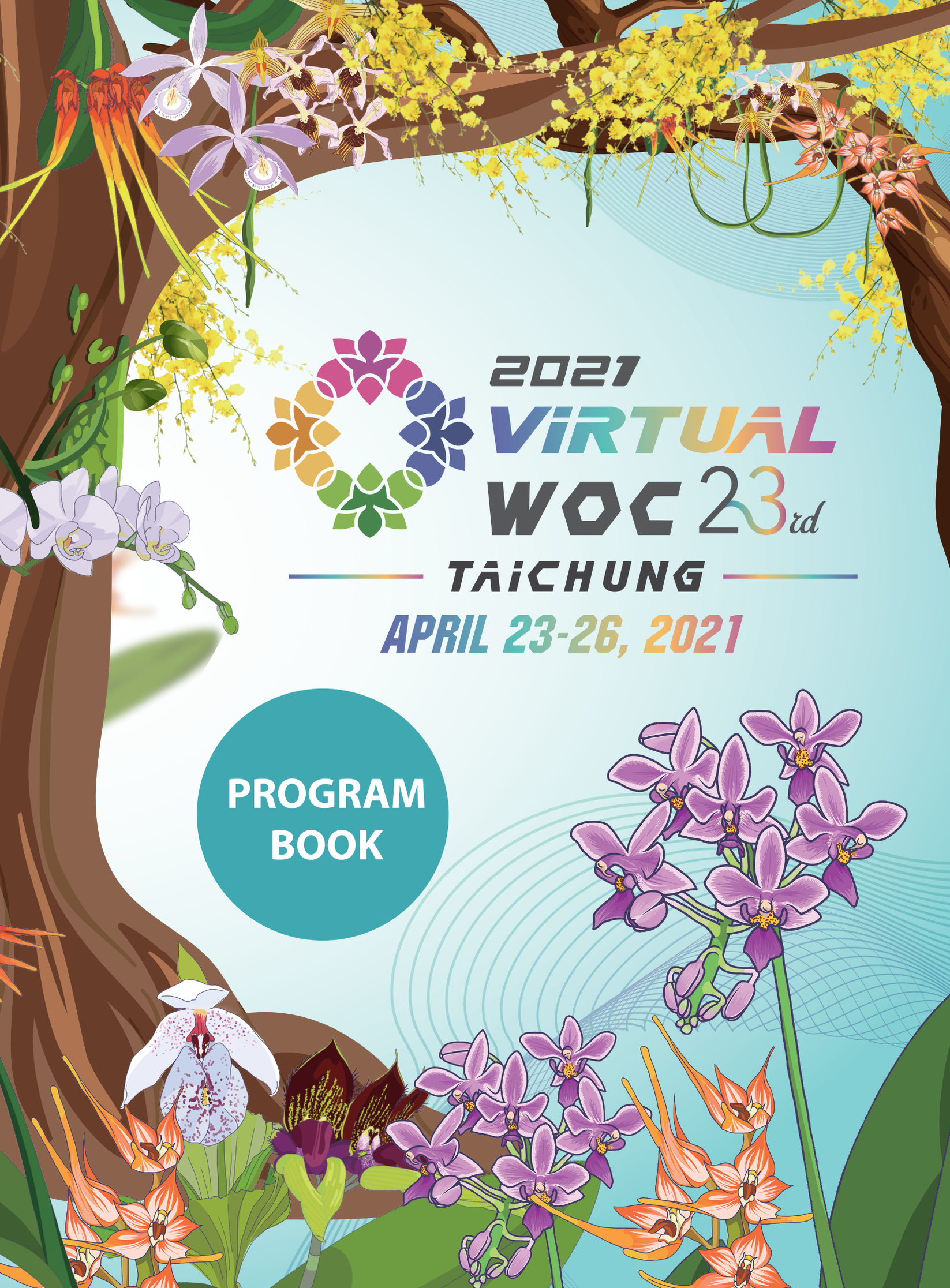

2021
VIRTUAL
WOC 23rd
TAICHUNG
APRIL 23-26, 2021
PROGRAM
BOOK

WELCOME MESSAGE

Message from the Taiwan Orchid Growers Association President

Due to the COVID-19 pandemic, the 23rd World Orchid Conference and Show was postponed with frustration, despite all the readiness and expectations. After another whole year's preparation, we start it over by holding the 2021 Virtual WOC in the form of a three-day online conference from April 24th to April 26th. At the same time, the digital orchid show will be online on April 24th, marking a new beginning. We hope that the public will continue to support the orchid industry through this platform.

Taiwan is one of the world's major orchid producers. It has been growing orchids for over a century and its large scale commercial orchid industry has become prosperous for more than 20 years. As a result, the orchid export business was born, making Taiwan one of the main sources of orchids in the global market.

Over the years, in an attempt to sustain the rich biodiversity on Earth, Taiwan has devoted great efforts to the conservation of orchids and the collection of genetic resources of orchids around the globe. On the other hand, the orchid industry, related government agencies, academia, and research entities have also been dedicated to studies and collection of indigenous species, in order to reestablish the endemic orchid species of high conservation urgency. In addition, they also have been working closely together on restoring the rare species, while educating the public about the knowledge and value of orchid conservation through promotion and orchid exhibitions.

During the Virtual Conference, the seven themes of the talks will focus on "breeding", "conservation," "cultivation and physiology", "ecology", "genetics and development", "orchid industry", and "systematic." Experts from various fields are invited to exchange and share knowledge, ideas, and experiences through the online conference platform. The speakers from abroad are unable to come to Taiwan to give their talks, but the virtual conference system allows us to overcome the barrier of distance and deliver the information to the public directly. All the talks have been recorded and the entire contents of this virtual conference can be viewed repeatedly online, making it possible to convey the information longer and broader.

We sincerely invite everyone who loves orchids to take part in this unprecedented 2021 Virtual WOC, enabling persons from other countries to feel the extraordinary charm of Taiwan's orchids.

Chen-Chung Chen
President, Taiwan Orchid Growers Association

Message from the WOC Trust President

Welcome to the first ever virtual conference of the World Orchid Conference Trust. Although the COVID pandemic has prevented us from holding the planned conference and accompanying show in Taichung as scheduled, this innovative virtual conference offers an exciting way forward, using digital technology, to include lecturers and delegates from around the world.

Success of this virtual conference could prove to be the future of further WOCT conferences as it makes presentations and discussions available to a wider audience and at a lower registration fee than would be possible with a traditional conference; a more inclusive affair.

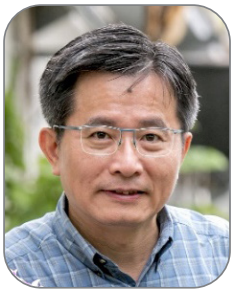
We will miss being together in person, I am sure, but we have the prospect of a stimulating and rewarding conference ahead.

I sincerely hope that you will enjoy the experience.

Thank you for your participation.

Liz Johnson
President, World Orchid Conference Trust

Message from the 2021 Virtual WOC Conveners



In 2005, we first began our discussions and work on making a bid to sponsor a future WOC. We sailed through some ripples and waves and it took over 15 long years of effort to put on a fantastic conference and show at the 23rd World Orchid Conference that was supposed to be held in early March of 2020. Unfortunately, as all was ready, COVID-19 came uninvited and we had to postpone this big event.

After more than a full year, the pandemic continues and travel restrictions and quarantine regulations make international travel impossible. Since a true World Orchid Conference requires in person attendance and onsite judging and orchid exhibit, with the generous understanding of the WOC trustees, this event is renamed as "2021 Virtual WOC" and all will be presented virtually starting on April 24, 2021.

Large international events like the WOC are the devoted results of many people and entities working together and coordinating closely with each other. We truly appreciate the Trustees of the World Orchid Conference and our colleagues and friends from various government agencies, Taiwan Orchid Growers Association, universities, research institutions, orchid nurseries, and other entities to make this virtual conference possible. All oral and poster presentations will be given by pre-recorded videos.

The 2021 Virtual WOC is fortunate to have well over 176 wonderful speakers from at least 43 countries and regions around the world. We have virtual oral sessions and poster presentations covering all aspects of orchidology, from breeding, conservation, cultivation, development, ecology, genetics, industry, physiology, to systematic. The Project Blossoming (Formosa Lectures) is for sharing the presenters' research and experience on orchids. The Project Rooting Symposium is devoted to orchid conservation and reestablishment of orchid populations in the wild. We also put in efforts and provide some scholar funds to assist young scientists to participate in Project Budding (Young Fellow Award) to share their findings. We thank the extraordinary efforts from all participants to make this virtual conference successful.

We wish that all of you will enjoy the virtual conference program, learn more about orchids, and hope to see you all in Taiwan in 2024, if not earlier.

Yao-Chien Alex Chang
Convener
2021 Virtual WOC

Yin-Tung Wang
Vice Convener
2021 Virtual WOC

CONFERENCE INFORMATION

Overview

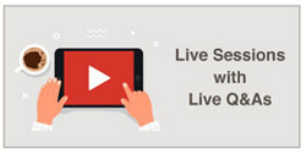
Date	April 23 (Fri) – 26 (Mon), 2021
Venue	Virtual Conference
Official Language	English
Website	www.woc23.com
Hosted by	Taiwan Orchid Growers Association

How to Participate in 2021 Virtual WOC?

Visit the 2021 Virtual WOC online platform

The ID and Password will be given by participant's email who had pre-registered.

Scan the QR code for detailed instructions.



Pre-recorded Sessions

All sessions will be broadcast pre-recorded presentations, and there will a remote live Q&A after the presentations.

E-poster Presentations

You can view e-Posters and watch short oral presentations.

Visit the 2021 Virtual WOC (Exhibition) online platform

We will present the show and the beautiful orchids to people virtually using the 3D, VR technology. We wish that, through this virtual orchid exhibition, visitors will get to know more about Taiwan and her fabulous orchid industry.

Scan the QR code to view the virtual exhibition.

Please note the Online Exhibition will open on April 24, 2021

Highlight Session

Opening Ceremony

April 23 (Fri) 09:00-10:10

Keynote Speech 1-Genetics & Development

April 24 (Sat) 09:00-09:35
Hong-Hwa Chen (Taiwan)
Regulation of *Phalaenopsis* Orchid Floral Scent

Keynote Speech 2-Breeding

April 24 (Sat) 13:30-14:05
Tim Wing Yam (Singapore)
Orchid Breeding at the Singapore Botanic Gardens – A 90-Years Journey

Keynote Speech 3-Cultivation & Physiology

April 25 (Sun) 09:00-09:35
Yin-Tung Wang (United States)
Plant Growth Regulators on Greenhouse Orchids

Keynote Speech 4-Orchid Industry

April 25 (Sun) 13:30-14:05
Setapong Lekawatana (Thailand)
Orchid of Thailand

Closing Ceremony

April 26 (Mon) 14:30-15:00

COMMITTEES

WOC Trustee *in alphabetical order by last name*

George Hatfield | Liz Johnson | Chris Purver | William Riley

Organizing Committee *in alphabetical order by last name*

Ting-Lin Chang	Taiwan Seed Improvement and Propagation Station, Taiwan
Fure-Chyi Chen	National Pingtung University of Science and Technology, Taiwan
Hsin-Yen Chen	Taitung District Agricultural Research and Extension Station, Taiwan
Wei-Jung Chen	National Ilan University, Taiwan
Li-Hua Du	Hualien District Agricultural Research and Extension Station, Taiwan
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Shun-Fa Tai	Kaohsiung District Agricultural Research and Extension Station, Taiwan
Chang-Hsien Yang	National Chung Hsing University, Taiwan
Hung-Ying Yang	Tainan District Agricultural Research and Extension Station, Taiwan

Scientific Committee *in alphabetical order by last name*

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Hong-Hwa Chen	National Cheng Kung University, Taiwan
Kingsley Dixon	Curtin University, Western Australia
Fuh-Jyh Jan	National Chung Hsing University, Taiwan
Yung-I Lee	National Museum of Natural Science, Taiwan
Setapong Lekawatana	Department of Agricultural Extension, Thailand
Tsan-Piao Lin	National Taiwan University, Taiwan
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Bijaya Pant	Tribhuwan University, Nepal
So-Young Park	Chungbuk National University, Korea
Hanne Nina Rasmussen	University of Copenhagen, Denmark
Erik Runkle	Michigan State University, USA
Wen-Chieh Tsai	National Cheng Kung University, Taiwan
Yin-Tung Wang	Texas A&M University, USA
Dennis F. Whigham	Smithsonian Institution, USA
Tim Wing Yam	Singapore Botanic Gardens, National Parks Board, Singapore
Edward Yeung	University of Calgary, Canada
Tomohisa Yukawa	Tsukuba Botanical Garden, National Museum of Nature and Science, Japan
Lawrence W. Zettler	Illinois College, USA

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Organizer

行政院農業委員會農糧署
AGRICULTURE AND FOOD AGENCY
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臺中市
TAICHUNG CITY

Implementer

The World Orchid Conference Trust

Taiwan Orchid Growers Association
TOGA
社團法人台灣蘭花產銷發展協會
Taiwan Orchid Growers Association

PROGRAM AT A GLANCE

Date	23 April 2021 (Friday)
Time	Event
09:00-10:10	**Opening Ceremony**

Date	24 April 2021 (Saturday)		
Time/ Room	Room 1	Room 2	Room 3
09:00-09:35	Genetics & Development Keynote Speech		
09:35-10:00	Genetics & Development Session 1	Cultivation & Physiology Session 1	Conservation Session 1
10:00-10:35			
10:35-11:00	**Break**		
11:00-11:30	Conservation Session 2	Orchid Industry Session 1	Project Seeding Session 1
11:30-12:00			
12:00-12:30			
12:30-13:00	**Break**		
13:00-13:30			
13:30-14:05	Breeding Keynote Speech		
14:05-14:30	Breeding Session 1	Conservation Session 3	Project Seeding Session 2
14:30-15:05			

Date	25 April 2021 (Sunday)		
Time/ Room	Room 1	Room 2	Room 3
09:00-09:35	Cultivation & Physiology Keynote Speech		
09:35-10:00	Cultivation & Physiology Session 2	Ecology Session 1	Systematics Session 1
10:00-10:35			
10:35-11:00	**Break**		
11:00-11:30	Genetics & Development Session 2	Conservation Session 4	Systematics Session 2
11:30-12:00			
12:00-12:30			
12:30-13:00	**Break**		
13:00-13:30			
13:30-14:05	Orchid Industry Keynote Speech		
14:05-14:30	Orchid Industry Session 2	Cultivation & Physiology Session 3	Project Rooting Symposium
14:30-15:00			
15:00-15:30			
15:30-16:00			
16:00-16:30			
16:30-16:45			

Date	26 April 2021 (Monday)		
Time/ Room	Room 1	Room 2	Room 3
10:30-11:00	Conservation Session 5	Conservation Session 6	Genetics & Development Session 3
11:00-11:30			
11:30-12:00			
12:00-12:30	Break		
12:30-13:00			
13:00-13:30	Orchid Industry Session 3	Ecology Session 2	Conservation Session 7
13:30-14:00			
14:00-14:30			
14:30-15:00	**Closing Ceremony**		

DAILY PROGRAM

Friday, April 23, 2021		
Opening Ceremony		
Date: Apr. 23 | Time: 09:00-10:10		
Location: Taichung Waipu Park Area		

Saturday, April 24, 2021		
Genetics & Development Keynote Speech		
Date: Apr. 24 | Time: 09:00-09:35		
Room: Room 1		
Moderator: Fure-Chyi Chen (Taiwan)		
Sat-KS-1	09:00-09:35	**Regulation of *Phalaenopsis* Orchid Floral Scent**
		Hong-Hwa Chen (Taiwan)
Genetics & Development Session 1		
Date: Apr. 24 | Time: 09:35-10:35		
Room: Room 1		
Moderator: Fure-Chyi Chen (Taiwan)		
Sat-R1-1-1	09:35-09:50	**The Absence of Endosperm Formation in Orchid Seeds – Possible Causes and Consequences**
		Edward Chee Tak Yeung (Canada) / Yung-I Lee (Taiwan)
Sat-R1-1-2	09:50-10:05	**Anthocyanin Synthetic Genes in *Rhynchostylis gigantea***
		Weenun Bundithya (Thailand)
Sat-R1-1-3	10:05-10:20	**Orchid Genomes and Orchid Morphological Evolution**
		Wen-Chieh Tsai (Taiwan)
	10:20-10:35	**Q & A**
Cultivation & Physiology Session 1		
Date: Apr. 24 | Time: 09:35-10:35		
Room: Room 2		
Moderator: Yin-Tung Wang (United States)		
Sat-R2-1-1	09:35-09:50	**A Selective Journey through the History of Advice on Growing Orchids from Williams to Webinars**
		Liz Johnson (United Kingdom)
Sat-R2-1-2	09:50-10:05	**Carbohydrate Partitioning Between Pseudobulb and Inflorescence During Reproductive Growth in *Oncidesa* Gower Ramsey 'Honey Angel'**
		Hsi Lin (Taiwan)
Sat-R2-1-3	10:05-10:20	**Species Orchids Should Be Species**
		Ian Chalmers (Australia)
	10:20-10:35	**Q & A**

Conservation Session 1		
Date: Apr. 24 | Time: 09:35-10:35		
Room: Room 3		
Moderator: Lawrence W. Zettler (United States)		
Sat-R3-1-1	09:35-09:50	**The Million Orchid Project: A Non-Traditional Approach to Orchid Conservation and Restoration**
		Jason Downing (United States)
Sat-R3-1-2	09:50-10:05	**Safeguarding Imperiled Orchid Species in the Southeastern United States and Caribbean**
		Emily E. D. Coffey (United States)
Sat-R3-1-3	10:05-10:20	**Pollination Biology of Orchids: A Case Study in An Endangered and Medicinally Important Northwestern Himalayan Indian Orchid, *Cephalanthera longifolia***
		Promila Pathak (India)
	10:20-10:35	**Q & A**

Break (10:35-11:00)

Conservation Session 2		
Date: Apr. 24 | Time: 11:00-12:30		
Room: Room 1		
Moderator: Yung-I Lee (Taiwan)		
Sat-R1-2-1	11:00-11:15	**Orchid Conservation in the 21st Century: What Can the Orchid Specialist Group Do?**
		Michael Fay (United Kingdom)
Sat-R1-2-2	11:15-11:30	**Effect of Plant Growth Regulators and Basal Media Strengths on Protocorm Proliferation and Development of Borneo Threatened Orchid, *Vanda dearei***
		Roslina Jawan (Malaysia)
Sat-R1-2-3	11:30-11:45	**Fungus Availability and Species Specificity Determine Restoration of Orchid Populations in Cultural Landscapes**
		Jana Jersáková (Czech RepublicIndia)
Sat-R1-2-4	11:45-12:00	**The Writhlington School Orchid Project - A Teacher's Perspective on Developing Orchid Science Education and Conservation in A State Secondary School**
		Simon Pugh-Jones (United Kingdom)
Sat-R1-2-5	12:00-12:15	**The Students' Experience of the Writhlington School Orchid Project**
		Chloe Mcgiveron (United Kingdom) / Tallis Inger Flecker (United Kingdom) Jess Buckle (United Kingdom)
	12:15-12:30	**Q & A**

Orchid Industry Session 1		
Date: Apr. 24 | Time: 11:00-12:30		
Room: Room 2		
Moderator: So-Young Park (South Korea)		
Sat-R2-2-1	11:00-11:15	**Current Status and Prospects of the Hawaii Dendrobium Industry**
		Teresita Amore (United States)
Sat-R2-2-2	11:15-11:30	**Newly Developed Tropical Cut Orchids in Taiwan**
		I-Szu Weng (Taiwan)
Sat-R2-2-3	11:30-11:45	**Orchid Industry in Korea**
		Ki Sun Kim (South Korea)
Sat-R2-2-4	11:45-12:00	**Multi-spikes and Big Lip Breeding of Phalaenopsis**
		Pen-Chih Lai (Taiwan)
Sat-R2-2-5	12:00-12:15	**Effects of Nano Particles on the Vase Life of *Oncidesa* Gower Ramsey 'Honey Angel' Cut Flowers**
		Ying-Hua Chin (Taiwan)
	12:15-12:30	**Q & A**

Project Seeding Session 1		
Date: Apr. 24 | Time: 11:00-12:30		
Room: Room 3		
Moderator: Saw Lwin (Myanmar)		
Sat-R3-2-1	11:00-11:15	**Conservation of A Critically Endangered Native Orchid Species of Singapore: *Acriopsis ridleyi***
		Tim Wing Yam (Singapore)
Sat-R3-2-2	11:15-11:30	**Conservation of A Critically Endangered Native Orchid Species of Singapore: *Polystachya concreta***
		Tim Wing Yam (Singapore)
Sat-R3-2-3	11:30-11:45	**Asymbiotic Seed Germination, Seedling Development and Reintroduction of *Pleione formosana*, An Endangered Epiphytic Orchid**
		Rebecca Hsu (Taiwan)
Sat-R3-2-4	11:45-12:00	**Ex Situ Conservation of *Bulbophyllum leopardinum*, A Threatened Medicinal Orchid of Nepal**
		Bijaya Pant (Nepal)
	12:00-12:30	**Q & A**

Break (12:30-13:30)

Breeding Keynote Speech		
Date: Apr. 24 | Time: 13:30-14:05		
Room: Room 1		
Moderator: Yin-Tung Wang (United States)		
Sat-KS-2	13:30-14:05	**Orchid Breeding at the Singapore Botanic Gardens – A 90-Year Journey**
		Tim Wing Yam (Singapore)

Breeding Session 1		
Date: Apr. 24 | Time: 14:05-15:05		
Room: Room 1		
Moderator: Yin-Tung Wang (United States)		
Sat-R1-3-1	14:05-14:20	**The Breeding of *Phalaenopsis* Orchids as A Hobby and Profession**
		Fure-Chyi Chen (Taiwan)
Sat-R1-3-2	14:20-14:35	***Coelogyne Inlovii*, An Orchid Genus with A Lot of Potential and Fascination**
		Marei Karge-Liphard (Germany)
Sat-R1-3-3	14:35-14:50	**Genome-wide Association Studies for Floral Aesthetic Traits of *Phalaenopsis* Orchids**
		Shu-Yun Chen (Taiwan)
	14:50-15:05	**Q & A**

Conservation Session 3		
Date: Apr. 24 | Time: 14:05-15:05		
Room: Room 2		
Moderator: Yung-I Lee (Taiwan)		
Sat-R2-3-1	14:05-14:20	**Conservation and Utilization of Medicinal Orchids through Research and Outreach Programmes**
		Bijaya Pant (Nepal)
Sat-R2-3-2	14:20-14:35	**For Young Fellow Award Studies on Diversity and Conservation of Wild Orchids of Westren Ghats**
		Chaitra H.P (India)
Sat-R2-3-3	14:35-14:50	**Time Since Isolation Affects Symbiotic Germination of the Critically Endangered Sun-orchid *Thelymitra adorata***
		Richard Dimon (Australia)
	14:50-15:05	**Q & A**

Project Seeding Session 2		
Date: Apr. 24 | Time: 14:05-15:05		
Room: Room 3		
Moderator: Dennis Kao (Taiwan)		
Sat-R3-3-1	14:05-14:20	**Long-term Restoration Efforts for *Tolumnia bahamensis*, A Critically Imperiled Coast Scrub Orchid**
		Jason Ligon (United States)
Sat-R3-3-2	14:20-14:35	**Screening of the in vitro Cytotoxic Effect of Selected Wild Orchids of Nepal**
		Pusp Raj Joshi (Nepal)
Sat-R3-3-3	14:35-14:50	**Enhancement of Seriously Depleted Populations of Some Critically Endangered and Endangered Wild Orchid Species in Their Natural Habitats in Bangladesh**
		Md. Mustafizur Rahman (Bangladesh)
	14:50-15:05	**Q & A**

Sunday, April 25, 2021		
Cultivation & Physiology Keynote Speech		
Date: Apr. 25 | Time: 09:00-09:35		
Room: Room 1		
Moderator: Yao-Chien Alex Chang (Taiwan)		
Sun-KS-1	09:00-09:35	**Plant Growth Regulators on Greenhouse Orchids**
		Yin-Tung Wang (United States)
Cultivation & Physiology Session 2		
Date: Apr. 25 | Time: 09:35-10:35		
Room: Room 1		
Moderator: Yao-Chien Alex Chang (Taiwan)		
Sun-R1-1-1	09:35-09:50	**The Physiological Parameters of Some Commercial Orchid Cultivars, Examined by Response Surface Methodology**
		Chen-Hsuan Wu (Taiwan)
Sun-R1-1-2	09:50-10:05	**Regulating the Flowering Process of *Phalaenopsis* Orchids**
		Erik Runkle (United States)
Sun-R1-1-3	10:05-10:20	**An Overview of Three Decade's Effort to Combat Orchid Virus Diseases in Taiwan**
		Chin-An Chang (Taiwan)
	10:20-10:35	**Q & A**
Ecology Session 1		
Date: Apr. 25 | Time: 09:35-10:35		
Room: Room 2		
Moderator: Wen-Huei Chen (Taiwan)		
Sun-R2-1-1	09:35-09:50	***Dendrobium* – Is It in Danger of Extinction?**
		Gary Yong Gee (Australia)
Sun-R2-1-2	09:50-10:05	**Mixotrophy and Mycoheterotrophy: An Overview of How Orchids Use Fungal Carbon and of Pending Questions**
		Marc-André Selosse (France)
Sun-R2-1-3	10:05-10:20	**Structure of Orchid-fungus Bipartite Networks in Two Climatic Regions**
		Sophie Mennicken (France)
	10:20-10:35	**Q & A**

Systematics Session 1		
Date: Apr. 25 | Time: 09:35-10:35		
Room: Room 3		
Moderator: Wen-Chieh Tsai (Taiwan)		
Sun-R3-1-1	09:35-09:50	**The Genus *Phalaenopsis***
		Olaf Gruss (Germany)
Sun-R3-1-2	09:50-10:05	**How Many Species of *Stichorlis* (Orchidaceae) Are There in the Philippines?**
		Mark Arcebal K. Naïve (Philippines)
Sun-R3-1-3	10:05-10:20	**Evolutionary Diversification of *Lepanthes* (Pleurothallidinae): A Hyperdiverse Neotropical Orchid Lineage**
		Diego Bogarín (Costa Rica)
	10:20-10:35	**Q & A**

Break (10:35-11:00)

Genetics & Development Session 2		
Date: Apr. 25 | Time: 11:00-12:30		
Room: Room 1		
Moderator: Chin-An Chang (Taiwan)		
Sun-R1-2-1	11:00-11:15	**The Strategy of Nobile *Dendrobium* Breeding at NPUST, in Taiwan**
		Shih-Wen Chin (Taiwan)
Sun-R1-2-2	11:15-11:30	**Capsule Development and in vitro Germination of *Vanilla planifolia* in Taiwan**
		Chih-Hsin Yeh (Taiwan)
Sun-R1-2-3	11:30-11:45	**Enzymatic Activities of Orchid Mycorrhizal Fungi**
		Alzbeta Novotna (Czech Republic)
Sun-R1-2-4	11:45-12:00	**Contribution to Variety Improvement of *Phalaenopsis* from Two Native Species: *Phal. aphrodite* and *Phal. equestris***
		Wen-Huei Chen (Taiwan)
Sun-R1-2-5	12:00-12:15	**The Orchid Hybrid Register – Where Are We Now?**
		Julian Shaw (United Kingdom)
	12:15-12:30	**Q & A**

Conservation Session 4		
Date: Apr. 25 | Time: 11:00-12:30		
Room: Room 2		
Moderator: Dennis Whigham (United States)		
Sun-R2-2-1	11:00-11:15	**Orchid Conservation: Responding to the Challenge**
		Philip Seaton (United Kingdom)
Sun-R2-2-2	11:15-11:30	**The Art of Orchid Adaptions in A Changing Environment**
		Ekaterina Zheleznaia (Russia)
Sun-R2-2-3	11:30-11:45	**The Orchid Collection of Dr. Cecilia Koo Botanic Conservation Center and Our Goals for the Future**
		Joshua Burton (Taiwan)
Sun-R2-2-4	11:45-12:00	**Orchid Conservation Initiatives in Malaysia**
		Rusea Go (Malaysia)
	12:00-12:30	**Q & A**

Systematics Session 2		
Date: Apr. 25 | Time: 11:00-12:30		
Room: Room 3		
Moderator: Wen-Chieh Tsai (Taiwan)		
Sun-R3-2-1	11:00-11:15	**Target Sequence Capture in Orchids: Developing A Kit to Sequence Hundreds of Single Copy Loci Across All Orchids**
		Lauren Eserman (United States)
Sun-R3-2-2	11:15-11:30	**Morphological and Molecular Differentiation in A Recent Monophyletic of Aphyllous *Vanilla* Species from the South West India Ocean Region: Implications for Species Delimitation in Madagascar**
		Andriamihaja F. Cathucia (France)
Sun-R3-2-3	11:30-11:45	***Vanilla* as A "Model System" in Orchid Biology**
		Kenneth Cameron (United States)
Sun-R3-2-4	11:45-12:00	***Gastrodia*, An Enigmatic Orchid Group with Specialized Fungal Symbioses**
		Tomohisa Yukawa Chen (Japan)
Sun-R3-2-5	12:00-12:15	**The Genus *Coelogyne* – An Overview**
		Gary Yong Gee (Australia)
	12:15-12:30	**Q & A**

Break (12:30-13:30)

Orchid Industry Keynote Speech		
Date: Apr. 25 | Time: 13:30-14:05		
Room: Room 1		
Moderator: Teresita Amore (United States)		
Sun-KS-2	13:30-14:05	**Orchid of Thailand**
		Setapong Lekawatana (Thailand)

Orchid Industry Session 2		
Date: Apr. 25 | Time: 14:05-15:20		
Room: Room 1		
Moderator: Teresita Amore (United States)		
Sun-R1-3-1	14:05-14:20	**Medicinal Dendrobium- Breeding, Good Agricultural Practice (GAP), Functional Assay and Chemical Composition**
		Chi-Luan Wen (Taiwan)
Sun-R1-3-2	14:20-14:35	**Investigation of the Anti-inflammation Effects of *Phalaenopsis bellina* Floral Scent Essential Oil**
		Chia-Yu Yen (Taiwan)
Sun-R1-3-3	14:35-14:50	**Plant Tissue Culture Has Been Dominating the Global Orchid Industry Supply Chain**
		Hon-Yen Zhao (Taiwan)
Sun-R1-3-4	14:50-15:05	**New *Paphiopedilum* Hybrids in Taiwan**
		Dennis Kao (Taiwan)
	15:05-15:20	**Q & A**

Cultivation & Physiology Session 3		
Date: Apr. 25 | Time: 14:05-15:20		
Room: Room 2		
Moderator: Peter Lin (United States)		
Sun-R2-3-1	14:05-14:20	**Orchid Cultivation in Thailand for International Markets**
		Kanchit Thammasiri (Thailand)
Sun-R2-3-2	14:20-14:35	**It Is Not A Good Practice to Reduce Nitrogen Fertilization during the Reproductive Period of *Phalaenopsis***
		Yao-Chien Alex Chang (Taiwan)
Sun-R2-3-3	14:35-14:50	**Phragmipediums in Ecuador**
		Kyle Lucyk (Canada)
Sun-R2-3-4	14:50-15:05	**Development of Flower Induction Technology of Nobile-Type Dendrobium**
		Ming-Chung Liu (Taiwan)
	15:05-15:20	**Q & A**

Project Rooting Symposium: World Orchid Collections 2021 Current Status of ex situ Conservation in Orchid Collections around the World		
Date: Apr. 25 | Time: 14:05-16:45		
Room: Room 3		
Moderator: Jean Linsky (Canada)		
Sun-R3-3-1	14:05-14:20	**Introduction and Results**
		Johan Hermans (United Kingdom)
Sun-R3-3-2	14:20-14:35	**Orchid Investigation and Conservation in the "Hapi Isles"**
		Tian-Chuan Hsu (Taiwan) / Chia-Wei Li (Taiwan)
Sun-R3-3-3	14:35-14:50	**Orchid Conservation in San Diego Zoo Global**
		Christy Powell (United States) / Heinfried Block (United States)
Sun-R3-3-4	14:50-15:05	**The Living Orchid Collection of the Missouri Botanical Garden in Africa & Madagascar**
		Simon Verlynde (Africa)
Sun-R3-3-5	15:05-15:20	**Orchid Collections and ex-situ Conservation at the Lankester Botanical Garden, University of Costa Rica**
		Diego Bogarín (Costa Rica)
	15:20-15:30	**Break**
Sun-R3-3-6	15:30-15:45	**Orchid Collections and Their Value in Conservation Efforts**
		Boris Schlumpberger (Germany)
Sun-R3-3-7	15:45-16:00	**Linking Orchid Horticulture with Research and Conservation in Hong Kong**
		Stephan Gale (Hong Kong)
Discussion	16:00-16:30	**Is ex situ Orchid Conservation Working**
		Jean Linsky (Canada) / Johan Hermans (United Kingdom) / Tian-Chuan Hsu (Taiwan) / Chia-Wei Li (Taiwan) / Christy Powell (United States) / Heinfried Block (United States) / Simon Verlynde (Africa) / Diego Bogarín (Costa Rica) / Boris Schlumpberger (Germany) / Stephan Gale (Hong Kong)
	16:30-16:45	**Concluding Remarks**
		Jean Linsky (Canada)

Monday, April 26, 2021		
Conservation Session 5		
Date: Apr. 26 | Time: 10:30-11:30		
Room: Room 1		
Moderator: Rong-Show Shen (Taiwan)		
Mon-R1-1-1	10:30-10:45	**The Orchid Garden Conservation Network (OGCN): Promoting Emerging 'Circa Situm' Initiatives for Orchid Conservation (and Research)**
		Thomas Mirenda (United States)
Mon-R1-1-2	10:45-11:00	**Ecology Informing Orchid Conservation Translocations**
		Noushka Reiter (Australia)
Mon-R1-1-3	11:00-11:15	**Orchid Conservation in the U.S. and Canada – North American Orchid Conservation Center**
		Dennis Whigham (United States)
	11:15-11:30	**Q & A**
Conservation Session 6		
Date: Apr. 26 | Time: 10:30-12:00		
Room: Room 2		
Moderator: Tim Wing Yam (Singapore)		
Mon-R2-1-1	10:30-10:45	**Bringing Moth Orchids Home—Identifying Genuine Native *Phalaenopsis* of Taiwan from Nursery Collections Using ddRADseq**
		Kuo-Fang Chung (Taiwan)
Mon-R2-1-2	10:45-11:00	**Conservation – Leopard Orchid (*Ansellia africana*) Project**
		Michael Tibbs (Netherlands)
Mon-R2-1-3	11:00-11:15	**Income Generated and Conservation Oriented Orchid Growing of Pansit Village, Myanmar**
		Saw Lwin (Myanmar)
Mon-R2-1-4	11:15-11:30	**In vitro Seed Culture of Native Orchids from Mt. Daraitan, Tanay, Rizal and Infanta, Quezon Provinces, Philippines**
		Jovita A. Anit (Philippines)
Mon-R2-1-5	11:30-11:45	**Taxonomy and Conservation of Philippine *Eria*, *Mycaranthes*, and *Trichotosia***
		John Paul S. Domingo (Philippines)
	11:45-12:00	**Q & A**

Genetics & Development Session 3		
Date: Apr. 26 | Time: 10:30-12:00		
Room: Room 3		
Moderator: Dennis Kao (Taiwan)		
Mon-R3-1-1	10:30-10:45	**Gene Expression in Mycorrhizal Roots of Adult Terrestrial Orchids Collected in the Field**
		Silvia Perotto (Italy)
Mon-R3-1-2	10:45-11:00	**Electric Potentials and Calcium Signals Involved in Emission of Floral Monoterpenes in *Phalaenopsis bellina***
		Ya-Lan Chang (Taiwan)
Mon-R3-1-3	11:00-11:15	**Breeding of Fragrant *Phalaenopsis***
		Yu-Che Yeh (Taiwan)
Mon-R3-1-4	11:15-11:30	**Functional Characterization of *EPIDERMAL PATTERNING FACTOR*-like (*PeEPFLs*) Genes from *Phalaenopsis equestris***
		Yu-Fu Lin (Taiwan)
Mon-R3-1-5	11:30-11:45	**Assessment of Violet-blue Color Formation in *Phalaenopsis* Orchids**
		Li-Min Huang (Taiwan)
	11:45-12:00	**Q & A**

Break (12:00-13:00)

Orchid Industry Session 3		
Date: Apr. 26 | Time: 13:00-14:30		
Room: Room 1		
Moderator: Setapong Lekawatana (Thailand)		
Mon-R1-2-1	13:00-13:15	**The Distribution of Orchids - Present Conditions and Future Prospects in Japan**
		Tetsuya Fukunaga (Japan)
Mon-R1-2-2	13:15-13:30	**Development of Distinctness, Uniformity and Stability (DUS) Testing Technology of *Phalaenopsis* and International Cooperation in Taiwan**
		Chih-Hao An (Taiwan)
Mon-R1-2-3	13:30-13:45	**Exploration of Orchid Species Diversity in Makawanpur District of Central Nepal and Biological Activities of Selected *Dendrobium* Species**
		Mukti Ram Paudel (Nepal)
Mon-R1-2-4	13:45-14:00	**Easy to Use Label-free Immunobiosensor for Directly Detecting *Phalaenopsis* Virus from Fresh Leaves**
		Ching-Wen Li (Taiwan)
Mon-R1-2-5	14:00-14:15	**Bioreactor System for the Stable Production of Plantlets and Bioactive Molecules in Orchid Species**
		So-Young Park (South Korea)
	14:15-14:30	**Q & A**

Ecology Session 2		
Date: Apr. 26 | Time: 13:00-14:30		
Room: Room 2		
Moderator: Yung-I Lee (Taiwan)		
Mon-R2-2-1	13:00-13:15	**Laser Microdissection as A Useful Tool to Dissect the Cellular Complexity in Orchid Tissues**
		Raffaella Balestrini (Italy)
Mon-R2-2-2	13:15-13:30	**The Orchid Migration in the Krakatau Islands**
		Irawati Irawati (Indonesia)
Mon-R2-2-3	13:30-13:45	**The Use of Multi-element Stable Isotope Natural Abundance ($\delta^{13}C$, $\delta^{15}N$, $\delta^{2}H$) to Elucidate Orchid Mycorrhizal Nutrition**
		Gerhard Gebauer (Germany)
Mon-R2-2-4	13:45-14:00	**A Synopsis of Recent Advances in Ghost Orchid (*Dendrophylax lindenii*) Research in Southern Florida and Cuba**
		Lawrence W. Zettler (United States)
Mon-R2-2-5	14:00-14:15	**Orchids on the Move: Go Forth and Proliferate**
		James D. Ackerman (United States)
	14:15-14:30	**Q & A**

Conservation Session 7		
Date: Apr. 26 | Time: 13:00-14:30		
Room: Room 3		
Moderator: Rusea Go (Malaysia)		
Mon-R3-2-1	13:00-13:15	**The Orchid Conservation Alliance**
		Gary Yong Gee (Australia)
Mon-R3-2-2	13:15-13:30	**Clonal Structure of the Largest Wild and ex situ Conserved Population of *Cypripedium japonicun* (Orchidaceae) in Japan**
		Yumi Yamashita (Japan)
Mon-R3-2-3	13:30-13:45	**Preliminary Inventory of Native Orchid Species in Mt. Daraitan, Tanay, Rizal**
		John Oliver Distor (Philippines)
Mon-R3-2-4	13:45-14:00	**Conservation of Aphrodisiac Orchids**
		Eng Soon Teoh (Singapore)
Mon-R3-2-5	14:00-14:15	**Growth Cycle of Some *Eulophia* in Thailand**
		Nuttha Potapohn (Thailand)
	14:15-14:30	**Q & A**

Closing Ceremony
Date: Apr. 26 | Time: 14:30-15:00
Room: Room 1

2021
VIRTUAL
WOC 23rd
TAICHUNG
APRIL 23-26, 2021