

Orchid Research Newsletter No. 80

January 2023

Editorial

Herbarium specimens are both fragile and durable. If they are kept dry—a herbarium is sometimes called a *hortus siccus*, a dry garden—and protected against insects, they can easily survive for centuries. Indeed, specimens in Kew's Lindley Herbarium, collected in the first half of the 19th century, may look as if they had been prepared last year. It helps that mounting paper from that period is of much better quality than that used in the late 19th and early 20th centuries, which has often become brown and brittle. This leads to the paradoxical situation that 200-year-old specimens may look better than 100-year-old ones. But, regardless of their age, herbarium specimens are fragile and should therefore be handled as little as possible. For that reason alone, digitising herbarium collections has great benefits.

In this regard, Kew has been lagging some other world-class herbaria, which have already digitised their entire collection and made the associated images and databases publicly available. Examples are the herbaria in [Leiden](#) and [Paris](#). Mention should also be made of the [GBIF](#) website, which allows you to search many of these online data portals simultaneously. For Orchidaceae, the herbarium collections of [Harvard](#) are fortunately accessible online too.



Inside the Orchid Herbarium at Kew. The Lindley Herbarium is in the far-left corner. Photo André Schuiteman

It is true that, over the years, many specimens from Kew's Herbarium have been digitised and put online, see for example the [Plants of the World Online](#) website. However, this mainly

concerns type specimens and represents only a small fraction of the estimated seven million plant specimens in the collection. In October 2021, Kew secured enough funding from the UK government, specifically the Department for Environment, Food & Rural Affairs (Defra), to finally start the huge project of digitising the entire Herbarium and Fungarium collections. I am pleased to say that the orchid collection will be among the first to be digitised, and tens of thousands of sheets have already been imaged since the start of this project. Unlike the way some other herbaria have done this, all specimens will be digitised (photographed and databased) on site, in several imaging stations throughout the building. In this way, the specimens will never be far from where they came from, and they will be out of their cupboards as short as possible. During the next few years, Herbarium visitors should ascertain beforehand that the material they want to see will be available.

What are the additional benefits of digitisation, apart from reducing the amount of handling of the specimens? The most obvious one is that anyone with an internet connection will instantly be able to look at any specimen, without having to travel to Kew. Researchers can freely enter the data portal to browse all the specimens of a particular genus or those from a given area. They can examine the images to make descriptions or to check for the presence of certain characters. They can verify identifications and use the label data to compile information on geographical distribution, habitat, elevational range, phenology, collecting history, etc.

This is all wonderful, but it does not mean that the specimens can soon be locked away. Even the best images do not show microscopically small details, and if they did, there is the problem that many plants tend to hide their most critical features. For example, in orchids of subtribe Goodyerinae, the lip and the column are usually largely covered by the sepals and petals. A photograph of a dried specimen, no matter how high the resolution, will not show all the details that we need. For these, and many other plant groups, we must be able to rehydrate a flower, to try to restore its three-dimensional shape and to analyse its properties under a dissecting microscope. Images are usually fine for assessing the vegetative morphology of most orchids, as well as the floral characters of species with relatively flat, widely opening flowers, such as many *Oncidium* species, but the latter form a minority. In general, orchids don't give up their secrets so quickly and easy access to physical specimens will remain necessary.

It is a little disappointing to report that not the entire Orchid Herbarium will be digitised this time. The Lindley Herbarium, already mentioned, is one of Kew's greatest treasures. It contains the types of most of the nearly 2000 orchid species that John Lindley described and was purchased by Kew from his widow, in 1865. Unfortunately, these specimens are mounted on a non-standard size of sheet, which makes it impractical to use the regular setup employed in the current digitisation project. The Lindley collection, comprising some 7000 sheets, may have to await a separate digitisation effort, possibly in conjunction with the herbarium of Cambridge University, where Lindley's non-orchid specimens are housed. I should also add that the spirit collections will not be digitised for now; it is likely that for these a technique like 3D photogrammetry would be required for a useful representation of the specimens.

Addendum to Editorial 79

Rafaël Govaerts kindly pointed out that users of the [Biodiversity Heritage Library](https://www.biodiversitylibrary.org/) can request for currently unavailable publications published before 1923 to be scanned and made available. Please see <https://www.biodiversitylibrary.org/contact#/request>.

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Please click [here](#) for the Repository of past issues of the Orchid Research Newsletter, starting with issue 39 (2002).

Upcoming Conferences

We welcome any news about future orchid conferences for promotion here. Please send details to the editor as far in advance of the event as possible, remembering that the *Orchid Research Newsletter* is published only in January and July of each year.

Jobs

We will be happy to announce job opportunities, provided they explicitly involve orchid research or conservation. Please send details to the editor.

Funding Opportunities

We will be happy to announce funding opportunities, provided they explicitly involve orchid research or conservation. Please send details to the editor.

The **American Orchid Society** is soliciting grant proposals for orchid research. Deadline is 1 March of each year. For application instructions see <http://www.aos.org/about-us/orchid-research/application-guidelines.aspx>

News from Correspondents

Please submit any news about recently completed research, future research plans and needs, change of address, upcoming or recent fieldwork, etc. to the editor. Graduate students are especially encouraged to share the subjects of their thesis or dissertation with the international community.

Nopparut Toolmal is a Ph.D. candidate at the School of Biological Sciences, University of Reading, and Royal Botanic Gardens, Kew, under the supervision of Alastair Culham, André Schuiteman, Timothy M. A. Utteridge, and Somran Suddee. His thesis will be about the taxonomy and phylogenetics of the genus *Thrixspermum* (Orchidaceae: Aeridinae) in mainland southeast Asia. Currently, three sections are distinguished within the genus (sects. *Thrixspermum*, *Dendrocolla* and *Katacolla*), and the former genus *Cordiglottis* has also been included in it. Almost nothing is known about the phylogenetic relationships within *Thrixspermum*, and the taxonomy of several species complexes is still unresolved.

Species of this genus have ephemeral flowers that are often poorly preserved in dried specimens, resulting in inadequate herbarium material and ambiguous protologues. Species delimitation in the literature is therefore problematic. To resolve these problems, Nopparut has been collecting living material in Thailand, which is being cultivated in a climate-controlled greenhouse in the country. This enabled him to obtain spirit samples for morphological study and fresh leaf material for DNA extraction. In his phylogenetic analysis he will be using hundreds of low-copy nuclear genes of the Angiosperms353 probe set, enhanced by next generation sequencing. This approach should help resolve species delimitation, generic circumscription, and infra-generic classification, and elucidate relationships among *Thrixspermum* species.

If you have images of unknown *Thrixspermum* species from mainland southeast Asia and would like to share these with Nopparut or are keen to know the species name, do not hesitate to contact him at n.toolmal@kew.org.



Thrixspermum obyrneanum N.Toolmal, P.T.Ong & Schuit. Photo Ong Poh Teck

Recent Orchid Nomenclature

New orchid names may be retrieved from the revamped IPNI website: <https://www.ipni.org/>. Click on “Advanced search”; after the search page appears, type in **Orchidaceae** under family name and select a date in “Recorded after”. This will pull up a list of all orchid names added to the IPNI database since that date. Also be sure to check the Plants of the World Online website (<https://powo.science.kew.org/>) which provides similar information with added maps and illustrations.

Recent Literature

If you are aware of any relevant and recent citations that should have been listed here or in the previous issues, please send them to the editor for publication in the next issue (July 2023). Book citations should include author(s), year of publication, title, publisher, and place of publication (in that order). Journal titles should be spelled out in full.

Anatomy and morphology

Burzacka-Hinz, A., Narajczyk, M., Dudek, M., and Szlachetko, D. L. 2022. Micromorphology of labellum in selected *Dendrobium* Sw. (Orchidaceae, Dendrobieae). *International Journal of Molecular Sciences* 23(17): art. 9578 (<https://doi.org/10.3390/ijms23179578>).

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de Lima, J. F. and Moreira, A. S. F. P. 2022. Structural plasticity in roots of the hemiepiphyte *Vanilla phaeantha* Rchb.f. (Orchidaceae): a relationship between environment and function. *Die Naturwissenschaften* 109(5): 46 (<https://doi.org/10.1007/s00114-022-01816-7>).

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Mantovani, A. 2022. Size dependent allocation to vegetative and reproductive organs of the orchid *Lankesterella ceracifolia* (Spiranthinae). *Lankesteriana* 22(3): 225–240 (<https://doi.org/10.15517/lank.v22i3.53115>).

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Conservation

Adert, N., Dullau, S., Neuhäuser, P., and Tischew, S. 2022. Workshop results: Grazing is an opportunity for the broad-leaved marsh orchid! *Naturschutz und Landschaftsplanung* 54(10): 12–13 [*Dactylorhiza*].

Barman, T., Samant, S. S., Singh, A., and Tewari, L. M. 2021. Population assessment, indigenous uses, and threat status of orchids in ban oak (*Quercus oblongata* D. Don) forests of Himachal Pradesh, northwestern Himalaya. *Journal of the Orchid Society of India* 35: 55–72.

Cicinelli, E., Zangari, G., Bartoli, F., Isola, D., Lucchese, F., and Caneva, G. (2022). Protecting monuments and plant biodiversity in archaeological sites: the case of the Etruscan necropolis of “Monterozzi” (Tarquinia, central Italy). *Acta Horticulturae* 1345: 123–128 (<https://doi.org/10.17660/ActaHortic.2022.1345.16>).

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Dorjey, K., Maurya, A. K., and Sinha, D. 2022. *Dactylorhiza hatagirea* (D. Doon[sic]) Soo, an important medicinal herb of the Himalaya and urgent need for its conservation—A review. *Indian Journal of Natural Products and Resources* 13(3): 265–273 (<https://doi.org/10.56042/ijnpr.v13i3.58263>).

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Cytogenetics and horticultural genetics

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