

Orchid Research Newsletter No. 59

Evolution versus Creationism. Part Two: The Birth of Fundamentalism and Anti-evolution Attitudes in the U.S. is being postponed until the next issue of the *Orchid Research Newsletter* to make room for an evaluation of the lecture programme of the recent 20th World Orchid Conference in Singapore.

A year ago I wrote in these pages that the 20th World Orchid Conference just might be the best ever. This is not the appropriate publication for comments on the show, judging, and social event (gala banquet), so I will confine my remarks to the lecture programme.

I was Editor of the *Proceedings of the 14th World Orchid Conference* (Glasgow) and am the designated chair of the lecture programme and *Proceedings* Editor of the 22nd WOC to be held in Guayaquil in 2017. I've attended every WOC beginning with the 12th in Tokyo in 1987 except for the 17th in Shah Alam, Malaysia, in 2002. It must be said at the outset that many others have a longer, unbroken record of attendance and so may have opinions different from mine based on the larger sample size.



The spectacular Marina Bay Sands Hotel with its three towers and Sky Park observation deck dominates the bay and the Convention Centre (right). The white building in the shape of a lotus flower (lower left) is the ArtScience Museum. Photo: Alec Pridgeon

First of all, the venue was amazing for its size and beauty. Adjacent to an upscale shopping mall, casino, and 57-story hotel with three towers topped by an observation deck, the Marina Bay Sands Expo and Convention Centre is vast, including more than 120,000 square metres and housing 2,000 exhibition booths, 250 meeting rooms, and 45,000 delegates. The lighting and seating in the lecture rooms was more than ample, the audio system was superb, and the technicians who pre-loaded the projectors with PowerPoint presentations were highly efficient. I cannot recall any significant glitches. The screen size in all the rooms was large enough to be seen not only in the back of the room but out in the hallway. As far as I know, this may have been the first WOC that allowed only PowerPoints and barred slide transparencies, moving us into the 21st century at last. At last we will no longer see slides sticking in the projector or failing to fall into place or projecting upside down. What a concept!

Thanks to Dr. John Elliott and his team, the topics were eclectic and the speakers well chosen, exemplified by the plenary speakers with long careers in various aspects of

Orchidaceae: Mark Chase (systematics and evolutionary biology), Wen-Hui Chen (micropropagation and biotechnology), Steve Johnson (pollination biology), Phillip Cribb (systematics and conservation), John Elliott (Asian orchids), Wong Sek Man (plant pathology, especially virology), Michio Tanaka (tissue culture, micropropagation, and genetic engineering), and Kingsley Dixon (pollination and conservation biology of Australian orchids). There were also several symposia, covering mainland Asian orchids, computer and database resources, conservation, pollination, judging, and medicinal uses of orchids. The lecture programme generally ran like clockwork, although the moderators were often too lax in insisting that speakers end their talks by the appointed time.

There were 65 presentations in the poster session, most of them good, some excellent. I had the pleasure of hearing Christopher Akatsuka (only 17 years old) from Windward Community College in Hawaii explain the inhibitory effects of aqueous extracts of some *Dendrobium* species on dermal and pharyngeal bacteria. His professor and co-author of the poster, Ingelia White, will be speaking at the Fourth Scientific Conference on Andean Orchids (see below under Upcoming Conferences).

Overall, and based solely on the eight World Orchid Conferences that I have attended, I would have to say that this was indeed the best of those, thanks in no large part to Conference Chairmen Dr. Kiat W. Tan and Dr. John Elliott. Congratulations to them and their many teams for planning and executing such a huge undertaking with clockwork efficiency. Their achievements have certainly raised the bar and at the same time shown us not just what to do but how to do it to perfection.

We look forward to seeing the *Proceedings* of the 20th WOC before too long and then to the 21st WOC in Johannesburg in 2014.

Alec Pridgeon

News from Correspondents

Please submit any news about newly completed research, future research plans and needs, change of address, upcoming or recent fieldwork, etc. to Alec Pridgeon (a.pridgeon@kew.org). Graduate students are especially encouraged to share the subjects of their thesis or dissertation with the international community. We will print submissions in the format below. Many thanks to those who have contributed.

Juan F. Silva Armas (Instituto de Ciencias Ambientales y Ecológicas ICAE, Facultad de Ciencias, ULA, Mérida, Venezuela; e-mail: : jsilva@ula.ve) and his colleagues have published a book in Spanish entitled *Botánica y Ecología de las Monocotiledóneas de los Páramos en Venezuela* in two volumes and edited by Professors Gilberto Morillo, Benito Briceño, and Juan F. Silva. A total of 22 families, 141 genera, and 597 species (including 226 orchids) are described and illustrated with drawings and photographs. Each species includes a botanical description, world and national distribution (including páramo sites), elevational limits, ecology, phenology, anatomy, and ethnobotany. The price of the two volumes is US \$90.00 plus shipping. For further information, you may contact Juan F. Silva and/or see the website at <http://www.ciencias.ula.ve/icae>.

Upcoming Conferences

We welcome any news about future conferences for promotion here. Please send details to Alec Pridgeon (a.pridgeon@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.

European Orchid Conference 2012, 11-13 May 2012

In the tradition of previous conferences held in Wuppertal and Schwäbisch Gmünd, the European Orchid Conference will be held 11-13 May 2012 at the Conference Centre proCom Eifelzentrum in Bad Münstereifel, Germany. For detailed information, please refer to the homepage at <http://www.aho-nrw.de/tagung>.

19th Australian Orchid Conference & Show, 11-16 September 2012

Eighteen speakers from several countries will fill out the large lecture programme in Perth, surely one of the most beautiful cities in Australia and home to Kings Park and Botanic Garden. You should not miss the five-day post-Conference tour to the South West with its rich terrestrial orchid flora that have been the subjects of many nature specials on television. For more information, go to http://www.waorchids.iinet.net.au/19th_AOC_Conference.htm.

Fourth Scientific Conference on Andean Orchids, 31 October-4 November 2012

After three highly successful Conferences, the Fourth Scientific Conference on Andean Orchids will be held 31 October- 4 November 2012 in Guayaquil, Ecuador. There will be three days of simultaneously translated talks at the fabulous Guayaquil Convention Center, which will be the venue for the 22nd World Orchid Conference in 2017. One day each will be devoted to topics related to systematics, ecology, and conservation science. Keynote speakers for the three days will be Professor Mark Chase, Professor James Ackerman, and Dr. Michael Fay, respectively. Poster sessions in all three areas of investigation will supplement the lecture series. The Conference will also be associated with a major orchid show. There will be local tours and multiple-day, pre-conference tours for registrants on a first-come, first-served basis. Now is your best chance to visit the world-famous Galapagos Islands. Registration and tour details will soon be on the Internet at <http://www.ecuagenera.com>. Additional publicity will appear in orchid journals in the coming months.

Recent Orchid Nomenclature

New orchid names may now be accessed on the IPNI website:

(www.ipni.org/ipni/plantsearch?request_type=search&output_format=query&ret_defaults=on)

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.

Species Profile: *Neobolusia ciliata*

Summerhayes (1958) aptly called it “a delightful little species” in his description of *Neobolusia ciliata*. It attracts attention by its dark glossy purple labellum, fringed with white cilia. Out of flower it blends in with the grassy environment in which it occurs and is easily overlooked. Plants are small, up to 30 cm tall. Stems are slender, with three or occasionally four leaves, the largest near the base. Inflorescences carry up to ten flowers.



Fig. 1. *Neobolusia ciliata*, flower. Photo: Tjeerd B. Jongeling

Neobolusia ciliata belongs to a small genus that contains three species. One species, *N. virginea*, was removed from it recently and placed in its own genus, *Dracomonticula*, by Linder and Kurzweil (1994). The other two species in *Neobolusia* are *N. tysonii*, which is only found in South Africa, Lesotho, and Swaziland, and *N. stolzii*, which occurs in the Nyanga area in Zimbabwe (though not in the Chimanimanis) and farther north in Malawi and Tanzania.

The genus *Neobolusia* was created by Rudolf Schlechter (1895), when he transferred *Brachycorythis tysonii* to a separate genus. He named it in honour of Harry Bolus: “Es ist mir eine angenehme Pflicht, diese neue Gattung dem um die Kenntnis der Orchideen von Südafrika so hoch verdienten Herrn BOLUS zu widmen.” The following year Bolus published his magnum opus *Icones Orchidearum Austro-Africanarum Extra-tropicarum* (1896). In the Preface he stated that he very much appreciated Schlechter’s help and his contributions to the study of orchids in South Africa, and he even named a species, *Disa schlechteriana*, after Schlechter. But Bolus wasn’t sensitive to flattery and transferred *N. tysonii* back to the genus in which he had originally described it himself, *Brachycorythis*, sinking the name *Neobolusia* (I owe this story to Werner Fiebeck). Most authors have followed Schlechter and have retained *Neobolusia*. In *Orchids of Southern Africa* Linder and Kurzweil (1999) wrote that monophyly of the genera in the *Brachycorythis* group (*Brachycorythis*, *Neobolusia*, *Dracomonticula*, and *Schizochilus*) has not been established and that it is possible that only a single genus should be recognized. Bolus may have it his way after all.

La Croix and Cribb (1995) stated in *Flora Zambesiaca* that it is “only known from the eastern border area of Zimbabwe and adjacent Mozambique”. There is actually one collection from the Rusape area, halfway between Harare and the Eastern Highlands in Zimbabwe, dating from 1953, which can only with some stretch of the imagination be said to be in the eastern border area. This is the earliest collection mentioned in the original description and in *Flora Zambesiaca*. In the National Herbarium in Harare there are additional specimens from the Chimanimani Mountains and Nyanga National Park. All the specimens from Nyanga mention the Pungwe Falls as the place of origin, and presumably there is one population there. In the Chimanimani Mountains there are at least three populations and probably more – botanical collectors are often casual about precise geographical locations, and it is sometimes difficult to decide whether the place where you find a plant is identical with the location mentioned on a herbarium sheet. The species has also been found at the edge of the Bunga Forest, in the Bvumba, a small mountainous area halfway between Nyanga and the Chimanimanis.



Fig. 2. *Neobolusia ciliata*, plants (12 March 2011). Photo: Tjeerd B. Jongeling

The rainy season in Zimbabwe extends from November to March. *Neobolusia ciliata* flowers in the second half of the rainy season. Rainfall is about 1200 mm annually in the Chimanimani district, but it may be higher in the mountains where *N. ciliata* actually occurs. Even when there is no rain, higher areas in the mountains are often covered in dense mist, locally called *guti*, which comes billowing over the crest of the mountains from the Mozambican side. The earliest flowering date among the specimens in the Herbarium in Harare is December 29. Most specimens have been found flowering in January, but the species will carry on flowering much later. Photographs of the flowering plants reproduced here were taken on 12 March 2011, which seems to be the latest date on record.

Neobolusia ciliata is found in montane grassland at elevations between 1500 and 2000 m, sometimes in steepish, rocky places and probably only shallow topsoil. The conspicuous lip probably plays a role in attracting pollinators, but as far as I know no information is available about the pollinators of the species. I have the impression that seed set is high, which may indicate that the orchid produces a reward for its pollinators.

Because the Chimanimanis are the stronghold of *N. ciliata* and because I have seen the species in several locations there, I will give a brief description of the area. The Chimanimanis are a small mountain massif straddling the Zimbabwe-Mozambique border. On both sides of the border the mountains are in a national park. On the Mozambican side there is serious disturbance by gold panners along the major streams, but apart from that the area makes a pristine impression. In the past there must have been herds of large grazers roaming the mountains, but these have all been poached, and the only biggish animals you come across these days are baboons and duiker. The disappearance of the large grazers may of course have influenced the composition of the vegetation. Phipps and Goodier (1962) and Goodier & Phipps (1962) provided a description of the vegetation of the Chimanimanis. For many years orchids were collected in the Chimanimanis and elsewhere in the eastern Highlands by John Ball. After he died from injuries sustained in a car crash in 1976, his sister, Jane Browning, edited his notes and published some of them as *Southern African Epiphytic Orchids* (Ball, 1978). Recently she edited and published his notes on terrestrial orchids (Ball, 2009), which contains some additional information on the distribution of *N. ciliata*. She herself found a single plant in the Bvumba (see above). The reference in that book to John Ball finding *N. ciliata* in Malawi is based on a misunderstanding and incorrect (personal communication, Jane Browning).



Fig. 3. View of the Bundi valley from the slopes of Mt. Peza (12 March 2011). Photo: Tjeerd B. Jongeling

The most easily accessible part of the Chimanimanis consists of the valley of the Bundi River, flanked on the eastern side by tall peaks that form the border with Mozambique and on the western side by a low ridge bordering on a steep escarpment. The Bundi River exits the area through a narrow, virtually impassable gorge, so that the valley of the Bundi can be reached only over the mountains, forming a secluded demi-paradise, a fortress built by Nature for herself. Overlooking the Bundi there is a mountain hut with basic facilities. At the north-eastern end of the valley there is a path over a gap in the mountains, called Skeleton Pass, to a place in Mozambique known as Martin's Falls. (Zimbabwe abounds with stories about people who have come to a sticky end in the bush, but I've never heard what event gave rise to the name Skeleton Pass.) A few kilometres along this path is the largest colony of *N. ciliata* that I have come across, at about 1550 m. There are at least a thousand plants, and perhaps many more. The colony is in lush, gently sloping grassland. In *Flora Zambesiaca* (la Croix and Cribb, 1995) a collection is mentioned from "between Skeleton Pass and Namadima", which presumably refers to the same colony.



Fig. 4. Looking into Mozambique from the top end of High Valley (20 January 2010). The large colony of *N. ciliata* lies in the distance in the right-hand bottom corner. Skeleton Pass is on the left, behind the rocks in the foreground. Photo: Tjeerd B. Jongeling

Due east of the mountain hut there is another, much smaller colony, halfway up the slopes of Binga, also known romantically as point 71. The colony is located in a secluded valley known as High Valley at about 1900 m, high above the valley floor of the Bundi. Finally I have found *N. ciliata* north of the hut, on the slopes of Mt. Peza, at about 1800 m.

The Chimanimanis are rich in orchids. Some 110 species have been found in the mountains or in Chimanimani District, seven of which are endemic to the Chimanimanis. It is perhaps helpful to mention here that Melsester, a name that occurs repeatedly among the places where *N. ciliata* has been found, was the colonial name of the village nearest to the Chimanimani Mountains; it is now called Chimanimani.

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References

- Ball, J. S. 1978. *Southern African Epiphytic Orchids*. Conservation Press, Johannesburg.
- Ball, J. S. 2009. *Terrestrial African Orchids: A Select Review* (ed. J. Browning). www.Lulu.com.
- Bolus, H. 1896. *Icones Orchidearum Austro-Africanarum Extra-tropicarum; or Figures, with Descriptions, of Extra-tropical South African Orchids*. Vol. I. William Wesley & Son, London.
- Goodier, R. and Phipps, J. B. 1962. A revised check-list of the vascular plants of the Chimanimani Mountains. *Kirkia* 1: 44-66.
- la Croix, I. and Cribb, P. J. 1995. *Flora Zambesiaca*. Vol. 11, in two parts. Flora Zambesiaca Managing Committee, London. (free on the web; for the page on *N. ciliata* click [here](#))
- Linder, H. P. and Kurzweil, H. 1994. Taxonomic notes on the African Orchidoideae (Orchidaceae): a new genus and combination. *Willdenowia* 25: 229-234.
- Linder, H. P. and Kurzweil, H. 1999. *Orchids of Southern Africa*. Balkema, Rotterdam, Netherlands.
- Phipps, J. B. and Goodier, R. 1962. A preliminary account of the plant ecology of the Chimanimani Mountains. *Journal of Ecology* 50: 291-319.
- Schlechter, R. 1895. Beiträge zur Kenntnis neuer und kritischer Orchideen aus Südafrika. *Beiblatt zu den Botanischen Jahrbüchern* Bd 20, Heft 4: 1-44.

Summerhayes, V. S. 1956. African orchids: XXIII. *Kew Bulletin* 11: 217-236.

Recent Literature

We consult a variety of other sources for recent literature, and you will find a more extensive range of journals from more disciplines than ever before. If you are aware of any recent citations not listed here and henceforth, please send them – in the exact style below – to Alec Pridgeon (a.pridgeon@kew.org) for publication in the following issue (January or July). Write "ORN references" in the subject line of the e-mail. Book citations should include author(s), date of publication, title, publisher, and place of publication (in that order).

Anatomy and morphology

Davies, K. L. and Stpiczyńska, M. 2010. Structure and distribution of floral trichomes in *Lycaste* and *Sudamerlycaste* (Orchidaceae: Maxillariinae s.l.). *Botanical Journal of the Linnean Society* 164: 409-421.

Davies, K. L. and Stpiczynska, M. 2011. Comparative labellar micromorphology of Zygopetalinae (Orchidaceae). *Annals of Botany* 108: 945-964.

Kant, R. 2011. Development of monads and associated changes in anther in *Cypripedium cordigerum* D. Don.: A rare orchid. *Vegetos* 24: 103-110.

Mulgaonkar, M. S. and Dabhade, G. T. 2010. Pollen study of six species of terrestrial orchids under scanning electron microscopy (SEM) from the Western Ghats of Maharashtra. *Phytotaxonomy* 10: 63-69.

Noguera-Savelli, E. and Jauregui, D. 2011. Comparative leaf anatomy and phylogenetic relationships of 11 species of Laeliinae with emphasis on *Brassavola*. (Orchidaceae). *Revista de Biología Tropical* 59: 1047-1059.

Nosrati, H., Hajiboland, R., Razban-Haghighi, A., and Nikniazi, M. 2011. A comparative assessment of fruit formation in some orchid species from the southern Caucasus region. *Turkish Journal of Botany* 35: 553-560.

Sampaio Mayer, J. L., Carmello-Guerreiro, S. M., and Appezzato-da-Gloria, B. 2011. Anatomical development of the pericarp and seed of *Oncidium flexuosum* Sims (Orchidaceae). *Flora* 206: 601-609.

Stpiczyńska, M., and Davies, K. L. 2009. Floral, resin-secreting trichomes in *Maxillaria dichroma* Rolfe (Orchidaceae: Maxillariinae). *Acta Agrobotanica* 62: 43-51.

Stpiczyńska, M., Davies, K. L., and Gregg, A. 2009. Nectary structure of *Ornithidium sophronitis* Rchb.f. (Orchidaceae: Maxillariinae). *Acta Agrobotanica* 62: 3-12.

Wu, M. K., Li, J., Shen, Z. J., and Liu, Z. Y. 2011. Observation on morphological development of seed embryo in three orchid species. *Guizhou Agricultural Sciences* 6: 19-22.

Conservation biology

Duffy, K. J., Fay, M. F., Smith, R. J., and Stout, J. C. 2011. Population genetics and conservation of the small white orchid, *Pseudorchis albida*, in Ireland. *Biology and Environment-Proceedings of the Royal Irish Academy* 111B: 73-81.

Cytogenetics

Chen, W-H., Tang, C-Y., Lin, T-Y., Weng, Y-C., and Kao, Y-L. 2011. Changes in the endopolyploidy pattern of different tissues in diploid and tetraploid *Phalaenopsis aphrodite* subsp. *formosana* (Orchidaceae). *Plant Science* 181: 31-38.

Lan, T. and Albert, V. A. 2011. Dynamic distribution patterns of ribosomal DNA and chromosomal evolution in *Paphiopedilum*, a lady's slipper orchid. *BMC Plant Biology* 11: 126.

Myo, M. M. T., Pal, A., and Jha, S. 2011. Chromosome number and modal karyotype in a polysomatic endangered orchid, *Bulbophyllum auricomum* Lindl., the royal flower of Myanmar. *Plant Systematics and Evolution* 294: 167-175.

Than, M. M. M., Amita, P., Sumita, J., Pal, A., and Jha, S. 2011. Chromosome number and modal karyotype in a polysomatic endangered orchid, *Bulbophyllum auricomum* Lindl., the Royal Flower of Myanmar. *Plant Systematics and Evolution* 294: 167-175.

Ecology/Mycorrhiza

Blinova, I. V. 2011. Peculiarities of seasonal development of orchid species north of the Arctic Circle. *Botanicheskii Zhurnal* 96: 396-411.

Brumback, W. E., Cairns, S., Sperduto, M. B., and Fyler, C. W. 2011. Response of an *Isotria medeoloides* population to canopy thinning. *Northeastern Naturalist* 18: 185-196.

Chutima, R., Dell, B., and Lumyong, S. 2011. Effects of mycorrhizal fungi on symbiotic seed germination of *Pecteilis susannae* (L.) Rafin. (Orchidaceae), a terrestrial orchid in Thailand. *Symbiosis* 53: 149-156.

Cruz-Fernandez, Q. T., Alquicira-Arteaga, M. L., and Flores-Palacios, A. 2011. Is orchid species richness and abundance related to the conservation status of oak forest? *Plant Ecology* 212: 1091-1099.

Eriksson, O. and Kainulainen, K. 2011. The evolutionary ecology of dust seeds. *Perspectives in Plant Ecology, Evolution and Systematics* 13: 73-87.

Galdiano Jr., R. F., Nascimbem Pedrinho, E. A., Luque Castellane, T. C., and de Macedo Lemos, E. G. 2011. Auxin-producing bacteria isolated from the roots of *Cattleya walkeriana*, an endangered Brazilian orchid, and their role in acclimatization. *Revista Brasileira de Ciencia do Solo* 35: 729-737.

- Girlanda, M., Segreto, R., Cafasso, D., Liebel, H T., Rodda, M., Ercole, E., Cozzolino, S., Gebauer, G., and Perotto, S. 2011. Photosynthetic mediterranean meadow orchids feature partial mycoheterotrophy and specific mycorrhizal associations. *American Journal of Botany* 98: 1148-1163.
- Jacquemyn, H., Merckx, V., Brys, R., Tyteca, D., Cammue, B. P. A., Honnay, O., and Lievens, B. 2011. Analysis of network architecture reveals phylogenetic constraints on mycorrhizal specificity in the genus *Orchis* (Orchidaceae). *New Phytologist* 192: 518-528.
- Jakalaniemi, A., Crone, E. E., Narhi, P., and Tuomi, J. 2011. Orchids do not pay costs at emergence for prolonged dormancy. *Ecology* 92: 1538-1543.
- Jiang, W-M., Yang, G-M., Zhang, C-L., Fu, C-X., Jiang, W. M., Yang, G. M., Zhang, C. L., and Fu, C. X. 2011. Species composition and molecular analysis of symbiotic fungi in roots of *Changnienia amoena* (Orchidaceae). *African Journal of Microbiology Research* 5: 222-228.
- Laroche, V., Pellerin, S., and Brouillet, L., 2012. White fringed orchid as indicator of *Sphagnum* bog integrity. *Ecological Indicators* 14: 50-55.
- Lee, M-C., Cheng, S-F., Chang, D. C. N., Chang, Y-J., and Chang, Y-S. 2010. Specific detection of mycorrhizal colonization in orchid roots by fluorescence microscopy. *Journal of Biotechnology* 150: S496.
- Li, S-F., Su, J-R., Liu, W-D., Zhang, Z-J., Liu, Q-Y., and Li, Z-W. 2011. Diversity and distribution of vascular epiphytes in different restoration stages of monsoonal broad-leaved evergreen forest communities. *Forest Research* 24: 151-158.
- Lohmus, A. and Kull, T. 2011. Orchid abundance in hemiboreal forests: standscale effects of clear-cutting, green-tree retention, and artificial drainage. *Canadian Journal of Forest Research-Revue Canadienne de Recherche Forestiere* 41: 1352-1358.
- Mardegan, S. F., Nardoto, G. B., Higuchi, N., Reinert, F., and Martinelli, L. A. 2011. Variation in nitrogen use strategies and photosynthetic pathways among vascular epiphytes in the Brazilian Central Amazon. *Revista Brasileira de Botanica* 34: 21-30.
- Meekers, T. and Honnay, O. 2011. Effects of habitat fragmentation on the reproductive success of the nectar-producing orchid *Gymnadenia conopsea* and the nectarless *Orchis mascula*. *Plant Ecology* 212: 1791-1801.
- Mondragon, D. 2011. Guidelines for collecting demographic data for population dynamics studies on vascular epiphytes. *Journal of the Torrey Botanical Society* 138: 327-335.
- Mroz, L. and Kosiba, P. 2011. Variation in size-dependent fitness components in a terrestrial orchid, *Dactylorhiza majalis* (Rchb.) Hunt et Summerh., in relation to environmental factors. *Acta Societatis Botanicorum Poloniae* 80: 129-138.

- Olaya-Arenas, P., Melendez-Ackerman, E. J., Perez, M. E., and Tremblay, R. 2011. Demographic response by a small epiphytic orchid. *American Journal of Botany* 98: 2040-2048.
- Ors, S., Sahin, U., Ercisli, S., and Esitken, A. 2011. Physical and chemical soil properties of orchid growing areas in eastern Turkey. *Journal Of Animal and Plant Sciences* 21: 60-65.
- Otero, T. J., Thrall, P. H., Clements, M., Burdon, J. J., and Miller, J. T. 2011. Codiversification of orchids (Pterostylidinae) and their associated mycorrhizal fungi. *Australian Journal of Botany* 59: 480-497.
- Parra-Tabla, V., Vargas, C. F., Naval, C., Calvo, L. M., and Ollerton, J. 2011. Population status and reproductive success of an endangered epiphytic orchid in a fragmented landscape. *Biotropica* 43: 640-647.
- Pekin, B. K., Wittkuhn, R. S., Boer, M. M., Macfarlane, C., and Grierson, P. F. 2011. Plant functional traits along environmental gradients in seasonally dry and fire-prone ecosystem. *Journal of Vegetation Science* 22: 1009-1020.
- Pylro, V. S., Cruz, E. dos S., Duarte, G. F., and Kozovits, A. R. 2011. The increase of N availability via atmospheric deposition and the reproduction phenology in *Habenaria caldensis* Kraenzl. (Orchidaceae) in the Parque Estadual do Itacolomi (PEIT) - MG, Brazil. *Biota Neotropica* 11: 25-30.
- Schrautzer, J., Fichtner, A., Huckauf, A., Rasran, L., and Jensen, K. 2011. Long-term population dynamics of *Dactylorhiza incarnata* (L.) Soo after abandonment and re-introduction of mowing. *Flora* 206: 622-630.
- Shefferson, R. P., McCormick, M. K., Whigham, D. F., and O'Neill, J. P. 2011. Life history strategy in herbaceous perennials: inferring demographic patterns from the aboveground dynamics of a primarily subterranean, myco-heterotrophic orchid. *Oikos* 120: 1291-1300.
- Sletvold, N. and Agren, J. 2011. Among-population variation in costs of reproduction in the long-lived orchid *Gymnadenia conopsea*: an experimental study. *Oecologia* 167: 461-468.
- Sullivan, M. 2011. The Green Swamp: the value of fire in preserving native orchids in a North Carolina Reserve. *Orchids* 80: 468-477.
- Tedersoo, L., Abarenkov, K., Nilsson, R. H., Schussler, A., Grelet, G-A., Kohout, P., Oja, J., Bonito, G. M., Veldre, V., Jairus, T., Ryberg, M., Larsson, K-H., and Koljalg, U. 2011. Tidying up international nucleotide sequence databases: ecological, geographical and sequence quality annotation of its sequences of mycorrhizal fungi. *PloS One* 6 (9): e24940.

- Torretta, J. P., Gomiz, N. E., Aliscioni, S. S., and Bello, M. E. 2011. Biología reproductiva de *Gomesa bifolia* (Orchidaceae, Cymbidieae, Oncidiinae). *Darwiniana* (San Isidro) 49: 16-24.
- Wang, H., Fang, H., Wang, Y., Duan, L., and Guo, S. 2011. *In situ* seed baiting techniques in *Dendrobium officinale* Kimura et Migo and *Dendrobium nobile* Lindl.: the endangered Chinese endemic *Dendrobium* (Orchidaceae). *World Journal of Microbiology and Biotechnology* 27: 2051-2059.
- Waterman, R. J., Bidartondo, M. I., Stofberg, J., Combs, J. K., Gebauer, G., Savolainen, V., Barraclough, T. G., and Pauw, A. 2011. The effects of above- and belowground mutualisms on orchid speciation and coexistence. *American Naturalist* 177: E54-E68.
- Wright, M., Cross, R., Cousens, R. D., May, T. W., and McLean, C. B. 2011. The functional significance for the orchid *Caladenia tentaculata* of genetic and geographic variation in the mycorrhizal fungus *Sebacina vermifera* s. lat. complex. *Muelleria* 29: 130-140.
- Wu, P-H., Huang, D-D., and Chang, D. C. N. 2011. Mycorrhizal symbiosis enhances *Phalaenopsis* orchid's growth and resistance to *Erwinia chrysanthemi*. *African Journal of Biotechnology* 10: 10095-10100.
- Wyse, S. V. and Burns, B. R. 2011. Do host bark traits influence trunk epiphyte communities? *New Zealand Journal of Ecology* 35: 296-301.
- Yagame, T. 2011. Study on mycorrhizal symbioses in Orchidaceae. *Nippon Kingakukai Kaiho* 52: 11-18.
- Yanoviak, S. P., Berghoff, S. M., Linsenmair, K. E., and Zotz, G. 2011. Effects of an epiphytic orchid on arboreal ant community structure in Panama. *Biotropica* 43:731-737.
- Zettler, L. W. and Piskin, K. A. 2011. Mycorrhizal fungi from protocorms, seedlings and mature plants of the eastern prairie fringed orchid, *Platanthera leucophaea* (Nutt.) Lindley: a comprehensive list to augment conservation. *American Midland Naturalist* 166: 29-39.
- Zitari, A., Tranchida-Lombardo, V., Cafasso, D., Helal, A. N., Scopece, G., and Cozzolino, S. 2011. The disjointed distribution of *Anacamptis longicornu* in the West-Mediterranean: the role of vicariance versus long-distance seed dispersal. *Taxon* 60: 1041-1049.
- Zotz, G., Schmidt, G., and Mikona, C. 2011. What is the proximate cause for size-dependent ecophysiological differences in vascular epiphytes? *Plant Biology* 13: 902-908.

Ethnobotany/Ethnopharmacology

Aravindhnan, V., Sathiyadas, K., Rajendran, A., and Thomas, B. 2011. Some rare/endemic medicinal orchids of Velliangiri Hills of southern western Ghats, Tamil Nadu, India. *Indian Forester* 137: 1077-1081.

Bonte, F., Simmler, C., Lobstein, A., Pellicier, F., and Cauchar, J.-H. 2011. Action of an extract of *Vanda coerulea* on the senescence of skin fibroblasts. *Annales Pharmaceutiques Francaises* 69: 177-181.

Challe, J. F. X., Niehof, A., and Struik, P. C. 2011. The significance of gathering wild orchid tubers for orphan household livelihoods in a context of HIV/AIDS in Tanzania. *African Journal of AIDS Research* 10: 207-218.

Manmohan, J. R., Bhojvaid, P. P., and Vasishta, H. B. 2011. Propagation and storage techniques for medicinal orchids - *Habenaria intermedia* (Virdhii) and *Microstylis wallichii* (Jeevak) of Asthavarga group. *International Journal of Forest Usufructs Management* 12: 19-36.

Perez Gutierrez, R. M., Anaya Sosa, I., Hoyo Vadillo, C., and Cruz Victoria, T. 2011. Effect of flavonoids from *Prosthechea michuacana* on carbon tetrachloride induced acute hepatotoxicity in mice. *Pharmaceutical Biology* 49: 1121-1127.

Prapagdee, B., Tharasaithong, L., Nanthaphot, R., Paisitwiroj, C., Benjaphorn, P., Lalita, T., Ratchaya, N., and Cholakan, P. 2012. Efficacy of crude extract of antifungal compounds produced from *Bacillus subtilis* on prevention of anthracnose disease in *Dendrobium* orchid. *Environment Asia* 5: 32-38.

Singh, H., Agnihotri, P., Pande, P. C., and Husain, T. 2011. Biodiversity conservation through a traditional beliefs system in Indian Himalaya: a case study from Nakuleshwar sacred grove. *Environmentalist* 31: 246-253.

History

Christenhusz, M. J. M. and Chase, M. W. 2011. In memoriam: Eric Alston Christenson (1956-2011). *Phytotaxa* 24: 59-60.

Ward, D. B. and Beckner, J. 2011. Thomas Walter's orchids. *Journal of the Botanical Research Institute of Texas* 5: 205-211.

Micropropagation/seed germination

Baque, M. A., Shin, Y.-K., Elshamari, T., Lee, E.-J., and Paek, K.-Y. 2011. Effect of light quality, sucrose and coconut water concentration on the micropropagation of *Calanthe* hybrids ('Bukduseong' x 'Hyesung' and 'Chunkwang' x 'Hyesung'). *Australian Journal of Crop Science* 5: 1247-1254.

- Cardoso, J. C. and Ono, E. O. 2011. *In vitro* growth of *Brassocattleya* orchid hybrid in different concentrations of KNO₃, NH₄NO₃ and benzylaminopurine. *Horticultura Brasileira* 29: 359-363.
- Chiu, Y-T., Lin, C-S., and Chang, C. 2011. *In vitro* fruiting and seed production in *Erycina pusilla* (L.) N.H.Williams & M.W.Chase. *Propagation of Ornamental Plants* 11: 131-136.
- Godo, T., Fujiwara, K., Guan, K., and Miyoshi, K. 2011. Effects of wavelength of LED-light on *in vitro* asymbiotic germination and seedling growth of *Bletilla ochracea* Schltr. (Orchidaceae). *Plant Biotechnology* 28: 397-400.
- Hsiao, Y-Y., Pan, Z-J., Hsu, C-C., Yang, Y-P., Hsu, Y-C., Chuang, Y-C., Shih, H-H., Chen, W-H., Tsai, W-C., and Chen, H-H. 2011. Research on orchid biology and biotechnology. *Plant and Cell Physiology* 52: 1467-1486.
- Jiang, W.-M., Zhao, M-S., and Fu, C-X. 2011. Studies on *in vitro* regeneration competence of pseudobulb cultures in *Changnienia amoena* Chien. *Chinese Science Bulletin* 56: 2580-2585.
- Lee, O. R. Yang, D-C., Chung, H-J., and Min, B-H. 2011. Efficient *in vitro* plant regeneration from hybrid rhizomes of *Cymbidium sinense* seeds. *Horticulture Environment and Biotechnology* 52: 303-308.
- Mata-Rosas, M., Baltazar-Garcia, R. J., and Chavez-Avila, V. M. 2011. *In vitro* regeneration through direct organogenesis from protocorms of *Oncidium tigrinum* Llave & Lex. (Orchidaceae), an endemic and threatened Mexican species. *HortScience* 46: 1132-1135.
- Miguel, T. P. and Leonhardt, K. W. 2011. *In vitro* polyploid induction of orchids using oryzalin. *Scientia Horticulturae* 130: 314-319.
- Naing, A-H., Chung, J-D., Lim, K-B., Naing, A. H., Chung, J. D., and Lim, K. B. 2011. Plant regeneration through indirect somatic embryogenesis in *Coelogyne cristata* orchid. *American Journal of Plant Sciences* 2: 262-267.
- Naing, A. H. and Lim, K. B. 2011. Optimization of embryogenic callus induction and plant regeneration in orchid *Coelogyne cristata*. *Korean Journal of Horticultural Science and Technology* 29: 260-266.
- Niknejad, A., Kadir, M. A., and Kadzimin, S. B. 2011. *In vitro* plant regeneration from protocorm-like bodies (PLBs) and callus of *Phalaenopsis gigantea* (Epidendroideae: Orchidaceae). *African Journal of Biotechnology* 10: 11808-11816.
- Nontachaiyapoom, S., Sasirat, S., and Manoch, L. 2011. Symbiotic seed germination of *Grammatophyllum speciosum* Blume and *Dendrobium draconis* Rchb.f., native orchids of Thailand. *Scientia Horticulturae* 130: 303-308.

- Pasqual, M., Soares, J. D. R., Rodrigues, F. A., de Araujo, A. G., and dos Santos, R. R. 2011. Light quality and silicon on growth *in vitro* of native and hybrid orchid species. *Horticultura Brasileira* 29: 324-329.
- Pathak, P., Piri, H., Vij, S. P., Mahant, K. C., and Chauhan, S. 2011. *In vitro* propagation and mass scale multiplication of a critically endangered epiphytic orchid, *Gastrochilus calceolaris* (Buch.-Ham ex J.E.Sm.) D.Don. using immature seeds. *Indian Journal of Experimental Biology* 49: 711-716.
- Pereira, M. C., Torres, D. P., Rodrigues Guimaraes, F. A., Pereira, O. L., and Megumi Kasuya, M. C. 2011. Seed germination and protocorm development of *Epidendrum secundum* Jacq. (Orchidaceae) in association with *Epulorhiza mycorrhizal* fungi. *Acta Botanica Brasilica* 25: 534-541.
- Potshangbam, N., Nirmala, C., Nongdam, P., and Chongtham, N. 2011. *In vitro* rapid propagation of *Cymbidium aloifolium* (L.) Sw.: a medicinally important orchid via seed culture. *Journal of Biological Sciences* 11: 254-260.
- Reis, C. A. M., Brondani, G. E., Almeida, M. de, and de Almeida, M. 2011. Floral biology, reproductive biology and vegetative propagation of vanilla. *Scientia Agraria Paranaensis* 10: 69-82.
- Rodrigues Soares, J. D., Pasqual, M., Rodrigues, F. A., Villa, F., and de Araujo, A. G. 2011. Silicon sources in the micropropagation of the *Cattleya* group orchid. *Acta Scientiarum-Agronomy* 33: 503-507.
- Shin, Y-K., Baque, M. A., Elghamedi, S., Lee, E-J., and Paek, K-Y. 2011. Effects of activated charcoal, plant growth regulators and ultrasonic pre-treatments on *in vitro* germination and protocorm formation of *Calanthe* hybrids. *Australian Journal of Crop Science* 5: 582-588.
- Suzuki, R. M., de Almeida, V., Pescador, R., and Ferreira, W. de M. 2011. Germinacao e crescimento *in vitro* de *Cattleya bicolor* Lindley (Orchidaceae). *Hoehnea* 37:731-742.
- Tao, J., Yu, L. Q., Kong, F., and Zhao, D. Q. 2011. Effects of plant growth regulators on *in vitro* propagation of *Cymbidium faberi* Rolfe. *African Journal of Biotechnology* 10: 15639-15646.
- Vasudevan, R. and Van Staden, J. 2011. Cytokinin and explant types influence *in vitro* plant regeneration of leopard orchid (*Ansellia africana* Lindl.). *Plant Cell Tissue and Organ Culture* 107: 123-129.
- Venturieri, G. A. and Mendoza de Arbieto, E. A. 2011. *Ex-vitro* establishment of *Phalaenopsis amabilis* seedlings in different substrates. *Acta Scientiarum-Agronomy* 33: 495-501.
- Yin, L-L., Ranjetta, P., James, J., Advina, L. J., Sreeramanan, S., and Yin, L. L. 2011. Preliminary investigation of cryopreservation by encapsulation-dehydration technique

on *Brassidium* Shooting Star orchid hybrid. *African Journal of Biotechnology* 10: 4665-4672.

Zhao, P., Wang, W., and Sun, M. 2011. Characterization and expression pattern analysis of *DcNAC* gene in somatic embryos of *Dendrobium candidum* Wall ex Lindl. *Plant Cell Tissue and Organ Culture* 107: 151-159.

Molecular biology

Aceto, S. and Gaudio, L. 2011. The MADS and the beauty: genes involved in the development of orchid flowers. *Current Genomics* 12: 342-356.

An, F. M., Hsiao, S. R., and Chan, M. T. 2011. Sequencing-based approaches reveal low ambient temperature-responsive and tissue-specific MicroRNAs in *Phalaenopsis* orchid. *PLoS One* May: e18937.

Cantone, C., Gaudio, L., and Aceto, S. 2011. The PI/GLO-like locus in orchids: duplication and purifying selection at synonymous sites within Orchidinae (Orchidaceae). *Gene* 481: 48-55.

Chang, Y-Y., Chu, Y-W., Chen, C-W., Leu, W-M., Hsu, H-F., and Yang, C-H. 2011. Characterization of *Oncidium* 'Gower Ramsey' transcriptomes using 454 gs-flx pyrosequencing and their application to the identification of genes associated with flowering time. *Plant and Cell Physiology* 52: 1532-1545.

Ejima, C., Kobayashi, Y., Honda, H., Shimizu, N., Kiyohara, S., Hamasaki, R., and Sawa, S. 2011. A *Phalaenopsis* variety with floral organs showing C class homeotic transformation and its revertant may enable *Phalaenopsis* as a potential molecular genetic material. *Genes and Genetic Systems* 86: 93-95.

Hsiao, Y-Y., Chen, Y-W., Huang, S-C., Pan, Z-J., Fu, C-H., Chen, W-H., Tsai, W-C., and Chen, H-H. 2011. Gene discovery using next-generation pyrosequencing to develop ESTs for *Phalaenopsis* orchids. *BMC Genomics* 12: 360.

Lertwiriawong, B., Phinija, K., Huehne, P. S., Benjawan, L., and Kisana, P. 2011. Sequence analysis of the *16SrRNA-rps12* inverted repeat region in chloroplast DNA of a *Dendrobium* orchid. *Kasetsart Journal, Natural Sciences* 45: 461-472.

Lu, F., Yu, N., Zhao, X., Zhang, J., Xiao, W., Li, W., Liu, R., Zhu, J., and Peng, C. 2011. Genetic diversity analysis of *Phalaenopsis* Frigdaas 'Oxford' using SRAP markers with reference to those genes responsible for variations in the pigmentation of petals and sepals. *Journal of Horticultural Science and Biotechnology* 86: 486-492.

Mohd-Hairul, A. R., Namasivayam, P., Abdullah, J. O., and Lian, G. E. C. 2011. Screening, isolation, and molecular characterization of putative fragrance-related transcripts from *Vanda Mimi* Palmer. *Acta Physiologiae Plantarum* 33: 1651-1660.

- Mondragon-Palomino, M. and Theissen, G. 2011. Conserved differential expression of paralogous DEFICIENS- and GLOBOSA-like MADS-box genes in the flowers of Orchidaceae: refining the 'orchid code'. *Plant Journal* 66: 1008-1019.
- Pan, Z-J., Cheng, C-C., Tsai, W-C., Chung, M-C., Chen, W-H., Hu, J-M., and Chen, H-H. 2011. The duplicated b-class MADS-box genes display dualistic characters in orchid floral organ identity and growth. *Plant and Cell Physiology* 52: 1515-1531.
- Perez-Almeida, I., Angulo Graterol, L., Osorio, G., Ramis, C., Bedoya, A. M., Figueroa-Ruiz, R., Molina, S., and Infante, D. 2011. Modified method to obtain genomic DNA from orchids (*Cattleya* spp.) for amplification with molecular markers. *Bioagro* 23: 27-34.
- Ratanasut, K., Wongkhamprai, B., and Maknoi, S. 2011. Expression of a CYP76AB1 correlates with the sequential white-blue-white colour transition of *Vanda coerulea* petals. *Biologia Plantarum* 55: 353-356.
- Silva, J. A. T. da, Dong Poh Chin, Pham Thanh Van, Mii, M., and da Silva, J. A. T. 2011. Transgenic orchids. *Scientia Horticulturae* 130: 637-680.
- Su, C-L., Chao, Y-T. Chang, Y-C. A., Chen, W-C., Chen, C-Y., Lee, A-Y., Hwa, K. T., and Shih, M-C. 2011. *De novo* assembly of expressed transcripts and global analysis of the *Phalaenopsis aphrodite* transcriptome. *Plant and Cell Physiology* 52: 1501-1514.
- Tee, C. S., Maziah, M., Tan, C. S., and Abdullah, M. P. 2011. Selection of co-transformed *Dendrobium* Sonia 17 using hygromycin and green fluorescent protein. *Biologia Plantarum* 55: 572-576.
- Teh, S-L., Chan, W-S., Abdullah, J. O., and Namasivayam, P. 2011. Development of expressed sequence tag resources for *Vanda* Mimi Palmer and data mining for EST-SSR. *Molecular Biology Reports* 38: 3903-3909.
- Widiez, T., Hartman, T. G., Dudai, N., Yan, Q, Lawton, M., Havkin-Frenkel, D., and Belanger, F. C. 2011. Functional characterization of two new members of the caffeoyl CoA O-methyltransferase-like gene family from *Vanilla planifolia* reveals a new class of plastid-localized O-methyltransferases. *Plant Molecular Biology* 76: 475-488.

Pathology

- Campoverde, E. V. and Palmateer, A. J. 2011. A sensitive molecular method for detecting virus in orchids. *Phytopathology* 101: S26.
- Cating, R. A., Hoy, M. A., and Palmateer, A. J. 2010. A comparison of standard and high-fidelity PCR in the detection of *Sclerotium rolfsii* and a *Dickeya* sp. from *Phalaenopsis* orchids. *Phytopathology* 100: 22.
- Cating, R. A. and Palmateer, A. J. 2011. Occurrence of a soft-rot disease on *Oncidium* orchids caused by a *Dickeya* sp. in Florida. *Phytopathology* 101: S29.

Chen, C. C., Lin, J. Y., Cheng, Y. H., and Chiang, F. L. 2010. Distribution of *Odontoglossum* ringspot virus on plant of *Cymbidium* spp. and its application in virus detection. *Plant Protection Bulletin (Taichung)* 52: 17-24.

Mano, E. T., Neves, A. A., Santos, V. C., Ferreira, A., and Araujo, W. L. 2010. Identification of *Burkholderia* sp. genes related to biological control of phytopathogens. *Phytopathology* 100: 7.

McMillan, R. T., Palmateer, A. J., and Cating, R. A. 2010. *Phytophthora cactorum* a serious problem on prefinished *Cattleya* orchid liners from Thailand. *Phytopathology* 100: 174.

Tarnowski, T. L., Palmateer, A. J., and McMillan, R. T. 2011. Effect of temperature on bacterial leaf spot of *Phalaenopsis*, caused by *Acidovorax cattleyae*. *Phytopathology* 101: 175.

Yoon, J-Y., Chung, B-N., and Choi, S-K. 2011. High sequence conservation among *Odontoglossum* ringspot virus isolates from orchids. *Virus Genes* 42: 261-267.

Zheng, Y., Chen, C., and Jan, F. 2010. Complete genome sequence of *Capsicum chlorosis* virus from *Phalaenopsis* orchid and prediction of the unexplored genetic information of tospoviruses. *Phytopathology* 100: 146.

Physiology/Phytochemistry

He, J., Tan, B. H. G., and Qin, L. 2011. Source-to-sink relationship between green leaves and green pseudobulbs of C(3) orchid in regulation of photosynthesis. *Photosynthetica* 49: 209-218.

Luangsuwalai, K., Ketsa, S., and van Doorn, W. G. 2011. Ethylene-regulated hastening of perianth senescence after pollination in *Dendrobium* flowers is not due to an increase in perianth ethylene production. *Postharvest Biology and Technology* 62: 338-341.

Majumder, P. L., Bandyopadhyay (Nee Guha), S., and Pal (Nee Ray), S. 2011. Four new stilbenoids from the orchids *Coelogyne ochracea* and *Coelogyne cristata*. *Journal of the Indian Chemical Society* 88: 1293-1304.

Yao, M. H. Chen, C. J., and Huang, G. S. 2011. Estimating optimum temperature and light intensity for orchid of *Phalaenopsis* from the measurements of carbon dioxide flux and daily carbon balance. *Crop, Environment and Bioinformatics* 8: 172-180.

Zhang, S-B., Guan, Z-J., Chang, W., Hu, H., Yin, Q., and Cao, K-F. 2011. Slow photosynthetic induction and low photosynthesis in *Paphiopedilum armeniacum* are related to its lack of guard cell chloroplast and peculiar stomatal anatomy. *Physiologia Plantarum* 142: 118-127.

Pollination

Bellusci, F., Musacchio, A., Stabile, R., Pellegrino, G. 2011. Differences in pollen viability in relation to different deceptive pollination strategies in Mediterranean orchids. *Annals of Botany* 106: 769-774.

Catling, P. M. and Kostiuk, B. 2011. Some observations on the pollination of round-leaf orchid, *Galearis (Amerorchis) rotundifolia*, Near Jasper, Alberta. *Canadian Field-Naturalist* 125: 47-54.

Catling, P. M. and Oldham, M. J. 2011. Recent expansion of *Spiranthes cernua* (Orchidaceae) into Northern Ontario due to climate change? *Canadian Field-Naturalist* 125: 34-40.

Duffy, K. J. and Stout, J. C. 2011. Effects of conspecific and heterospecific floral density on the pollination of two related rewarding orchids. *Plant Ecology* 212: 1397-1406.

Giangarelli, D. C. and Sofia, S. H. 2011. First record of a gynandromorph orchid bee, *Euglossa iopoecila* (Hymenoptera: Apidae: Euglossini). *Annals of the Entomological Society of America* 104: 229-232.

Goegler, J., Twele, R., Francke, W., and Ayasse, M. 2011. Two phylogenetically distinct species of sexually deceptive orchids mimic the sex pheromone of their single common pollinator, the cuckoo bumblebee *Bombus vestalis*. *Chemoecology* 21: 243-252.

Humeau, L., Micheneau, C., Jacquemyn, H., Gauvin-Bialecki, A., Fournel, J., and Pailler, T. 2011. Sapromyophily in the native orchid, *Bulbophyllum variegatum*, on Reunion (Mascarene Archipelago, Indian Ocean). *Journal of Tropical Ecology* 27: 591-599.

Juillet, N., Salzmann, C. C., and Scopece, G. 2011. Does facilitating pollinator learning impede deceptive orchid attractiveness? A multi-approach test of avoidance learning. *Plant Biology* 13: 570-575.

Lunau, K., Papiorek, S., Eltz, T., and Sazima, M. 2011. Avoidance of achromatic colours by bees provides a private niche for hummingbirds. *Journal of Experimental Biology* 214: 1607-1612.

Nattero, J., Malerba, R., Medel, R., and Cocucci, A. 2011. Factors affecting pollinator movement and plant fitness in a specialized pollination system. *Plant Systematics and Evolution* 296: 77-85.

Nemesio, A. 2011. *Euglossa bembei* sp. n. (Hymenoptera: Apidae): a new orchid bee from the Brazilian Atlantic Forest belonging to the *Euglossa cybelia* Moure, 1968 species group. *Zootaxa* 3006: 43-49.

Nemesio, A. 2011. *Exaerete salsai* sp. n. (Hymenoptera: Apidae): a new orchid bee from eastern Brazil. *Zootaxa* 2967: 12-20.

- Nemesio, A. 2011. First record of *Exaerete lepeletieri* Oliveira & Nemesio (Hymenoptera: Apidae: Euglossina) in Venezuela and comments on the distribution of *Eufriesea laniventris* (Ducke) in the Amazon. *Bioscience Journal* 27: 505-509.
- Nemesio, A. and Rasmussen, C. 2011. Nomenclatural issues in the orchid bees (Hymenoptera: Apidae: Euglossina) and an updated catalogue. *Zootaxa* 3006: 1-42.
- Nemesio, A. and Siqueira, E. L. 2011. *Acanthopus excellens* Schrottky, 1902 (Hymenoptera: Apidae: Ericrocini) attracted to eugenol in southeastern Brazil. *North-Western Journal of Zoology* 7: 164-166.
- Niet, T. van der, Liltved, W. R., and Johnson, S. D. 2011. More than meets the eye: a morphological and phylogenetic comparison of long-spurred, white-flowered *Satyrium* species (Orchidaceae) in South Africa. *Botanical Journal of the Linnean Society* 166: 417-430.
- Pansarin, E. R. and Pansarin, L. M. 2011. Reproductive biology of *Trichocentrum pumilum*: an orchid pollinated by oil-collecting bees. *Plant Biology* 13: 576-581.
- Pauw, A. and Bond, W. J. 2011. Mutualisms matter: pollination rate limits the distribution of oil-secreting orchids. *Oikos* 120: 1531-1538.
- Pemberton, R. 2011. Pollination studies in phragmipediums: flower fly (Syrphidae) pollination and mechanical self-pollination (autogamy) in *Phragmipedium* species (Cypripedioideae). *Orchids* 80: 364-367.
- Pemberton, R. W. and Liu, H. 2011. Naturalized yellow cowhorn orchid, *Cyrtopodium flavum* (Orchidaceae), spreading in Florida. *Journal of the Botanical Research Institute of Texas* 5: 331-335.
- Ramirez, S. R., Eltz, T., Fujiwara, M. K., Gerlach, G., Goldman-Huertas, B., Tsutsui, N. D., and Pierce, N. E. 2011. Asynchronous diversification in a specialized plant-pollinator mutualism. *Science* 333: 1742-1746.
- Schlueter, P. M., Ruas, P. M., Kohl, G., Ruas, C. F., Stuessy, T. F., and Paulus, H. F. 2011. Evidence for progenitor-derivative speciation in sexually deceptive orchids. *Annals of Botany* 108: 895-906.
- Schorkopf, D. L. P., Mitko, L., and Eltz, T. 2011. Enantioselective preference and high antennal sensitivity for (-)-ipsdienol in scent-collecting male orchid bees, *Euglossa cyanura*. *Journal of Chemical Ecology* 37: 953-960.
- Steiner, K. E., Kaiser, R., and Dotterl, S. 2011. Strong phylogenetic effects on floral scent variation of oil-secreting orchids in South Africa. *American Journal of Botany* 98: 1663-1679.

Storti, E. F., Soares B. P. I., and StorFilho, A. 2011. Biologia reprodutiva de *Cattleya eldorado*, uma especie de Orchidaceae das campinas amazonicas. *Acta Amazonica* 41: 361-367.

Subedi, A., Chaudhary, R. P., van Achterberg, C., Heijerman, T., Lens, F., Van Dooren, T. J. M., and Gravendeel, B. 2011. Pollination and protection against herbivory of Nepalese Coelogyninae (Orchidaceae). *American Journal of Botany* 98: 1095-1103.

Van der Niet, T., Hansen, D. M., and Johnson, S. D. 2011. Carrion mimicry in a South African orchid: flowers attract a narrow subset of the fly assemblage on animal carcasses. *South African Journal of Botany* 77: 562.

Van der Niet, T., Liltved, W. R., and Johnson, S. D. 2011. More than meets the eye: a morphological and phylogenetic comparison of long-spurred, white-flowered *Satyrium* species (Orchidaceae) in South Africa. *Botanical Journal of the Linnean Society* 166: 417-430.

Venter, N. and Peter, C. 2011. Pollinator driven divergence in hawkmoth pollinated orchids (*Mystacidium capense* and *M. venosum*) and an estimate of rates of outcrossing in naturally pollinated fruit. *South African Journal of Botany* 77: 564.

Westwood, A. R., Borkowsky, C. L., and Budnick, K. E. 2011. Seasonal variation in the nectar sugar concentration and nectar quantity in the western prairie fringed orchid, *Platanthera praeclara* (Orchidaceae). *Rhodora* 113: 201-219.

Xu, S., Schlueter, P. M., Scopece, G., Breitkopf, H., Gross, K., Cozzolino, S., and Schiestl, F. P. 2011. Floral isolation is the main reproductive barrier among closely related sexually deceptive orchids. *Evolution* 65: 2606-2620.

Zimmermann, Y., Schorkopf, D. L. P., Moritz, R. F. A., Pemberton, R. W., Quezada-Euan, J. J. G., and Eltz, T. 2011. Population genetic structure of orchid bees (Euglossini) in anthropogenically altered landscapes. *Conservation Genetics* 12: 1183-1194.

Systematics and distribution

Acharya, K. P., Vetaas, O. R., and Birks, H. J. B. 2011. Orchid species richness along Himalayan elevational gradients. *Journal of Biogeography* 38: 1821-1833.

Alappatt, J. P. 2011. *Bulbophyllum restrepia* (Orchidaceae) - a new record for Indian flora. *Rheedea* 21: 84-85.

Ayasse, M., Stoekl, J., and Francke, W. 2011. Chemical ecology and pollinator-driven speciation in sexually deceptive orchids. *Phytochemistry* 72: 1667-1677.

Barrett, C. F. and Freudenstein, J. V. 2011. An integrative approach to delimiting species in a rare but widespread mycoheterotrophic orchid. *Molecular Ecology* 20: 2771-2786.

- Batista, J. A. N., Carvalho, B. M., Ramalho, A. J., and Bianchetti, L. B. 2010. Three new species of *Habenaria* (Orchidaceae) from Serra da Canastra, Minas Gerais, Brazil. *Phytotaxa* 13: 27-39.
- Bora, R. K., Basumatary, N., and Sarma, C. M. 2011. A note on additions to the orchid flora of Assam. *Phytotaxonomy* 10: 1-4.
- Brzosko, E., Wroblewska, A., Talalaj, I., and Wasilewska, E. 2011. Genetic diversity of *Cypripedium calceolus* in Poland. *Plant Systematics and Evolution* 295: 83-96.
- Cai, X., Feng, Z., Zhang, X., Xu, W., Hou, B., and Ding, X. 2011. Genetic diversity and population structure of an endangered orchid (*Dendrobium loddigesii* Rolfe) from China revealed by SRAP markers. *Scientia Horticulturae* 129: 877-881.
- Callmander, M. W., Phillipson, P. B., and Gautier, L. 2011. Notes on the flora of Madagascar, 6-13. *Candollea* 66: 105-106.
- Chase, M. W. and Whitten, W. M. 2011. Further taxonomic transfers in Oncidiinae (Orchidaceae). *Phytotaxa* 20: 26-32.
- Chen, L-J., Liu, Z-J., Li, Y-Y., and Li, L-Q. 2011. A new orchid *Paphiopedilum guangdongense* and its molecular evidence. *Journal of Systematics and Evolution* 48: 350-355.
- Chung, M. Y., Nason, J. D., and Chung, M. G. 2011. Significant demographic and fine-scale genetic structure in expanding and senescing populations of the terrestrial orchid *Cymbidium goeringii* (Orchidaceae). *American Journal of Botany* 98: 2027-2039.
- Cribb, P. J. and Whistler, W. A. 2011. The orchids of Tonga, Niue, and the Cook Islands. *Lankesteriana* 11: 99-177.
- da Cruz, D. T., Selbach-Schnadelbach, A., Lambert, S. M., Ribeiro, P. L., and Borba, E. L. 2011. Genetic and morphological variability in *Cattleya elongata* Barb. Rodr. (Orchidaceae), endemic to the campo rupestre vegetation in northeastern Brazil. *Plant Systematics and Evolution* 294: 87-98.
- de Oliveira, M. L. 2011. Taxonomic notes on *Exaerete* (Hymenoptera: Apidae: Euglossina), with the description of a new species. *Biota Neotropica* 11: 129-132.
- Delahaye, T. 2011. Rarete et vulnerabilite des orchidees de Savoie. *Bulletin Mycologique et Botanique Dauphine-Savoie* 51: 85-95.
- Delannoy, E., Fujii, S., des Francs-Small, C. C., Brundrett, M., and Small, I. 2011. Rampant gene loss in the underground orchid *Rhizanthella gardneri* highlights evolutionary constraints on plastid genomes. *Molecular Biology and Evolution* 28: 2077-2086.

- Djordjević, V., Tomović, G., and Lakušić, D. 2010. *Epipactis purpurata* Sm. (Orchidaceae) - a new species in the flora of Serbia. *Archives of Biological Sciences* 62: 1175-1180. [Correction in pagination]
- Droissart, V., Sonke, B., Hardy, O. J., Simo, M., Taedoumg, H., Nguembou, C. K., and Stevart, T. 2011. Do plant families with contrasting functional traits show similar patterns of endemism? A case study with Central African Orchidaceae and Rubiaceae. *Biodiversity and Conservation* 20: 1507-1531.
- Duncan, G. 2011. 710. *Satyrium princeps*: Orchidaceae. *Curtis's Botanical Magazine* 28: 160-168.
- Fan, Z. G., Kong, L. J., Peng, D. Z., Huang, S. L., Tan, T. H., and Yang, B. Y. 2011. Distribution and floristic characteristics of wild orchids in Qiyunshan Nature Reserve. *Journal of Tropical and Subtropical Botany* 19: 159-165.
- Go, R., Eng, K. H., Mustafa, M., Abdullah, J. O., Naruddin, A. A., Lee, N. S., Lee, C. S., Eum, S. M., Park, K-W., and Choi, K. 2011. An assessment of orchids' diversity in Penang Hill, Penang, Malaysia after 115 years. *Biodiversity and Conservation* 20: 2263-2272.
- Greulich, F. and Prunier, P. 2011. Pourquoi de nouveaux noms chez les orchidees? *Bulletin Mycologique et Botanique Dauphine-Savoie* 51: 7-20.
- Hedren, M., Nordstrom, S., and Bateman, R. M. 2011. Plastid and nuclear DNA marker data support the recognition of four tetraploid marsh orchids (*Dactylorhiza majalis* s.l., Orchidaceae) in Britain and Ireland, but require their recircumscription. *Biological Journal of the Linnean Society* 104: 107-128.
- Hopkins, S. E. and Taylor, D. L. 2011. Microsatellite loci development in mycoheterotrophic *Corallorhiza maculata* (Orchidaceae) with amplification in *C. mertensiana*. *American Journal of Botany* 98: E253-E255.
- Hu, S-J., Hu, H., Yan, N., Huang, J-L., and Li, S-Y. 2011. Hybridization and asymmetric introgression between *Cypripedium tibeticum* and *C. yunnanense* in Shangrila County, Yunnan Province, China. *Nordic Journal of Botany* 29: 625-631.
- Jacquemyn, H., Brys, R., and Hutchings, M. J. 2011. Biological flora of the British Isles: *Orchis anthropophora* (L.) All. (*Aceras anthropophorum* (L.) W.T. Aiton). *Journal of Ecology (Oxford)* 99: 1551-1565.
- Jersakova, J., Malinova, T., Jerabkova, K., and Doetterl, S. 2011. Biological flora of the British Isles: *Pseudorchis albida* (L.) A. & D.Love. *Journal of Ecology* 99: 1282-1298.
- Jordan, D. 2011. Essai de cle de determination des Orchidees defleuries et fructifiees des Alpes du nord. *Bulletin Mycologique et Botanique Dauphine-Savoie* 51: 21-57.

- Juarez, L., Montana, C., and Ferrer, M. M. 2011. Genetic structure at patch level of the terrestrial orchid *Cyclopogon luteoalbus* (Orchidaceae) in a fragmented cloud forest. *Plant Systematics and Evolution* 297: 237-251.
- Karremans, A. P. 2011. *Dracontia*: the little-known dragon orchids. *Orchids* 80: 560-566.
- Lee, Y-I., Chang, F-C., and Chung, M-C. 2011. Chromosome pairing affinities in interspecific hybrids reflect phylogenetic distances among lady's slipper orchids (*Paphiopedilum*). *Annals of Botany* 108: 113-121.
- Li, J-H., Liu, Z-J., Salazar, G. A., Bernhardt, P., Perner, H., Yukawa, T., Jin, X-H., Chung, S-W., and Luo, Y-B. 2011. Molecular phylogeny of *Cypripedium* (Orchidaceae: Cypripedioideae) inferred from multiple nuclear and chloroplast regions. *Molecular Phylogenetics and Evolution* 61: 308-320.
- Li, P., Huang, B. Q., Pemberton, R. W., Luo, Y. B., and Cheng, J. 2011. Floral display influences male and female reproductive success of the deceptive orchid *Phaius delavayi*. *Plant Systematics and Evolution* 296: 21-27.
- Liu, Z-J., Chen, L-J., Chen, S-C., Cai, J., Tsai, W-C., Hsiao, Y-Y., Rao, W-H., Ma, X-Y., and Zhang, G-Q. 2011. *Paraholcoglossum* and *Tsiorchis*, two new orchid genera established by molecular and morphological analyses of the *Holcoglossum* alliance. *PLoS One* 6: e24864.
- Logacheva, M. D., Schelkunov, M. I., and Penin, A. A. 2011. Sequencing and analysis of plastid genome in mycoheterotrophic orchid *Neottia nidus-avis*. *Genome Biology and Evolution* 3: 1296-1303.
- Machado Neto, N. B. and Vieira, L. G. E. 2011. Assessment of genetic diversity in *Cattleya intermedia* Lindl. (Orchidaceae). *Brazilian Archives of Biology and Technology* 54: 939-946.
- McCartney, C. 2011. Florida's vanillas: a look at the vining, twining orchids of the Sunshine State. *Orchids* 80: 280-289.
- Miranda, M. R. and Neto, L. M. 2011. Redescoberta de *Centroglossa macroceras* Barb. Rodr. e *Thysanoglossa jordanensis* Porto & Brade (Orchidaceae), duas micro-orquídeas consideradas presumivelmente extintas no Estado de São Paulo, Brasil. *Hoehnea* 37: 403-405.
- Misra, S., Panda, S. P., and Nayak, P. K. 2011. *Bulbophyllum guttulatum* Wall. ex Hook.f.: a rare orchid from the eastern Ghats of India. *Journal of Economic and Taxonomic Botany* 35: 174-178.
- Molnar, A. V., Mate, A., and Sramko, G. 2011. An unexpected new record of the Mediterranean orchid, *Ophrys bertolonii* (Orchidaceae) in Central Europe. *Biologia* 66: 778-782.

- Nusbaumer, L., Cribb, P., and Gautier, L. 2011. *Nervilia gassneri* Barge Pett. from Africa is conspecific with the Malagasy *N. lilacea* Jum. & H. Perrier. *Candollea* 66: 127-130.
- Oliver, E. G. H., Liltved, W. R., and Bytebier, B. 2011. *Disa albomagentea* (Orchidaceae), a new species from the Hottentots Holland Mountains in the Cape Floristic Region, South Africa. *South African Journal of Botany* 77: 313-318.
- Panda, S. P., Sahu, D., and Misra, S. 2011. Additions to the orchidaceous flora of Andhra Pradesh, India. *Journal of Economic and Taxonomic Botany* 35: 105-107.
- Pérez-Bravo, R., Salazar, G. A., and Mora-Guzmán, E. 2010. Orquídeas de las Lomasla Manzanilla, Sierra Madre Oriental, Puebla, México. *Bol. Soc. Bot. Mexico* 87: 125-129.
- Pessoa, E. M. and Alves, M. 2011. Orchidaceae Juss. na Serra de Itabaiana, Sergipe, Brasil. *Revista Caatinga* 24: 102-114.
- Pinheiro, F., de Barros, F., Palma-Silva, C., Fay, M. F., Lexer, C., and Cozzolino, S. 2011. Phylogeography and genetic differentiation along the distributional range of the orchid *Epidendrum fulgens*: a Neotropical coastal species not restricted to glacial refugia. *Journal of Biogeography* 38: 1923-1935.
- Ram, P., Medhi, R. P., and Pal, R. 2011. Variability in the germplasm of *Cymbidium elegans* Lindl. orchid collected from Darjeeling district of West Bengal. *Indian Journal of Forestry* 34: 177-180.
- Renner, M. A. M. and Beadel, S. M. 2011. *Taeniophyllum norfolkianum*: a second genus of Vandeeae (Orchidaceae) indigenous to New Zealand. *New Zealand Journal of Botany* 49: 435-439.
- Robinson, D. J., Gandy, E., VanHoek, C., and Pemberton, R. W. 2011. Naturalization of the nun's hood orchid (*Phaius tankervilleae*: Orchidaceae) in central Florida. *Journal of the Botanical Research Institute of Texas* 5: 337-339.
- Rose, P. E. and Benkeblia, N. 2011. Plants of horticultural importance in Jamaica and the Caribbean region: botany and distribution. *Acta Horticulturae* 894: 57-64.
- Salazar, G. A., Cabrera, L. I., and Figueroa, C. 2011. Molecular phylogenetics, floral convergence and systematics of *Dichromanthus* and *Stenorrhynchos* (Orchidaceae: Spiranthinae). *Botanical Journal of the Linnean Society* 167: 10-18.
- Salazar, G. A., Chávez-Rendón, C., Jiménez-Machorro, R., and de Ávila, A. 2011. A new species of *Galeoglossum* (Orchidaceae, Cranichidinae) from Oaxaca, Mexico. *Systematic Botany* 36: 261-267.
- Sarat, M., Nayak, P. K., Panda, S. P., and Misra, S. 2011. Notes on *Habenaria stenopetala* Lindl., an uncommon terrestrial orchid from India. *Indian Journal of Forestry* 34:181-184.

Schuiteman, A., Vermeulen, J. J., De Vogel, E., and Vogel, A. 2011. Nocturne for an unknown pollinator: first description of a night-flowering orchid (*Bulbophyllum nocturnum*). *Botanical Journal of the Linnean Society* 167: 344-350.

Serguera Nino, M. and Sanchez Losada, M. 2011. A new natural hybrid, *Bletia xekmanii* (Orchidaceae), from Cuba. *Willdenowia* 41: 107-111.

Solano, R., Salazar, G. A., and Jimenez, R. 2011. New combinations in Orchidaceae of Mexico. *Acta Botanica Mexicana* 97: 49-56.

Solano Gomez, R., Jimenez, R. M., and Damon, A. A. 2011. Two new records and one rediscovery for Orchidaceae of Mexico. *Acta Botanica Mexicana* 96: 59-72.

Sumathi, R., Jayanthi, J., and Karthigeyan, K. 2011. *Liparis atosanguinea* Ridl. (Orchidaceae), a new orchid addition to India from Andaman and Nicobar Islands. *Taiwania* 56: 257-260.

Wu, D-F. and Jin, X-F. 2011. Two new records of orchids from Zhejiang, China. *Xibei Zhiwu Xuebao* 31: 1891-1893.

Wu, L., Huang, Y. F., Nong, D. X., and Xu, W. B. 2011. New records of orchids from Guangxi, China. *Journal of Guangxi Normal University - Natural Science Edition* 29: 57-59.

Xiang, X-G., Hu, H., Wang, W., and Jin, X-H. 2011. DNA barcoding of the recently evolved genus *Holcoglossum* (Orchidaceae: Aeridinae): a test of DNA barcode candidates. *Molecular Ecology Resources* 11: 1012-1021.

Yeh, C-L., Leou, C-S., Hsu, T-C., and Yeh, C-R. 2011. *Gastrodia sui* sp. nov. (Orchidaceae) from Taiwan. *Nordic Journal of Botany* 29: 417-419.

Zhao, M-X., Du, F., Yan, X-S., He, X., Zhuang, C-Z., Zhang, Q-R., Zhao, M. X., Du, F., Yan, X. S., He, X., Zhuang, C. Z., and Zhang, Q. R. 2011. Analysis on species diversity of Orchidaceae in Tongbiguan Nature Reserve, Yunnan Province. *Journal of Southwest Forestry University* 31: 31-44.

New Books

The Cape Orchids by William R. Liltved and Steven D. Johnson will soon be published by Sandstone Editions, P. O. Box 372, Noordhoek 7979, Cape Town, South Africa. This spectacular title is in two volumes, bound and jacketed, in a slipcase. More than 2000 photographs depict the Cape orchids and their habitats, with full species accounts covering nomenclatural derivations, descriptions, flowering periods, relationships, distribution, field notes, and biology. For more information about this major publishing event, please visit the website: <http://www.capeorchids.co.za>.