

# ORCHID CONSERVATION NEWS

The Newsletter of the Orchid Specialist Group of the IUCN Species Survival Commission

Issue 2

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## CONSERVATION : NEW IDEAS, NEW INITIATIVES, DOING IT BETTER!

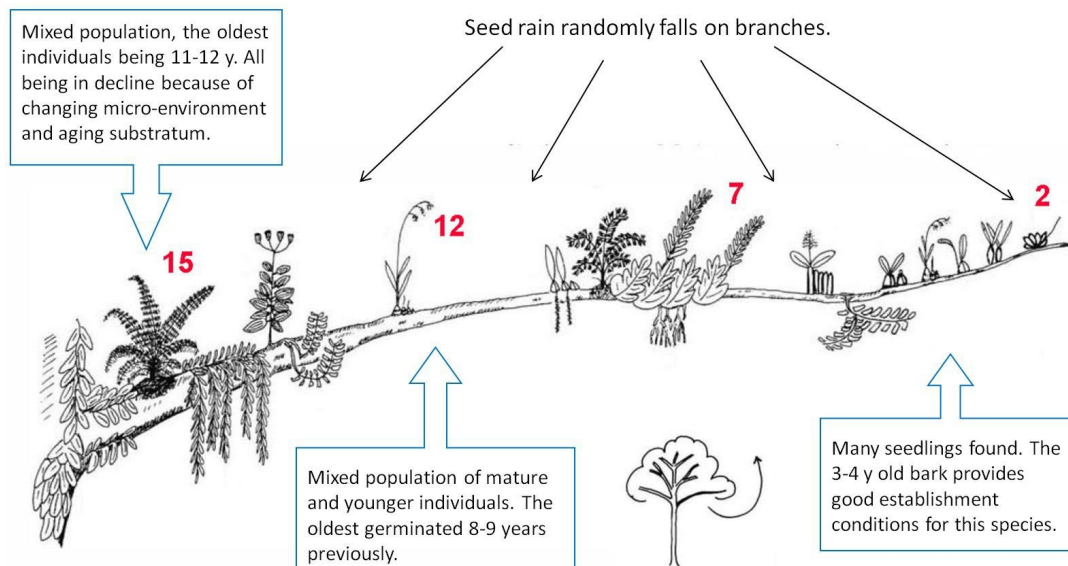


Figure (above): The branch age gradient is illustrated with arbitrary ages (red numbers (yrs); based on sketch in Johansson 1974). Arrows present milestones in the life history of a theoretical orchid species. Widespread seed dispersal may lead to widespread germination, but seedling establishment is in this case assumed to be favoured in the youngest part close to the periphery of the tree crown (right). Where the branch is 12 years old, the oldest individuals may have reached flowering stage (centre). Decline in the population is assumed to occur on branch segments 15 years of age (left). Variations of this scenario will apply to actual epiphytic orchid species. See: **New Epiphytology: Orchid biology in context of tree development**

## Editorial

As you will read in this issue, orchid conservation is progressing on many fronts. Fundamental is knowledge acquisition, what we need to know about species through risk assessment so that management decisions are based on fact. Assessment teams have been working in Africa with the support of the private and public sectors. Putting a stop to poaching, and illegal trade especially via e-commerce requires political will and we see this initiative now in China. Moreover, we need to identify alternate approaches to ecological studies. How can we do this better? Hanne and Finn Rasmussen suggest how we can examine the phorophyte habitat to understand how epiphytic orchids establish in their aerial environment. Ours is both a challenge and an opportunity to better conserve orchids and the ecosystems that support them. It is our ecosystem also.

*Marilyn H.S. Light, Editor (mslight@distributel.net)*

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### New Epiphytology: Orchid biology in context of tree development

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Many students of epiphytes implicitly regard the phorophyte as a static structure. Indeed, orchids may grow on fences and telephone poles where little environmental change is anticipated. It is quite another matter to be attached on a growing tree where the orchid is subjected to the consequences of an expanding tree crown, and a stretching and aging bark (Rasmussen & Rasmussen 2018). When several years elapse between seed germination and flowering, the adult orchid will be found under conditions that are rather different from the ones it germinated under; during its life it must be subjected to a range of host traits, from smoother towards rougher bark, from more to less light and so on.

Based on this reasoning, one can make predictions about **any particular epiphytic orchid species**:

- Some seedlings will be found on branches that are younger than those that carry flowering individuals.
- Pioneer seedlings that are found on the youngest branches reveal conditions that are adequate for seed germination: the position being sufficiently protected from wind and light exposure, and the bark just sufficiently mature for providing suitable substratum.
- Seedlings may or may not be able to develop adjacent to adults plants, but such individuals have a shorter time to reach maturity than the pioneers.
- Eventually the conditions around an epiphyte colonization will have changed so much that individuals succumb to the increasing shade, rugged bark, or high humidity prevailing inside the crown. Other epiphyte species with other requirements may take their place in the new habitats that arise in the inner crown, as the trees grows older (Woods *et al.* 2015).
- Meanwhile, the younger individuals closer to crown periphery will reach reproductive stage and their seeds will be able to colonize new branches as they develop into suitable colonization sites. Once established, the epiphyte population is thus likely to persist within that tree by short-range dispersal. This might explain why clumped distribution is often found among the trees (Zotz *et al.* 1999).

These predictions can be tested by sowing experiments or by analysis of the actual distribution of orchid seedlings and adults along an age gradient in the tree. Preferred subject would be a species with easily recognizable protocorms, enabling analysis in the youngest branches to ascertain the location of pioneer

seedlings. Since any portion of stems and branches in the tree has an age that corresponds to its position, an estimate of time elapsing between germination and flowering can be derived from the age of the youngest branches that carry seedlings and the youngest crown part where the reproductive individuals can be seen (Rasmussen *et al.*, in press).

Sowing experiments are of course also interesting for exploring distributional bias of an epiphytic orchid among tree species. However, the location of germination sites within the trees needs to be known for tests to yield useful information. The same applies to identifying the mycobiont(s) associated with germination.

### References

Johansson, D. (1974). Ecology of vascular epiphytes in West African rain forests. *Acta Phytogeographica Suecica* 59: 1–129.

Rasmussen, H.N., Nord-Larsen, T., Hansen, E.S. & G. Hoareau. MS. Estimation of life history in corticolous lichens by zonation. *The Lichenologist*, in press.

Rasmussen, H.N. & F. N. Rasmussen (2018). The epiphyte habitat on a living host. Reflections on the orchid-tree relationship. *Botanical Journal of the Linnean Society* 186 (4): 456–472.

Woods, C. L., Cardelús, C. L. & S. J. DeWalt (2015). Microhabitat associations of vascular epiphytes in a wet tropical forest canopy. *Journal of Ecology* 103: 421–430.

Zotz, G., Bermejo, P. & H. Dietz (1999). The epiphyte vegetation of *Annona glabra* on Barro Colorado Island Panama. *Journal of Biogeography* 26: 761–776.

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### China has taken a major multi-lateral initiative this summer toward wild orchid conservation

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On July 18, 2018, an open letter calling for specific actions to curb rampant trade of wild-collected orchids was released during a high profile event staged in Shenzhen of Guangdong province by the National Forestry and Grassland Administration of China, with the assistance from the National Orchid Conservation Center of China and the Orchid Conservation & Research Center of Shenzhen. The letter, titled “A call to protect wild orchids and reject disorderly trade of wild orchids” was drafted and issued collectively by 16 Chinese Civil Societies, NGOs, and seven major Chinese online trading platforms\*. The multi-lateral nature of the release of the letter is a highly unusual event in the Chinese plant conservation scene, signaling wide recognition within China of the conservation challenges facing Chinese wild orchids and determination to take actions to deal with these challenges.



Figure 1. A seller on Taobao.com (a Chinese popular e-commerce platform) presenting his wild-collected Cymbidium orchid. Taobao.com has strengthened the platform regulation on wild orchid trade by removing postings like this, with specific terms indicating wild-collected.

The letter cites that currently unregulated wild orchid collecting and trade are rampant due to three major factors. Firstly, it costs less to collect from the wild than establish and maintain an artificial propagation production system; Secondly there exists the belief that wild-sourced materials are more potent than those cultivated, and finally, domestic legislation lacks strong legal constraints on collecting orchids from the wild. The traditional orchid trade in China occurs mainly in the physical flower and medicinal markets. The problem of unregulated and rampant trading of wild-sourced orchids has been made worse by the rapid development of internet technology, which has provided more diversified trading channels, and the ability for individual collectors/marketers to reach a national or even international audience. Many Chinese e-commerce platforms, social media and forums have many merchants or individuals selling wild orchids (Fig. 1).

Additionally, some Chinese botanical gardens and other scientific research institutions use a large number of wild orchids to create large landscape displays in plant or orchid shows, which has added to the wild orchid collecting pressure in China. Unfortunately there is no systematic study or peer-reviewed report on the extent of the wild orchid trade in China thus far. Nevertheless, in recognition of the pervasive nature of the wild orchid trade and its threat to many wild orchid species in China, the letter calls for the following actions:

1. For the individual consumer, refuse to buy wild orchids and report large-scale harvesting and trafficking of wild orchids to the local forestry authorities.
2. The Internet platform conducts a rigorous review of information on the wild orchid trade so as to strengthen platform advocacy on purchasing artificially propagated orchids, and gradually restricts the sale of wild orchids.
3. A call to the government to strengthen legal protection of wild orchids by incorporating orchids into the Lists Of Wild Plants Under Special State Protection as soon as possible. Provide appropriate government support to the cultivation of wild orchid species in nurseries and strengthen oversight on the implementation of rules on wild-collecting by a nursery and certification of artificial propagation during the trading processes.
4. A recommendation to botanical gardens, parks and municipal garden departments not to use wild orchids for their landscaping purposes and only purchase or use certified cultivated orchids.
5. Deny the admission of wild orchids into any orchid show or competition.
6. The relevant government branch shall encourage Chinese herbal medicine enterprises to use cultivated medicinal

orchids, and establish and maintain the tracking system of source materials.

7. When implementing construction or timber harvesting, try to avoid trampling or destroying orchids in the construction area or forest.
8. A recommendation to the mainstream media not to report positively on wild orchid collection and instead use the media to enhance the public awareness of wild orchid conservation.
9. Social organizations concerned with nature conservation shall initiate orchid conservation activities from time to time that engage the general public and allow them to participate.

The release of this open letter was accompanied by a reintroduction event in the mountains of Shenzhen of the lady slipper orchid, *Paphiopedilum purpuratum*, a Critically Endangered species on the IUCN Redlist. This lady slipper orchid represents the many orchids which have been collected to near extinction. Reintroduction of the species represents conservation efforts of many years carried out by the National Orchid Conservation Center (Fig. 2).



Fig. 2. A wild plant of *Paphiopedilum purpuratum* in full bloom in Shenzhen, Guangdong Province, China.

Photo: Lijun Chen

A symposium on orchid conservation was also held immediately after the open letter release, with speakers invited from government agencies, research institutes, NGOs, and e-commerce companies. Notably, a representative from the Chinese E-commerce giant, Alibaba, was among the invited speakers at the symposium. Alibaba has since launched a public education campaign against trade of protected wildlife including wild orchids. OSG members, Professors Yibo Luo, Zhongjian Liu, and Hong Liu were also among the invited speakers at the symposium (Fig. 3).



Fig. 3. OSG member Hong Liu and colleague Yingyi Zhang standing before the poster with the orchid conservation open letter

The release of the letter is well timed with the effort to revise and expand the current Lists Of Wild Plants Under Special State Protection. Plants on these lists (class I and II) are protected by the Regulations of the People’s Republic of China on Wild Plants Protection, the highest level of Chinese plant protection. Violations of the regulation are a prosecutable offense and subject to fine and jail time. The current lists of wild plants species under state protection was released in 1999, and no Chinese orchid species is on it. The revision effort started more than a decade ago but has been stymied by the irreconcilable opinions of different government agencies. The recent reform effort to streamline central government agencies and their responsibilities has placed the revision of the Lists, which includes the addition of Chinese orchid species, on the priority list of the National Forestry and Grassland Administration.

**\* The list of the 16 organizations that sponsored the open letter is as follows:**

- China Wild Plant Conservation Association
- China Flower Association
- Orchid Society of China
- China Association of Traditional Chinese Medicine
- Chinese Union of Botanical Gardens
- WWF–World Wide Fund for Nature
- Shan Shui Conservation Center
- World Federation of Chinese Medicine Societies
- Guangxi Biodiversity Research and Conservation Association
- Baidu
- Alibaba
- Kuaishou Phone App
- [www.qyer.com](http://www.qyer.com)
- 58.com

Zhuanzhuan.com  
Xcwt.org

**Red List assessment of Central African orchids**

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The Central African Plant Red List Authority convened in June 2017 at the Congo Basin Institute (CBI) campus in Yaoundé to conduct Red List assessments prepared as part of a project funded by the American Orchid Society that aims to evaluate the 183 orchid species endemic to Central Africa (Fig. 1).

<https://www.researchgate.net/project/An-integrated-approach-to-long-term-orchid-conservation-in-central-Africa>  
Please copy and paste the above link to follow this project



Fig. 2. Workshop on Orchidaceae IUCN Red List assessment at Congo Basin Institute (CBI), Yaoundé, Cameroon, June 2017. Photo: Tariq Stévant, MBG.

Assessments were carried out by experts from the University of Yaoundé, the Institut de Recherche pour le Développement, Royal Botanic Gardens, Kew, and the Missouri Botanical Garden. About 72% of the 40 orchids assessed were found to be threatened (4 Critically Endangered, 18 Endangered, and 7 Vulnerable), and two species endemic to São Tomé and Príncipe islands (*Angraecopsis dolabriformis* and *Angraecum astroarche*) are considered as Extinct. The

40 Red List assessments were published on the IUCN Red List of Threatened Species website in June 2018, representing an increase of some 20% compared to the African orchid species assessed to date by IUCN experts (Fig. 2).



Fig. 2. One of the threatened orchid species, (*Calypstrochilum/Ossiculum aurantiacum*), assessed during the Red List assessment workshop in July 2017, at the Congo Basin Institute (CBI), Yaoundé, Cameroon. The species was downgraded from Critically Endangered (CR) to Endangered (EN). Photo: Vincent Droissart, IRD.

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## Food for Thought

### Papers in the Botanical Journal of the Linnean Society from IOCC VI

Bogarín, D., Fernández, M., Borkent, A., Heemskerk, A., Pupulin, F., Ramírez, S., Smets, E., and B. Gravendeel (2018). Pollination of *Trichosalpinx* (Orchidaceae: Pleurothallidinae) by biting midges (Diptera: Ceratopogonidae), *Botanical Journal of the Linnean Society* 186: 510–543. <https://doi.org/10.1093/botlinnean/box087>

Edens-Meier, R., Arduser, M., Camilo, G.R., and P. Bernhardt (2018). Comparative pollination ecology between two populations and two varieties of *Cypripedium parviflorum* (Orchidaceae) in Missouri, United States of America – does size matter? *Botanical Journal of the Linnean Society* 186: 544–559. <https://doi.org/10.1093/botlinnean/boy001>

Fay, M.F., Feustel, M., Newlands, C., and G. Gebauer (2018). Inferring the mycorrhizal status of introduced plants of *Cypripedium calceolus* (Orchidaceae) in northern England using stable isotope analysis. *Botanical Journal of the Linnean Society* 186: 587–590. <https://doi.org/10.1093/botlinnean/box104>

Gale, S.W., Fischer, G.A., Cribb, P.J., and M.F. Fay (2018). Orchid conservation: bridging the gap between science and practice. *Botanical Journal of the Linnean Society* 186: 425–434. <https://doi.org/10.1093/botlinnean/boy003>

Gargiulo, R., Ilves, A., Kaart, T., Fay, M.F., and T. Kull (2018). High genetic diversity in a threatened clonal species, *Cypripedium calceolus* (Orchidaceae), enables long-term stability of the species in different biogeographical regions in Estonia. *Botanical Journal of the Linnean Society* 186: 560–571. <https://doi.org/10.1093/botlinnean/box105>

Hinsley, A., de Boer, H.J., Fay, M.F., Gale, S.W., Gardiner, L.M., Gunasekara, R.S., Kumar, P., Masters, S., Metusala, D., Roberts, D.L., Veldman, S., Wong, S., and J. Phelps. A review of the trade in orchids and its implications for conservation. *Botanical Journal of the Linnean Society* 186: 435–455. <https://doi.org/10.1093/botlinnean/box083>

Hutchings, M.J., Robbirt, K.M., Roberts, D.L., and A.J. Davy (2018). Vulnerability of a specialized pollination mechanism to climate change revealed by a 356-year analysis. *Botanical Journal of the Linnean Society*: 186: 498–509. <https://doi.org/10.1093/botlinnean/box086>

Li, J., Gale, S.W., Kumar, P., Zhang, J., and G. Fischer (2018). Prioritizing the orchids of a biodiversity hotspot for conservation based on phylogenetic history and extinction risk. *Botanical Journal of the Linnean Society* 186: 473–497. <https://doi.org/10.1093/botlinnean/box084>

Mújica, E.B., Mably, J.J., Skarha, S.M., Corey, L.L., Richardson, L.W., Danaher, M.W., González, E.H., and L.W. Zettler (2018). A comparison of ghost orchid (*Dendrophylax lindenii*) habitats in Florida and Cuba, with particular reference to seedling recruitment and mycorrhizal fungi. *Botanical Journal of the Linnean Society* 186: 572–586. <https://doi.org/10.1093/botlinnean/box106>

Rasmussen, H.N., and F.N. Rasmussen (2018). The epiphytic habitat on a living host: reflections on the orchid–tree relationship. *Botanical Journal of the Linnean Society* 186: 456–472.  
<https://doi.org/10.1093/botlinnean/box085>

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### Other Recent Papers of Interest

Eiseman, C.S. (2018). New rearing records for muscoid leafminers (Diptera: Anthomyiidae, Scathophagidae) in the United States. *Proceedings of the Entomological Society of Washington* 120: 25–50.

Light, M.H.S. and K.B. Gregg (2017). Long term tracking of terrestrial orchids: A protocol and suggested approaches. *The NOC Journal* 14: 2–17.

Liu, H., Gale, S.W., Cheuk, M.L., and G. Fischer (2018). Conservation impacts of commercial cultivation of endangered and overharvested plants. *Conservation Biology* <https://doi:10.1111/cobi.13216>

Simo-Droissart, M., Stévant, T., Sonké, B., Mayogo, S., Kamdem, N., and V. Droissart (2018) New taxonomic and conservation status of *Ossiculum* (Vandaeae, Orchidaceae), a highly threatened and narrow-endemic angraecoid orchid from Central Africa. *PhytoKeys* 98: 85–97.  
<http://dx.doi.org/10.3897/phytokeys.98.23511>

Texier, N., Deblauwe, V., Stévant, T., Sonké, B., Simo-Droissart, M., Azandi, L., Bose, R., Djuikouo, M.N., Kamdem, G., Kamdem, N., Mayogo, S., Zemagho, L., and V. Droissart (2018). Spatio-temporal patterns of orchids flowering in Cameroonian rainforests. *International Journal of Biometeorology* 62 (11): 1931–1944.  
<http://dx.doi.org/10.1007/s00484-018-1594-3>

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### Mark your Calendar

**IOCC VII – 28 May to 01 June, 2019**  
Royal Botanic Gardens, Kew, Richmond, UK

**23<sup>rd</sup> World Orchid Conference – 2020– Taiwan**  
Dates to be announced

### Changes to contact information?

To maintain effective communication, we need to know of any changes in contact information.  
Please inform the OSG Chair, Mike Fay.  
([M.Fay@kew.org](mailto:M.Fay@kew.org))

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### Call for conservation news

Members are invited to provide news of their recent conservation activities for publication in the OSG Conservation News.

Please submit material in Microsoft Word, and illustrations, if any, as separate jpeg files. If applicable, please include suggested captions and photographic credits. Send news to Marilyn Light, Editor, ([mslight@distributed.net](mailto:mslight@distributed.net))