japanese term and consists of two Japanese words, ‘bon’ meaning a shallow container and ‘sai’ meaning a plant. Basically, bonsai is the art of keeping miniature trees or shrubs in small containers. In China it is called “Penjing” or potted landscape. It is sub-divided into “Landscape Penjing” for which plants are laid into miniature gardens or landscapes, and “Tree Penjing” for which the plants are appreciated for their individual natural beauty.

To create a good bonsai, one needs to have (1) horticultural knowledge to keep plants healthy, (2) pruning, trimming and artistic styling skills, and (3) a great deal of time and patience to train the plant. The difference in growing an ordinary



Phyllanthus myrtifolius

Blue round glazed Chinese pot
Height of plant : 66cm
Size of pot : diameter 33cm X 10cm



***Melaleuca bracteata* Golden Gem**

Brown rectangular unglazed Chinese pot
Height of plant : 64cm
Size of pot : 36cm X 26cm X 9cm



***Bougainvillea* cv Mrs Eva**

White square glazed Japanese pot
Height of plant : 40cm
Size of pot : 15cm X 15cm X 12cm

BONSAI, continued from page 3

1986 to 1991. Due to redevelopment of the Gardens, the collection is now housed in the Plant Resource Centre. Plant materials used are from tropical and sub-tropical regions. They are of different styles and shapes, ranging in height from 15 to 165 centimetres. There are a total of 120 specimens including: *Adenium*, *Bambusa*, *Bauhinia*, *Bougainvillea*, *Carmona retusa*, *Ficus*, *Gmelina*, *Ixora*, *Juniperus*, *Murraya paniculata*, *Pinus*, *Phyllanthus*, *Pithecellobium dulce*, *Podocarpus*, *Rhapis*, *Sagaretia*, *Serissa*, *Schefflera*, *Ulmus parvifolia* and *Wrightia religiosa*.

Our emphasis is on the use of tropical species for bonsai. Many local species, however are a little difficult to train as they tend to have too few leaves, brittle branches and straggly branching. Therefore, selection of the right plant material and the combination of skill and patience are even more crucial to the successful creation of bonsai of local plants.

A few tropical species that we have successfully transformed

into attractive bonsai are described below:

***Murraya paniculata* (Rutaceae)**

Murraya paniculata is a shrub, native to parts of India and Southeast Asia. The trunk is strong and a light yellow colour. It has pinnate leaves with 3-9 glossy green leaflets. The inflorescence consists of 2-6 flowers which are white and strongly scented. These give rise to orange-red fruits. It is a popular plant for bonsai and is selected for its dense foliage of glossy green leaflets and the fragrance of its blooms.

***Melaleuca bracteata* Golden Gem (Myrtaceae)**

Melaleuca bracteata Golden Gem is an Australian plant with rough grey bark. The fine leaves when young are golden yellow but turn green at a later stage. The golden yellow leaves and the interesting bark, combine to produce a vibrant, attractive and beautiful candidate for bonsai. However, one setback is the difficulty in training the young branches, due to their brittleness. The advantage is that it is hardy and free from pests and resistant to diseases.

***Phyllanthus myrtifolius* (Euphorbiaceae)**

Phyllanthus myrtifolius is a small shrub and is native to Sri Lanka. The fine leaves are arranged alternately on gracefully arching branches and the plant bears pink flower on long stalks. The relatively small leaves and attractive flowers make this plant especially suitable for bonsai. It appears to be free of pest and disease problems.

***Bougainvillea* cv Mrs Eva (Nyctaginaceae)**

Bougainvilleas were introduced from South America. Captivated by their brilliant colours, many new hybrids and varieties have been created by breeders. Amongst these, *Bougainvillea* cv Mrs Eva is a free flowering shrub commonly used for planting locally. The leaves when compared with other cultivars, are sharper and smaller. Branches are thorny with pink blooms. It thrives well under local conditions and is relatively pest free. The profuse flowering makes it attractive as a bonsai specimen.

Quek-Phua Lek Kheng
Dr Lim-Ho Chee Len
Tissue Culture Unit



the Dainty Mosses at the Singapore Botanic Gardens

Picture 1
Mossy forest found on
Gunung Brinchang of
Cameron Highlands,
Peninsular Malaysia.

Mosses are a group of small non-vascular plants that grow abundantly in humid and wet places. They form velvety, greenish carpets over rock and ground surfaces, along shaded paths, stream banks and on tree trunks. In high mountains in the equators as well as in temperate countries with high rainfalls, they festoon the forest with thick cushions and pendent drapes, creating a picturesque and magical world of mosses (picture 1). Ecologically, mosses play important roles in soaking up excess water during the rain, providing breeding

grounds and food sources for invertebrates, and protecting the soil from erosion (picture 2).

In Singapore, one sees large patches of mosses appearing on shaded cement walls, clay pots and decayed logs after weeks of rain. Few people, however, stop to look close at the tiny spore producing capsules standing up to the blow of the wind (picture 3). In many garden shows, mosses are used to create the miniature lawn for bonsai plants. And in greenhouses, they are used in potting materials for plant cuttings. Indeed, their inconspicuous forms and small sizes make them an under-exploited group of ornamental plants in the tropics.

There are more than 450 species in 135 genera of mosses known from the Peninsular Malaysia of which about 150 species have been reported for Singapore. In 1927, Dr. R. E. Holttum, then Director of the

Singapore Botanic Gardens, published a list of 48 species of mosses belonging to 24 genera collected from the Gardens. For this, he stated...

"The Gardens presents a fairly wide range of habitat for mosses, from the most exposed position on the ground or on trees to the shade of rockeries and the Gardens jungle; but there is no place so moist and shady as much of the natural jungle of the Peninsula. The (garden) conditions are on the whole artificial and this is reflected in the character of the moss flora; the more typical forest species are infrequent or absent..."

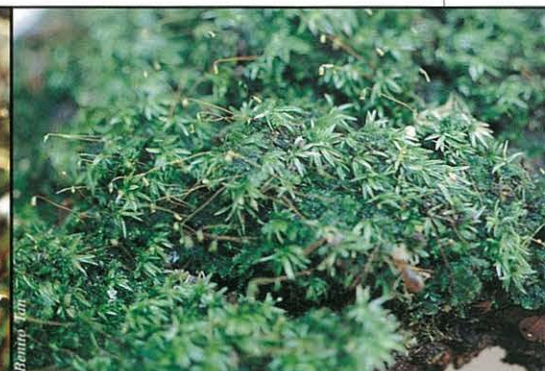
My survey conducted in 1998, mainly from the Gardens forest and the newly established National Orchid Garden, reveals that there are 45 species of mosses belonging to 23 genera. The more common are the *Calymperes*, *Leucophanes* (picture 4), *Isopterygium* (picture 5) and *Hyophila*. A handful of moss taxa reported by Holttum were not found during the survey. Most notably of these are *Campylopus serratus* and *Leucobryum sanctum* (picture 6), both of which were described in 1927 as very abundant locally. Since both species are forest mosses requiring good shade, their absence in the Gardens could be the consequence of a changed microclimate as the



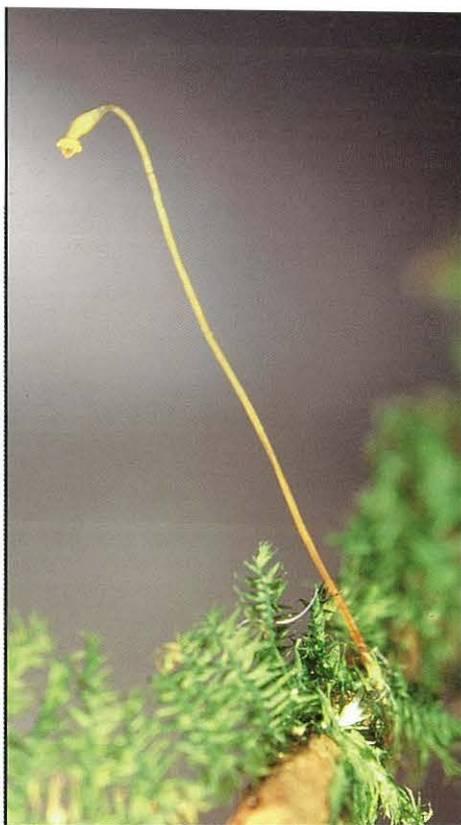
Picture 2
Large recent landslide covered with bryophytes.



Picture 3
Capsules of *Pogonatum*.



Picture 4
Population of *Leucophanes* with capsules, one of the common mosses seen in Singapore.



Picture 5

The sporophyte of *Isopterygium* with its long seta (stalk) and oblong capsule.



Picture 10

The presence of mosses adds a nice watery green color to the brownish rocky boundary of many garden plots.



Picture 11

Barbula (narrow leaved moss) and *Hyophila* (broadly ovate-leaved moss), two of the most weedy moss species found in the Gardens.



Picture 6

Close-up of leaves of *Leucobryum*, the so-called *Lumut putih*.

MOSSES, continued from page 5

surrounding environment of the Gardens became more urbanized over recent decades.

One can imagine Singapore having larger tracts of primary forests at the turn of this century. In fact, several mosses, e.g., *Myurium rufescens* and *Hypnodendron arborescens* (picture 7), collected from the Gardens by resident and visiting botanists in the 20s, represent plants of primary lowland rain forests. Their demise today in the Gardens is to be expected.

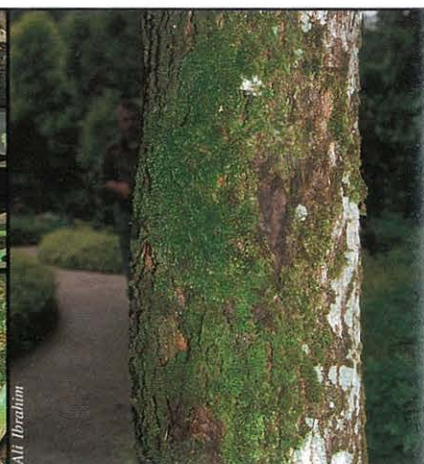
Other early garden collections had subsequently become the types of new moss species described. I know of three

mosses that have the Singapore Botanic Gardens listed as their type locality. Of these, *Trichosteleum singapurens* which was described in 1905 proves to be a widespread species in western Malesia while *Ectropothecium singapurens* remains a little known species, having been collected only once by Binstead in 1924 from an open grassy location in the Gardens. The other species, *Trichosteleum brachypelma*, is treated as a synonym of *Trichosteleum boschii*. I know of no other botanic garden around the world, which has become the type locality of a good number of moss taxa. For this reason alone, the Gardens deserves to be preserved for posterity.



Picture 12

Vesicularia, a common creeping moss found in shaded wet places. Several species were collected from wooden stands in the Gardens green houses.



Picture 13

Trunk of *Melaleuca* provides an ideal substrate for many mosses to grow and perpetuate.



Picture 7
Hypnodendron, a large and beautiful moss of primary forest that has become extinct in Singapore.



Picture 8
Fissidens, a rock moss found frequently in shaded garden ground.



Picture 9
Decorative Balinese statue at Tan Hoon Siang Mist House covered with mosses.

On the other hand, I have collected 7 mosses not reported in the 1927 list of garden mosses. One of these, the *Philonotis*, is a seasonal moss sprouting on wet soil, and disappears fast during the dry period of the year. Its presence in the Gardens may have been overlooked by past collectors. Others are small rock mosses such as *Fissidens guangdongensis* and *F. gymnogynous* (picture 8), and a species of *Calymperes* that has invaded a man-made habitat, the asphalt road.

One interesting find is a *Platygyrium repens*-like moss collected from the base of a tree at the National Orchid Garden. The specimen lacks the sporophyte and the adventitious

buds to confirm its identity. *Platygyrium repens* is a common moss of tree trunks in open forest in Eurasia and North America. Its presence in the Gardens, if confirmed, is another case of the inadvertent introduction of plants around the world through horticultural activities.

Within the garden compound, the National Orchid Garden supports a diverse local moss flora. Visitors to the Tan Hoon Siang Mist House to admire the showy orchids, such as *Cattleya*, *Paphiopedilum* and *Phalaenopsis*, can also witness the greening of several Balinese decorative idols resulting from the growth of mosses (picture 9). The rocks lining the boundaries of orchid beds and bordering the flowing streams and mini-waterfalls are likewise overgrown by mosses (picture 10) belonging to species of *Fissidens*, *Hyophila* and *Barbula* (picture 11). On wet wooden stands of potted plants too are large populations of species of *Vesicularia* (picture 12). Of great horticultural interest are the tree trunks of *Melaleuca* (picture 13) along the walking path leading to the Burkill Hall. Because of its bark texture, many epiphytic mosses are observed to be colonizing this new habitat. *Meiothecium microcarpum* (picture 14) an uncommon moss in Singapore,

was found on trunks of this exotic tree species introduced from Australia.

With continuous misting and the consequential increase in ambient air humidity, the National Orchid Garden can become a haven for many more kinds of mosses, which, in turn, will add color and atmosphere to this beautiful corner of the Gardens. Since botanical gardens function as ex-situ refugia for the increasing number of plant taxa which are endangered in their natural habitats, it is a praiseworthy institutional effort for the Singapore Botanical Gardens to conserve and display all forms of plant life, not just the seed plants.

I look forward to the establishment of a cool house planned for the growing of upland tropical plants. Such an environment is ideal for the re-introduction of the ombrophilous or moisture-loving mosses from the region's primary rain forests, many of which have become extinct in Singapore. The assisted re-establishment of these mosses at the Gardens, no doubt, will provide great horticultural and educational values to the local public.

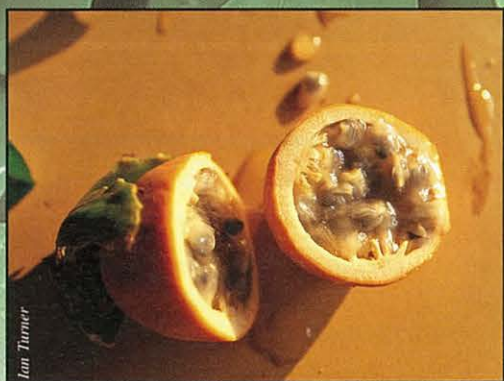
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Picture 14
Meiothecium microcarpum, an uncommon moss found growing on a number of tree trunks inside the National Orchid Garden.

PASSION

in the Gardens



The fruit of *Passiflora aurifolia* is known locally as buah susu.



The arrowheaded leaves of *Passiflora biflora*.



The flowers of *Passiflora aurifolia* have a corona striped in purple and white.

Passion-flowers, likewise passion-fruits, are members of the genus *Passiflora*.

The passion in either the vernacular or botanical names refers not to any actual or supposed influence of the flowers or the fruits on human emotions, but to the passion or crucifixion of Jesus Christ. Passion-flowers have very complex structures, and early Christian missionaries to South America, where most of the passion-flowers are found, used the shape and numbers of various parts to tell the story of the crucifixion. However, many species of *Passiflora* have extremely beautiful flowers and some have fruits with seeds encased in a tangy pulp, delicious to eat or squeezed to make a drink. People can indeed be passionate about *Passiflora*.

Passion-flowers are mostly climbing plants, using tendrils to grab hold of surrounding vegetation as they grow up. Once a nearby branch or twig is caught, the tendril coils up pulling the stem of the vine in close to the support. The passion-flowers generally have an extra set of appendages inside the petals known as a corona. In many species this consists of numerous fine filaments. The sexual parts are often raised on a stalk well above the petals, leading to the three-dimensional complexity of the flowers. A range of strong colours and pleasant fragrances add to the ornamental potential of the passion-flowers. Other species are grown for their highly esteemed fruits. These are berries with leathery skins. Despite providing luscious fruits, the rest of the plants are often very toxic due to the presence of cyanide-

producing chemicals in the leaves. When the plants are damaged prussic acid (HCN) is released which is highly poisonous to all animals.

Of the 400 or so species of passion-flower only about 20 are native outside the Americas. Southeast Asia only has a handful of indigenous species, none of which occur in Singapore. Many other species of passion-flower have been introduced deliberately or accidentally to the region, mostly to be grown for their attractive flowers or edible fruits. The Botanic Gardens' collection includes several examples. Perhaps the most attractive of which is *Passiflora coccinea* which can be seen growing on the Cluny Park Road fence opposite the School of Horticulture. The vermilion petals contrast spectacularly with the outer black and inner white filaments of the corona to produce a memorable floral display.

Passiflora biflora has more modest white flowers, but is made attractive by its unusual leaf shape. These are like rounded arrowheads, with the point attached to the leaf stalk.

Besides the planted passion flowers, all of the species that are found in Singapore as naturalized exotics also turn up in the Gardens as weeds from time to time. Probably the commonest is *Passiflora suberosa*. It grows well in semi-shaded places usually climbing up fences or tree trunks, and can be seen in the hedges and some of the wilder corners of the Gardens. It has small flowers, barely more than 2 cm in diameter and small purplish black fruits. The leaves of *Passiflora*



Passiflora suberosa, a common weed in the Botanic Gardens.

suberosa are very variable in shape, often with three lobes, but sometimes simple in outline.

Passiflora foetida, another native of tropical South America, can be encountered growing as a weed and climbing fences. The plant is covered in long, sticky hairs and is easily recognised by the three highly divided bracts that surround the flower and the fruit. Some Indian scientists have recently put forward the idea that the bracts may act like a sticky cage protecting the flower and developing fruit from attack by small insects. They showed that glands on the bracts secrete a solution that can break down protein. What is more, the bracts may also be able to absorb the digested material, making the passion-flower a carnivore. *Passiflora foetida*, literally 'stinking passion-flower', gets its name from the unpleasantly scented flowers. The fruit of this species is round, about 2 cm in diameter and orange in colour when ripe. It is edible.

The third weedy immigrant passion-flower is *Passiflora laurifolia*. This is the buah susu, which has large egg-shaped fruits that are edible. It is a bigger plant than the other two naturalized

species, growing over trees. The flowers are attractive with white bands on the purple filaments of the corona. It may be seen around the margins of the Rain Forest.

Ian Turner
Nature Conservation Branch



Passiflora foetida, a common weed of wasteground with its characteristic feathery bracts that surround the flower and the fruit.



Passiflora coccinea, a beautiful red passion-flower

The Gardens' Bougainvilleas



B. glabra cv. Formosa

Bougainvilleas (Nyctaginaceae) are native to tropical South America where there are at least eighteen species described. The three key species in the genus *Bougainvillea* are *B. spectabilis*, *B. glabra* and *B. peruviana* while the three major hybrid groups are *B. x buttiana* (*B. glabra* x *peruviana*), *B. x spectoperuviana* (*B. spectabilis* x *peruviana*) and *B. x spectoglabra* (*B. spectabilis* x *glabra*).

Those varieties belonging to the *glabra* group tend to flower throughout the year in Southeast Asia. Those of the *spectabilis* group are at their best only in the dry season while the *peruviana* group consists of periodic bloomers.

Although the species are not represented in the Gardens' collection, we do have 141 hybrids and cultivars. The Gardens' bougainvilleas are now mainly found in the Bukit Timah Core. This new home was established in 1996. Plants were re-located from Lawns B, E, L of the Gardens as well as acquired from external sources and planted in the Bougainvillea Plot near Ecolake in the Economic Garden.

As Bougainvilleas come in many colours, the Gardens' designer and horticulturists have chosen to arrange the collection in two major plots based on a colour theme. One plot features bougainvilleas with colours white to orange such as *B. Manila Hybrid*, and *B. Camarillo Fiestro*, while the other plot showcases the pink to red cultivars like *B. Elizabeth Angus*, *B. Mrs Eva*, *B.*

glabra cv. Formosa, *B. glabra* cv. Magnifica and more.

Bougainvilleas in the Singapore Botanic Gardens go back a long way. Our records show that we received a *Louis Wathen* from one Sir Andrew Caldecott on 21 May 1936. In this plant the orange-coloured bracts change with age, to a bright fiery rose pink. However this cultivar tends to be shy of flowering for no apparent reason.

Other "oldies" in our collections include *B. glabra* Cypheri which the Gardens received from the Royal Botanic Gardens, Kew on 4 October 1938 and *B. peruviana* Princess Margaret Rose from the Agricultural Society of Madras, India, on 25 May 1942. *Bougainvillea glabra* Cypheri with large, deep purple bracts and conspicuous yellowish flowers, is rampant in growth while *B. peruviana* Princess Margaret Rose has bracts which have been described as small, ruffled, pale pink. Its young plants often send out long climbing canes.

There are also "patriotic" naming such as *B. glabra* Singapore Girl, *B. glabra* Singapore Beauty,



B. glabra cv. Magnifica

B. glabra Singapore Pink, *B. glabra* Singapore White and *B. glabra* Pride of Singapore. Many bougainvillea cultivars have apparent synonyms which can be confusing. For example, Singapore Beauty is "synonymous" with Singapore Girl and Singapore Pink. It is thought that one of the contributing factors to this confusion is that as varieties were imported into various countries from different sources, more than one name may be given for the same cultivar. Another possible cause is that profit-oriented marketers who bring in cultivars often readily give the newly imported plants catchy names without consideration for their original identity.

Among the interesting cultivars in the Gardens' collection are the bi-coloured cultivars like *B. Mary Palmer* which is a mutation from another hybrid *Mrs H.C. Buck*. This mutated hybrid cultivar is magnificent when in flower. The bracts are large and variously coloured deep pink to white.

There are also the double-bracted cultivars which evolved by mutation from the cultivars of the *B. x buttiana* (*B. glabra* x *peruviana*) group. They have no flowers but instead produce densely packed heads of bracts in five distinct colours. Within the double-bracted cultivars, there are also those with variegated leaves, thereby adding to the range of variations within this group. An example from this group is *B. Coconut Ice*, a variegated-leaved variety with double bracts of white with pink tips.

An outstanding cultivar is Mrs Butt's bougainvillea. This is a natural hybrid discovered by Mrs R. V. Butt of Trinidad in a priest's garden in 1910. The crimson-bracted *B. x buttiana* with prominent flowers that are

white tinged with red, is famous for its wide distribution. The cultivar was introduced into the United States in 1913 and plants were sent to Kew Gardens in 1923. From there they were further distributed to New Zealand, India, Australia and other parts of the world. This plant is also in the Gardens' collection.

Bougainvilleas have simple needs. They are happy in the

sun and will reward you generously with a spectacular sight of colours if they are well taken care of. Come and see them in the Gardens and do bring your camera for you will want to capture the blazing display of colours on film.

**Camelia Marican
Wong Wei Har**
*Singapore Botanic Gardens
Management Branch*



B. cv. Manila Hybrid



B. cv. Mrs Eva

Highlights from the School of

SKYRISE GARDENS EXHIBITION '98

27 – 31 May 98

Skyrise Gardens Exhibition '98, the third episode in a series of exhibitions initiated in 1992 by the former Minister for National Development, Mr S. Dhanabalan, was staged at the Tropics Atrium of Suntec City from 27 – 31 May 98. The event served as a timely continuation of the Government's drive to encourage highrise dwellers to introduce greenery to their living environment and to take up gardening as an element of gracious and healthy living. The theme "A Tropical Garden In Every Home" was adopted for Skyrise Gardens Exhibition '98.

Similar to the previous two exhibitions, Skyrise Gardens Exhibition '98 saw multi-agency input. In addition to the regular organising agencies i.e. the National Parks Board, the Housing & Development Board (HDB) and the Primary Production Department (PPD), representation of the People's Association (PA) was welcomed. With its extensive network of Community Centres/Clubs and Resident Committees, PA's involvement greatly enhanced the objective and means to reach out to the HDB masses.

Planning started a year in advance by 10 sub-committees looking into the requirements of venue, design, sponsorship, finance, publicity, leasing of commercial booths, logistics, contest, launch and show management. As the event has a strong public outreach component, the public education arm of the School of Horticulture was tasked to play a spearheading role. The venue, Tropics Atrium of Suntec City, was selected on account of its central location, being well-served by public transport, good size carpark and office population. Moreover, its glass ceiling created a natural sunlit ambience for the exhibits.

On the morning of 27 May 98, Parliamentary Secretary of the Ministry of National Development (MND), Mr Koo Tsai Kee, opened the exhibition. A commemorative Transitlink card, the 2nd Edition of "Skyrise Gardening in Highrise Homes" – a guidebook for "skyrise" gardeners and the "Apartment Gardens '98 Contest", were also launched at the opening ceremony.

The anchor exhibits were life-size mock-ups of an Executive Apartment and a 5-room HDB apartment tastefully decorated with indoor plants. They demonstrated to the public on the choice



Launch of Exhibition by Mr Koo Tsai Kee, Parliamentary Secretary of the Ministry of National Development



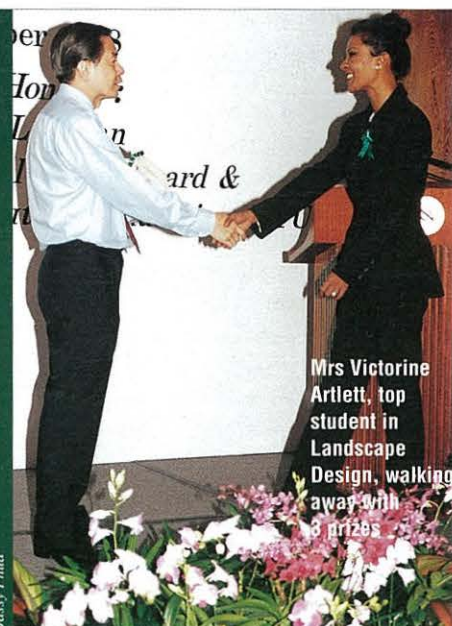
A relaxing moment in the 5-room Housing & Development Board mock-up.

22nd CONVOCATION

The School of Horticulture held the 22nd Convocation for its Diploma and Trade Certificate graduates at the Fort Canning Centre on 9 September 1998. The occasion, attended by some 300, witnessed the largest batch of graduands in the history of SOH.

In addressing the ceremony, the Guest-of-Honour, Professor Leo Tan, former Chairman of the SOH Council and present Chairman of the National Parks Board, commended on the progress that the School had accomplished since its inception in 1972. From a humble beginning with one programme and about 20 students, the School is now conducting 5 formal programmes with a combined student strength of some 160.

Notably, through its on-going endeavor to provide academic progression for its students and better the standing of the school, two new courses were introduced following the signing of a tripartite Memorandum of Understanding with Lincoln University of New Zealand and the Ngee Ann Polytechnic. The Advanced Diploma in Landscape Studies, a joint programme with Lincoln University, was initiated in July



Mrs Victorine Artlett, top student in Landscape Design, walking away with 3 prizes

Horticulture



Foong Thai Wu



Foong Thai Wu

Plant displays

of plants and some practical, effective and innovative ways to display them in restrictive areas. As in past exhibitions, the "Plant Clinic" was a draw, being highly consultative and interactive. Diagnoses and remedies were provided on-the-spot for a broad spectrum of pest, disease and nutritional problems associated with house plants. The new features included the "Plant Delights" – a display of new introductions, a special display of orchids suitable for "skyrise" gardens and a dish garden competition for children. Talks and demonstrations, and sale of plants and garden paraphernalia by commercial participants were the order of the days. Despite the economic downturn, sale was brisk.

The Singapore Gardening Society, the Orchid Society of South East Asia, the Nanyang Orchid Association, the Singapore Penjing Society, the Singapore Institute of Landscape Architects, the Institute of Parks & Recreation and the Singapore Society for Soilless Culture provided further garnishing with their interesting and informative displays. A number of nurseries supported the event by offering an island-wide plant sale over the exhibition period.

Some 52,000 visited the exhibition over the 5-day period. Among these were 3,965 members from 75 Resident

GARDENS EXHIBITION, continued on page 14

HOBBY FAIR '98



George Tay

Hobby Fair '98. The Prime Minister (centre) visits.

The public education arm of the School of Horticulture is a regular participant in the "Hobby Fair," a biannual exhibition on hobbycrafts, organised by the People's Association. This year, the Fair was organised as part of the Singapore Carnival, a national event to mark the close of the National Day '98 celebrations.

Preparations of the "Hobby Fair" segment got underway in January 98 and an in-house team comprising Janice Yau, Andrea Kee, Dr Foong and Hayuni Hadi was formed to look into the display concept and attendant material and logistical requirements.

On the morning of 29 August 98, materials were moved to site and the team let its creative juices flow. Under the careful eyes of Andrea, a simple but effective display of aquatic plants came together – a design that those interested could follow. The environmentally-controlled growth chamber on loan courtesy of Orchidville Pte Ltd, made possible the display of a wider range of plants for indoor conditions portraying a novel high-tech means of plant cultivation. An exhibit of vegetables and herbs grown hydroponically was kindly put up by Dr Mallick Rahman.

At the break of dawn on 30 August 98, we were on site to give the displays the finishing touches. The event commenced at 9 am with the "Great Singapore Workout" led by the Prime Minister. We were much encouraged by his stopover at our booth and his few kind words. Despite intermittent inclement weather, about 60,000 visited the Carnival and some 9,600 viewed our displays. Those who expressed interest in gardening and nature appreciation were added to our mailing list.

Albeit a one-day event, the large turnout at the Carnival had made our efforts to promulgate gardening as a hobby, very worthwhile.

Janice Yau
Education Branch

1997. The first intake, which now stands at 19, is into the second year of the programme. Students have performed well in the first year. Those who successfully complete the programme are eligible for admission to the 3rd year of Lincoln University's 4-year Bachelor of Landscape Architecture programme. The School together with the Ngee Ann Polytechnic launched the 3-year full-time Diploma in Horticulture and Landscape Management in July this year. The response was overwhelming. 42 applicants were finally selected from over 80 for the first intake.

For the first time, certificates of appreciation were awarded as a tribute and recognition to past and present part-time lecturers and trainers for services rendered to the School. In the words of the Principal, they are really the unsung heroes whose contribution to the School has gone somewhat unacknowledged. What is a school without its instructors?

The 48 Diploma and 30 Certificate recipients received their awards amidst rounds of heartfelt congratulations and resounding applause.

Foong Thai Wu
Nashita bte Mustafa
Education Branch

Tan Choon Hooi
Janice Yau Chew Kuan

FROM THE ARCHIVES

Of all the original artwork in the Gardens' library archives, the water colours by Charles de Alwis are the finest. He was employed by the Gardens between 1900 and 1908 producing during this time paintings of a series of plants, both wild and cultivated.

There is no published information about Charles except that he came from Ceylon. We are indebted to Ismeth Raheem whose research in Sri Lanka indicates that he was the son of Harmanis de Alwis Seneviratne who worked in the Royal Botanic Gardens at Peradeniya for almost three quarters of a century. The Peradeniya Gardens was established in 1821 and already had a tradition of botanical artists. Presumably Charles received his training there before coming to Singapore first as a photographer in the Public Works Department.

Ruth Kiew
Herbarium

A Charles de Alwis water colour of *Macaranga motleyana* ssp *griffithiana* (Euphorbiaceae), a local secondary forest species.

Rehan Yussuff



GARDENS EXHIBITION, continued from page 13

Committees, Community Clubs/ Centres whose visits were coordinated by PA. Of the visitors surveyed, 98% of them rated the exhibition above 5 and 35% above 8 on a scale of 1 to 10. 52% of the surveyed indicated that they had either visited the show in 1992 or 1995, implying a sustained interest in gardening. Central to the objective of the exhibition, however, was the finding that 86% of the respondents stayed in highrise and 71% of the latter actually reside in HDB flats.

To further the Organiser's effort to reach out to the HDB communities, key components of the main exhibition were moved to the Bukit Batok Community Club and subsequently to the Tampines East Community Club when the event at



Foong Thai Wu

The highly popular "Plant Clinic" operating at the Bukit Batok Community Club.

Suntec City ended. The so-called "Mini Skyrise Gardens Exhibitions" at the two CCs for duration of 3 and 2 days respectively attracted some 12,500 visitors.

At the close of the Apartment Gardens '98 Contest on 15 August 1998, a total of 74 entries were

received for the three competing categories i.e. for 1-4 Room HDB Apartments, 5-Room/Executive HDB Apartments and Private Apartments. Our hearty congratulations to the winners, they will get to visit Kew Garden in the United Kingdom or Nara Garden in Japan soon.

All in all, the objectives of the event were well achieved. A round of applause goes to all involved for their great effort in making the exhibition a success.

Foong Thai Wu
Janice Yau Chew Kuan
Nashita bte Mustafa
Tan Choon Hooi
Education Branch

Tan Puay Yok
Horticulture Branch

Key Visitors To The Singapore Botanic Gardens

(June – December 1998)

S/No	Name	From	S/No	Name	From
01	Dr Abdul Ghafoor	Karachi University Herbarium, Pakistan	30	Dr (Mrs) Luisa P Ejercito Estrada	Wife of the President of Philippines
02	Mrs Aline Chretien	Wife of the Prime Minister of Canada	31	Mr Martin J. Sands	Royal Botanic Gardens, Kew, UK
03	Dr Alistair Hay	Sydney Botanical Garden, Australia	32	HE Mary McAleese	President of Ireland
04	Mr Anders Linstorm	Nong Nooch Garden, Thailand	33	Mr Masatoshi Uchida	Executive Director, Commerce, Industry & Labour Dept, Japan
05	Mr Anthony Lamb	Agriculture Park, Sabah, Malaysia	34	Dr Matyas Buzgo	University of Zurich, Switzerland
06	Dr Barbara Gravendeel	Rijksherbarium, Leiden, The Netherlands	35	Mr Michael Ferrero	Nong Nooch Garden, Thailand
07	Mr Chen Jin	Xishuangbanna Tropical Botanical Garden, China	36	Mr Nobuyuki Tanaka	Tokyo University, Japan
08	Mr Dale Dixon	James Cook University, Australia	37	Mr Phen Intharathy	Deputy Director, Dept of International Economic Cooperation, PM's Office, Vientiane, Lao People's Democratic Republic
09	Dr David Frodin	Royal Botanic Gardens, Kew, UK	38	Dr Phoutong Seng Akhom	Vice Mayor, Vientiane Municipality Lao People's Democratic Republic
10	Mr Fan Han Ming	South China Botanical Garden, Guangzhou, China	39	Ms Quek Swee Peck	Harvard University, USA
11	Dr George Weiblen	Harvard University, USA	40	Mr Raymond Harley	Royal Botanic Gardens, Kew, UK
12	Mr Gregori Hanbali	Bogor Botanic Gardens, Indonesia	41	Mr Richard Button	Nurseryman, USA
13	Dr Halijah Ibrahim	University of Malaya, Malaysia	42	Mr Robert Johns	Royal Botanic Gardens, Kew, UK
14	Dr Helen Kennedy	University of British Columbia, Canada	43	Mr Robert Woodman	Royal Botanic Gardens, Kew, UK
15	Mr Hidenobu Funakoshi	Tohoku University, Japan	44	HE Samane Vignaket	President of the National Assembly, Lao People's Democratic Republic
16	Mr Hitoshi Ishida	Hyogo Prefectural Govt, Japan	45	Mrs Sovanh Vignaket	Wife of the President of the National Assembly, Lao People's Democratic Republic
17	Mr Ian Leese	Royal Botanic Gardens, Kew, UK	46	Mr Steve Benham	Auckland Regional Botanic Gardens, New Zealand
18	Dr James Soong	Taiwan Provincial Governor	47	Mrs Suluweti Rabuka	Wife of the Prime Minister of Fiji Islands
19	Mr Jeff Marcus	Palm Expert, Australia	48	Mr Teiji Sasho	Director, Nambo Paradise, Japan
20	RT Hon Jenny Shipley	Prime Minister of New Zealand	49	Mr Thomas A. Coft	Royal Botanic Gardens, Kew, UK
21	Mdm Jiang Qingping	Wife of the Vice Chairman of the Central Military Commission, State Councillor and Minister of Defence, People's Republic of China	50	Dr J Veldkamp	Rijksherbarium, Leiden, The Netherlands
22	Mr Jim Little	Jim Little Nursery, Hawaii, USA	51	Ms Vicky Isana	National Capital Botanical Garden, Papua New Guinea
23	Dr John H. Beaman	Royal Botanic Gardens, Kew, UK	52	Mr Xu You-Kai	Xishuangbanna Tropical Botanical Garden, China
24	Mr John L. Dowe	James Cook University, Australia	53	Mr Yoshio Shiwaku	Hyogo Prefectural Govt, Japan
25	Dr W. John Kress	Smithsonian Institution, USA	54	Mr Yoshikazu Ozawa	Director, General Economic Promotion Division, Commerce, Industry & Labour Dept, Japan
26	Mrs Khamla Keobounphanh	Wife of the Prime Minister of Lao People's Democratic Republic			
27	Mr K M Kochummen	Forest Research Institute, Malaysia			
28	Ms Li Liming	Xishuangbanna Tropical Botanical Garden, China			
29	Mr Liu Nian	South China Botanical Garden, Guangzhou, China			

New & Exciting

Dangling trailers of *Strophanthus preusii*

Strophanthus preusii

Common Name : Corkscrew Flower; Spider Tresses

Family : Apocynaceae



This is a genus of about 40 species of shrubs and climbers native to tropical Africa and Asia. *Strophanthus* is largely grown for its showy, ornamental and curious flowers.

Strophanthus preusii is a woody liana or sometimes a stout creeping shrub. The most outstanding feature of this species is the trailing tips that extend from the petals. They hang down for 12 cm to 30 cm. This species has the longest and most spectacular tails of all *Strophanthus* flowers.

The petals with their reddish-brown to purple dangling trailers look like a white beard when they first open but gradually turn creamy and finally yellow in colour. The flowers are borne in a cluster. Each blossom bears reddish-brown stripes in the throat; it is fragrant in the evening.

In its native habitat in west and central Africa,

Strophanthus preusii grows to a height of 3 m in primary and secondary forests, forest margins and clearings, from sea-level to 1400 m altitude. It thrives best on well-drained soils in sunny spots.

Traditionally in African countries, bows are made from the stems of *Strophanthus* and arrows are laced with the poisonous extract from its seeds. However, young leaves may be used as a vegetable.

The discovery of strophanthin, a wonder drug effective for the treatment of severe cardiac problems from the seeds of *Strophanthus kombe* has since 1969 subjected this genus to intensive pharmaceutical research. This beautiful plant may therefore hold other potential that has yet to be discovered.

Andrea Kee
Plant Introduction Unit