

The Native Orchid Conference Journal



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Photo: Lorne Heshka front cover

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Native Orchid Conference Journal is published four times a year by the Native Orchid Conference, Inc., a non-profit [501(c)3] organization, as a service to its members. The organization is devoted to fostering the study, conservation, and enjoyment of orchids native to North America. Membership dues are \$25, \$30, and \$35 for individuals, families, and international subscribers, respectively. Address inquiries about membership, back issues of this journal, and requests for copies of the bylaws to the Treasurer: Christine Fleissner, NOC, Inc., P.O. Box 29010, Greensboro, North Carolina 27429-9010, USA; nativeorchids@yahoo.com OR ncorchid@yahoo.com.

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President's Message

When David McAdoo and I started the Native Orchid Conference in 2002, I envisioned an organization with memberships not only from the United States and Canada but also from many other countries. I hoped that we would publish a journal with at least an annual issue and hopefully quarterly issues. All of these hopes have been realized during the past eight years.

Under the leadership, first of David and then Lorne, we have grown considerably and are in excellent financial condition. Since our initial conference in Greensboro, NC we have held conferences in various regions of the United States and Canada and this year we celebrated our ninth consecutive successful conference.

I am honored and excited to accept the office of president and with the help of Vice President Phil Oyerly, Secretary John Horner, Treasurer Christine Fleissner, and the remaining board members I would hope to work along these same lines to sustain the continued growth of the organization. The officers and board of directors will need the help of each of our members to achieve this.

My first request will be asking each of you to help by please recruiting at least one new member! We will be contacting many of you in the future to assist the Native Orchid Conference with these goals.

Our primary contact with the membership is through our "Journal." Under the editorship of Dr. Jyotsna Sharma this publication has evolved into a fountain of native orchid information that we all enjoy receiving each quarter. Due to new commitments, she has relinquished this duty and, starting with this issue, Dr. Duane Erdmann will assume the editorship of the "Journal." Please feel free to contact Duane or any member of the publication committee with articles, comments, or suggestions. "The Native Orchid Conference Journal" is no better than the support we get from our membership.

I look forward to seeing everyone in Delaware in 2011. The dates for our next conference are July 30 – August 2, 2011 at the Mt. Cuba Center. Please save these dates and plan on attending what looks to be an excellent conference. We are still looking for someone to host the 2012 conference with the Mid-America region a top destination request. If there is someone from the Missouri area willing to help please contact either Phil Oyerly or myself.

I am always available to talk with the membership so if you have any compliments, suggestions or complaints please contact me at rmarkrose_2000@yahoo.com or call me at 336-288-6558. If you use Skype, my user id is trilliumboy.

In Orchids, Mark Rose

A Message from the Past President

Lorne Heshka

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It has been a pleasure to serve as President of the Native Orchid Conference Inc. for the last four years! The commitment to our group by the general membership has been outstanding and the growth and development of our organization has been encouraging.

Annual conferences in different areas of the continent are an annual highlight, and, over the last four years, have been held in Oregon (2007) – chaired by Carol Ferguson, West Virginia (2008) – chaired by Scott Shriver, Wisconsin (2009) – chaired by Kip Knudsen, and most recently in Alberta – chaired by Ben Rostron.

The organization of each conference was unique, reflecting the style of the individual committees. The presenters selected have challenged us to look at orchids from a different perspective and more importantly – to learn about significant ongoing research activities. Conservation is always a significant theme. Through well organized field trips, we have experienced unique orchid habitats and have observed a number of orchid species that were new to many of us. These conferences are as much about the people as they are about the orchids, and they provide us with the opportunity for renewing our friendships and making new friends. On behalf of the membership, I would like to express our gratitude to all conference organizers along with their support staffs for a job well done!

Proceedings of the 2009 Wisconsin Conference have been published. The document is entitled “North American Native Orchid Conservation - Preservation, Propagation and Restoration.” This is an excellent reference for each one of us and any others who are considering conservation projects. Thanks, Kip, for all of the effort that went into this publication!

The 2010 conference included presentations at the University of Alberta in Edmonton and field trips at Wagner Bog near Edmonton and in the Jasper area of the Rocky Mountains. An excellent array of speakers, a fantastic display of orchids, incredible scenery and perfect weather contributed to a conference we won't forget! Thanks, Ben!

As our name implies, the annual conference is the principle reason our organization exists. However, other significant activities are ongoing.

A “Conservation Committee” chaired by Kip Knudsen ensures that we are committed to our responsibility in protecting not only the plants we love, but also the environment in which they are found. This committee ensures that we properly support conservation activities like the “1% for Conservation” and, for those who wish to grow native orchids, a list of vendors that sell laboratory propagated plants has been created.

Bob Sprague chairs a “Publicity Committee” which has been instrumental in advertising Native Orchid Conference Inc. through a number of venues. Bob began by organizing presentations and a comprehensive photographic display of North American native orchids at the 2007 annual orchid show of the South-eastern Pennsylvania Orchid Society. From that original collection of photographs, he created a traveling display that is available for use at tropical orchid shows and other appropriate venues. This display has been used at a number of orchid shows across the continent, including the prestigious World Orchid Conference in Miami. As a tropical orchid grower, Bob has established a connection with the American Orchid Society (AOS). The monthly “Orchids” journal, published by AOS, now regularly features articles on native orchids written by our members. Bob was also instrumental in setting up an “open” website.

We are all familiar with our quarterly Journal. Jyotsna Sharma has been the editor of the “Journal” for a number of years and, along with her editorial and publishing committee, has done an outstanding job of gathering and publishing articles. Most of these articles originate from our members. Because of increased work commitments, Jyotsna has asked to be relieved of this responsibility. Thanks, Jyotsna, for your years of dedication to the “Journal.” Fortunately, one of our newer members, Duane Erdmann, has agreed to take on the editor role. Please continue to support the “Journal” by providing Duane with suggestions, feedback, and articles.

Regularly, changes of personnel occur within the NOC Board, and a number of different members have served on the Nominating Committee to find people to fill these positions. To all who have been instrumental in the nomination of officers – appropriately chosen to guide our organization - a sincere “Thank you.”

It is with great satisfaction that I welcome one of our founding fathers, Mark Rose, as President of the Native Orchid Conference Inc. We are in good hands!!

Lorne Heshka



What a Day!

Cathy Bloome

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Orchid conferences are my favorite kind of vacation. This year we explored an area near Edmonton and Jasper National Park in Alberta, Canada. The first day we spent at Wagner Natural Area just west of Edmonton. Seeing hundreds of *Cypripedium parviflorum*, *Calypso bulbosa* and *Amerorchis rotundifolia* was outstanding. *Amerorchis* was a first for me. Someone even found a plant with no markings and the palest shade of pink. It doesn't get much better. My favorite part of this conference was the second day of field trips in Jasper National Park.

Anne Kotowski, Kevin Duerksen and I traveled together for the field trips. We left Edson at 8:00 am heading for Jasper. In Jasper National Park we stopped at the Overlander site and quickly photographed *Cypripedium passerinum* (Figure 1; page 13). I was happy to finally see this orchid, as this was another first for me. There were some *Cypripedium parviflorum* (Figure 2; page 13) and *Amerorchis rotundifolia* but we didn't linger. We knew it would be a long drive so we left for the Baker Lake rest stop along Highway 16. Along the way we had a pleasant photo op at Mt. Robson rest stop. Blooming lupines and other wild flowers were in a meadow with a clear view of the mountain – postcard perfect.

When we arrived there were several members already there showing us the most photogenic plants. The sign posted said this was named the Natasha Boyd Wetland Conservation Area. *Cypripedium ×columbianum*, a natural hybrid, is found here. *Cypripedium parviflorum* and *C. montanum*, the parents, are most likely no longer present. Anne and Kevin found a large population at a second site east of the rest area. Most of the plants were in prime condition. After a few hours and numerous photos we headed back.

We were undecided on our next stop. We planned to get the most from our extremely long day hours this far north. We hashed over the pros and cons during a quick dinner in Jasper. We decided on Majorie Lake trail since the start was at one end of Jasper town. By the time we started the trail it was 7:00 pm. We were in no hurry since all of the orchid guides were long gone. After all we did have the map. After a short time on the trail I announced to Anne and Kevin that this had been *Platanthera orbiculata* habitat. Sure enough Anne

quickly found two, one with a spike a few weeks from blooming. Kevin was next in finding a few *Calypsos* in good condition. Since this was the first find for this trip we all took turns photographing them. We found many more scattered along the whole trail but most were on their way out.

Our next find was *Corallorhiza maculata* (Figure 3; page 13). There were some plants in full bloom and many still in bud. We also found some *Corallorhiza trifida* but it was past prime. One section of the trail was covered with aspen, just beautiful.

I had seen several old seed capsules but no orchid plants. I wondered what they could be when Anne found some *Goodyera oblongifolia*, one had the same remaining old spike. The surrounding moss almost had grown to entirely cover the plants. Next everyone found plants of *Platanthera obtusata* (Figure 4; page 13) in full bloom. More photos were taken. Kevin found another *Platanthera orbiculata* here. Eventually we reached Majorie Lake to find complete silence. The water was still and the mountains reflected in the water. It was spellbinding. When we recovered from another photo frenzy, I started looking around the shoreline. There were many *Platantheras* just starting their spikes. We guessed that they were *Platanthera aquilonis*. Of course we were thrilled to have found some extra species not listed on the map. Finally it was time to head back; we had taken 2½ hours to walk one-way. On the return trip we kept spotting the same orchids and had a second look. By then there was poor lighting for any good photos. We tried to keep a good pace, after all Ann and I still had to set up our tents for the night.

I was leading when something stopped me dead in my tracks. It was a bull elk and blocking our way on the path. We all grabbed our cameras for the last photo session. Wow! I had never seen a wild elk before. When we had enough photos Anne started clapping and yelling with us doing the same. Well Mr. Elk decided he would only move a few feet and that was that. Who were we to object? We made a large circle around him and got back to the trail. I'll admit I was looking over my shoulder the whole way back hoping that a bear wouldn't be next.

We got back to our car at 10:00 pm. It had been 14 hours since we started that morning. We had seen ten species and one hybrid that day, three new to me. Finding orchids on your own is always a thrill! What a day!



In Vitro Seed Germination and Seedling Development, with and without Illumination, of *Pogonia ophioglossoides* (L.) Ker Gawl. From the Northern Part of its Range: A Qualitative Study

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Pogonia ophioglossoides (L.) Ker Gawl. is a widespread North American terrestrial orchid whose north-south range is approximately 1,700 km from Newfoundland to Florida. Northern habitats are characteristically very wet whereas southern habitats are often seasonally dry and may be subject to periodic burns. Light and Sharma (2010) conducted an *in situ* germination study of *P. ophioglossoides* in both a northern wetland and in a southern pine flatwood, where seeds were buried in packets within the seed source habitat and close to adult plants. They reported germination differences, and in the extent of seedling development in buried seed packets. Seeds of the northern wetland site germinated during the first two years of burial but never progressed past the early stages whereas a few of the packets buried in soil of the southern, seasonally dry, fire regime habitat contained some well developed white seedlings after two years (Light and Sharma, 2010).

There have been relatively few studies of the effect of darkness or light on germination outcome of terrestrial orchids although the concept of variable germination response to light vs darkness is not new (Stoutamire, 1964; Zettler and Hofer, 1997; Zettler *et al.*, 2000). Rasmussen *et al.* (1990) observed that seeds of the European terrestrial, *Dactylorhiza majalis* have an initial light sensitive phase but that germination of a small percentage of seeds could proceed without a requisite 14 days of complete darkness. Light (1993) reported greater germination in darkness with four species of the Australian terrestrial orchid, *Diuris*, but that two of these species were less susceptible to light exposure during the first two months after sowing. An investigation of *Pleione* germination revealed that seeds can germinate in both light and darkness but that dark-germinated protocorms fail to develop further when later removed to light (Light, 1992). In a comparative study of germination with two epiphytic Mexican orchids *Galeandra batemanii* Rolfe from moist tropical forest, and *G. greenwoodiana* Warford, which grows in leaf axils of the sabal palm in hot, seasonally dry conditions, Light and MacConaill (2003) reported that incubation with illumination had a minor inhibitory effect on germination of *G. greenwoodiana* but a positive effect on germination of the other species. They suggested that control of germination of seeds not yet in darkness within a leaf axil could be useful to a species whose habitat is seasonally dry.

Kauth *et al.* (2008) conducted an *in vitro* germination study of response to photoperiod by the widespread *Calopogon tuberosus* var. *tuberosus*. They reported that short days promoted higher germination amongst Florida populations but that no such effect could be established with seed from northern populations. Clearly, there are differences in light sensitivity within the same seed lot, between species and across populations but there is insufficient knowledge to let us predict behavior. Seeds buried in the Florida pine flatwood soil clearly were able to germinate and develop further in darkness (Light and Sharma, 2010). Would seeds of *P. ophioglossoides*, harvested from the northern wetland site be able to initiate germination in darkness but be unable to develop further in continual darkness? I knew from experiments conducted during the 1990s that seeds from northern populations of *P. ophioglossoides* could germinate symbiotically on solid media, with illumination, and at room temperature (approx. 20 C) without a need for prechilling: embryos and protocorms became green within a few weeks of sowing (Light, unpublished). I had also observed small single-leaf seedlings growing within the wet moss substrate of the northern site (Figures 1 and 2; page 14). Seedlings were approximately 4 cm long and minimally rooted within the substrate, with the leaf located within the looser living moss layer. All seedling parts were green including the root tip which suggested daily exposure to light. Given my experience with *in vitro* germination, I decided that the best way to learn if seeds could germinate and develop in darkness was to conduct a simple, qualitative screening study with seeds from the same site.

METHODS

Capsules from the northern wetland population (45.8° N) were collected shortly before dehiscence in 2007. Seeds were prepared according to Light and Sharma (2010). On October 6, 2007 dry seed was surfaced sterilized in 1:10 bleach solution for 10 min, rinsed once in sterile deionized water, and sown aseptically on replicate slants of Orchid Maintenance Medium containing agar and charcoal (P658, PhytoTechnology Laboratories). Culture tubes were stored upright in plastic zipper bags at room temperature (approx. 20 C), in either total darkness or with illumination, 16/8 h L/D photoperiod. Tubes were removed periodically for monitoring and photography. For cultures being kept in darkness, single slants were removed without exposing the other samples to light. Any samples exposed to light were so marked before being returned to the dark environment. Certain samples were re-examined periodically to obtain a photographic record for a representative development time series as with Figures 6, 7, 8, 9, 10 and 11 (page 15). One month before the experiment ended (November 13, 2008), all culture tubes, including those that had been kept in complete darkness for the entire period, were exposed to a 16/8 h L/D photoperiod at room temperature. Development was monitored over the next month then the experiment was terminated on December 15, 2008.

For the purposes of this investigation, germination was monitored qualitatively only using direct observation and photographic record. Seeds and plantlets in unopened culture tubes were photographed using an Olympus T-10 Ring Flash fitted with its polarizing Ring Cross Filter POL which minimized reflections from the glass surfaces.

RESULTS

The results are summarized in Table 1 (page 9). Seeds germinated and developed in the presence and absence of light although only those protocorms illuminated daily became green. Seedlings which had germinated in darkness and later had been briefly exposed to light for photographic purposes remained white until they had been exposed to daily illumination after 13 mo incubation. Few seeds (<10%) germinated initially with either treatment; a substantially greater proportion (>80%) had germinated after 8 mo (June 08) with illumination, and by 13 mo (Nov 08) in continuous darkness. Protocorm development was more rapid in light. Rhizoids became apparent after 1 mo with light but only after 4 mo in darkness (Figures 3, 4; page 14). A shoot primordium was clearly visible after 4 mo with illumination but only after 8 mo in continuous darkness (Figures 5, 6; page 14 and 15). The most apparent difference after 9 mo incubation was the relative size and branching of seedlings. In darkness, white seedlings had etiolated but also branched such that multiple growing points (shoot primordia) were evident (Figure 7; page 15). Light-exposed seedlings remained more compact, the first true leaves having appeared after 9 mo when the next shoot primordia became evident at the base of those leaves (Figure 8; page 15). After 13 mo incubation, when all dark-raised specimens were exposed to light, white seedlings became pale green within one week. Larger seedlings, that had been previously raised in darkness, developed leaves at their several growing points within the next month (Figure 9, 10, 11; page 15). Shoot buds and blunt root initials could be seen.

DISCUSSION

This study has demonstrated that seeds of *P. ophioglossoides* from a northern wetland population can germinate and develop *in vitro* in the presence and absence of light. Seeds were found to germinate sporadically rather than all at once with either treatment: many seeds had germinated by the end of the 13-month experiment with or without illumination. This suggests, as observed *in situ* by Light and Sharma (2010), that seeds can germinate over an extended period pointing to the possibility of a seed bank or protocorm bank strategy in both northern and southern populations. In the 2007 Pinelands Ecosystem Case Study, Delaware, IVM Partners Inc. reported that the locally rare *P. ophioglossoides* appeared one year after herbicide treatment removed competing vegetation. They suggested that seeds already present in the wetland soil had germinated. Whether these plants they observed were seedlings of recently germinated seeds or from existing protocorms, were shoots developed from dormant plants, or from plants overlooked in previous years is not known.

TABLE 1. Development stages of *P. ophioglossoides* germinated *in vitro* with and without illumination over 14 months.

TIME	LIGHT	DARK
Start Oct 07	seed	seed
1 mo Nov 07	Some germination Green protocorms; first rhizoids	Some germination Embryo white, swollen, testa intact
3 mo Jan 08	Protocorms enlarge, more rhizoids	Testa splits
4 mo Feb 08	Shoot primordium	Protocorm with rhizoids
5 mo Mar 08	Primordium develops	Protocorms worm-like, undifferentiated
6 mo Apr 08	No apparent change	Protocorms worm-like, undifferentiated
8 mo Jun 08	Protocorms elongate More seeds germinate	*Seedling with shoot primordium
9 mo Jul 08	First leaf	*Seedling elongates and branches
13 mo Nov 08	Next shoot primordia develop	*#DARK: Multiple shoot primordia on seedlings. More seeds germinate Removed to LIGHT: green within 1 wk
14 mo Dec 08	More seeds germinate	*#New leaf, multiple growing points

* The same seedling was used for photographic record.

Development stages reflect what was observed across replicates not exposed to light over 13 mo.

Light and Sharma (2010) had observed that seeds buried in a wet northern habitat germinated well initially but that there was substantial attrition after two years of burial when testae and embryos became degraded or seeds could no longer be found in packets: all seeds were dead after three years. Buried seed packets cannot exactly emulate how seeds behave once they enter a substrate. The buried packet technique was developed to assess *in situ* germination of terrestrial orchids (Rasmussen and Whigham, 1993). Packet burial places seeds in darkness and in close continual contact with the substrate. By situating packets close to adult orchids, investigators hope that some seeds are also in proximity to the orchid mycorrhiza required for germination but mycorrhizal distribution can be spotty and its presence is difficult to predict (Rasmussen, 2002; Light and MacConaill, in press). Burying packets hides them from animals, passersby, and may also shelter them from fire but the seeds must

germinate and develop in darkness. Where seed packets buried in the dense substrate of a pine flatwood had remained at their initial depth (J. Sharma, pers. comm.), those buried initially at 5 cm depth in a sphagnum wetland were found to be as much as 10 cm below the surface after three years of burial. No green protocorms were found in any packets at either site which suggests that they were not exposed to light during the course of that experiment. Seeds buried in the pine flatwood substrate germinated, a few protocorms developing substantially over three years, although their ability to survive in darkness over a longer period is unknown. Since the present investigation has demonstrated that seeds from the northern site can germinate in the absence of light, absence of light cannot explain why seedlings did not develop further in the wetland packets. A possible explanation is that packets were not at an appropriate depth for mycorrhizal interaction or were buried where no mycorrhizae were present. While adult orchid roots were in the vicinity of packets at 5 cm depth, and were occasionally found deeper, naturally occurring seedlings were located much closer to the surface. It is possible that the active mycorrhizal zone for germination and development of seedlings in such wetlands is situated above the adult root zone.

Does an orchid with widespread distribution differ in reproductive strategy across the range or is habitat type a more influential determinant as to how the species behaves in a particular situation? Kauth *et al* (2008) reported that seed germination and development was more rapid with seeds from a northern Michigan population than from Florida populations of *Calopogon tuberosus* var. *tuberosus* but that photoperiod only had an effect among Florida populations. They concluded that there was evidence for ecotypic differentiation.

Light and Sharma (2010) found that seeds of a northern *P. ophioglossoides* population were released about 75 days post-anthesis or around the time when autumn frosts were likely. Accelerated fruit maturation would be a useful adaptation if seeds had to mature before frost damaged the fruits. Being able to germinate in light would be an advantage when seeds are released into a continually moist habitat where imbibition could happen quickly for at least some seeds. Fruits of the southern Florida population dehisced approximately 135 days after blooming, releasing seeds into a seasonally dry habitat. Seeds from this habitat would have a real advantage if they could first enter into the dense substrate via cracks and fissures during dry weather, away from the risk of desiccation and fire, and later be able to germinate in the absence of light. We could speculate that if northern wetlands become seasonally dry because of climate change, *P. ophioglossoides* has considerable adaptive germination potential provided its mycorrhizal associates and companion plants can adapt also.

ACKNOWLEDGEMENTS

Many thanks to Michael MacConaill for his photographic assistance, to Jyotsna Sharma for useful comments and photograph, and to reviewers for their helpful critique.

LITERATURE CITED

IVM Partners, Inc. 2007. 2007 *Pineland Ecosystem Case Study*. Threatened and Endangered (T&E) Species Habitat Restoration. IVM Partners, Inc., Newark, DE. <http://www.ivmpartners.org/pinelands.pdf>

Kauth, P.J., Kane, M.E., Vendrame, W.A., and C. Reinhardt-Adams. 2008. Asymbiotic germination response to photoperiod and nutritional media in six populations of *Calopogon tuberosus* var. *tuberosus* (Orchidaceae): Evidence for ecotypic differentiation. *Annals of Botany* 102 (5): 783–793.

Light, M.H.S. 1992. Raising Pleiones from seed. *The Orchid Review* 100: 7–10.

Light, M.H.S. 1993. Germination of *Diuris* seed...Does darkness matter? *Orchids Australia* 5 (2): 51–53.

Light, M.H.S., and M. MacConaill. 2003. Seed characteristics and asymbiotic germination of *Galeandra batemanii* Rolfe and *G. greenwoodiana* Warford. *Lankesteriana* 7: 141–144.

Light, M.H.S. and M. MacConaill (in press). The role of common orchids in appreciating the complexity of biodiversity conservation. *Proceedings of the Third Scientific Conference on Andean Orchids*.

Light, M.H.S. and J. Sharma. 2010. Comparison of *in situ* germination of *Pogonia ophioglossoides* in the northern and southern parts of its range. *The Native Orchid Conference Journal* 7(2): 12, 21–24.

Rasmussen, H.N., Andersen, T.F., and B. Johansen. 1990. Temperature sensitivity of *in vitro* germination and seedling development of *Dactylorhiza majalis* (Orchidaceae) with and without a mycorrhizal fungus. *Plant, Cell and Environment* 13: 171–177.

Rasmussen, H.N. 2002. Recent developments in the study of orchid mycorrhiza. *Plant and Soil* 244: 149–163.

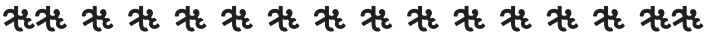
Rasmussen H.N. and D.F. Whigham. 1993. Seed ecology of dust seeds *in situ*: a new study technique and its application in terrestrial orchids. *American Journal of Botany* 80: 1374–1378.

Stewart, S.L., and M.E. Kane. 2006. Symbiotic seed germination of *Habenaria macroceratitis* (Orchidaceae), a rare Florida terrestrial orchid. *Plant Cell, Tissue and Organ Culture* 86: 159–167.

Stoutamire, W.P. 1964. Seeds and seedlings of native orchids. *Michigan Botanist* 3: 107–119.

Zettler, L.W. and C.J. Hofer. 1997. Sensitivity of *Spiranthes odorata* seeds to light during *in vitro* symbiotic seed germination. *Lindleyana* 12: 26–29.

Zettler, L.W., Sunley, J.A., and T.W. Delaney. 2000. Symbiotic seed germination of an orchid in decline (*Platanthera integra*) from the Green Swamp, North Carolina. *Castanea* 65: 207–212.



2011 Native Orchid Conference

Mark your calendar for this exciting event.

Dates: Saturday, July 30 – Tuesday, August 2, 2011

Mt. Cuba Center, located in northern Delaware, will be hosting the 2011 Native Orchid Conference.

The July 30 and July 31 lectures and presentations will be held at Mt. Cuba Center.

On August 1 and August 2 we will go on field trips to observe native orchids in their natural and varied habitats within the region.

Priority Registration will be open for NOC Members Only from mid February to mid March 2011.

After that date the general public will be invited to fill any of the remaining limited slots. When you receive registration material, be sure to promptly reply!

If you can extend your stay, the region offers many beautiful gardens and historic sites.



Habenaria cillaris, by Robert Brown

I will post more information as we approach the event.

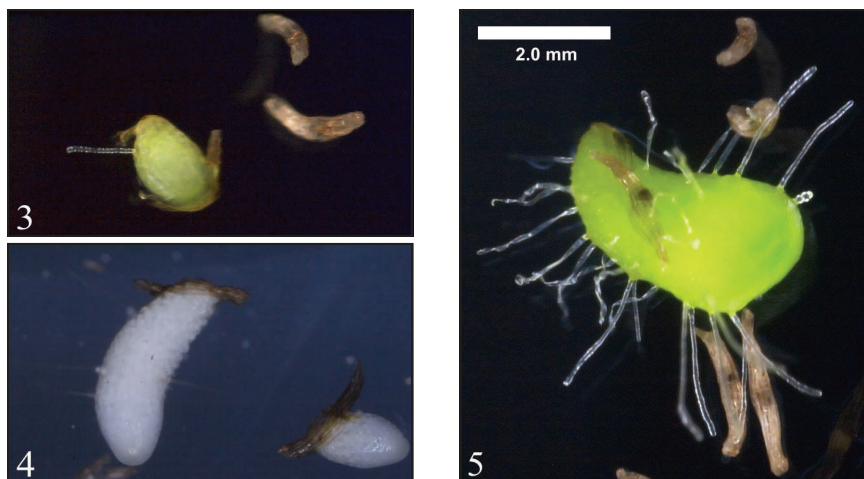
Phil Oyerly, poyerly@mtcubacenter.org

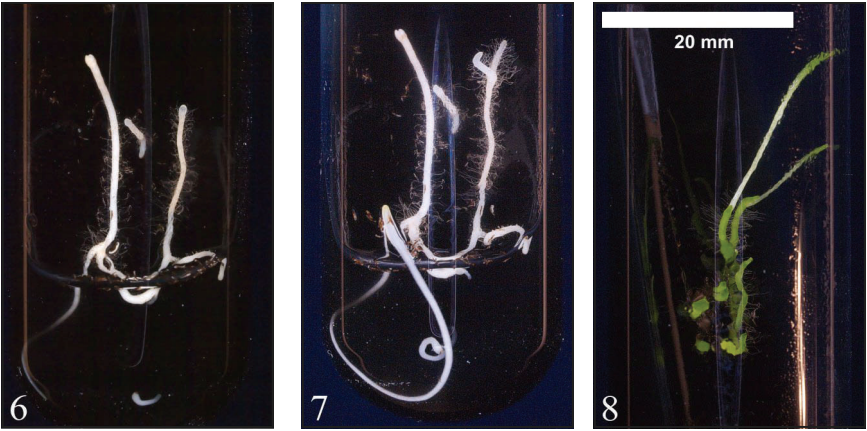
Figures to accompany “What a Day!” by Cathy Bloome (page 4).

Images: Cathy Bloome. 1. *Cypripedium passerinum*, 2. *Cypripedium parviflorum*,
3. *Corallorhiza maculata*, 4. *Platanthera obtusata*

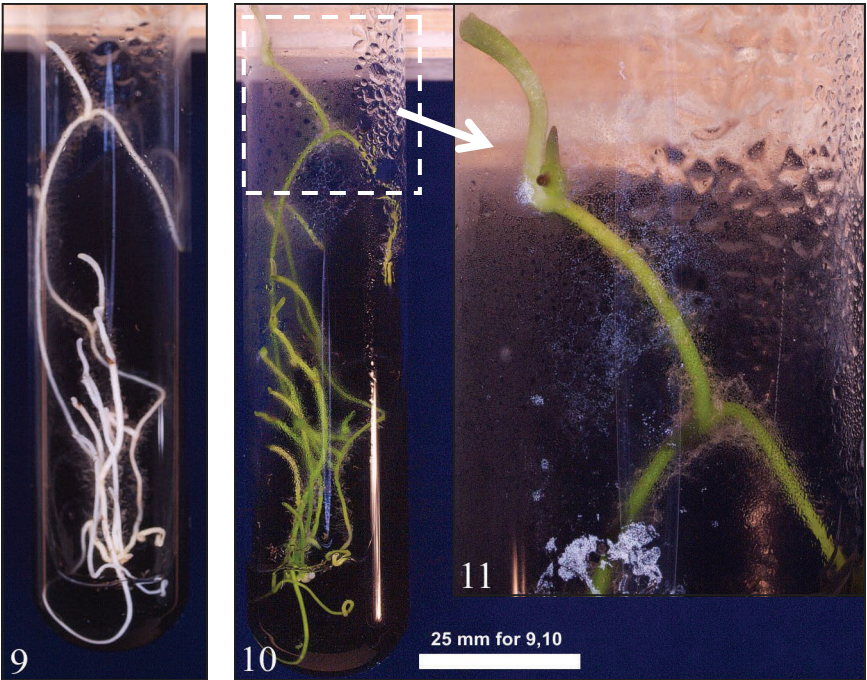


Figures to accompany “In Vitro Seed Germination and Seedling Development, with and without Illumination, of *Pogonia ophioglossoides* (L.) Ker Gawl. From the Northern Part of its Range: A Qualitative Study” by Marilyn Light (page 6). Images: Michael MacConaill.





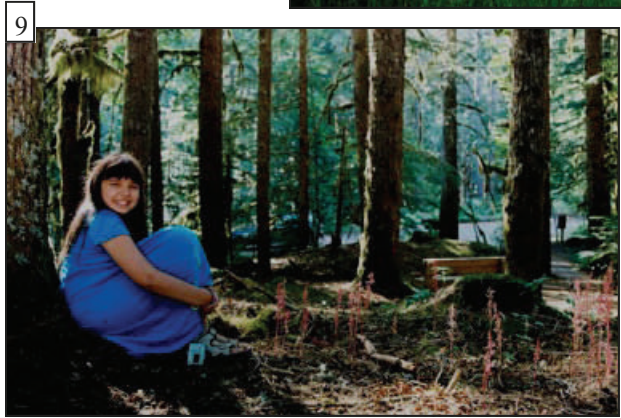
Figures 6 to 8: 6 – *P. ophioglossoides* shoot primordium after 8 mo in darkness; 7 – Figure 6 seedling after 9 mo in darkness showing root, branched stem and multiple growing points; 8 – *P. ophioglossoides* with illumination; leaf development after 9 mo. Scale bar: 20 mm.



Figures 9 to 11: 9 – Figure 6 seedling after 13 mo in darkness; 10– Figure 9 seedling after one month of daily illumination; 11 – Inset from Figure 10 showing leaf, shoot bud and root initial. Scale bar for 9 and 10: 25 mm.

Figures to accompany “ A Family Orchid Vacation to the Western United States—Part 2” by Tom Nelson (page 21).

Images: Tom Nelson 7. *Cypripedium montanum*, 8. *Platanthera dilatata* var. *dilatata* habitat, 9. Johanna with *Corallorhiza mertensiana*, 10. *Piperia unalascensis* f. *olympica*,



11. Author photographing *Piperia transversa* (Photo by Johanna Nelson), 12. *Epipactis gigantea*,



Figures to accompany “The Many Forms of *Amerorchis rotundifolia*” by Lorne Heshka (page 29).

Images: Lorne Heshka. 1. Typical habitat in southern Manitoba, 2. Close up of a typical *Aos. rotundifolia*.



3. Spots of the lip have coalesced on flowers in Churchill, Manitoba, 4. *Aos. rotundifolia* f *lineata* from Kootenay National Park, BC, 5. forma *immaculata* from same location, and 6. variation from Churchill, Manitoba



7. *Aos. rotundifolia* f *rosea*, 8. paler form, 9. forma *beckettiae* (Photo by Trish Shearer and Bill Hildebrand), and 10. forma *wardii* with its fine misting of tiny spots on the lip.



A Family Orchid Vacation to the Western United States

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Part II ¹

Today, July 7, 2009, we were headed for Bend, Oregon. Luckily for us, Crater Lake National Park was on the way. I had read up on the park and was hoping to hike the two wildflower trails that the Park Service maintains where there are several species of orchids listed. I didn't realize that the elevation at the rim of the lake is well over 8,000 ft; most of the trails were still under snow and were not even open. So we hiked one of the rim trails instead and were amazed with the incredible beauty of this park. I've never seen water the color of Crater Lake anywhere else. Something about how it reflects the sky is truly mesmerizing. Thankfully many proposals for building restaurants, trams, lodges and other foolish things in the caldera have never been approved, and the lake itself remains wild and is accessible only by taking an arduous hike many hundreds of feet down, and then, of course, back up. Bravo! We sat on one of the overlooks for a long time just soaking in the serenity.

After our afternoon idyll ended, it was on to Bend and a dinner appointment with Kermit and Donna Williams, Bend residents and our Oregon orchid guides. I had helped Kermit with information about orchid sites in Manitoba, and he repaid the favor with some great Oregon orchid sites. Located on the eastern slopes of the Cascade Mountains, Bend is an attractive town, and we enjoyed a nice dinner in a restaurant overlooking the scenic Deschutes River that runs right through its center. After getting acquainted and exchanging many orchid-hunting stories, plans were made for a trip the following day to central Oregon to hopefully find *Cypripedium montanum* (mountain lady's-slipper) still in bloom at this late date.

Central Oregon is high desert that gives way at the higher altitudes to montane forest. Sparsely populated, the scenery is terrific. As we crossed the Ochoco Mountains in July, we were amazed by the abundance of roadside wildflowers. Scarlet gilia, penstemon, Indian paintbrush, balsamroot — the spectacle was incredible! I glimpsed a wet meadow that was loaded with *Platanthera dilatata*. I made a mental note to stop there on the way back.

1. Part I was printed in Volume 7 (2). Other parts will follow in subsequent issues.

Our first stop was at John Day Fossil Beds National Monument and the Painted Hills. Beautiful reds, yellows, blues, greens and lavender are all mixed in stripes on barren desert hills that are volcanic in origin. Ron Parsons had told me to watch for the stunning *Calachortus magnocarpus* (green-banded mariposa lily) in this area, but we couldn't locate any plants. As we drove on eastward I suddenly spotted – at 70 mph – the unmistakable blossoms of the mariposa lilies in all their glory on a sagebrush covered hillside along the highway. I started frantically honking at Kermit, who was leading the way and we turned around and found a place to pull over. Swaying in the breeze, the blossoms were an indescribable shade of lavender and were very large, at least as big in circumference as my camera lens.

After checking into the Best Western in John Day, we headed south into the nearby Strawberry Mountains to the *Cypripedium montanum* (Figure 7, page 16) site. The road climbed up through a steep canyon and then leveled out at about 8,000 ft. into beautiful ponderosa pine parkland. We followed Kermit down a side road and parked the cars at the beginning of a two-track dirt road which we followed into the forest. We soon started seeing a lot of lady's slippers but it was immediately apparent that most of them were about a week past. The previous week's heat wave had apparently pushed them over the hill. But what a site! Hundreds, if not thousands of plants, were growing in a dry balsam fir/ponderosa pine forest, with many quite tall double-flowered plants and countless seedlings. My quest was now almost complete. Except for the two Alaskan species, I had now seen all of the North American *Cypripedium* species in the wild.

Kermit and I scoured the area and found quite a few plants – maybe 25% – that were still in pretty good condition, and one group of prime plants was found deep in the shade, which we set about photographing eagerly. Thank heavens! It would have been disappointing to drive 3,900 miles only to find everything out of bloom. Kermit is a fascinating individual who has, amongst other things, climbed all of the major peaks in Oregon. He is an accomplished nature photographer as well and it was a great learning experience to be in the field with him. Donna, a retired veterinarian, is his equal as a nature lover and outdoors-person. Today she was kindly helping Jackie entertain the kids while the boys searched for the perfect specimen.

The plants and flowers of *Cypripedium montanum* are much smaller than I had expected but are nonetheless very beautiful. Pure white lips contrast with purple or green sepals and petals. The inside of the slipper is accented with attractive maroon striations and the bright yellow column with maroon spots highlights the entire flower, which is sweetly fragrant. Also present in the forest were many *Goodyera oblongifolia* and a few *Piperia unalascensis*. Mixed in with huckleberry (*Vaccinium parvifolium*) and *Arnica cordifolia*, the cyps are one of the dominant species present in the forest understory; the numbers here rival some of the populations of *Cypripedium parviflorum* var. *pubescens* that

I have seen on the Bruce Peninsula in Ontario and the limestone barrens of Newfoundland. The site is on National Forest land and is obviously an open range area. Cattle trails run throughout the habitat, which doesn't seem to bother the lady's-slippers at all. They are actually most plentiful in some of the disturbed areas where there is little competition. Kermit is a member of the Oregon Native Plant Society and tells me that the society members check the logging bids very carefully each year to make sure that this incredible site is not on the list and are determined to protect it. When it became too dark to photograph any longer, we headed back to the cars where the ladies were waiting to avoid the mosquitoes. Then it was off to dinner and more good conversation before retiring for the night.

We bid Kermit and Donna goodbye on the morning of July 9 and thanked them for taking the time to show us a beautiful part of Oregon. It was really great having such knowledgeable and enthusiastic guides. They were off on a hike in the Strawberry Mountains and we were going to make the long drive west and north to Hood River, in the Columbia River gorge. The meadow full of *Platanthera dilatata* that I had seen on the way to John Day beckoned as we drove by, so I stopped and went down to investigate. Hundreds of pure white, strongly scented *Platanthera dilatata* var. *dilatata* (Figure 8, page 16) were standing at attention in the morning sun, just waiting to have their pictures taken.

We kept pushing ahead, traveling along the eastern flank of the majestic Cascade Range and reached Mt. Hood by mid-afternoon. Talk about scenery! Kermit had given us directions to a high altitude site for *Corallorhiza mertensiana* in a campground slightly west of Mt. Hood. We found the orchids – hundreds of brightly colored beauties illuminated by the afternoon sun – easily and were glad to get out of the car and relax in this sylvan setting (Figure 9, page 16). This was the only time on the entire trip that we found this species in fairly good condition. Jackie, who is always a step ahead of me and has an eagle eye, discovered a few prime *Listera convallarioides* (broad-lipped twayblade) scattered in with the coralroots. This was our first sighting of this species.

We then headed up to historic Timberline Lodge which is perched high on the slopes of Mt. Hood. There was an amazing display of *Xerophyllum tenax* (bear grass) along the road. It was in prime bloom at this high altitude. The view at the lodge was spectacular but the restaurant that we had planned to dine at was too pricey, and unbelievably it had no view of Mt. Hood, so we headed for our motel in nearby Hood River and a more reasonably priced dinner.

July 10 was spent in the Hood River area. I had been in contact with Mellissa Rathbun-Holstein, the president of the Washington Native Orchid Society, and she had kindly provided me with directions to a site in the Columbia River Gorge for *Cephalanthera austiniiae*, *Corallorhiza striata* var. *striata*, *C. striata* var. *vreelandii* and *C. maculata* var. *occidentalis* forma *aurea*. We found the site without a problem, but everything was way past at this low elevation. It

looked like it would have been breathtaking about three weeks earlier. I knew it was too late for the *Corallorhiza*, but I was hoping the *Cephalanthera* might still be blooming. The three species were growing everywhere on a steep hillside under a canopy of conifers. Some of the *Cephalanthera* were very tall – upwards of 30 inches – and were two to three times as big as the individuals we had seen at Cook and Green Pass. We spent the afternoon searching for *Spiranthes porrifolia* (western ladies'-tresses). We never found it, but the scenery in the gorge is spectacular, and we did find a nice colony (our first) of *Piperia transversa* (flat-spurred piperia) (Figure 11).

It was July 11 and our destination was Olympic National Park, 254 miles away. We were excited about the scenic drive along the Columbia River. Kermit had suggested getting off the Interstate and following the old road to Multnomah Falls. This was a great suggestion. The old road was built in the 1920s as one of the first scenic byways in the country for the wealthier residents of nearby Portland and was very charming, complete with ornate bridges and masonry work the likes of which is never seen on a modern road. The falls were spectacular and we enjoyed taking the foot trail up the side of the gorge for a better view. We then put the “pedal to the metal” and headed for the Olympic Peninsula.

Leaving the urban sprawl of Portland and Olympic, Washington behind, we began to relax again as we made the restful drive up the western side of the Puget Sound and out onto the peninsula. Since we live in a big city, I always try to plan vacations that take us far from the maddening crowds, but unfortunately we occasionally “bounce off” a city as we travel. We soon caught sight of the spectacular Olympic Range towering in the distance, filling everyone with anticipation for the adventures that lay ahead.

We finally reached Port Angeles on the northern coast of the Olympic Peninsula by late afternoon. I had directions to a site for a short coastal race of *Spiranthes romanzoffiana* (hooded ladies'-tresses) that I wanted to check out before dinner. Unfortunately the site was now a gated community, complete with its own airstrip. Progress! I searched in a nearby state park but came up empty-handed, so we assuaged ourselves with a delicious dinner of Dungeness crab. The town of Dungeness is nearby and the crab had been caught fresh that day. Delicious! We then made the drive over to Olympic National Park and Lake Crescent Lodge, which would be our headquarters for the next two nights.

Ah, Olympic! What a fabulous place. Built in 1925, historic Lake Crescent Lodge sits on the shore of the lake and is a much sought-after tourist destination. I had made our reservations six months ago, and now, on July 12 there wasn't a room to be had. We had a second floor balcony overlooking the lake in a modern annex surrounded by sword ferns (*Polystichum munitum*) and tucked discreetly away into the forest. It would have been easy to stay right there all day, drinking in the ambience, but there were orchids to find and scenery to see, so after a nice breakfast we headed out.

Paul had given me a lot of site information and “Wild Orchids of the Pacific Northwest and Canadian Rockies” has more, so we had a wealth of information to go on. Our first stop was outside of the park on the western end of River Road, where we found our first *Piperia candida* (slender white piperia) growing prolifically along the road with *Piperia unalascensis*. When I first started trying to find native orchids I didn’t realize that disturbed areas with a lot of light, such as roadsides, are ideal orchid habitat; I would always search the deep woods and never find anything. There was also a lot of beautiful *Lilium columbianum* (Columbia lily), a very common flower in certain parts of Olympic. It was a wonderful windless, overcast day – perfect for photography – so I got to work.

We then headed over to Hurricane Ridge Road. For anyone with an interest in wildflowers, this drive is a real treat. The road climbs up to the top of the Olympic Range and gains many thousands of feet in elevation, passing through several vegetation zones along the way. We checked out a location at the beginning of the road where four species of *Piperia* had been found previously, but the roadside bank was now densely overgrown with shrubbery. Plant succession strikes again! 2009 was a hot dry year in the Pacific Northwest and the coralroots and twayblades at the lower elevations were unfortunately all past bloom.

As the road climbs higher, the array of non-orchid species is truly dazzling: Paintbrush, columbine, larkspur, Columbia lilies, alpine bistort, Piper’s bellflower and elephant heads fill the roadsides with their brilliant blooms. The roadside seeps are filled with all three varieties of *Platanthera dilitata* including our first sighting of var. *albiflora*. One seep had *Platanthera aquilonis*, *Platanthera dilitata* and *Platanthera stricta* (slender bog orchis) another new species, all growing together. There were so many photo opportunities that it took us nearly three hours to travel the eighteen miles to the top. Jackie and the kids were very patient as I worked. Unfortunately it is a busy road with a lot of traffic, so Jackie didn’t feel safe letting the kids out of the car very much, and they missed a lot of what I saw.

We eventually reached the top (elevation 5,549 ft) and set out on the Hurricane Ridge Trail, which affords incredible views of the Olympic Range. Johanna and Christina were thrilled to be out of the car and scampered happily about. We were now in the sub-alpine zone and it seemed like an unlikely place for an orchid, but after a half mile or so we found prime specimens of *Platanthera unalascensis* forma *olympica*, (Figure 10, page 16) the object of our search. Short and stout, this unique form is well adapted to the harsh environment after which it is named. We found several more populations as we continued the pleasant hike along the ridge top. Everyone was getting hungry by this time so we tore ourselves away and headed back to Port Angeles for a delicious dinner of local seafood.

We bid farewell to Lake Crescent Lodge on July 13 and headed over to the other side of the lake to East Beach to look for *Epipactis gigantea*, (stream orchid) the only species of *Epipactis* native to North America (Figure 12). After careful searching, we finally found twenty plants – some prime – scattered in a heavy growth of alders. A far cry from the numbers that used to be there; plant succession rears its ugly head again.... The chatterbox orchid, as it is also known, is a very attractive plant. The slender stems hold numerous green, yellow, purple and orange blossoms, with beautiful deep-red veining on the translucent lip petal. It was nice to be able to show the ladies a brightly colored orchid for a change; let's face it, the *Platanthera* and *Piperia* species we had been seeing, while fascinating to the botanist, are not famous for their showiness.

Our next stop was the Sol Duc Falls Trail, on the western side of the park. The drive in along the Sol Duc River is very scenic. There is an old-growth cedar forest along the way that was thankfully spared the woodsman's axe; it is wonderful to see all the giant trees that just as easily could have been logged had they not been preserved. We reached the trail head and set off through a beautiful forest filled with more giant cedars. We were searching for *Listera banksiana* (western twayblade) and didn't immediately find any, as we thought we would. Jackie has a real knack for finding hard-to-spot orchids. She was searching ahead of me and managed to spot a beautiful specimen obscured under some shrubbery. Totally green, it blends in with its surroundings and is very hard to spot. It turned out that there were quite a few plants growing around a huge cedar tree; I knew that I would be here for awhile, so as I set up my camera Jackie and the kids headed on up the trail to the falls.

The setting was spectacular. The old-growth coniferous trees and twayblades had been growing happily together here for centuries and we were lucky enough to spend time in this beautiful spot that was a long, long way from the busy streets of New York. A tonic for the soul! The western twayblade is, in my opinion, one of the most handsome members of the genus. The specimen that Jackie found was at least several inches tall and very robust. The petals and sepals are green and the lip is greenish-yellow and is highlighted with two darker green stripes. There are two black spots near the top of the lip resembling eyes that to my eyes give the flower the appearance of a comedic face.

I eventually finished up and headed up to the falls – almost a mile away – to find the family. There were more *Listera* along the way, including a colony of past-prime *Listera cordata* var. *nephrophylla* (western heart-leaved twayblade) but none of the specimens of *L. banksiana* matched the first colony in size or beauty. I was photographing right by the trail when two hikers stopped and asked me what I was photographing. I replied: "an orchid!" one of the gentlemen then said: "Wow! That will be pretty when it blooms!" I didn't bother to tell him that it *was* in bloom....

The falls were beautiful and the girls excitedly asked me if I had seen the *Corallorhiza mertensiana* along the trail. It's good to have a support crew as I had totally missed it. They had marked the spot for me, as well as the *Listera cordata* site. Incredible! We headed back down the trail and sure enough, there were five *C. mertensiana*, mostly past, blooming a little ways off the trail. One plant had some good blossoms left that were nicely back-lit by the afternoon sun. Click! Click!

It was then out to Rialto Beach, on the Pacific Ocean, to search for *Corallorhiza maculata* var. *ozettensis*, (Ozette coralroot) a newly discovered coralroot that is endemic to this part of the Olympic Peninsula. There are many miles of wilderness coastline preserved in Olympic National Park and Rialto Beach is a great example of what was thankfully preserved. The beach is beautiful with "sea stacks" off in the distance and millions of perfectly rounded pebbles that would be the envy of any Japanese gardener. The directions were unfortunately not very detailed. The orchids grow on the bluffs overlooking the beach, which sounded easy until we got there. The bluffs were miles long and were heavily forested with impenetrable undergrowth. This was a true rain forest where everything was giant-sized. I left the family happily playing in the surf while I waded through waist-high *Equisetum*, sword ferns with five foot long fronds and a plant that resembled skunk cabbage with leaves the size of a man's upper body. All of this vegetation covered a maze of fallen-down timber and rocks that was impossible to walk through. I couldn't even go 25 ft, let alone climb up onto the bluffs! So I rejoined the ladies on the beach and savored the fact that we were sitting on the opposite side of the continent gazing west at the Pacific Ocean. I had really wanted to visit the Hoh Rain Forest as well today, but we had used up all of our time and so we headed to Kaloch Lodge, about 40 miles on down the coast, to check into our room.

Kaloch Lodge, like Crescent Lake Lodge, is a privately run concession within the park. Built in 1950, it is located in a beautiful setting overlooking the Pacific with miles of undeveloped beaches in either direction. It was July 14 and after a refreshing morning jog along US 101 – the coastal highway – we set out to explore the area for a few hours. We followed a sign along 101 that said "old cedar tree" and were amazed to find, about a half mile off the road, a giant western red cedar (*Thuja plicata*) gnarled with age but still very much alive. It was at least 15 ft in circumference and the gnarled roots were a testament to its longevity.

This area is famous for its tidal pools, so next we headed to a nearby beach where luckily it was low tide. The girls were able to experience first-hand the variety of sea life that is exposed when the tides go out: Sea anemones, starfish, mussels and sea urchins were all on display at close range and were a fascinating sight.

It was now time to head back south. We had originally planned to continue north to Vancouver Island and then return east across Canada, but Paul felt that it made more sense orchid-wise to return south to catch some later-blooming species in California and Colorado. So we piled in the car and made the 470 mile drive to Grant's Pass Oregon – arriving by 9 pm – just in time to dine at our favorite restaurant before it closed.

The plan was to spend July 15 exploring different areas in Redwood National Park along the California coast. But as we drove down Highway 199 along the Middle Fork of the Smith River we passed the turnoff to the incredible *Cypripedium californicum* site. I had not even thought of stopping, as I had the day's itinerary all planned out, but Jackie casually mentioned that perhaps we should go see the lady's-slippers one last time.... So we turned around and took an unexpected detour back up the long gravel road to the site. It had been eight days since we were last there, but amazingly a lot of the plants that were in the shade were still in good bloom. But what we noticed next horrified us. It looked like a group of people had visited the site and had been very careless. A lot of the *Platanthera* had been trampled and even a few of the cyps. I can't imagine that true "orchid people" would treat a site in such a cavalier fashion; it sickened me to see the wanton destruction of the vegetation by careless feet. It shows the vulnerability of a roadside orchid site and further reinforced the fact that these locations have to be kept secret.

Since it was on the way, we drove through Jedidiah Smith State Park again and took some more photos amongst the giant trees. We then followed US 101 on down the coast through Redwood National Park. One stretch of road had incredible numbers of very tall Columbia lilies – taller than the specimens in Olympic – growing amongst the redwoods. I stopped to photograph, but it was so windy that it was almost impossible to get a decent shot. One has to take mental photographs at a time like this. There are only so many hours in a day, and we had spent a lot of them with the lady's-slippers, so we had to bypass the other areas that I had intended to see, such as Fern Canyon and the Lady Bird Johnson Grove. As we drove into Arcata, California to check into our motel the fog was rolling in and darkness was falling, so we called it a day and went in search of a good restaurant.

NOTES

1. Reprinted with permission from the *North American Native Orchid Journal* 15(3) 2009.
2. Tom's orchid photo galleries: www.pbase.com/tomdean



The Many Forms of *Amerorchis rotundifolia* (Banks) - the Small Round-leaved Orchid^{1, 2}

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In 1814, a North American orchid closely resembling the Austrian species *Orchis ustulata* was assigned the name *Orchis rotundifolia* (Banks ex Pursch). This was the only species from the New World listed in the genus *Orchis*. It was not until 1968, when Eric Hultén noted that the roots of this North American species were fibrous, not tuberoid like other species of *Orchis*. To address this inconsistency, Hultén created a new monotypic genus - *Amerorchis*, into which this North American species was transferred. “Amer” in the generic name reflects the distribution of this orchid, while the specific name “rotundifolia” is derived from the round or oval shape of the single basal leaf of the plant.

This orchid requires cool soil and is found only in northern regions of North America and southern Greenland. In the United States it has been recorded from the New England states of Maine and Vermont, as well as from New York, Michigan, Wisconsin, Minnesota, Montana, Wyoming and Alaska. It is now considered extirpated in the state of New York and rare to uncommon in the New England states. In Canada, it has been recorded from all Provinces and Territories with the exception of Nova Scotia and Prince Edward Island. The largest populations are found in sub-arctic regions with colonies consisting of hundreds of plants in Alaska and northern Canada.

The likely habitats of the small round-leaved orchid include moist, often calcareous coniferous forests, fens, and tundra. Blooming begins in early June in the cool, moist, bogs and fens in the southern extent of its range and continues into late July on the sub-arctic tundra.

Flowering plants vary in size from 4 inches (10 cm) on the tundra, to 10 inches (25 cm) in its southern range; with an inflorescence of one to fifteen blossoms. Typically each flower is from $\frac{3}{8}$ to $\frac{1}{2}$ inch (9 to 12 mm) in size. The lateral sepals are white, with purplish-pink dorsal sepals and petals that together form a hood over the lip. The lip is white, three-lobed, and is spotted with purple. Fancifully, the blossoms have been described as having the appearance of an

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1. Reprinted with permission from *Orchids*, January 2009, 78(1) 40-45.
 2. See photographs on pages 18-20.

angel, dressed in a spotted white gown. Authors Morris and Eames described this orchid plant as “exquisite” in their 1929 book “Our Wild Orchids.”

With perseverance and good fortune, astute observers may discover one or more of these delicate “angels” dressed in a fashion differing from what is considered to be typical. These distinct individuals have been botanically described and assigned a forma designation:

angustifolia Rousseau (narrow-leaved form) – has a narrow leaf instead of the typical round or oval leaf.

beckettiae (Boivin) Hultén (white-flowered form) – white dorsal sepals and petals, white lateral sepals, white lip without spots. Reported from Churchill, Manitoba in 1954 and more recently, with photographs, from the Swan River, Manitoba area in June 2010.

lineata (Mousley) Hultén (lined-lip form) – broad, longitudinal purple stripes on the lip versus the typical spots. This widespread form was first reported in 1941, at Elkwater Lake, Alberta. Since then it has been recorded in Ontario on the north shore of Lake Superior, at Sibley Park, as well as from a site near Frontenac. The author has recently photographed this form in the mountains of British Columbia within Kootenay National Park and in the Churchill region of Manitoba. An additional site with photographs has been recorded in Manitoba, from the Swan River area.

immaculata Mazurski and L. P. Johnson (white-lipped form) – lilac dorsal sepals and petals, white lateral sepals, white lip without spots. First observed at Sibley Park, Ontario, in 1993 within the site where the form *lineata* had been reported. In 2006 the author photographed this form in Kootenay National Park, at the *lineata* site mentioned previously. During the 2010 NOC Conference in Alberta, this form was also discovered in the Wagner Bog – much to the delight of the field trip members.

rosea P. M. Brown (rose-colored form) – deep rose dorsal sepals and petals, deep rose lateral sepals, white lip with rose spots. Initially reported in Newfoundland in 1997, the holotype photograph was taken at Churchill, Manitoba in 2003.

wardii P. M. Brown – purplish-pink sepals and petals, lateral sepals white, lip white with a misting of fine spots that appears as a blush. Discovered and photographed in 1999 by Ian Ward in the Libau Bog located approximately 50 km north east of Winnipeg, Manitoba.

Three of the six described color forms in North America have been reported from the Churchill, Manitoba region. Best known as the Polar Bear Capital of

the World, this region is one of the best places in North America to observe *Amerorchis rotundifolia*.

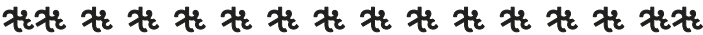
Of the ten species of orchids recorded at Churchill, the small round-leaved orchid is without question, the most common. Growing conditions here are ideally suited to this species and as a result a host of different environments have been colonized including; moist coniferous forests, willow fringed meadows, open tundra and even the seemingly inhospitable windswept rocky outcroppings along the coast of Hudson Bay. In many locations the communities of this orchid are so dense, that is difficult to step off the beaten path without crushing a plant.

For those adventurous individuals who have braved the hoards of mosquitoes and black flies in search of the small round-leaved orchid at Churchill, it is not surprising to learn that several different color forms exist here. Aside from the described color forms, *beckettiae*, *lineata*, and *rosea*, many plants have been observed with flowers in intermediate variations to these named forms. Flowers with blotches of color on the lip along with spots, some with very pale flowers and little of the characteristic purple or mauve coloration of the sepals and petals, while others have a unique lip shape. Although the typical three-lobed lip is common here, many blossoms have an unlobed lip which has not been reported from southern Manitoba populations. This extensive Churchill population is highly variable and each time we leave this fascinating place, we leave wondering not “if” but “when” other forms of *Amerorchis rotundifolia* will be discovered here.

REFERENCES

- Ames, Doris et al. 2005. Native Orchid Conservation Inc., Winnipeg. Orchids of Manitoba
- Brown, P. M. 2004. New Taxa from Northern and Western North America. North American Native Orchid Journal, Volume 10, 2004
- FNA-Editors. 1993+. Flora of North America North of Mexico. FNA Association. Accessed 2008-Feb 3 from http://www.efloras.org/flora_page.aspx?flora_id=1
- Morris, Frank and Eames, Edward A. 1929. Our Wild Orchids. Charles Scribner's Sons, New York
- St. Hilaire, L. 2002 New England Wild Flower Society. New England Plant Conservation Program, *Amerorchis rotundifolia* (Banks ex Pursh) Hultén Small Round-leaved Orchis Conservation and Research Plan for New England. Accessed 2008- January 21 from <http://www.newfs.org/docs/pdf/Amerorhisrotundifolia.pdf>





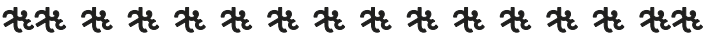
Publication Committee

With this edition of “The Native Orchid Conference Journal,” some changes have been made to the Publication Committee. Duane Erdmann has assumed the position of editor, Pat Harris has taken on the challenge of doing the layout, and Martha Hill is assisting Pat. Dr. Charles Sheviak will remain our technical advisor. Ron and Jan Coleman are continuing to be proofers but will no longer handle distribution — thanks for carrying this load for seven years. We thank Dr. Jyotsna Sharma, past editor, for her leadership and appreciate her staying on the team as an advisor. We also thank retiring Dr. George Johnson for his past services.

As with any worthwhile publication, we must begin with good material. Please continue to be on the lookout for articles and encourage the write-up of relevant topics. Are you even one of our future contributors? To continue with correct content, we would like to add one or two people to the team who are both subject matter experts and good proofers. Any volunteers?

We look forward to continuing our publication’s tradition and are open to your thoughts and comments to help us improve it.

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