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Report on the 5th Annual NOC Meetings

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The 5th annual Native Orchid Conference meeting was held in Ashland, Oregon from 8 to 12 June 2006. The Conference was held on the lovely campus of Southern Oregon University and was arranged by Dr. Carol Ferguson, professor of Entomology at the University with help from Ron Coleman, an NOC Board Member. This meeting was sponsored in part by the SOU Department of Biology. This was the first NOC meeting to be held in the Pacific Northwest, and one of the objectives was to learn about and see some of the rare and beautiful orchids of this region, principally the western *Cypripedium* and the western variety of *Calypso*. Like all of the previous conferences, the Ashland Conference featured two days of talks and two days of guided field trips to see the orchids. Just over 100 orchid lovers registered for the event making this the most heavily attended of the five conferences.

The meetings started on 8 June with a keynote address by Dr. Frank Lang on the Botany of the Klamath Region. This was an overview of plant communities in southern Oregon and northern California. A welcome reception followed and early arrivals to the conference regaled attendees with tales of *Calypso bulbosa* var. *occidentalis* (page 13) blooming by the thousands and cascades of *Cypripedium californicum* (page 13)

School was still in session at SOU so field trips were planned for Friday and Monday, with presentations on Saturday and Sunday. The first day of field trips on 9 June was to the Illinois River Valley (page 12) in southern Oregon. The Ashland Conference featured several innovations regarding the field trips that are worth considering for future conferences. Twelve-passenger vans were used to transport attendees on the field trips. The vans were used to reduce the impact on the sensitive plant communities and to avoid the lost-car syndrome experienced at several of the previous conferences. Multiple field trips were planned each day but to different areas, although with most of the same plants. Again, this was to reduce the impact of many people ranging the same small area to examine the same plants.

Everyone came back from the field trips on Friday eager to share what they had found. *Cypripedium californicum* indeed was blooming in cascades and still in peak form. This lady's slipper is endemic to northern California and southern Oregon and restricted to serpentine soils. Attendees saw and photographed thousands of plants with up to 20 flowers on each plant. We often found *Platanthera sparsiflora* (page 10) and *Epipactis gigantea* (page 11) growing with or near *C. californicum*. *Cypripedium montanum* (back cover)

was also still in good bloom though not as numerous as the *C. californicum*. The California pitcher plant, *Darlingtonia californica*, was growing with *C. californicum* in many places, and though it is not an orchid, was the subject of many photographs. After the planned field trip, many attendees took off on their own to explore for orchids and some were rewarded with a few plants of *Calypos bulbosa* var. *occidentalis* still in peak bloom.

On 10 June, the first day of talks started at 9:00 AM with a welcome and introduction by Native Orchid Conference President David McAdoo. Dr. Andy Huber then presented a talk on his successful efforts to create a private orchid reserve and his experiments in growing *C. montanum* from seed *in situ*. Huber's reserve is called GROWISER (Grande Ronde Overlook Wildflower Institute Serving Ecological Restoration) and on it he has tagged and tracks approximately 2700 plants of *C. montanum*. He experimented with various methods of sowing seed and reported that seedlings appear in 2 to 7 years. One intriguing aspect of his report was that *Piperia* seedlings are appearing with the *C. montanum* seedlings even though he did not sow any *Piperia* seeds. He does not yet understand that observation.

Ron Coleman then presented an overview of the orchids of Oregon. Ron showed photos of the orchids known to grow in Oregon and indicated which ones conference attendees were likely to see. Ron emphasized *C. montanum*, *C. californicum*, *E. gigantea*, and *C. bulbosa* var. *occidentalis*, all of which conference attendees had a good chance of seeing before their trip was over.

Dr. Nevin Aspinwall of Kirkland, Missouri, talked about Conservation Biology of North American *Cypripedium* Orchids. He presented the conservation status of our native *Cypripedium* spp. The goal of his project is to improve propagation techniques and eventually produce seedlings for reintroduction into native habitats. He described the sowing media he uses and how to grow out the plants to seedlings, including the critical vernalization process.

In addition to being our host and organizing the conference, Dr. Carol Ferguson presented a talk on the Pollination System of *Cypripedium fasciculatum* (page 13). She explained the basis of pollination and techniques for collecting potential pollinators. Fruit set varied from year to year in her study and the percent of pollination corresponded to pollinator activity. She identified parasitic diapriid wasps as one of the pollinators and noted that this was the first report of that pollinator for *C. fasciculatum*.

Henry Whitridge of the Bureau of Land Management presented a talk on Identity and Function of *Cypripedium fasciculatum* Mycorrhizae. Whitridge stated that orchid mycorrhizae differ from other mycorrhizae in that there is no apparent benefit to the fungus, which just gets digested by the orchid. He suggested that a more correct term for the relationship might be myco-heterotrophy. He

used DNA sequencing to identify one of the fungi involved with *C. fasciculatum* as common with *Corallorhiza*. Whitridge also established that *C. fasciculatum* maintains its myco-heterotrophic relationship all its life and that its primary fungus also was linked to a tree, suggesting *C. fasciculatum* to be an indirect parasite.

Dr. Bill Mathis presented a talk titled Growing Natives, based on his book *Hardy Perennial Orchids*. He talked about the cultural needs of native orchids and how to meet these needs in a garden setting. Mathis talked about legitimate sources of seed propagated *Cypripedium* becoming readily available but strongly recommended that we avoid trying to grow *Cypripedium acaule* – and suggested hybrids of native orchids would be good plants to start with because they are much easier to grow.

Tom Mirenda of the Smithsonian talked about Hardy Orchids. He discussed the various habitats for native orchids and which species grew in each habitat. He also strongly recommended that we avoid trying to cultivate *Cypripedium acaule*.

After dinner there was an evening session with a combined talk by Dr. Nan Vance and Peter Bernhardt on Comparing the Reproductive Ecology of Some North American and Chinese Lady Slipper Orchids. In both the American and Chinese *Cypripedium* spp. we have a case of pollination by deceit in which insects are lured by an aroma that suggests nectar but the flowers do not have any nectar reward for the pollinator. They talked about the timeline of pollination and compared American *Cypripedium* spp. such as *C. fasciculatum*, *C. montanum*, and *C. parviflorum* with their Chinese cousins *C. bardolphianum*, *C. plectrochilum*, and *C. tibeticum*. One of the many interesting observations they presented was that *C. bardolphianum* smells like rotting fruit, a fig, and is pollinated by fruit flies.

The first speaker on Sunday was Bob Lauri, a PhD student at Rancho Santa Ana Botanic Garden in Claremont, CA. Bob's topic was The Systematic Study of *Piperia*. He talked about the distribution and morphology of the genus. Presenting preliminary results of his work Bob confirmed that the current 10 species of *Piperia* are well supported by his DNA studies. He must wait for further results before deciding if *Piperia* should be included within *Platanthera* as some recent authors have suggested. Bob's talk was a good lead in to our field trip that followed on Monday as two species of *Piperia* were found in bloom: *P. candida* and *P. unalascensis* (page 10).

Dr. Jyotsna Sharma, editor of our Native Orchid Conference Journal, spoke next on the Fungal Food Web of *Piperia*. Sharma used the term orchid mycobionts to describe the relationship that often results in sugar transfer from the

fungus to the orchid. Sharma's molecular research shows that there is mycorrhizal diversity in terrestrial orchids with many taxonomic groups of fungi involved in relationships with orchids. Some of those fungi also form relationships with surrounding vegetation resulting in transfer/exchange of sugars and nutrients between those plants and the orchids. Sharma stressed that biodiversity in a habitat, including mycorrhizal diversity, is critical to survival of the eco-system, and ultimately, the orchids.

After a short break Lucy Dueck of Aiken, South Carolina spoke on The *Spiranthes* Genetics Project: Results. This was a follow-up to a talk she gave at an earlier Native Orchid Conference. Dueck is in the finishing stages of a multiple year study of the DNA sequences of *Spiranthes* and she has sampled almost the entire genus. Her results show that some taxa are still evolving and that some North American species are closely related to some European species.

Dr. Chuck Sheviak presented a talk on *Platanthera tescamnis* and a Reluctant Look at *Platanthera sparsiflora*. *Platanthera tescamnis* is a species newly described by Sheviak and Jennings that grows in drier habitats than most of the *Platanthera*. Heretofore *P. tescamnis* had been included within *P. sparsiflora* but differs by having a smaller column and leaves on the bottom quarter of the stem. Sheviak talked about the effort to ascertain that *P. tescamnis* was in fact unique and then the need to search for an appropriate name. He then showed examples of the still widely varying *P. sparsiflora* and related species *P. brevifolia* and *P. zothecina*.

Dr. Ken Cameron presented a paper on North American *Vanilla*. There are five species of *Vanilla* in the United States, all occurring only in Florida, and another three in Puerto Rico. Cameron's research involves applying DNA barcoding to *Vanilla* identification. *Isotria*, *Pogonia* and *Cleistes* are part of Vanilleae. Cameron chose five genes for his barcoding study, but does not yet have a perfect match. One potential economic impact of his work will be the ability to identify which species selected vanilla beans came from, which is important with vanilla beans going for $500 per kilogram. Sadly, much of the habitat of *Vanilla* in Florida was destroyed in the past hurricane season.

Scott Stewart, a PhD student from Gainsville, FL presented results from his conservation work in a talk titled Florida's Panthers, Gators, and Orchids. Stewart has teamed with the US Fish and Wildlife Service to use fire as a tool for habitat restoration with a goal of removing invasive species. Stewart said management agencies need to know what to do to manage for plants, and that real orchid conservation implies integration of ideas. In addition to using controlled burns to restore habitat, Stewart is working on restoring historic ponds.

Simon Andrew of Crewkerne, Somerset, UK spoke on European *Cephalan-*

thera. Andrew has been studying European orchids for over 40 years and recently expanded his interest to include North American natives. He is especially intrigued by the similarities and differences between European and American plants in the same genus. Several of his European *Cephalanthera* looked very similar to our own *C. austiniae* (page 14) except the European plants were photosynthetic. Some of the conference attendees were able to see *C. austiniae* in bloom either doing the conference field trips or afterwards.

Our last speaker was Dr. Camile De Jong of the Netherlands who spoke on *Cypripedium* of China. De Jong showed photos of the many Chinese orchids he photographed on a recent trip and told of his harrowing experiences to capture the photographs. Many of the Chinese *Cypripedium* spp. De Jong showed have cousins in North America that look very similar. *Cypripedium elegans* looks very much like *C. fasciculatum*, and *C. plectrochlum* looks very much like *C. arietinum*.

The last item on the Conference agenda was the annual business meeting, called to order by the outgoing President David McAdoo. The nominating committee presented the new slate of officers and they were elected by NOC members. The new officers for 2006-2007 are:

President - Lorne Heshka, Winnipeg, Canada
Vice President - Stefan Ambs, Silver Spring, Maryland
Secretary - Jim Pyrzynski, Bellevue, Nebraska
Treasurer - Mark Rose, Greensboro, North Carolina

All officers are members of the board. Three at-large members also serve on the NOC Board. At-large board members are:
1 Year Term - Shirley Curtis, Rollinsford, New Hampshire
2 Year Term - Jim Fowler, Greenville, South Carolina
Past President - David McAdoo, Kernersville, North Carolina

Dr. Jyotsna Sharma continues as the Editor of the *Native Orchid Conference Journal*. The Editorial Committee for the Journal also includes, Ron Coleman, Jan Coleman, and George Johnson. Kip Knudson will serve as the NOC Conservation Committee Chair.

This Conference election was an important step in the maturation of the Native Orchid Conference. The Native Orchid Conference was founded based on the efforts and inspiration of outgoing President David McAdoo and past and current Treasurer, Mark Rose. Though it was not mentioned at the Conference, the smooth transition of power from one of the founders to the next generation of officers is a powerful testimony to the maturity and staying power of the Native Orchid Conference. Everyone was extremely appreciative of the leadership David has provided during his term in office, and the incoming Presi-

dent Lorne Heshka expressed the organization's appreciation for David by announcing a gift for him (see page 15).

David McAdoo then presented the Treasurer's report because Mark Rose was unable to attend. The Treasurer's report is reported separately in the Journal and will not be covered here except to observe that the Conference is on sound financial footing. Because the Conference is financially sound, it was voted to offer scholarships in the form of reduced rates to full time students for both the annual membership and conference fees. It was also voted to establish a research grant to further the study of native orchids.

The last order of business was to discuss the location for the conference next year. Based on discussions, the 2007 Native Orchid Conference is scheduled to be held in south Florida (see page 24).

The final day of the Conference included the second set of field trips. One trip headed into northern California (page 12) and other trips went to Dead Indian Plateau and Porcupine Gap. Many attendees either came out early or stayed after the conference ended to enjoy the orchid flora of the region. Some went to the coast to search for *Spiranthes porrifolia* and others went into the Sierra Nevada Mountains of California in search of *C. fasciculatum* in bloom. Most were successful in their hunts and many scored lifetime firsts due to the unique orchids in the northwest.

This conference would not have been successful without the enormous effort by Dr. Carol Ferguson in planning the conference and the SOU Department of Biology for sponsoring it on campus. Many thanks are also due to the members of the local chapter of the Native Plant Society and volunteers from the Bureau of Land Management who planned and led field trips. These helpers, without whom the conference would not have been as successful, included Jim Duncan, Norm Jensen, Frank Lang, Kathleen Donham, Marcia Wineteer and Armand Rebischke.

The Ashland Native Orchid Conference was an outstanding success. It built on previous conferences with a mix of technical and lay papers. It added some innovations in the use of vans and multiple sites with similar flora to reduce the impact of field trips. We can all look forward to the next conference in the series and the pure joy of meeting just to learn more about our native orchids.

An Alternative Mode of Reproduction for *Spiranthes lucida* (H.H. Eaton) Ames

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Summary: Here I report the finding of an undocumented reproductive mode of *Spiranthes lucida*, a rare species in Québec, Canada. Propagules are produced at the base of the plant and are perhaps involved in hydrochory. The following is a short description of the finding based on *in situ* and *in hortus* observations.

Observation of *Spiranthes* plants or clumps with multiple inflorescences is not uncommon. The different processes that can explain this (listed below) are not always obvious in the field:

1. Although usually only one axillary bud develops on the rhizome, sometimes two or more do. This will then show two blooming leafy growths that are in fact one plant. Eventually the older connecting part of the rhizome disintegrates. When this happens two genetically identical individuals can be mistaken for two genetically distinct individuals.

2. Some species in the genus have the ability to grow plantlets from the root-tips. This is the case with *S. casei* var. *casei*, *S. cernua*, and *S. odorata*. These plantlets are clones, but when the originating root disintegrates determination of the process is again problematic.

3. The base of the parent plant can be "sprinkled" with seeds from its dehiscing ovaries. This can result in either clones (for apomixic species) or sexually-derived seedlings.

4. Asexual embryo-like propagules are produced at the collar of a plant. When these develop and mature, a dense clump is produced.

In July 2005, I found a new colony of *Spiranthes lucida* (see front cover and page 9 for color images), a rare species in Québec. In a new station for the species here, the habitat was the typical "rocky or sandy shores that are scrubbed annually by ice and flood waters" (Reddoch and Reddoch, 1997) or "gravelly sand bars and river banks, lake shores" (Case, 1987).

In the largest group of about 85 flowering plants were a few "clumped" specimens. These had between two and five inflorescences and had a shorter, dense leafy base than the rest. One of the "clumped" specimens had five inflorescences. Numerous smaller plants were immediately at the base of these and were

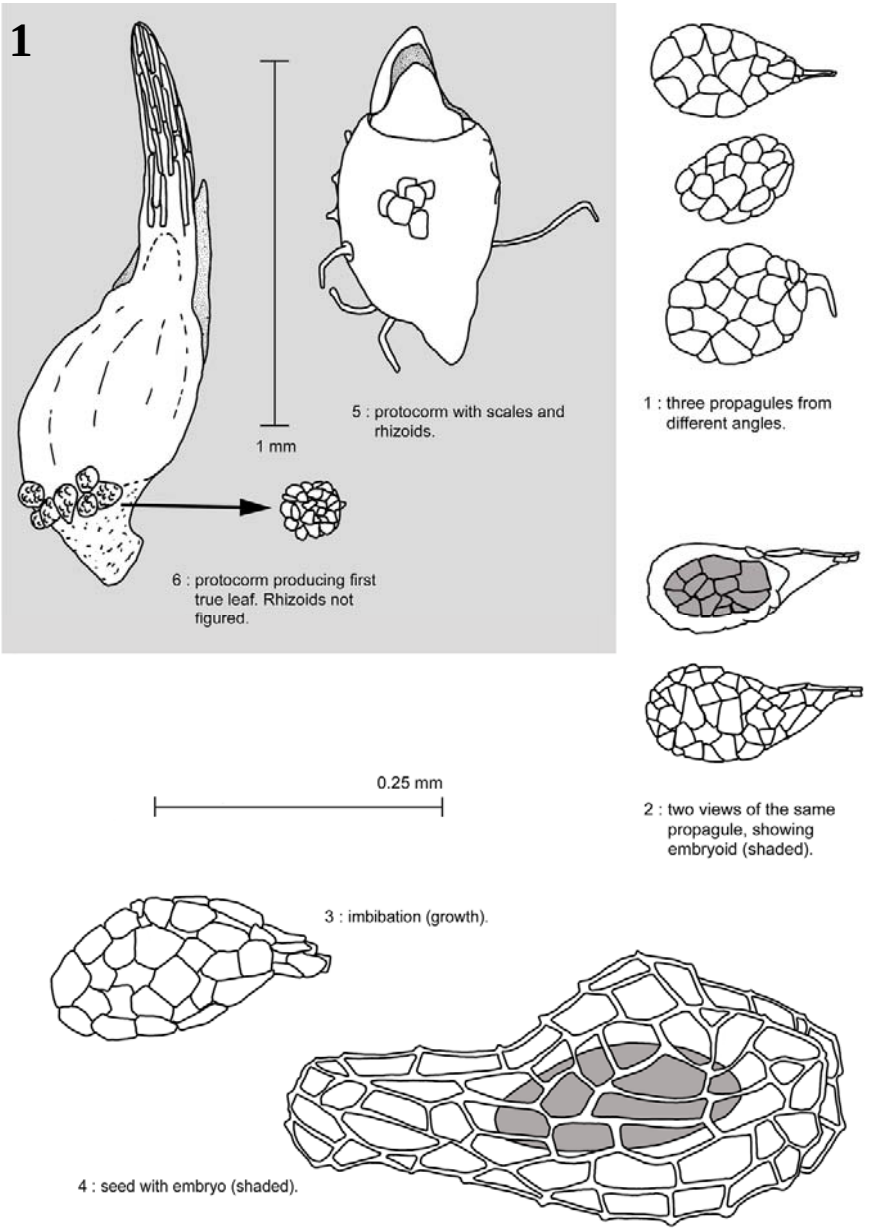

Figure 1. Under the microscope the propagules had the appearance of embryos in a translucid envelope, the whole measuring 0.20 - 0.25 mm in length. The scaled drawings show these are much smaller and have a different shape than seeds.

Spiranthes lucida. Photo: Roger Latour

Photos to accompany 'Report on the 5th Annual NOC Meetings' by Ron Coleman (page 1).

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Attendees at the NOC, Inc. annual meeting visited sites in southern Oregon and northern California. The attendees were divided in two groups and each group visited a different area. This strategy helped NOC, Inc. members to reduce the impact of many feet and many vehicles on a single habitat, and it gave the groups a chance to interact closely with each other and with the leader.

Photos to accompany ‘Report on the 5th Annual NOC Meetings’ by Ron Coleman (page 1).

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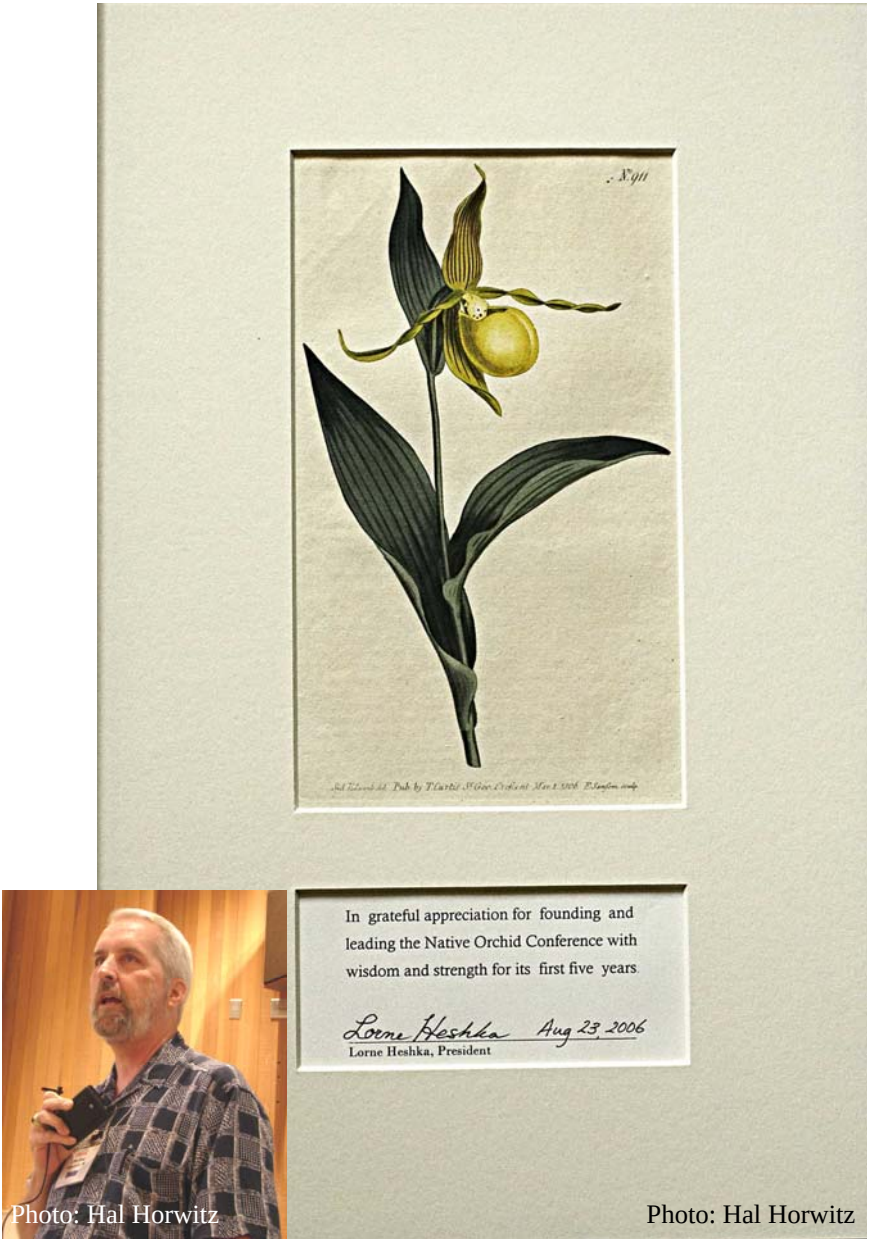
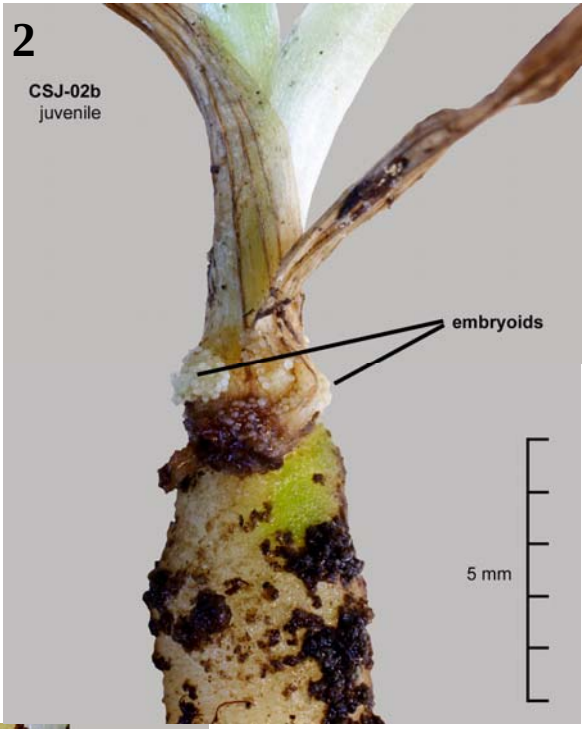


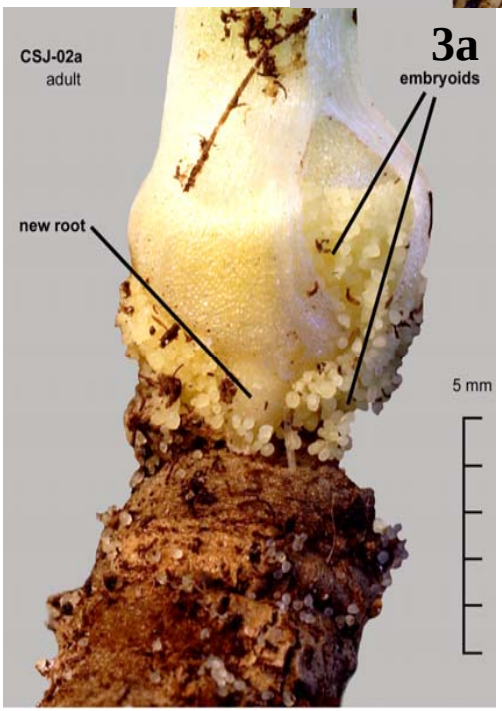
Photo to accompany 'Report on the 5th Annual NOC Meetings' by Ron Coleman (page 1). A token of appreciation was presented to the outgoing President David McAdoo (inset) for his strong leadership during the first five years of NOC, Inc. The organization's gift to David was a matted and framed antique 1806 print of *Cypripedium parviflorum* var. *pubescens*.

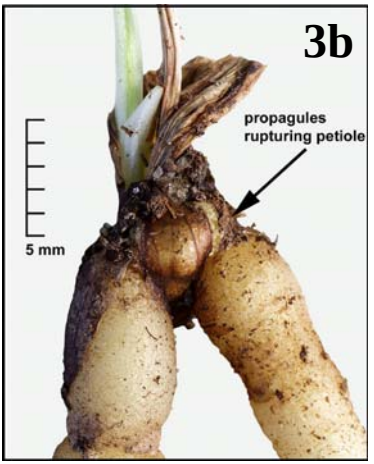
Figure 2 and 3 from 'An alternative mode of reproduction for *Spiranthes lucida* (H.H. Eaton) Ames' by Roger Latour (page 7).

2. A single-root juvenile plant with embryoids.

3. After anthesis, a mature plant producing embryoids on the overwintering growth. New roots seen with adhering propagules. Split petiole (3a and 3b) shows the site of production of the propagules.







part of the specimen, whereas other juvenile plants were scattered a few centimeters away. Laboratory examination of that "clumped" specimen showed that the plants forming it had all their roots intertwined. Careful cleaning of the adhering substrate and separation of the plants revealed that the clump was composed of :

⇒ one mature double blooming plant (joined by a rhizome that had two of its buds develop). Leaf length: 11 - 13 cm.

⇒ three "free" (i.e., not showing any rhizome connection) mature, blooming plants. Leaf length: 11 - 13 cm.

⇒ ten "free" juvenile plants. Leaf length: 3 - 4.5 cm.

⇒ three "free" rootless plantlets. Leaf length: 1 -1.5 cm.

Examination was suspended in view of the fragile and fast-dehydrating roots (more so than other *Spiranthes* species) requiring immediate potting.

These plants were then put in cultivation under artificial light. Two months later in September, as I was removing the dried leaves before setting the plants for cold treatment, I noticed a cream-colored unidentified "granular powder" all around the base of all the plants between the leaf abscission scars. More such grainy material was found between the roots. Under the microscope this material had the appearance of embryos in a translucid envelope, the whole measuring 0.20 - 0.25 mm in length. As the scaled drawings (Figure 1; page 8) show these are much smaller and have a different shape than seeds. It should also be noted that all juvenile plants (Figure 2; page 16) had produced the same material. Also found were a few protocorms, some showing an apex producing scale leaves, others having true leaves. The protocorms were covered with rhizoids and these showed penetrating hyphal strands.

Although no laboratory culture of these embryo-like structures was undertaken, the full set of age classes and generations observed (from embryo-like structures, some imbibed, protocorms, juvenile, to blooming plants; Figure 1) seems to indicate a new mode of reproduction for *S. lucida.* The developed propagules (protocorms) were likely from an earlier production and were missed by the initial incomplete examination in July 2005.

The growth and proliferation of the hundreds of embryo-like structures is important enough to produce bulges all around the base of the plant a few millimeters below the soil surface. These sac-like structures have a decidedly outward and downward growth and eventually the petioles will be (presumably) punctured by the pressure of these. This is also the region where roots will later emerge, dragging some adhering propagules deeper in the substrate

(Figure 3; page 16). Further inquiry is needed to establish whether the propagules are produced by meristematic activity at the internodes (on the stem) or by the inner surface of the petioles themselves.

Initial verification at the herbarium at MT (Montréal, Marie-Victorin Herbarium) revealed that some desiccated specimens also had these propagules. With minimal intrusion their observation in the field is done by gently scraping with the back of a blade, the substrate away from the collar of the plant. Then, careful removal of any senescing leaves might help. Examination with a 10x magnifier or a good photographic macro-lens is perhaps necessary. It is of course helpful to choose plants in colonies that show some "clumps." The optimal moment is apparently after anthesis in September. It is yet unclear why some plants in herbaria or *in situ* show the phenomenon and some do not. Inquiry into a possible distribution pattern of this variation might be of interest.

Another interesting possibility, in view of the frequent shore habitat of the species, is that these embryo-like structures are involved in a hydrochoric mode as suggested for *Malaxis paludosa* (Taylor, 1967). This means of dissemination may explain the rather clearly established riparian habitat of *S. lucida* and its distribution pattern linked to drainage basins (watersheds). Plants outside such watersheds may be the product of anemochory. The colony discussed here was located between two documented stations in a typical habitat along such a watershed. The plants were under about a meter of water this spring.

It should be noted that although previously undocumented for North America (except for the elusive *M. paludosa)* such vegetative reproduction is known from two other *Spiranthes* species in Eurasia and Asia-Australia: *S. aestivalis* and *S. sinensis* (Mrkvicka, 1999; Rasmussen, 1995).

Different terms are used for vegetative propagules in orchids: adventive embryos, brood buds, buds, bulbils, bulbs, etc. Reproductive structures in *Malaxis paludosa* were earlier named "foliar embryos" (Taylor, 1967). Flora of North America uses "gemmae" for these. That term is also used for a variety of structures in algae, bryophytes, pteridophytes, and angiosperms.

Gemmae in *Malaxis paludosa* bear primordia of leaves (Batygina et al., 2003). The propagules of *S. lucida* have no leaf primordia and apparently show parallel development to the seeds in going through a protocorm stage.

A recent proposal to distinguish asexual embryos that are morphological analogs to sexual embryos is the term "embryoids" (Batygina, 2005) which may more aptly apply to the somatic "embryo-like" reproductive structures here discussed.

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Specimens bearing embryoids seen at Marie-Victorin Herbarium, Montréal (MT):

Ontario. Grey County (1490), damp springy river bank, Loc. 462. Egremont Tp., on Sangeen R., 6 mi North of Mount Forest, 11July 1957, J.H. Soper and G. Fleischmann 6480.

Ontario. Carleton County, March Twp., 3/4 mi North of Shirley Bay along Ottawa River, 14 August 1947, W.J. Cody and J.A. Calder 642.

Rhode Island. Providence County, open pasture near middle quarry Limerock, Lincoln, 9 June 1921, J. Franklin Collins (s.n.).

Indiana. Whitley County, foggy sandy marl border of the north side of New Lake, about 9 miles northwest of Columbia City, rather frequent here, 1 July 1924, Chas. C. Deam collector 40 771.

Maine. Alfred, Notre-Dame Institution, lake shore, 30 June 1933, F. Cléonique-Joseph 5579.

Maine. Somerset County, valley of the Kennebec River, 24 July 1916, M.L. Fernald and Bayard Long 13335.

New York. Madison County, Peterboro, marly wet soil, 23 June 1928, H.D. Honse 15901.

Names, Names, Names – Why the Confusion?

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One of the biggest challenges for amateur orchidologists is nomenclature. Old names of familiar species change from time to time, which makes it challenging to remember all the names and hinders clear communication with our peers.

The purpose of this article is to discuss some reasons for changes in plant names, why the same plant may be given different names in various publications, and to recommend that the Native Orchid Conference Inc. adopt a standard nomenclature for North American orchids for all its publications, including this Journal.

Background

Because the human brain has limits, we have a need to pigeonhole facts; it is the easiest way to remember and make sense of information. Some say our brain is wired to group things. As an example, we meet a new person and exchange names. We then hope to remember names in the context of time, the situation surrounding the meeting and the relationship of this person to other acquaintances. This is all to put the person we just met (by means of a name) into a framework.

Similarly with plants, we meet a plant and immediately want to categorize it. After all, we think Linnaeus already did this for us – he put things straight, right? The ultimate goal of plant taxonomists is to name every plant, and place it in natural groupings in relation with other plants. If we hear the name "*Spiranthes* …," we immediately bring up an image from memory, along with our understanding of a number of its close relations. Depending on the level of sophistication of the listener, additional information pops onto the mental screen – the group of genera associated with the genus *Spiranthes*, its family name, the characters used to differentiate this genus from others, etc. This concept is noble; however, is it practical to think the universe can be so simplified? In other words, is it possible that we can assign a clear and unambiguous name to every plant we meet, a name that would encompass and elucidate its relationship with all other plants? Experts suggest that the answer is mixed. Yes, we may come close to perfection, but we will never get every plant absolutely pigeonholed. Dr. Robert Dressler, a top expert in orchid classification, provides a good description of this dilemma (Dressler, 1981, 1993). As Orchidaceae is "…a family in a state of active evolution, we find 'good species,' semispecies, and variable complexes, just as one would expect." Given that the planet was not populated with a group of plants that never changed, Dr.

Dressler's comments explain in part why it is so difficult to determine exactly into which pigeonhole to place every specimen we find. Furthermore, there is, as yet, no agreement on what constitutes a plant species, either biologically or conceptually.

Why Names Change

A plant might be described in the literature as a new species when it is only a variant of a recognized species. In the past decade, several North American orchids described in botanical journals as either species new to science or new to North America were found, in fact, to be merely examples of formerly recognized species.

Each of us has come across a plant that looked a little different from our concept of an existing species. Our heart goes a little faster and we are nearly certain we have at least a new variety and perhaps a new species. Then we learn that great lesson in field botany – do not rush to judgment until you see and study a species across all its range, in all its habitats. All species have a range of size, color, and sometimes, of habitat or pollinator. In addition, the descriptions we read in our available texts do not have room to describe the total scope of possibilities. Species names consequently represent approximations.

This brings us to the subject of lumpers and splitters. Some investigators have a tendency to split species or varieties or forms into ever-smaller divisions of pigeonholes, based on smaller and smaller degrees of differences. Others tend to conceptualize species as having more variability and are reluctant to create more taxa. In the end, each of these points of view indicates a personal concept of the natural arrangement of plants.

Two facts about lumpers and splitters have become apparent to me. First, neither a lumper nor a splitter will agree to being confined by that title; all investigators believe their concept gets us closer to the truth. The second attribute is that often a taxonomist will be a splitter as regards some botanical groups and a lumper in others. In many cases, it depends on the individual's area(s) of interest.

Recent wholesale changes in botanical nomenclature have resulted from genetic research. Although it appears that the orchid family has experienced many changes, other families were revised more dramatically. Nearly all investigators believe that DNA analysis and other molecular techniques can help us determine plant family, genus, and species with more scientific objectivity than before. Molecular research, however, remains but one tool, along with morphology, chromosome study, systematics, and statistical study (Bell, 1998), as well as pollination. A clear explanation of DNA research and overview of its use is presented in the preface to Volume 1 of *Genera Orchidacearum* (Pridgeon et al., 1999).

Names are changed officially when historical study determines that an earlier applied name has priority. In other instances, it is a matter of better understanding from continued study. In state and regional floras, old names may be retained simply because an author is not familiar with the other names.

In frustration, some suggest that Luer's texts are the gold standard, and that we should just stick with it for nomenclature. While true that Carlyle Luer's texts were landmarks thirty years ago, much new information has been generated since then. It is instructive to note that Dr. Luer used nineteen new name combinations in his text – quite a number of changes. In the decades following his work on North American species, Dr. Luer has gone on to describe hundreds of new species of tropical orchids – all as a result of enormous intellect and great insight and study. Luer's life work exhibits perfectly that nomenclature is not static, and this is a lesson for all of us.

Regardless, all this discussion does not help the poor orchid enthusiast cope with the variety of names used for the same plant and the changes that continue to be published. However, I hope it explains some reasons why names change and why experts may disagree.

Conclusion

Based on this understanding, we should accept that orchid taxonomy is changing; it always has and most likely will continue to evolve for some time to come. In addition, as a rule, general sources will not be as accurate as more specialized ones. We should also recognize that variation in nomenclature amongst authors reflect honest differences. The bottom-line is that each botanical author uses a naming scheme that reflects their personal concept of species, genus, and family. There may be different names for a plant in print at a given time; the one accepted by most experts generally indicates the concept most acceptable.

While all individuals are free to subscribe to their favorite concept, the use of different names by various authors leaves most readers confused. Because the primary benefit of botanical names is the ability to communicate and understand one another, the Native Orchid Conference, Inc. should adopt a standard reference for its publications. To achieve clarity and unambiguous communication, a standard is essential. Other organizations, notably The American Orchid Society, have adopted such a position for just this reason. Adopting a standard will not stop name changes, but it will provide a sorely needed reference point.

There is no shortage of possible sources; however, two major resources top the list – *Flora of North America* (http://efloras.org/florataxon.aspx?flora_id=1&taxon_id=10638)

and World Checklist of Monocots, established by the Royal Botanical Gardens, Kew. There are valid reasons for considering Flora of North America – experts in North American orchids compiled it and it provides keys, descriptions and discussions, not just names. It is also available online. World Checklist of Monocots, established by the Royal Botanical Gardens, Kew, on the other hand, is only available online, and is primarily based on the molecular work done by Kew scientists.

A truism in any field is that those who know a subject best are those who study it in depth. Those of us attending the annual NOC meetings in Ashland heard a report by one North American researcher, detailing different conclusions from Kew's list. When asked why the changes suggested by Kew did not agree with his conclusion, the investigator pointed out that his research was based on the use of North American plant material.

My recommendation to the NOC, Inc. is to use the Flora of North America as the basis for its reference standard. To keep this standard list current, a small group of North American orchid taxonomists could be assembled to review the standard list as needed. The up-to-date version could also be posted on the NOC website for all members and authors.

The benefits of using this standard will reach far beyond those who read our publications. The NOC Internet Discussion Group is a lively source of communication, and a standard reference point will help a wider group of native orchid enthusiasts remain up to date as well.

Acknowledgement: I gratefully acknowledge the assistance and guidance from Dr. Charles Sheviak. He offered many suggestions and good counsel. Most good points in this article can be attributed to him; all errors, including judgment and conclusions, are attributable to me.

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END NOTES

Case wins Keenan Award

Hal Horwitz

The American Orchid Society announced that Fred Case, author of *Orchids of the Western Great Lakes Region* (1964, 1987) was the winner of the Philip Keenan Award. The award, named for an accomplished photographer and author, Philip Keenan, who died tragically of ALS, recognizes individuals, groups or organizations for work in the field of Native Orchids.

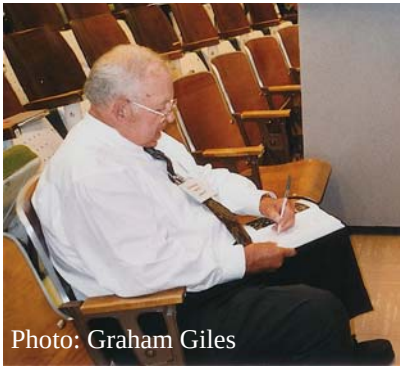

Photo: Graham Giles

Fred's qualifications, as enumerated by his nominator, Dr. John Freudenstein of Ohio State University, encompassed three areas. As an author, his book *Orchids of the Western Great Lakes Region* is the model for all regional orchid treatments to this day. It remains unmatched for scholarship, description and depth and breadth of personal understanding of the species and their habitats. In addition, he published many scientific papers on native orchids.

As a teacher, Fred excelled. Winning teaching awards during his long career was a testament to his engaging style and personal interest in students. Dr. Freudenstein, a student of Fred's in high school, is but one of many scientists inspired and nurtured by the orchid man from Saginaw, Michigan. Beyond the classroom, Fred has taught and lectured across North America and Europe and is eagerly sought out by botanical groups on both continents. Many of us were fortunate to hear him give a fabulous presentation at our annual NOC meeting in Canada three years ago – what a *tour de force*.

As a conservationist, Fred has made significant contributions to preservation of orchids in the Great Lakes region and served as consultant to the State of Michigan Department of Natural Resources and other organizations. He also established a Nature Conservancy Preserve in Alabama in memory of his late wife, Roberta.

Fred has touched many lives in his career, and his life long legacy benefits all of us and the world of native orchids. Thank you, Fred, for all you have accomplished; we bask in your light.

NOC, Inc. 2007 Annual Conference

Please book the dates on your calendar for our next annual meeting in South Florida! The 6th annual NOC, Inc. meetings will be held **14-17 April 2007** at the University of Miami in Coral Gables, FL. The presentations will be held on the 14th and the 15th, while the field trips are scheduled for the 16th and the 17th.

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