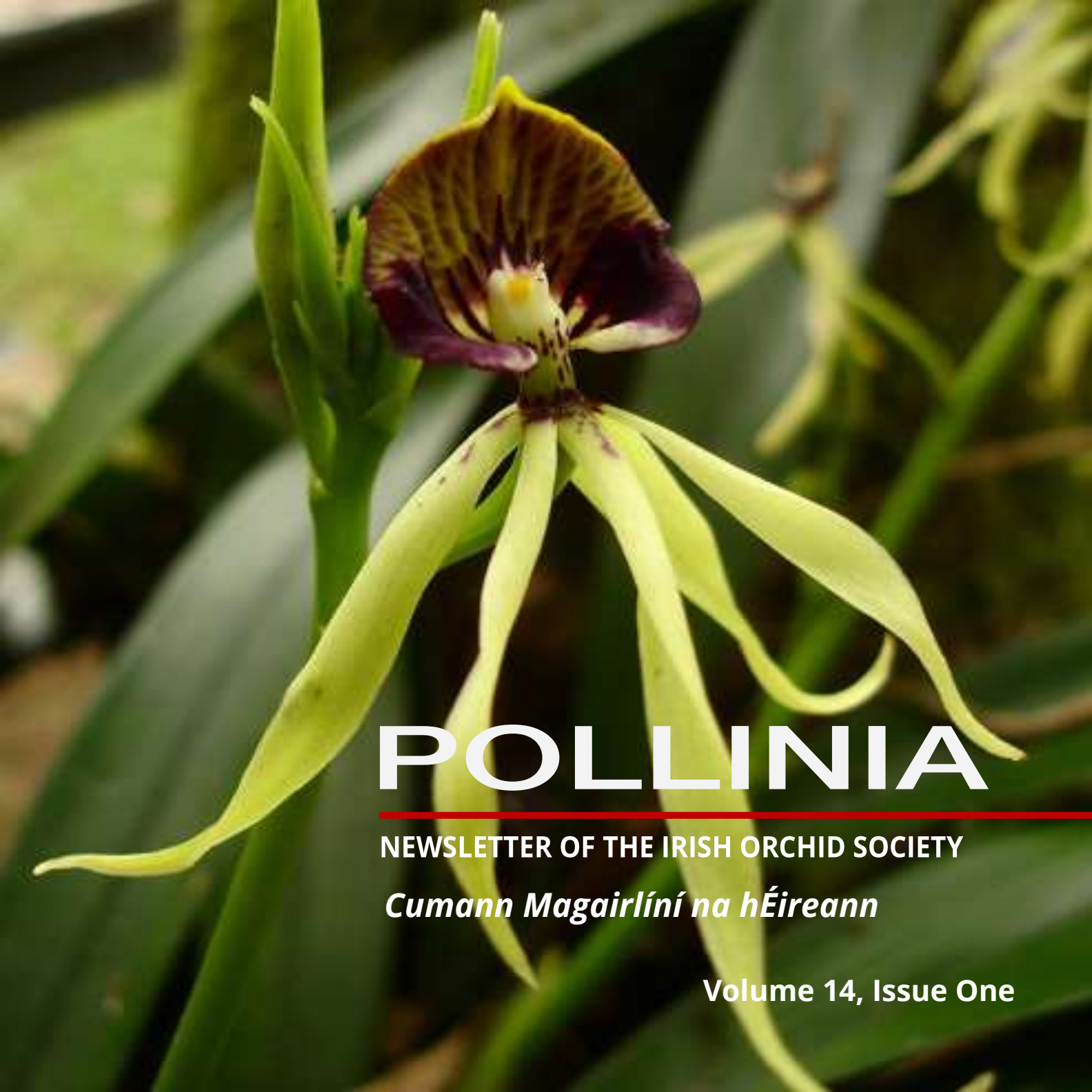

POLLINIA

NEWSLETTER OF THE IRISH ORCHID SOCIETY

Cumann Magairlíní na hÉireann

Volume 14, Issue One

THE IRISH ORCHID SOCIETY

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POLLINIA

(pol-LIN-ee-uh)

The compact packets of pollen found in orchid flowers. Plural of *Pollinium*.

Waxy pollen clumps or grains usually found in the anthers of most orchids; often yellow, distinct, and found under the pollen cap of the column.

Pollinia contain the male reproductive cells. Latin *pollin-*, stem of pollen "fine flour, dust."

Orchid Pollinia

MEMBERSHIP DETAILS

ANNUAL SUBSCRIPTION
(renewable in June of each year)

- ❑ Adult Single €20.00
- ❑ Family €30.00
- ❑ OAP/Student* €15.00

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Applications, questions about membership and other society communications should be made to:

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EDITORIAL INFORMATION

The Editorial Staff reserve the right to edit and/or amend articles submitted to the Newsletter.

The views or comments published within this Newsletter are not necessarily views shared by either the Editorial Staff or the Irish Orchid Society.

Contributions of articles, photos or comments may be sent by email to:
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Print copies may be ordered. Please contact the Editor.

Cumann Magairlíní na hÉireann

FROM THE EDITOR

WELCOME TO THE 'NEW' **POLLINIA**. We have changed to what we believe is a better format and publishing schedule. The 8" x 8" design was approved by the Committee; the fonts have changed to what I hope will be more readable. Content will remain focused on the Society, orchids and their surrounding environment. I hope Members like the changes, but more importantly that you let me know whether you do or do not, and offer your suggestions for improvement.

Pollinia is a very important part of the Society, especially to those members who cannot make it to the meetings and events. We will now publish and send to members twice annually, in January and July. Information on events will be in the printed version; events are always available and up-to-date on our website. Members should always consult the website for any changes to the schedule. Members may also opt to receive the Digital version, sent in PDF format by email. This version will also be published on the **Pollinia** website. The new section on your plants offers the ideal opportunity to make your personal contribution.

Why changes? In part after re-reading comments as far back as the 2007 AGM from Members who wanted a different approach, but also the costs of everything: printing, envelopes and postage for four issues a year have dramatically increased. We are now accepting paid advertisements and sponsorship support, with the idea of supplementing membership subscriptions by additional money earmarked for **Pollinia**. With that extra, we can increase the number of pages, and perhaps in future afford to print better photographs of plants. As you note, this issue has 28 pages. Eight of those pages were added to the 20 pages scheduled thanks to an anonymous donor and advertising. I would like to keep each issue at 28 pages.

Every member making a donation through PayPal online or by post will receive a personal gift of appreciation from the Editor. Members may chose anonymity or mention; please advise of your preference. Thank you.

MEMBERS SUBSCRIPTION REMINDER Members are reminded that the Membership year begins on June 1st each year. Annual Subscriptions will soon be due for 2016-2017. Subscription per the schedule on page two are to be posted to: Deirdre McGrane , Secretary Irish Orchid Society c/o National Botanic Gardens . If you prefer, you may use the Credit Card/PayPal form at our website: http://www.irishorchidsociety.org/membership.php

THE IOS 2015 FIELDTRIP

BRENDAN SAYERS

THE NORTH BULL ISLAND FIELD TRIP

MEMBER REPORTS

Records from Met Eireann show that 4.7 mm (3/16 in) of rain fell at Dublin Airport on Monday July 6th, 2015. As many people intending to go on a field trip will wait to see how the day is, some decided that the 2015 trip to the North Bull Island was to be missed. With relatively small showers at 6.30pm six members decided to take a walk regardless of the dark and heavy rain clouds out to sea.

Heading in the direction of the old lavatory block from the Interperative Centre we encountered the pyramidal orchid (Anacamptis pyramidalis), marsh helleborine (Epipactis palustris), common-spotted orchid (Dactylorhiza fuchsii), the probable hybrid of the early marsh and common-spotted orchid, (D. incarnata x D. fuchsii = Dactylorhiza x kernerorum) on higher ground. As we dipped down into the large dune slack behind the toilet block we saw the last plants of the dune subspecies of the early marsh orchid (Dactlyorhiza incarnata subsp. coccinea) fading into plump seed pods, along with common twayblade (Neottia ovata) and large clumps of marsh helleborine. Also here was a broken flowering stem of the probable hybrid of the northern marsh and common-spotted orchid (Dactylorhiza purpurella x D. fuchsii = D. x venusta).

The northern marsh orchid was the second last orchid seen that evening and so began the return walk and all eyes on the look out for a bee orchid (Ophrys apifera). Finally found, it closed the evening with delight to see such an amazingly structured flower.

2015 seems a good year for orchids at the North Bull Island and the overabundance of dank grass that was obvious in 2013 seems to be diminishing. ■

NORTH BULL ISLAND, DUBLIN

NORTH BULL ISLAND ORCHIDS


Bee orchid - Ophrys apifera


Epipactis palustris


Dactylorhiza fuchsii


Dactylorhiza incarnata coccinea


Dactylorhiza kernerorum


Anacamptis pyramidalis

Images courtesy of Deirdre McGrane

This year we did not find the Common fragrant orchid (Gymnadenia conopsea) as we did not trek in the direction of the Alder Marsh; Bob and I found it there about five years ago. However, seeing that wonderful Dactylorhiza x venusta was a great boon and no less than four Bee Orchids made the overhanging clouds just a trifle!

MARY BRADSHAW

The Common Twayblade as the name suggests is usually found growing profusely on the North Bull Island however this year we found only a few. This may be because they were at the end of their season and there seemed to be more on the north side of the Island last year. It is thought that it takes twelve years for a Twayblade to grow from seed to flowering plant.

ÚNA BREATHNACH

Despite lower numbers than normal due to the weather conditions, we were not in the least disappointed in the numbers of orchids encountered, not just in variety but sheer volume. A beautiful sight indeed. Thanks go to Marie Hourigan, Vincent Sex and others who visit Bull Island prior to our annual trip to give us a 'heads up' on the best places to go. No doubt next year the weather will be more favourable!

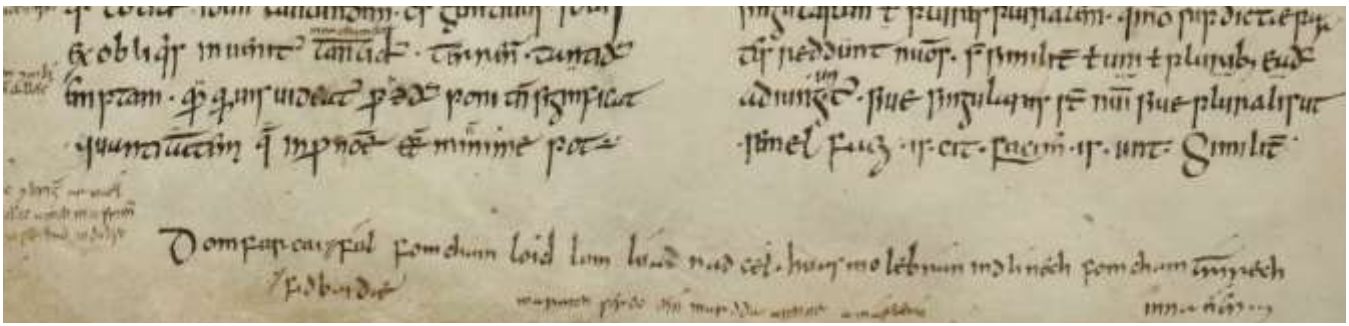
LISA COFFEY

Dom-farcai fidbaide fál
fom-chain loíd luin, lúad nád cél;
h-úas mo lebrán, ind línech,
fom-chain trírech inna n-én.

Fomm-chain coí menn, medair mass,
hi m-brot glass de dingnaib doss.
Debrath! nom-Choimmdiu-coíma:
caín-scríbaimm fo roída ross.

Over me green branches hang
A blackbird leads the loud song
Above my pen-lined booklet
I hear a fluting bird-throng

The cuckoo pipes a clear call
Its dun cloak hid in deep dell:
Praise to God for his goodness
That in woodland I write well



The scribe in the woods. This beautiful early Irish poem describes the joy of a scribe working in a forest surrounded by bird song and nature. It is found in the margins of a ninth century Irish treatise on Latin grammar, which now resides in the monastery of St. Gall in Switzerland.

RARE ORCHIDS KEEP QUIET ON POLLINATION PROCESS

The majestic spider orchid (*Caladenia winfieldii)* Credit: Andrew Brown

Orchids located throughout the south-western Australia continued to excite and amaze locals during the recent wildflower season as conservationists work to secure the endangered specimens.

A few species, such as the majestic spider orchid (Caladenia winfieldii) and the pink spider orchid (Caladenia harringtoniae), came to the attention of orchid enthusiast and Albany Advertiser editor Nathan Watson on a recent field trip.

The exact location of the rare orchids is a closely guarded secret by conservation biologists like Western Australia Herbarium Orchidaceae curator Andrew Brown.

Mr Brown and UWA Albany-based Winthrop Professor Stephen Hopper named the majestic spider orchid in 2001 after retired forest worker Harry Winfield who discovered the plant near Walpole.

Mr Brown is also a Western Australia Native Orchid Study and Conservation Group founding member and the Department of Parks and Wildlife threatened flora coordinator, and oversees a citizen science project to collect information on threatened and vulnerable orchids.

The Adopt an Orchid program involves volunteers monitoring thirty-eight priority species, including the majestic spider orchid, to determine conservation status and recovery plans to protect their population—which is limited to a single site east of Manjimup.

Mr Brown has spent more than forty years studying Western Australia's native orchids and says the scarce distribution of the majestic spider orchid is mysterious.

He says there are less than a hundred majestic spider orchids known in the wild and although the main threats to the species survival include grazing by feral pigs and kangaroos, fire and dieback, the precise cause of its rarity is unknown.

"It may be something to do with a pollinator or a rare fungus associated with the Mycorrhizas fungal relationship that supplies nutrients to the plants—but we do not really know," he says.

Mr Brown says feral pigs inhabit the same area and are known to dig up the specific root that stimulates the orchids' growth during a brief flowering season from October to November. "When we first looked at that population it was badly damaged by pigs," he says.

Mr Brown says the majestic spider orchid's pollination process could also be a contributing factor to its limited number. "We do not really know what the pollinator is—there is a bit of mystery about it," he said.

"We suspect it is a native bee and we know it worked as we have seen plants with seed pods but I have never seen it in action.

"Introduced bees could be a threat to native orchid populations as they remove pollen but do not deposit it." ■

AN ORCHID SITUATION IN 1997

As you are reading this, a small team of gardeners from the National Botanic Gardens in Glasnevin is winging its way home from Belize in America. Travelling with the group in the jet's passenger cabin - if all went according to plan is a number of big cotton bags stuffed with live orchid specimens.

"I hate to have my specimens away from me at any time," explained the expedition leader, a few days before embarking on the trip. Brendan Sayers, who was appointed orchid gardener at Glasnevin three years ago, has been rebuilding the gardens' once famous collection - hence his destination.

During the last century and for the first part of this one, orchids were among the pet plants of two consecutive directors, David Moore and his son Frederick. And in the 1840s, for the first time anywhere in horticulture, orchids were grown from seed and brought to flower at Glasnevin, a great advance in the cultivation of this complex and mysterious family.

Frederick Moore retired in 1922, leaving about 2,000 different kinds of Orchidaceae species and hybrids at Glasnevin. By the time Brendan Sayers took over responsibility for the orchids in 1994, this number had dwindled to about 250 different species and hybrids.


Brendan Sayers

Rebuilding and restoring the collection has proved an arduous and time consuming task. The process of assessing the existing cache of plants is dependent on waiting for each orchid to produce its blooms, as "over the years the labels have got mixed up. I can't trust any label until I've verified the flower," Brendan said.

Not counting those flying to Ireland at this moment, Glasnevin's orchid numbers have now increased by another 150 species and hybrids: some bought in as seedlings, others acquired through exchanges. But the bulk of the new population arrived last year when Brendan and fellow gardener, Noleen Smyth - and Brendan's companion, Ger Doyle - made their first trip to Belize.

They carried back with them about 60 different live species collected from the wild. Dried specimens for the herbarium, on the other hand, made their own way on a Fyffes banana boat.

"When I looked at Belize I discovered its orchid flora today comprises 278 species - which I could comfortably hold here if we were ever fortunate enough to have them all," Brendan said. "And it would allow us to have a good collection of certain genera - such as Maxillaria and Pleurothallis - so people could come here to study them."

Pleurothallis grobyi, a dainty tree dwelling (epiphytic) orchid, was among the smallest collected last year. The tiniest were the Platystele species, with pinhead sized flowers, amazingly perfect in all their parts. These and the other small species now live in "the pits" at the Botanic Gardens, a range of behind the scenes glass houses. Inside the pits, vulnerable plants are further mollycoddled inside marine ply growing frames, in which they enjoy an extra humid atmosphere.

Some of the larger Belizian specimens are on display in the Orchid House: among them Oncidiuni ascendens, its in multi bloomed, lemon yellow and toffee brown racemes being humbled by fat orange bottomed bees, and Gongora unicolour, its pinky brown, strappy blossoms supposedly smelling "of chocolate covered tortilla".

Humidity is essential to these tropical beauties from Belize where, even in the dry season, heavy mists descend at night. During the day the temperature can rise to 100° Fahrenheit, creating stifling Turkish bath conditions, an uncomfortable business for travellers from temperate Ireland.

And the heat is only one of the hazards faced by the orchid collectors; plants of the Myrmecophila genus support entire colonies of vicious, black ants. In one of those curious plant animal bargains brokered by Mother Nature, the orchids secrete a sticky ant food, and in return the ants aggressively protect their syrup factory, rushing out and attacking any visitor, be it a questing caterpillar or a prodding Irish finger.

There are other dangerous animals about: panthers, jaguars, and great slithery snakes. In the dry season these latter congregate by the rivers, where many of the orchids are also found, so "when we walked though any area that we thought would have snakes, we sang". The entire Blondie catalogue proved an effective snake deterrent.

And so, despite the heat, humidity and animal life, last year's team and its precious cargo came back safe and sound: "Nobody got injured and nobody got malaria". Let's hope that this year's trip was equally successful, another step towards reinstating Glasnevin's orchid collection to its former international glory. ■

JANE POWERS
The Irish Times
April 26, 1997

CALLING ALL MEMBERS

The IOS Committee encourages all members to submit articles, solutions, questions and suggestions for inclusion in Pollinia - your newsletter.

Please submit your article, pictures, or links to: editor@pollinia.org or by post to:

Laurence T. May
Bellarush
Castlebaldwin via Boyle
Co. Roscommon, F52 DV79

The current issue begins a new regular series - Members Plants - for you to show your plants in bloom.

Send a photo of and story about your beautiful success, please.

ON THE COVER

Prosthechea cochleata, formerly known as *Encyclia cochleata, Anacheilium cochleatum,* and *Epidendrum cochleatum* and commonly referred to as the clamshell orchid or cockleshell orchid, is an epiphytic, sympodial New World orchid native to Central America, the West Indies, Colombia, Venezuela, and southern Florida.

Each oblong discoid pseudobulb bears one or two linear nonsucculent leaves. The flowers are unusual in that though the labellum is usually below the column in the orchids, in the members of Prosthechea the labellum forms a "hood" over the column. This makes the flower effectively upside down, or non-resupinate. Whereas the species usually has one anther, *Prosthechea cochleata* var. *triandra* is an endangered variety that has three anthers and is autogamous, allowing its existence in Florida where no appropriate pollinators appear to be present.

Prosthechea cochleata is the national flower of Belize, where it is known as the 'Black orchid.'

NARROW-LEAVED HELLEBORINE

ZOË DEVLIN

Common Name:	Narrow-leaved Helleborine
Scientific Name:	*Cephalanthera longifolia*
Irish Name:	*Cuaichín caol*

Also known as Sword-leaved Helleborine, this elegant member of the Orchidaceae family is a slender-stemmed plant which bears numerous strap-shaped dark green leaves, the largest at its base. On its narrow 25mm to 60mm long stalk it carries some beautiful pure white 12mm long, bell-shaped flowers, each with a small bract. Through June and July, graceful spikes of between three and twenty flowers open and in each is an orange spot at the base of the lip. This native plant is considered to be rare here and is protected under the 1999 Flora Protection Order in the Republic of Ireland. In the UK it is classed as vulnerable.

This beautiful plant is part of the Orchid family and as such has a distinctive way of becoming pollinated. The flower has an open mouth and on the lower lip is a 'landing pad' for bees. When the bee lands, the mouth is forced further open to accommodate the insect as it goes in search of nectar. Then the mouth closes and the bee has to turn around and force its way back to the opening, and in doing so it gets covered in pollen. When it is free, it flies off to another flower and in repeating the search for nectar, the pollen gets spread onto the next blossom.
I recorded and photographed this wildflower near Woodford, County Galway in 2010, through the great kindness of Jackie O'Connell, who gave me directions to this plant. They were in perfect condition and a joy to behold. Jackie drove over to see them two days later but, due to their position right on the side of the road, they had been flattened by the wheels of a motor vehicle. I am told that they have appeared again, in the same place. ■

Cephalanthera longifolia

ZOË DEVLIN

Zoë Devlin is passionate about wildflowers and the environment. She combined her interests in botany and photography by developing the website: *www.wildflowersofireland.net.*

Zoë's book The Wildflowers of Ireland – A Field Guide is published by The Collins Press, and is available in all good bookshops and online from: *www.collinspress.ie*

Recommended for all orchidists and wildflower lovers.

NEW PLANT SPECIES DISCOVERED IN 2015

Dendrobium cynthiae, photo by A. Schuiteman

More than 140 species new to science were uncovered by researchers at the botanic gardens in 2015, twice as many as the previous year, raising hopes that new types of medicines, essential oils and crops may be developed.

The discoveries were made across the world as botanists sought to catalogue and study unknown plants and fungi, and to determine their chemical properties. Among the most exciting are 22 new species of trees and shrubs in the myrtle family. They were identified in Brazil's coastal rainforest, and have potential for use in medicines, perhaps as antiseptics or diuretics, and by the aromatherapy industry.

Several of the finds have potential uses in agriculture, including a type of sweet potato found in Bolivia. It was one of 18 new species belonging to the Ipomoea family – familiar to British gardeners as morning-glory. The new sweet potato is unlikely to be grown as a crop in its own right, but it could be cross-bred with the commercial species to create new varieties that might be more disease-resistant or able to grow in drier or wetter areas. Specific genes might also be transferred to create genetically modified strains.

Other discoveries likely to interest commercial growers include five that are relatives of the custard apple, or sugar apple, and ylang-ylang, another important source of essential oils; these were unearthed in Malaysia and Indonesia.

The largest and heaviest discovery of the year was a tree, *Gilbertiodendron maximum,* which grows 45m high and has a 1.4m-diameter trunk. It grows only in Gabon and was one of eight rainforest giants located in the Cameroon - Congolian region.

Six new orchids were described by Kew researchers, including a 3-metre slipper orchid, *Selenipedium dodsonii*, from Ecuador. It was identified from a specimen taken from the wild decades ago and stored unnoticed in a US herbarium.

Researchers identified 25 new acanthuses, more than any other family of plants this year, while in Mozambique a small patch of land described by botanists as "highly threatened" by a French petroleum company yielded an astonishing 36 previously unknown species.

Dr Martin Cheek, a senior scientist at Kew, said finding new plants is vital. "They could be important to our survival. If we wipe them out they aren't going to be of any help." ■

THE SECRETS OF ORCHID GENETICS

Research decodes genetics behind flower's wide-ranging beauty.

Orchids come in extraordinary diversity. With more than twice the myriad species of birds, orchids make up what may be the largest family in the plant kingdom. Now scientists are unlocking the genetic mechanisms that make orchids unique among flowering plants.

The more than 26,000 recognized species making up the orchid family are full of oddities. For example, Dracula orchids, several of which possess blood-red blossoms, are pollinated by flies that are lured in by flowers that look and smell like the mushrooms on which the insects normally lay eggs. Ophrys orchids, on the other hand, look like female bees, transferring pollen when males of the insect species attempt to have sex with them. Orchids are often such masters of mimicking what pollinators might want that roughly a third of all orchid species do not even put out rewards such as nectar to attract insects, said orchidologist Barbara Gravendeel at the Naturalis Biodiversity Center in Leiden in the Netherlands.

Orchid complexity inspired Darwin's follow-up project to his groundbreaking tome on evolution, On the Origin of Species. As Darwin's health suffered, he increasingly examined plants from the comfort of his own home. He collected evidence that orchid complexity could be explained by the flowers evolving together with their pollinators, supporting his theory of evolution and countering arguments that orchid complexity required a divine creator.

For instance, the orchid Angraecum sesquipedale of Madagascar has a star-shaped flower that releases its fragrance at night and held its nectar on the bottom of a thin foot-long tube. Darwin predicted its pollinator had an unprecedentedly long proboscis, which is an elongated appendage usually attached to the head of an animal, like an elephant's trunk. Twenty-one years after Darwin's death, scientists discovered Xanthopan marganii, a moth that indeed had an unusually long proboscis.

To unlock the secrets of orchid complexity, plant developmental biologist Chang-Hsien Yang at National Chung Hsing University in Taichung, Taiwan, and his colleagues investigated the genetic mechanisms that make orchids different from other flowering plants. While most flowers have protective sepals surrounding the petals that are merely green and leaf-like, orchid sepals are colored and ornamented just like petals to help attract pollinators. In addition to their normal petals, most orchids have an unusually large petal known as a lip that can serve as a landing platform for insects and take on the outstanding shapes that many orchids use to deceive and lure pollinators.

The nature of most flowers can be explained by five classes of plant genes — labelled A, B, C, D and E — interacting to develop floral organs. The B-class genes are especially key to petal formation. However, scientists could not figure out how exactly this ABCDE model helped create the orchid lip.

"For instance, you might find one B-class gene active in the lip that helped explain lip formation, but it was also active in petals," Yang said. "That didn't make sense if you thought only a single gene

was responsible for lip formation — such a gene should be expressed exclusively in the lip."

Instead, Yang and his colleagues discovered that orchid flower shape is determined by two groups of protein complexes, which they call the L or lip complex and the SP or sepal-petal complex. These complexes, which are each composed of four proteins, compete to promote the formation of the lip and petals, respectively. When the researchers used a virus-based strategy to silence the L complex within the lips of two orchid species, they became like petals and sepals, and when they stifled the SP complex within petals, they became lip-like.

Yang calls their discovery the Perianth code, referring to the structure formed by the petals and sepals. They found many subfamilies of orchids with different types of lips and petals all obeyed this code, according to the findings detailed online in the journal Nature Plants.

"It's been known for a long time that the current plant genetic models are not completely applicable to orchids," said Gravendeel, who did not take part in this research. "This very simple Perianth code model is very elegant at explaining lip formation. We thought it would be more complex than this."

In principle, this research could lead to new genetically-modified orchids where petals and sepals are converted to lips or vice versa, Yang said. However, in practice, the method that scientists often use to genetically modify other plants does not work well in orchids.

"Genetic transformation in orchids is extremely difficult and time-consuming," Yang said.

The researchers now plan to identify the genes that go on to control the size, shapes and colors of the lips, sepals and petals. "There are many more aspects to how orchid flowers attract pollinators," Gravendeel said.

CHARLES Q. CHOI

INSECT FACTS

The most successful creatures. To date, scientists have catalogued about 1.5 million species of organisms on the planet, with insects making up about two-thirds of this bounty, researchers report in the journal Proceedings of the National Academy of Sciences. But scientists have only begun to scratch the surface: Studies estimate the total number of species on Earth is probably closer to 9 million. Of the planet's wildly diverse collection of creatures, some 90 percent of species are reckoned to belong to the class Insecta. Reasons for insects' success include their tiny size, which both makes hiding easier and reduces overall energy requirements; wide diet of both natural and artificial foods; tough, protective exoskeletons; frequent possession of wings, which help them reach safety, grub and mates; and prodigious ability to reproduce.

Planet of the ants. Outside in warm temperatures? If so, when you look down you'll probably spy an ant or two or 10 scurrying along. (It's not uncommon to see ants when indoors, either.) The renowned biologists Bert Hölldobler and E. O. Wilson estimated in their Pulitzer Prize-winning 1990 book, **The Ants** (Belknap Press), that on the order of 10 quadrillion ants live on the planet at any given moment. That's about 1.4 million ants per human, based on a world population of 7.3 billion people.

Methuselah insects. Most insects live for only a few days or weeks as reproducing adults, having spent much longer periods as larvae and pupae, the first two stages of the three-part insect life cycle. There are exceptions, however. Amongst the Hymenoptera order (ants, bees and wasps), the egg-laying queens of colonies can live for decades. In the case of the red harvester ant, *Pogonomyrmex barbatus*, queens can live perhaps as long as 30 years, according to research published in 2013 in the Journal of Animal Ecology. Taking the top prize are termite queens, which may reign for a half century, according to the USDA.

Meet the beetles. Beetles, of the insect order Coleoptera, are the most biodiverse group of creatures known, with more than 380,000 species described to date, making up 40 percent of all insect species on the books. When asked what a study of nature tells you about a creator, the British scientist J.B.S. Haldane once reportedly quipped that you can assume such a creator has "an inordinate fondness for beetles. ■

ASK THE EXPERTS

QUESTION:

"How may I make my orchid flowers last longer?"

Moira - Glasthule, Co. Dublin

ANSWER:

Editor: Moira, here are three simple tips for your flowers.

► Beware of Ripening Fruit.

As soon as your orchid starts to bloom, move it to a location in your home at least ten feet away from any ripening fruit.

When fruit ripens, it releases ethylene gas, and ethylene gas can cause the flowers on your orchid to fade and many times even collapse.

It's essentially the same thing that happens when "one bad apple spoils the whole bunch." That one bad apple can spoil your orchid too.

Also, never spray household air freshener or aerosol cans of any kind near your orchids for the same reason - they're filled with that very same ethylene gas that you want to desperately avoid.

► Bring Your Orchids Inside.

Are you keeping your orchids outdoors? Because, once you start seeing flowers, it's time to bring them inside. Here's why:

As soon as orchid flowers come in contact with bees or other flying insects, they'll begin to die almost immediately after they're pollinated.

Sometimes this can happen just a few days after flowers first appear.

Keeping your orchid indoors and AWAY from pollinating insects can extend your plant's blooming period by weeks.

► Keep Your Orchids Nice And Cool.

You can also extend the blooming period of your orchids by introducing them to ***slightly*** cooler temperatures - not above 75°F (24° C) - once they begin blooming?

This is a bit cooler than what most orchids prefer when they're not in bloom, and going through a "growth spurt" period.

But by lowering the temperature a bit, you're essentially slowing down the aging process of your plant while it's in bloom - which means many more mornings where you get to wake up, have a cup of tea and admire those gorgeous flowers.

But don't go overboard. You don't want to send your orchid into a "deep freeze." Just a few degrees cooler than your orchid's recommended temperature range is all you need to achieve your desired outcome.

Does that all make sense?

If not, please send questions to the Editor: ***editor@pollinia.org***

LARGEST ORCHID IN THE WORLD FLOWERS AT KEW

It's the first time the orchid, known as the 'queen of orchids' (Grammatophyllum speciosum), has flowered since it was collected 32 years ago from Malaysia.

Currently standing 1.5 metres high (5 feet,) the flower spike is growing around 1.5cm (.60") a day, with the spike expected to hit an astonishing three metres (nearly 10 feet.) Its impressive blooms are expected to last five to six weeks.

The queen of orchids is grown in Kew's behind-the-scenes Tropical Nursery. Visitors will be able to go behind the scenes at the Tropical Nursery to view this giant orchid.

Species information

Scientific name: *Grammatophyllum speciosum Blume*

Common name: queen of orchids, tiger orchid, giant orchid, sugar cane orchid

Conservation status: Listed in Appendix II of CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora).

Habitat: Lowland tropical rain forest.

Key Uses: Ornamental.

Known hazards: None known.

Taxonomy

Class: Equisetopsida
Subclass: Magnoliidae
Superorder: Lilianae
Order: Asparagales
Family: Orchidaceae
Genus: Grammatophyllum

Free tours to see the orchid while it's in flower will be available on Wednesdays at 1pm and 2pm, starting at White Peaks café. Though tours are free-of-charge, there's limited space available and pre-booking is essential. To book your place, contact info@kew.org.

Christopher Ryan, Tropical Nursery Supervisor at Royal Botanic Gardens, Kew says: 'We were thrilled, and surprised, when this plant produced a flower spike as it is incredibly rare for these orchids to flower in cultivation in Europe. We are so lucky at Kew to have a glasshouse large enough to grow such a big specimen and also to have the incredible expertise to give this orchid the amount of care and attention it needs to bloom. What an honour to be able to finally see it flower at Kew!'

Rare in cultivation

This plant, which was collected by Phillip Cribb and Christopher Bailes in Sabah in 1983, produced a flowering spike for the first time in August 2015.

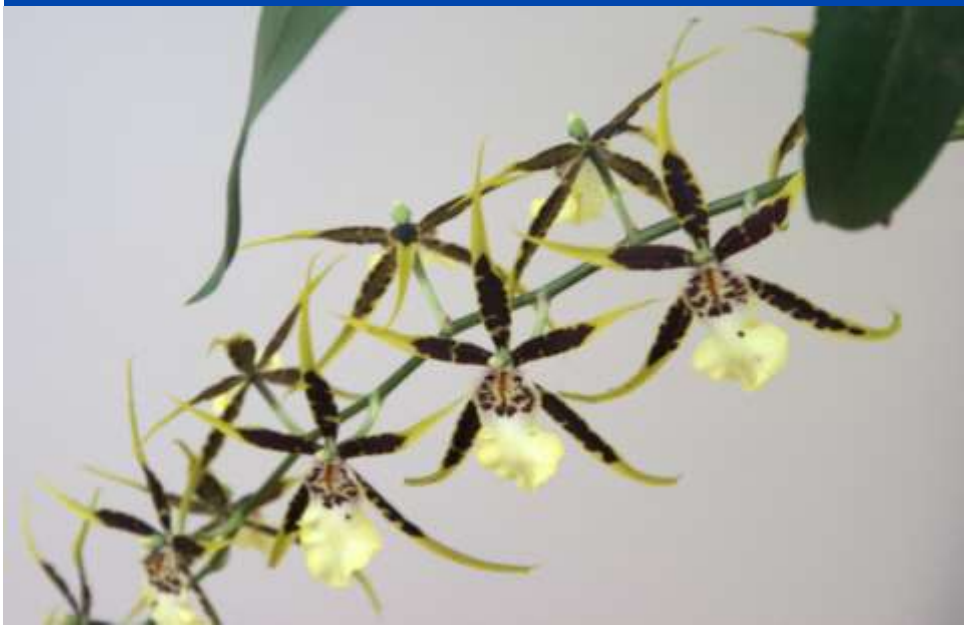
Queen of orchids is relatively rare in cultivation due to its enormous size, but is prized by orchid specialists for its showy flowers. It's also known as tiger orchid, giant orchid and sugar cane orchid, and is normally found growing in tall trees in Southeast Asia. The flowers are pale or greenish yellow, heavily spotted with chestnut markings.

Two tonne specimen at the Great Exhibition

The Queen of orchids is reputed to be the largest of all orchids, with its immense leafy stems, each several metres long in a mature specimen. A plant weighing two tonnes was one of the highlights in the 1851 Great Exhibition in Hyde Park in London.

http://www.kew.org/discover/news/largest-orchid-world-flowers-kew

IOS MEMBERS ORCHIDS



Brendan and several other members suggested a new column for the **Pollinia** to feature images, descriptions and growing techniques of Member's plants. I have two plants which qualify at the moment.

The first one is a dark Vanda species (right.) It was bought at the London Orchid Show about three years ago from Akerne Orchids of Belgium. Unfortunately, I have mislaid the label and forgotten its price. I grow it in a large glass vase.

I grow it on a south-facing window and it is treated by soaking the roots in a tepid tap-water mixture with very little tomato fertiliser. This is done only once per fortnight, throughout the year. Soaking is carried out for (approx.) one hour. It has been flowering since mid-August and I expect it to flower for another two weeks, at minimum.

The second plant pictured (above) is a Cambria species, bought about one year ago at IKEA and costing €6 approximately. It was back in flower in September and has another spike to follow the one above.

Feeding is as with the Vanda all year round but the plant is grown on a north-facing window. Lately, I was surprised to seen some aphids on the unopened spike. They were dealt with by spraying with Bug Clear Ultra gun (Acetamiprid). I hope to get another few weeks out of this spike which flowered in mid-September

.

MARY BRADSHAW

Etymology

The type genus (i.e. the genus after which the family is named) is *Orchis*. The genus name comes from the Ancient Greek ὄρχις (*órkhis*), literally meaning"testicle", because of the shape of the twin tubers in some species of *Orchis*.

The term "orchid" was introduced in 1845 by John Lindley in **School Botany,** as a shortened form of *Orchidaceae*.

TREES

A new study found that an additional ten trees on a given block corresponded to a one-per-cent increase in how healthy nearby residents felt.

HOW TREES CALM US DOWN

In 1984, a researcher named Roger Ulrich noticed a curious pattern among patients who were recovering from gallbladder surgery at a suburban hospital in Pennsylvania. Those who had been given rooms overlooking a small stand of deciduous trees were being discharged almost a day sooner, on average, than those in otherwise identical rooms whose windows faced a wall. The results seemed at once obvious—of course a leafy tableau is more therapeutic than a drab brick wall—and puzzling. Whatever curative property the trees possessed, how were they casting it through a pane of glass?

That is the riddle that underlies a new study in the journal Scientific Reports by a team of researchers in the United States, Canada, and Australia, led by the University of Chicago psychology professor Marc Berman. The study compares two large data sets from the city of Toronto, both gathered on a block-by-block level; the first measures the distribution of green space, as determined from satellite imagery and a comprehensive list of all five hundred and thirty thousand trees planted on public land, and the second measures health, as assessed by a detailed survey of ninety-four thousand respondents. After controlling for income, education, and age, Berman and his colleagues showed that an additional ten trees on a given block corresponded to a one-per-cent increase in how healthy nearby residents felt. "To get an equivalent increase with money, you'd have to give each household in that neighborhood ten thousand dollars—or make people seven years younger," Berman told me.

Are such numbers fanciful? The emerald ash borer, which has killed a hundred million trees across North America in recent years, offers a grim natural experiment. A county-by-county analysis of health records by the U.S. Forest Service, between 1990 and 2007, found that deaths related to cardiovascular and respiratory illnesses rose in places where trees succumbed to the pest, contributing to more than twenty thousand additional deaths during the study period. The Toronto data shows a similar link between tree cover and cardio-metabolic conditions such as heart disease, stroke, and diabetes. For the people suffering from these conditions, an extra eleven trees per block corresponds to an income boost of twenty thousand dollars, or being almost one and a half years younger.

What is most interesting about this data, though, is one of its subtler details. The health benefits stem almost entirely from trees planted along streets and in front yards, where many people walk past them; trees in back yards and parks

don't seem to matter as much in the analysis. It could be that roadside trees have a bigger impact on air quality along sidewalks, or that leafy avenues encourage people to walk more. But Berman is also interested in a possibility that harks back to Ulrich's hospital-window finding: perhaps it is enough simply to look at a tree.

In the late nineteenth century, the pioneering psychologist and philosopher William James proposed a distinction between "voluntary" and "involuntary" attention. When you cross a busy intersection or pore over a spreadsheet, you are depleting finite reserves of voluntary, directed attention. The antidote is not, as one might first guess, to sit quietly in a darkened room. "The environment has to have some kind of stimulation to activate your involuntary attention—your fascination," Berman said. Urban environments can certainly elicit involuntary attention (honking horns in Times Square), but they do so in a harsh, peremptory way that requires voluntary attention to override. Natural environments, on the other hand, provide what Berman calls "softly fascinating stimulation." Your eye is captured by the shape of a branch, a ripple in the water; your mind follows.

As a doctoral student at the University of Michigan, a decade ago, Berman conducted a study in which he sent volunteers on a fifty-minute walk through either an arboretum or city streets, then gave his subjects a cognitive assessment. Those who had taken the nature walk performed about twenty per cent better than their counterparts on tests of memory and attention. They also tended to be in a better mood, although that didn't affect their scores. "What we're finding is that you don't have to like the interaction with nature to get the benefits," Berman said. Some of the walks took place in June, whereas others took place in January; most people didn't particularly enjoy trudging through the harsh Michigan winter, but their scores jumped just as much as in the summer trials. Not surprisingly, those whose directed attention is most depleted seem to get the biggest benefits: an end-of-workday nature romp probably packs a greater restorative punch than one first thing in the morning, and the boost is five times bigger in people who have been diagnosed with clinical depression.

You can produce an attenuated version of the same effect simply by looking out a window, or (for experimental convenience) at a picture of a nature scene. Over the past few years, Berman and his colleagues have zeroed in on the "low-level" visual characteristics that distinguish natural from built environments. To do this, they broke down images into their visual components: the proportion of straight to curved edges, the hue and saturation of the colors, the entropy (a statistical measure of randomness in pixel intensity), and so on. The view of an arboretum, for instance, tends to have higher color saturation than that of a street corner, indicating that "the colors in nature are more of the 'purer' version of those colors," Berman said. Even when images are scrambled so that there are no recognizable features, like trees or skyscrapers, to betray what they represent, their low-level visual characteristics still predict how much people will like them.

It's nice to think that research like this can affect public policy. Ulrich's work has already "directly impacted the design of many billions of dollars of hospital construction," according to one health-care trade publication. Perhaps we will reconceive our cities and move toward richly hued streetscapes and buildings with fractal patterning that whispers to our nature-starved souls. Berman's aim, though, is more prosaic: he hopes that we will plant more trees. His results reveal a clear and consistent hierarchy. A walk in the woods trumps a picture of a tree, which trumps an abstract image, no matter how soothing. Something deep within us responds to the three-dimensional geometry of nature, and that is where arguments of economic equivalence, however well intentioned, fall short. If someone offers you ten thousand dollars or ten trees, take the trees. ■

ALEX HUTCHINSON
THE NEW YORKER

NEW ORCHID SPECIES FOUND ON 'LOST WORLD' VOLCANO IN THE AZORES

This shows details of the flowers of Hochstetter's Butterfly orchid, a newly recognized and exceptionally rare orchid recently discovered on the Azorean island of São Jorge.

For years, there was only one formally recognized species of orchid on the Azores, a cluster of volcanic islands west of Portugal, though some taxonomists claimed there were two species.

However, a recent, three-year study to describe these Azorean flowers found that three species of orchids exist on the islands, including two that are newly recognized.

One of the new species was found atop a remote volcano and is arguably Europe's rarest orchid, said Richard Bateman, a botanist at Kew Royal Botanic Gardens in London. Researchers were surprised to find the new species atop the volcano, which had "a really 'Lost World' feel to it," he told LiveScience.

The orchids likely originate from a single species that arrived by seed millions of years ago. They soon developed smaller flowers, unlike their ancestors, which had large blooms. The most widespread orchid on the island, the short-spurred butterfly orchid (Platanthera pollostantha), is known for these small flowers, Bateman said.

Analysis of other orchids found on the islands soon turned up another species, known as the narrow-lipped butterfly orchid (Platanthera micrantha).

But then scientists happened upon an even rarer and more striking orchid, with large flowers, like those of the plants' ancestors. "In a sense, evolution has reversed itself," Bateman said. This species, now known as Platanthera azorica or Hochstetter's butterfly orchid, was originally collected more than 170 years ago, but hadn't been further studied or recognized as a unique species.

Mónica Moura, a researcher at the University of the Azores, happened upon the flower, and noticed it was different. "I immediately

recognized the flowers as being exceptionally large for an Azorean butterfly orchid," Moura said, according to a release describing the study.

The new species require urgent conservation; the International Union for Conservation of Nature, a global environmental organization, currently lumps all of these into a single species, which is incorrect, Bateman said.

Like many other orchids, the two rare orchid species have symbiotic relationships with fungi that allow them to survive. Without a certain type of fungi, the seeds can't germinate, Bateman said. It's possible these rare species can only survive in the presence of a single fungal species, which helps them germinate and supplies them with nutrients as adult plants, he said. More widespread species can likely partner with a variety of fungi, he added. ■

DOUGLAS MAIN

This is the more widespread short-spurred butterfly orchid -- the likely ancestor of Hochstetter's

RHIZOME OR ROOT ?

It is important to recognize plants as one of man's primary providers for the continuation of life. Botany paves the way for further study of plants and its families. Their wonders and characteristics also open the minds of many to the systems in which they thrive.

A rhizome is a hefty horizontal stem of a plant, usually found underground, and often branching out roots and shoots from its nodes. Its origin comes from the Greek word "rhizome," which means "mass of roots." Rhizomes are essentially underground modified stems. They develop parallel to the Earth's surface having nodes and internodes as stems, tiny leaves, and buds. Rhizomes work as food storage and aid in vegetative propagation which is a method of growing rhizome pieces into new plants. Examples of plants that are grown this way consist of asparagus, ginger, hops, and orchids.

Some plants have rhizomes that breed at ground level or that lie at the soil surface itself including ferns. Rhizomes generally form a sole layer, but a plant called Giant Horsetails can be multi-layered.

Meanwhile, roots are part of the root system that put rhizomes under its hood. It is the organ of a plant that usually lies underground. However, some roots can grow aerially, or above the ground, or by aerating, or above water. It is essential to determine a root as a part of a plant body that has no leaves and nodes.

The four major functions of roots include: absorption of water and nutrients, storage of food, prevention of soil erosion, and attachment of the plant body to the ground.

There are about 14 main types of roots for unique purposes. Most of them cater to different uses almost always aiding in the growth of a plant's body.

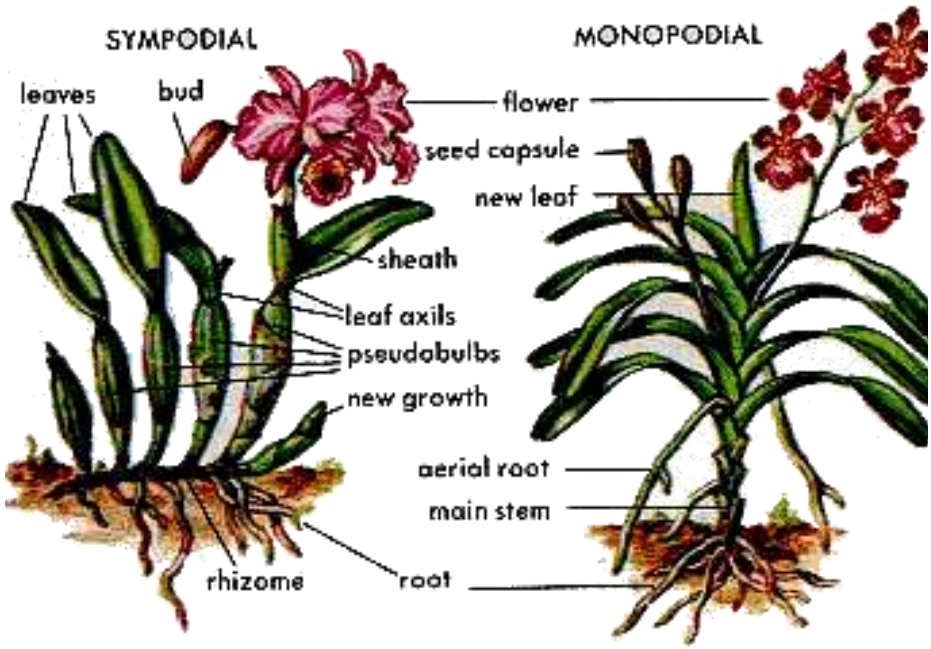
Roots are vital not only to plants but also to humans. Aside from plants that are consumed by man to complement his diet, roots can also be used for the same purpose. Fortunately, roots are found to have essential nutrients and minerals that can also be used in health endeavors. Roots also have a great responsibility in upholding a healthy environment for the benefit of humans. ■

Summary:

1. Rhizomes are essentially underground modified stems while roots are part of the root system that put rhizomes under its hood.

2. Rhizomes work as food storage and aid in vegetative propagation while roots' functions include absorption of water and nutrients, storage of food, prevention of soil erosion, and attachment of the plant body to the ground.

3. Rhizomes have nodes, internodes, tiny leaves, and buds while roots don't have anything similar.



BEAUTY DRIVES ORCHIDS TOWARDS EXTINCTION

At plant markets in Thailand, exquisite orchids are for sale. Those orchids are unlike the ones you can buy at many U.S. shops; many of them are rare species that were collected from the wild. Selling them is illegal.

This trade is "invisible" because hardly any of it makes it into government statistics that are supposed to document illegal trade in wild flora, Jacob Phelps and Edward Webb of the Center for International Forestry Research in Bogor Borat, Indonesia, note this month in Biological Conservation. The pair conducted a rare in-depth study of trade in wild-collected ornamental plants in Southeast Asia and found 347 orchid species, including many considered threatened, for sale at Thai markets.

Paphiopedilum callosum is one of several species of slipper orchids classed as endangered .

Not all orchids are declining, but trade is regulated for every species in the family Orchidaceae, requiring a permit or other approval to sell. That's because many species are disappearing. And there are some healthy species that look enough like threatened ones that distinguishing between them is difficult. It's just easier to regulate them all than to risk losing the rare ones.

The reasoning behind these rules was apparent this week. The International Union for the Conservation of Nature released the latest updates to the IUCN Red List— the big database of species that documents threats and assesses conservation statuses.

Of the 84 species of Asian slipper orchids, including some Paphiopedilum orchids that were assessed in this round of updates, 99 percent are threatened with extinction.

Habitat fragmentation and destruction, deforestation and illegal logging are contributing to many species' decline, IUCN notes. But an additional huge concern is that people are collecting these species from the wild for regional and international trade. And though this trade is illegal, no one is enforcing the rules.

Phelps and Webb documented this untrammeled trade in Thailand. They visited plant markets across the country in 2011 and 2012, surveying the species for sale and speaking with vendors. The researchers found orchids for sale from across the region, mostly from neighboring countries. Such international trade was illegal, but it occurred in the open. And it didn't show up in any official statistics of illegal trade.

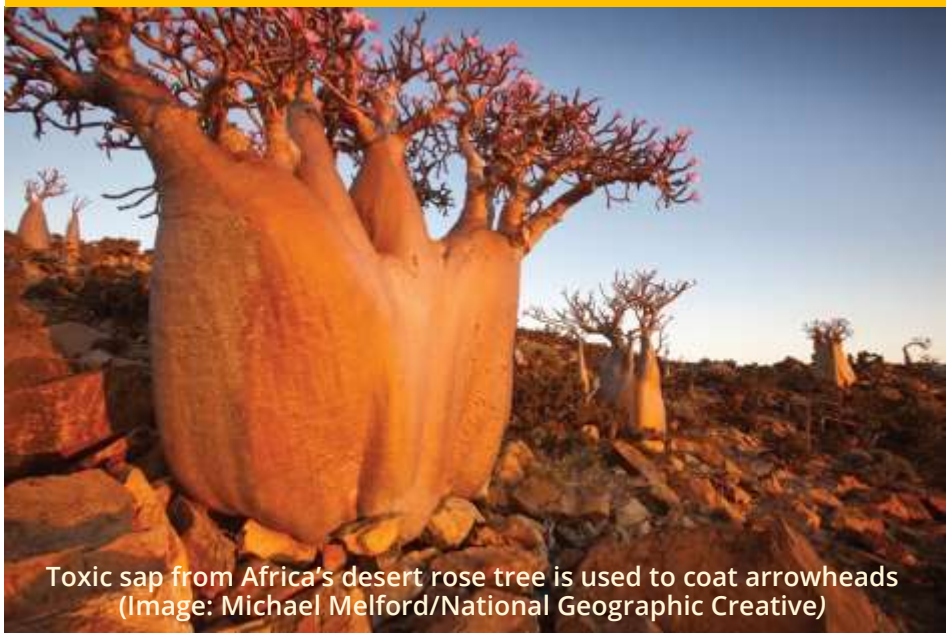
Monitoring the markets wouldn't take much effort, they say. Their surveys took a couple of people only a day or two per site. And it takes only a little training to distinguish a wild-grown plant from a cultivated one. "The open and prevalent nature of trade in protected plant species means that monitoring is viable, given increased commitment and reasonable levels of investment into capacity building and human resources," they write.

The new IUCN listing shows why such a commitment is necessary. And local people in Southeast Asia have already told scientists that wild orchids are quickly becoming much harder to find. If such trade is allowed to continue, the only orchids left in the world could be the common ones you find in local shop. And the Earth would be a far less beautiful place.

SCIENCE NEWS
June 23, 2015

BOOK REVIEW
KILLERS, KICKS AND CURES: OUR COMPLEX RELATIONSHIP WITH PLANTS

PHYTOMEDICINES, HERBAL DRUGS, AND POISONS
Ben-Erik van Wyk and Michael Wink
University of Chicago Press/Kew
978-0226204918 - June 2015



Toxic sap from Africa's desert rose tree is used to coat arrowheads (Image: Michael Melford/National Geographic Creative)

A compendium of the homicidal, hallucinogenic and healthy, new book **Phytomedicines, Herbal Drugs, and Poisons** tracks plant power from ancient times to now

I love English country gardens and churchyards full of yew trees, foxgloves, native monkshood and snowdrops. They mark the seasons, and are utterly charming.

They are also so utterly deadly that they should be better known as cell toxins, heart-stoppers and neurotoxins.

The whole of the English yew (*Taxus baccata*), bar the plump, red flesh around its seeds, is poisonous. Foxgloves (*Digitalis purpurea*) can stop hearts dead, whereas monkshood (wolfsbane or aconite) opens the doors of sodium ion channels in cells, poisoning neurons while "opening minds". Even the tiny snowdrop (Galanthus) can be highly toxic.

My list is only a subset of the 360 plants inside **Phytomedicines, Herbal Drugs, and Poisons**, a compendium of the homicidal, hallucinogenic and healthy. Few books can have scarier disclaimers. The inside page warns that some plants can cause "death, serious intoxication, severe allergies and other harmful effects", and that nothing in the book should be interpreted as "a recommendation to experiment." The authors and publishers also stress that they cannot "be held responsible for claims arising from the mistaken identity of plants or their inappropriate use".

As botanical compendiums go, it's a rollicking read. It is also highly political in the UK at least, where rows about "legal highs" and herbal drugs have been reignited after UK home secretary Theresa May pledged a clampdown, amid controversy about the scientific evidence behind the move. And from the mind-altering seer's sage (*Salvia divinorum*) to the tranquillising valerian (*Valeriana officinalis*), there are plenty of "highs" and herbals to choose from here.

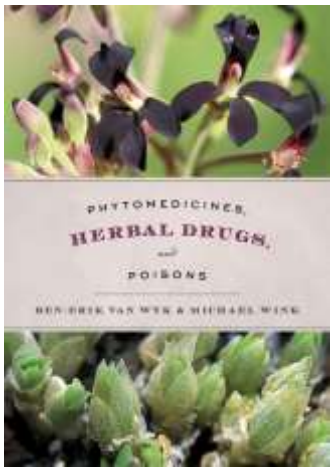
Plants go back a long way in traditional medicine. Records left by the Assyrians, Babylonians and Sumerians some 4000 years ago show that they not only used herbal medicines but possibly had clay-tablet prescription pads.

We have since learned about the chemical basis for the purported benefits of plants such as lavender (useful for de-stressing) and garlic (which can be used as a blood thinner, antiseptic and more). In addition, modern medicine can now harness old killers for good: the yew yields the cancer drug paclitaxel, while foxgloves give us the heart drug digitoxin.

Under duress, I've eaten the Bengali appetiser fried neem leaves (the bitterest dish on Earth), and tasted a more palatable papaya curry appetiser. Neem (*Azadirachta indica*) is a natural insecticide that is used to treat stomach

ailments and intestinal parasites, whereas papaya is a digestive, and turmeric in curry contains curcumin, which has anticancer and antimicrobial properties.

The section on poisons puts the English killers in perspective. Laburnum is the worst culprit in Europe thanks to seeds that attract children. And the odollam tree (*Cerbera odollam*) from Asia and the Pacific has bitter fruits containing glycosides that inhibit ion channels in heart muscle. The fruits are said to have killed more people (through suicide or murder) than any other plant poison. In Africa, toxic sap from the roots and stems of the desert rose tree is still used on arrows for hunting game.



Phytomedicines is beautifully illustrated, with an accessible reference section, and it fulfils the authors' pledge to provide a general reference book for pharmacists and lay public alike. I'm less sure whether it can do all that while offering a first port of call in an emergency. But it is still a welcome addition to any budding botanist's bookshelf, and a potent reminder of our complex relationship with plants. ■

ORCHID AND ORANGE I

Zhang Jiuling - 張九齡 - 678AD –740AD

Tender orchid-leaves in spring
And cinnamon- blossoms bright in autumn
Are as self- contained as life is,
Which conforms them to the seasons.
Yet why will you think that a forest-hermit,
Allured by sweet winds and contented with beauty,
Would no more ask to be transplanted
Than would any other natural flower?

EUROPEAN ORCHID PROTECTION CENTRE TO BE OPENED

České Budějovice will host centre to protect flowers threatened by global warming

Prague — A European center for orchids protection will be established in the Czech Republic, Professor of Ecology Pavel Kindlmann has told the Czech News Agency.

The centre to be seated in České Budějovice, south Bohemia, was founded by scientists from 12 universities and academic institutes in nine European countries.

The institute will prevent the decrease in the number of orchid species that is caused by negative global changes, expanding built-up areas and intensive farming, Kindlmann said.

The center will work in the Czech Republic under the aegis of the Czechglobe academic institute and the Faculty of Science of Charles University.

Apart from interconnecting the existing databases of the orchid localities in particular countries, each of the laboratories and research groups will specialize in a certain research area.

The European centre will also focus on teaching and an interdisciplinary research into the biology of orchids, their relations with symbiotic fungi and pollinators and their population dynamics. It will also house a seed bank.


Pseudorchis albida

Researchers may gain finances from European grants for the European collection of the seeds of endangered orchid species to be centered in Britain, Kindlmann added.

There are some 50 orchid species in the Czech Republic. However, there numbers have been declining as in other countries in the past decades. The negative development has slowed down since the collapse of the communist regime in 1989 since farmers use less fertilizers.

One of the most precious orchid species on Czech soil is small white orchid Pseudorchis albida, growing in the Šumava mountains. However, its existence is threatened by construction activities near the Kvilda village.

CZECH NEWS

IOS & OTHER ORCHID EVENTS, FAIRS, MEETINGS, SHOWS, CONFERENCES

All talks are held in the Visitors Centre of the National Botanic Gardens, Glasnevin, and begin at 8:00pm, unless otherwise stated. Please check the IOS website for possible changes.

FEB 1 2016

MEMBERS' NIGHT

Monday February 1st, 2016, 7:30pm

Free raffle for young slipper orchids. Bring any orchids you'd like to discuss.

MAR 7 2016

KARL DUFFY
DUBLIN TO KWAZULU-NATAL

Monday March 7th, 7:30pm

Karl Duffy studied the pollination biology of rare Irish orchids for his PhD at Trinity College Dublin. He then travelled to South Africa for a post-doctoral position at the University of KwaZulu-Natal in Pietermaritzburg. He has recently returned to Europe and is based at the Ecology, Evolution and Biodiversity Conservation section of the University of Leuven in Belgium. He will tell us intriguing tales of orchids from both continents.

APR 23-24 2016

DUBLIN ORCHID FAIR

Saturday April 23rd & Sunday 24th

Opening hours: 10am – 5pm, Admission free

The annual orchid fair organised by the National Botanic Gardens is to be held this weekend in the conservatory at the gardens in Glasnevin. This is the premier annual orchid event in Ireland with a large selection of species and hybrids for sale.

MAY 9 2016

JOHAN HERMANS
RECENT TRAVELS AROUND THE ORCHID WORLD

Monday May 9th, 2016, 8:00pm

Johan Hermans is deeply seated in the world of orchids. For 30 years he has been studying the orchids of Madagascar and authored most of the recent books on its flora. As Chairman and member of the Royal Horticultural Orchid committee he has travelled and lectured at international shows around the world. His talk to the IOS will give a flavour of his travels and experiences.

JUNE 13 2016

ANNUAL GENERAL MEETING

Monday June 13th, 7:30pm

The traditional state of the Society address will be given with the Committee putting forward ideas to advance the society in the year ahead. It is also the forum for members to give their feedback and suggestions.

IRISH BANK HOLIDAYS 2016

Friday	Jan 1	New Year's Day
Thursday	Mar 17	St. Patrick's Day
Friday	Mar 25	Good Friday
Sunday	Mar 27	Easter
Monday	Mar 28	Easter Monday
Monday	May 2	May Day
Monday	Jun 6	June Bank Holiday

GLASGOW ORCHID FAIR
14TH & 15TH MAY 2016

Free entry to the orchid fair held in the Kibble Palace Glasgow Botanic Gardens

WORLD ORCHID CONFERENCE

22nd World Orchid Conference
Guayaquil, Ecuador -
8th through 12th November 2017
http://www.woc22.com/

POLLINIA
Volume 14, Issue One

03 FROM THE EDITOR
04 BULL ISLAND TRIP
07 RARE POLLINATION
08 1997 REDUX
10 ZOË DEVLIN
12 GENETIC SECRETS
14 ASK THE EXPERTS
16 *GRAMMATOPHYLLUM*
17 MEMBERS' PLANTS
18 TREES
20 *PLATANTHERA AZORICA*
22 RHIZOME OR ROOT?
23 EXTINCTION
24 PHYTOMEDICINES,
26 NEW EUROPEAN CENTRE
27 IOS CALENDAR
REAR COVER:
GRAMMATOPHYLLUM SPECIOSUM

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9 771649 117008