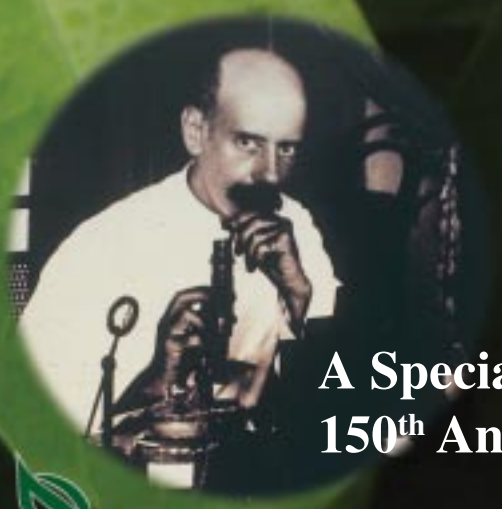
Gardenwise

THE NEWSLETTER OF THE SINGAPORE BOTANIC GARDENS VOLUME 25, JULY 2005 ISSN 12-1688



A Special Issue to Commemorate the 150th Anniversary of H.N. Ridley (1855-1956)

NParks' Publication

Contents

Front Cover:
Snapshot of H.N. Ridley with plants described by him and named after Singapore. The plants are *Kopsia singapurensis* with its red middle and the thorny *Durio singaporensis*

Photo Credit:
Hassan Ibrahim (for Kopsia singapurensis), Derek Liew (for Durio singaporensis) and from SBG Archives (for snapshot of Ridley)

Message from the Director

This special issue commemorates the 150th anniversary of the birth of the distinguished botanist, Henry N. Ridley, the first director of the Gardens (1888-1912).

Ridley's contribution to the economy of the region is legendary. He experimented with and energetically promoted the growing of Para Rubber. His enthusiasm and vision for this Brazilian tree laid the foundations for the rubber industry in this part of the world. Several facts are worth retelling. By 1917, the Gardens had distributed over 7 million rubber seeds, a major source of income. By 1920, Malaya was producing 50% of the world's rubber and Singapore was pre-eminently the rubber market of the world. Ridley has been aptly dubbed 'the father of Malaya's rubber industry.

Ridley's legacy to botany and natural history is no less. He laid the foundations for Malayan botany with his collections and publications. He extensively explored the region, especially the Malay Peninsula, and collected all plants from fungi, to mosses, ferns and higher plants. The number of plants he collected and new species he discovered are without parallel.

He devoted special efforts to building up the herbarium and the living collection of economic plants. In 1891, he established the *Agricultural Bulletin of the Malay Peninsula* that continues today as the *Gardens' Bulletin Singapore*. His five-volume *Flora of the Malay Peninsula*, completed after his retirement from the Gardens, is still the only flora that attempts a comprehensive account of plants of the Peninsula. If we were to bequeath paternity, he must also be 'the father of Malayan botany'. With a number of selected articles, we celebrate, in a small way, the memory of this remarkable man and his contributions, whose influence on Malayan history has been said to be second only to that of Raffles.

The Gardens has, in particular, built upon the botanical foundations he established and for a long while, with names including I.H. and H.M. Burkill, E.J.H. Corner, M.R. Henderson, R.E. Holttum, and others, led the region.

The tremendous plant diversity of the region, a paucity of botanists and the rapid pace of forest conversion and destruction mean that time is running out for the region to document its botanical wealth. Only an estimated 25% of the plants of the region have been subjected to taxonomic revision. Needless to say, the numbers that have been subjected to detailed chemical or genetic analysis for bioactive compounds are dismal.

The Gardens is well placed to take a leading role in plant taxonomy with the botanical legacy of the extensive herbarium with 650,000 specimens including at least 6,000 types and a comprehensive botanical library dating from the 19th century. It must build its capacity and reassert its leadership role and fulfill its botanical and conservation responsibilities if it is to have any serious claim as a botanical institution.

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R E S E A R C H

Diversity and Conservation of the Singapore Flora

The Herbarium team continues to survey important plant areas (IPAs) in Singapore. Based on historic data from old herbarium sheets, the herbarium is re-surveying areas where rare plant species had previously been collected. By the end of 2004, 20 species designated 'extinct' in the Singapore Red Data Book were re-discovered. These species came from 16 different families.

Field trips are also conducted on a weekly basis to areas that require plants to be identified for labels, signages and where checklists of plants of IPAs are required. These include places such as the newly opened HSBC Tree Top Walk, Mac Ritchie, Nee Soon freshwater swamp forest areas and many others.

Serena Lee, Paul K F Leong, Gwee Aik Teck, Samsuri Ahmad and Ruth Kiew
Herbarium
in collaboration with staff from Biodiversity Centre

Serena Lee

Mohd Noor beside a huge climbing palm, the rattan - *Plectocomia elongata*

Taxonomy of Begonias

Serena Lee

Begonia sizemoreae, a new species with horticultural potential

This year saw the completion of the revision of *The Begonias of Peninsular Malaysia* that included the description of 52 begonias, of which 13 species and 1 variety are new to science (see page 24). Two other begonias of great horticultural interest were also described as new to science. The one from Vietnam, *Begonia sizemoreae* Kiew, has fine variegated leaves, while *B. sabahensis* Kiew & J.H. Tan, is the first yellow-flowered species from Borneo.

Ruth Kiew
Herbarium

Revision of *Bulbophyllum*

The revision of *Bulbophyllum* sect. *Sestochilus* has taken longer than expected because some species complexes are more difficult to resolve than expected. To see if molecular data can shed some light on this matter, a collaborative project with several European universities is initiated. Apart from this, a synopsis of the *Bulbophyllum* species occurring on the island of Sulawesi is in preparation. The synopsis will include some 30 species new to science.

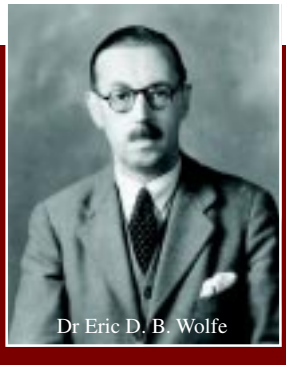
Jaap Vermeulen
Herbarium

Jaap Vermeulen

Unidentified form of *B. lobbii* complex

Jaap Vermeulen

Unidentified form of *B. membranifolium* complex


Dr Eric D. B. Wolfe

Sally Handford

Dr Eric Wolfe, Amateur Plant Collector

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My father Eric Wolfe was born in Hertfordshire, England in 1903, the son of a civil servant. He was educated at Aldenham School near his home and St Andrews University in Scotland where he qualified in medicine in 1928.

Rather than following the conventional career pattern of medical doctors, he enlisted as ship's surgeon on a Dutch East Indiaman trading between Europe and what is now Indonesia. After a couple of voyages, the lure of the East had taken hold, and he joined the Malay Medical Service, then run by the colonial government of the Federated Malay States. He was posted to Kuala Kangsar where he set up home and married the daughter of a tea planter from Assam.

It was at this period of his life, around the time when I was born, that he developed the interest in botany which remained with him for the rest of his life. Orchids were his great passion, but sadly a hitherto unknown variety that he found appears not to have survived. He presented the herbarium with a specimen of the rare climber *Petraeovitex wolfei* (see article on page 17) and a rare bauhinia, both found in Kedah in 1938.


John Handford

Sally Handford with specimens collected by her father in the 1930s

When the war came, he was mobilised in the Federated Malay States Volunteer Force, and, together with most of his comrades, was imprisoned by the Japanese at Changi. Here he gave what medical aid he could to fellow prisoners, and we have his list of plants with medicinal properties found and used in the camp (see below).

After the war, he was soon back in Malaya and, following postings in Kedah and Johore, became Deputy Director of Medical Services in Penang, all the time continuing to study the flora. He supplied snakes to M.W.F. Tweedie at the Raffles Museum, and worked with R.E. Holttum on the propagation of the *Matonia*. He returned to England when he retired in 1954, and lived until 1975.

I visited Singapore recently for the first time since 1942. I was delighted to be welcomed at the herbarium by Dr Ruth Kiew and her staff, and to find that my father's plant hunting adventures all those years ago are still on record.

PLANTS USED IN PRISONER-OF-WAR CAMPS IN SINGAPORE (1942-1945) – *recorded by Dr E.D.B. Wolfe*

***Ageratum comyzoides* (Compositae) White Weed**
Dried leaves used by Dutch P.O.W's in Java as substitute for tobacco. Used as dried leaves to improve very coarse canteen tobacco at Keranji camp. Pleasant flavour probably due to coumarin (Burkill) a well known flavouring for tobacco (cf. Gold Block tobacco).

***Bacopa* sp. (Scrophulariaceae)**
This was collected at the edge of the mangrove at Keranji and used as a vegetable.

***Carica papaya* (Caricaceae) Papaya**
Apart from the ordinary use of the fruit, the dried leaves were used extensively as a substitute for tobacco. Used quite independently also by civil internees.

***Centrosema pubescens* (Leguminosae)**
Seeds bought in bulk from Central Messing Fund as an emergency food when Mung Bean or *Kachang Hijau* (*Vigna radiata*, Leguminosae)was not obtainable. An uninteresting and tasteless food though not bad in soup. Produced allergic skin and mouth reactions in a large number of people especially those who had had pellagra.

***Dalbergia oliveri* (Leguminosae) Tamalan Tree**
An Indian species of this wood, reddish pink in colour, was used by the Indian Army for stretchers. It was used for making tobacco pipes and was successful, though the bowls tended to crack especially when cut with the grain of the bowl vertical.

***Datura metel* (Solanaceae) Purple Thorn Apple**
Dried leaves smoked with benefit by some asthma patients.

***Hevea braziliensis* (Euphobiaceae) Para Rubber**
The seeds were eaten extensively both raw and cooked especially by the Dutch. Roasted seeds were used also as a substitute for coffee. A very few people suffered from gastro-intestinal symptoms after eating a large quantity for the first time.

***Hibiscus rosa-sinensis* (Malvaceae) Hibiscus**
Leaves eaten raw as an anti-scorbatic in early days before green vegetables could be grown. Too mucilaginous to be pleasant. Flowers were used as a boot blacking by some of the smarter troops – produced a good shine.

***Hibiscus sabdariffa* (Malvaceae) Roselle**
Quantities of seed were issued by the Japanese. Plants grew well at Keranji. Leaves were used as a salad and fruits were used for a kind of jam and for sweets.

***Hyptis suaveolens* (Labiatae) Wild Basil**
A blue-flowered labiate plant growing in large quantities near the shore at Changi – was cultivated and used extensively as a flavouring.

***Jatropha curcas* (Euphobiaceae) Physic Nut**
Seeds were eaten and enjoyed by the troops. A few cases of poisoning were seen, but all recovered quickly. Five seeds appeared to be the maximum that could be eaten without causing symptoms.

Lantana camara* (Verbenaceae) Lantana, *Bunga Tahi Ayam
Called 'wild mint' by the troops and used as a flavouring.

***Lawsonia inermis* (Lythraceae) Henna**
A decoction of the leaves was used with success as an astringent and soothing lotion. Used with a suspension of kieselgur (from Army water carts) as a substitute for calamine lotion.

***Melastoma malabathricum* (Melastomataceae) Senduduk**
A watery decoction of the young leaf shoots given as a prophylactic against riboflavin (vitamin B) deficiency caused nausea and vomiting and its use had to be abandoned.

***Mucuna* sp. (Leguminosae)**
Grown at Changi and Keranji. Several cases of poisoning occurred as a result of taking soup to which the water in which the seeds had been boiled had been added. Cases of poisoning occurred also in certain people after eating the beans, even though they had been well washed and the taste removed. Symptoms consisted of shivering, nausea, and a vague feeling of being unwell. Many ate the beans in quantity and over a long period without ill effects.

***Murdannia nudiflora* (Commelinaceae)**
Used as green vegetable at Keranji, but went out of use when other green vegetables became available.

***Nephelium lappaceum* & *N. rambutan-ake* (Sapindaceae) Rambutan & Pulasan**
Seed of both species eaten boiled and roasted in large quantities at Keranji – no ill effects.

***Ocimum basilicum* (Labiatae) Basil**
A dark-stemmed variety cultivated extensively at Changi and Keranji and used as a flavouring in cooked foods.

***Paraderris elliptica* (Leguminosae) Tuba**
Watery extract of the burned roots was used for the treatment of scabies. One medical officer claimed success, but others preferred sulphur ointment when available.

***Passiflora foetida* (Passifloraceae) Love-in-a-Mist**
Young green shoots eaten as a green vegetable and also used in a decoction as a prophylactic against riboflavin deficiency – no ill effects.

***Phyllanthus amarus* (Euphobiaceae) Pick-a-Back**
Used by Dutch medical officers at Changi for treatment of dysentery and diarrhoea.

Piper sarmentosum* (Piperaceae) *Daun Kadok
An upright pepper with dark green slimy leaves and pleasant odour when crushed, was found growing in several Chinese gardens. Eaten raw as a salad and used for sambals.

***Plumeria rubra forma acutifolia* (Apocynaceae) Frangipani**
Latex used by Dutch medical officers for treatment of ringworm – results not known.

***Psidium guajava* (Myrtaceae) Guava**
A strong infusion of the leaves was found useless for the treatment of diarrhoea in the British Hospital.

***Pterocarpus indicus* (Leguminosae) Angsana**
A watery extract of the bark was used as a gargle by a Dutch medical officer - results not known.

***Pterocarpus dalbergioides* (Leguminosae) Andaman Redwood**
Used by the Indian Army for stretchers, which in turn were used for making tobacco pipes. For this purpose the wood was excellent. It 'smoked in' quickly and well and very seldom burnt or cracked provided the grain of the bowl was not cut vertically.

***Senna alata* (Leguminosae) Seven Golden Candlesticks**
Used for treatment of tinia when supplies of chrysophanic acid ran out. Extraction of the acid was not possible owing to inability to obtain suitable solvents. Mildly effective, but content of chrysophanic acid not really sufficiently high.

***Sesuvium portulacastrum* (Aizoaceae) Sea Purslane**
Grew extensively at edge of mangrove at Changi and was highly esteemed as a vegetable. First used by the Dutch troops. Must be boiled twice and the first water discarded.

***Solanum melongena* (Solanaceae) Brinjal**
The leaves were dried and used as a substitute for tobacco. Usually mixed with dried papaya leaves.

***Spermacoce* sp. (Rubiaceae)**
Used as a green vegetable before better vegetables were available. Later acquired a great reputation among the troops as a cure for sore mouth due to riboflavin deficiency, even when abundant green vegetables were available. This reputation was not confirmed by clinical observation. Analysis of riboflavin and nicotinic acid content might be worthwhile.

Beautiful Austral Mosses
in the Cool House

The Cool House in the National Orchid Garden of the Singapore Botanic Gardens has a daytime maximum of 27°C and a night time minimum of 15°C, with daily relative humidity of about 90%. It was designed to capture for the public the beauty of canopy landscapes of tropical montane forest with their many interesting epiphytes. It is no wonder that this newly added gem of botanical display has become one of the main attractions for the half a million visitors to the National Orchid Garden each year.

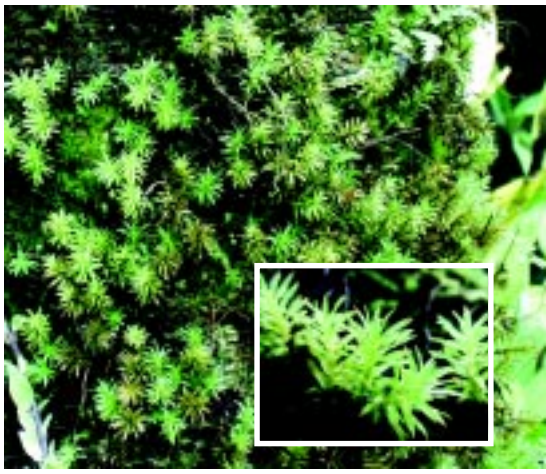
Once inside the Cool House, one cannot but help to notice the thick, green moss carpets covering the trunks of tree ferns and cliff faces. The dripping wet mosses have created a verdant backdrop for the other plant groups like lycopods, ericads, gesneriads and aroids.

Among the many species of bryophytes from the equatorial regions growing in the Cool House, three mosses are obviously accidentally introduced from the southern hemisphere. They came in, most likely, with the imported Australian tree fern (*Dicksonia antarctica*) and have become established on trunks of tree ferns and the adjacent rock ledges forming large patches of attractive green. They are *Leptobryum spiniforme*, *Atrichum androgynum* and *Thuidiopsis sparsa*.

The first one, *Leptobryum spiniforme*, bears the common name of Pear-Fruit Moss, referring to the pear-shaped capsules that are always produced in abundance. This erect moss, measuring 1-1.5 cm tall, forms loose populations. The narrow and long, silken leaves, together with the pear-shaped capsules, make the species easy to recognize. Although it is a widespread moss and a common greenhouse weed in the northern and southern hemispheres, its presence in tropical Southeast Asia, even as a greenhouse weed, has not previously been reported.

Another moss, *Atrichum androgynum*, is a fairly large-sized plant, up to 4-6 cm tall, including the capsule. Its common name, Austral

The Pear-Fruit Moss, *Leptobryum spiniforme,* with its distinctive pear-shaped capsules (see picture below)



The Austral Crane Moss, *Atrichum androgynum*, and a close-up [inset]

A cross-section of the leaf of *A. androgynum*

The toothed or serrate leaf margin of this moss

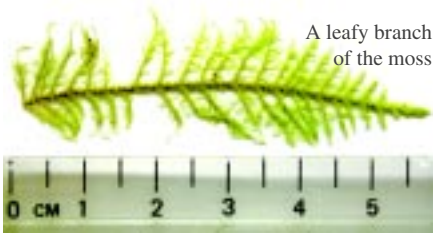
Crane Moss, alludes to the somewhat long and curved capsule often seen with a long pointy membranous calyptra that looks like the head of a crane with a long beak. The wavy and serrate leaves add another distinguishing character to the moss. One peculiar feature of this moss is the presence of many outgrowths from the upper leaf surface called lamellae, which increase the photosynthetic area of the plant. In *A. androgynum*, the lamellae, seen in cross-section, are short, each consisting of (1)2-3 cells, quite unlike the other species of the genus, which usually have leaf lamellae that are 4-6 cells long.

The Austral Crane Moss is a widespread forest moss in the southern hemisphere distributed from Australia, New Zealand to South America and South Africa. Although a common colonizer of open and shaded sites, it has not been reported as an alien species in the northern hemisphere.

The third moss, *Thuidiopsis sparsa*, is a large moss, up to 10 cm tall minus the capsule. Its common name, Austral Feather Moss, reflects the highly branched plant habit. In the Cool House, the plants form attractive dense, yellowish green wefts, or mini-hedges, on one rock face. Being variable, the species is best identified, in addition to its highly branched habit, by the numerous tiny green appendages called paraphyllia, covering the surfaces of the stem and branches. Each paraphyllium is made up of branched filaments consisting of several papillose cells. The other distinguishing features of this moss are the very different shapes of the stem and branch leaves, and the hexagonal to round leaf cells.

The Austral Feather Moss is a common moss in forest undergrowth in Australia. The species is distributed mainly in Australia and New Zealand, but is also found in Fiji, New Caledonia and Cook Island in the Pacific and westward in a few scattered localities in Sulawesi, Lesser Sunda Islands, Java and southern Borneo.

The Austral Feather Moss, *Thuidiopsis sparsa*



A leafy branch of the moss

The existence of these three beautiful exotic mosses inside the Cool House, - whose origin is the southern hemisphere - is worth watching. Considering the natural habitat preference of these three warm temperate mosses, there is no threat posed by their becoming invasive alien weeds in the hot and less humid conditions of urban Singapore.

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Photos by Benito C. Tan

Double Happiness - The Marriage of Two Double Coconuts

The Double Coconut, *Lodoicea maldivica*, like people, is male or female and only comes to sexual maturity after many years - about 25 years in the case of the Double Coconut.

So when the lone female tree in Kebun Raya, the famous Bogor Botanic Garden, became sexually active, it was time to start match-making and look for a suitable male partner.

Dr Irawati, the Director, contacted our Director, Dr Chin See Chung, to see how he felt about the match. Dr Chin has gained a reputation for match-making when he successfully pollinated our female tree near the Main Gate with pollen from the male tree about 500 m away in the Palm Valley (see *Gardenwise* **9**: 12-13).

Dr Chin readily agreed and pollen was sent when the female in Bogor was receptive. The first batch of pollen did not successfully resulted in fruit set. Pollen sent on 29th April 2004 produced two healthy fruits.

When the female again became receptive, we once more sent pollen on 17th January 2005. This time, Dr Irawati arranged a nuptual canopy over the inflorescence to encourage fruit set as heavy rain may dampen the proceedings.

Indeed, this time the union has been blessed with another two fruits. We are keeping a paternal eye on their development. Double Coconut fruits take six or more years to mature and then more than a year to germinate.

Ruth Kiew
Herbarium

Irawati

Bogor's female Double Coconut Palm

Irawati

The developing fruits. The two large ones in the netting are from the first mating and the other two on the right are from the subsequent mating

EVENTS

Visitor Services

Minister Mah Bow Tan viewing the art exhibition at the launch of the Evolution Garden

In January 2005, the Gardens had the privilege of playing host to Dr Henry Oakeley, Dr Joyce Stewart and Mr Peter Furniss. They are the trustees for World Orchid Conference and they were here to assess Singapore's suitability as a host venue for the prestigious 2011 World Orchid Conference. They must have been impressed with our Gardens' orchid programme and found our infrastructure up to the mark. The successful visit bore fruit when the committee later announced in Dijon, France, during the recent World Orchid Conference, that Singapore won the bid to host the similar event in 2011.

14th February 2005 morning saw the launch of the Evolution Garden by Minister for National Development, Mr Mah Bow Tan. This attraction depicts the amazing story of how plants gave us life and how, long before we humans arrived, they started to evolve into the myriad complex life forms we see today. To walk through the Evolution Garden is to travel back in time, from the barren un-livable Earth, to the time when dinosaurs roamed the fern and cycad forests to the lush rain forests of the tropics. An art exhibition by students of Siglap Secondary School (Centre of Excellence, Art, East Zone) featuring their impressions of the Evolution Garden on canvas was also unveiled during the launch.

A new tour of the Evolution Garden for the general public was subsequently launched in April 2005. This free tour conducted by the Gardens' volunteers runs every 1st and 4th Saturday of each month at 9 am. Three new programmes for schools based on the Evolution Garden have also been launched by the Educational Outreach team.

On 26th February 2005, Professor Leo Tan, National Parks Board Chairman, launched the book, *Begonias of Peninsular Malaysia*, authored by Dr Ruth Kiew, (see article on page 24). The comprehensive book was the impressive result of numerous field trips to study and collect begonias in Peninsula Malaysia. It featured beautiful pictures and detailed descriptions of this group of plants. The book is available on sale at the Botanic Garden shop. Further information can also be found in the website: *http://www.nhpborneo.com*

On 1st May 2005, Minister Mah Bow Tan launched the new Shaw Foundation Symphony Stage with great fanfare. The new stage, sponsored by the Shaw Foundation, features an iconic stage structure that derived inspiration from the plants surrounding it. With new backstage artiste facilities and improved sound and light systems, the stage is set to entrench the Gardens' reputation as a premier outdoor performance venue. The complimentary Singapore Press Holdings' (SPH) Gift of Music Series, a sponsored series of concerts to be performed in the Gardens on the 1st Sunday of every month featuring various music genres, was launched at the same event. The Singapore Symphony Orchestra once again took pride of place on stage with their rousing performance. Despite the light drizzle from heaven above, the event captured a turnout of about 6,000 people.

The Gardens came alive on 5th June 2005, when under the auspices of one of SPH Gift of Music Series called 'Let's do Latin!', had the crowd of about 6,000 in Palm Valley on their feet, sashaying to the infectious Latin beat. This was a lively and upbeat concert featuring 'Ireson', a true-blue Latin 'big band' with hot-blooded musicians hailing from Mexico, Colombia and Singapore. Members of the group on stage and on the lawn led the audience to dance steps, and whole families from babies to grandparents were seen moving to the irrepressible beat.

On 3rd July 2005, the Straits Times celebrated its 160th anniversary in the Gardens with President S.R. Nathan as the guest-of-honour. A new orchid hybrid from the Gardens, *Dendrobium* The Straits Times, was named to mark the occasion. It was a celebration to be remembered. The Straits Times brought together Singapore Idol Taufik Batisah, crowd favourite Sylvester Sim, award-winning singer and songwriter Tanya Chua, evergreen crooners Clement Chow and Robert Fernando and upcoming Jazz Kids for a not-to-be-missed concert titled 'Voices'. The outstanding concert drew a capacity crowd of about 8,000, with many arriving hours before the concert to reserve their preferred location at Palm Valley. As it was coincidentally also President Nathan's birthday, the crowd joined in with the performers and sang happy birthday to the President.

Visitor Services

Capacity crowd enjoying a concert at Palm Valley

Visitor Services

President Nathan during the naming of *Dendrobium* The Straits Times, assisted by CEO NParks, Dr Tan Wee Kiat (right)

Another new hybrid from the Gardens was named on the occasion of the International Olympic Committee (IOC) 117th Session in Singapore. Prime Minister Lee Hsien Loong and IOC President Jacques Rogge unveiled *Dendrobium* IOC on 5th July 2005 during the opening ceremony of the IOC held at the Esplanade Theatre. This orchid has our National flower, *Vanda* Miss Joaquim, as one of its proud lineage. *Dendrobium* IOC has free-flowering blooms that are representative of the enduring Olympic spirit.

A number of new VIP orchids were also revealed on behalf of many visiting dignitaries. These include *Dendrobium* Susilo Bambang Yudhoyono 'Ani' after the First Lady of Indonesia, Mrs Ani Bambang Yudhoyono, *Dendrobium* Begum Khaleda Zia after the Prime Minister of Bangladesh, HE Begum Khaleda Zia, *Dendrobium* Thabo Mvuyelwa Mbeki after President of South Africa HE Thabo Mvuyelwa Mbeki, *Vanda* Mohammed VI after King of Morocco HM Mohammed VI, *Dendrobium* Shaukat Aziz after the Prime Minister of Pakistan HE Shaukat Aziz, *Dendrobium* Hamad Bin Khalifa Al-Thani Amir of Qatar after HH Sheikh Hamad Bin Khalifa Al-Thani, and *Dendrobium* Silvia Cartwright after the Governor-General of New Zealand HE Dame Silvia Cartwright.

Camille Foo
Visitor Management & Education

4th International Symposium on the Family Zingiberaceae

In July 2006, the Singapore Botanic Gardens will be hosting the 4th International Symposium on the Family Zingiberaceae. This symposium is open to all who are interested in gingers and their relatives.

The symposium will highlight recent research in the Zingiberaceae and related groups in the Zingiberales as well as providing the venue for researchers to meet and discuss their work. The symposium includes oral presentations and posters covering such diverse fields as taxonomy & systematics, molecular studies & phylogeny, phytochemistry & pharmacognosy, diversity & conservation, horticulture & hybridization and all aspects of their biology, etc. For more information, log on to *http://www.sbg.org.sg/igs2006.asp*. Register before April 2006 to get an early bird discount!

Serena Lee
The Secretariat
4th International Symposium
on the Family Zingiberaceae

Two New Books from the Gardens

An illustrated guide to grasses of Singapore has been published as a supplement to the *Gardens' Bulletin Singapore*. The author, Dr Helena Duistermaat, started her taxonomic work on the grasses of Singapore as a hobby soon after joining her husband here in 2000. With three children in tow, she managed to devote more time to return to the taxonomy of grasses in 2002 when her youngest started school. She is now a Senior Research Officer in the herbarium.

Grasses play a major role in sustaining life. Some members of the family Gramineae like wheat, maize and rice are the staple diet of many cultures around the world. Many are important food sources for grazing animals, while some are useful as ornamentals or for lawns, and others are known as very persistent weeds. This book gives a good introduction to one of the largest families in the plant world and includes a section on turf grasses used in Singapore.

The book, ***Field Guide to the Grasses of Singapore***, excludes bamboos but covers 134 species and varieties of grasses occurring in Singapore, including 16 new records. It draws attention to a considerable number of our native grass species that are endangered or extinct. Grasses invade disturbed, open habitats and many are intentionally or unintentionally introduced here. This book will serve as a good guide to anyone interested in identifying grass species occurring in Singapore. So, the next time you sit on a patch of grass somewhere in Singapore, you will know what grass it is. You might even see Lalang in a different light.

The second book, ***Begonias of Peninsular Malaysia*** by Dr Ruth Kiew, will enchant plant enthusiasts on the beauty of this group of plants. It includes 52 native species of begonias growing wild in Peninsular Malaysia as well as two garden escapes.

There are more than 1,500 named species of begonias found in tropical and subtropical Asia, Africa and America and many more are waiting to be discovered. This group of plants - identified by their asymmetrical leaves in most species - has extricate patterns, colours and textures on their leaves. Their beauty makes them popular as ornamental plants. While there are more than 10,000 hybrids and cultivars available in trade, their commercial potential in the horticultural world has not been tapped fully.

This book - arising out of the author's 30 years of dedicated interest in wild begonias - describes the 54 species with minimum use of technical jargon and is lavishly illustrated by stunning photographs, watercolour paintings and botanical drawings of the plants. It not only includes detailed descriptions of the flowers and fruits of begonias *per se* but also notes on propagation, pest problems and common local uses associated to them. Do you know that begonia leaves are used to wrap fish before roasting or chopped fine to make *sambal belachan* (a spicy relish) to cook prawns? Or that the sour flowers are eaten by some? Well! Why not acquire a copy of this book and learn more about the begonias of Peninsular Malaysia. If the text alone does not fascinate you, the pictures will.

Hassan Ibrahim

The book *Begonias of Peninsular Malaysia.* [Inset] The author (right) in her light blue cheong sam with Chairman of NParks, Prof Leo Tan, during the launch of the book on 26th Feb 2005

Hassan Ibrahim
Herbarium

Copies of "Field Guide to the Grasses of Singapore", priced at S$30 (including postage & packing), can be obtained from the Library, Singapore Botanic Gardens. To order "Begonias of Peninsular Malaysia", published by Natural History Publications (Borneo), please refer to http://www.nhpborneo.com for details.

Hassan Ibrahim

The book *Field Guide to the Grasses of Singapore* and the author standing in front of the Greater Tasselgrass (*Themeda villosa*), one of the grasses highlighted in the book

The Day the Rubber Trees Cried

It was rubber-tapping day at the Singapore Botanic Gardens on the evening of 2nd March. Two authentic tappers, Mr Raman Narayanan and Mr Kandasamy Chelambran, from Malaysia, were specially brought in for a task professionally not seen in cosmopolitan Singapore anymore.

A film crew from the British Broadcasting Corporation was on site to film a documentary on the history of rubber. Back in 1877, eleven Para Rubber (*Hevea brasiliensis*) seedlings were successfully planted in the Gardens. The whole craze on rubber had its roots here when H.N. Ridley, the Director of the Gardens from 1888-1912, saw the potential of this white latex. So it was only apt that a demonstration on rubber tapping be filmed in the Gardens.

Ridley had encouraged planting of the rubber trees in Malaysia. The latex was already in demand for products like flooring and footwear. But Ridley, with fervour and great dedication, developed the herringbone pattern of cuts – a forerunner of the present day tapping method – that allows the continuous tapping of rubber latex. The old method was so damaging that it soon killed the tree. Perhaps it was his foresight, or perhaps it was perfect timing, but the rise of the motorcar industry at the beginning of the 20th century saw the demand for rubber skyrocket. Today, Malaysia is still one of the major producers of natural rubber.

To be a rubber tapper, you must be prepared to work at the crack of dawn, as latex flows more abundantly in the cool mornings. You need a special tapping knife and skills to cut thin shaving of the bark just 2 mm thick. The milky fluid is then collected in a clay cup 12 cm in diameter. When latex flows like pearly teardrops, it appears as if the rubber trees are crying. This slow weeping may last two to three hours before it stops. The rubber tapper then visits all the trees for a second time to collect the liquid latex from the cups.

Rubber tapping is not done on rainy days as the latex runs straight down the trunk instead of into the cups. Trees are tapped when they are about five years old. We witnessed the tapping of the rubber trees planted near Symphony Lake. These are new high yielding hybrids from the region. It was a rare opportunity to witness a gift of nature, a time when rubber trees did cry.

Hassan Ibrahim & Serena Lee
Herbarium

SBG Archives

The herringbone method, developed by Ridley

Serena Lee

The white latex: when the rubber tree cries

Hassan Ibrahim

Mr Kandasamy Chelambran at work

New Nature Workshops and Tours in Singapore Botanic Gardens

Participants studying a *Dendrobium* flower under the microscope in the 'Young Orchidologists' workshop

Making a dinosaur garden in the 'Dinosaurs & Plants' workshop

Mrs Koh, Research Officer, demonstrating the methods of separating and sterilizing orchid seedlings to participants of the 'Young Orchidologists workshop

For the December 2004 and June 2005 school holidays, new thematic half and full-day workshops 'Young Plant Detectives', 'Young Orchidologists' and 'Dinosaurs & Plants', offered to children of Lower Primary (Primary 1 to 3), Upper Primary (Primary 4 to 6) and Kindergarten (Kindergarten 1 & 2) levels respectively attracted 112 children.

In the 'Young Plant Detectives' workshop, children toured the EcoGarden in the Bukit Timah Core to learn more about economic plants and their uses. This was followed by an indoor session of arts and crafts using herbs and spices, and the planting of their own miniature dish garden.

Participants of the 'Young Orchidologists' workshop enjoyed a tour of the National Orchid Garden. Indoors, children were involved in examining orchid plants, flowers and seeds, the hybridization process, and the laboratory cultivation of orchids. The workshop ended with the children planting their own orchid plantlets to take home.

'Dinosaurs & Plants' participants went on a guided tour of the Evolution Garden using the new children's workbook *Adventure with Plants, Sara at the Evolution Garden*. The story is on the adventures of Sara, the Gardens' resident dinosaur and her squirrel friends in the Evolution Garden. It introduces relatives of ancient plants to readers through the experiences of Sara. At one stage Sara had a terrifying encounter with Monty, the carnivorous Thunder-lizard, but makes a new friend in Minmi, a little dinosaur who resides in the Evolution Garden. This new workbook is a compilation of story, colouring and sticker activity pages. Back in the classroom, after the tour, children were taught how to make their own dinosaur (dish) garden.

Besides the new workshops, a general tour of the Evolution Garden was added to our current repertoire of guided nature tours. Targeting families, this tour enjoyed the participation of 214 children and their accompanying parents, grandparents and guardians during the December 2004, March and June 2005 school breaks.

In our bid to cultivate and increase interest, more activities are lined up for the Evolution Garden. Besides continued offers of the tours in the Evolution Garden to the general public, the Educational Outreach team has come up with two tours targeted at schools. These 1.5 hour tours are designed according to the school syllabus, with one focusing on Plant Classification, the other focusing on Evolution & Adaptation of Plants. In the meantime, we are also working on assembly talks on the Evolution Garden to be held in schools. Look out for a report on this in the next issue of Gardenwise!

Janice Yau
Educational Outreach

Photos by Janice Yau

FROM THE ORCHID SPECIES COLLECTION

Complex Species

Most plant species have distinct and clear-cut (although sometimes minute) characters to distinguish them from other species. But some show such a wide variation in shape that extreme forms have been erroneously described by taxonomists as separate species - particularly when too few specimens were available to span the intermediate forms. Subsequent taxonomists felt the need to do something useful with the intermediate forms - often by naming more 'species', sometimes with slew of 'subspecies', 'varieties', and 'forms' - to cover specimens that do not fit satisfactorily in one of the 'species'.

After carefully comparing all the specimens that are available, plant taxonomists may be able to determine whether such assemblages of often similar-looking units are in fact a single, unusually variable species (a 'complex species') or consist of a number of related species (a 'species complex').

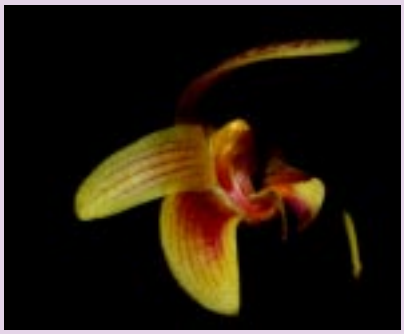
Bulbophyllum lobbii and *B. dearei* are examples of a complex species or a species complex. For a long time, the general idea among horticulturists was that each of these was a species, but recently numerous forms have been described as separate species. Scientists in the Netherlands, Germany, Austria, and Singapore have formed a team to establish the status of *B. lobbii* and *B. dearei*. The team is currently studying herbarium specimens and living plants, and checking for visible characters, as well as the genetic similarity of different forms. Herbarium material of these large-flowered orchids is often damaged or incomplete. The team relies heavily on living material, and that is why the research collection in Singapore Botanic Gardens includes a fair number of plants of *B. lobbii* representing many different forms. *B. lobbii* and *B. dearei* are also on display in the Coolhouse in the National Orchid Garden, and flower spectacularly at least twice a year.

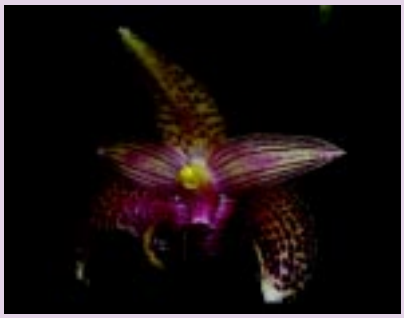
Jaap Vermeulen and Paul K F Leong
Herbarium

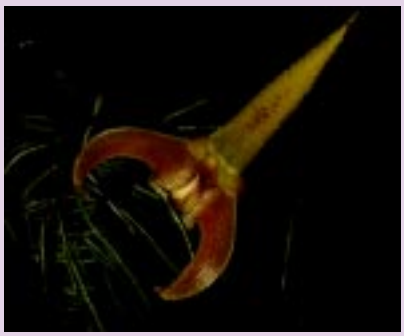
Photos by Jaap Vermeulen

B. dearei in the National Orchid Garden Coolhouse

B. lobbii – the various forms. Are they all one or separate species?







Nura Abdul Karim

STAFF NEWS

(Clockwise from far left): Tona Tuominen, Jeffrey Forsyth, Kho Soo Pei and Leni Duistermaat

Nura Abdul Karim is no new face to the Gardens. In 1996, she received a scholarship and took study leave to pursue her degree in Horticulture at Curtin University, Perth, Australia. She excelled in her academic pursuit and was awarded a prestigious scholarship by the Australian Government to embark on her PhD. In January 2005, Nura was "reintroduced" into the Gardens after completing her research on the biology of tropical orchids of the north-west region of Western Australia. She has noticed many changes in the Gardens and looks forward to contributing in her capacity as Plant Record Manager.

Tona Tuominen joined the Singapore Botanic Gardens in February 2005 as Manager (Marketing & Commercial Activities). She had previously worked in the retail, broadcasting media and information technology sectors. To de-stress, this bubbly lady enjoys listening to Taiwan's rock group, "Wubai & China Blue". Currently, she is pursuing a part-time Masters Degree in Marketing Communications.

Dr Helena Duistermaat or Leni for short, came on board in March 2005 as a part-time Senior Research Officer at the Herbarium. Already in 2000 she had started to study the grasses of Singapore as a hobby since arriving from the Netherlands with her family. That hobby became a passion and her work was recently published in the *Gardens' Bulletin Singapore*. Besides spending time with her three children, Leni also likes to work with beads, the tinier the better, she said.

Jeffrey Forsyth came to us from the Great Sandy Region Botanic Gardens in Queensland, Australia, where he had spent the last six years of his life-long fascination with Horticulture. His interest in widening his knowledge of tropical plants spurred him to join us as Manager (Horticulture) since March 2005. Jeff considers gardening as one of his creative hobbies, relaxes with a good meal and red wine, and adores Raquel Welch as one of his idols. He has two daughters residing in Australia.

Kho Soo Pei joined the Gardens in May 2005 as Assistant Director (Special Projects) on a 2-year secondment from the Ministry of National Development. Prior to her posting, she was the Assistant Director (Infrastructure) pertaining to policy works of Agri-Food & Veterinary Authority, Building & Construction Authority and National Parks Board.

Hassan Ibrahim
Herbarium

Photos by Hassan Ibrahim

TAXONOMY CORNER

Family Names for Plants

The international system for naming plants follows the International Code for Botanical Nomenclature (ICBN), which recommends that family names be based on the name of one of the genera in the family with the ending '-aceae' added. For example, the name of the ginger family, Zingiberaceae, is based on the genus name, *Zingiber*. But note that while the genus name is in italics, the family name is not.

However, there are some notable exceptions. These are traditional names that are based on an unusual and/or conspicuous character and many of these families have always been important as, for example, a source of food or spices, long before the ICBN came into being. These family names have the ending '-ae'.

Having two names for a family can cause confusion. I was at a talk recently where one of the audience asked why palms had not been included in the study. They had but under the less familiar name 'Arecaceae'. For most of these families, the genus name chosen as the basis for the family name is one common in Europe but is unfamiliar in tropical regions, such as the dead nettle, *Lamium*, that gives the family name Lamiaceae for the Labiatae. Perhaps because of this, the traditional names have continued to be used more commonly in this region.

Ruth Kiew
Herbarium

Traditional Name (Common Name)	Meaning	Alternative Name Based on a Generic Name
Compositae (sunflowers)	flower head of many flowers that looks like a single flower	Asteraceae
Cruciferae (cabbages)	'cross-wise' referring to the arrangement of the petals	Brassicaceae
Gramineae (grasses)	grain (wheat, rice, etc.)	Poaceae
Guttiferae (mangosteens)	producing latex	Clusiaceae
Labiatae (mints)	flower with a large lip-like petal	Lamiaceae
Leguminosae (beans and peas)	the fruit is a pod or bean	Fabaceae
Palmae (palms)	characteristic palm habit	Arecaceae
Umbelliferae (carrot, coriander)	stalked flowers in ball-like heads	Apiaceae

KEY VISITORS TO THE GARDENS (JANUARY 2005 – JUNE 2005)

NAME	FROM
Mr Aaron Betsky	Director, Netherlands Architecture Institute in Rotterdam
HE Abderrahmane Drissi Alami	Ambassador of the Kingdom of Morocco to Singapore
HE Abdeslam Jaidi	Ambassador of King of Morocco
HRH Prince Haji Al-Muhtadee Billah	Crown Prince of Brunei Darussalam
Mr Albert Cheng Ting-ning	Assistant Director, Civil Engineering and Development Department, Hong Kong SAR Government
Mrs Ani Bambang Yudhoyono	First Lady of the Republic of Indonesia
Ms Ann Schmidt	Special Events Manager, Fairchild Tropical Garden, USA
HE Dr Arun Shourie	Member of the Rajya Sabha and Former Minister of Communication, Information and Technology and Disinvestment, Republic of India
Dr Axel Poulsen	Royal Botanic Gardens, Edinburgh, UK
HE Begum Khaleda Zia	Prime Minister of the People's Republic of Bangladesh
Mrs Betty Tung	Wife of Chief Executive, Hong Kong SAR Government and Honorary Advisor of Green Fun Committee
Mr Bob Deaco	General Manager, Darling Harbour of Sydney, Australia
Dr Carrick Chambers	Royal Botanic Gardens, Sydney, Australia
Mdm Cecile Vignot	Media Head, National Museums of France, France
Mr Chalezmpol Suwanphakdec	Khon Kaen University, Thailand
Mr Charan Leevetiwong	Khon Kaen University, Thailand
Ms Chin Lea Yen	Universiti Putra Malaysia, Malaysia
Sir David Akers-Jones	Member of Green Fun Committee, Hong Kong SAR Government
Mr David Lan	Member of Green Fun Committee and Former Secretary for Home Affairs, Hong Kong SAR Government
Dr David Mabberley	University of Washington, Seattle, USA
Dr Ed de Vogel	National Herbarium of the Netherlands, the Netherlands
Dr Elizabeth A. Widjaja	Herbarium Bogoriense, Indonesia
Prof Fumihiko Maki	Principal of Tokyo-based Maki & Associates, Japan
Dr George Weiblen	University of Minnesota Herbarium, USA
Mr Gerard Rondeau	Renowned Photographer
HE Dr Gyorgy Nanovfszky	Ambassador of the Republic of Hungary to Singapore
Dr Hanna Margonska	Gdansk University, Poland
Mr Hassan Amrani	Governor of Rabat, Kingdom of Morocco
Dr Henry Oakeley	Trustee of World Orchid Conference (WOC)
Mr Ho Cheow Teck	Honorary Consul of the Kingdom of Morocco to Singapore
HE Hugh Swift	Ambassador of Ireland to Singapore
Mr James Folsom	Director, Huntington Botanic Garden, USA
Dr Jeremy Purseglove	Cambridge, UK
Mr Jiang Xing Rong	Deputy Director, Greenery Management Department, Changzhou City, People's Republic of China
Prof Jim Chi-yung	Member of Green Fun Committee, Hong Kong SAR Government
Mr Jimmy Chan Pai-ming	Senior Engineer, Civil Engineering and Development Department, Hong Kong SAR Government
Prof Joan Busquets	Martin Bucksbaum Professor in Practice of Urban Planning and Design, Harvard University Graduate School of Design, USA
Dr Joanna Choo	Rutgers University of New Jersey, USA
Prof John Niland	Chairman, Centennial Parklands, Australia
Dr Joyce Stewart	Trustee of World Orchid Conference (WOC)
Ms Julia Sang	Forest Research Centre, Sarawak, Malaysia
Ms Kamolhathai Phulphong	Khon Kaen University, Thailand
Mr Khanit Wangwasit	Khon Kaen University, Thailand
Prof Kirk Smith	Nephew of the late Colonel Griffin
Dr Kongkanda Chayamarit	The Forest Herbarium, Thailand
Mrs Lana Kinoshita	Member of Green Fun Committee, Hong Kong SAR Government
Mr Laszlo Takacs	Counsellor and Deputy Head of Mission of the Republic of Hungary to Singapore
Mrs Laura Eileen Collins-Merciez	Wife of Assistant Naval Attache of United States of America to Singapore
Dr Lawrence Chau	Member of Green Fun Committee, Hong Kong SAR Government and Senior Manager of Flora Conservation and South China Biodiversity Team, Kadoorie Farm and Botanic Garden
HE Lee Hae-chan	Prime Minister of the Republic of Korea
Mrs Lee Jung-ok	Wife of Prime Minister of the Republic of Korea
Ms Marge Magner	Chairman and Chief Executive Officer of the Global Consumer Group, Citigroup
Ms Maria Tam Wai-chu	Chairman of Green Fun Committee, Hong Kong SAR Government

NAME	FROM
Ms Marilyn Jordan Taylor	Chairman, Skidmore Owings and Merrill (SOM), USA
Mrs Matsuko Nakajima	Japan
Mr Michael Law Hing-sun	Senior Engineer, Civil Engineering Development Department, Hong Kong SAR Government
Dr Michael Maunder	Director, Fairchild Tropical Garden, USA
HM Mohammed VI	King of the Kingdom of Morocco
HE Munshi Faiz Ahmad	High Commissioner of the People's Republic of Bangladesh to Singapore
Dr Nanakorn Weerachai	Director, Queen Sirikit Botanical Garden, Thailand
Datin Nancy Chiu-Ng	Member of Green Fun Committee, Hong Kong SAR Government
Mr Ng Shun-pui	Senior Landscape Architect, Civil Engineering and Development Department, Hong Kong SAR Government
HE Dr Osman Mohamad Osman	Minister of Urban Planning, Arab Republic of Egypt
Dr Phang Siew Moi	University of Malaya, Malaysia
Mr Park Soung Chan	General Director, Environment Department of Jung-Gu Ward Office, Incheon City, Republic of Korea
Mrs Pascale Isabelle Fabre-Kridelka	Spouse of Ambassador of Belgium to Singapore and Executive Director of Alliance Francaise Singapore
Ms Phatchani Srikhumsuk	Khon Kaen University, Thailand
Sir Peter Crane	Director, Royal Botanic Gardens, Kew, UK
Prof Sir Peter Hall	Professor of Planning, Bartlett School of Architecture and Planning, University College of London, UK
Prof Puangpen Sirirugsa	Professor of Department of Biology, Faculty of Science, Prince of Songkla University, Hat Yai, Thailand
Yang Amat Mulia Pengiran Muda Qawi	Brother of Crown Prince of Brunei Darussalam
Mrs Ryu Joo Hee	Wife of Ambassador of the Republic of Korea to Singapore
HE Ryu Kwang-sok	Ambassador of the Republic of Korea to Singapore
Mrs Sandie Burrows	Botanist and Writer of African Flora (Southern African Ferns & Fern Allies [1990], Figs of South-Central and Southern Africa [2002] and Plants of the Nyika Plateau, Malawi [2004])
HRH Pengiran Anak Isteri Sarah	Wife of Crown Prince of Brunei Darussalam
Mr Sarrai Mattaphon	Khon Kaen University, Thailand
HE Shaukat Aziz	Prime Minister of the Islamic Republic of Pakistan
HH Sheikh Hamad Bin Khalifa Al-Thani	Amir of the State of Qatar
HE Dame Silver Cartwright	Governor-General of New Zealand
Mr Soh Wuu Kuang	Forest Research Institute, Malaysia
Ms Sou Channary	Officer, Administrative Department, Ministry of Foreign Affairs, Cambodia
Mr Steve Corbett	Director and Chief Executive, Centennial Parklands, Australia
Mr Surapol Saensook	Khon Kaen University, Thailand
Mrs Susan Cross	Wife of Vice Commander of the United States Coast Guard
Mr Tae-Gab Song	Researcher Fellow, Gwangju Jeonnam Development Institute, Republic of Korea
HE Thabo Mvuyelwa Mbeki	President of the Republic of South Africa
Mr Thomas Sin Park-wah	Secretary of Green Fun Committee, Hong Kong SAR Government
Mr Tibor Magyar	Attache of the Republic of Hungary to Singapore
Mr Toong Yet Han	Universiti Putra Malaysia, Malaysia
Mr Tsao Tak-kiang	Director, Civil Engineering and Development Department, Hong Kong SAR Government
Dr Vincent Demoulin	University of Liege, Belgium
Ms Wendy Yong Sze Yee	Universiti Putra Malaysia, Malaysia
Mr Wirot Kesonbua	Khon Kaen University, Thailand
Dr Wong Ching Lee	University of Malaya, Malaysia
Mr Yan Li	Deputy Party Secretary, CPC Suzhou Municipal Committee, Mayor of Suzhou, People's Republic of China
Mdm Yang Aidi	Wife of Ambassador of the People's Republic of China to Singapore
Ms Yang Cher Hing	Universiti Putra Malaysia, Malaysia
Mr Yang Xiaoming	Chief Planner, Planning and Construction Bureau, Suzhou, People's Republic of China
Mr Yonchoke Sukmarg	Director-General, Department of City Planning for Bangkok Metropolitan Administration, Thailand
Ms Zarina Bte Ahmad Osman	Director, Parks and Recreation Department, Kuala Lumpur, Malaysia
Mdm Zhang Ruizhen	Wife of Chairman Wu Bangguo, Speaker of Parliament, People's Republic of China
Mr Zhang Wen Wei	Director, Office of Wuxi City Population Planned Committee, Wuxi City Government Bureau, People's Republic of China
Mr Zhao Zheng Gang	Director, Huaian City Development Committee Jiangsu Province, People's Republic of China

A Particularly Important de Alwis Watercolour: *Citrus halimii*

Among the 185 or so watercolours prepared for the Gardens by Charles de Alwis at the beginning of the 19th century (*Gardenwise* **20**: 24) there is a drawing of one of the very few truly wild Malaysian citrus, a species which was not to be named until over 70 years later: *Citrus halimii* Stone (*Biotropica* **5**: 106, 1973).

The surviving herbarium material (there were no duplicates) bears a letter annotated by Ridley 'Limau Kedangsa' and 'Drawing by Alwis', 'fruit in spirit', though Stone seems not to have examined the illustration. The letter itself (discussed by Stone) is a note dated 28 December 1902 from W. Egerton [not 'Egeton' of Stone], British Resident at Seremban, Negri Sembilan, 'Dear Ridley, I send you by [R.W.] Hullett [Principal of Raffles Institute and member of the Gardens Committee] some leaves and fruit of a Mountain Lemon or Citron found growing in primeval jungle at a height of 2,200 ft about two miles from the Bukit Tangga pass to Jelebu. It may be unknown but I expect to hear you know it well'.

Whether Ridley responded is unknown, but he did indeed refer 'Limau Kedangsa' to one of the varieties ('perhaps wild') of the citron, *Citrus medica* L., in his *Flora of the Malay Peninsula* (**1**: 359, 1922), though he labelled the drawing 'Citrus cf. hystrix', while the specimen itself was later named *C. limonia* (i.e. the lemon, *C. limon* (L.) Osb.) by the eminent citrologist Tanaka. By contrast, Burkill included it under the pomelo, *C. maxima* (Burm.) Merr., in his masterly account of the genus (*Gardens' Bulletin Singapore* **5**: 222, 1931) and in his monumental *Dictionary*. Today this truly wild species is known from Peninsular Thailand, Peninsular Malaysia and Sabah (*Tree Flora of Sabah & Sarawak* **1**: 366, 1995), apparently as well as northern Sumatra (*Blumea* **49**: 20, 2004).

The watercolour is particularly important, not merely because it documents the plant's first collection but because it shows in great detail the structure of the fruit and seeds that have subsequently been lost from the Herbarium spirit collection. It therefore beautifully demonstrates the scientific significance of archive drawings preserved in the Gardens.

Citrus halimii Stone (Rutaceae) painted in Singapore by Charles de Alwis from material sent from Negri Sembilan in December 1902

David Mabberley
College of Forest Resources
University of Washington Botanic Gardens
Seattle, Washington
U.S.A

Ruth Kiew
Herbarium & Library

Photo by Serena Lee

Designed & Produced by PD ADDISON

The Singapore Herbarium Type Project

http://herbaria.plants.ox.ac.uk/bol/?singapore

The opening page of the website on the Singapore Herbarium Type Collection

The Singapore Herbarium has made a continued effort to verify and database type specimens. Information on more than 6,000 types has been entered into the Botanical Research And Herbarium Management System (BRAHMS). An online search of these types including their images can be viewed via the following website *http://herbaria.plants.ox.ac.uk/bol/?singapore*. We estimate that there are a further 500 types to be included, not to mention those continuously identified from the general collection.

Ruth Kiew, Hassan Ibrahim & Serena Lee
Herbarium

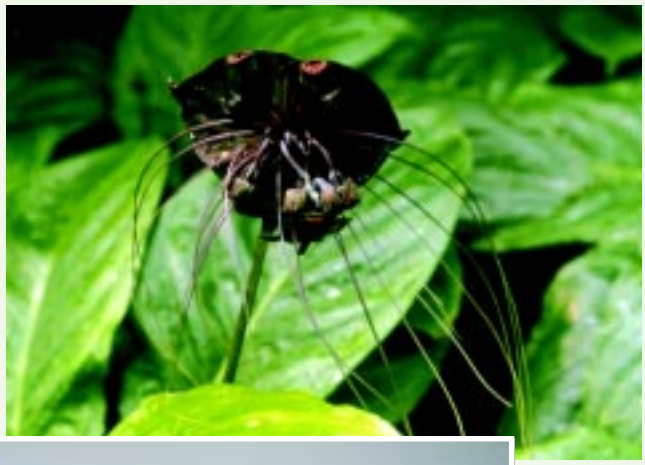
Mass Production of *Tacca chantrieri*, the Bat Lily

Tacca chantrieri is a herbaceous perennial plant. Its flowers are rich maroon black and shaped like bats with wide-spreading wings, and they have long trailing filaments or whiskers radiating out from the centre. The olive-green leaves have an oblique base. The plant has been called by many names such as Bat Lily, Cat's Whiskers, and Devil Flower, due to its strange and uniquely shaped flowers. It is propagated by division of rhizomes or from seeds when available.

A commercial grower brought some seeds of this plant to the Micropropagation Laboratory. Germination rate of the seeds was low, about 20-30%. We were contracted to do the work as the grower hoped to speed up mass production by tissue culture. Our experiments were successful, and about 2,000 plantlets were delivered within three years to the grower.

Lim-Ho Chee Len, Jassy Phua &
Koh-Low Neok Chein
Orchid Breeding & Micropropagation

Flowering plant of *Tacca chantrieri*



Jassy Phua

Plantlets of *Tacca chantrieri* produced by tissue culture

Lim-Ho Chee Len

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Who Was *Henry Nicholas Ridley?*

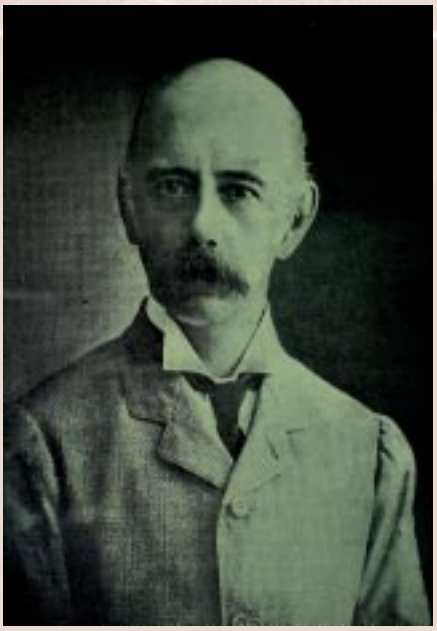
As 2005 is the 150th anniversary of Ridley's birth, it is appropriate that we review his contributions.

Henry Nicholas Ridley, whose life work included economics, botany, zoology, ethnography, medicine, etc, is well known in Singapore where he was Director of the Singapore Botanic Gardens from 1888 until 1912. The respected Asian scholar, Sir Richard Winstedt, in the1955 celebrations of Ridley's 100th birthday, said that Ridley was second in importance only to Raffles in the history of Singapore and Malaya. In an obituary by Professor Eric Holttum, the third Director of the Gardens from 1925 until 1949, Ridley is described as a genius. Ridley's peers repeatedly acknowledged his achievements by electing him into prestigious scientific societies. He received medals of recognition from the British government, the American government and from private organizations.

Ridley before Singapore

As a child and schoolboy, Ridley showed an interest in nature. During his schooling he made good collections of beetles and mammals. So good was he that one summer he was excused from cricket to work on the beetle collection. In 1875, he entered Oxford College.

His adult life began in 1878 with a degree in science. He then spent two years researching fossils at the Oxford Geological Museum. He next moved to the Botanical Department, British Museum and in his eight years at this post he published about 50 papers dealing with botany and zoology. He had "time off" in 1887 when the Royal Society sent him on an expedition to Brazil.



SBG Archives

H.N. Ridley (1855-1956)

However, Ridley wanted to explore the botany of the tropics. His museum work and membership in the Linnean Society had drawn the attention of England's leading natural scientists, and when the Colonial Office created the post of Director of Gardens and Forests for the Straits Settlements, he was asked if he was interested. In 1888, he came to Singapore.

Ridley and Singapore's Rubber Trees

The History of the Introduction of Para Rubber into the Malay Peninsula, January 1903, is Ridley's essay describing the early years of Malayan rubber growing. He writes that the first seedlings (50 plants, not seeds) destined for Singapore were sent from Ceylon in 1876. But "Owing to the delay in payment of freight these plants all perished. On June 11th 1877, 22 plants were sent to the Botanic Gardens Singapore…"

Of these 22, nine were planted at Kuala Kangsar, Perak, where Ridley reported that they grew well and by 1882 some of their seeds had been planted at the Singapore Botanic Gardens. By 1888, these seeds had grown into mature trees. Ridley understood the economic potential of this crop and had the foresight to realize the immediate need was for seeds. Thus trees that survived and fruited in the Gardens became the primary source of all the rubber planted at that time. And, to show Ridley's administrative ability, became an important income for the cash-strapped Gardens.

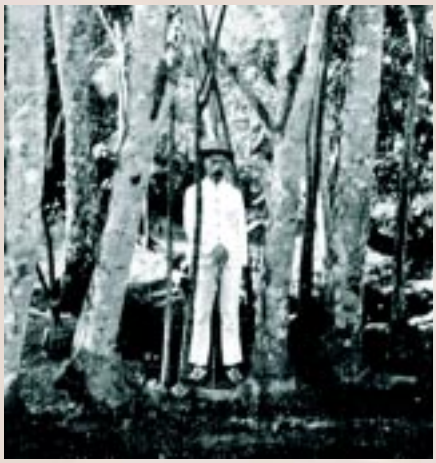
How Ridley came to be called "Mad Ridley"

In his unpublished autobiography, *The Life of a Naturalist,* Ridley recalls an interesting tale. "…I found near a rest house in Tapah in Perak, some very large [rubber] trees then owned by a Malay who said he was getting about a half a pickul (66 pounds) from one tree 12 feet round. The house had formerly been that of a District Officer whom I had worried to plant [rubber] seeds. I stuffed his pockets with seeds."

"One day a traveller who had been from my house to visit Ceylon shortly after the boom in rubber began, returned to me, and told me he had met a tea-planter in Ceylon whose name he unfortunately forgot. The planter said 'Oh you have been in Singapore. Did you meet a fellow called "Mad Ridley"? The traveller said he had. 'Well,' said the other, 'some years ago he sent me a lot of rubber seeds and asked me to plant them. As I wanted to get something out of him [Ridley], I did so to please him. Well they grew up…' ". The

story then ends with the tea-planter becoming a rich rubber planter, all thanks to "Mad Ridley". This story, along with others, reveals Ridley's sense of humor. He also had a great intellect.

The papers that Ridley wrote in the early years of the rubber industry in Malaya, 1897 to 1910, reveal a mind that was clear and focused. He studied tapping and perfected the herringbone method. He described layering. He wrote about the most successful planting systems. He added knowledge of prevention and control of insects, and other diseases on rubber. In summary he wrote about everything from seeds to stumps. The clarity of his writings aided by the adoption of his practices led to the success of the plantation system. B. J. Eaton in 1935, while marking Ridley's 80th birthday, said "We in Malaya, not to mention other rubber growing countries in the East, owe him a considerable debt of gratitude for his pioneer work in connection with the plantation rubber industry and his optimism and faith in its future." And while doing all the above, he still maintained a substantial output of quality papers in botany, zoology, geology, ethnology, medicine, and biography. These writings contain extensive descriptions and analysis, which reveal a rational, productive mind, completely in touch with reality.



From Malaya, 1953

Ridley in 1903, among rubber trees planted before 1888

Ridley as a Scientist

In 1881, Ridley was elected to the Linnean Society and later to the Society's Council. In 1914 he held the post of Vice-President. The Royal Society is the domain of world famous scientists who vote in new members. According to the Society "The main criterion for election as a Fellow is scientific excellence". In 1907, Ridley was elected a Fellow of the Royal Society. In the same election, 21 other outstanding scientists were elected, including Sir William Bragg and Ivan Pavlov. The botanical contributions Ridley made during his lifetime were formally recognized in 1950 when the Linnean Society awarded him the prestigious Gold Medal. He was also honoured many times over by the rubber industry.

Ridley collected about 50,000 herbarium specimens, many of which he described. This huge volume could only be accomplished with a bit of haste and the resulting odd error. But Ridley's errors are not important when viewed against his overall contributions. In 1960, Eric Holttum wrote of Ridley's errors: "He was a genius and as such much can be forgiven."

Ridley and Orchids

Ridley had a science degree from Oxford based on a geology scholarship and had worked on systematics in museums and carried out fieldwork in England and overseas. In the British Museum, he specialized in monocotyledons. Orchids are monocotyledons and he may have had a special interest in them judging by the number of species he described – about 200 alone in Malaya. He also described a comparable number of ferns, gingers, etc. Ridley appreciated the difficulty of growing wild orchids without consideration for their native habitat. Nonetheless, he developed a fine collection of worldwide plants that were displayed in the Gardens.

Ridley's Description of *Vanda* Miss Joaquim

Vanda Miss Joaquim was described by Ridley in 1893. Ridley was a very competent botanist. He clearly knew the difference between an artificial and a natural hybrid. Botanists had made the distinction for many years as is evident by the literature of the time. Ridley read and published in many leading journals about new species of plants, including orchids, and their ecology. His writings about pollination reveal an acute awareness of the role of insects. When the Joaquims had a new orchid and asked him to identify it, he noted that it was midway between two species and thus a hybrid. Ridley wrote "A few years ago Miss Joaquim, a lady residing in Singapore, well-known for her success as a horticulturist, succeeded in crossing *Vanda hookeriana* Rchb. *f.*, and *V. teres*...". It is clearly indicated that *Vanda* Miss Joaquim is an artificial hybrid.

Conclusion

A study of Henry Nicholas Ridley reveals him as an exceptional person who made important contributions to life science and economic development in Asia. E. J. Salisbury wrote: "…[his] total output, from the time he was a schoolboy of seventeen to when he was an old man of ninety-one, is an impressive monument to his industry and alertness of his mind."

Harold L. Johnson
23 Chartwell Drive, Singapore 558717

Henry Nicholas Ridley (1855-1956) – An Extraordinary Botanical Explorer

Although Singapore Botanic Gardens was founded in 1859, it did not have a designated director until 1888. This was when Henry Nicholas Ridley arrived from England to take up his post as Director of the Botanic Gardens.

Ridley was 32 years old. His directorship lasted for more than 23 years until he retired in 1912. His achievements during the period as director were enormous and they laid the foundations for truly monumental contributions to botany that resulted from his long and productive retirement living near the Royal Botanic Gardens Kew in England.

Gardens and Forests

Ridley was responsible for administering the Gardens, not just those in Singapore, but the Waterfall Gardens in Penang also. Additionally, he was in charge of the Forest Reserves in the Straits Settlements (Singapore, Penang and Malacca).

The colonial administration was always sparing with funds and Ridley had perpetual problems with obtaining enough money for the Gardens. His post was actually abolished while he was on one of his periods of home leave, and it was only through the intervention of the Director of Kew Gardens that the post was reinstated giving Ridley a job to go back to. A man of lesser abilities would have been happy to serve out his time, write the reports, make sure enough work was done to satisfy the Governor. This was not enough for Ridley. He single-handedly turned Singapore Botanic Gardens into a major centre for tropical plant science. From being something of a backwater compared to places such as Calcutta in India and Peradeniya in Sri Lanka, Singapore shot forward thanks to Ridley's tireless efforts.

Economic Plants, Herbarium

Ridley developed the Gardens, particularly the living collections of economically important plants. He travelled through the region collecting plants, both living specimens for the Gardens and dried specimens for the newly developed herbarium and making notes on all aspects of natural history and anthropology. He was secretary of the Straits' Branch of the Royal Asiatic Society and edited their journal, himself filling many of the pages with articles on plants, as well as animals, minerals, folklore and other subjects.

Rubber and Spices

He was an enthusiastic advocate for the rubber industry in Malaya. Ten years before Ridley arrived in Singapore, 22 of the famous seedlings of Para Rubber *(Hevea brasiliensis)* reached the island from Brazil via Kew and Peradineya. Ridley therefore had a few young trees to start experiments on latex extraction and for seed production to increase the planting material. Ridley's persistence with rubber paid dividends for those planters who followed his advice, and was an enormous boost for the economy of Southeast Asia. Popular history views him as 'Mad Ridley', with an obsession for rubber. This fixation is perhaps to be understood in seed production being one of the few possibilities for income of the Gardens. But rubber was just part of Ridley's many and varied activities with introduction and trials of plants of economic potential. At the time of his retirement, Ridley published *Spices*, a monograph on spice plants and their cultivation, which was the standard work on the subject for many years.

Expeditions and Floras

Ridley took every opportunity to visit the forests and islands of the region collecting plants whenever possible. Some trips were official business, but most expeditions were during his leave and funded out of his own pocket. The flora of the Malay Peninsula was poorly known and there were new discoveries to be made everywhere. Calcutta had been the main centre for research on plants of the British colonies in Southeast Asia. Ridley collaborated with the Calcutta-based botanists Sir George King and James Gamble, sending specimens to them, but himself specialising in the monocots, notably gingers, orchids and palms. Ridley described thousands of new species and before his retirement, the preliminary account for much of the Malayan flora had been published by King, Gamble, Ridley and others as a series of 'Materials'.

Ridley took up residence in the leafy London suburb of Kew and became an almost daily visitor to the herbarium of the Royal Botanic

Gardens. Retirement did not diminish his energy for scientific work and he began work on his *Flora of the Malay Peninsula*. It took ten years for the first volume to appear in 1922, and by 1925 all five volumes were published. This industrious activity strained Ridley considerably and there were worries whether he would live to see the enormous task complete, but he did.

Plant Dispersal

At 70, one might imagine his life's work was complete and he could finally retire. But no, Ridley started work on another tome for which he had been keeping careful notes for many years. Ridley had always been fascinated by how plant species spread, for instance, how are islands colonised? He realised that information on how seeds are dispersed is vital to answering these sorts of questions. So he decided to collect together all the information on this topic and published *The Dispersal of Plants Throughout the World* in 1930. In his eighties, Ridley continued to publish on botanical subjects and was a keen birdwatcher in Kew Gardens. He attended meetings at the Royal Society and the Linnean Society, and got married for the first time. His last great achievement was to reach 100 years of age. By all accounts though increasingly frail in his final years, he retained the clear mind and excellent recall that he had always possessed. He died in 1956 in his 101st year.

Ridley, the Person

The many books and papers Ridley published are testament to his immense contribution to tropical botany, as is the continuing existence of Singapore Botanic Gardens and the rubber industry in Southeast Asia. However, they do not provide much insight into Ridley as a person. The

SBG Archives

Ridley, the ever-tireless botanist, zoologist and explorer

photographs of him give the impression of a small man with a bald head, a bushy moustache and very penetrating eyes – an energetic and enthusiastic man eagerly searching for information from the world around him.

The ultimate source of information on Ridley is his personal notebooks and journals. These he bequeathed to the archives at Kew. There are 15 volumes of journal recording his life in detail. I have had the opportunity to dip briefly into some of these, but hopefully some day the complete work will become available to a wider audience (though at the outset Ridley wrote that the journal was for his own personal use and not intended for publication). The journals make it clear that Ridley was fascinated by natural history from an early age and his great ambition was to explore the biological diversity of the tropics. The boyhood passion for bugs and birds did not diminish with age and was reinforced by a thirst for scientific knowledge particularly when he went to Oxford University. It was an exciting time to be a biology student with Darwin's writings on evolution rocking the scientific establishment and being discussed by everyone.

Ridley's eventual appointment to Singapore was therefore the fulfillment of his great ambition, though chance (through job opportunities at the British Museum) had diverted him to botany when zoology was his first love. He clearly made the most of the opportunities his position gave him. It is hard to believe anyone could have done more to document the botanical diversity of the region. In retrospect, Ridley has often been criticised for his rather slapdash approach to botany. This is perhaps understandable when one realises the magnitude of the task Ridley could see lying before him. Later botanists could sort out the problems, he wanted to record the thousands of new species of plants he found. Perhaps also, Ridley was not by nature a taxonomist, not obsessed with pigeonholing and discriminating and the technicalities of type specimens and accurate descriptions. I suspect that the reluctant botanist became a keen plantsman. It was the plants (as well as the animals, the rocks, the ethnography and everything else) that inspired the insatiable curiosity that made him one of the great explorers of the botanical world.

Ian Turner
Winchelsea East Sussex
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United Kingdom

Henry Nicholas Ridley (1855-1956)

H. N. Ridley, the Indefatigable Collector

"When I first arrived in this country in 1889, large areas of forest and mountain, now easily reached by train and motorcar, were only accessible by long and difficult marches."
Ridley, 1917

Indeed, the easiest form of travel in those days was by gharry or dogcart, if there were passable roads, or by horseback on ponies along bridle paths or by boat if river access was possible. Otherwise, there was nothing for it but to walk.

Ridley's first attempt in 1891 to climb Gunung Tahan, the highest mountain in Peninsular Malaysia, started at Pekan on the East Coast and involved a six-day boat ride up the Pahang River to Temerloh, where he changed to smaller boats and took another 14 days to reach Kuala Tahan, followed by a further three days up the Tahan River to reach the foot of the mountain. At that time, the route to the summit had not been found and after 20 days, running short of food and with two out of three men suffering from fever, they turned back without having reached the summit.

The next time he climbed Gunung Tahan in 1911, he took a house boat from Kuala Lipis in central Pahang and reached the foot of Gunung Tahan in seven days. The trail to the summit was then known and could be reached in two days. Ridley was the first botanist to explore the strange, stunted padang flora on the sandstone plateau and he collected and described many new species.

Between 1889 and 1911, and later in his retirement, he collected extensively in Peninsular Malaysia and Singapore. In most cases, he worked up his collections describing new species and compiling checklists for the specific areas he had explored. His account of his expedition to what is now known as the Cameron Highlands area listed 612 species of vascular plants.

He was particularly interested in plant geography and the origin of the flora and was the first to study the change in the north of the Peninsula from tropical rain forest with its predominantly evergreen species to the monsoon forest with many deciduous species. He determined that the change occurred close to the town of Alor Setar, a finding that later study has confirmed. In his exploration of mountains, and he climbed many (Gunung Jerai, Taiping and the Larut Hills, Gunung Bujang Melaka, the Cameron Highlands area, Genting Simpah, Genting Peras, Gunung Tahan, Gunung Ledang, Gunung Panti and Gunung Pulai) and he noted those species that formed part of the temperate element, such as violets and sanicles, that grew in mountain forests.

His collections are important, as the vegetation in many of the areas that he explored, for example in the Kinta Valley, which was exploited for tin-mining, Rawang in Selangor, Malacca, and Tebrau in Johore, are long gone.

In 1917, he deplored *"the wide development of agriculture of late years has not been, alas, all to the advantage of the Naturalist, for the felling and burning of the forest has caused the disappearance of many plants and probably many insects and other animals; and as this work is still continuing, it becomes of more and more importance to save specimens of the vanishing flora and fauna, ere they become as extinct as Dodos."*

In his *Flora of the Malay Peninsula*, he recorded in 1924 that *Echinodorus ridleyi* (now a synonym of *Ranalisma rostrata*), which he had collected in 1897 from 'a patch of black mud in dense forest' at Batu Caves, outside Kuala Lumpur, had never been found again. It was one of the first examples of extinction in the Peninsula.

Ranalisma rostrata, discovered by Ridley in 1897, was never seen again

From Ridley's Flora of the Malay Peninsula 4: 363

Hassan Ibrahim

A herbarium specimen of *Memecylon cantleyi* collected and described by Ridley with close-up of the label. This is the 13,012th plant he collected. Note his initials HNR in his handwriting. Ridley collected this from the Gardens Rain Forest

"Formerly I always used presses made of crossed laths of hard wood, but these proved awkward sometimes to carry through thick forest, and I substituted for them the ordinary wire presses of crossed wire, which I contrived to have made sufficiently strong and not too heavy, in fact hardly as heavy as the wooden ones, and more easily portable.

In the Telom and Temango expeditions we found plenty of bamboos which, split into suitable lengths and tied with string or bast from some jungle tree or climbers made suitable presses. The laths were tied together with twine and when that failed some jungle string had to be sought. Rattan split is excellent but often unprocurable and then one has to fall back on the inner bast of mahangs (Macaranga) or dadaub (Bauhinia) or Gnetum, Artocarpus, or the like. It is very seldom that one has to go far in the forests for jungle string.

The paper we use is Chinese bamboo paper procurable at most village shops in the country. Only a few sheets are put in each press, which is put out in the sun and taken in on the approach of rain. Most of the plants dry thus in a few days and a week suffices for anything but the very succulent plants such as aroids or orchids.

The plants when dry were made up into bundles and wrapped in American cloth for travelling, so as to take no injury from damp." Ridley 1910

SBG Archives

Ridley and Ahmad, plant collector with plant press, in the Gardens Rain Forest

So, too for Singapore, where of the species he listed in his 1900 *Flora of Singapore*, only about three quarters of them can still be found growing in Singapore. This underlines the great importance of his collections that are, in many cases the only permanent record of what there was at the turn of the last century.

It is estimated that Ridley collected about 50,000 plants. For each plant collection he made, he collected several duplicates that were sent to other herbaria specializing in the flora of Indo-Malayan region, such as Kew, the British Museum (now the Natural History Museum) and the Botanic Garden in Calcutta. He also sent plants to botanists who specialised in particular groups. For example, he sent palms to Dr O. Beccari in Florence. A great number of his collections represented new species. Many, it is estimated about one thousand, new species were described by Ridley himself, while many others were described by specialists in other herbaria. Frequently, they commemorated his discovery of the new species by naming it 'ridleyi' or 'ridleyana'.

He wrote all the labels for these 50,000 species and their duplicates by hand himself. He abbreviated his name to his initials HNR and recorded minimum data – locality (very brief), the date and scientific name. Occasionally, he might add a short note about flower colour or uses. He numbered his specimens in the herbarium (most botanists number their plants in the field) and many ended up with *s.n.*, *sine numero*, meaning no number.

He not only collected green plants, he also arranged for toadstools to be collected from the Gardens, which were painted by the resident artist Charles de Alwis while still fresh to capture their delicate colours. These were sent to George Massee, the mycologist at Kew, and many proved to be new species (*Gardenwise* **15**(2000)24).

He not only extensively covered the Peninsular Malaysia and Singapore in his botanical exploration, he also travelled further afield to southern Thailand, the east coast of Sumatra, the Riau Archipelago, northwest Borneo, Lundu, Labuan and

SBG Archives

A Charles de Alwis' painting of a toadstool

Christmas Island. Christmas Island, for which Ridley wrote a flora, was then under the administration of Singapore.

As J.W. Purseglove wrote on the occasion of Ridley's 100th birthday: *"Mr Ridley's work as a field botanist added more than that of any other single man to our knowledge of the Malay Peninsula."*

Ruth Kiew
Herbarium

Ridley's Namesake – His Legacy in the Gardens

Ridley passed away in 1956 but his name has been immortalised in many plant species from the Malay Peninsula – a legacy befitting a great naturalist.

Few people have achieved so much in 23 years of service in the tropics as the late H.N. Ridley. During his tenure, he collected about 50,000 botanical specimens. His interests were varied, and he studied the entire spectrum of plant families.

In the Gardens we have a living collection of about 90 species named after Ridley and a number of species that were described by the man himself. Some of the plants described by Ridley or were named after him

Koh Sin Lan

Dracaena yuccifolia Ridl. (Agavaceae)

Koh Sin Lan

The attractive blue flowers of the aquatic plant *Monochoria elata* Ridl. (Pontederiaceae)

Tan Puay Yok

The flowers of an Apocynaceae named after Singapore, *Kopsia singapurensis* Ridl.

are *Platycerium ridleyi* Christ., *Gigantochloa ridleyi* Holttum, *Dracaena yuccifolia* Ridl., *Monochoria elata* Ridl., *Spatholirion ornatum* Ridl. All the plants mentioned here are grown in our Gardens.

New species described by Ridley

In 1900, Ridley authored the first checklist of Singapore plants, entitled "The Flora of Singapore" (in *Journal of the Straits Branch of the Royal Asiatic Society* **33**: 27-196). During his time, he described over 5,200 species of plants as new species. Those cryptic letters "Ridl." after the scientific names of the plants is an abbreviation for 'Ridley'. This means they were first named and described by him.

Nura Abdul Karim

The erect fertile fronds of *Platycerium ridleyi* Christ. (Polypodiaceae). This endangered fern species is highly valued in the horticultural trade and once grew in Singapore

In his taxonomic work, Ridley had also honoured Singapore by naming a few of the new plant species he or others had collected around the island after our nation, such as *Kopsia singapurensis* Ridl. and *Dracaena singapurensis* Ridl.

New combinations made by Ridley

Besides actually naming new species of plants, he also transferred some of his contemporaries' described and named plants into their proper genera. In reassigned cases, the complete scientific names of these plants would have the original author's name in brackets followed by the name of the current author who transfers the plant to its correct genus. For example, the Nibong Palm known scientifically as *Oncosperma tigillarium* (Jack) Ridl. was first described by William Jack in 1820 as *Areca tigillaria* Jack before Ridley transferred it to its present genus *Oncosperma*.

Likewise, other taxonomists have also reassigned some of Ridley's named species. For instance, in 1905, Ridley described and named a remarkable

Koh Sin Lan

The very useful but spiny palm, *Oncosperma tigillarium* (Jack) Ridl. (Palmae), better known as Nibong
(Inset: Close-up of the thorns on the trunk)

Koh Sin Lan

Borassodendron machadonis (Ridl.) Becc. (Palmae) growing in Palm Valley

new palm species discovered by a colleague, Machado, from the forest of Kamuning, Malaysia, as *Borassus machadonis* Ridl. Nine years later, an Italian taxonomist, Odoardo Beccari, transferred this palm to a new genera, *Borassodendron* and ever since then, this palm, first described by Ridley, has been known as *Borassodendron machadonis* (Ridl.) Becc.

Ridley as honoured by his fellow botanists – past and present

Over the years a number of plant species have been named in honour of Ridley by other botanists. The specific name for most of these plants is *ridleyi*, but a few are named *ridleyana*, *ridleyanus* and *ridleyanum*. There are even a small number of genera named after Ridley, such as *Ridleyara*, *Ridleyella* (both Orchidaceae) and *Ridleyandra* (Gesneriaceae).

The table below shows a list of 9 taxa named after Ridley that are in our Gardens' collection. They range from ferns, orchids, bamboos , grasses to dipterocarps, asclepiads and gesneriads among others.

Example of plants in the Gardens named after H.N. Ridley

SPECIES	FAMILY	COMMON NAME
Alangium ridleyi	Alangiaceae	*Mentulang Daun Lebar*
Gigantochloa ridleyi	Gramineae	–
Hoya ridleyi	Asclepiadaceae	–
Oryza ridleyi	Gramineae	–
Platycerium ridleyi	Polypodiaceae	Ridley's Staghorn Fern
Ridleyandra kiewii	Gesneriaceae	–
Vatica ridleyana	Dipterocarpaceae	*Resak Buah Chana*
Wikstroemia ridleyi	Thymelaeaceae	–
Ridleyara Fascad	Orchidaceae	–

A living Ridley legacy

In 1956, the former director of Botanic Gardens, R.E. Holttum had described and named a species of bamboo growing in the Botanic Gardens after Ridley - his well-respected predecessor.

The very plant Holttum studied was brought to the Gardens by Ridley himself from Province Wellesley (now Seberang Perai), Malaysia, and is still alive at the Palm Valley. This bamboo, *Gigantochloa ridleyi* Holttum, is a living type specimen and will serve as a reminder of Ridley and his connection with the flora of Malay Peninsula and the Gardens.

Nura Abdul Karim
Plant Records Unit

Nura Abdul Karim

The clump of *Gigantochloa ridleyi* Holttum (Gramineae) at Palm Valley. This is a living type specimen

Ridley and Orchids

H.N. Ridley had already written papers on tropical orchids before arriving in Singapore. He had worked in the Botany Department of the British Museum of Natural History from 1880 to 1887 where he was in charge of the monocotyledon section of the herbarium. It was natural therefore that he made Malayan orchids an early subject of study. Wherever he went plant-collecting, he collected orchids for the herbarium, for cultivation and for exchange.

Published records show that Ridley described 13 orchid genera and about 200 new species. Some of these genera and species have been reduced by later taxonomists.

Table 1:
Orchid genera described by Ridley

Ascochilus	*Poaephyllum*
Ascotainia	*Porphyroglottis*
Forbesina	*Radinocion*
Glossorhyncha	*Renantherella*
Leucolena	*Staurochilus*
Orestia	*Zetagyne*
Pelatantheria	

Holdings in the Singapore Herbarium show that Ridley collected some 5,932 specimens of plants in Singapore of which 125 are types. Of these, 459 are orchids comprising 59 genera and 154 species and include 35 types.

His work on orchids brought him recognition with almost 30 species and 2 natural genera (*Ridleya* and *Ridleyella*) named after him. In honour of his contribution, the Gardens named an artificial genus *Ridleyara* (*Arachnis* x *Vanda* x *Trichoglottis*) after him. To date, *Ridleyara* Fascad (*Aranda* Eileen Addison x *Trichoglottis fasciata*) is the only grex registered in the genus.

Yam Tim Wing

Ridleyara Fascad

Ridley wrote the first account of the orchids of the Malay Peninsula in 1896. He amplified it in his complete study of the monocotyledons of the peninsula in 1907 (*Materials for a Flora of the Malay Peninsula, Monocotyledons* **1**) and finally in 1924 in *Flora of the Malay Peninsula* **4**. At the age of 75 Ridley published his last major work, *The Dispersal of Plants Throughout the World* (1930). This book is still an important source of information regarding the dispersal of orchid seeds.

During Ridley's time, Charles Curtis, Superintendent of Gardens and Forest, Penang from 1884-1903, which came under the Singapore Botanic Gardens' administration, recorded in his reports the collecting of orchids in the northern part of the Malay Peninsula while engaged on forest survey work. He built a herbarium in Penang, which in 1910 was incorporated into that of the Singapore Botanic Gardens. Mohamed Haniff who entered the Gardens Department in 1890, and later stationed in the Waterfall Gardens, Penang from 1911-1921, was another important collector. Owing to the efforts of Ridley, Curtis, Haniff and other collectors, by 1912, orchids had become the largest group of living plants in the Gardens with 276 species in the living collection.

In 1893, Ridley described the first orchid hybrid, *Vanda* Miss Joaquim, from Singapore. This hybrid was later selected as the National Flower of Singapore in 1981.

Table 2:
Orchid species named after Ridley

Acriopsis ridleyi Hook.*f.*
Bulbophyllum ridleyi Kraenzl.
Cleisostoma ridleyi Garay
Coelogyne ridleyana Schltr.
Coelogyne ridleyi Gagnep.
Corybas ridleyanus Schltr.
Cynosorchis ridleyi Th. Dur. *et* Schinz
Dendrobium ridleyanum Kerr
Dendrobium ridleyi Merr.
Eria ridleyi Rolfe
Habenaria ridleyana Kraenzl.
Lecanorchis ridleyana Schltr.
Malaxis ridleyana P.Francis Hunt
Microstylis ridleyi J.J.Sm.
Polystachya ridleyi Rolfe
Sarcanthus ridleyi J.J.Sm.
Thrixspermum ridleyanum Schltr.

Yam Tim Wing, Aung Thame
Orchid Breeding & Micropropagation

Acknowledgement: We would like to thank Serena Lee and Hassan Ibrahim for providing information from the herbarium; Christina Soh and Zakiah Agil for providing help in the library.

Ridley intended his *Flora of the Malay Peninsula* **4** to have colour illustrations and employed James & Charles de Alwis to paint orchids from the Gardens' living collections. However, there were insufficient funds for their publication. Here is a selection of a few of the orchid paintings from the SBG Archives.

Eulophia keithii

Thrixspermum ridleyanum
(synonym of *Dendrocolla maculate*)

Anoectochilus geniculatus

Bromheadia pungens

Bulbophyllum acuminatum

From SBG Archives

The Gardens' Menagerie

Imagine this sight! You are taking a stroll in the Gardens and admiring the beautiful flowers. But there sitting comfortably is an Orangutan sipping a glass of whisky and puffing on a cigar. Further on you notice two tiger cubs accompanying the Director of the Gardens on his daily walks. Then even more remarkable – you think you see a crocodile swimming in Swan Lake. Are these scenarios very far-fetched?

Well! Not if you were a visitor to the Gardens in the late 1890s when H.N. Ridley was here. As Director of the Gardens, he not only oversaw the management of the botanical collections, but also ran a small zoo.

The collection of living animals went back to the days of the Agri-Horticultural Society in 1859 – the precursor to our present Gardens. An annual report on the Zoological Collections in 1876 highlighted the presence of a rhinoceros, sloth-bear, kangaroo, and a collection of birds just to name a few. In its heyday, the zoo was even well-known around the world. In those days the first question that travellers asked was "Where is the menagerie?"

Most of the animals were donated by regular patrons of the Gardens or had been captured within the region – like the Malayan Honey Bears which were kept in bear pit - and handed over to the Gardens for upkeep. Once

Jeremy Purseglove

Ridley as Noah, during a fancy dress party

common animals in Singapore (but rare now) like the porcupine or the scaly anteater were kept in cages. The menagerie even boasted an exotic collection of animals like the flamingoes from Egypt, various marsupials from Australia and even foxes from China. Ridley's zoo was also used as a temporary abode for many animals before they were shipped to faraway zoological gardens like London, Vienna and Calcutta.

Ridley made acute observations on the animals in the zoo. Regular activities were recorded in the Annual Reports of the Gardens. He even published a detailed account of the fascinating behaviour of the animals which included many funny anecdotes (H.N. Ridley, 1906, "The Menagerie at the Botanic Gardens", in the *Journal Straits Branch of the Royal Asiatic Society* **46**: 133-194).

Remember the crocodile in Swan Lake? Well! That's not a tale at all. Ridley mentioned that one of the crocodiles escaped to the lake and grew to about 2 m long. It devoured waterfowls there and even tried to drag workers who were taking water from the lake. When the lake was drained, it managed to hide in the mud and later escaped. Somehow it was never captured, nor seen nor heard of again.

Tigers were also kept in the collection. But it must have been dangerous to visit the Gardens back then. Ridley recorded that a wild tiger used to roam round the Gardens' Jungle for months in 1893! And another tigress, originally caught in Pahang, would be labelled "racist" nowadays. Apparently she was tame with Europeans but totally disliked the natives. So…the "Sarong Party Girl" concept was already present in those days. And the drinking, smoking Orangutans are no tale either. They really acquired the taste for sweet wines like port. Can you imagine them sitting on the verandah of Burkill Hall, merrymaking the days away with booze in one hand and cigars in the other? Ridley even recorded how a Malayan tapir and the rhinoceroses always dropped their dung on the exact same spot making housekeeping for them convenient.

Despite careful attention, many animals perished perhaps due to ignorance of their proper diet or lack of knowledge on their upkeep. There's a poignant story of two partridges (a male and a female) that were at first kept in separate cages but were united together as they kept calling for each other. But alas! Marital bliss was not meant to be as the male bird pecked the head of the female till she died. This was one male who didn't want to be henpecked at all! A number of animals also succumbed to illnesses and died during their stay in the Gardens or while on their onward voyage over the sea to distant lands.

Many past directors of the Gardens resided in Burkill Hall including J.W. Purseglove, who was Director from 1954-1957. These old photographs, taken in the mid-50s, have been kindly provided by his son, Jeremy Purseglove. A young Jeremy is seen in the bottom picture, playing with his friends, Andrew (middle) and Gillian (far right), children of J.W. Ewart (see page 17 on the mention of J.W. Ewart). It was mentioned that there used to be bear pits in the background of this picture where Malayan Honey Bears were once kept.

When the Pursegloves lived in Burkill Hall, they kept ducks near their home. These ducks merrily enjoyed a swim in the orchid-watering tank located nearby. Notice a gravestone on bottom right of the top picture with the name "Susan" engraved on it. Besides overseeing the animals in the zoo, Ridley also had a pet dog, Susan. When the dog died, it was buried near Burkill Hall.

We are totally grateful to Jeremy for providing these personal family photographs.

The ducks at play and a reminder of Susan (1889-1902)

Jeremy (far left) with the Ewart children

Photos by Jeremy Purseglove

SBG Archives

The Gardens in the 60s, when long-tailed macaques were once common residents

Rarely were the animals purchased. After 1881, no funds were granted by the government for their upkeep. So expenses for feeding and housing the animals were paid out of what could be spared from the Gardens' vote. No large animals like the elephant could be kept on account of the expense. It was this perennial pecuniary problem that ultimately caused the demise of the menagerie. As its upkeep became too much to bear, the zoo was abolished in 1903 and the animals were gradually taken away.

So gone are the days of the menagerie. And no longer do the visitors ask "Where is the menagerie?" but instead "Where is the National Orchid Garden?" Our only zoological collections are the free roaming animals that are part and parcel of the Gardens. One might notice the occasional monitor lizard scurrying away on a flight to freedom, or the delicate green Oriental Whip Snake slithering away amidst the green *Murraya* hedges. But the common "zoo" residents like squirrels, terrapins and parakeets or even our screeching cicadas are here to stay and make a visit to the Gardens all the more an entertaining one. Don't fret the next time you thought you saw the scales of a crocodile bobbing out of the murky waters of Swan Lake. It could be our long lost crocodile coming back for a visit or how would you like to see our Director walking around the Gardens with two tigers - Siegfried and Roy - as his bodyguards? Wouldn't that be a sight!!!

Derek Liew

One of our current resident zoological collections, the Oriental Whip Snake, which can be spotted now and then

Hassan Ibrahim
Herbarium

Ridley's World of Fungi

Ridley started the Herbarium's fungal collection by systematically collecting macrofungi from the Gardens. These included mushrooms, toadstools and bracket fungi.

Way before the epoch of digital photography, Ridley commissioned Charles de Alwis to make watercolour paintings of fresh specimens before they were dried and lost all their colours.

Duplicates of the specimen were then sent to Kew where a copy of the painting was made. These were identified and described by G. Massee, who commented on the importance of the 'very beautifully executed coloured drawings' in making description of these new species.

Many of the fungi were collected from the Gardens Rain Forest. Several were species new to science thus making the Rain Forest an important type site. This refers to the original location from where a specimen new to science (type specimen) was collected and later described for the first time.

To date, as many as 14 species have been named after him: namely, *Boletus ridleyi, Calodon ridleyi, Clavaria ridleyi, Cordyceps ridleyi, Crepidotus ridleyi, Daedalea ridleyi, Hydnum ridleyi, Melanotus ridleyi, Ophiocordyceps ridleyi, Polyporus ridleyi, Polystictus ridleyi, Pulveroboletus ridleyi, Tulostoma ridleyi* and *Xylaria ridleyi*.

Painting of a type specimen
Hypholoma elatum

A selection of other toadstool paintings

Serena Lee
Herbarium

From SBG Archives

Ridley and Mosses

H.N. Ridley collected a significant number of mosses from Singapore and Malaysia, the duplicates of which are preserved in the Singapore Herbarium.

On the basis of publications, we counted well over 300 moss specimens collected by him, most of which are from Peninsular Malaysia, several from Singapore (the Gardens' Jungle, Bukit Timah, and the locality called Chan Chu Kang), with a few from Sarawak in Borneo. In Peninsular Malaysia, a large part of Ridley's moss collections came from Mount Ophir, Gunung Tahan and Penang Hill. A total of 172 species and 12 varieties of mosses were identified, mainly by H.N. Dixon in the United Kingdom. Following today's taxonomic concepts, these represent 152 species, one subspecies and eight varieties.

Thirty one species and varieties were validly described as new from Ridley's moss collections. Three of these new taxa have the type locality in Singapore, namely *Syrrhopodon ridleyi* Dixon (= *Syrrhopodon involutus* Schwaegr.), *Taxithelium subtrachaelophyllum* Dixon (= *Taxithelium nepalense* (Schwaegr.) Broth.), and *Trichosteleum brachypelma* var. *compactum* Dixon (= *Trichosteleum boschii* (Dozy & Molk.) Jaeg.). Of these 31 Ridley's types, only 12 are accepted taxa today.

Three moss taxa bore Ridley's name as the species epithet, namely, *Acroporium ridleyi* Dixon, *Syrrhopodon ridleyi* Dixon, and *Thysanomitrium ridleyi* Dixon (= *Campylopus exasperatus* var. *lorentzii* (M. Fleisch.) J.-P. Frahm). Only one, *A. ridleyi*, has stood the test of time and not been reduced to synonymy.

We are fortunate in Singapore and Peninsular Malaysia that Ridley showed interest in collecting mosses for posterity. During his stint in Singapore at the turn of the 19th

century, the Malay Peninsula and Singapore were covered largely by pristine rain forests. Having a keen eye for morphological differences, Ridley proved a good collector of moss novelties. This is evident from the broad variety of moss genera and species that he collected. Among the moss species he collected from Singapore, several are large, dendroid ground plants, while others are medium-sized epiphytes forming extensive populations on tree trunks and branches. These mosses, for example, *Hypnodendron arborescens, Leucobryum javense, Neckeropsis gracilenta, Leucophanes candidum, Lopidium struthiopteris, Desmotheca apiculata* and a number of *Macromitrium* species, are widespread Malesian taxa found in humid and well shaded lowland forest. Unfortunately, they can no longer be seen in Singapore today. Interestingly, Ridley collected a fairly small forest moss, *Fissidens crassinervis*, from Geylang. This last mentioned species can still be found in Bukit Timah Nature Reserve and Central Catchment forests, but not in Geylang.

Other than the large-sized mosses, Ridley also had a good eye for collecting very tiny mosses growing on twigs and leaves (e.g. *Ephemeropsis tjibodensis* from Penang Hill), as well as morphologically unique mosses (e.g., *Cryptogonium phyllogonioides* from Perlis), and rare or uncommon mosses found in our region (e.g., *Chaetomitrium borneense* from Selangor and *Glossadelphus bilobatus* from Perak).

We should thank Ridley for giving us a glimpse of the past richness of moss diversity in our forests in Singapore and Peninsular Malaysia.

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Article

Wolfe's Vine

A recent introduction into the horticultural world, Wolfe's Vine (*Petraeovitex wolfei*, Verbenaceae), has captured the hearts and minds of many gardeners and landscape designers alike.

It was recently re-introduced to the Gardens. It was documented in 1956 (*Garden's Bulletin Singapore*, **15**: 18) that Mr. J.W. Ewart, the Assistant Curator, first introduced this charming climber into the Gardens in 1939. He had obtained the plant from Dr E.D.B Wolfe for whom this climber had been named. Dr Wolfe was then the Deputy Director of Medical Services, Federation of Malaya (see article on page 18). This climber was first recorded in both the states of Kedah and Trengganu in Peninsular Malaysia.

Mr J.W. Ewart was appointed as Assistant Curator to the Botanic Gardens, Singapore on 9th October 1937. He was transferred to Penang in 1938 and came back in 1939. During the Japanese Occupation, he was again relocated to Agriculture Gold Coast in Africa and returned to the Gardens in 1946. He acted as Director for two months from June to August in 1954. In 1957, he retired.

Close-up of the flower of *Petraeovitex wolfei*

Petraeovitex wolfei covering the entire fence

This free-flowering, vigorous climber has long pendulous yellow inflorescences borne at the tips of its stems. It bears bright yellow bracts and creamy white flowers. The bracts can last for many weeks making this a most attractive climber. The plant is suitable on fencing or a pergola where it can best display its bright pendulous inflorescences.

Our re-introduction was purchased from a private collector in Thailand in 2002. It can be viewed together with other climbers along the fence at the upper edge of the Evolution Garden.

Andrea Kee
Plant Resource Centre

Photos by Andrea Kee