

## Orchid Research Newsletter No. 70

July 2017

Fourteen years ago, Ed de Vogel and I contributed a chapter called *Taxonomy for Conservation* to a book about orchid conservation (Schuiteman and de Vogel, 2003). In it, we discussed some of the services provided by taxonomists to conservation. Most of these are obvious—thanks to taxonomy, organisms are named and classified in a meaningful way, they can be identified, we know about their geographical distribution, and we can make inferences about their conservation status, using georeferenced specimens in herbaria.

We also pointed out some problems. For example, not all taxonomists agree on species delimitation. What to one botanist is merely a form or variety may be a species in the opinion of another. This is not always, as one might think, caused by different species concepts being employed by these botanists. They may well agree on a theoretical definition, but still come to different conclusions, even when presented with the same evidence. The evidence may simply be insufficient. Often, the taxonomist has to draw conclusions from a handful of specimens that do not display the full range of variation that exists in the field. Perceived differences between two sets of specimens may or may not fall within the range of variation of the species concerned.

DNA analysis to the rescue? Perhaps. If two disputed groups of specimens are not sisters in a phylogeny (based on appropriate genetic markers), then this suggests that the two groups could well be distinct species. But when they do appear as sister groups, or when their members are shown to be mixed up in a single clade, then we are still in the dark about the status of these groups. The situation regarding DNA evidence, at present, is analogous to what the computer scientist Edsger Dijkstra famously wrote about finding errors (bugs) in a computer programme: “Program testing can be a very effective way to show the presence of bugs, but is hopelessly inadequate for showing their absence.” Similarly, DNA evidence may show that two groups are taxonomically distinct, but it cannot always show that two groups are not taxonomically distinct. It may show the presence of different species, but not their absence.

What I am driving at is that taxonomy is a science like any other, in that its practitioners generate hypotheses. The same evidence can lead to different hypotheses. To any taxonomist this should be uncontroversial. It is why performing taxonomy by committee will not work. When there is disagreement, a majority opinion is not necessarily the right one. And when the evidence is unequivocal we don't need a committee in the first place.

I feel that I am stating the obvious, and would not have bothered to write the above, were it not for a recent ‘comment’ in *Nature* that displays a remarkable ignorance about the nature of taxonomy. Provocatively titled *Taxonomy anarchy hampers conservation*, this piece by Garnett and Christidis (2017) correctly identifies some of the same problems for conservation caused by taxonomy that de Vogel and I had already pointed out. It is true that taxonomists may disagree about the rank of a particular taxon, and it is true that this could influence the attention—and funding—

this taxon receives in conservation efforts, and from collectors who may or may not want to add that taxon to their collection, depending on whether or not it is considered a species.

But the *Nature* article goes off the rails, in my opinion, where the usual academic freedom to form hypotheses is hyperbolically described as “anarchy” when it is enjoyed by taxonomists (presumably, the same freedom doesn’t lead to anarchy in other sciences). The authors roundly propose that taxonomists should lose their freedom. Instead, they suggest that a commission should be established that sets binding standards as to what is and what is not a species in a particular group:

In our view, the IUBS [International Union of Biological Sciences] should create a process that does exactly what that effort avoids — restrict the freedom of taxonomic action. And it should do so by creating boundaries for species (and other taxonomic units) that can be applied consistently across multiple life forms.

Apparently, Garnett and Christidis are not aware that such universal boundaries do not exist. They seem to think that differences in taxonomic treatments are exclusively due to differences in species concepts used. But, as I already pointed out, even taxonomists who follow the same species concept may differ in their interpretation of the evidence. The main reason for this is that it is impossible to tell in advance (1) which character states are relevant for species recognition in a particular group, and (2) how much infraspecific variation is possible in the relevant character states.

Botanists are already bound by a byzantine set of rules called the *International Code of Nomenclature for algae, fungi, and plants (Melbourne Code)*. This only applies to the formalities for naming plants, not to species delimitation. I shudder to think of the complexities involved and the bureaucracy needed to formalize the process of delimiting taxa. What we need is more taxonomists, and more funding for revision work, not more rules that create an artificial consensus by dictate from above.

Conservationists can rightly be frustrated by the realization that countless organisms have not yet been formally named and described, or by the fact that it can be quite difficult to identify even common organisms in many parts of the world. But they should not try to interfere in the practices of a science that some of them do not fully understand.

**André Schuiteman**

## **References**

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## Upcoming Conferences

We welcome any news about future orchid conferences for promotion here. Please send details to André Schuiteman ([a.schuiteman@kew.org](mailto:a.schuiteman@kew.org)) 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.

## 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 André Schuiteman ([a.schuiteman@kew.org](mailto:a.schuiteman@kew.org)). Graduate students are especially encouraged to share the subjects of their thesis or dissertation with the international community.

**João Farminhão** is a FRIA-funded PhD student at the Université Libre de Bruxelles, Belgium, working on the systematics and reproductive biology of African angraecoids, under the joint supervision of Prof. Pierre Meerts and Dr. Tariq Stévant, from October 2016. His thesis research revolves around the interplay between pollinators and floral morphology, in the genus *Rhipidoglossum* Schltr, which comprises ca. 40 species confined to Tropical Africa. This genus is remarkable amongst angraecoids for its varied floral morphology, notably that of the rostellum. Indeed, *Rhipidoglossum* exhibits, as a whole, an array of floral traits rather divergent from the paradigmatic moth-pollinated flowers associated with *Angraecum* and other well-known angraecoid genera. Within the framework of the identification of pollination syndromes, João is conducting a detailed morphological study of the flowers, with a special focus on the rostellum and pollinaria. His guiding hypothesis is that the variation of the column structure in *Rhipidoglossum* reflects an adaptation to different pollinators. Accordingly, João also aims to identify potential pollinator functional groups of some species of *Rhipidoglossum*, with fieldwork planned in Cameroon, Gabon, Rwanda and São Tomé. In the light of a molecular phylogeny, he aims to map the occurrence of pollinator shifts, and to investigate the phylogenetic signal versus homoplasy involved in the interspecific variation of the rostellum structure. As a corollary of his research, João is also preparing a taxonomic revision of *Rhipidoglossum*, in which he is reappraising its generic boundaries and addressing its current paraphyly relative to other allied little-known genera, by adopting an integrative phylogenetic approach to Linnean taxonomy.

In order to complete the molecular sampling for his phylogenetic analyses, João invites everyone who has access to fresh material of *Rhipidoglossum* and closely related genera confined to East Africa, from referenced cultivated collections, to contact him. Photos of any species of *Rhipidoglossum* are also wanted and most welcome, and can be sent to [joao.farminhao@ulb.ac.be](mailto:joao.farminhao@ulb.ac.be)

## Obituaries

### Leslie A. Garay (1924–2016)

Leslie Garay was perhaps the most influential orchid taxonomists of the 20<sup>th</sup> century. He was born in Hungary and studied under Adolf Oliver Horvat (1907–2006). During the war, he entered a seminary to train as a Catholic priest. However, with the chaos following the defeat of the Nazis, he emigrated to Canada in 1948 where he anglicised his Christian names from Lazlo Andras to Lesley Andrew. There, he became fascinated by botany and studied it under Henry Teuscher. As a result, in 1957, he was recruited by Richard Evans Schultes, Professor of Botany at Harvard University, to follow Charles Schweinfurth as curator of the Oakes Ames Herbarium at Harvard, then also the base of the American Orchid Society run by Gordon Dillon. Through their mutual interest in orchids, he became friendly there with Professor Herman Sweet of Tufts University in Massachusetts and, as a result, obtained his doctorate there in 1964. The partnership of Garay and Sweet survived until the latter's death.

Garay was a prolific author, publishing in both scientific journals (e.g. *Botanical Leaflets of Harvard University* and *The Kew Bulletin*) as well as hobby journals (*Orchid Digest*, *Orchid Review*, *Journal of the American Orchid Society*), making full use of the superb orchid herbarium and library at Harvard. He also travelled extensively, often with Herman Sweet, undertaking field work in the American tropics and visiting herbaria around the world. As a result, he assembled an extensive collection of dissected flowers preserved in glycerol on microscope slides, and paralleled by drawings of the dissected flowers. This formed the basis of his encyclopaedic knowledge of orchids.

His publications on a wide variety of tribes (*Angraecinae*, *Sarcanthinae*, *Spiranthinae*) and genera (*Oncidium*, *Phragmipedium*, *Stelis*, *Oeceoclades*, *Angraecum* etc.) inspired orchid students to take up more detailed studies of these groups and of others. He published an interesting theory of the origin of the orchids in pre-DNA days that acted as a catalyst to others to consider the origins and evolution of the family. However, his most influential work is probably his and Galfrid (Stalky) Dunsterville's *Venezuelan Orchids Illustrated*, published in six volumes between 1959 and 1976, where each species was illustrated by Dunsterville's detailed line drawing accompanied by Garay's text. Their partnership, with Nora Dunsterville (Stalky's wife), was immensely productive, leading to numbers of new species being described. It also inspired a new generation of collectors to explore the tropical Americas for new orchids. The extensive illustrated accounts of the orchids of, for example, El Salvador, Colombia, Ecuador, Peru, Borneo, *Epidendrum* and the *Pleurothallidinae* are all attributable, in my opinion, to his influence and example.

Garay could be immensely generous, particularly to young scientists, many of whom he helped in establishing their careers. He helped me when I worked at Harvard for three months in 1979 and we enjoyed several field trips to Massachusetts and Vermont on weekends. However, he could also be extremely sensitive to what he considered to be challenges to his views and perceived slights. As a result he fell out, over the years, with many of his contemporaries, often over trifling matters. This

should not, however, detract from the influence that he had on orchid systematics. He led a full and productive life and we are all the richer for his studies and insights.

### **Phillip Cribb**

Kew

### **Pandora Sellars (1936–2017)**

Few would deny that Pandora Sellars who died in early May was the most influential botanical artists of her generation. Pandora was born in Herefordshire and studied design at Cheltenham School of Art and Manchester College of Art. On graduating, she married Jim Sellars, also an artist, and they moved to Southampton where he took up a lecturing post. She developed a superb technique as a freelance botanical artist and taught alongside her husband. Jim grew orchids as a hobby and Pandora painted them.



I met Pandora when I joined the Kew staff in 1974, identifying orchids for Jim so that her artwork was accurately identified. At the time she was completing a fine set of paintings of the wild plants of Jersey for Frances Le Seuer's *Flora of Jersey* (Société Jersiaise: 1984). She subsequently produced a series of wonderful paintings of slipper orchids for *Curtis's Botanical Magazine* and for my monograph *The Genus Paphiopedilum* (RBG Kew 1987, 2nd ed. 1998). Working with her, I was aware of the demands that she made of herself. On one occasion she tore up an almost completed painting that did not meet, in her view, her high standards.

Her watercolour paintings are renowned for their imaginative design and precision. She is widely admired by modern botanical artists, many of whom have been taught by her or influenced by her work. Pandora also inspired Shirley Sherwood to collect botanical art, a collection now so extensive that it inspired Kew's new art gallery. Pandora's painting of a Brazilian orchid (*Laelia tenebrosa*) was the first that Shirley purchased.

In 1999, she received the Jill Smythies award from the Linnean Society, Wedgewood selected her painting of a *Gloriosa* lily for a plate celebrating the Shirley Sherwood Collection of botanical art. Her paintings of orchids from the Eric Young Orchid Foundation in Jersey featured on two sets of the island's stamps.

Following Jim's death, Pandora continued to work in her studio in Herefordshire, travelling up to London for teaching, exhibitions and RHS shows until last year. She will be greatly missed by her many friends here and abroad and by the botanical art community which has grown so much in the past few years.

### **Phillip Cribb**

Kew

### **Recent Orchid Nomenclature**

New orchid names may be retrieved from the IPNI website: <http://www.ipni.org/ipni/plantnamesearchpage.do>. Click on "Show additional search terms" on the right-hand side of the screen. After the search page appears, type in **Orchidaceae** under family name and (for example) **2010-11-30** under "Record date" and "Added since." This will pull up a list of all names added to the IPNI database since 30 November 2010. Also be sure to check the World Checklist of Selected Plant Families (<http://apps.kew.org/wcsp/>) for accepted names and synonyms as well as for building your own checklists.

### **Recent Literature**

We are grateful to Paolo Grünanger for supplying references from journals dedicated to European orchids. If you are aware of any relevant citations published between December 2016 and May 2017 not listed here or in the previous issue, please send them—in the exact style below—to André Schuiteman ([a.schuiteman@kew.org](mailto:a.schuiteman@kew.org)) for publication in the next issue (January 2018). Write "ORN references" in the subject line of the email. 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.

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