POLLINIA

NEWSLETTER OF THE IRISH ORCHID SOCIETY

Cumann Magairlíní na hÉireann

Volume 17, Issue One

THE IRISH ORCHID SOCIETY
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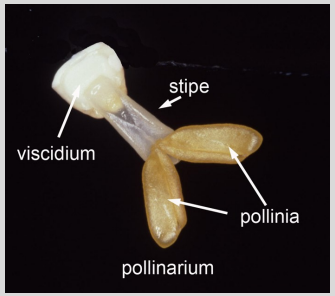
POLLINIA
(pol-LIN-ee-uh)

The compact packets of pollen found in orchid flowers. The 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]

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

*Confirmation of student status required

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Payments may be made by Credit Card and by PayPal on our website. Members and friends may also donate in support of the Society's educational activities and ***Pollinia***. Please contact the Editor for information on advertising.

Applications, questions about membership and other Society communications should be made to:
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c/o National Botanic Gardens
Botanic Road, Glasnevin, Dublin, D09VY63
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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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Copies of this and previous issues (in pdf format) are available at:
www.pollinia.org
Print copies may be ordered. Please contact the Editor.

Cumann Magairlíní na hÉireann

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

JUL 5+7 2019

ORCHID CLINIC

Friday 5th July 1pm-4pm. Sunday 7th 11am-1pm

Orchid Clinic at the National Botanic Gardens
Bring your sick plants along for help and discussion, members and non members welcome.

AUG 2019

AUGUST

No Meeting

SEP 2 2019

"How I Discovered Orchids Are Among The Easiest Of Plants"

September 2nd 7.30pm

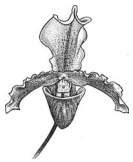
Ray Creek of Ray Creek Orchids based in Scunthorpe, North Lincolnshire, UK, will talk about his orchid experiences and why he thinks orchids are easy to grow.

OCT 7 2019

BRENDAN SAYERS

Monday October 7th, 2019, 7:30pm

The title of Brendan's talk will be confirmed in the coming months.



NOV 4 2019

THE ORCHID TRADE

Monday November 4th, 2019, 7:30pm

An overview of the legal complexities and a guide on how to be a responsible consumer.

Dr. Noeleen Smyth holds an Honours Degree in Botany and a Diploma in Statistics from Trinity College Dublin. She completed a PhD at Trinity College Dublin on invasive species control and restoration of the threatened native flora of Pitcairn Island in the South Pacific. Noeleen has worked for National Parks and Wildlife Service, BEC Consultants, and Natura Environmental Consultants, and as a horticulturalist both at the National Botanic Gardens and Talbot Botanic Garden, Malahide Castle. She has also carried out botanical research in Uganda, Guyana, and Pitcairn Island and participated on plant expeditions to Belize, Bhutan, China, and Jordan.

DEC 2 2019

CHRISTMAS PARTY

Monday December 2th, 2019, 7:30pm

Test your orchid knowledge with Brendan Sayers' Orchid Quiz, along with a few nibbles and light refreshments! As with all meetings, bring along any orchids you'd like to show your fellow members.

A Happy Christmas to all IOS members and family.

Taichung, Taiwan, March 29, 2020

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

2020

JAN 1 2020

JANUARY

No Meeting

Athbhliain faoi shéan is faoi mhaise daoibh.

Happy New Year!

FEB 3 2020

MEMBERS' NIGHT

February 3rd 2020 7.30pm

Potting demonstration no need for members to bring any plants to this meeting. The evening will start with a short lecture and be followed with a practical potting demonstration for beginners and experts.

MAR 2 2020

MEMBERS' NIGHT

March 2nd 2020 7.30pm

Marie Hourigan will talk on Climate Change and Gardeners

APR ? 2020

ANNUAL ORCHID FAIR

Annual Orchid Fair in The National Botanic Gardens - Dates to be confirmed

This is the premier annual orchid event in Ireland with a large selection of species and hybrids for sale. See website for dates.

MAY 11 2020

MEMBERS' NIGHT

Monday May 11th, 7.30pm

All are welcome to bring your plants new and old, sick and healthy for discussion, tips and help

JUN 8 2020

ANNUAL GENERAL MEETING

Monday June 8th, 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.

These are only a very small handful of wonderful-smelling orchids, and is by no means a comprehensive list.

Aeranthes grandalena: These flowers are said to have a sweet jasmine scent.

Brassavola nodosa: Commonly known as "Lady-of-the-Night," orchid. This orchid has beautiful white flowers that are said to smell of a strong freesia or lily-of-the-valley scent.

Cymbidium Golden Elf: This is a Cymbidium hybrid that produces beautiful yellow flowers and give off a lemony scent.

Maxillaria tenuifolia: Commonly known as "Coconut Pie Orchid" and its tiny blooms smell deliciously like coconut.

Miltoniopsis santanaei: This small orchid has beautiful white flowers that emit a wonderful rose smell.

Phalaenopsis violacea: This small beautiful orchid is said to emit a spicy cinnamon smell.

Zygopetalum: There are many fragrant Zygopetalum hybrids. There is debate on what the scent smells like and has been described as smelling of hyacinths, freesias, and even baby powder.

Rhynchostylis gigantea: An orchid has large flowers that give off a very powerful citrus smell.

FROM THE EDITOR - LAURENCE MAY

MEMBERS SUBSCRIPTION REMINDER Members are reminded that the Membership year now begins on the date a member joins the Society. Annual Subscriptions are now due for 2020-2021. Subscription payments per the schedule on page two are to be posted to: Secretary, The Irish Orchid Society c/o National Botanic Gardens, Dublin, D09 E7F2. If you prefer, you may use the Credit Card/PayPal form at our website: www.irishorchidsociety.org/membership.php

The increased costs of printing and of post have caused serious damages to our funds. The Committee is considering several alternatives among which is having **Pollinia** become an Annual publication. I would note here that after ten years as your Editor I am considering retiring and having another Member take over. I'm sure there are many people with better design abilities, fresh ideas and more interesting content management. Please contact the Secretary or Chairperson if you are interested. ■

Front Cover: ***Platanthera praeclara***, known as the western prairie fringed orchid and the Great Plains white fringed orchid, is a rare and threatened species of orchid native to North America. Manitoba Tall Grass Prairie is the home of the endangered Western Prairie Fringed orchid.

Found in meadows in the Midwestern U.S. and into Canada, there are 172 known populations, of which only four have numbers greater than 1,000 plants. The orchid is considered threatened in all states with known populations due to development of untouched, native lands, according to the Endangered Species Coalition.

Arising from a fleshy tuber, it grows from 38 to 85 centimeters (1 ft 3 in to 2 ft 9 in) tall. Each plant can have up to two dozen or more flowers arranged in a stalk. ***P. praeclara*** is distinguished from ***Platanthera leucophaea***, the eastern prairie fringed orchid, by its slightly larger flowers, petal shape, and longer nectar spur.

P. praeclara is a long-lived perennial. It emerges in May and blooms in June or in July further north. The flowers are fragrant at night and are pollinated by large sphinx moths. ***P. praeclara*** is a plant of the tallgrass prairie and requires direct sunlight for growth. It is most often found in moist habitats or sedge meadows. ***P. praeclara*** has persisted in areas that have been lightly grazed, periodically burned, or regularly mowed. It is not yet understood how these activities affect plant survival. It may be that removal of dead grass mulch is beneficial, but heavy grazing is detrimental.

Rear Cover: ***Dendrobium purpureum* var *alba*** is native to Vanuatu, Fiji, Bougainville, New Guinea, the Caroline Islands and the islands of the Malay Archipelago. This plants occur on coastal lowlands and in mountain forests, from sea level up to 1150 m. They were also encountered on trees in the forest at an altitude of 800 m, on Mt. Klabat (Minahassa).

This Dendrobium blooms at most any time of the year with spring as the main time on a 2.5 cm long, several to many flowered inflorescence with the semi-closed flowers held in a cluster arising on leafy and leafless stems. The flowers are 1.3-2.0 cm long and often remain rather closed. The sharp outer petals of the outer whorl and the rounded petals of the inner whorl may be red, purple, pink-purple or white, but they always have green tips and may be paler at the base. The edges of the inner whorl flakes and the lip may have delicate cilia. The underside of the outer whorls flakes is rarely covered with tiny warts. The lip is white, slightly 3-membered, narrowed below half the length and has edges wrapped in. The top of the lip sometimes has a green tinge.

THE OBSESSION

Roses Are Red, Orchids Are Addictive

Families struggle when flower obsession strikes a loved one; 'God help us'

About a year ago, 11-year-old David Marcovici started collecting orchids. Since then, he's amassed a few dozen that have turned the family kitchen into a mini-rainforest. His favorites are miniatures, which he calls his "little guys."

He brought $267—all his savings—to spend at a recent orchid show in New Jersey. Then it was on to another show earlier this month. "God help us," says his dad, Geno.

Orchid lovers really love their orchids. Many describe their hobby as an addiction. It has a name in many circles: Orchidelirium.

For the people who love orchid lovers, living with their obsession is a lesson in acceptance.

David Marcovici, 11, at an orchid show in New Jersey.

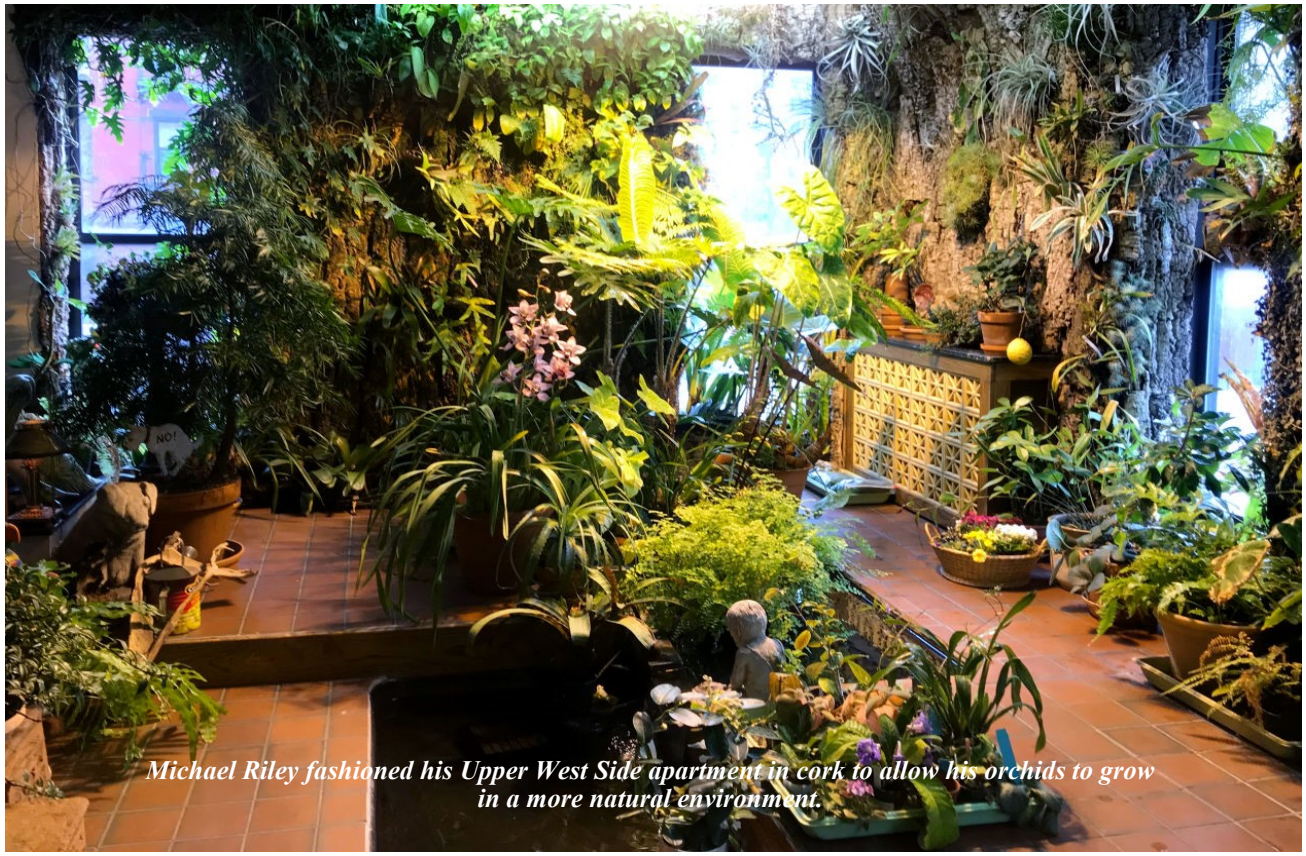
Collectors will often go to extremes: Traveling far—and paying top dollar—for rare specimens; rescuing discarded plants off the street; determinedly collecting specimens of a species like children collecting Pokémon cards; and, often, turning their living spaces into veritable jungles.

In his Upper West Side apartment, Michael Riley wanted to recreate how orchids grow in nature. They hang from trees and rocks. They don't grow in pots. To mimic the ecosystems he visited around the world, he outfitted two walls with plywood, a thick rubber membrane, and sheets of cork he bought through a specialty vendor. To the cork, he pins the plants' roots, which he covers in moss to help them acclimate. An automated misting system, similar to those grocery stores use to keep produce wet, hangs near the ceiling.

"It's a hobby gone wild," he said.

His partner, Francisco Correa Mendoza, does a lot of plant care, but the pay is lousy, the couple jokes.

Orchids, among the planet's most diverse family of plants, have long captured the imagination of hobbyists. In the Victorian Age, wealthy Europeans contracted orchid hunters who would travel to South America, Africa and Asia in search of rare specimens. Often collectors would instruct their envoys to misdirect competitors or destroy whatever they couldn't take to prevent others from finding the same flowers.



Michael Riley fashioned his Upper West Side apartment in cork to allow his orchids to grow in a more natural environment.

Now, the scouting is mostly reserved to online shops, auctions and orchid-show season, which roughly spans January to March.
At the same orchid show where Mr. Marcovici was chasing his son from vendor to vendor, Aga Montes was on the hunt for an Epicattleya Rene Marques, a yellow-and-fuschia dendrobium she says is hard to find.

"Ever since I saw it at the [New York Botanical] Garden, I wanted one," said the 31-year-old chemist, who was dressed in orchid-embroidered pants. "And of course I won't steal from the Garden."

She bought two from a Taiwanese retailer. Each plant was $30. By the time she hit that stand, she'd already dropped more than $100.

Aga Montes was on the hunt for an Epicattleya Rene Marques with a yellow-and-fuschia dendrobium orchid at a New Jersey orchid show.

Her flowers take up an entire room in her three-bedroom home in New Jersey, with more sprinkled throughout the house. She stopped counting after she topped 100, in part because then her "hubby can't say, 'Well, you already have 500,' " she said.

He made her promise she'd keep his desk orchid-free. "He doesn't mind it as long as he has room to sit," she said.

Fans say growing orchids can be relaxing, plus it provides them with a sense of accomplishment and a community. While some orchids still have steep price tags, in recent decades, orchid collecting has taken root beyond the elites, thanks to technological advances that have made commercial growing cheaper and easier.

Phalaenopsis, or the "moth orchid," which is the gateway plant for many modern collectors, often costs only about $10 at grocery stores.


Aga Montes

Social media and the internet have also seeded new ways for orchidphiles to indulge. Orchids' ornate and colorful flowers fit well into social media's cult of pretty, according to growers.

Younger fans call themselves plant parents and take to Instagram, YouTube and Facebook to show off their blooms, share growing tips and make new friends. The more popular ones, who can have thousands of followers, are known as "plantfluencers."

"There's this really nasty stigma out there…that orchids are hard," said Chris Satch, who promotes the hashtag #orchidsareforeveryone to his roughly 3,800 Instagram followers. "It's just retraining your mind to think, 'What does this plant want?' "

About four years ago, a friend gave Mr. Satch a coconut orchid, a lush, blood-red flower that typically grows in Mexico and Central America and smells like coconut cream pie.

"It's the best thing in the world to wake up to," he said. "It gave me the orchid disease."

Mr. Satch, 27, now shares his small New York City apartment with roughly 90 orchids—plus a human. His dendrobiums, oncidiums, cattleyas and other orchids inhabit the window sills in his bathroom, kitchen and living room. But his most prized plants, including an octopus orchid, he keeps in his bedroom on shelves he built himself, where they enjoy a humidifier and special light fixtures. He had to bargain with his new roommate, Koko Lawson, to get the bedroom with the windows—for his orchids' health, Ms. Lawson, 28, said. He pays a little more in rent. When the two moved in together a few months ago, Mr. Satch warned her about his plant obsession. She asked him if it was "Jumanji-level," to which he replied "sort of," she recalled.

She accepted his plant family, but told him she wanted no part in taking care of them.

Will Wilson, 18. Mr. Wilson keeps his collection in a spare bedroom.

Before Will Wilson moved to a bigger house outside New Haven, Conn., with his mom and stepdad, his orchids "took up every spare counter space we had," he said. In their new place, his collection of nearly 300 orchids is mostly contained to a spare bedroom, though there is still some spillover.

"It was almost forced upon me. Not that I complained, of course," said the 18-year-old high-schooler, who wants to study plant genetics in college.

The good news for family harmony is that his mom, Mary Ellen, is now collecting orchids, too. "I've been infected," she joked.

The bad news: She wants to expand her collection of 40 orchids into the back of the house, and her husband "just doesn't know it yet."

DANIELA HERNANDEZ
THE WALL STREET JOURNAL

‘YOU DON’T FIND ORCHIDS; THEY FIND YOU’

Q&A

WITH BOTANIST EDICSON PARRA

Edicson Parra has not only discovered more than 20 new species of orchids in his home country of Colombia, but has also used his expertise in orchid diversity to help halt development, road and mining projects that would have otherwise threatened their forest habitats.

But studying orchids can be a dangerous challenge in Colombia, due to drug traffickers and threats to environmentalists in the country.

Parra says orchids could be “one of the most sensitive of all Earth’s taxa.” Orchids are particularly vulnerable and fragile to deforestation, including edge effects, making protecting large tracts of forests key to their survival.
When a mining company came to exploit an old-growth cloud forest near Edicson Parra’s hometown of Fusagasuga in Colombia, he decided to take action. He rallied as many relatives and friends as he could and joined a street protest against the looming project.

Photos of Parra and his family waving placards and sporting identical Colombian soccer jerseys ran in local newspapers. But Parra had one superpower nobody else at the protest possessed: he had spent 10 years learning how to identify orchids.

On entering the tract of forest slated for demolition, Parra, who recently received his Ph.D. in conservation science from Imperial College London, did what any biologist worth their salt would do: he carried out a biological survey. Rooting through mossy treetops and rotten logs, Parra found 24 species of orchids living in the cloud forest. Three were endemic to Colombia. One of these, Epidendrum fusagasugüense, Parra had discovered and named after his hometown only the year before.

He provided the information from his botanical survey to a legal team fighting the mining. A court eventually banned development in the ecosystem. A central factor in

the ruling was the recognition of the forest as an orchid hotspot, along with the fact that this forest provides freshwater to over 1,000 households.

But this wasn't the first time Parra had used his orchid knowhow in defense of Colombia's cloud forests. Already once before, his botanical surveys helped divert a road set to cut through a unique forest reserve in the Central Cordillera. And when a company planned to build a gated community of luxury chalets in a forest that Parra calls "the orchid Garden of Eden" – home to 126 orchid species, including 15 completely new to science — his targeted surveys once again came to the rescue.

Mongabay caught up with Parra to chat about using orchids to save forests, the realities of working as a biologist in war-torn and post-conflict Colombia, and the threats and conservation opportunities for Colombia's most enigmatic plant family.

Edicson Parra searches for understory and canopy orchids in the cloud forests of the Colombian Andes.

Mongabay: Where did your passion for orchids come from?

Edicson Parra: My mum was into her flowers. When I was young, we used to hike up into the hills and look for orchids. I literally fell in love. I can't think of another explanation apart from love. Whenever I get the chance to go into the forest now, I always bring that passion with me. I try to keep the link between being a scientist and a human. There's this perception of scientists as heartless. But how can you be called heartless when you regularly say out loud that you are in love with a family of plants? It helps that orchids are so emblematic in Colombia and that we really are the global epicenter for orchid diversity — for sure, that keeps things interesting!

Why are there so many orchid species in Colombia and do you think there are many more to still be discovered?

My country has more than 4,000 species of orchids. Even though orchids are the most diverse plant family in the entire world, that's still a hefty chunk of Earth's orchids! The story of why Colombia is the most orchid-rich country on the globe is closely linked to the uplift of the Andes. As these mountains rose, it provided a huge altitudinal and spatial gradient, with lots of varied microhabitats that

epiphytes [plants that grow on other plants], including orchids, were able to exploit. We also have this land gradient between the Amazon and the Andes in southwest Colombia which is incredibly diverse.

The second reason for Colombia's staggering orchid diversity lies in the very high diversification rate of some of its smaller orchids, especially the subtribe of orchids known as the *Pleurothallidinae*. These essentially settled in one place and then exploded in diversity like an orchid atomic bomb!

There are definitely many more species to be discovered in Colombia. Previously conflicts with guerrillas made it difficult to access some areas for surveys, but in peacetime lots of new expeditions are on the hunt for new species. There's huge potential for exciting discoveries, especially in the Chocó biogeographic region in the west of the country, which is pretty well preserved.

Colombia is the most orchid-rich country in the world, with more than 4,000 species. Images by Edicson Parra.

How do orchids respond to forest degradation?

So far there has actually not been much research into how orchids respond to habitat degradation, but from what we do know, things look very worrying indeed. When you chop down or fragment a forest it creates these new edges that my research has shown can have devastating impacts on orchids.

Working in the Brazilian Atlantic Forest, I found that there are some drought-resilient orchid species that can survive in farms or colonize the drier edges of forests. But this is only a tiny fraction of hardy orchids. Most species, including those that are the most critical in providing pollen and other rewards to pollinators, are extremely sensitive and simply cannot survive in forest edges.

Because orchid seeds don't have a protective tissue, to grow, their seeds have to land in a sort of Goldilocks zone, where conditions such as moisture and mycorrhizal associations are just right. But these Goldilocks zones vanish as humans homogenize forests and as edge effects fritter away core forest area.

In my research, I found that 85 percent of orchids need to be half a kilometer [0.3 miles], or even more, away from the forest edge to have the right sort of habitat to survive. That's huge! To put that in perspective, that means that less than one-fifth of habitat remaining in the entire Brazilian Atlantic Forest biome, which has already been heavily fragmented and reduced by farming, could actually conceivably support forest-specialist orchids into the future. Orchids could very well be one of the most sensitive of all Earth's taxa.

You've discovered more than 20 species of orchid. Which were the most meaningful to you?

You never forget your first love, and it's like that with my first orchid discovery: *Lepanthes foreroi*, named after my botany professor at university. I remember working in Yotoco reserve with my friend when I stumbled across it. And then, during my master's, I found a few species. The one I named after my son, *Hapalorchis dominicii*, is of course special to me. And then a few species, *Epidendrum fusugasugüensis* and *Lepanthes dapäensis*, came at a really good time for the conservation of community forests. Ah, it's so hard to pick one!

The one I've named after my partner is still in press, waiting to be published, so that will be a nice if it comes through!

People in my field, especially non-academics, say that you don't find orchids. Spend enough time in the forest, and it's the orchids that find you. Like a human pollinator, you are pulled in by their fragrance and the complex, fragile reproductive systems that they have evolved. I have to admit that I do put some stock in that. Whenever I go in the forest, I just feel this lure toward orchids. It's magnetic! Probably something is wrong with my brain.

Parra's discovery of Epidendrum fusagasugüense *came at a very important time for the conservation of a community cloud forest imperilled by a looming mining project. Image by Edicson Parra.*

What were some of the more harrowing experiences of working as a biologist in Colombia during the war?

In 2010, I was working alone in Garrapatas, near the Páramo las Hermosas. This area was historically under the control of drug-trafficking groups. Once, I was stopped at a territorial checkpoint, stripped of my clothes and held at gunpoint for several hours. I was only an undergrad at the time and I had barely enough money even for transport, let alone to pay any bribes. But I'd committed the mistake of borrowing a GPS from my university. This raised a lot suspicion, as the guys thought I had been sent by the military to spy on their territory. There was a lot of shouting and arguing. In the end I think they got bored of my wimping and let me go. But that was scary.

Another time I was carrying out orchid surveys in cloud forests near the Chalet de la Muerte. This place was the scene of a horrible atrocity, where a cartel wanting control over the area had slaughtered many community leaders. While I was exploring my forest plot sites, I collapsed through the forest floor and into a hole. Initially I thought I had fallen into an ancient indigenous tomb and was really excited. But I quickly realized I was walking on bones and that this was in fact the scene of a mass slaughter and grave. That still makes me really sad today because I know that the people murdered were innocents who only wanted to live their lives in peace.

The most danger I have been in myself though was nothing to do with the conflict. I was 27 meters [89 feet] up a tree looking for canopy epiphytes and my rope was caught in a bromeliad at the fork of a branch. I went to untangle the rope and got bitten by a very venomous pit viper. It was probably hunting for frogs around the bromeliad. So I did what any macho man would do in that situation: I screamed out, cried a lot and shouted for help! I was silly enough to be in the forest on my own, so it was a long and dizzy way back down the tree, to camp, and then on to the hospital to get anti-venom. When I next went back to the field, I made sure that I had an assistant!

Edicson Parra returns from a day hunting for orchids in mountaintop cloud forests. Image by Gianluca Cerullo.

Why was the forest near your hometown under threat and how did you help to ensure its conservation?

In short, this cloud forest reserve, which provides water to over 1,000 Colombian households and farmlands, was imperilled by a mining development project. After community members attended a workshop run by the mining company, they felt they had been unfairly tricked into accepting the project by its silver-tongued representatives. This fomented distrust. When a fire suspiciously broke out in the forest, locals fought to douse the flames and save some of the resident wildlife. This was when our community really came together and were galvanized to attempt to halt the mining through peaceful protest.

I was having drinks with other protesters and I expressed my intention to help out in any way that I could. And the only thing I know how to do is sample orchids. Apart from that I'm pretty useless. So I went into the forest, carried out my surveys and found these rare orchids — one of which had never been recorded before in the Central Cordillera. It was pretty exciting for the community who weren't aware how diverse the orchids in the forest were.

I also did something else. Here in Colombia, whenever a company wants to carry out a small- or large-scale project, they have to hand in a report that quantifies which species are present in the area. But when I looked in public archives at the report submitted by the mining company, I found that it a was plagiarized copy of a completely different assessment carried out elsewhere. This report said that there were no orchids at all even present in the forest — which was in complete contradiction to my findings.

Orchids are protected in Colombia by law. So if a company wants develop in an orchid area, they have to spend money on restoration or mitigation. And the last thing a mining company wants to do, at least from my own experience, is spend money on biodiversity.

But if you lie in a public document, it means you are lying to the government and the state. Which is a crime. So I submitted my findings as documents in the trial. The judge validated my report, and thanks to that report — and especially to the hard work of the community, without whom the whole process wouldn't have even been possible — the company was prevented from mining in the area.

We celebrated with lots of beer and Tejo! [Tejo is a Colombian sport that involves throwing metal pucks at a clay target full of balls of gunpowder, which explode on impact.]

Are there any other examples of how you have used your knowledge of orchids to save forests?

I once carried out a knowledge-exchange project with my botanist friend Oscar Perez in a community reserve in Dapa, near Cali. It was in this 10-hectare [25-acre] forest fragment. We found around 126 species in this one fragment. It's the most orchid-rich forest I've ever been in, like some kind of orchid Garden of Eden. Around 15 of the species we found were completely new to science!

But that reserve was in the eyes of a construction developer. Dapa is in this really privileged spot that overlooks all of Cali, so this construction project wanted to build luxury chalets there. The community was against that. So they organized themselves and they were trying to find evidence that the forest had value — not just biological value, but also cultural value.

Using our surveys in the fragment, as well as of orchids in the surrounding forests, the community was able to demonstrate the high biological value of the area. But we'd also trained some kids and community leaders on how to spot and cultivate orchids in the forest. And we'd made an orchid trail through the ecosystem so that community members could make a bit of money through ecotourism, from people coming from Cali to see orchids in the wild. This was further evidence that the fragment had cultural value to the community too.

With proof of its importance, the community was able to apply pressure to halt construction in the fragment. It was a real group effort that in the end led to the local government negotiating with the project manager to even bring the fragment into a corridor of small protected forest reserves. That was a great achievement.

I've also been involved in a locally organized and community-driven project to divert a road from being expanded through the only official forest reserve on the flank of the Valle del Cauca Cordillera. Again, with orchid surveys, and in close concert with local communities and the National University of Colombia, we were able to force the road developer to build tens of kilometers of extra road so that they circumvented cutting through this monkey-filled and orchid-bursting cloud forest.

Is it dangerous for environmental activists to challenge extractive industries in Colombia?

Since 2018, 317 social leaders, including environmental activists, have been killed in Colombia, with a further 4,000 considered to be under threat. The impact of this is huge, not just because of the life and expertise lost with each leader, but because of how the fear surrounding these murders stifles the emergence of new leaders in remote areas, where they are needed most. We're tired of this sort of thing. We've already had 60 years of war.

It's hard to link these deaths to extractive industries directly. A lot of it is over territorial conflict, with splinter paramilitary and criminal groups using brutal tactics to take over previously FARC-dominated areas left in the post-conflict power vacuum.

Currently, one of the frontiers for environmental activism in Colombia is related to mineral extraction in our high-altitude flagship páramo ecosystems. These strange areas studded with frailejon [a sunflower-like shrub] are like natural sponges that provide water to literally millions of people. But with strong political support, they are being carved up into gold and rare mineral concessions at the behest of transnational corporations. Just in the past days we've seen tens of thousands of people in Bucaramanga rise up to protest against the company Minesa, which is planning to mine for gold near the Santurban páramo.

Colombia's páramo ecosystems capture, regulate and provide water for millions of people, but are threatened by mining and poor government protection. Image by Gianluca Cerullo.

What are some of the key threats that orchids face in Colombia?

The conversion of land and expansion of the agricultural frontier is the main threat because of the high sensitivity of orchids. Harvesting and collection of orchids for the illegal trade is probably a big threat also, but there is very little reliable information on the magnitude or extent of this currently. Historically, the orchid trade was likely much higher than today. I've been told stories by local people in the Eastern Cordillera who used to see entire trucks filled with orchids drive past their houses several times a week 25 years ago.

What worries me most of all about climate change is how it's going to worsen the already considerable problems caused by habitat degradation. Already, our forest fragments and edges have drier exteriors that don't hold moisture well and have more intense light exposure. Water is such an important factor for the survival of orchids, and looking at how so many orchid species just go extinct at forests' dry edges, what's going to happen when warmer temperatures and changes to water cycles are added to the mix? It's not just the orchids that are going to suffer, but the pollinators that rely on them.

Orchids provide key resources to pollinators including bats, hummingbirds, bees and many other insects. Images by Edicson Parra.

Colombia is undergoing huge political change. Do you think this will lead to a shift in how its forests are managed in the future?

Yes. We are in a strategic moment. Currently, there is a lot of discussion about Colombia's national plan and its planes de ordenamiento territorial, which dictates regional environmental policy over 12 years. Similar to what is happening in Brazil, with [President Jair] Bolsanaro strongly favoring expansion into the Amazon, our current government is very much in favor of pursuing unsustainable development, recently opening up new areas to fracking, mining and oil extraction, and also seeking to unravel protective legislation, particularly in páramos. It's certainly a tense time for Colombia's environment. We are at a tipping point.

If you could give one message to Colombian politicians or members of the public to help in orchid conservation, what would it be?

For politicians, let's look at the scientific evidence of the impacts of habitat destruction on people and the environment, instead of just viewing exploitation as a means for short-term economic gains. For communities, let's be happy with the amazing diversity of Colombia and try to protect it. That's our legacy and our heritage as citizens lucky enough to live in one of the most biologically rich countries on Earth!

What advice would you give to young conservationists who want to use their research to act?

For me, I got lucky. I fell in love with orchids, which are naturally a very charismatic and treasured family of plants. So when I go to talk to people about orchids, they take an immediate interest. From my orchids and experiences, I have learned that you should embrace the knowledge that you have and make it sound fun. That's how you will get people to listen to you. Understand the scientific literature, and then think of ways to transform it into ways that will be easy to understand for politicians or community leaders. People are not stupid, but conservationists are not always the best at communicating. So be active in trying to engage people about science.

GIANLUCA CERULLO

ACROSS CHINA: GREEN SHOOTS OF PROSPERITY ON TCM-COVERED TREES

GUIYANG, March 12 (Xinhua) -- It is early spring in southwest China's Guizhou Province, but the natural forest in Zhegui Village is already filled with vitality: oak trunks are covered with orchid-like stalks, with branches swaying in the breeze.

"They're the *Dendrobium officinale*, a valuable Chinese herbal medicine," said Ruan Jian, deputy manager of Anlong Xicheng Xiushu Agriculture and Forestry Company. "Zhegui Village has sufficient forest coverage with proper altitude and climate conditions, which is very suitable for the imitated wild Dendrobium to grow."

The plant, a member of the orchid family, is known as an important traditional medicine in China since many of its biomedical benefits have been scientifically examined.

Wild plants of *Dendrobium officinale* became an endangered species in the 1980s. With the breakthrough of tissue culture technology in the early 2000s, however, artificial cultivation of precious plants entered the market.

However, with the expansion of scale, Dendrobium planted in some regions suffered from problems such as pesticide residues, elevated levels of heavy metal and poor quality.

"We grow high-quality Dendrobium without sabotaging the ecological environment, allowing the villagers to make a living from the mountains," said Ruan, who introduced the medical herbs into forests in Zhegui Village after a thorough investigation.

Oaks in the village feature rough and thick bark, which are rich in water and nutrients, making it easier for the D. officinale to attach while absorbing more nutrients, Ruan said.

Since 2013, the company has planted *D. officinale* on the tree trunks of more than 267 hectares of oak forest.

Located in Anlong County of the Buyi and Miao Autonomous Prefecture of Guizhou Province, Zhegui Village is rich in forestry resources and has an obvious three-dimensional climate -- neither too hot in summer nor too cold in winter.

For a long time, however, due to poor traffic conditions, the landlocked village has not exerted its unique ecological advantage. Growing the *D. officinale*, broadly known as the "fairy herbs," in the village is something that the local villagers, including 44-year-old Chen Jian, have never thought of.

"All the oaks are 'cash cows' now," Chen said. "Natural forests cannot be cut, so we did nothing but protect them in the past. Ever since the *D. officinale* were 'planted' on the tree trunks, the green hills that we have kept for decades have turned into gold."

Chen, who used to work outside of Guizhou for many years, now works in the village as a manager of the *D. officinale* planting base.

"It's wonderful that our village has an industry now, so I don't have to leave my hometown anymore. Life is much more comfortable than in the past," said Chen, adding that she now earns a monthly salary of more than 3,000 yuan (about 446 U.S. dollars), takes only a few minutes to cycle to work, and can take care of her two children and elderly mother-in-law.

"Without competing with agriculture, planting the *D. officinale* can liberate good fields. Without harming the grass or trees, we can

achieve harmonious co-existence. High mountains and deep forests do no harm to the plant, but can help restore authentic herbs," Chen said as she cited the benefits of planting the herbs.

The period for flower gathering lasts from April to June every year, and the fresh branch picking period is from November to March. Residents of the neighbor area can all come to work at the base, and a skilled worker can earn up to 500 yuan a day.

"Last year, salaries that we paid totaled more than 4 million yuan," said Ruan, adding that there are always job vacancies in the base. During the peak picking period, more than 200 workers are needed every day.

Because the cultivation features "zero chemical fertilizer, zero chemical pesticides, zero hormones, and zero transgenics," dendrobium produced in Zhegui Village is quite favored in the market.

According to Ruan, the finished products after the drying process are sold at a market price of more than 15,000 yuan per kilo. In the markets of Hunan and Fujian provinces, some products are still in short supply and sold at over 20,000 yuan per kilo.

Now the company is gradually entering markets in Beijing, the Yangtze River Delta and Pearl River Delta regions.

Besides considerable economic benefits without woodcutting, the dendrobium industry has also accelerated the poverty alleviation process of local villagers.

Poverty-stricken villagers are encouraged to work at the dendrobium base and buy shares of the company, with an average yearly income of over 30,000 yuan. A total of 1,691 residents in 445 households in Zhegui have stepped out of poverty, statistics showed.

Spreading from Zhegui Village, *D. officinale* has made roots in many regions in Anlong County, with the total area of imitation wild the plants covering more than 340 hectares.

Dendrobium Officinale Garden at the Yulin Wucai Tianyuan Park of Guangxi

The saying "plant dendrobium and harvest gold" is widely used in the local area, and "*Anlong Dendrobium officinale*," now listed as China Protected Geographical Indication Products, has formed a series of brands.

According to the plan of Guizhou Province, the planting area of Dendrobium in the province is to reach 200,000 mu (13,333 hectares) by the end of this year, so that more people will benefit from it.

XINHUA

AN ORCHID THAT NEVER BLOOMS

Figure 1:
Lecanorchis nigricans in Iwata, Nishimuro County, Wakayama prefecture. The flowers never bloom, but the plant still fruits .

A flower identified as *Lecanorchis nigricans* has been revealed to be a different identity, *Lecanorchis nigricans* var. *patipetala*.

Both species are self-pollinating, but the flowers of the true *L. nigricans* never open.

Some plants have evolved to be parasites, feeding off host fungi. These plants are known as mycoheterotrophs. They don't photosynthesize, so they only show themselves above ground for brief periods when fruiting or in flower. This makes them hard to find and classify, and the true identities of many species remain a mystery. Professor Suetsugu works with other researchers to document mycoheterotrophic plants in Japan.

Professor Suetsugu's research team noticed that *L. nigricans* (found in Japan's Miyagi prefecture and Kochi prefecture) bears fruit without blooming at all. The flower has spatula-shaped purple-tipped petals that don't branch. From these characteristics the team were able to identify it as *L. nigricans* or a close relative. However, the species known as *L. nigricans* is documented as having flowers that fully open. This open-flower (chasmogamous) *L. nigricans* is found in many parts of Japan.

L. nigricans var. *patipetala* is generally the more common variety in Japan (in Kochi prefecture the closed-flower *L. nigricans* is more common). This may have led to the widely-held misconception that the *L. nigricans* var. *patipetala* is *L. nigricans*. It is now clear that the species discovered by SAWA Yutaka is the same as the open-flower *L. nigricans* in other locations.

As well as abandoning photosynthesis, the *L. nigricans* also self-pollinates – its flowers remain buds until they fall. Non-photosynthesizing plants such as *L. nigricans* often grow on the dark forest floor, an environment that bees and butterflies rarely visit. Because of this, *L. nigricans* and *L. nigricans* var. *patipetala* are both self-pollinating species. *L. nigricans* may have stopped opening its flowers because this used up too many resources. Similar evolutionary patterns are occurring in other mycoheterotrophic plants.

"When plants give up photosynthesis, this changes their relationship with other organisms, such as the insects who may pollinate them," comments Professor Suetsugu. "Through taxonomic and ecological research on mycoheterotrophs, I will continue to study the changes that take place when plants make the extreme decision to abandon photosynthesis."

https://phys.org/news/2018-01-orchid-blooms.html

ORCHIDS SHUN THE SUN, SACRIFICING GENES

Not all plants rely on photosynthesis for nutrition, genetic research reveals.

The green of a plant's leaves reminds us that the energy that fuels life on Earth ultimately comes from the sun through the process of photosynthesis. But new research shows that some orchids have lost the ability to photosynthesise entirely. The sun, it seems, is not the only way to go.

Craig Barret and Brandon Sinn of West Virginia University, US, and Aaron Kennedy of America's Department of Agriculture, have delved into the genomes of a particular group of "heterotrophic" plants: the leafless orchid genus *Hexalectris.*

Plants are termed heterotrophic if they do not derive their energy directly from the sun. They include insectivorous species, ones that feed on dead matter, parasites and symbiotes, and epiphytes that grow on other plants but do not take nutrients from them.

The nine species of *Hexalectris* seem mostly, and to various degrees, to have transitioned to a myco-heterotrophic lifestyle, meaning that they parasitise fungi and feed on the nutrients they produce. In orchids more generally, it is estimated that some 30 species have made this transition.

This non-photosynthetic strategy removes evolutionary selection pressure on the genes that produce photosynthetic apparatus.

Barret and his colleagues wondered to what degree this lack of selection pressure had led to the loss of photosynthetic genes, because it was unclear how many of the nine species had transitioned to full myco-heterotrophy, and how many remained partly dependent on the sun.

To measure this, they investigated the plastomes – the genome of a small organelle found in plant cells, called a plastid – of all nine *Hexalectris* species. Plastids are often filled with chlorophyll (making them, thus, chloroplasts) and are the site for the photosynthetic process.

The researchers' work, published in the journal **Molecular Biology and Evolution**, revealed that at least four, perhaps five, of the orchids have lost genes necessary for photosynthesis over the past 10 to 30 million years.

Intriguingly, this appears to have happened independently each time. The researchers suggest that the leap to myco-heterotrophy is facilitated by the fact that all young orchid plants feed this way before they develop photosynthetic abilities.

The fact that so many species in just one small genus have moved away from dependence on photosynthesis has wider implications for orchids and, indeed, all plants.

"Our unprecedented finding of multiple, independent transitions to a fully myco-heterotrophic lifestyle in a single genus," the authors write, "reveals that the number of such transitions among land plants is likely underestimated."

It seems that more plants than we ever suspected have come to shun the sun.

https://cosmosmagazine.com/biology/orchids-shun-the-sun-sacrificing-genes

OVER 60,000 PLANTS BLOOM INSIDE THE WORLD'S LARGEST ORCHID GARDEN

Singapore's National Orchid Garden. A collection which includes 600 newly created hybrid species

Singapore's national flower, the *Papilionanthe* "Miss Joaquim," is a Frankenstein orchid—a mix of two species, *Vanda Hookeriana* and *V. teres*, hybirdized in the 1890s by an Armenian horticulturalist, Agnes Joaquim, living in Singapore. The flower, which displays a large pink lip with a red and yellow splash in the middle, became Sinapore's national flower in 1981, when it was selected out of 40 others as the one that most represented the country's vibrant and resilient spirit. Now that flower, along with 60,000 others, is on display in the National Orchid Garden in the Singapore Botanic Gardens, creating the largest exhibit of orchids anywhere in the world.

The botanic garden—now Singapore's first UNESCO site and the heritage program's only tropical botanic garden listed—has been a fixture in Singapore since 1859, with a flagship orchid breeding program established in 1928. The National Orchid Garden opened as a place for horticulturist staff to show the best of their hybrid breeds. Currently, more than 1,000 orchid species and more than 2,000 hybrid orchids are on display—incuding about 200 VIP orchids that can only be seen at the garden.
To date, the breeding program at the garden has created more than 600 new and unique orchid species, including the *Papilionanda* Mimi Palmer (a cross between the *Papilionanda* Tan Chay Yan and *Papilionanda tessellata*), which has a sweet scent and dense markings on the flowers; the *Papilionanda* Tan Chay Yan (a cross between the *Papilionanda dearei* and *Papilionanda* Josephine van Brero), which is considered one of the finest hybrid orchids ever produced in Singapore; and the *Arachnis* Maggie Oei (a cross between the *Arachnis hookeriana* and *Arachnis flos-aeris*), which was the first Singapore hybrid grown commercially as a cut flower.

Dr. Leong Chee Chiew, Executive Director of National Parks, Gardens & Nature Reserves, explained to Smithsonian.com how the hybrid breeding program works, a process that can often take years to bear fruit:

"Orchids are pollinated by hand by depositing pollen from one flower to another. If fertilization is successful, the seedpods will develop and ripen in a few weeks to a few months. Just before they split open, seedpods are sent to the laboratory for seed sowing and germination to prevent contamination by fungus or bacteria spores in the air. Seedpods are sterilized and opened to extract the seeds, which are then sowed onto an agar media in a scientific flask for germination to take place. This produces orchid seedlings, which are cultivated in other media such as sphagnum moss. When the plants mature and flower after a few years, a specimen is selected based on its attributes and then cloned through tissue culture."

More than 200 of the garden's orchid hybrids are named for foreign dignitaries and heads of state, Leong said. It's meant as a gesture of friendship and goodwill between Singapore and other countries. The Obamas have their own, and so does Nelson Mandela, Prince William, Kate Middleton, Jane Goodall and Jackie Chan. All the "famous" species are kept in a specific areas called the VIP and Celebrity Orchid Gardens. The garden also runs a preservation and conservation program for native orchids, allowing endangered species to be repopulated and distributed throughout green spaces in Singapore.

SMITHSONIAN

THE
IRISH ORCHID
SOCIETY

2019
ANNUAL GENERAL
MEETING

MINUTES

DUBLIN
10 JUNE 2019

Irish Orchid Society
AGM Minutes 10th June 2010

Apologies: Una Breathnach, Mark Garvey, Larry May, Mary Flynn

Attendance: 19

The meeting opened with the minutes of the Annual General Meeting 2018 read at 19:40 by Marie Hourigan, Chairperson. Minutes were proposed by Hylda Beckett and seconded by Brendan Sayers. The Treasurer's Report was read out by Mary Bradshaw, proposed by Olwyn Lanigan and seconded by Carmel Higgins.
One correction was noted, the spelling of Myra to Myrad was corrected.

Chairperson's Report
Marie began with a quick recap of the events that took place over the last 12 months. In July Brendan Sayers led a tour of Bull Island, where there was a poor turnout for the evening walk.

In September Marie conducted a tour of the orchid house here at the Gardens, which had a good turnout.

Lesser Known Orchids revisited was the title of the talk in October. Brendan Sayers brought us through the history of the orchid collection in Glasnevin using a lecture given by Frederick Moore to the RHS in 1908 as a template. The lecture was previously given during the Three Threads exhibition for the Orchid Fair 2018 when the RHS Orchid Committee visited.

Shane Kerr one of our long standing orchid growers and previous chairperson regaled us with *10 Success Secrets for the Orchid Hobbyist* in November. For 34 years Shane has grown a diverse range of orchids and calculated that his failure rate of 70% and success of 30% has given him plenty of experience which he shared with us. Shane discussed all the old favourites: watering, fertilizer, hygiene along with buying tips and how to educate yourself using websites and books.

2019 AGM DUBLIN

Members Table at the Annual General Meeting

Best In Show - AGM June 2019 - Winner of the best in show is Aleksandra Kucharczyk

Our annual indulgence of goodies was held in December, it was a night of catching up and our fun party Quiz, thanks to Brendan. It's always a great night and where we find out who all the good chefs in the Society are.

Marie expressed many thanks to all who contributed and baked.

The February potting demonstration didn't quite go to plan due to technology problems but all had a good night where Marie got her hands dirty and the age old question of dividing or clumping was trashed out again. I think it was enjoyed by all who attended. The wonderful slide show she had prepared will have to wait till next year!

In March Eszter Bogolin one of our newest members discussed 'How to save an Orchid when something goes wrong'. Eszter talked about stressed plants, pest invasion, root and top rot. She gave us her insight on how to rescue those poor sad orchids we see for €1 and gave us some insight into how she grows, her tips and tricks.

The cancellation of the Orchid fair in April was regrettable and unavoidable and it meant we have missed out a valuable revenue source for the Society and more importantly it is one of the few times we as a Society get to interact with the public. Hopefully the fair will be back next year.

Our last meeting this year was a tour of the orchid houses here at the gardens, it was a glorious sunny evening, and it's always worth a quick tour at different times of the year just in case there is that rare nugget in flower.

Looking forward to the year ahead, in July there is an Orchid Clinic at the National Botanic Garden, some of our guest speakers for the coming year are Ray Creek in September, Brendan Sayers in October and in November Dr. Noeleen Smyth will discuss being a responsible consumer. December will be party night, February potting, March I will give a talk and all going well the Orchid Fair next April and May will be a members night. All dates will be in the next *Pollinia*

I'd like to thank the committee for all their fundraising efforts without which the Society would not be able to function, a special thanks has to go to Alek's. Lisa always on hand for website issues, Mary to keep us all on the straight and narrow financially, Larry for all his time putting *Pollinia* together, and Carmel who has chosen to step down from the committee as secretary so a special thanks to her for her service to the society.
Thanks to all the members who turn up to our monthly meetings and support the society, both financially through the raffles and by imparting there knowledge to other members via questions and comments.
Many thanks to the staff and management of the National Botanic Gardens for allowing the I.O.S to use the gardens for their meetings etc.

Treasurer's Report

Mary gave a brief synopsis of the balances held in both bank accounts for the year going forward. She went through the expenditure for the year gone. Please see following page for more detail.
Tom Petherbridge questioned the finances and thought they did not add up, there was more money in the account than the report would suggest there should be.

Election of committee members

Tom Petherbridge was proposed as new treasurer by Marie Hourigan and seconded by Philippa Thomas.
Eszter Bogolin was proposed as new secretary by Carmel Higgins and seconded by Shane Kerr
Philippa Thomas was proposed as a committee member by Shane Kerr and seconded by Brendan Sayers.
Committee members from June 2019:
Marie Hourigan, Chairperson
Tom Petherbridge, Treasurer
Eszter Bogolin, Secretary
Laurence May, Editor
Philippa Thomas, Committee member
Aleksandra Kucharczyk, Committee member
Lisa Coffey, Committee member

A.O.B.

The IOS website was the first topic for discussion, many members are having difficulty logging onto and using the forums. [Progress following AGM, Marie Hourigan (M.H.) discussed same with Lisa Coffey after the AGM. Lisa will add a step by step guide to log-on, to the homepage which was completed]

The cost of posting *Pollinia* was discussed and it was agreed by a show of hands that we will continue to post same.

Scott MacNaughton asked if we could get a receipt or membership card for our subscription. MH said that the society used to issue membership cards. Tom Petherbridge (TP) said he would contact all members in due course in regards to receipts or membership card. The committee will discuss which one would be more suitable.

Noreen Mulligan questioned the need for Society insurance and MH responded by saying it had been examined before and the cost was prohibitive. The society could not afford same. Advertising of field trips must be carefully worded.

Philippa Thomas (PT), asked if members could receive a reminder sms prior to meetings, MH said the committee would discuss but G.D.P.R. would probably be an obstacle. PT also questioned the downsizing of pictures for the website and how difficult it was to reduce them for uploading to the forums. PT put forward a suggestion of mini raffles for the weekend of the Orchid Fair.

Brendan Sayers, thanked the committee for all their work throughout the year and wished Hylda Beckett all the best for her upcoming 90th birthday.

Happy 90th Birthday wishes to Hylda Beckett from the Irish Orchid Society members and friends.

The next event will be an Orchid Clinic in July and the next meeting will be on September 3rd.
The meeting was closed at 20:40.

The Myrad Best Perpetual Salver for Best in Show was presented to Aleksandra Kucharczyk after the AGM and the night finished with a raffle.

Best in Show *- Restrepia striata, Aleksandra Kucharczyk*

Best Species *– Coelogyne mooreana 'Brockhurst', Philippa Thomas*

Best Paphiopedilum *– Hylda Beckett*

Best Hybrid *– Vuylstekeara, Philippa Thomas*

Best Phalaenopsis *- Naomi Mc Elroy*

Best Pleurothalid *- Restrepia striata, Aleksandra Kucharczyk*

FINANCIAL STATEMENT

THE IRISH ORCHID SOCIETY

INCOME	€	EXPENDITURE	€
SUBCRIPTIONS	355.00	POLLINIA	420.00
LIFE MEMBERS	0.00	ORCHID COUNCIL FEE	70.00
RAFFLES	227.00	WEB COSTS	73.00
BARK SALES	102.00	RHS PRESENTATIONS	360.00
POLINIA SALES	160.00	ORCHID GB FEE	31.00
SALES OF PLANTS	147.00	STATIONARY/STAMPS	222.00
DONATIONS	250.00	BANK FEES	79.00
PRINT SALES	75.00	RAFFLE PRIZES	61.00
TOTALS	€1316	TOTALS	€1316

CASH AT BANK **€ 6629.00**

May 30, 2019

GASTRODIA PUBILABIAT

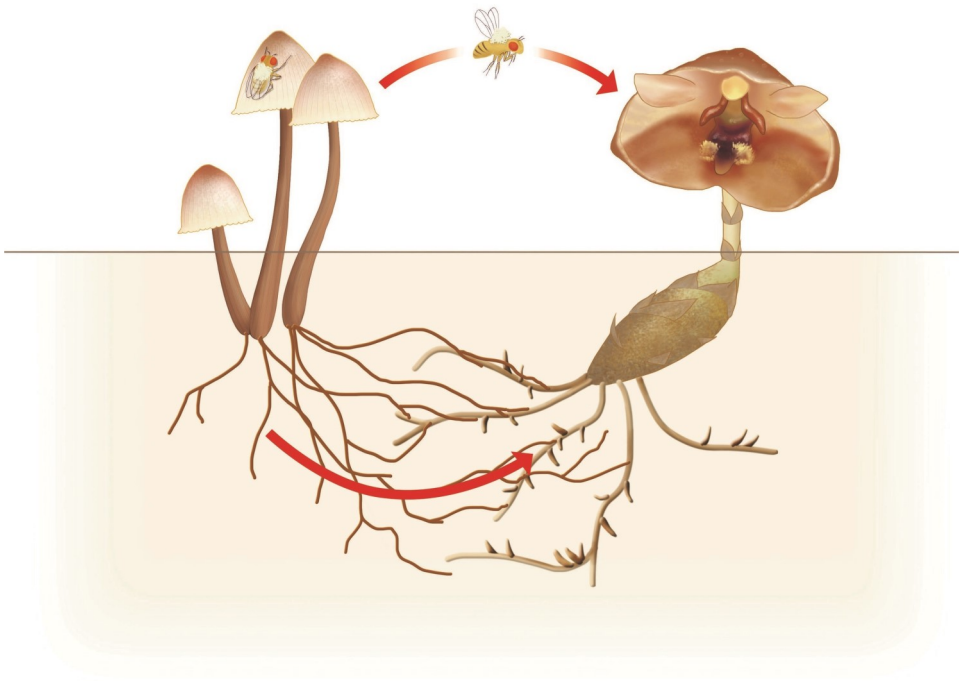
Freeloading orchid relies on mushrooms above and below ground

A) This is *Gastrodia pubilabiat* flowers and the fruit fly pollinators. (B) *G. pubilabiat* flowers with eggs laid by fruit flies. (C) Fruit fly carrying *G. pubilabiata* pollen mass on the Mycena mushroom. (D) Fruit fly carrying *G. pubilabiata* pollen mass on fermented kaki fruit. Credit: Kobe University

The non-photosynthesizing orchid species *Gastrodia pubilabiata* smells like rotting mushrooms or fermented fruit, and is pollinated by fruit flies who mistakenly lay their eggs in its flowers. If there are rotting mushrooms near the orchid, its pollination rate increases. As well as using mushrooms to attract insect pollinators, *G. pubilabiata* survives by absorbing nutrients from the fungal hyphae of mushrooms. This is the first time a plant has been discovered to depend on mushrooms both above and below ground.

The research findings by Project Associate Professor SUETSUGU Kenji at the Kobe University Graduate School of Science were published in **Ecology.**

Over 90 percent of flowering plants use animals to help them pollinate. In most cases, the animals are rewarded with pollen or honey—it's a win-win situation. However, some plants trick insects into bringing them pollen without providing any compensation. G. pubilabiata, by emitting a smell of fermented fruit and rotting mushrooms, advertises itself as a good brood site for fruit flies. The fruit flies pollinate the plant by laying eggs there and visiting their brood.



Proposed relationship between Gastrodia pubilabiata and its fungal host species. Pollination rates rise when it is close to rotting mushrooms

However, *G. pubilabiata* does not have anything the young fruit flies can eat, so they die soon after hatching.

When such plants disguise themselves by mimicking other species in close proximity, insects may mistakenly visit the imitator of the plant. Professor Suetsugu compared the reproductive success rate of *G. pubilabiata* with and without rotting mushrooms nearby. The results showed that with rotting mushrooms beside it, the pollination rate for *G. pubilabiata* rose significantly.

G. pubilabiata has another interesting trait—instead of engaging in photosynthesis, it lives on nutrients from fungal hyphae of the mushrooms. In other words, this plant survives on nutrients taken underground from mushrooms, and also uses mushrooms to attract pollinating insects. This is the first time a plant has been observed to rely on mushrooms both above and below ground.

Plants that have abandoned photosynthesis can survive in environments without sunlight, giving them an advantage over potential competitors. However, in these environments, they probably cannot rely on typical pollinators such as bees and butterflies for pollination, because both bees and butterflies prefer areas of high light intensity. In order to take nutrients from mushrooms, they live on the dark forest floor. Therefore, their lifestyle inhabiting the dark understory may influence the pollination biology of these achlorophyllous plants.

Fruit flies also use rotten fruit as brood sites, so *G. pubilabiata* could potentially increase their reproductive rate in the vicinity of fermented fruit. Professor Suetsugu will continue these surveys to shed light on the changes that take place when plants abandon photosynthesis.

KOBE UNIVERSITY

OrchidWire

Connecting a World of Orchids
.orchidwire.com/index.html

Swiss Orchid Foundation

The Swiss Orchid Foundation is working on a world orchid iconography (**orchid.unibas.ch)** and has slides, drawings and herbarium specimens from over 13,000 different orchid species, that you can find here: **orchid.unibas.ch/iconography.search.php**

BibliOrchidea

BibliOrchidea is with over 150,000 entries the largest orchid literature database worldwide.
orchid.unibas.ch/bibliorchidea/pages/applet.php

"It's an orchid."

Secret Gardens of Sligo

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Farm and gardens by Lough Arrow. The gardens are a mix of established shrubs, trees and developing areas around a new house, including low maintenance borders, perennials, ornamental grasses, annuals and pots. There is a raised vegetable garden with greenhouse, fruit beds and composting area. Walk around the wildlife pond or through the fields to the lake shore.

VISIT ALL OF THE GARDENS
https://www.secretgardensofsligo.com/

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