

*NORTH AMERICAN
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A FAMILY ORCHID VACATION TO THE GREAT LAKES REGION AND POINTS BEYOND

MORPHOLOGICAL VARIATION IN *HABENARIA MACROCERATITIS*

***PLATANThERA* HYBRIDS FROM WESTERN NORTH AMERICA**

TWO NEW FORMS OF THE FLORIDA ADDER'S-MOUTH

A NEW GENUS FOR THE NORTH AMERICAN *CLEISTES*

NEW COMBINATIONS AND A NEW SPECIES IN *CLEISTESIOPSIS*

and more.....

The *North American Native Orchid Journal* (ISSN 1084-7332) is a publication devoted to promoting interest and knowledge of the native orchids of North America. A limited number of the print version of each issue of the *Journal* are available upon request and electronic versions are available to all interested persons or institutions free of charge. The *Journal* welcomes articles of any nature that deal with native or introduced orchids that are found growing wild in North America, primarily north of Mexico, although articles of general interest concerning Mexican species will always be welcome.

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Cover: *Pogonia ophioglossoides* by Stan Folsom

NOTES FROM THE EDITORS

The 15th year of the *North American Native Orchid Journal* has been off to a frustrating start, what with both technological and personal physical problems, but we are now on track and additional issues will follow shortly.

The electronic format continues to be well received and we now reach more than 1200 readers.

You may read back issues at: <http://wiki.terrorchid.org/tow:journals>. The current update of the *North American Personal Checklist* is also available at that website. The checklist will be updated as needed with new taxa noted.

Scott Stewart will be joining the journal as Associate Editor. He has contributed many articles over the years and his expertise on propagation and cultivation will be greatly appreciated.

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**A FAMILY ORCHID VACATION TO THE GREAT LAKES AND POINTS
BEYOND
June 27th – July 16th 2008
Tom Nelson**



Johanna and Christina with *Cypripedium reginae*, Bruce Peninsula, Ont.

After a very successful orchid-hunting trip to Newfoundland in 2007 that we knew would be hard to top - see related article in *NANOJ* January, 2008 - I began formulating a plan for another grand orchid-tour. Paul Martin Brown and Stan Folsom's orchid guides all have great orchid-hunting tips and after pouring over the various trip suggestions and talking with Paul, I came up with a plan: we would travel from our home in New York City to the Bruce Peninsula in Ontario and then on to Winnipeg, Manitoba via the north shore of Lake Superior. The return trip would be along the south shore of Lake Superior, thereby making a complete circle of the lake. The family liked the idea; we would see a lot of new country with beautiful scenery and orchids; and with any luck we would knock off a few trophy species in the process.

6/27/08: We are very fortunate to have a schedule that allows us ample time to travel. I am a free-lance jazz pianist that is kept very busy ten months of the year, but wonderfully has few engagements during July and August. My wife, Jackie, is a kindergarten teacher that, along with our daughters Johanna age 9 and Christina age 5, has a long summer vacation.

School had ended the day before, and we were finally on our way. We were running late; a family of four is never easy to get out the door and a pile-up on the New York State Thruway had cost us a lot of time. We had finally reached Syracuse and were now following Interstate 81 north towards Canada. The roadside forests were looking very tempting; this was the Tug Hill Plateau region of New York State and there are many orchid populations. But they would have to wait for another time, as our sites were set further north today. The plan had been to botanize in the swamp at Bonaparte Lake in the Adirondack Mountains near Watertown, New York, a spot long known for its orchids. But we had run out of time, so we checked in to our motel and went out for a nice dinner in Watertown.

6/28/08: We woke up to pouring rain, scuttling any further plans to visit Bonaparte Swamp. Leaving Watertown (aptly named today) and continuing north on I 81, the roadsides began to transform into spruce-fir forest and bogs, like a welcome mat for us orchid fanciers. The scenery was spectacular as we crossed the St. Lawrence River into Canada. The Thousand Island Bridge gives one a bird's-eye view of the countless forested islands stretching away to the horizon.

After crossing the border, we headed east for a slight detour to visit a site for the endangered eastern prairie fringed orchis, *Platanthera leucophaea*, in eastern Ontario. The weather had been alternating between a steady drizzle and heavy downpours but luckily, when we reached the designated search area it was only drizzling lightly. Johanna and I donned our bog boots and headed into a roadside fen that yielded an amazing number of orchids: scores of rose pogonias, *Pogonia ophioglossoides*, carpeted the ground, along with an equal number of grass-pinks, *Calopogon tuberosus*, and my first two Loesel's twayblades, *Liparis loeselii*. Johanna bravely slogged through the sometimes knee-deep water with me, patiently holding an umbrella as I valiantly attempted to photograph. The calopogons were especially pretty with the raindrops accentuating their brilliant color.

The prize was proving to be elusive, but we finally came upon three *Platanthera leucophaea*, about 200 yards out in the fen. They were still in bud, except for one flower that was partially open. This is the plight of the orchid hunter; we travel hundreds if not thousands of miles, only to find the plants not in bloom. It started to rain again, so we were unable to do a thorough search, but we did find two more plants in tight bud on the way out. Paul had warned me that we were probably too early for blooming, but it was not much of a detour and it is always gratifying to find a rare species for the first time. By the time we got back to the car it was pouring again. It had been a very successful foray; now that we knew where the plants were we could stop by on our way back and hopefully catch them in bloom.

As we drove west along the north shore of Lake Ontario towards Toronto, Jackie spotted several *Platanthera* from the car window. They were probably *P. aquilonis* or *P. dilatata*. We were definitely in orchid country now!

6/29/08: After a pleasant night in Toronto with Jackie's family, we left the urban sprawl behind and headed northwest through the beautiful wooded hills and farmland of Ontario. This is one of our favorite drives, and we purposefully avoided the freeway, sticking to the scenic back roads. This will be our fourth visit to the Bruce Peninsula, or simply the Bruce as it is known to the locals and regular visitors, and we made our usual lunch stop at Inglis Falls Provincial Park near the town of Owen Sound, at the base of the peninsula. Originally the site of

a historic mill, the falls makes a dramatic two or three hundred foot plunge over the Niagara Escarpment, the same geological formation the Niagara Falls plunges over 150 miles to the southeast. The surrounding dolostone woods are rife with ferns: the rare hart's tongue fern, *Asplenium scolopendrium*, is found here, in company with numerous male ferns, *Dryopteris filix-mas*, and giant specimens - some with fronds two feet long - of northern holly fern, *Polystichum lonchitis*, fill every crevice under a canopy of hardwoods. After lunch we strolled amongst the ferns, trading the bright sunlight of the picnic area for the cool tranquility of the mossy, seemingly enchanted forest.

We then headed for the Bruce, an area famous for its rare and unusual plants and a well known orchid hot-spot. Forty-four orchid species are found there and our goal on this day was to find one of the three known populations – all of which are in Ontario - of the European twayblade, *Listera ovata*. Generally considered a weed in Europe and the most common orchid in Great Britain, it has followed another European, the helleborine, *Epipactis helleborine*, to North America, but is not nearly as widespread. It has been known in Ontario since 1968, where there are three known sites. Unlike all the other rare, shy, and delicate members of its genus, this species is large, up to 2 ft., robust, and aggressive and should be easy to spot.



Listera ovata, Red Bay, Ont.
Flowering plant, 1/4 natural size.

The site was near Red Bay, on the Lake Huron side of the peninsula. The directions said to find a certain red barn with the letters “Bar A” painted on its side and then to proceed 100 feet further on to a spot with over 1000 plants on the left. There was nothing there at first. After carefully searching for about twenty minutes, I began to notice dozens of anemic looking plants with two opposite leaves – much bigger than I had imagined - turning yellow and languishing under a heavy growth of horsetail, *Equisetum* spp., and sensitive fern, *Onoclea sensibilis*. It was indeed the twayblade in question, but the population was obviously falling victim to the enemy of most orchids: plant succession. Like many terrestrial orchid species, *Listera ovata* is an early successional plant and therefore is adapted to disturbance, preferring lots of light and little competition.

Not yet ready to admit defeat, we followed the road to its end at the Huron shore, where I turned around near some attractive homes. My eyes immediately landed on a giant twayblade, illuminated by the afternoon sun, growing right by someone's mailbox! Jackie, my co-pilot and chief orchid-spotter blurted out “I saw that... I thought it was a weed!” I had forgotten to tell her how big the plants were... As I was parking the car, a very nice woman emerged from the house and shouted “are you looking for the twayblades?” Apparently she gets a lot of visits from ‘orchi-tourists’ – a more specific version of eco-tourist – and was not at all surprised by our sudden appearance. The number of friendly, helpful people that we meet on our travels never ceases to amaze and hearten me.

Our new friend became our de-facto guide and hostess for the next few hours. There were many more twayblades on her property, along with past prime yellow lady's-slippers,

Cypripedium parviflorum var. *pubescens*, still blooming at this very unusual late date. She then took us over to her neighbor's house, where a large clump of showy lady's-slippers, *C. reginae*, were in full bloom by the back porch. They had been transplanted there years ago and were flourishing. She turned out to be an artist and even brought some of her paintings out to show us. They were all of - what else - lady's-slippers! She was even kind enough to hold the stalks of the twayblades,



Cypripedium parviflorum var. *pubescens*, within the city limits of Tobermory, Ont. 1/4 natural size. Note the golden-green petals and sepals.

in an attempt to stabilize them against the stiff breeze that was blowing off Lake Huron, which was making it almost impossible to photograph these tall, top-heavy plants. The family was exhausted and was mostly patiently waiting in the car while I clicked away. I really appreciate their tolerance at times like this, but enough was enough, so I packed up and we headed for the wonderful Princess Hotel - a favorite - in Tobermory, 35 miles further north.

6/30/08: The scenery on the Bruce is some of the best we've seen anywhere. The Niagara Escarpment continues its northward march, its precipitous white dolomite cliffs creating stunning vistas as they drop into the deep, clear, turquoise waters of the eastern, or Georgian Bay section of Lake Huron. The Georgian Bay drains into Huron, keeping it always sparkling and crystal-clear. Much of this country is protected as wilderness, and wonderful hiking opportunities abound on the Bruce Trail and elsewhere.

The protected harbor of Tobermory sits at the northern tip of the peninsula, and is a favorite vacation destination for us and many others. The setting is unique; wide limestone ledges form 'shelves' and descend step-like right to the water. Jackie and the kids love the small shops and restaurants and Dad loves the orchids. Perfect!

Thousands of yellow lady's-slippers grow on the Bruce and are common within the city limits of Tobermory. The season was very late this year; all our previous visits have been made during dry, hot years and the yellows - as they're called here - are always long gone. I mentioned this fact to one of the kitchen staff at breakfast and she directed us to an area a few blocks away on the edge of town, where an amazing number of these beautiful orchids were still mostly in bloom. Large clumps poked their heads out of the balsam fir, *Abies balsamea*, and aspen, *Populus tremuloides*, forest, clamoring for sunlight along the roadside. There were at least a thousand plants in a two block stretch!

This species has presented many classification challenges to botanists over the years; the nomenclature has changed several times during my lifetime, with the description of one new species, *Cypripedium kentuckiense*, and several varieties. As I travel and see different populations, I've noticed that the coloration of the petals and sepals is highly variable. In Newfoundland they are golden; a population in Vermont is very dark chocolate-brown; and the populations here on the Bruce are a beautiful and unusual greenish gold.

Jackie and Johanna had been exploring further down the road, and Johanna suddenly came running excitedly back, saying "mommy thinks she sees an orchid in the woods!" Christina and I went to investigate, and sure enough, Jackie had somehow spotted - through the thick fir forest - our first Alaska rein-orchid, *Piperia unalascensis*. A tall, rather nondescript greenish orchid that used to be part of the *Habenaria* complex, it was nice to see it here in this beautiful setting, at the southeastern terminus of its range.

At this point a woman strolled up the road and stopped to chat. I recognized her as the owner of the Grandview Restaurant, where we had dined the previous evening. Famous for its Georgian Bay whitefish – a local delicacy – it is the best fine-dining in town. She was very enthused about our orchid-quest and informed me that just last week she had seen a white calypso, *Calypso bulbosa*, still in bloom by the Visitor's Center in nearby Bruce Peninsula National Park. Our next stop!

The Visitor's Center is brand new and very impressive, and has a beautiful photo display of all 44 species of orchids found on the Bruce. I used to have a contact there, but no longer, so I asked who on the staff knew about orchids. I was directed to a ranger that was sitting outside doing crafts with the kids. A Native American, she helped the girls make 'dream-catchers', while I asked her about orchid sites. She was very friendly and gave us precise directions to the calypso site and also told us where to find western spotted coralroot, *Corallorhiza maculata* var. *occidentalis*, as well as purple fringed orchid, *Platanthera psycodes*, later in the season.

As we followed the nature trail through the pristine forest, we were amazed at the botanical surprises awaiting us. Jackie remarked that it was like Christmas, not knowing what we would unwrap next. *Piperia* were everywhere, very attractively highlighted against the white limestone. There were a lot of past-bloom yellows and large numbers of giant rattlesnake orchid, *Goodyera oblongifolia*, still in bud. We located one out of bloom calypso. I knew a blooming plant was too much to hope for, but it was nonetheless thrilling to finally locate this site that I had heard about but had never been given directions to. We'll be back... We found the *Corallorhiza*; five plants going past but still amazingly beautiful. Jackie had never seen a coralroot before and was completely taken by its brilliant colors and unique appearance.

We then visited a nearby site for showy lady's-slippers, *Cypripedium reginae*, beside the main highway on the outskirts of Tobermory, right across from the Stone Orchid, an appropriately named Indonesian restaurant. In 2006 there had been a few past-bloom plants there, but this was a wet, late year and we were greeted by two large clumps of nearly pure white orchids. It was a truly stunning sight (1).

As we drove further south down Hwy. 6 we were enthralled by the abundant wildflowers lining the roadside. Paintbrush, *Castilleja coccinea*, wood lily, *Lilium philadelphicum*, northern

bluebell, *Mertensia paniculata*, and in the damp areas blue flag, *Iris versicolor*, were present in amazing numbers. Extensive limestone and marble pavement laced with treacherous cracks and crevices – known as alvars – caught our eye as we drove. A unique ecosystem; they harbor many rare ferns and orchids. We soon turned off onto the Cypress Lake Campground road and reveled in the numerous blooming yellow lady’s-slippers and almost blooming Alaskan rein-orchids growing together right up to and sometimes into the edge of the pavement. What a year!

We then headed south towards Dyers Bay Road to visit Ken and Marylyn Finucan, whom we had met two years ago. At that time we were driving along and noticed a sign advertizing maple syrup for sale. We followed a long driveway through the woods that was lined with out of bloom yellows – nothing unusual about that up here – and knocked on the door. A nice lady answered the door – we never seem to meet anything else – and asked us in. Her husband turned out to be a woodcarver and was working on a life-size carving of a yellow lady’s-slipper. He paints the finished sculptures to achieve a dramatic life-like effect. Several of his works are on display at the Visitor’s Center. Talk about fate....

Today Marylyn answered the door and took us in to see Ken, who was happily carving away and was pleased to see us. He makes his living carving wooden cows for Holstein Canada displays. On our previous visit he had taken us on an unsuccessful but very enjoyable search to try to find a still blooming yellow on his property. He was great company in the woods and is truly a fellow native orchid fanatic.

I have to admit that I had an ulterior motive for our visit today; during that hike two years ago he had told me about an area on his neighbor’s property where a colony of over 500 ram’s-head lady’s-slippers, *Cypripedium arietinum*, grow. There was a massive forest fire on the Bruce in the 1880s that created ideal conditions for these rare orchids, and they are actually common in some areas. Even though I knew they would be past, I brought up the subject and he took the bait and offered to show us the site.

What an amazing display! Growing in a second-growth spruce-fir forest was a carpet of ram’s-heads so thick that it was impossible to walk without stepping on one. I kept the family back – to avoid trampling - and gazed in wonder at the incredible display. An area of about 100 square feet was the full extent of the site, but the orchids were really packed in, many with ripening seed capsules. They were the only plants growing under the forest canopy. Ken told us that there are smaller populations scattered throughout the area. Out of bloom yellows were ubiquitous; we’ll just have to come back...

We had one more stop to make, so after buying some more maple syrup (it’s the least we could) do we bid Ken and Marylyn adieu, and headed a few miles further south for yet another mega-flora display. On our first trip to the Bruce in 2005, Johanna contracted strep-throat on the drive up. When I took her to the emergency room in the town of Lion’s Head for treatment I shamelessly asked the attending physician – after he was finished treating her of course – if he knew where any orchids were. Surprisingly, he replied that his wife was a member of the local garden club and had visited a bog recently where there were orchids, although he didn’t know what kind they were.

After a day-long search for the site – due to a mix-up in directions - we finally found an incredible population of 500+ showy lady’s-slippers, growing massed together in a clearing in a northern white cedar, *Thuja occidentalis*, swamp. It was my first time seeing this species and when I first glimpsed the Queen holding court through the trees that day, the sight of hundreds of these utterly gorgeous orchids - with their pink and white slippers - standing tall in tight formation was almost too much to bear. In all my travels I have yet to see another showy site where the plants grow in such close ranks; they are usually spread out in separate clumps.



“Knee-deep in orchids” Tom with *Cypripedium reginae*, Bruce Peninsula, Ont. Photo by Johanna Nelson

Every time I see this population it takes my breath away, and today was no exception. It is located on private land, and is not a publicized site. The owner generously allows public access, and a boardwalk has been constructed to protect the orchids. I’ve taken many photographs there, but the shady afternoon light on this day was excellent, so we spent a good hour and a half blissfully shooting away. Jackie and Johanna - as of this season - have officially joined me as photographers. The more, the merrier!

Our incredible orchid day ended, we enjoyed another great dinner at the Grandview and then it was off to bed, as we had a 7 AM ferry to catch in the morning. We were finally headed for Lake Superior, and for us, uncharted territory.

7/1/08: A travel day. We awakened at 5 AM to line up for the big ferry ride to Manitoulin Island. The ride takes two hours but is worth it in saving precious time to points on the north shore of Lake Superior. The limestone bedrock of the Bruce Peninsula and Manitoulin Island changes abruptly to granite on the southern edge of the Precambrian Canadian Shield, on the mainland near Espanola and Sudbury, Ontario. The landscape is attractively glaciated, with large, colorful granitic outcroppings that are various shades of pink and ochre.

We caught our first glimpse of mighty Superior by early afternoon, and soon reached Lake Superior Provincial Park, on the eastern shore. Here we entered the boreal forest zone, which stretches from Alaska and the Rocky Mountains eastward to Newfoundland. It is excellent orchid habitat.

We immediately headed to the Visitor’s Center – another newly constructed interactive masterpiece that the kids loved – so that I could bother the rangers about orchid sites. They showed me a checklist of the vascular plants found in the park; there were 14 species of orchids listed. Time was short, but they directed us to a nice trail near the precipitous lake shore that wound its way down amongst dramatic glacially rounded-off granite outcroppings. I could see

why the late 19th century Canadian landscape painters known as the Group of Seven traveled to this area to discover new sources of inspiration; the mountainous scenery is fantastic. We found five past-bloom pink lady's-slippers, *Cypripedium acaule*, growing amongst coral lichen, *Cladonia stellarise*, on the granite. The bunchberry, *Cornus canadensis*, was in full bloom - always a good portent for orchid hunters.

We attempted another hike on a boardwalk along a lakeshore, but were driven back by hordes of mosquitoes. It was too late in the day to douse ourselves in repellent and put on bug hats, so we admitted defeat and headed for our motel in nearby Wawa.

7/2/08: We awakened to heavy rain, so there was no reason to leave the motel. The proprietor told me that it was the rainiest year in memory. It finally eased up a bit, so we left Wawa and headed northwest around Superior towards the town of Marathon. We drove slowly, hoping to see orchids along the roadside, but weren't able to spot many. We did find five northern green bog orchids, *Platanthera aquilonis*, and one very nervous sharp-tailed grouse, *Tympanuchus phasianellus*, carefully minding her three chicks.

At White Lake Provincial Park – just as we were giving up hope of finding anything – we were rewarded with a remarkable display of pink lady's-slippers in prime bloom - six weeks later than the populations on Long Island. As we drove into the campground I noticed a few individuals, so I stopped to investigate. The openings in the surrounding second-growth spruce-fir forest were filled with hundreds of pink lady's-slippers – or moccasin flower as it is often called - growing in a deep, lush carpet of Schreber's moss, *Pleurozium schreberi*. I walked through the forest, sinking into the moss as I went and became totally absorbed in the tranquility of this other-worldly place. The abundant rain – it was still drizzling - that had made the forest so lush had been very good for the entire ecosystem; the bugs were so bad that it was impossible for the ladies to even get out of the car to photograph. There was no al fresco picnic today; we dined in the car with the windows up. After lunch we drove around the campground and happened upon

a huge moccasin flower growing out of a decaying tree stump, right at eye level. I pulled the car alongside and Jackie got a great shot without even rolling the window down.

When we got to Marathon I searched around the motel for the striped coralroot, *Corallorhiza striata*

var. *striata*, that had been found there in the past. I didn't find any, but did locate four out of bloom early coralroots, *Corallorhiza trifida*.



7/3/08: After three rainy days, we finally awakened to clear blue skies. We are now quite far north, and the long boreal twilight lasts past 11 PM. It makes it hard to go to sleep, and even harder to wake up in the morning. Today is a big day, for we hope to find the Franklin's lady's-slipper. More commonly known as the sparrow's-egg lady's-slipper, *Cypripedium passerinum*, it is one of the few members of the orchid family that grows within the Arctic Circle. First discovered by Dr. John Anderson on a polar sea expedition in 1820, it was named after Sir John Franklin, the leader of the expedition. It is one of the main reasons for our trip, so we headed out early to nearby Pukaskwa National Park to begin the search.

A wilderness park that was established in 1983, Pukaskwa, pronounced *puck'-a-saw*, is well off the beaten path and is ruggedly scenic. The deep, cold waters of Superior have created a micro-climate in this area that is very cool; growing conditions are ideal for several species of arctic plants – including the sparrow's-egg - that form disjunct populations far south of their normal range.

Our first stop was the one that always yields the best results: park headquarters. We found Christine Vance, the park ecologist and our contact person, in her office, complete with her photos of native orchids on the walls. We were in good company! She referred us to Stan, who has been a park warden for many years. He is always very busy; we finally tracked him down in the campground and he agreed to take us over to the Pic River Dunes, on the shore of Lake Superior, where the orchids are. It was an invaluable offer.

We followed Stan out of the park and after crossing the muddy, rain-swollen Pic River, turned south on to First Nation Indian Lands. He led us to an easily accessible colony of 22 plants which, much to our disappointment, were just budding out... The late season that had allowed us to see yellow lady's-slippers blooming on the Bruce Peninsula at the end of June (unheard of!) was now working against us. Stan left us and we proceeded to search for another site that we



The wild Superior shoreline near the Pitcher's thistle study area in Pukaskwa Nat'l Park.

had directions to. Case mentions the Pic River locale for *Cypripedium passerinum* was originally discovered by John Macoun in 1869 and then rediscovered by Dr. James Soper in 1964. A self-taught naturalist and world-renowned botanist that joined the Geological Survey of Canada at the ripe old age of fifty – after he grew tired of being a farmer - Macoun collected more than 100,000 plant specimens. I have seen one of his Pic River sparrow's-egg specimens from 1869 in the herbarium of the New York Botanical Garden.

As we headed out on to the dunes I felt as if we were walking in Macoun's footsteps. The area is undoubtedly little changed since he collected there and is about as far removed from New York City as one can get. The back side of the dunes is heavily forested and large patches of bunchberry, twinflower, *Linnaea borealis*, blue bead lily, *Clintonia borealis*, smooth wild rose, *Rosa blanda*, and the charming orchid-like fringed polygala, *Polygala pauciflora*, carpeted the ground. We found a colony of 16 attractive *Corallorhiza trifida* in prime bloom; they were bright greenish-yellow and really stood out amongst their forest companions. One of my favorite genera to photograph, coralroots are entirely mycotrophic, meaning that they have a symbiotic relationship with mycorrhizal fungi, which are attached to the roots. They arise from a coralloid rhizome, which gives them their name. *Corallorhiza trifida* does have some chlorophyll, hence the bright greenish-yellow coloration. Growing secreted away beneath the undergrowth was a 1" tall, just-emerging moonwort fern, *Botrychium lunaria*, a species that is locally abundant in the Marathon area, but very rare elsewhere.



Corallorhiza trifida, Pic River dunes Ont. A flowering stem enlarged 4 times

As we worked our way out along the dunes, the wild shores of Lake Superior stretched away to the horizon and there wasn't another person to be seen. It is one of my top priorities to have the kids experience true wilderness as they grow up, and it doesn't get any better than this. They had a great time playing in the sand in the windy, bug-free environment as I followed the directions and searched for the appropriate spot to go over the back side of the highest dune to search for the orchids. The back side drops about 100 ft. and is very steep.

After several fruitless and very strenuous trips up and down, I read the directions one more time and reconfigured myself, heading in a different direction. I soon saw what appeared to be the dead tree that points to the site. Forging ahead through a thick white spruce forest, *Picea glauca*, with a thick undergrowth of red osier dogwood, *Cornus stolonifera*, I suddenly spied, right in front of me, a large patch of 26 sparrow's-egg lady's-slippers. They were in the shade, and weren't even close to flowering, but what a sight! Larger and more floriferous than the first colony, many were close to 2



Platanthera aquilonis, near Marathon, Ont. A flowering stem, enlarged 4 times.

ft. tall, with large, unmistakable *Cypripedium* leaves. We then headed back to the car, where Jackie made turkey and avocado sandwiches, which we ate with the windows up to escape the overly-friendly mosquitoes and black flies.

It was then back to Pukaskwa, to search around the campsites for another north-shore rarity, the northern twayblade, *Listera borealis*. We didn't find any, but as usual, the thrill was in the chase. The forest was very lush, with pink lady's slippers scattered amongst the trees. There were numerous lesser rattlesnake orchid, *Goodyera repens*, and more early coralroots. Jackie – with her eagle eye – spotted another moonwort fern. After letting the kids stick their fingers in the icy, 40 degree waters of Superior, we headed back to Marathon. After dinner we saw a black bear contentedly munching dandelions right by the side of the road. The kids, and adults, loved it.

7/4/08: The good weather is holding, and I took an early morning jog west along the Trans-Canada Highway to see if I could spot any striped coralroot. I still found nothing. The jogger's perspective is great for botanizing; I spotted 17 *Platanthera aquilonis* growing in a seepage area, giant clumps of rusty woodsia, *Woodsia ilvensis*, a rock fern, growing on a huge granite slab, and large colonies of pink pyrola, *Pyrola asarifolia*. Large blooming masses of *Linnaea borealis* carpeted the ground along the roadside.

After breakfast we headed over to Pukaskwa to spend the day hiking and botanizing. I dropped the girls off at Horseshoe Bay beach to play and headed over to Park Headquarters to see if I could talk Stan the warden into giving me directions to a site for *Listera borealis*. He knows where a population is, but is hesitant to tell me as it is near a study area that contains the only site in the park for Pitcher's thistle, *Cirsium pitcheri*, an endangered species. After some pleading, he drew me a rough map, and I set off on my quest. The area was conveniently located further along the Horseshoe Bay Trail. I did not find the *L. borealis*, but did find two immature sparrow's-egg lady's-slippers growing near the study area. It was great to see that there is more than one population in the area. After a nice hike around Promise Lake, we headed back to Marathon for dinner.



Corallorhiza maculata var. *occidentalis*
forma *aurea*. Golden yellow/spotted
form about 1/3 natural size.

Stan had told me that if I couldn't find the *Listera borealis*, he would meet me after dinner and take me to the site to search. He is a very nice man. Unfortunately he couldn't really remember exactly where they were, so we searched together for an hour with no luck. I did find two of the more common heart-leaved twayblade, *Listera cordata*, plentiful early coralroot and more *Goodyera*. A lot of trees had blown down in a big storm four years ago, and the area had changed drastically. Oh well. Stan tells me there is a ranger named Wayne who is off-duty but could tell me exactly where the *borealis* is, as he does a plant survey every year. I've decided to come back from Winnipeg this way instead of along the south shore, in order to catch the sparrow's-egg in bloom, so I'll try to talk to Wayne then. Bone-tired, I returned to the motel after 9 PM and told the ladies the disappointing news: no *borealis*, yet.

7/5/08: We left Marathon and headed west along the north shore through fantastic scenery. The area is sparsely populated and quite mountainous; picture-postcard views of Lake Superior contrast nicely with the undeveloped boreal forest. There were not a lot of roadside orchids in this area, but we did find a nice colony of 37 *Platanthera aquilonis*, many of them just opening up.

We turned off at Rainbow Falls Provincial Park and were immediately greeted by an incredible sight: large clumps of western spotted coralroot, right on the side of the road (2). There were 45 plants, many not even close to opening. After photographing for awhile, we drove around the corner and discovered 67 more. The black flies were so thick that we had to photograph in shifts; one of us would run out – under heavy ‘sniper-



Corallorhiza maculata var. *occidentalis*, Rainbow Falls Provincial Park, Ont. Flowers, twice natural size.

fire’ – and photograph until it became unbearable and then retreat to the car, at which time someone else would make a run for it. The resulting pictures were well worth the effort.

We drove a little further down the road and found a colony of 16 stunning yellow western coralroots forma *aurea* near the entrance station. We then stopped for lunch in a picnic area – a breezy, mercifully bug-free windy lake-side location - that had many blooming pink lady’s-slippers, and after “just a few more” pictures, headed over to see the falls (3). Due to the heavy rains, there was a massive volume of water going through the gorge and we followed the long wooden staircase all the way to the bottom for a spectacular view.

We arrived at our destination of Pass Lake – near Thunder Bay - around 6 PM and after checking into the only motel – a rather bare-bones establishment next to the truck-stop on the Trans-Canada – we had dinner at Karen’s Country Kitchen, a wonderful restaurant built in a refurbished Canadian Rail-road station master’s house, circa 1880, over-looking beautiful Pass Lake. After dinner we drove down the Sibley Peninsula into nearby Sleeping Giant Provincial Park for a preview of tomorrow’s fun. It was very inviting; giant old-growth white cedars, huge eastern white pines, *Pinus strobus*, and large quaking aspen lined the road. We caught our first glimpse of the geological formation known as the “sleeping giant.” Looks like fun!

7/6/08: Our first day at Sleeping Giant dawned with strong thunder and lightning and heavy downpours. I was resigning myself to a rainy day of orchid hunting – the show must go on – when, as if by magic, the clouds parted and the sun came out. So we excitedly headed down the Sibley to the park.

Founded in 1944 by the far-sighted government of Ontario to preserve a few remaining stands of virgin forest after decades of uncontrolled logging, Sleeping Giant is a naturalist’s paradise. Twenty-four species of orchids occur in the park and due to the cooling effect of the cold lake waters, disjunct populations of several rare alpine plants. Red fox, porcupine, moose, white-tailed deer, bear, wolf and lynx abound and the Thunder Bay Bird Observatory – located at the tip of the Sibley - has recorded more than 190 species of birds. The park occupies 150 square miles - most of it wilderness.



Our first stop was the Visitor’s Center, to speak to Leslie Ng, the park naturalist. She wasn’t in, so I situated the family at nearby Marie Louise Lake Beach, where the water is warmer than Superior’s and the swimming is great, and headed out. I had been in contact with Leslie since the previous fall and she had sent me a lot of useful information. Of special interest were excerpts from Laurence Johnson’s 1995

Native Orchid Survey of Sleeping Giant Provincial Park. Of the many orchid locations mentioned, one of the most intriguing was the conifer swamp located at the south end of Marie Louise Lake, which Johnson called “one of the most important orchid stations in the park.” He noted the presence of seven species: *Goodyera repens*; *Platanthera obtusata*; *Listera cordata*; *Cypripedium calceolus* (sic) and two prizes: the striped small round-leaf orchis *Amerorchis rotundifolia* forma *lineata* and *Calypso bulbosa* forma *rosea* - the only population of this form in Ontario.

It looked easy enough on the map; follow Red Sandstone Lake Creek down from the point where it crosses the Marie Louise Lake perimeter road until it drains into the lake, about $\frac{3}{4}$ mile away. One hundred meters to the east of Red Sandstone Creek – near the lake shore - would be the orchid site. Red Sandstone Creek turned out to be just a small rivulet and I set off, using it as my compass.

I soon realized the futility of not having a guide; I really had no idea where I was going and many of the giant cedars had toppled over, making the going extremely difficult. I have a lot of woods experience and it took all of my skill not to lose the tiny stream whenever I would make a detour around a blow-down. The lake was higher than usual and the stream eventually petered out in an impenetrable maze of alders and fallen-down cedars. I considered trying to go 100 meters east, but knew I would probably get lost. Get a compass, you fool...

I turned around and started to head out. I decided to go up the other side of the stream in hopes that it might be easier. No such luck. After almost losing the stream several times, and hot and thirsty, I started to panic a bit. It seemed steeper than on the way in and everything looked different; maybe I was on the wrong stream! I felt lost in a primeval forest and as if to reinforce that fact, a large stag with a full rack of velvet antlers bounced through the sun-lit forest in front of me as if to say: “you can’t follow me out of here!” When I finally glimpsed my trusty Subaru through the trees I was very relieved, to say the least.

When I got back to the Visitor’s Center Leslie had returned and I spoke with her at length. She was using Paul and Stan’s great book *Wild Orchids of the Canadian Maritimes and Northern Great Lakes Region* to reference species. She couldn’t help too much, but did tell me where to find dragon’s-mouth orchid, *Arethusa bulbosa*, at Rita Lake. She also gave me some information that would end up being very useful; it seems that Warren Mazurski –a local orchid expert that worked with Laurence Johnson on his orchid survey – keeps a seasonal campsite in the campground. She looked up his site number for me and we headed over and found no one there, which didn’t surprise me, as it was midday.

We then set out on a hike to Middlebrun Bay Fen, a site for *Amerorchis* and *Platanthera dilatata* mentioned in Johnson’s study. The hike was long – probably three miles round trip – but the weather was great and the forest very beautiful. The girls did a great job; especially since I had insisted on rubber boots – Jackie had wisely demurred - thinking the area would be mucky. We got a lot of bemused looks from other hikers as we walked down the bone-dry trail in our rubber boots and me with kneepads! Look at those city slickers....

We found one *Platanthera aquilonis* and five *Corallorhiza maculata* forma *aurea* – not nearly as robust as the plants at Rainbow Falls - along the trail. While the kids played on the beautiful Lake Superior beach at Middlebrun Bay, I searched parts of the large and very intriguing cedar

fen with no luck. I saw a lot of deer, which is never a good sign for an orchid hunter. I was unable to determine where Fork Bay Fen was. It is the type locality for the white-lipped small round-leaf orchis, *Amerorchis rotundifolia* forma *immaculata*, and also has a population of forma *lineata*. The maps in Johnson's survey marked it as being midway between the trail head and Middlebrun Bay, along what at that time was a two-track road; all I could see was trees and more trees, with no delineating habitat changes or wet areas. After the hike we stopped by Warren's campsite again; still no sign of him.

On the drive back to the motel we saw many deer along the road, including a magnificent four-point buck in velvet that posed for pictures. We stopped at Rita Lake and I found seven *Arethusa* – most past-peak, but a few were prime – growing in a boggy area at the edge of the lake. Everyone was tired, so we'll return tomorrow to photograph.

7/7/08: I awakened early and while the ladies were sleeping, I took a jog to survey the area. I ran down the Sibley to where the old Trans-Continental Railroad crosses a deep valley on a huge wooden trestle. The old-timers were amazing! The boreal forest was beautiful and very peaceful in the early morning. I spotted three more *Platanthera aquilonis* – the dandelion of the orchid world – in a roadside ditch. It was a good omen.

The motel proprietor told me that we had brought good weather; apparently it had been raining for weeks. Exulting in the clear blue skies, we drove down to the park. We stopped by Warren's camp again and determined that he must be nearby, since the fire was still smoking and the radio was playing. Not sure what to do, but mildly optimistic, I dropped the family off at the beach, which luckily has a great playground and is also near the Visitor's Center. I am very fortunate and really appreciate having a wife that enjoys traveling to the ends of the earth looking for orchids and also entertains the girls during the often time consuming searches. I could never imagine making these trips alone and the gift we are giving Johanna and Christina – a familiarity with and hopefully a love of the natural world – is well worth any sacrifices that bringing the whole family entails. Plus, everyone gets to see the orchids!



Corallorhiza striata var. *striata*, unusual color form, Sleeping Giant Provincial Park, Ont. A flower, two times natural size.

After making a few loops around the campground, I managed to locate Warren by simply asking a likely looking man walking down the road if he was Warren Mazurski - he was! I introduced myself and told him that I had driven 1700 miles from New York City and would dearly love to see some *Amerorchis*, and was having a hard time locating any. He looked me up and down and after accepting the fact that his day was suddenly changing, he agreed to guide me into the fen at Fork Bay at 2:30. What luck! I was very excited, as I was beginning to realize that without a guide or GPS directions, the orchid sites here in Sleeping Giant would be next to impossible to locate.

I went back to the beach and told Jackie the good news. Warren had told me about an orchid-rich area at the north end of Pickerel Lake where showy and yellow lady's-slippers grow; after a quick lunch we scurried over there to check it out. I left the ladies in the car watching a DVD and headed out into the woods to try to find the lake shore. The north end is accessed by neither road nor trail and the going was quite hard, with a lot of heavy under growth.

I was almost immediately rewarded with two striped coralroots, *Corallorhiza striata* var. *striata*, blooming by a fallen-down cedar in an impossible tangle. These individuals were a lighter color than any I had ever seen before, further evidence of regional color differences in orchid species. I cleared away enough of the undergrowth so that I could lie on my stomach to get a 'worm's-eye view' for optimum camera angles of this very attractive orchid. When I reached the lake shore I realized that the water level was too high to proceed without either a swimming suit or a boat. Happy with my coral root, I bush wacked back to the car.

I met Warren at 2:30 and we drove over to the trail head. We took a detour along the way so that he could show me where to go in to access the area on the south side of Surprise Lake where the bog adder's-mouth, *Malaxis paludosa*, has been found. He told me that he had searched - on his hands and knees - for several days, in two different years, for this miniscule plant and had never found it. Paul found it in the early 90s, so if I have time, I'll give it a shot.

We then headed out to Fork Bay Fen. The hike in was very enjoyable. Warren has a vast knowledge of the natural world – not just orchids – and is a pleasure to be in the woods with. He is very involved with the Thunder Bay Bird Observatory and does a lot of volunteer work for Sleeping Giant Park. In 1994 he discovered a new white-lipped form of *Amerorchis* at Fork Bay. As Warren tells the story, he and Laurence Johnson had been botanizing in the fen; on the way out, Warren passed an *Amerorchis* that, after thinking about it, he realized was different, so he called Laurence and they went back to investigate. It was forma *immaculata*. Warren was hoping to show me forma *immaculata* and forma *lineata* today. Sounds good!

This was the same trail that we had been on yesterday, and I soon discovered that I was totally clueless as to where to search. At a seemingly arbitrary point, Warren stopped, got out his compass - a true woodsman - and said "this seems about right." We headed into the woods and the habitat soon changed into an incredible wonderland of moss hummocks and cedars. It was prime orchid habitat. I soon spotted a blooming *Amerorchis* and then nearby, another group of 6 more. As we pushed further into the fen Warren became puzzled, as there were very few plants. He started to think that it was too early, or that the deer had eaten them.



Amerorchis rotundifolia forma *lineata*, Fork Bay Fen, Ont. 3 times natural size

Warren does not give up easily; after searching diligently he suddenly came upon a depression between two hummocks where there were seven blooming *lineata*. Bonanza! They were an incredible sight. The pretty sister of the normal form of *Amerorchis*, the red-striped lip petal looks as if someone – maybe Van Gogh – has daubed big splotches of blood-red paint on its surface. I've seen no other similarly marked flower and it seems to be unique in the botanical world. We soon discovered many more normal-flowered plants and several more forma *lineata*. Warren didn't have his GPS, so we were unable to find forma *immaculata*. The initial population consisted of seven plants and Warren told me that there have been fewer every year. He will go in on Friday with his GPS and see if there is anything there this year, and then let me know. Hopefully we can see it on our return trip and search for *Malaxis paludosa* as well. We saw even more *Amerorchis* on the way out – probably 50 plants in total - and several more forma *lineata*.



Dragon's-mouth orchid *Arethusa bulbosa* at Rita Lake.
Jacqueline Nelson



An old friend - *Arethusa*

After thanking him for his time and generosity, I dropped Warren off, picked up the girls and headed over to Rita Lake so that Johanna, Jackie and I could photograph the *Arethusa*. We all donned our rubber boots and made the short walk to the lake shore where the orchids were. Everyone was thrilled to see our old friend *Arethusa*. Johanna managed to fall in the water – she's still learning to walk in bogs – and Christina was traumatized by the black flies, which thankfully were not too bad in most of the park, but were having a field day here. We managed to get a few good pictures; it was great to see this rare jewel in bloom so late in the season. We then rewarded ourselves with a great fine-dining experience at the Caribou Restaurant in Thunder Bay.

7/8/08: It is 450 miles from Thunder Bay to Winnipeg, so to make it bearable our destination today would be Dryden, Ont.; about 2/3 of the way there. About 40 miles west of Thunder Bay is Kakabeka Falls, known as Niagara of the north. Historically known as Grand Portage, it plunges 40 meters over sheer cliffs and was a rendezvous site for fur trappers in the old days. Now a provincial park, it is well worth stopping to see. Due to heavy mineral content, the water is a very attractive shade of ochre and sienna and resembles root beer.

At one point as we were driving we saw two bald eagles feasting on road kill. We turned around to try to get a closer look, just in time to see a group of buzzards drive the eagles away.

We made a short detour to Sandbar Lake Provincial Park hoping for orchids; it was raining [surprise!] so we drove around the campground and enjoyed the luxuriant patches of twinflower and bunchberry carpeting the forest floor. There were also large colonies of polypody fern, *Polypodium virginianum*, on some flat boulders. We drove on through the rain to Dryden. After three nights in the very Spartan motel in Pass Lake, the Dryden Best Western seemed like a luxurious palace.

7/9/08: We left Dryden early and made the beautiful drive through the glacially carved lakes and hills of northwestern Ontario. It is very scenic. Reminiscent of the High Sierra of California, the beautifully colored granite contrasts nicely with the boreal forest. As the Trans-Canada Highway enters Manitoba, it leaves the bedrock-controlled terrain of the Canadian Shield-or Height of Land Area –behind and flattens out, with boreal forest still lining the road.

I am a member of Native Orchid Conservation Inc., a Winnipeg-based non-profit organization founded in 1998 whose purpose is to protect unique mini-ecosystems and their plant communities. This primarily involves native orchids, but can extend to other rare or endangered plants. I had been in touch with the president, Doris Ames, about our planned visit. She was very welcoming and offered to guide us, but will be away on a heroic trip to Inuvik, NWT during our visit. She kindly arranged for Richard Reeves, a NOCI board member, to be our guide while we were in Winnipeg for the next three days. Can't beat that!

We had arranged to meet Richard at a gas station about an hour east of Winnipeg. The fun began right away; after introductions, we drove north to a beautiful jack pine, *Pinus banksiana*, forest, near Contour. We soon began spotting robust specimens of Hooker's orchis, *Platanthera hookeri*, scattered about in the woods. They were just past-prime, but impressive nonetheless. I found a checkered rattlesnake orchis, *Goodyera tessellata*, still in bud, and quite a few pink lady's-slippers, well past.

We then headed down the road to an incredible roadside fen that harbors hundreds of rose pogonias, *Pogonia ophioglossoides*. They were in prime bloom, and were very photogenic. I



clicked away, trying to capture this incredible place on film (4). The flowers point downward, and one gets quite wet trying to get a good camera angle. The skies suddenly opened up on us and we ran back to the nearby cars for refuge. Richard told me the next day that there had been a tornado reported a little further east... The rain soon ended and we continued exploring. There were two big

clumps of Loesel's twayblade, also in prime bloom and a different and very beautiful species of paintbrush, *Castilleja miniata*. As I was surveying the scenery I noticed a beautiful stag - with a full rack - striking a regal pose on the edge of the forest across the pond that adjoins the fen. It looked like a painting from the Age of Enlightenment. This part of Manitoba is quite undeveloped and the minute one leaves the road one enters pure wilderness. Showy lady's-slippers are very common along certain roadsides; they often grow mixed in with large numbers of wood lilies, creating an incredible floral spectacle.

Richard is a wonderful guide who truly loves the natural world. We stopped at a highway bridge over a river and the girls were thrilled when he took them under the bridge and showed them dozens of cliff swallows, *Petrochelidon pyrrhonota*, complete with chicks and dive-bombing parents, all at eye-level.

Our next stop was at the Libau Bog Nature Reserve for yet another orchid bonanza. Richard and I went into the bog alone this time, as it was not very child friendly. There were many blooming *Amerorchis* scattered around. We found five stunning *Corallorhiza trifida* that were green, with bronze-tipped sepals and petals and pure white lips. This is the northern color form of this species. There were several past-prime *Arethusa* as well. We searched for green adder's-mouth, *Malaxis unifolia*, and *M. paludosa*, both of which have been found here, but to no avail. Richard pointed at a mossy hummock and told me he had seen the very rare *M. paludosa* growing "right there." Not this year...

After a mid -afternoon stop for some much needed lunch on the Ojibway Reservation, we headed to the nearby Brokenhead Wetland Ecological Preserve. A calcareous fen, NOCI worked hard in collaboration with the Brokenhead Ojibway Nation to preserve it and essentially saved it from development. It is home to many rare and unusual plants including 28 species of native orchids. We stopped at an unmarked spot on the side of the road, donned our bug hats and rubber boots and headed into the forest, following a faint trail. The ground soon grew wet and before long we entered a beautiful cedar fen. There were orchids everywhere! Stately Queen's lady's-slippers were scattered about and much to our delight, two very tall 24" high blooming yellow lady's-slippers. There were four species of *Platanthera*: *P. huronensis*, *P. aquilonis* and *P. obtusata* were in bloom; *P. orbiculata* was in bud. There were quite a few past-bloom ram's-heads and two blooming *Listera cordata*.

Yellow lady's-slipper, Brokenhead Preserve, MB. A flower, deep in the fen, about half natural size.





Corallorhiza striata var. *striata*, forest road near east Braintree, MB. About 1/3 natural size.

On the forest's edge - as we entered the open fen - there were past-bloom *Arethusa* and *Amerorchis*. Richard pointed out one large *Arethusa* growing on a stump that a week or so ago had been one of the most magnificent specimens that he had ever seen. But he had saved the best for last: out in the open fen were four pure white showy lady's-slippers *Cypripedium reginae* forma *albolabium* the first I had ever seen. What a treat! There were more very large blooming yellows as well. As we moved along the edge of the trees, we suddenly came upon several *Platanthera dilatata*. Sometimes called "scent bottles" due to their wonderful fragrance, they were a delight to



Cypripedium reginae forma *albolabium*, Brokenhead Preserve. Flower, slightly reduced. Jacqueline Nelson

behold. Richard seems to know the location of every orchid in the reserve; simply amazing!

We had completed a circle and as the others went ahead, I lingered to take a few more pictures of the large yellows – so wonderfully secreted away in this magical place - and to marvel at the number of other orchid species present. When I caught up, Richard had spotted a prime blooming long-bracted green orchis, *Coeloglossum viride* var. *virescens*, along the trail. The mosquitoes were so ferocious that I didn't stop to photograph, a decision that I regretted later, as it was the only blooming *Coeloglossum* that I encountered on the entire trip. It brought the total for our visit to Brokenhead to 11 species and 1 form. Not bad!

Johanna and Christina had done very well and had really enjoyed Brokenhead, but the incredible hordes of mosquitoes were starting to get to them, so Richard and I went in alone for the final foray of the day, another calcareous fen at nearby Stead Road. He wanted to show me a population of *Calopogon*, an uncommon species in Manitoba and he really delivered the goods. We walked in quite a ways and reached an area teeming with this gorgeous orchid. The blossoms had a lilac tint to them that I had never seen, so I photographed away. It was now 8 PM; we had been in the field for nine hours! I got a nice shot of a prime *Arethusa* nicely back-lit by the setting sun. There were more showies and Loesel's twayblades, all glowing in the long northern sunset. When we got back to the car, we saw a bear running across the road in the distance; the ladies were thrilled.



Calopogon tuberosus, Stead Rd. fen, MB. Lilac colored flower, enlarged 1/2 times.

Bone-tired, we made the hour drive south to Winnipeg, grateful to have such a tireless guide to show us all of these wonders. After making arrangements for tomorrow's trip, we bid Richard adieu and checked in to the wonderful Hampton Inn in downtown Winnipeg.

7/10/08: Everyone was very tired from our exciting day yesterday, but I managed to get us up and going by 8 AM. The plan today is to visit the Sandilands Provincial Forest east of Winnipeg to see orchid sites there. We picked up Richard and drove to Hadashville to meet Mary Wiebe, who will be our guide for the day. Mary is Doris Ames's sister. They grew up in the area and thanks to a botanically-inclined father, know the local flora like the backs of their hands.

We picked up Mary at her house and set off, with Richard and Mary leading the way in Mary's truck. We followed a gravel road into the Sandilands Forest. A profusion of wood lilies, black-eyed Susans, *Rudbeckia hirta*, harebell, *Campanula rotund-ifolia*, and prickly rose, *Rosa acicularis*, lined the roadside. As we were botanizing we feasted on the plentiful wild strawberries, *Fragaria vesca*.

After about an hour, we stopped at a cedar bog and went in to search for orchids. There were numerous past-bloom *Platanthera bookeri* and an equal number of blooming blunt-leaved rein orchids, *Platanthera obtusata*. Mary told us that over 150 Calypsos have been counted here and we found a few remnant leaves as evidence. We were amazed and couldn't believe that she

was wearing only short sleeves and used no insect repellent in the bug-laden woods; she claims that the mosquitoes don't like the way she tastes! I think she is a good candidate for cloning as a bug-resistant *Homo sapiens*. We drove on stopping to inspect whatever caught our eye. Huge swarms of horse flies – worthy of a Hitchcock movie – landed on the car whenever we stopped, but didn't bother us or bite. It was as if they were guarding the orchid-troves secreted away in the forest, and deemed us to be all right.



A flowering stem of *Corallorhiza striata*, about twice natural size.



After awhile we turned on to another road and soon began to pass large groups of blooming showy lady's-slippers growing along the road, almost like weeds (5). Unbeknownst to me, until I examined my photos later, I even managed to photograph (6) a well camouflaged white crab spider *Thomisadae* family, *Misumena* spp. waiting for prey on the dorsal sepal of a showy. Richard tells me that these spiders are white on white flowers and yellow on yellow flowers. Mary stopped at a certain spot that she knew and as Jackie and I were busy photographing, disappeared into the woods. Richard followed her in and soon came running out, as if being chased by something. He blurted out "she's got something in there for you!" and ran to get his camera. She had found five of the much sought after (for us) striped coral root, *Corallorhiza striata* var. *striata*, in prime bloom. I had wanted the family to see this beautiful orchid, and here it finally was. A saprophyte that contains no chlorophyll, the brightly colored candy-striped blossoms and stems are a unique prize in the orchid world. The plants were a robust 10-12" high. This stop proved to be a real orchid bonanza... Making a small little loop in the woods, we found the *Corallorhiza striata*, numerous *Platanthera obtusata*, several *P. bookeri*, three very tall 36" and robust green bog orchids *Platanthera huronensis*, numerous blooming *Amerorchis*, a few past bloom



Cypripedium reginae and *Cypripedium parviflorum* var. *makasin* near East Braintree, MB.

Cypripedium acaule and to top things off, by the road on the way back out, five fading large yellow lady's-slippers and next to a clump of *Cypripedium reginae* with one blossom open, a clump of five prime-blooming northern small yellow lady's-slippers, *Cypripedium parviflorum* var. *makasin*, sweetly fragrant, with stunning mahogany-red petals and sepals - yet another color variation of this highly variable species. That was a whopping total of eight species and one variety. Wow! This was worth driving 2500 miles for! Next we stopped at a beautiful pond to see a profusion of yellow pond-lilies, *Nuphar variegatum*, and some wild calla lilies, *Calla palustris*, both aquatic plants. Growing on the edges of the pond were numerous *Platanthera aquilonis*. Mary knew of other sites, but the kids were getting tired, so we decided to call it a day and headed north towards the nearby town of East Braintree, where Doris and Mary grew up. We stopped at one point to see some amazing yellow-flowered wood lilies. The showies became frequent along the roadside again, and could be seen growing in the roadside ditches in front of the houses on the outskirts of town.

We returned to Mary's house and while Jackie, Richard and I rested from a long day afield, she played games with and entertained Johanna and Christina. How fortunate we are to meet such wonderful people as Mary and Richard; they truly love life and nature and that love is infectious. It was close to 6 PM, so after thanking Mary for a wonderful day, we headed back to Winnipeg, where we dropped Richard off –after thanking him too - and went out for a much deserved steak dinner. We were famished!

7/11 08: Today was the big day we had waited so long for; we had traveled all the way to Winnipeg primarily to see the western prairie fringed orchis, *Platanthera praeclara*. This species is federally listed as threatened and the largest extant site at the northern limit of its range is in the Tall Grass Prairie Preserve, an hour south of Winnipeg, near the US/Canadian border. Thousands of plants flower here annually-some years up to 20,000! Richard was picking us up at 9:30 to take us to the preserve. His daughter, Laura Reeves, is a botanist that does research at Tall Grass, so we were in good hands.

The drive south was beautiful. Most of southern Manitoba is aspen parkland, but the prairie ecosystem makes an incursion into this area. The flat farmlands of Manitoba stretch away endlessly to the horizon; it is obviously some of the best farmland in the world. The rich loam is the darkest black soil I have ever seen. The entire area was the bottom of ancient Lake Agassiz, which explains its suitability for farming. In the 1980s a survey was done to locate any remnant pockets of tall grass prairie – less than one percent has survived the plow – and the area where the preserve is located was discovered. Apparently it was too rocky to farm and was thankfully never plowed.

We soon reached the town of Stuartburn and after turning east, spotted our first *Platanthera praeclara*, soon after leaving town (7). Impossible to miss, the tall, stately orchids were growing on the roadside in great numbers. I excitedly got out of the car to photograph the first group and was not disappointed. The individual creamy white flowers are the size of a fifty cent piece and the fragrant racemes are easily the size of a man's hand. Due to the late season, only the bottom half of the racemes were open and the plants had not yet reached their full height, which can be as tall as three feet. The ones we saw were one to two feet tall and were growing along roadside ditches or in flooded prairie areas.

We drove on, marveling at the local abundance of this very rare orchid and soon turned off into the preserve itself. The staff headquarters is located in an old farm house that adjoins a flooded field where hundreds of western fringed orchids wave in the breeze. Christina was recovering from a bout of car sickness, so Jackie stayed in the car with her while Richard, Johanna and I – outfitted in our rubber boots - walked far out into the flooded prairie. The photographic conditions were excellent; there was no wind and thunderstorms were forecast for the day. The dark, overcast skies contrasted nicely with the stunning white flowers. There was no one at headquarters, so we drove slowly out of the preserve, stopping often to photograph.



Richard and Tom with *Platanthera praeclara*. Johanna Nelson

We made a quick side trip south to nearby Gardenton to

visit a site for the endangered small white lady's-slipper, *Cypripedium candidum*. I knew that they would be way past, but I wanted to see the habitat. I was very surprised that they were growing in drier prairie conditions than I was expecting. I have seen this species in the marl fen at Bergen Swamp near Rochester, New York, and these conditions were very different. Richard and I searched for about fifteen minutes and finally came up with one very healthy set of leaves

hidden in amongst the grass. We then headed east towards Vita, stopping to give Jackie a chance to photograph some prime roadside specimens of *Platanthera praeclara*.



Our next stop was the area east of Wood-ridge. As we drove northeast we soon re-entered the boreal forest zone. All the usual friends were back; wood lilies, hare-bell, some unusual yellow paint-brush, and of course hundreds of showies lining the roadside. We still can't get used to the abundance of this species in certain areas of Manitoba, and never cease to be thrilled by the sudden appearance of these orchids. We stopped at one particularly luxuriant patch and while Johanna and I photographed – the bugs that had been absent on the prairie were back with a vengeance here – Jackie and Christina waited in the car. Richard popped into the

nearby cedar woods and came upon hundreds of *Amerorchis* growing in the moss – a population that he was unaware of.

We reluctantly tore ourselves away from this spot and moved on to an area that was marked with red tape, where NOCI monitors the orchid population and does some seed collecting for a seed bank. There were showies everywhere and as we entered the woods, we were greeted by hundreds of *Amerorchis*. The ‘grand orchid tour’ continued with prime *Platanthera buronensis*, *P. obtusata*, several large clumps of ram’s-head leaves with ripening seed pods, out of bloom yellows, three *Listera cordata* and two giant *P. orbiculata*, in bud. There was an area inside the woods where the *Amerorchis* formed a carpet of blooms around a clump of showies. The other side of the road had several large clumps of ram’s-heads and many more showies. A true orchid paradise! Once again I was amazed by the number of orchid species – in this case eight – to be found in one small area. We came to Winnipeg to see *P. praeclara* and thanks to Richard, ended up with an orchid bonanza! We then checked out a nearby site for *Coeloglossum viride*, but could only find two past-bloom plants.

Very tired but happy, we headed back to Winnipeg and made plans to meet the Reeves for dinner. Richard gave so freely of his time – three full days of guided field trips to secret orchid sites is more than any orchidophile could ever hope for – and we are really going to miss him. His wife, Marie Ann, is a lovely person and after dinner we went to their home for cake and ice cream. I played a few tunes on the piano and we had a great time. The Reeves had nice gifts for us as well: a box of Richard’s excellent wildflower photo greeting cards; Richard’s handmade wooden puzzles and toys for the kids; NOCI calendars; and various decorative items for the house. A class act! All of this and three days of orchid-guiding too! Our stay in Winnipeg had far exceeded my expectations and we owed it all to our two guides, Richard Reeves and Mary Wiebe and not to forget Doris Ames who gave us Richard. These generous and knowledgeable people made the orchid trip of a lifetime possible.

7/12/08: I suppose that next time we visit Winnipeg we will have to see the city. I took a morning jog in the beautiful park along the Red River near the Centennial Centre and realized that we had seen absolutely none of Winnipeg and had been there for three days. As I jogged back to the hotel the rain began and really started coming down in earnest as we drove out of town. We were listening to the news on the radio and apparently the mosquito populations were much higher in Manitoba this season than usual. We were not surprised. We had really lucked out with the weather; other than two notable passing thunder showers, our stay was rain-free. As we drove east, the rain intensified and was soon coming down in sheets. Unfortunately we had to make the 450 mile drive back to Thunder Bay in one day in order to stick to our revised schedule, so we plowed on through the rain.

Of course the natural world is beautiful no matter what the weather. Showies were waiting along the side of



The next generation: Johanna Nelson, budding orchidologist, with *Platanthera praeclara*.



the Trans-Canada to bid us farewell and as we neared the Ontario border, Jackie spied some yellow lady's-slippers growing on a hillside. The drive back over the Canadian Shield and the drop back down into Thunder Bay is very dramatic. The Sleeping Giant formation is visible for many miles, and serves as a welcoming beacon to east-bound travelers. We arrived in Thunder Bay at 9:30 PM and after a quick dinner, headed out to Pass Lake and checked into the motel.

7/13/08: We awakened to overcast skies that fortunately started clearing during breakfast. After yesterday's torrential rains, we were ready for some sun.

We drove down the Sibley to Sleeping Giant and felt really glad to be back. The blooming season had progressed very quickly during our five day absence. Ox-eye daisies, *Chrysanthemum leucanthemum*, an introduced weed species, now covered the roadsides and the

bunchberry had finished blooming. The remaining rain clouds were scudding quickly to the east and the brilliant post-storm light illuminated the fantastic scenery, heightening an already incredible scene.

We stopped by Warren Mazurski's camp site and could tell he was nearby, as the fire was still burning and the radio was playing. He soon appeared and after exchanging friendly hellos, he told me that he had been unable to find the *Amerorchis rotundifolia* forma *immaculata* with his GPS, but was willing to look for it today. That sounded good to me, so Johanna, Warren and I headed over to the Flat Bay Trail Head. The woods were very welcoming and familiar as we walked out to the orchid site. At one point, as we passed a rock outcropping, I heard a commotion and looked up and saw a very large brown animal with a lighter brown belly scrambling up the hillside. I excitedly asked Warren "is that a moose?" and he replied very calmly, his eye never leaving it, "no, it's a bear, and it's headed in the right direction." Ah, the thrills of the North Woods! As we walked further in, I spotted another of the curiously light-colored striped coralroots blooming along the trail. I had seen nothing there five days ago.

We soon reached the spot in the trees – known only to Warren and a few others – where you head into the fen. Warren got out his compass and GPS and we started out. We soon came upon several normal *Amerorchis* (8). They were now in prime bloom; last week they were mostly in bud with just a few flowers open. We reached point zero on the GPS and there was, as Warren had said, nothing there. Not to be deterred, we continued searching. Warren soon found a group of three *lineata* – in prime bloom – which Johanna and I set about photographing with enthusiasm (9).

Warren meanwhile was making a circular search of the area. I had basically given up hope of seeing *immaculata* and was contentedly photographing the *lineata* when I heard Warren say from about fifty feet away “I found it.” I couldn’t believe my ears, so I hurried over as soon as I could. Johanna’s shoe had come off in a hole, and I was trying to help her get it back on. When I finally got there, I was greeted with the sight of ONE beautiful almost pure white *Amerorchis* growing under a cedar tree, bathed in a heavenly shaft of sunlight. What a sight! Forma *immaculata* is known as the white-lipped form, and the specimen in front of me had red present only in the dorsal sepal, with the yellow column providing a nice contrast (10). The flowers looked quite different than the normal *Amerorchis*; the sepals and petals seemed thicker and were waxier in appearance. I photographed intently for the next 45 minutes, oblivious to the feasting mosquitoes. Warren even took over my fatherly duties and kindly pulled Johanna’s foot out of another hole while I was flat on my stomach, trying to get the perfect shot. I was so mesmerized by this rare orchid that I didn’t want to get up to help her - I’m sure she’ll need therapy later – a victim of the “orchid-orphan” syndrome... Warren really hopes that there are more *immaculata* in Fork Bay Fen; hopefully this isn’t the last plant there.



We left the fen in high spirits. I tried to savor every moment in this incredible place as we hiked out. There were a lot more *Amerorchis* blooming than the first time, and the *lineata* were truly amazing. Johanna especially is getting a lot of woods experience on this trip and she did a great job of negotiating her way through the circuitous path that we bush-wacked through the sharp cedar branches and often treacherous mossy hummocks of the fen. How many New York kids do that!

We headed back to Marie Louise Lake Beach, where Jackie and Christina had been entertaining themselves while we were out bog-trotting and told Jackie the great news: Success in finding a very rare orchid. I was extremely lucky to meet-up with Warren and be the beneficiary of his orchid-expertise. He gave generously of his time and certainly helped make our trip a memorable one. We never did make it to Grassy Lake to search for *Malaxis paludosa*, but I was very happy with having seen *lineata* and *immaculata*. We’ll just have to come back!



We reluctantly left Sleeping Giant midafternoon and made the short but beautiful drive back along the north shore of Superior to Marathon. The granite that comprises the Canadian Shield is such an obstacle to construction that the Trans-Canada – the major east-west artery across Canada - is only two lanes across most of Ontario. It is just too expensive to blast out a freeway, thank heavens! The scenery is spectacular, with dramatic roadcuts through the mountains, glacial lakes, and miles and miles of unpopulated boreal forest. It is heartening to know that such areas still exist.



Flowering plants of *C. passerinum*, about 1/3 natural size..
Second Pic River site, on the backside of the big dune.

7/14/08: It was good to be back in Marathon and we awakened very excited to go out to the Pic River Dunes to see if the sparrow’s-egg lady’s-slippers were blooming. I called Wayne the warden and he miraculously picked up the phone and agreed to meet me at 11 AM to guide me to the *Listera borealis* site. Wow! After a quick breakfast, we got in the car and high-tailed it over to Pukaskwa.

Once again the blooming-season had progressed markedly during our eleven day absence. Wood lilies were blooming now and were covering the roadsides, many with 3-4 blossoms per stem. The fringed polygala was finished blooming and had been replaced by blue violets, *Viola adunca*, in the carpet of moss under the conifers. We had time for a quick stop at Pic River before seeing Wayne and lo and behold, the lady’s-slippers were in full bloom! It had been well worth the extra effort it had taken to retrace our steps to see this orchid, which was one of our main goals.

Sometimes called the homeliest of the cyripediums, due to the smallness of the flower and the disproportionately larger leafy stem, it is beautiful nonetheless, and is one of Jackie’s favorites. The thumbnail-size white flowers are self-pollinating. It is the only lady’s-slipper with an all green dorsal sepal that actually clamps down over the pouch opening, essentially closing it to all insect visitors and orchid lovers as well. If one gently lifts the dorsal sepal, floral wonders begin to emerge. Attractive maroon spots line the rim of the pouch and the yellow column as well, with larger maroon spots on the floor of the pouch (11). This purple spotting leads to the common name of



sparrow’s-egg lady’s-slipper. A little nomenclature: the family of Old World sparrows is classified as *Passeridae* and the Latin name for the house sparrow is *Passer domesticus*; the sparrow’s-egg lady’s-slipper is known as *Cypripedium passerinum*, meaning like a sparrow’s egg.

I am very glad to now have two additional photographers in the family that are as intent on getting the perfect shot as I am. In previous years, I would always set up and start to shoot right away, but now certain rules of etiquette have to be observed so that every one can have a turn with minimal environmental impact on the orchid sites. I usually let the ladies go first and then coerce one of them in to assisting me by holding reflectors and other accessories. After an abbreviated initial photo shoot at Pic River, we left to go meet Wayne.



Sparrow's-egg lady's-slipper,
natural size. Pic River Dunes,
Ont.

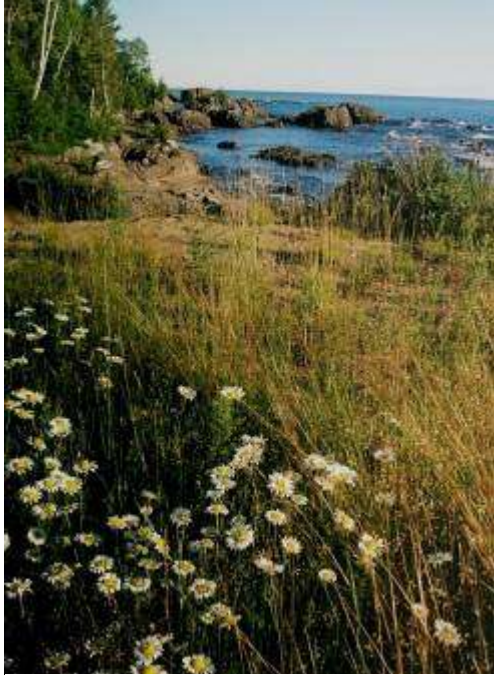
Wayne was very friendly and eager to show me the *Listera borealis* site. After dropping the family off at Horseshoe Bay, where the girls constructed survivor-type structures out of driftwood in my absence, Wayne and I followed a different- and shorter-trail out to the lake shore. There my worst fears were realized: the blown-down trees that I had been searching in ten days ago are indeed where the *borealis* is/was. In my previous search I had come across several numbered metal markers scattered in the undergrowth and didn't know what they meant. I now learned that each one had marked the location of a *Listera* plant. Wayne took me to the backside of a small dune where he had seen many plants four years ago and all that remained were about a dozen markers... My guess is that when the big spruces blew down, the bows shaded the orchids and they died out. Wayne said that the warden who had discovered and used to monitor the *borealis* site had retired and he regrets not making sure that the site was monitored more closely. I saw stakes numbered as high as 33, a veritable *Listera borealis* graveyard! We both searched for about forty five minutes, but there were no plants to be seen. Next time...

I was happy to see a thriving colony of 43 *Cypripedium passerinum* blooming nearby; the increased light when the big trees fell undoubtedly favored the light-loving Cyps. I thanked Wayne and told him that he was one of many wonderful 'kindred spirits' that we had met along the way that had helped immeasurably with our orchid-quest.

I picked up the ladies and we drove back over to Pic River to photograph some more. The black flies were fiercely guarding the cyps, but Jackie, Johanna and I photographed away, blithely trying to ignore them. We then set out to check on the other site. While still in the forest we passed a giant pile of very fresh bear dung, with large tracks to go along with it. Luckily this is not grizzly country and I wasn't worried, so singing and clapping so as not to surprise Bruno, we made our way up on to the dunes, where there were bear and wolf tracks zigzagging all over the place. Apparently our ursine and canine friends were as bug-challenged as we were, and were seeking refuge on the windy dunes.

The other site is in deep woods and the blossoms were just opening up. The photographic conditions were not ideal and the girls were less than thrilled about being left alone up on the dune, surrounded by large predator tracks, while I disappeared into the trees. So we trekked back to the other, more accessible site, which is nicely positioned on a gentle slope with little other vegetation. It is wonderful to see that a disjunct population of *Cypripedium passerinum*, at least a thousand miles from the nearest known other population of this species northward on

the shore of Hudson Bay is thriving and seems to be expanding its range. Christina Vance told me that she knows of at least one other population in Pukaskwa, making four different sites that I know of.



Ox-eye daisy, Batchawana Bay, Ont.

It was now 2 PM and we got in the car and drove another 380 miles. Wending our way back along the rugged eastern shore of Superior and enjoying once again the scenic grandeur of Lake Superior Provincial Park, we made frequent stops to photograph as the lush evening light slanted across the lake, vividly lighting up the shoreline. We finally reached the upper-peninsula town of Munising, Michigan, located on the south shore of Lake Superior, at 11:30 PM after a very long day of orchidizing and driving. Whew!

7/15/08: The reason we had come to Munising was to visit nearby Pictured Rocks National Lakeshore, which has some good orchid sites. The problem was that we had no guide or site-specific directions. I had read and re-read Fred Cases' now out of print book *Orchids of the Western Great Lakes*. This was one of the first orchid books that I had checked

out of the University Library in Logan, Utah when I was fourteen years old and was a budding wild-orchid fancier. We were specifically looking for some *Listera* species that had so far eluded us. Case talks at length about the area around Sable Falls, near the town of Grand Marais as a good site for broad-lipped twayblade, *Listera convallarioides*, auricled twayblade, *Listera auriculata*, and the rare hybrid of the two, Veltman's twayblade, *Listera ×veltmanii*. Sable Falls is the type locale for *L. ×veltmanii*, discovered there by Case in 1964.



Corallorhiza maculata var. *maculata*, Sable Falls, MI. About twice natural size.

It is a forty mile drive – mostly over pleasant sandy forest roads – to Sable Falls. It is a very enjoyable drive and on the way out I noticed a fen that I knew would be worth checking out on the way back. There were occasional glimpses of the colorful wind and water eroded rock formations along the lakeshore that give the area its name, but there was no time to stop, as we only had one day here, and were on a mission.

We stopped at the Sable Falls Visitor's Center and amazingly there was an orchid-savvy ranger manning the register. He knew many orchid locations nearby and even had a copy of Cases' book. What luck! He said that *Listera auriculata* could be found easily along the trail between the Visitor Center and the falls. It seemed too good to be true and it was. After searching with four eyes, mine and Jackie's, in very suitable habitat for about forty minutes we

found nothing. The girls went ahead to play on the beach while I visited a nearby sandy pine forest that the ranger had told me to check out. I was rewarded with five orchid species. There were 17 blooming spotted coralroots, *Corallorhiza maculata* var. *maculata*. Growing in full sunlight, their attractive red tepaled flowers, with white lips that are spotted with red, were a sight to behold. There were numerous *Goodyera oblongifolia*, still in bud. Exploring further, I found ram's-head leaves, pink lady's-slippers with ripening seed capsules and a few withering *Calypso* leaves.



The lady of the house in full bog regalia with *Calapogon tuberosus*.
Pictured Rocks Nat'l Lakeshore, MI.

I then walked all the way back, searching one more time as I went, to see if the ranger could be of any further help. He said he hadn't been out that way recently, but they were always there... I guess there must be a twayblade conspiracy, and I am the target! Luckily I was then able to drive fairly close to where the girls were playing on the beautiful Superior shore.

They were happily collecting pretty rocks, unconcerned with such foolish endeavors as twayblade hunting. We played for awhile and then returned to the car, going back up the wooden staircase that parallels the dramatic falls to the parking lot.

We headed back and as we approached the fen that I had noticed in the morning, I could see that there were pink flowers – obviously orchids of some kind – blooming prolifically in the grassy expanse. I got out of the car to investigate and could see that the fen was filled with hundreds of blooming *Calapogon* and rose pogonia (12). Jackie stayed with Christina while Johanna and I pulled on our boots and headed into the muck. There was one incredible *Calapogon* with at least 15 blossoms that really stood out. Johanna held my white umbrella - a great accessory to diffuse the intense afternoon sun, as I took one of my favorite photos of the trip (13). Then I returned the favor while she photographed. Teamwork! Johanna then stayed with Christina – who was happy in the car – and Jackie and I walked far out into the fen, drinking in the beautiful setting and marveling at the sheer number of orchids.

The Holiday Inn in Munising is built high up on a bluff that affords a beautiful view of Lake Superior, and the unique rock formations that attract visitors from far and wide were clearly visible from our balcony. It was the full moon, so the celestial show was spectacular. Superior was bathed in a silvery light and we lingered on the balcony, enjoying the peaceful tranquility.

7/16/08: This was our last day in the field and we had a lot of ground to cover, but I decided to make a side trip back to Grand Marais to look for the *Listera* again. It wasn't that far out of our way, but unexpected road construction cost us a lot of time. I dropped the family off at a beautiful beach to play and went searching. I happened on a very promising area that had been donated by a long-time resident family that was now a nature preserve. The habitat was perfect: alders growing along sandy streams, just back from the lake shore, just as Case had described it. But the twayblades once again proved to be elusive... This is when one needs Warren Mazurski or Richard Reeves to step in!

When I returned the girls were having a ball and had even found some tiny fossils in the sand. They didn't want to leave, but I managed to get everyone into the car, and we headed south to the Lake Michigan shore, about two hours away. Fred Case mentions that the roadside ditches along US 2 west of St. Ignace, Michigan are rich in orchid species, so that would be our route.

We reached US 2 and after heading east for a few miles stopped at a rest area where seven orchid species had been found before. We split up; searching the woods and marshy areas for about an hour, we managed to come up with ten robust pink lady's slippers next to a picnic area, many with ripening seed pods, but the other species were hiding somewhere, probably in plain sight. The difference between the two lakes is considerable. Gone were the clear waters and colorful water-rounded stones that characterize the beaches of Superior; the beach here on Michigan was muddy with brownish water to match, much like the Lake Huron side of the Bruce Peninsula. During lunch I spoke to a potential client back in New York about doing a piano gig in the fall and I think the fact that I told her I was returning her call from the idyllic shores of Lake Michigan, whilst hunting for wild orchids, helped seal the deal!

We got back in the car and headed east on US 2 again. It was midafternoon and we still had a long way to go, so with me watching the left and Jackie watching the right, we were whizzing along at 60 mph when I suddenly spied a large purple *Platanthera* growing on the roadside. Screech! Turning around, we drove slowly back and soon located what turned out to be a gorgeous 12" tall small purple fringed orchis, *Platanthera psycodes*, in full bloom. There was

only one plant at this site and I saw no others anywhere else along the roadside.



Satisfied with our only sighting of this very desirable species, we continued on our way. We saw no other orchids. Unfortunately a lot of development and road widening has occurred in the forty five years since Cases' book was written, wiping out a lot of habitat. Jackie thought she spotted a *Spiranthes* at one point, but we couldn't locate it when we turned around. We then crossed the mighty Mackinac Bridge, a marvel of engineering that connects the upper and lower peninsulas of Michigan at the Straits of Mackinac, where Lake Michigan meets Lake Huron. The view from the bridge is truly magnificent. The blue lake waters are dotted with emerald green islands outlined in white limestone outcroppings. Think of all the orchids! We reached our final destination of Oscoda, MI, midway down the lower-peninsula, after 11 PM. Grueling!



Platanthera psycodes, US 2 west of St. Ignace, Michigan. Flowering stem, about natural size.

7/17/08: We couldn't believe that the big trip was over! It had been a long haul from Winnipeg to this point, but there was no time to relax, as we had to get to Toronto today, hopefully by dinnertime to enjoy some of Jackie's mother's excellent cuisine. The urban sprawl of southern Michigan and southwestern Ontario is not a pretty sight and it made us even more appreciative of the incredible wild places we had seen in the last eighteen days. We reached Toronto just in time for rush hour joy, but were rewarded with a nice home-cooked meal. I would be heading south to Morgantown, West Virginia in the morning to attend the annual Native Orchid Conference - never enough - and the family would stay with the cousins until the following weekend, when I would drive back up to get them after fulfilling some work obligations in New York. So I bid the family farewell in the morning and headed on to another great orchid adventure in the Appalachian Mountains of West Virginia and Pennsylvania. But that is another story....

On my return trip to Toronto, I stopped by the *Platanthera leucophaea* site in eastern Ontario and amazingly, I managed to locate one plant still in bloom. It was a fitting book-end to a great trip. By the time we got back home, I had driven over 7000 miles! I want to thank Paul Martin Brown for the initial inspiration, travel tips and directions and for taking my phone calls from far-flung places; Warren Mazurski, Richard Reeves and Mary Wiebe for being incredible guides; Doris Ames for making sure we had guides in Manitoba; Lorne Heshka of Winnipeg and Mike Parsons of the UK for sharing orchid site information and all the rangers and wardens at the various parks that enabled our success.

The Great Orchid Year of 2008 finally ended. Whether due to climate change or just a blip in the cycle, the cool, wet, late blooming season that the northeastern United States and eastern Canada experienced made for a banner year of wildflower blooming. Besides our Great Lakes trip and my Appalachian excursion, we also went orchid hunting in Great Smoky Mountain and Shenandoah National Parks, the Chesapeake Bay area of Virginia, Vermont, eastern Long Island, Moab, Utah - where we found two species of *Platanthera* growing in desert alcoves, eastern Pennsylvania, and the Pine Barrens of New Jersey. The total number of orchid species, varieties and forms found for the year was a healthy sixty two. Amen!

Species found on Great Lakes Trip 2008:

1. *Amerorchis rotundifolia*
 forma *immaculata*
 forma *lineata*
2. *Arethusa bulbosa*
3. *Calopogon tuberosus* var. *tuberosus*
4. *Calypto bulbosa* var. *americana*
5. *Coeloglossum viride* var. *virescens*
6. *Corallorhiza maculata* var. *maculata*
7. *Corallorhiza maculata* var. *occidentalis*
 forma *aurea*
8. *Corallorhiza striata* var. *striata*
9. *Corallorhiza trifida*
10. *Cypripedium acaule*
11. *Cypripedium candidum*
12. *Cypripedium parviflorum* var. *makasin*
13. *Cypripedium parviflorum* var. *pubescens*
14. *Cypripedium reginae*
 forma *albolabium*
15. *Epipactis belleborine*
16. *Goodyera oblongifolia*
17. *Goodyera repens*
18. *Goodyera tessellata*
19. *Liparis loeselii*
20. *Listera cordata*
21. *Listera ovata*
22. *Piperia unalascentis*
23. *Platanthera aquilonis*
24. *Platanthera dilatata* var. *dilatata*
25. *Platanthera hookeri*
26. *Platanthera huronensis*
27. *Platanthera leucophaea*
28. *Platanthera obtusata* subsp. *obtusata*
29. *Platanthera orbiculata*
30. *Platanthera praeclara*
31. *Platanthera psycodes*
32. *Pogonia ophioglossoides*

Photographs by Tom Nelson unless otherwise credited

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www.pbase.com/tomdean/nativeorchids

LEAF COLOR AND GROWTH HABIT VARIATION IN *HABENARIA MACROCERATITIS* IN FLORIDA¹

Scott L. Stewart, Ph.D.

Introduction

Floral and vegetative structure variation is known to occur in the Orchidaceae. This variation can occur both within and between populations of the same species, and is thought to arise from microevolutionary pressures that may be population or site specific (Meléndez-Ackerman et al. 2005). Vallius et al. (2004) examined morphological variation within and between populations of co-occurring varieties of *Dactylorhiza incarnata* (L.) Soó. In a survey of five populations, they reported little morphological difference between populations of varieties; however, varietal differences within populations were high. Vallius et al. (2004) suggested that sympatric evolution is occurring among these co-occurring varieties resulting in within population morphological variation.

Studying sympatric populations of the terrestrial orchid *Gymmadenia conopsea* (L.) R. Brown, Soliva and Widmer (1999) identified a high degree of floral variation between early- and late-flowering populations of this species. As before, this variation may represent microevolutionary changes within metapopulations of *G. conopsea* to limit competition for pollinators. A similar trend in competition-limiting morphologic variation has been documented in the tropical epiphytic orchid *Tolumnia variegata* (Ackerman and Garza-Pérez 1991).

Within population morphological variation may be the result of microevolutionary forces driving speciation in the Orchidaceae. To this end, many orchid taxonomists have used floral and vegetative variation to identify stable color and growth forms within some orchid species. For example, *Epidendrum amethystinum* A. Richard forma *rubrifolium* P.M. Brown has been identified as a red-leaf color form of the otherwise green-leaf *E. amethystinum* (Brown 2000). An example of a morphological variation resulting in a unique taxonomic trait can be observed with *Listera australis* Lindl. forma *scottii* P.M. Brown (Brown 2000). Typically, *L. australis* forms two leaves per plant; however, forma *scottii* regularly forms four or more scattered leaves per plant, and this trait is stable year-to-year in the same plants. Finally, an example of floral color variation can be seen in the terrestrial orchid *Sacoila paludicola* (Luer) P.M. Brown forma *aurea* P.M. Brown (Brown 2001). This form differs with its yellow flowers, instead of typical red flower color.

Observations

A unique leaf color form and growth habit of *Habenaria macroceratitis* Willdenow was noted during recent ecological studies on the species in Hernando County, Florida (Stewart

¹Adapted from Stewart (2007).

2001). Typically, leaves of *H. macroceratitis* possess a glossy bright green appearance (Figure 1A). However, it was noted that leaves of particular plants of *H. macroceratitis* within the study population possessed lateral parallel striping alternating between dull green and yellow-green in color (Figure 1B, C). This unique color pattern was seen with only a few plants (17 out of 250, 8.5%) in the study population, remained stable for all plants during all observation years (2002-2006), and was observed from emergence of the first leaf to complete senescence of plants in all observation years. Plants possessing this lateral striping were not noted at any other *H. macroceratitis* site in Florida. No differences in floral or other gross morphological character were noted between these striped plants and otherwise normal-appearing plants. It remains to be seen if this variation in leaf color is due to plant nutrition, site variability, or some other microevolutionary force.

In addition to the leaf color variation, a unique growth habit was noted during field studies of *Habenaria macroceratitis* at the Hernando County, Florida site. Plants growing in full sun conditions with no canopy shade showed an upright growth form to their leaves (Figure 2). Typically, *H. macroceratitis* grows in shaded or partial-sun conditions under canopies of *Quercus* and *Magnolia*. Under these normal conditions, the leaves of *H. macroceratitis* grow perpendicular to the flowering stem and parallel with surface of the soil. However, the leaves of these plants were observed growing at an acute angle to the flowering stem and nearly vertical from the soil surface (Figure 2B). This growth habit is likely due to exposure to higher levels of light than what is typical for this species, and a morphological response to limit light exposure of leaves and reduce water loss from transpiration. However, *H. quinqueseta* (Michaux) Eaton has been observed growing in a similar high light situation in Levy County, Florida without this upright leaf growth (S.L. Stewart, personal observation).

Conclusions

Here, I report unique leaf color pattern and plant morphological variations seen within one population of the terrestrial orchid *Habenaria macroceratitis*. The variation in leaf color pattern appears to demonstrate no competitive advantage over the more common solid, shiny green leaf observed on the majority of plants in the study population or in other Florida populations. Therefore, this variation may be the result of micro-site nutritional variation or differences in orchid-fungal associations within these micro-sites. Further study of the long-term stability and reproduction of leaf color pattern from seed-derived plants is needed before this color variant is given further taxonomic or ecological consideration.

The variation in leaf angle exhibited by *Habenaria macroceratitis* plants growing in full-sun conditions at the study site is likely a physiological response to increased light levels and serves to help control transpiration rate in the plants. Taxonomic importance of this variation is negligible; however, ecological importance may be high given that *H. odontopetala* has been observed growing in similar high-light situations at the study site with no apparent change in leaf angle or morphology (S.L. Stewart, personal observation).

Flower color and plant morphological variation are well-documented phenomena in the Orchidaceae. These variations are likely driven by microevolutionary forces that may be site (or even micro-site) specific, or effect larger geographic areas encompassing several populations. Additionally, questions remain about the evolutionary advantage, genetic differentiation, and mycobiont utilization and succession that may be associated with both flower color and plant morphological variation seen in some orchid populations.



Figure 1 (left)—Lateral striping variant of *Habenaria macroceratitis* at the Hernando County, Florida study site. A) Comparison of striped leaf (top) and normal leaf (bottom). B) Vegetative plants of *H. macroceratitis* showing lateral striping. C) Flowering plant of *H. macroceratitis* showing an extreme example of lateral striping. Scale bar = 2.5 cm.



Figure 2 (below)—Plants of *Habenaria macroceratitis* at the Hernando County, Florida study site showing upright leaf growth habit. A) Flowering plant showing acute angle between leaf and flowering stem. B)



Vegetative plant showing vertical leaves. Scale bar = 2.5 cm

STEWART: LEAF COLOR AND GROWTH HABIT VARIATION IN *HABENARIA MACROCERATITIS*

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NEW TAXA & COMBINATIONS

PAUL MARTIN BROWN

FOUR NEW *PLATANThERA* HYBRIDS FROM WESTERN NORTH AMERICA

An extended trip to the western states in 2007 provided abundant information on hybrids in the genus *Platanthera*. Three of the hybrids involved recently described species. In each of the four cases both putative parents were present and the hybrid was easily detected as they blended distinctive characters of the parents.

***Platanthera* × *evansiana* P.M. Brown** nothosp. nov.

TYPE: U.S.A. Colorado: Denver Co. wet roadside ditch along Mt. Evans Highway. 27 July 2007. P.M. Brown 27707 (holotype: FLAS). (Figure 1B).

Planta inter *Platanthera purpurascens* (Rydberg) Sheviak and Wm. Jennings et *P. aquilonis* Sheviak intermedia et habitu, colore et forma florum, vel proprietibus specierum mixtis

Intermediate in characters between the two parents *Platanthera purpurascens* and *P. aquilonis*

ETYMOLOGY: *evansiana* from the Latin honoring Mt. Evans

Common Name: **Mt. Evans hybrid rein orchid**

***Platanthera* × *folsomii* P.M. Brown** nothosp. nov.

TYPE: U.S.A. California: Tolumne Co. wet meadow Yosemite National Park. 30 July 2007. P.M. Brown 30707 (holotype: YM). (Figure 2B).

Planta inter *Platanthera dilatata* var. *leucostachys* (Lindley) Luer et *P. yosemitensis* Colwell, Sheviak & Moore intermedia et habitu, colore et forma florum, vel proprietibus specierum mixtis

Intermediate in characters between the two parents *P. dilatata* var. *leucostachys* and *P. yosemitensis*

ETYMOLOGY: *folsomii* from the Latin, honoring Stanley Folsom who first observed the plant and brought to the attention of the author

Common name: **Folsom's hybrid rein orchid**

***Platanthera* × *kelleyi* P.M. Brown** nothosp. nov.

TYPE: U.S.A. California: Mono Co., wet woods along dirt road south of Lee Vining. 31 July 2007. P.M. Brown 31707 (holotype: FLAS) (Figure 3B).

Planta inter *Platanthera sparsiflora* (S. Watson) Schlechter et *P. tescamnis* Sheviak & Wm. Jennings intermedia et habitu, colore et forma florum, vel proprietibus specierum mixtis

Intermediate in characters between the two parents *P. sparsiflora* and *P. tescamnis*

ETYMOLOGY: *kelleyi* from the Latin, honoring Brad Kelley who guided the author to one of several sites for this locally abundant hybrid

Common name: **Kelley's hybrid rein orchid**

***Platanthera* × *smithii* P.M. Brown** nothosp. nov.

TYPE: U.S.A. Colorado: Eagle Co. river banks along Eagle River near Edwards Rest Area. 28 July 2007. P.M. Brown 28707 (holotype: FLAS) (Figure 4B).

Planta inter *Platanthera aquilonis* Sheviak et *P. tescamnis* Sheviak & Wm. Jennings intermedia et habitu, colore et forma florum, vel proprietibus specierum mixtis

Intermediate in characters between the two parents *P. aquilonis* and *P. tescamnis*

ETYMOLOGY: *smithii* from the Latin, honoring Scott Smith avid Colorado orchid enthusiast

Common name: **Smith's hybrid rein orchid**



Fig. 1

A. *Platanthera aquilonis*

B. *Platanthera x evansiana*

C. *Platanthera purpurascens*



Fig. 2

A. *Platanthera dilatata*

B. *Platanthera x folsomii*

C. *Platanthera yosemitensis*



Fig. 3

A. *Platanthera sparsiflora*

B. *Platanthera x kelleyi*

C. *Platanthera tescamnis*



Fig. 4

A. *Platanthera aquilonis*

B. *Platanthera x smithii*

C. *Platanthera tescamnis*

TWO NEW FORMS OF THE FLORIDA ADDER’S-MOUTH, *MALAXIS SPICATA* SWARTZ

Malaxis spicata is an uncommon orchid found throughout much of the coastal southeastern United States. Only in central and northern Florida is it relatively frequent. In Goethe State Forest, Levy County, Florida large colonies may be found. At one site the variation within the colony is impressive. Several years ago a three leaved plants was found, forma *trifoliata*, and such plants continue to be found. In the summer of 2008 two other variations were found--plants with all green flowers, rather than the typical orange and green flowers and a striking plant with variegated leaves.

The plants with concolorous green flowers were found by Larry Roberts and monitored for several weeks. Although the lower flowers did turn somewhat yellow as they faded the typical orange lip was never seen in either fresh or older flowers.

***Malaxis spicata* Swartz forma *morganiae* P.M. Brown** forma nov.

TYPE: USA, Florida: Levy County, Goethe State Forest. October 13, 2008 P.M. Brown 101308 (Holotype: FLAS) Fig. 5.

Forma floribus viridis conspeciebus diversa.

Differing from the type in having concolorous green flowers

ETYMOLOGY: *morganiae*, in honor of the discover’s young daughter Morgan Roberts, whose first wild orchid was a *Malaxis*.

COMMON NAME: Morgan’s green Florida adder’s-mouth

The striking variegated plant was found by Prem & Josh Subrahmanyam. The following is note concerning the discovery. “In mid-August 2008, Florida orchid photographer Prem Subrahmanyam and his son, Joshua, were photographing *Malaxis spicata* at a known population in Goethe State Forest near Dunellon, FL. As Mr. Subrahmanyam was taking photographs, Joshua surveyed the surrounding area for more plants, where he chanced upon a medium-sized plant with very strongly variegated leaves. The deep green leaves had a strong yellow variegation not unlike the leaf of a Pothos plant (*Epipremnum aureum*). He promptly brought this to his father’s attention, and its location was noted for future reference and photographs were taken of the plant in very early spike. Upon returning home and consulting the literature, it became apparent that a variegated form had not yet been described for this species. Mr. Subrahmanyam in turn brought this to the attention of Paul Martin Brown and returned several weeks later to flag the plant’s exact location, as well as protect it from deer and hog browse, for further study.”

***Malaxis spicata* forma *variagata* P.M. Brown, P. & J. Subrahmanyam** forma nov.

TYPE: USA, Florida: Levy County, Goethe State Forest. October 12, 2008 P.M. Brown 101207 (Holotype: FLAS) Fig. 6.

Forma foliae variegata conspeciebus diversa

Differing from the type in having variegated leaves

ETYMOLOGY: *variagata* from the Latin for variegated

COMMON NAME: variegated Florida adder’s-mouth



Fig. 5. *Malaxis spicata* forma *morganiae*
P.M. Brown
photo by Larry Roberts



Fig. 6. *Malaxis spicata* forma
variagata P.M. Brown, P. & J.
Subrahmanyam

**A WHITE/GREEN FORM OF THE GENTIAN NODDINGCAPS,
TRIPHORA GENTIANOIDES (Swartz) Ames & Schlechter**

The following form was brought to my attention by Stephen Jones of Plantation, Florida.
***Tripfhora gentianoides* (Swartz) Ames & Schlechter forma *albidaviridis* P.M. Brown & S. Jones forma nov.**

USA, Florida: County, Plantation, growing in bark mulch. June23, 2009 *S. Jones s.n.* (Holotype: FLAS) Fig. 7.

Forma floribus albida et plantae viridis conspicebus diversa
Differing from the type in having green plants with white flowers

ETYMOLOGY: *albdaviridis* from the Latin for white and green

COMMON NAME: white-flowered gentian noddincaps

Numerous plants were observed growing in bark mulch accompanied by the typically darker-colored individuals (Fig. 8.)

“I have noticed *Tripfhora gentianoides* in multiple locations throughout the City of Plantation, Fla., where I live.

During my run route, I noticed a small colony in a landscaped bed next to a sidewalk, that I could observe closely. I saw a different variation of *T. gentianoides* as it appeared entirely green. At the location of discovery, across from a park, the number of individuals is approximately 20. It's in a perilous location due to landscape maintenance and may be eliminated soon. My head in the bushes and brush seems to have paid off.

What a good feeling!”

Stephen Jones.



Fig. 7 *Tripfhora gentianoides* forma *albidaviridis* P.M. Brown & S. Jones



Fig. 8 Typically colored plants from same locale photos by Stephen Jones

WHAT I DID ON MY SUMMER VACATION

The Slow Empiricist

Summer is wonderful time of the year, especially if you have the time to devote to your passion for wild orchids. This is particularly true if you live in the parts of the world where winter means an end to the growing season and ice and snow reign supreme. You see, summertime is when you can get out and about and actually commune with the growing plants.

This objective, however, requires some careful preparations. I will try to enumerate some of the more important points in order to have a successful experience.

Let's start with yourself. Have you done your homework? You should have been learning all that you can about the orchids you wish to find. You should have been studying about them by consulting books, journals, and websites to expand your understanding. It is probably easier to contact someone who is a fellow enthusiast and get him or her to direct you to the plants or, if you are really lazy, con them into taking you to see the plants when they are in bloom.

Now, I may have been harsh to label a person as a con artist who merely wants to tic off another orchid who lets someone else do the work of locating suitable habitat and tracking down the particular specimens but you really aren't conning anyone but yourself by letting someone else do the work for you. You are depriving yourself of the fun and pleasure of actually doing the work yourself and the satisfaction of realizing your quest when your goal has been successfully discovered.

The rewards are multiple. You have done your homework. You have added a great deal of knowledge to your store of information and you have hard-won tools to apply to future quests for other orchids.

I was an educator for many years before I retired. Good educators continue to educate themselves over the years. In a class I took while pursuing a doctorate at Boson University I learned there are three types of learning/teaching experiences. They are autocratic, laissez-faire, and democratic.

The autocratic teacher directs his/her pupils every step of the way much like the experience you would have if you let someone guide you to the orchids you are seeking. The laissez-faire teacher goes with the flow, never directing the student towards any particular goal. If they stumble on the answer – good, if not– there is always tomorrow. This attitude does not create a wonder-filled experience for students. Can you imagine paying a great deal of money to visit an orchid hot spot with such hit or miss directions to find the plants? Certainly you enjoy the scenery, get some sun and exercise but do you want to have to wait until another year or whatever to reach your quest? There are enough incidents that can foil your goal like weather, sickness, animals eating the flowers, to name a few. Good prior preparation is essential. The democratic teacher works with his/her students and gives them tools to solve the problem for themselves. These students are able to advance and solve future problems on their own. The autocratic run classrooms aren't able to be so independent. The laissez-faire don't even get off the mark. Being able to work independently is a worthy goal for aspiring wild orchid enthusiasts. You will have invaluable tools to help you on your own. You should be able to apply your knowledge and discover new sites and maybe even new species or varieties of orchids. It is an exciting prospect to look forward to knowing more and more as you grow in orchid culture and lore. Then you will be able to write an exciting essay on what you did on your summer vacation.

Now, here is what I did this summer of 2009. I was privileged to explore the White Mt. region of New Hampshire and nearby Maine. After spending the winter in relatively flat Florida it was exhilarating to see the soaring peaks and to climb mountain trails in the orchid quest. I found my own large pad-leaved orchid, *Platanthera macrophylla*, in a shady glen off Bear Notch Rd. and watched it mature into a stunning specimen. I scrambled over rocks and tree roots, traversed a shaky wooden suspension bridge over the Wild River and forded back across the current rather than retrace my steps as we searched for twayblades and coralroots.

I found a perfect large purple fringed orchid, *Platanthera grandiflora*, growing along a mountain road and then further along the road, a pure white form in with a dozen more purples. I've seen fields of large and small purple fringed (*P. grandiflora* and *P. psycodes*). I had the pleasure of finding the first green fringed for the area near the Mt. Washington Hotel, simply because my knowledge of the plant's habitat made the hillside look right, time of year was right, and it all fell into place. Once I found the first green fringed the adjacent roadsides seeps have them and with them purple fringed and their resulting hybrids *P. xandrewsii*, *P. xkeenanii* including a pure white form of *P. xkeenanii*. What fun! I must of done my homework.

Your Slow Empiricist



Platanthera grandiflora and the forma *albiflora* Bog Dam Rd. Coos Co., NH



Platantbera macrophylla Bear Notch Rd. Carroll Co., NH





Platantbera lacera (top)

Platantbera x *keenanii* rare white form
(*P. lacera* x *P. grandiflora*) (center)

Platantbera x *andrewsii*
(*P. lacera* x *P. psycodes*) (bottom)

Rt. 302 near Mt. Washington Hotel, NH



A NEW GENUS FOR THE NORTH AMERICAN *CLEISTES*

Emerson R. Pansarin et al.
Paul Martin Brown

Note: For some years several authors have indicated that perhaps the North American representatives of the genus *Cleistes* would be better recognized in a separate genus. Pansarin, Salatino, and Salatino (2008) reemphasized this and followed up with a recent publication in the *Kew Bulletin*, Pansarin and de Barros (2008). Although this may lead to some frustration among North American native orchid enthusiasts it fits well with a larger view of the Pogonieae. Pertinent details relating to the North American species are quoted, with permission, from their respective publications. In addition, the proposal of the genus *Cleistesopsis* requires the new combination for one form, the same for a hybrid and this optimum time for the publication of an additional North American species in the genus. Readers are encouraged to access the entire text of both of the papers quoted below. *PMB*

Phylogeny of South American Pogonieae (Orchidaceae, Vanilloideae) based on sequences of nuclear ribosomal(ITS) and chloroplast (psaB, rbcL rps16, and trnL-F) DNA with emphasis on *Cleistes* and discussion of biogeographic implications. Pansarin, E., A. Salatino, and M.L.F. Salatino. *Organisms, Diversity & Evolution*. 8: 171–81. 2008.

.....All analyses of the present investigation provide evidence of close phylogenetic relationships among *Cleistes divaricata*, *C. bifaria*, *Isotria* and *Pogonia*. This fact points to the necessity of taxonomic realignments in *Cleistes*. Segregation of *C. divaricata* and *C. bifaria* from *Cleistes* is phylogenetically and biogeographically meaningful. The type species of *Cleistes* is *C. grandiflora* (Aubl.) Schltr., a tropical species distributed in South and Central America. Realignment in *Cleistes* was previously suggested by Cameron and Chase (1999), with two alternative proposals: (1) establishment of a new genus for North American *Cleistes*, or (2) assembling *C. divaricata*, *C. bifaria*, *Isotria* and *Pogonia* into a single genus, *Pogonia* Juss. Those authors, however, commented that such changes could not be made until studies with additional *Cleistes* species were done. The inclusion of most South and Central American *Cleistes* in the present molecular analyses provides strong evidence that South and Central American *Cleistes* form a monophyletic tropical group distinct from its temperate congeners, as previously suggested by Cameron et al. (1999). Of the two alternatives put forward by Cameron and Chase (1999), we prefer the creation of a new genus for *C. divaricata* and *C. bifaria*, because *Isotria* with its whorled leaves and *Pogonia* with its long hairs on the lip are distinct from *Cleistes* (Pansarin 2005). This proposal does not conflict with molecular evidence.

Taxonomic notes on Pogonieae (Orchidaceae): *Cleistesopsis*, a new genus segregated from *Cleistes*, and description of two new South American species, *Cleistes batistana* and *C. elongata*

Emerson R. Pansarin & Fábio de Barros *Kew Bulletin* 63: 441–48. (2008)

.....*Cleistes* is also paraphyletic and the North American *C. divaricata* (L.) Ames, and *C. bifaria* (Fernald) Catling & Gregg are closer to the North American genus *Isotria* and the North American-

Asiatic genus *Pogonia* than to their Central and South American congeners (Cameron & Chase 1999; Cameron et al. 1999; Pansarin 2005; Pansarin et al. 2008). The Central and South American *Cleistes* form a monophyletic group characterized mainly by the presence of tuberous roots, glandular nectaria, and South-Central American distribution (Pansarin 2005; Pansarin et al. 2008). *Cleistes* is typified by *C. grandiflora* (Aubl.) Schltr., a tropical species ranging from South to Central America (Pansarin & Barros, in prep.). Realignment in *Cleistes* was previously suggested by Cameron & Chase (1999), with two alternative proposals: (1) creating a new genus for North American *Cleistes*, or (2) assembling *Cleistes divaricata*, *C. bifaria*, *Isotria* and *Pogonia* into a single genus, *Pogonia* Juss. However, those authors asserted that such changes could not be made until studies with additional *Cleistes* species were completed. The inclusion of most South and Central American *Cleistes* in recent molecular analyses based on ITS, *rbcL*, *psaB*, *rps16* and *trnL-F* (Pansarin et al. 2008) provided strong evidence that, in fact, the South and Central American *Cleistes* form a monophyletic tropical group, distinct from their temperate congeners, as previously suggested by Cameron et al. (1999) and Cameron & Chase (1999). Between the two alternatives suggested by Cameron & Chase (1999), we find the first one more appropriate, i.e., creating a new genus for *Cleistes divaricata* and *C. bifaria*, because *Isotria*, with its pseudo-whorled leaves, and *Pogonia*, with its long hairs on the lip, are distinct from *Cleistes* based on evidence from morphology and DNA sequence data (Pansarin 2005; Pansarin et al. 2008).

Cleistesiosis Pansarin & F. Barros gen. nov. A genus *Cleistes* simile sed radicibus tuberosis, nectariis glandulosis, sepalis lateralibus sursum, distributione geographica regionibus temperatis Americae borealis differt. Type: *Arethusa divaricata* L., Sp. Pl. 2: 951 (1753).

The name *Cleistesiosis* is based on the resemblance of the reproductive characters of *Cleistesiosis divaricata* and *C. bifaria* to those of the tropical genus *Cleistes*. As presently conceived, *Cleistes* is a paraphyletic genus with two well supported clades. One clade includes the North American species: *C. divaricata* and *C. bifaria*, the North American genus *Isotria*, and the North American-Asiatic genus *Pogonia* (Cameron & Chase 1999; Cameron et al. 1999; Pansarin 2005; Pansarin et al. 2008). The Central and South American *Cleistes* forms the second clade characterized by the presence of tuberous roots, glandular nectaria, non erect sepals and South-Central American distribution (Pansarin 2005; Pansarin et al. 2008). Furthermore, the South American species of *Cleistes* produce nectar as a reward and are pollinated by several species of social and solitary bees (Pansarin 2003, 2005) or are co-pollinated by hermit hummingbirds (Pansarin 2003). The North American *Cleistes bifaria* and *C. divaricata* have few fibrous roots, glandular nectaria are absent, and are pollinated by *Bombus* and *Megachile* spp. attracted to their flowers by deceit or pollen offered as a reward (see Gregg 1989, 1991a, b; Dressler 1993). On the basis of the evidence presented here, *C. bifaria* and *C. divaricata* are distinguished from South and Central American *Cleistes* by molecular and nonmolecular characters (see Cameron & Chase 1999; Cameron et al. 1999; Pansarin 2005; Pansarin et al. 2008). As the type of *Cleistes* is *C. grandiflora*, a tropical species from South and Central America (Pansarin & Barros, in prep.), *Cleistes bifaria* and *C. divaricata* should be regarded as belonging to a different genus than described here. The following new combinations are also necessary.

Cleistesiosis bifaria (Fernald) Pansarin & F. Barros comb. nov. Type: North Carolina: Burke Co.: Summit of Table-Rock Mountain, 2 July 1891 Small & Heller 285 (holotype GH; isotype NY!).

Cleistes divaricata (L.) Ames var. *bifaria* Fernald, *Rhodora* 48 (572): 186, pl. 1048, map 2 (1946).

Pogonia bifaria (Fernald) P. M. Br. & Wunderlin (1997: 451).

Cleistes bifaria (Fernald) Catling & Gregg (1992: 65).

DIAGNOSTIC FEATURES. Flowering plants in general 13 – 50 cm tall. Leaves 4 – 14 × 0.5 – 2.5 cm. Sepals 25 – 52 × 2.5 – 5 mm. Petals 22 – 33 × 6 – 11 mm. Lip 2.2 – 3.5 × 1.2 – 1.5 cm with a thick central crest very slightly grooved, groove deep and verrucose or brainlike with discontinuous

ridges. Column 1.5 – 1.9 cm. DISTRIBUTION. *Cleistesiosopsis bifaria* is distributed in North America, occurring in the acid soils of savannas, meadows, open areas in oak or pine woodlands, mountain habitat, often xeric, (between 0 – 1000 m a.s.l.).

NOTES. *Cleistesiosopsis bifaria* has been treated as a variety of *Cleistesiosopsis divaricata* (as *Cleistes divaricata* var. *bifaria* Fernald), which has been raised to species level by Catling & Gregg (1992). According to these authors *Cleistesiosopsis bifaria* is separated from *C. divaricata* by the relatively shorter column and lip, which is correlated with the relatively small size of the other floral parts, differences in lip keel, and some degree of geographic and phenologic isolation. Where the ranges of both species overlap, *Cleistesiosopsis bifaria* blooms earlier than *C. divaricata*, which also produces a different floral fragrance (Catling & Gregg 1992).

Cleistesiosopsis divaricata (L.) Pansarin & F. Barros comb. nov. Type: Without data (lectotype LINN 1059.3!). Lectotypified by Catling & Gregg (1992: 70). *Arethusa divaricata* L., Sp. Pl. 2: 951 (1753).

Pogonia divaricata (L.) R. Br. (1813: 203). *Cleistes divaricata* (L.) Ames (1922: 21).

Cleistes divaricata (L.) Ames forma *leucantha* P. M. Br. (1995: 8). Type: Florida: Duval Co.: Without locality,

May 1960 (holotype Luer, Native Orchids Florida t. 8 (6) (1972)).

DIAGNOSTIC FEATURES. Flowering plants in general 30 – 70 cm tall. Leaves 3 – 13 × 0.5 – 2 cm. Sepals 30 – 60 × 3.5 – 5 mm. Petals 27 – 50 × 5 – 18 mm. Lip 3 – 5.5 × 1.8 – 2.5 cm, with a thick central crest deeply and broadly grooved, smooth with 1 – 3 low and continuous ridges. Column 2.2 – 2.7 cm.

DISTRIBUTION. *Cleistesiosopsis divaricata* is distributed in North America, occurring in coastal plain savannas, in acid soils (between 0 – 200 m a.s.l.).

New Combinations

P.M. Brown

***Cleistesiosopsis divaricata* (L.) Pansarin & F. Barros forma *leucantha* (P.M. Brown) P.M. Brown comb. nov.** Fig. 5

Basionym: *Cleistes divaricata* (L.) Ames forma *leucantha* P. M. Br. (1995: 8). Type: Florida: Duval Co.: Without locality,

May 1960 (holotype Luer, Native Orchids Florida t. 8 (6) (1972)).

***Cleistesiosopsis* × *ochlockneensis* (P.M. Brown) P. M. Brown comb. nov.**

Basionym: *Cleistes* × *ochlockneensis* P.M. Brown, *North American Native Orchid Journal* 10: 25. 2004.

Type: Florida: Wakulla Co. Ochlocknee River State Park

Emended description: *Cleistes bifaria* should be emended to *Cleistesiosopsis oricamporum*

A New Species

Cleistesiosopsis oricamporum

Several authors have indicated that the Coastal Plain populations and mountain populations of *C. bifaria* are distinct and may represent different species (Gregg, 1989 ; Smith, 2004). With the publication of *Cleistesiosopsis* and revision in the North American nomenclature it appears the time is ideal to differentiate between those two taxa.

The following is proposed:

***Cleistesiosopsis oricamporum* P.M. Brown sp. nov.**

Cleistesiosopsis oricamporum P.M. Brown sp. nov. a similari *C. bifaria* (Fernald) Pansarin & F. Barros bractea florali florem pedicellatum aequanti vel eo brevior (non majore) et odore dulci vanillae (non sine odore) differt.

Differing from the similar *Cleistesiopsis bifaria* (Fernald) Panarin & F. Barros in floral bract equal to or shorter than pedicellate flower (bracts greater than pedicellate flower in *C. bifaria*) and in sweet vanilla fragrance (fragrance lacking in *C. bifaria*).

Type: USA: Florida: Clay Co. May 1983. Moist forest along stream with occasional boggy openings; surrounded by pine-plantations. Open areas of cut-over pine woods. Moist, acid areas; lip white with pinkish markings; uncommon; with *Pogonia*, *Calopogon*. *Walter S. Judd 3334 collected with Dana Griffin & Bob Simons* (Holotype: FLAS 150480) Fig. 1,2,3c

Etymology: *oricamporum* from the Latin for coast – *ori* - and plain - *camporum*

Cleistesiopsis bifaria (fig. 4) was originally described by Fernald (1946) from plants in the mountains of North Carolina and therefore the specific epithet *bifaria* is applicable to the mountain plants. The Coastal Plain plants, although considerably more numerous and well-distributed, represent genetically distinctive populations with, admittedly minor, morphological differences but significant other characteristics. *Cleistesiopsis oricamporum* plants have a strong vanilla fragrance and overall are usually larger than *C. bifaria* whereas *C. bifaria* are lacking in noticeable fragrance and the plants tend to be smaller and more compact. Conversely the floral bract in the Coastal Plain plants is equal to or shorter than the pedicellate flower and in the mountain populations noticeable longer than the pedicellate flower. Based upon these differences and statements in Catling and Gregg (1992) and Smith et al. (2004t) regarding the genetic and molecular differences the Coastal Plain populations therefore require a new species epithet – *C. oricamporum*.

The distribution map for *Cleistesiopsis* (as *Cleistis*) *bifaria* in Catling and Gregg (1992, fig. 9) clearly shows populations in two different geographic areas and the two species conform to these counties. Those of the mountain counties in W. Virginia, Virginia, Kentucky, Tennessee, Virginia, South Carolina, and Georgia are *Cleistis bifaria* and those plants from the coastal and nearby piedmont counties of Virginia, North Carolina, South Carolina Georgia, Florida, Alabama, Mississippi, Louisiana, and a possible record for Texas would all be referable to *C. oricamporum*.

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Figure 1. *Cleistesopsis oricamporum* P.M. Brown



Fig. 3. a. *Cleistesioipsis divaricata*
Wakulla Co., Florida

b. *C. xochlockneensis*

c. *C. oricamporum*



Fig. 4 *Cleistesiosipsis bifaria* N. Carolina
photo by Jim Fowler



Fig. 5 *Cleistesiosipsis divaricata* forma *leucantha*

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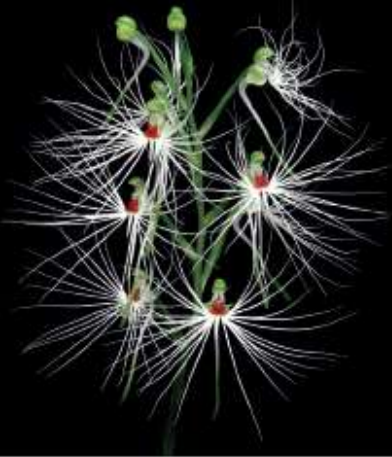
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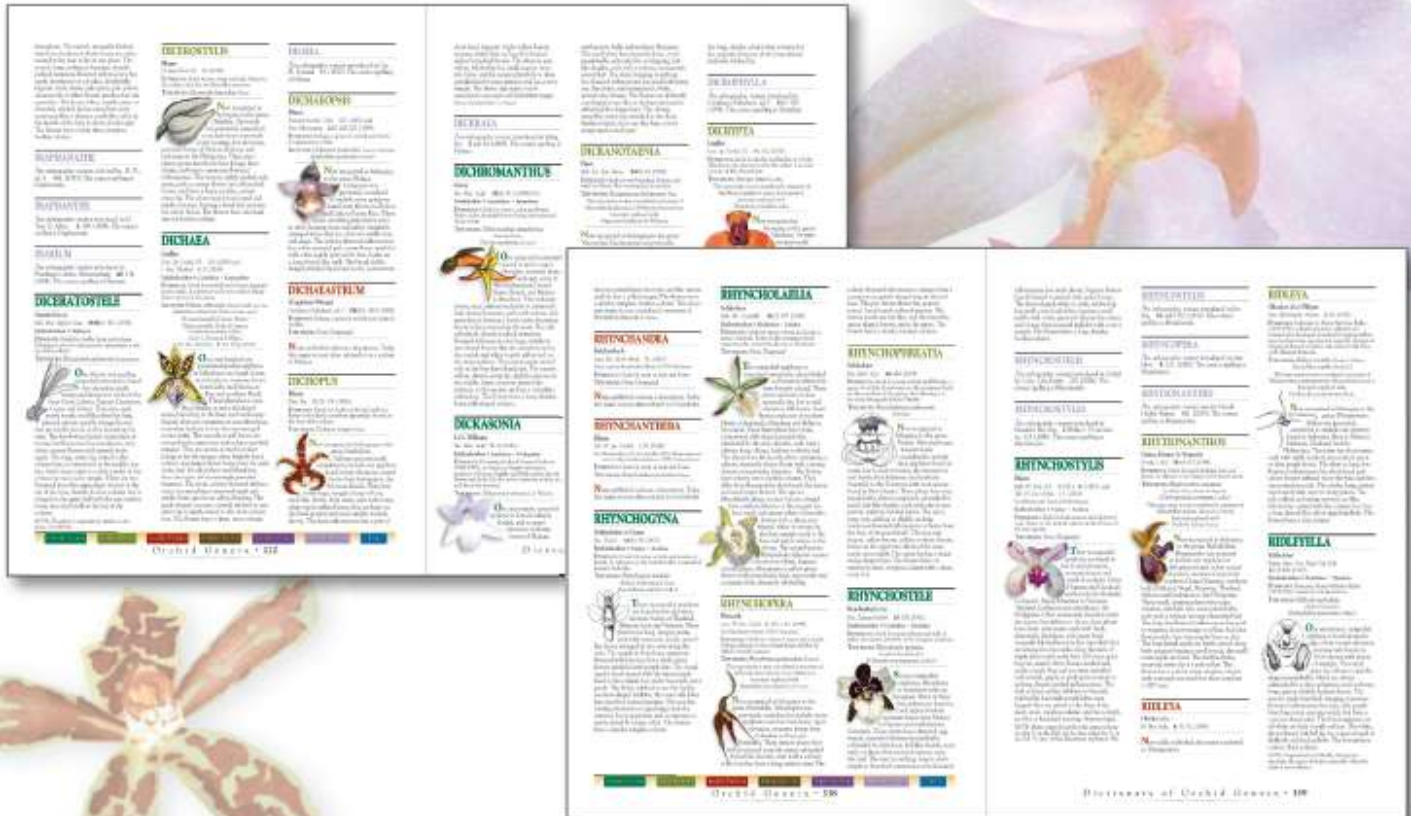
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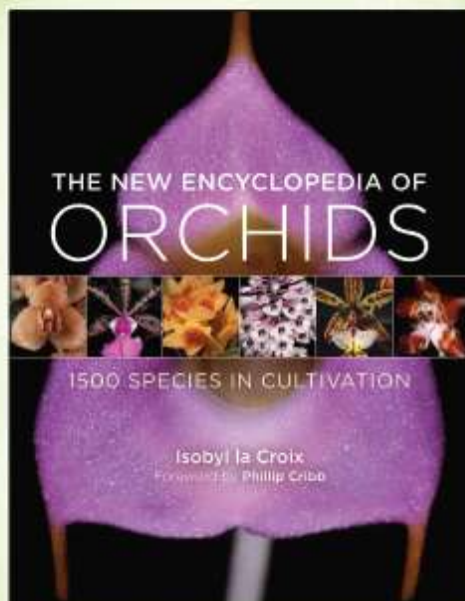


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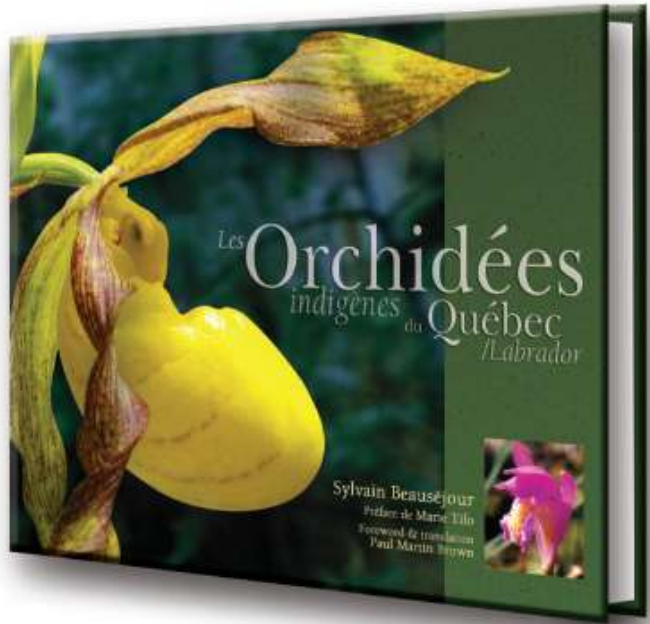
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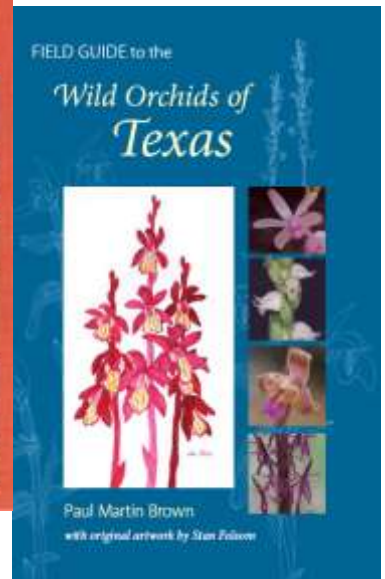
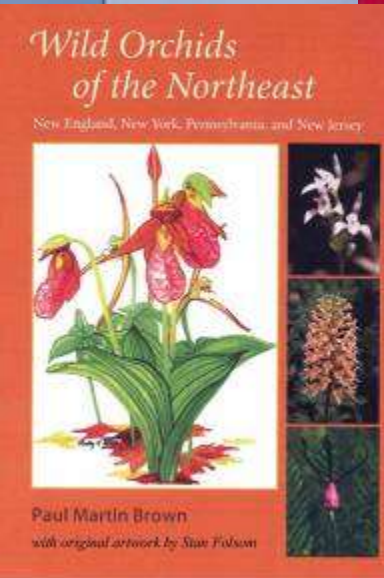
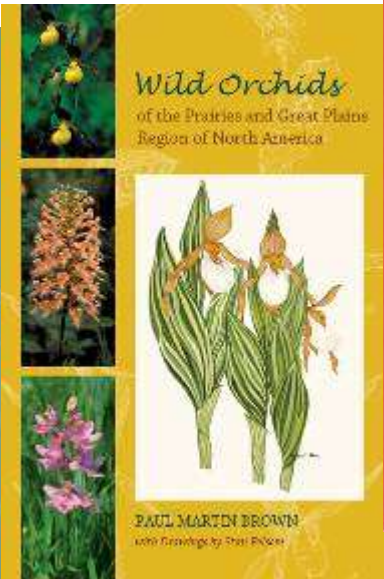
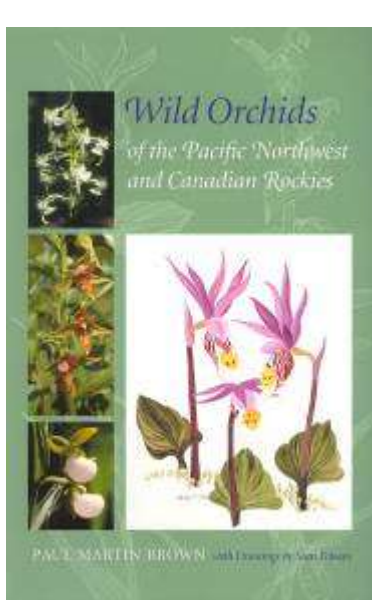
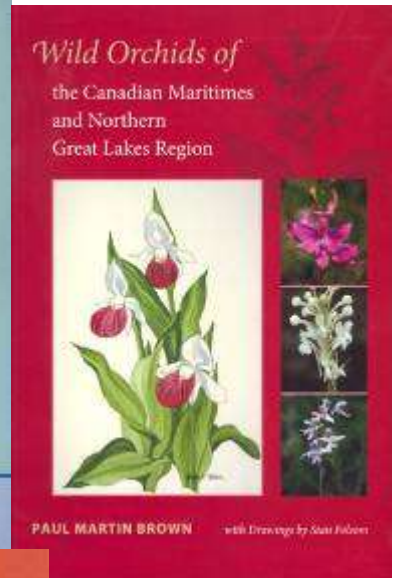
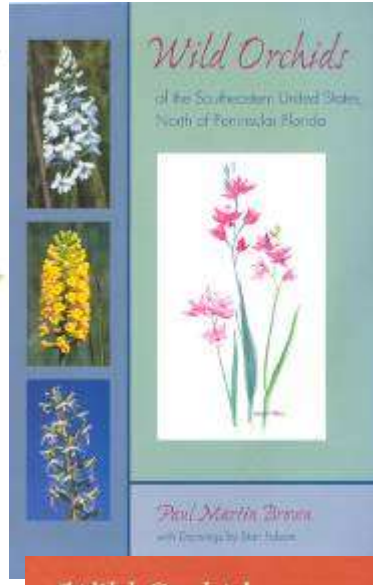
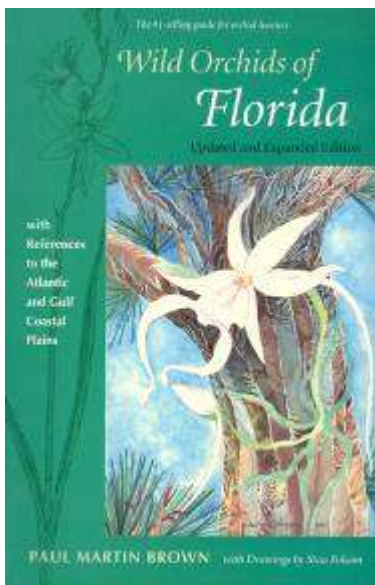
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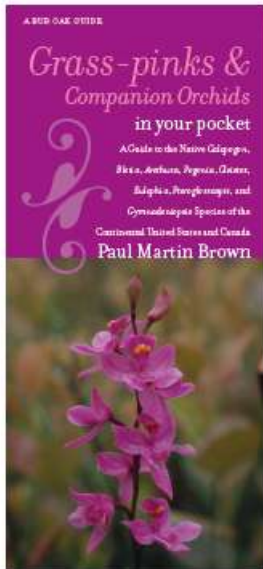


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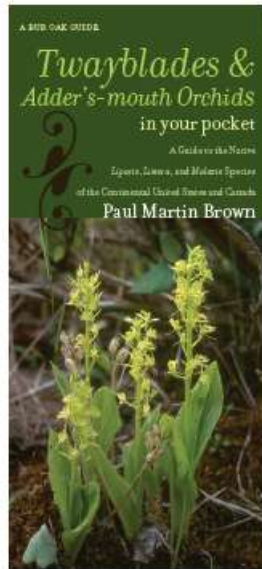
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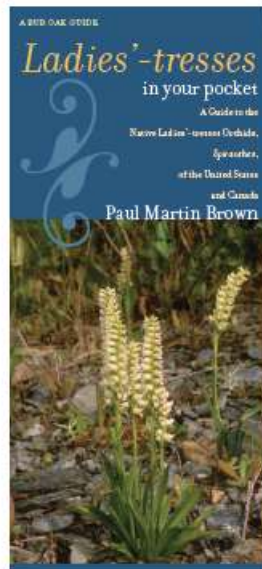
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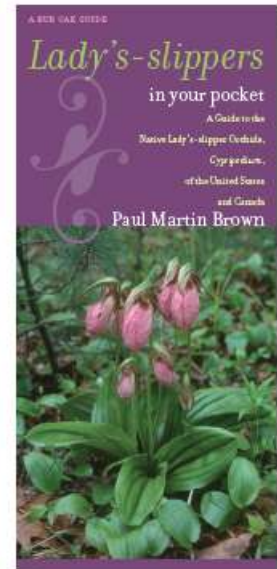
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