



Volume 6, Issue 1

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tion to see what is actually going on underground when a plant does not send up an aerial shoot. Understanding why plants remain underground and whether it is beneficial or harmful should give us important information that will help conserve and manage orchid populations at risk.”

At the 2009 conference in Green Bay, Wisconsin, the NOC Conservation Committee will be looking for another candidate to make a donation to promote *in situ* conservation of native orchids. If you have a question about ‘1% FOC’ or a suggestion for the donation of ‘1% FOC’ funds to a particular *in situ* orchid conservation project, please contact the committee chair, Kip Knudson at knudy@centurytel.net.



NOC, Inc. News

David McAdoo, Kernersville, North Carolina

Membership in our organization continues to rise from year to year. Although we are not becoming a large organization that loses touch with its members, we have grown from 112 charter members in 2003 to 227 in mid November of 2008.

In addition, it is interesting to note that our free Yahoo list-serve has grown to more than 535 participants since starting in late 2002. These folks have exchanged more than 4,150 messages over the past 6 years. It is a fun site, and the discussions that go on are very interesting. If you are not a participant, you ought to join-in at <http://tech.groups.yahoo.com/group/NativeOrchidConference/>. The next step in the evolution of our group is being led by Bob Sprague who is heading up our Publicity group. He spearheaded our exhibit at the Miami World Conference which won the trophy for the Best-in-Show Educational Exhibit. Next to come is our relationship with the American Orchid Society's magazine *Orchids*. We have been invited to contribute a continuing series of articles on the wild orchids and their habitats in North America. Finally, work is underway by member Charles Garratt to create a public web site for the organization. It is in development and can be found at <http://www.nativeorchidconference.org/>.

It amazes me that we have been so successful for this long. All this history and these efforts make this a fun group to be involved with. I hope that you enjoy it as much as I do.



Ram’s Head, *Cypripedium arietinum* R. Br.

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The statement “best things come in small packages” is typically used in reference to gems, and *Cypripedium arietinum* certainly is a gem (Figures 1-3; page 9). It is the smallest, most delicate and intricately designed of North American slipper orchids.

The genus name, *Cypripedium*, is Latinized ancient Greek and derived from two words: *Kypros* referring to Venus of Cyprus, and *pedilon* meaning shoe or slipper. The species name, *arietinum*, refers to either the ‘bent’ nature of the lip (as seen from a lateral perspective) or its resemblance to a sheep’s head (Mayr, 1998).

Plants are 10-35cm tall, covered with soft hair throughout, with 3-5 narrow to elliptical leaves 5-10 x 1.5-3 cm in size and spirally arranged along its stem. The floral bract is 3-5 x 1-1.5 cm and lanceolate. Single flowers are the rule, although double-flowered individuals are rarely reported. Sepals and petals are brownish to brownish green. The dorsal sepal is broadly elliptic, 15-20 x 5-11 mm in size, and is positioned at about a 30-45° angle to the top of the flower. The remaining sepals and petals are similar, very narrow and long (~13-20 x 1-2 mm in size). Unique amongst our lady’s slippers, the lateral sepals are free to their base – not joined as are all our other species. The lip is 1.5-2.5 x 1-2 cm in size, funnel-shaped, with the base narrowed antero-posteriorly and the apex rounded. The orifice, 1-2 mm wide, faces upward, is rolled inward, and is covered with long hairs. Lip color is bright white, overlaid with a purple netlike pattern that merges toward the much narrowed but rounded apex, that is often green.

Although tiny and delicate, *Cypripedium arietinum* is a cold climate plant. It is found in the Canadian provinces of Nova Scotia, Quebec, Ontario, Manitoba and Saskatchewan, and in nine northern states in the USA: Maine, Vermont, New Hampshire, Massachusetts, Connecticut, New York, Michigan, Wisconsin and Minnesota. Michigan is the only state where this species is not listed as threatened or endangered (USDA, NRCS 2008). Even in Michigan the number of extant populations has dwindled to less than half those once known (Michigan State University, 2002). Habitat for ram’s head ranges from moist to dry coniferous forests to fens and beach thickets, but it reaches its greatest profusion amongst Jack Pine (*Pinus banksiana* Lamb.) woodlands in the dunes bordering Lake Superior (Case, 1987). The flowering season for ram’s head lady’s slipper ranges from the end of May through June.

Pollinators for this species have been determined to be sweat bees in the genus *Lasioglossum* (Stoutamire, 1967). The bees must be small to force their way through the tiny lip orifice. As with our other slipper orchids, pollination is by deceit because no edible reward is available. The attractant is scent. Although capsules contain prodigious amounts of seeds (Stoutamire, 1964), reproduction is thought to be largely asexual by way of offshoots (Brower 1977).

One feature - the totally free lateral sepals, not partially joined into a synsepal, as they are in other *Cypripedium* species - has caused considerable discussion. This characteristic is considered primitive and some investigators segregated ram's head lady's slipper in a separate genus, *Criosanthes* (Rafinesque, 1818; Atwood, 1984). This position was rejected by most botanists, and recent study of genetic variations in North American slipper orchids validated maintaining this species within *Cypripedium* (Case, 1994).

Another fascinating aspect of this extraordinary species is that a plant endemic to central China, *Cypripedium plectrochilum*, is similar enough to *C. arietinum* that early investigators thought they were the same species; however, morphological and molecular analyses substantiate sister species status (Chen, 1983; Cribb, 1997; Li, 2008).

The Iroquois Indians used a tea made from this species for intestinal trouble with inflation and pains (Moerman, 1986). Propagation of ram's head orchids from seed has been successfully accomplished and documented (Steele, 2007); however, since it is a rare and endangered species, respectable growers are reluctant to offer plants for sale.

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END NOTES

Errata

NOCJ 5(3): 7-10, 19-21. In Jim Fowler's article 'NOC 2008 Meeting Field Trips: Part I (Central and Southwestern Pennsylvania),' the term 'secund' on page 9 was incorrectly printed as 'second.'

NOCJ 5(4): 1-4. In Matt Richards' article 'Assisting the Conservation of *Tolunnia bahamensis*,' Jonathan Dickinson State Park was incorrectly spelled as Jonathan Dickenson State Park.

Our apologies for these oversights.



Native Orchid Conference, Inc. and 1% FOC: Monitoring for Conservation in West Virginia

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The Native Orchid Conference, Inc.(NOC) has made a \$100 donation toward the continuation of several *in situ* orchid conservation projects in West Virginia. This donation represents NOC's commitment to the '1% For Orchid Conservation' (1 % FOC) program initiated in 2006. In 2007, NOC contributed \$50 to the Florida Panther Refuge to help with laboratory supplies.

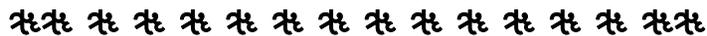
The 2008 grant was to support field studies by an undergraduate biology major, Miss Julie Powelson of Shinnston, WV, who is working under the supervision of Dr. Katharine Gregg, Professor of Biology, West Virginia Wesleyan College. Kathy Gregg described these projects as follows: "The first project involves long-term monitoring of two populations that were grazed by deer some years ago. Careful monitoring of damage and recovery helps us better understand the importance of protecting critical orchid populations from herbivores. A second project is monitoring seedling emergence and growth in a natural population where seedling production has been fairly constant in recent years. Observing where they come up relative to mature flowering plants and microclimate and how likely and how long they survive will help us better understand the requirements and timeline of seedling development in the wild. The third project is looking at prolonged, or adult, dormancy, a little understood phenomenon that appears in many different species of terrestrial orchids. This project is being investigated by experimental bud removal and by excava-

This was my best-to-date so you could imagine how thrilled I was, and that I would spend my time trying to capture good images. In this condition, many would not find this to be an exciting or photographic event. However for those who would have been in my shoes you would want to take full advantage of the opportunity not knowing if or when another might come along. Even though past prime, a cluster viewed from a perspective that captures a number of orchid flowers filling the frame makes for a worthwhile record. Furthermore, the one flower that I could prop up and gently tease to a more open posture temporarily satisfied my desire for a close-up.

The steep slopes alongside the camp road were gently sprinkled with three-birds orchids. Some were singles while others were in clusters of a few to half a dozen. Too bad our timing was off by just one day. Some of my companions who were familiar with this site over a number of years told of banner years when they had encountered significant numbers and caught them in prime bloom. I could only be envious of their good fortune. While I was indeed envious, I was still quite happy to see what was available this day.

The forest was host to other orchid species as well. A few *Goodyera pubescens* (the downy rattlesnake plantain orchid) waved their stout spikes of tiny white flowers above the bright basal leaf rosettes. The leaf clusters with their criss-cross venation in bright white attract plenty of attention. One can easily appreciate a need for caution that is advisable in disclosing locations for such an attractive collectable from the standpoint of domestic growers. The glossy ovate leaves from the spring blooming *Galearis spectabilis* (showy orchis) were all that remained to indicate their presence. Memories of these orchids in bloom could be reason to return in another season. Single basal strap shaped leaves indicating one of the *Platanthera* species left one guessing as to which of a couple candidates dwell here. A few seed-pods and leaves were all that remained from the earlier blooming *Liparis loeselii*.

All too soon it was time to move onward as this was just one of four major sites we had targeted for today. It would not be my only orchid first this day either. In later afternoon after several other stops it was to be my first ever view of *Corallorhiza bentleyi* (Bentley's Coral Root). But as they say, that's another story.



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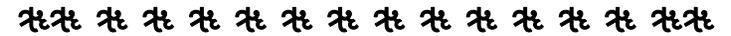
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Platanthera integrilabia (Correll) Luer

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Platanthera integrilabia (Figures 1-3; page 10) is an interesting plant. Though it can sometimes be found in large numbers in years of consistent rain, it is still rare enough to be considered a good find. The U.S. Fish and Wildlife Service has listed it as a "Candidate" species for protection. It is well known as having a very limited range, centered primarily on the Cumberland Plateau and Unaka Range foothills of east Tennessee.

For starters, don't believe everything you read about it; better to see it in the field and draw your own conclusions. For example, some authors will tell you that it is a small plant growing only in shade or that it is only fragrant at night. Baloney! It can be up to four feet tall, is often very healthy in full sun (as long as its feet don't dry out), and usually rewards close inspection in broad daylight with a wonderful perfume.

The common name of "monkey-face" is indeed the most frequent non-scientific term in current use for this orchid, but nobody seems certain as to how this name originated. In *The Native Orchids of North America North of*

Mexico (1978; pp. 416, University Microfilms International), Donovan Correll quotes a 1938 letter from Dr. H.K. Svenson which accompanied some specimens from Tennessee: “These were collected on the Cumberland Plateau near Beersheba Springs. I saw approximately two hundred specimens in grassy swamps, accompanied by *H. ciliaris* and *H. cristata*.” He goes on to note that “Like the other species of *Habenaria* it is known locally as ‘Monkey-face.’” In recent times, however, that common name has not been applied to any other orchid species, at least not in the U.S.

From time to time various wildflower enthusiasts will squint at a bloom from various angles, trying to discern some simian resemblance. The most frequent observation is likening the elongated and curved spur to a monkey’s tail. Others sometimes compare the lateral sepals to monkey ears. Efforts to further the comparison generally have gone for naught.

Authors generally put the blooming time during August and September, but in some years you had better start looking for it before the end of July or it might already be past prime when you find it. In 2008, however, yet another mid-summer drought resulted in unusually low numbers of blooming plants, along with surprisingly delayed blooming times, in some cases near mid-August. At first it appeared that no plants would bloom at all in some of the best spots for it on the Cumberland Plateau near Cagle, Tennessee, because of the terribly dry conditions. However, Dr. Margret Rhinehart of Spencer, TN, correctly predicted that some of the plants would eventually bloom, and indeed they did, approximately three weeks later than in wetter years.

There are a number of stations for the monkey-face orchid that have just a few plants, particularly at the edges of its range. But in the center of its distribution in SE Tennessee it can sometimes be seen by the hundreds, which is a magnificent sight. Very often it appears interspersed with other summer *Platanthera* species such as *P. ciliaris*, *P. cristata*, and/or *P. clavellata*, composing an absolutely breathtaking panorama.

One of the best sites for spectacular displays has been the swamp bogs on Starr Mountain near Etowah, TN. Some interesting hazards, however, have served effectively to protect the plants from poaching. Underground-nesting yellow jackets have been known to erupt suddenly like a volcano, inflicting serious stinging on unwary hikers. Following the branching creeks to the open central bogs is like trying to figure out a maze, and many seekers have gotten lost, for hours or even overnight! One academic researcher admitted that he purposefully marked a false trail to mislead plant hunters into bypassing the best areas, where he and his students were conducting studies of soil fungi and bacteria species. Local rattlesnake hunters report success from just driving the few access roads, but botanists see copperheads more frequently than rattlesnakes in the bogs.

One hopes that those you pass are wide awake and in control of their big rigs. Radio stations from places not normally accessible provide a wide array of interesting choices.

On the south side of Pittsburgh our first rendezvous was completed and three were now joint venturers in a van heading southbound for West Virginia. It was only after seven and I already was heading for my third state.

In Flatwoods, West Virginia, we added a fourth passenger. We would not add the fifth until Richwood, considerably downstate. Weather was moderate for this time of year. Normally, one expects the dog days where temperature and humidity are in an Olympic competition for which gets highest fastest and farthest. This current period was a most pleasant exception. This has considerable relevance for one of the orchid species we were targeting for today.

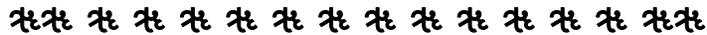
Camp Caesar is within the Monongahela National Forest. The nearest municipality of any size is Webster Springs. This private campground was our first destination. The main camp road rapidly ascends into a beautiful mixed forest. I am particularly impressed by a most prolific and beautiful display of fungi. I could have spent the entire day or more investigating and photographing the fungi without paying attention to anything else. However, this was not the goal today. My particular quarry was an orchid species I had heretofore failed to ever catch in prime bloom. Today would also not be considered prime as our specimens were slightly past by probably one day. However, they were the most open and nearest-to-prime of any I had ever seen before. I speak of *Triphora trianthophora* (three-birds orchid). As you aficionados well know, the blooming prerequisite for this species is both intriguing and complicated. First, there occurs the usual hot humid weather one normally associates with August. This must be interrupted by rain. The rain must be accompanied or at least followed by a cool period. The exact period of time for such period seems to vary according to who is reporting. Reported ranges for this cooling period seems to run anywhere from at least a day to two or more with the temperature drop being at least a half-dozen or more degrees from what had preceded. If the sequence comes to pass, then the swollen buds should open and last about a day. Clearly, our specimens seen this day had opened the day before and were now collapsing.

Sometimes, one can have poor timing but still get lucky. Adjacent to the dirt vehicular road into the forest, we found a cluster which had clearly been knocked over. They were so close to the path that either a vehicle or even foot traffic of some sort had trampled them. I gently set about teasing them back into a standing position. Other adjacent sturdier stalked vegetation was used to partially support the cluster. One stalk even had a flower that was fresh enough to also be coaxed into a more natural open position. There I was: face-to-face with a species I had been chasing for many years and just now getting a look.

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Four in the Morning and Four States to See in 24 Hours

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Whenever I am scheduled to go on an orchid hunt, I get exactly zero hours of sleep the night before the journey. I guess I get so emotionally wound up that no matter what I do in preparation, the result is the same. This can be costly in terms of health and ability to withstand the rigors of a long trip. Nevertheless, I still eagerly anticipate these outings.

Saturday, August 9th was no exception. I had an early dinner and avoided any late night snacking, so I thought I was ready for at least a few hours of sleep. It never came. Nonetheless, I was awake and in full preparation mode by 3:30 a.m. There I was feeding the cats, brewing my mandatory coffee and gathering the usual suspects in terms of necessary equipment for what I knew in advance would be at least 24 hours straight before I would return home. It helps a lot to pre-plan the night before. I packed and had conveniently placed in strategic locations all gear essentials for a mad dash to the car.

It never ceases to amaze me how different the neighborhood is outside the house at 4:30 a.m. Rabbits are munching on the lawns. Raccoons and skunks are waddling here and there. The sky intrigues the curious with a panel of sparkling jewels twinkling above.

Pulling out of the drive I knew I had to be at a rendezvous point in Pittsburgh, Pennsylvania by 7:00 a.m. The freeway overnight construction crews were still at it with their Hollywood set of oversized strobe-lights turning the dark into day. Truckers still ply the freeways to pick up or deliver their precious loads.

There are also sites near Chattanooga that are either along roadsides or involve fairly short walks to get to them. If the weather has cooperated by supplying at least a modicum of precipitation distributed throughout the growing season, they normally have large and obvious populations of this and other summer orchids. Most of these sites are relatively level and do not involve any great deal of difficulty or special gear to visit, but a few of them can inflict misery in the form of thorns, briars, poison ivy, chiggers, ticks, mosquitoes, yellow jackets, and unrelenting heat.

The drought and consequent low plant populations of this past summer forced rare plant seekers to explore the more inaccessible and remote sites, one of which is a large recovering clear-cut woodland with a maze of paths obscured by new plant growth. This site, known locally as the old military rifle range, contains a long narrow wetland which hosts a number of summer orchids and other interesting plants. After the logging of the overstory a few years ago it was feared that the summer sun would dry out the boggy areas, but thus far the only obvious change is greatly reduced numbers of orchids in dry years. This year, trying to find photogenic plants at this site for visitors turned out to be an exercise in severe futility, complete with sweat-soaked clothes stained by blood from brushing against thorny blackberry bushes and vine briars. It took subsequent visits to discover that the correct path in the maze of intersecting choices had been strategically hidden by young pine trees! But once the best sections of the bog were rediscovered, it was found that some of them contained a few excellent monkey-face orchids that had somehow survived the drought. As with so many things, persistence eventually pays off.

Platanthera integrilabia was commonly lumped as a variety of *P. blephariglottis* (formerly *Habenaria blephariglottis*), the white-fringed orchid, until Carlyle Luer elevated it to species status. There do not appear to be intermediate gradations, and in the field it does appear to be consistently very different in numerous well-documented aspects, which strengthens the argument that it is a valid species. In large numbers and interspersed with other very attractive orchid and non-orchid wetland species, it can present a truly awesome feast for the eyes. Those of us who live in its neighborhood are generally glad to show it to other NOC members, but we certainly recommend choosing a good weather year!



Auricled Twayblade (*Listera auriculata*) – A Rare Twayblade with a Peculiar Affinity for Alder Thickets

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The genus *Listera* is named after an English naturalist, Martin Lister, and consists of 25 species. They are found in the cool temperate zones of Asia, Europe, and North America. A common feature of this genus is a single pair of oppositely arranged leaves, which are positioned about midway up the stem in a flowering plant. Eight species occur in the United States and Canada. One of these, *Listera ovata* (Figure 1; page 11), is a recent introduction into Canada. It has established itself at a few places in Ontario and can be seen on a visit to the Bruce Peninsula. This foreign invader from Europe is much larger than the native twayblades, which are usually small, greenish plants of no more than 5-35 cm in height. In contrast to its North American cousins, which are more or less uncommon and of local occurrence, *Listera ovata* is the most abundant orchid species in the temperate zone of Europe. There are few places in Austria, Germany, or Switzerland, where this plant cannot be readily found.

Listera cordata (Figure 2; page 11), the heart-leaved twayblade, occurs widely in the Northern Hemisphere including Europe where I have seen plants in a Blackforest sphagnum bog in Southwest Germany. This is the most common twayblade in the United States with a distribution from Alaska across Canada to northern California and the New England states. In the West, the plant is occasionally joined by *Listera caurina* (Figure 3; page 11). This endemic of northwestern coniferous forests tends to grow in drier places than *Listera cordata*, which prefers moist cold woods and sphagnum bogs. Nevertheless, both species occur together and can be seen blooming at the same locations in the Olympic Peninsula and Mount Rainier National Parks from mid to late June. These National Parks are good places to see both species where they are rather common and easily observed along creeks and moist open woods.

Restricted to the eastern United States are *Listera australis* (Figure 4; page 11) and *Listera smallii* (Figure 5; page 11). The Southern Twayblade, as *Listera australis* is called, ranges from Canada to Florida and Texas and frequents sphagnum bogs in the northern part and moist bottom woodlands in the southern part of its distribution. It starts blooming in early February in the deep south and in April in the mid-Atlantic states, but blooms in summer at its few locations in New England and adjacent Canada. *Listera smallii* is restricted to moist wooded locations in the Appalachian Mountains and grows preferentially under Rhododendron thickets at moderate to high elevations. At the Native Orchid Conference in West Virginia, July 2008, many had the opportunity

Morphologically the yellow flowers are structurally identical to the traditional greenish flowers, differing only in color. The background color of the sepals, petals, and lip is a rich apricot yellow. The stripes are dark green, slightly darker than in the typical flowers. The throat on all yellow flowers was very dark green. In typical flowers the throat is either greenish or pale yellow but some do have a dark green area deep in the throat but it does not approach the intensity seen in the yellow form.

Dichromanthus michuacanus f. *armeniacus* is apparently also in Mexico. McVaugh (1985) reported yellow flowers of *D. michuacanus* from Mexico saying "Flower color varies from ivory-white to 'ocher yellow.' In some plants the flowers are yellow, sometimes strongly so, the center sometimes dark."

Two other aspects of the yellow form of *D. michuacanus* f. *armeniacus* stand out. First is its habitat. These are the only *D. michuacanus* I am aware of on a ridge crest rather than in a more or less level forest or on the lower slopes of a canyon or drainage. However, the companion plants, soil rockiness, and exposure are essentially the same as at other locations. The second apparent difference is the aroma. *Dichromanthus michuacanus* has a sweet aroma. On the typical greenish flowers you must practically stick your nose in the flower to smell it. The aroma of the yellow flowers smells the same but is much more noticeable. When I was setting up to photograph the plants I smelled them from about a meter away. Hal and Helen Horwitz, and Stefan and Anita Ambs accompanied me on a revisit to the plants on 14 October 2008. We all agreed the aroma was much stronger on the yellow flowers. Time of day could be a factor in the aroma differences. We had just left a large colony of the greenish flowered plants, Colony 4, and we had all smelled them. However, it took about 90 minutes to get to the yellow plants and perhaps since it was closer to evening, the plants might simply have been increasing their output of aroma to attract pollinators.

Several important conclusions derive from this experience:

- (1) long term studies of orchids are very valuable;
- (2) it pays to keep really good notes on field work;
- (3) there is really no good excuse for poor field technique; and
- (4) we have a strikingly beautiful color form of *D. michuacanus* to add to our orchid flora.

Acknowledgement:

Chuck Sheviak of the New York State Museum in Albany provided the Latin description and suggested the color definition.

Literature Cited:

Coleman, R.A. 2005. Population Studies in *Dichromanthus* and *Hexalectris* in South-

plants in flower. Therefore I never really made it a point to see my study plants in bloom each year, although I have seen the majority of them in bloom. Most years my visits for the long term study are in late August or early to mid-September. The reasons for this timing are two fold. First, at that time monsoon moisture is still available and while the flower spikes are well up, the plants have not started to abort the leaves so leaf size can be accurately measured. Second, early in the rainy season surrounding herbaceous plants have not reached their full height and the orchids are easy to see. That reasoning and really poor luck conspired to the effect that I never visited Colony 2 even once in a blooming season during the entire previous 13 years I have been studying the plants. That all changed in 2008.

Due to schedule conflicts in 2008 I was unable to visit any of my study colonies until the second week in October. On 9 October while still walking up the hill to Colony 2 I was more than a little surprised to see not pale green but bright, apricot yellow flowers staring at me (Figures 3-5; page 16; and front cover)! I thought at first it was simply age induced fading of the flowers. Many of our plants abort the inflorescence prematurely due to the stress of our hot, dry conditions and perhaps these yellowed while fading. However, a quick examination showed the flowers were fresh and newly opened and even the buds were the same intense apricot yellow as the oldest open flower. A survey of the study area revealed five plants either in bloom or ready to open and all flowers had the same yellow color! No plants with the more common green flowers were blooming in the colony. Neither had I seen any plants intermediate between these two color extremes anywhere else.

My next thought was that I was looking at drought stress induced color change. We were in a decade long drought in Arizona as was much of the Southwest. All the plants in this one Colony being the same color regardless of exposure argued against that line of reasoning however. Also other plants visited this year with equal exposure in other colonies retained their normal color. Upon returning home I dug out my notebooks and went over the records for Colony 2. All my notes said "In spike." Never once did I note "In bloom." A check of the visit dates proved I never visited Colony 2 during blooming season. While dealing with the embarrassment of really poor field technique, I realized Colony 2 features a yellow form of *D. michuacanus* which has not been previously reported in the United States. It has not been described so a description follows.

Dichromanthus michuacanus (Llave & Lex.) Salazar & Soto Arenas forma *armeniacus*, R.A. Coleman, forma nov.

Type: U.S.A Arizona: Coleman 2008.001 (ARIZ)

A forma *michuacanus* floribus *armeniacus*, fauce atranti differt.

From forma *michuacanus* with the flowers yellow, the throat darkening it differs.

to observe this species in bloom at the Alan Seeger Natural Area in northern Pennsylvania and at Droop Mountain bog near Cranberry Glades in West Virginia.

Two other *Listera* species are restricted to cold environments in North America and range across Canada and the adjacent United States. *Listera borealis* (Figure 6; page 14) is the most northern member of the genus. It prefers high elevation forests and the Canadian boreal belt with occurrences in the United States in the Rocky Mountains as far south as Colorado. I have observed this species only at Lake Eklutna near Anchorage, Alaska, where it bloomed in mid to late June along with *Cypripedium passerinum* and *Platanthera obtusata*. The second species is *Listera convallarioides* (Figure 7; page 14), which resembles *Listera caurina* superficially, and overlaps with it in distribution in the Pacific northwest and the northern Rocky Mountains. This species can be locally common in northern New England and adjacent Canada, where it prefers calcareous moist woods. It also occurs in high elevation forests of the West as far south as the Santa Catalina Mountains near Tucson, Arizona.

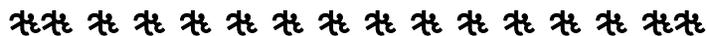
Perhaps the least observed of all North American twayblades is *Listera auriculata* (Figures 8 and 9; page 14). This species is restricted to the northeastern United States from the Great Lakes to Newfoundland and into northern New England. Nowhere is it common, however. Most of the known locations are in Ontario and Quebec. There are no more than 10-15 extant sites in northern Michigan and Maine, respectively, and only very few sites in any other state including Minnesota, Wisconsin, New York, Vermont, and New Hampshire.

Auricled twayblade is very closely related to the northern twayblade, *Listera borealis*, which it replaces in the northeast. Both have up to 20 greenish flowers along a flower stalk that rises between the two leaves. The stalks are finely haired above the leaves and smooth below them. *Listera borealis* has a broader lip with less of a cleft at the lip apex than *Listera auriculata*, but the most distinguishing feature is the lip base where the ear-like lip extensions ("auricles") diverge in *L. borealis* but curve around the base of the column in *Listera auriculata*. Another difference between them is the preference of *Listera auriculata* for temporarily flooded riparian areas in close vicinity to *Alnus incana* ssp. *rugosa*, the tag alder, whereas *Listera borealis* is more a plant of mossy coniferous woods without a close association to the presence of alders. The populations of *Listera auriculata* are usually small and short-lived, also because of their preference for habitats, e.g., sandy alluvial deposits and banks along streams, that are prone to floods and erosion, which can cause population losses in years with increased ice movement or excessive rainfall. It is not known why this orchid is so closely associated with alders. One may speculate that some of the same mycorrhizae are shared between the tree and the orchid. The pollinators of *Listera auriculata* appear to include fungus gnats and perhaps mosquitoes, which are certainly abundant wherever you find a plant

(believe me!). Plants appear in June and start flowering by the end of the month. Blooming plants can be found throughout July, but the best time to see this orchid is the first half of July.

I had the opportunity to observe this species in northern Maine in July of 2008. I followed the directions of my friend, Mark Larocque, who had seen it blooming more than 15 years ago along the St. John River near Fort Kent. Here, *Listera auriculata* has a few known locations in sandy soil along the river together with alders. Although I searched for many hours at various places and at one known location, I could not find the plants. Perhaps, the population may have shifted, or I simply overlooked the small plants that often do not exceed 10 cm in height. The next day, I traveled south to Ashland and from there to the west into The Northern Woods of Aroostook County. It was here where I had my first encounter with the auricled twayblade. That day, I found two colonies of a few plants each in rather typical locations for this orchid. The first colony was under alders along a small pond near the Machias River. The second colony grew a few miles away underneath alders in a wooded streamside. Both colonies were in their prime on 5 July. I did not see any other orchids nearby although I searched the areas for *Listera convallarioides* that could have grown in the surrounding moist woods.

Listera auriculata is a globally rare plant and is threatened or endangered in most states. Human activity can negatively impact the survival of this species, however, it appears that *Listera auriculata* was always rare to uncommon, and it just does not exist in many locations that appear to be suitable for this tiny orchid.



A Yellow Form of *Dichromanthus michuacanus* (Llave & Lex.) Salazar & Soto Arenas in Arizona

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Dichromanthus michuacanus (Llave & Lex.) Salazar & Soto Arenas occurs in only two areas of the United States: Big Bend National Park in Texas, and in the southeastern Arizona counties of Cochise, Pima, and Santa Cruz. It is more widely distributed in Mexico. Many references cite it as either *Stenorrhynchos michuacantum* (Lexarza) Lindley or *Spiranthes michuacana* (Lex) Hemsl., but Salazar et al. (2002) transferred it to the genus *Dichromanthus*.

Since 1995 I have been conducting a long term study on *D. michuacanus*. I visit four widely separated colonies in southeastern Arizona at least once every year. Each plant in the study is staked and numbered. I record whether or not the plant appears, the number and size of leaves, and whether or not it blooms. The primary objectives of the study are to learn about blooming patterns and multi-year dormancy. Specifically, do plants bloom each year once reaching maturity and do they even come up every year? An interim report was contained in Coleman (2005). The answer appears to be "no" to both those questions.

Dichromanthus michuacanus is one of our monsoon orchids. These are orchids that though more commonly found in Mexico make it into the southwestern states of Texas and Arizona because of our summer rains. The plants do not appear above ground until after the onset of the summer rainy season in early July. *Dichromanthus michuacanus* is the last of the monsoon orchids to bloom. Depending on the timing of the rains, plants begin blooming by the first or second week of October and remain in bloom until late October and probably early November. The rains usually end by the middle of September and the leaves are either partially or completely faded at anthesis. A typical inflorescence bears 10 to 30 flowers on a stem that is between 25 and 50 cm tall. The most robust plant I've seen was 71 cm tall with 42 flowers and buds. The largest flower on that plant was 2.5 cm across. Flower color varies slightly in intensity, but the overwhelming majority of *D. michuacanus* flowers in Arizona are a base cream to pale green with darker green stripes on sepals, petals and lip (Figure 1; page 15). Some plants have flowers with a hint of pale yellow in the throat (Figure 2; page 15). *Dichromanthus michuacanus* grows in Madrean evergreen woodland, primarily in association with alligator juniper (*Juniperus deppeana* Steud.).

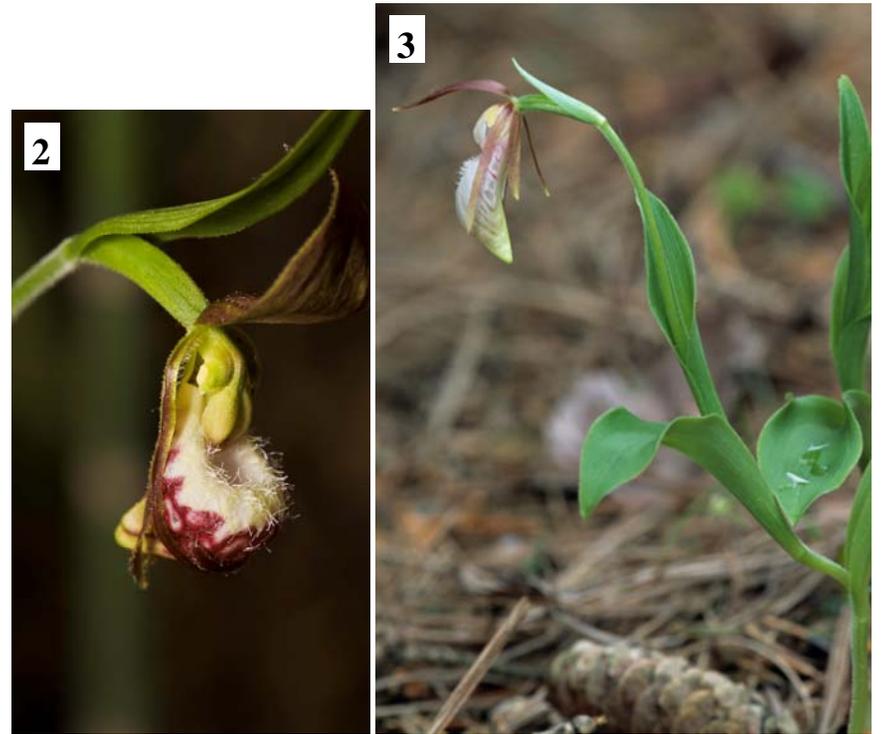
I have seen thousands of plants of *D. michuacanus* in Arizona and hundreds of



Photos to accompany 'A Yellow Form of *Dichromanthus michuacanus* (Llave & Lex.) Salazar & Soto Arenas in Arizona' by Ron Coleman (page 17). Images: Ron Coleman.

- 3. Rocky crest habitat of *D. michuacanus* f. *armeniacus*.
- 4. *Dichromanthus michuacanus* f. *armeniacus* spike in habitat.
- 5. Close up of *D. michuacanus* f. *armeniacus*.

Figures to accompany 'Ram's Head, *Cypripedium arietinum* R. Br.' by Hal Horwitz (page 1). Images: Hal Horwitz.





Figures to accompany '*Platanthera integrilabia* (Correll) Luer' by Chuck Wilson (page 3). Images: Chuck Wilson.



Photos to accompany 'A Yellow Form of *Dichromanthus michuacanus* (Llave & Lex.) Salazar & Soto Arenas in Arizona' by Ron Coleman (page 17). Images: Ron Coleman.

1. *Dichromanthus michuacanus* f. *michuacanus* showing green throat.

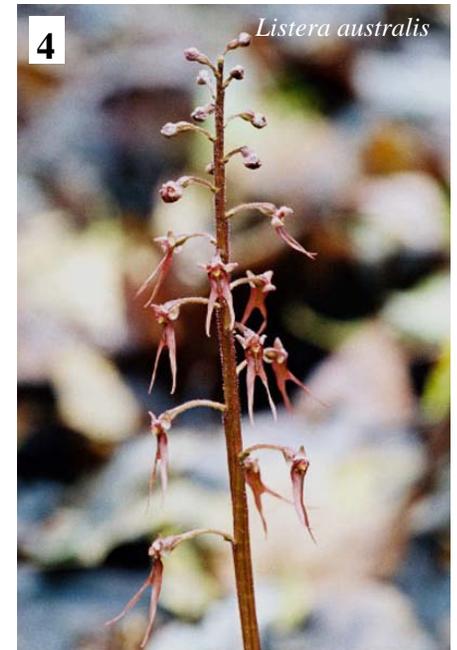
2. *Dichromanthus michuacanus* f. *michuacanus* showing yellow throat.



Figures to accompany 'Auricled Twayblade (*Listera auriculata*) – A Rare Twayblade with a Peculiar Affinity for Alder Thickets' by Stefan Ambs (page 6). Images: Stefan Ambs.



Figures to accompany 'Auricled Twayblade (*Listera auriculata*) – A Rare Twayblade with a Peculiar Affinity for Alder Thickets' by Stefan Ambs (page 6). Images: Stefan Ambs.



Wild Orchid Illustrations

Melissa Rathbun-Holstein, Gig Harbor, Washington

Tina Taylor is a self-taught watercolorist whose art is featured here (center-fold and back cover). She has been working with watercolor media for the last six years as a hobby. Tina gained her love of nature, plants and art from growing up in the beautiful Puget Sound area of Washington State.

Tina is the co-founder of the Washington Native Orchid Society (www.wnos.net). This Society was co-founded by Tina Taylor and her daughter Melissa Rathbun-Holstein after the destruction of a beloved *Calypso bulbosa* var. *occidentalis* colony in their home town of Allyn, WA. Tina is also a volunteer for the University of Washington Rare Plant Care and Conservation Program, and is a member of the Tacoma Orchid Society, the Native Orchid Conference, Inc., the Washington Native Plant Society, and the Native Plant Salvage Alliance.



Facing page:

1. *Cypripedium parviflorum* var. *pubescens*

This page:

2. *Calypso bulbosa* var. *occidentalis* (also see back cover of this issue).
3. *Cypripedium montanum*



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1



2



3



Facing page:

1. *Cypripedium parviflorum* var. *pubescens*

This page:

2. *Calypso bulbosa* var. *occidentalis* (also see back cover of this issue).
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