

The Native Orchid Conference

ISSN 1554-1169

Journal



Volume 12(4)
Oct-Nov-Dec, 2015

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The Native Orchid Conference, Inc.

P. O. Box 2047 Boone, NC 28607-2047

Web Sites

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The Native Orchid Conference Journal is published four times a year by the Native Orchid Conference, Inc., a non-profit [501(c)3] organization, as a service to its members. The organization is devoted to fostering the study, conservation, and enjoyment of orchids native to North America. Membership dues are: US Individual: \$30; US Family: \$35; Student: \$15, and non-US Individual or Family: \$40. Address inquiries about membership, back issues of this journal, and requests for copies of the bylaws to the editor at 343 John Wayne Trail Victoria, Texas 77905, or to noceditor@gmail.com

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Editor's note

At the conference in Gorham, NH, your editor offered a few thoughts, and it might be useful to convey similar information to ones of the general membership who were not present at that New Hampshire meeting. To an editor, manuscripts for publication are like blood to a human: lacking manuscripts submitted to the editor, the journal, as a publication becomes – at best – anemic, even ceases to exist. Yet, lacking access to a well-stocked orchid library's information, many an author is severely handicapped at the start! From experience gleaned over several years, this editor is well aware that many city libraries and even some well-known university libraries amount to little more than a vast wasteland when it comes to information about the orchid family. One of the standard “put-offs” is, “have you checked the internet?” The Catch-22 is that although there is much good to be gleaned via the internet, there's also information that's not only misleading, but - in some instances – dead wrong! One help would be for the orchidist-author to own or have ready access to an orchid-rich library, but orchid books and an extensive run of many orchid periodicals are not only expensive, but – in many cases – effectively *impossible* to obtain! All editors desire good manuscripts, but not everybody in the conference has a well-stocked library!

Thus far, a rather gloomy picture has been painted, and what's about to be written may be tantamount to opening the proverbial Pandora's Box, but I'll go ahead and write it anyway! Your editor and wife have a rather extensive orchid library, and if it can help your article-to-be, let your editor know!

A little about the breadth of our library was touched on at the Gorham conference, but for benefit of ones not present, here are a few remarks about our library. The library's computer-locator document is 61 pages long, single-spaced, and is kept using Times New Roman, at font size nine, it's shelves high, and the shelf length totals over 162 feet. AOS *Bulletin/Orchids* issues are five or six issues short of a complete run from volume 1(1) of June, 1932 to the present. The *Orchid Digest* goes back to 1954 with a few issues even earlier. There's an almost-complete set of the Cogniaux et Goossens *Dictionnaire Iconographique des Orchidées* folios (late 1800's-early 1900's), and although recent years are sadly lacking, the library has the early 20 years of the *Orchid Review* beginning with volume 1(1) in 1893. Also in the library are the two original volumes of *Species Plantarum* (1763 & 1764), and the seven volume set of Walpers' *Annales Botanices Systematicae* beginning with volume I (1848-1849). Oakes Ames' writings and fascicles begin in 1904 and go to 1985 with Donovan Correll. Orchid writers of North America include Bingham, F. K. Boyle, Brown & Folsom, Case, Craighead, Gibson, Keenan, and others, plus volumes of the orchids of various states. We also have a few thousand orchid-oriented 35mm color transparencies; some as slide mounts, plus many as digital images All this is only a quick thumbnail sketch of the library!

The *hope* of all the above is to **inspire**. It's an attempt to get NOC members to contribute to your journal! This editor is here to help if he can, but it takes **you**, the ones in the field, in many locations, to photograph, write, and contribute! Your editor can't publish articles and images he never receives!

Orchid Hunting in Glacier/Waterton National Parks

Tom Nelson
tomjackie90@msn.com

All images by author unless otherwise noted

July 5th, 2011 was a travel day and we awakened early as we had a long way to go. Having just completed a whirlwind four day tour of some choice orchid sites on the upper peninsula of Michigan and in the Lake Itasca area of Minnesota, our sights were now set on the Rockies, 1000+ miles straight west and we were eager with anticipation. The original plan had been to follow US 2 straight across Minnesota and North Dakota to St. Mary’s, Montana. This would have allowed us to visit a site for *Platanthera praeclara* (western prairie fringed orchid) in western Minnesota on the way. Unfortunately, there was record flooding in North Dakota and the road was closed in several places, so leaving Bemidji, Minnesota, we headed south to Interstate 90 as an alternative. As we drove along the bucolic back roads on our way to the Interstate we soon left the North Woods behind and entered the very agreeable Aspen Parkland vegetation zone for a brief time before finally reaching open prairie and the Interstate.

In his biography of the explorer John Wesley Powell, titled *Beyond the Hundredth Meridian*, the noted western author Wallace Stegner stated that “the west truly begins when the Hundredth Meridian is reached.” As we drove west through North Dakota, the heat and humidity was oppressive and almost unbearable. The land begins rising, imperceptibly at first and then, as happens on Interstate 80 in Nebraska, a steep plateau is climbed and suddenly, there are the sagebrush and junipers! The traveler has now reached the West, with its blessed low humidity and starkly different flora. We soon passed by Theodore Roosevelt National Park and its interesting “badlands” landscape. Lacking time for a proper visit, we had to settle for a photo-op from the scenic overlook next to the highway, which has an impressive vista. This is one of the great benefits of driving cross-country as opposed to flying: one gets to see all the places along the way and the good ones can be re-visited later if deemed worthy. After a mediocre dinner in the strange and imminently forgettable Old West/Frontier-replica town of Medora, North Dakota—next to the park—we pushed ahead to Glendive, Montana, a little more than halfway to Glacier.

Glendive is touted as the “Center of Montana’s Dinosaur Trail” which may sound intriguing but is only a local chamber of commerce attempt at tourism. Like many parts of the west, this area of Montana has recently experienced an economic boom due to the energy industry and all the motels are filled with workers and the roads with big noisy trucks.

Unlike eastern Wyoming and Colorado, today’s drive, on July 6th, 2011, through eastern Montana was quite scenic. We soon left Interstate 90 and began to head northwest. Large ranches extend to the horizon and as the middle part of the state is reached, it becomes quite mountainous; all along our route the Big Sky land-

scape was brimming with colorful wildflowers. At one point the Big Snowy Range loomed to our south. There are collections from these mountains for *Calypso bulbosa* var. *americana* (eastern fairy slipper) and *Cypripedium montanum* (mountain lady's-slipper) in the herbarium at the New York Botanical Garden dated July 9th, 1949 and I had at one point in the trip planning considered stopping for a day to try to locate the sites, as an orchid hunt is always a great excuse to visit a place that one would never, ever, visit otherwise. I finally decided that it would take too much time with no guaranteed result, which was a wise choice, as we found both species later on. After many hours we reached the city of Great Falls and there joined up with Interstate 15, which we followed north almost to the Canadian border. Turning west towards Glacier, we could see the snow-covered ramparts of the Rockies up ahead. We were almost there! As we neared the park, the wildflower display was phenomenal. As one climbs up into the foothills vegetation zone, the prairie zone species are still present and begin to mix with species from the higher montane zone, a unique phenomenon seen only in this part of the Rockies. Wild iris (*Iris missouriensis*) was growing everywhere and I really wanted to stop and photograph, but it was almost dinner time. We soon entered the stunning beauty of Glacier National Park and after checking into our rustic cabin, where we would thankfully be staying for two nights, we enjoyed a delicious meal in the lodge, complete with a great view of the peaks.

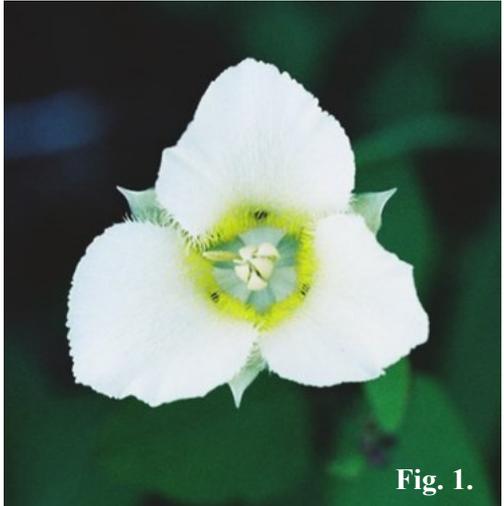


Fig. 1.

2011 was a very unusual season in the Northern Rockies. There was record-breaking snowfall followed by a cold spring, all of which combined to make the blooming season two to three weeks late. This mostly worked in our favor as a lot of orchid species that would normally be past-bloom were in prime-bloom for our visit. But sometimes it didn't. The plan for July 7th, 2011 had been to travel through the park over scenic Logan Pass via the famous, "Going to the Sun Highway" and visit McDonald Lake on the west side of the park, but due to the unprecedented snowfall, the highway was still closed and wouldn't open for another 10 days, the latest it has ever opened. The scenery in Glacier is some of the best in the world and we drove slowly through the alpine paradise, stopping often to photograph. The bear grass (*Xerophyllum tenax*) was just starting to bloom and was a glorious sight. We found a nice population of *Calochortus apiculatis* (pointed mariposa lily) a species new to us. (Fig. 1) We drove to where the road was closed and then stopped to look around. Jackie immediately made an exciting orchid discovery: growing in the woods next to the parking lot was a nice clump of *Corallorhiza maculata* var. *occidentalis* forma *aurea*, the yellow flowered form of the spotted coralroot. A ranger had told us

about a nice hike along St. Mary's Lake to a waterfall, so we headed in that direction. Johanna was interested in learning the different fern species on this trip and there was a great display on the road to the trailhead: *Athyrium felix-femina* (lady fern); *Dryopteris felix-mas* (male fern); *Polystichum lonchitis* (mountain holly fern - one of my favorites); *Pteridium aquilinum* (bracken fern); and *Woodsia ore-gano* (western cliff fern) were all growing on one roadside bank!

We pulled into the parking lot and, as the ladies readied themselves, I walked to the other end to look at the trail map. Then disaster struck! As I was walking back to the car a truck pulled off the main road and started driving slowly right behind



Fig. 2

me as there was a parking place he wanted in the direction we were both headed. Wanting to get out of his way, I instinctively started to jog ahead. Then, without warning, my size 14 hiking boot somehow got turned sideways and I came down on my left ankle with my full body weight. I felt the tendons rip and excruciating pain ensued. Unbelievable! A sprained ankle on our first day in the Rockies! I hopped back to the car and waited until the pain subsided a bit, and then with grim resolve forged ahead with the scheduled hike. I had planned this trip for nine months and already driven 2000 miles; I was not going to sit in the cabin all afternoon feeling sorry for myself.

We headed down the trail and soon came upon an unusual light-chocolate colored clump of spotted coralroots growing on a hillside (Fig. 2). I had never seen coralroots this color before and made a mental note to come back the next day and take the time to set up my light tent and photograph them properly. We reached the beautiful waterfall and the girls enjoyed splashing their feet in the lake and just being in such an incredible place, after which we returned to the cabin so that I could ice and elevate my ankle.

After this brief respite we headed over to the historic Many Glacier Lodge, about

20 miles from our cabin, for dinner. On the way we stopped at a very scenic roadside site (Fig. 3) for *Platanthera huronensis* (green bog orchid Figs. 4, 5, & 6) and *Platanthera dilatata* var. *dilatata* (white bog orchid Fig. 7).

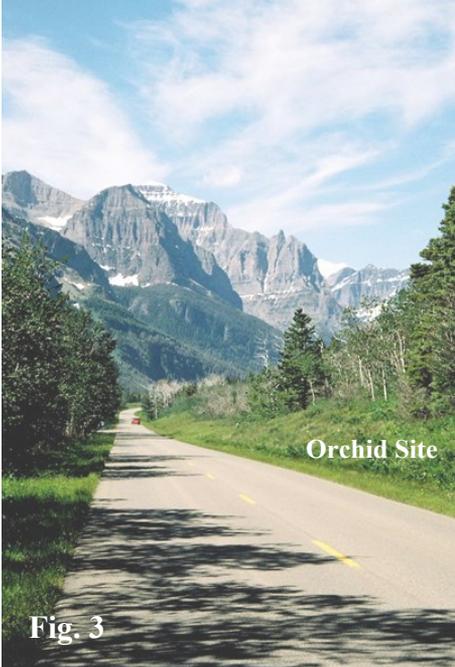


Fig. 3



Fig. 4



Fig. 5



Fig. 6

We had noticed the orchids growing there earlier in the day and now the afternoon light was perfect for photography. I was trying to get used to life with a sprained ankle. It would bother me to varying degrees for the rest of the trip and



eventually required physical therapy months later. Scrambling up and down roadside banks was a challenge but I carried on, as the modern-day orchid hunter refuses to die!

I was awakened in the night by branches banging against the metal roof of our cabin. Looking out the window I could see that a fierce wind was blowing and assumed a storm was moving in. When daylight arrived, the sky was clear, but the wind had not subsided. The waitress at breakfast informed us that a 60+ mph wind such as this was not an unusual phenomenon here where the Rockies meet the Great Plains.

It was July 8th, 2011 and we were headed to nearby Waterton National Park, just over the border in Alberta, Canada and I had planned to photograph the unusually colored coralroots before leaving, but even with my light tent to block the wind that would have been impossible. It would have been blown away! Oh well. Glacier and Waterton National Parks straddle the US/Canadian border and were founded as an “International Peace Park.” It is only 41 miles from Glacier to the town of Waterton and the scenery is of course fantastic, with the craggy peaks of the Rockies creating an incredible panorama off to the left as one drives north.

Upon arrival we immediately went to the Visitor’s Center to speak to a ranger named Blandine, whom I had spoken to on the phone a few weeks ago. I had simply called up the number listed on the Internet for the park and asked the person who answered (Blandine) if she knew of any locations for mountain lady’s-slippers in the park. I use this tactic often with mixed results, but this time I really

lucked out; Blandine informed me that she was a runner and that she knew of a large roadside population of the desired species that she monitors on her runs and would give me directions to the site when we got to Waterton, and the best part was that due to the incredibly late season, they would probably be in bloom for our visit! Blandine proved to be as nice in person as she had been over the phone. She gave us precise directions to the site and told me that Edmonton based orchid-friend Ben Rostron whom I had also put in touch with Blandine had been by the previous day. After visiting the site he had reported to Blandine that I was going to be “very happy” when I saw it.

When we reached the site, I couldn’t believe my eyes: after a little searching I located several hundred *Cypripedium montanum* (mountain lady’s-slipper) in bloom, growing in the disturbed soil of the roadside embankment. (Fig. 8). When I



first started hunting wild orchids it took me awhile to learn that some species are primary invaders and prefer areas with lots of sun and little or no competition from other plants. Many orchid species are found along the roadsides across North America, which certainly makes for convenient orchid hunting. These lady’s-slippers were growing in a mixed deciduous forest comprised mainly of small aspen trees (*Populus tremuloides*) and Saskatoon (*Amelanchier alnifolia*)—a low shrub—and various species of herbaceous flowering plants. We had seen mountain lady’s-slippers once before near Bend, Oregon in 2009, but that was a hot, dry year and the population was mostly past. Finally finding so many plants in prime bloom was incredible and we spent a long time admiring the beauty of the orchids and enjoying their delicious and unique fragrance. The wind was still whipping and would continue to do so for the next few days, but luckily the site was down in a protected area and there was little wind. I set my light tent up over the biggest clump (42 blossoms!) and got to work (Fig. 9). I was in heaven! Any direction that I pointed my lens a picture awaited and I was soon lost to the world. (Figs. 10, 11,

12, & 13).

Whenever I find an orchid bonanza such as this, I am always grateful for my very helpful and tolerant family. Jackie and Johanna are great photographer's assistants and help a lot with setting up the tent, holding the reflector and taking a lot



Fig. 9 (Image by Johanna Nelson)



Fig. 10



Fig. 11

of good “back-up” photos as well. An orchid expert in her own right, Johanna has memorized the Latin names of nearly all of the 103 species and varieties that we have found since 2007. And she can even spell them all—my own personal spell-checker! Jackie usually entertains the younger and more rambunctious Christina and as the minutes invariably turn into hours, they all three end up waiting—mostly patiently—in the car, watching videos or reading.



Fig. 12



Fig. 13

Today was the usual story; after finishing with the big clump, I packed up and



Fig. 14

headed up the bank only to discover a smaller clump with beautiful bronze-colored

sepals and petals that I had somehow missed. Even though they were ready to go, the girls gave the go ahead to set everything up again and “capture” the plants on film (Fig. 14). While I was doing that, Jackie reminded me that there were two *Corallorhiza striata* (striped coralroot) plants growing as a sympatric species (i.e. growing together in the same habitat) with the lady’s-slippers, both obviously enjoying the symbiosis with the mycorrhizal fungi that all terrestrial orchids require in the soil to grow. Johanna held my white diffusion umbrella over the orchids to shade the intense afternoon sun as I photographed (Fig. 15). What a team!



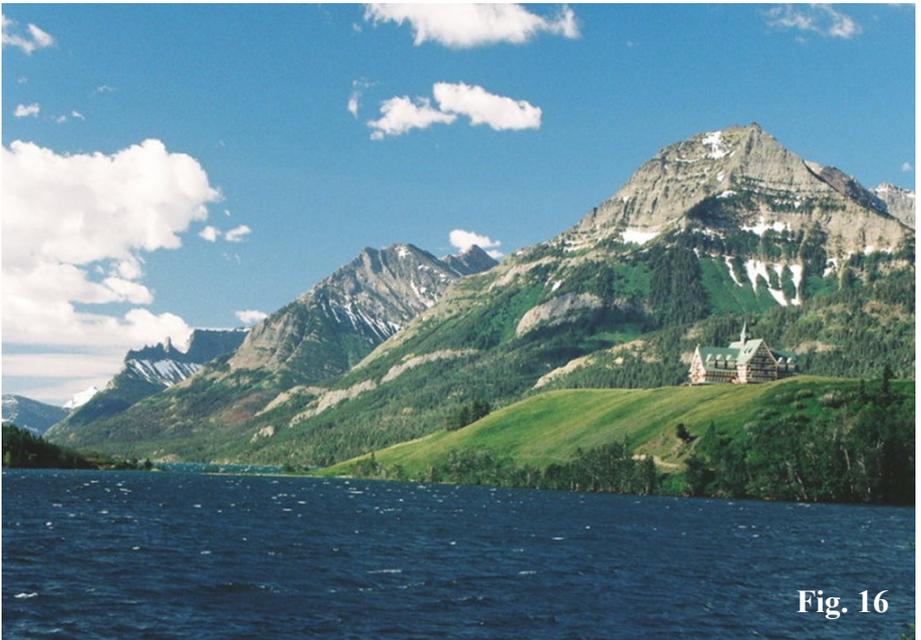
Fig. 15

After finally finishing up, Jackie and I decided to investigate the other side of the road before leaving. There was also a large population of *C. montanum* there as well, but it was sunnier and they were all well past. Thank heavens for the shade on the other side of the road. One magnificent clump had a well-beaten path to it, so the location is obviously no secret. There were also hundreds of wood lilies growing with the orchids, a combination I would love to photograph someday.

It was now about 5 p.m. and we headed back to Waterton and checked into our motel. Blandine had told me about a nearby trail with a lot of orchid species, so leaving the tired ladies in the room, I headed in that direction. It proved to be a steep climb and soon afforded spectacular views of the city of Waterton, the historic Prince Albert Hotel and the miles-long Waterton Lake (Fig. 16), whose rug-

ged shore the trail followed. I found two orchid species on the way up: *Platanthera unalascensis* (Alaskan piperia) and *Goodyera oblongifolia* (giant rattlesnake orchid). Blandine had mentioned the possibility of blooming calypso further down the trail, but it was late, so after absorbing the scenery and lovely alpine ambience for a while at a lookout point high above the lake, I headed back. I soon came upon a nice colony of eight *C. montanum* right along the trail that I had somehow missed. These plants all had beautiful dark ebony-colored petals and sepals, the third color I had seen in the species that day. There is great variance in the color of the sepals and petals in some of the species of the genus *Cypripedium*, a wonderful phenomenon—but one that has caused some confusion with regard to their classification over the years.

After an over-priced and mediocre dinner, we drove to the shore of Lake Waterton to photograph the sunset. We love visiting the northern latitudes in the summer because the sun rises early and sets late, a real advantage when you try to pack too much into each day, as I always do. The wind was still whipping and nearly blew me over as I photographed. I felt very lucky to have had the good fortune to find a “mother lode of montanum”. To think that we had been viewing masses of *Cypripedium reginae* in flower only four days earlier was a bit mind boggling. In the morning we would be heading north into the heart of the Canadian Rockies to find out what the orchid gods had in store for us next. Stay tuned!



Scenic wonder: Historic Prince Albert hotel and wind-whipped waters of Waterton Lake.

Tierney Rosenstock NOC Presentation Synopsis

Tierney R. Rosenstock
trosenstock@antioch.edu

With the recent declines in pollinator abundance due to increased insecticide use, habitat destruction, disease, and climate change, the delicate relationship between plant and pollinator is under threat. Orchids with their highly specialized dependencies with only one or a few pollinator species are particularly vulnerable to population declines. Since pollinators utilize an array of plant species for forage, co-flowering species can serve to facilitate pollination of rewardless orchids by aiding in pollinator attraction.

The pink lady's-slipper, *Cypripedium acaule*, is a rewardless orchid, which utilizes only four species of bumblebee pollinators; two of which are already of conservation concern. Since bumblebees quickly learn which plant species offer rewards and those that do not, it is hypothesized that *C. acaule* relies on newly emerged, inexperienced bumblebees for pollination. Due to the ability of bumblebees to learn to avoid non-rewarding species, the fruit set of *C. acaule* is historically low. However, the presence of co-flowering species that do offer pollinator reward can serve to attract and retain higher abundances of *C. acaule* pollinators, therefore increasing *C. acaule* fruit set.

My master's thesis, which was accepted by Antioch University New England in 2013, explored the relationship between *C. acaule* fruit set and the density and proximity of reward-providing, co-flowering species. In addition, I examined how the density, proximity, and distribution of *C. acaule* themselves may influence their own fruit set. My study included over 500 flowering *C. acaule* individuals across 15 study sites in northwestern Massachusetts during the summer of 2012.

Through a series of statistical analyses my research suggests that the density of co-flowering species does in fact influence *C. acaule* fruit set. Increasing the density of co-flowering species also increases *C. acaule* fruit set. Furthermore, dense populations of clustered *C. acaule* also facilitate fruit set. These findings suggest that *in situ* conservation efforts should encourage dense, clustered populations of *C. acaule* surrounded by high densities of rewarding co-flowering species.

***Hexalectris parviflora* L. O. Williams (Orchidaceae)**
New to the United States Flora

Ronald A. Coleman
ronorchid@cox.net

Janet Fox
jfox@westlandresources.com

All images by first author unless otherwise noted

Abstract

Hexalectris parviflora has been documented for the first time in the United States, in Arizona. Previously the known northern extent of this species' distribution was in the Sierra Madre Occidental in Mexico. On 1 May, 2015 Janet Fox, leading a team fielded by WestLand Resources Inc. conducting surveys for coral-root orchids (*Hexalectris* spp.), observed an orchid unknown to her in West Cochise Stronghold in the Dragoon Mountains in southeastern Arizona. Ronald Coleman subsequently identified the plant as *Hexalectris parviflora*. After this identification, Teague Embrey, also working on a field team for WestLand Resources Inc., discovered an additional plant on 27 May, 2015 in the Peloncillo Mountains of extreme southeastern Arizona. These records increase the known number of *Hexalectris* species in Arizona to four, and in the United States to eight. These two discoveries represent northern range extensions of approximately 260 miles and 220 miles respectively, from the closest *Hexalectris parviflora* records in the Sierra Madre Occidental of Mexico.

Hexalectris is a myco-heterotrophic terrestrial orchid genus which manufactures no food on its own and is totally dependent upon its mycorrhizal fungal associate for carbon and mineral nutrients. As with another local myco-heterotrophic orchid genus, *Corallorhiza*, there is little or no chlorophyll in the plants, and the leafless stems appear above ground only to bloom and set seed. Members of the genus *Hexalectris* have color and growth patterns similar to *Corallorhiza*, however, they are distinguished from *Corallorhiza* by the multiple raised crests down the center of the lip.

The genus *Hexalectris* was established by Rafinesque in 1825. Prior to 2015, seven *Hexalectris* species were known to occur in the United States of which three were known to occur in Arizona (Catling 2004). The discovery of *Hexalectris parviflora* in the United States in 2015 expanded the known *Hexalectris* species in the United States to eight. A current list of the *Hexalectris* species in the United States is provided in **Table 1** based on distribution data as provided in Goldman, et al. (2002) and Kennedy and Watson (2010).

WestLand Resources, Inc. has been conducting field surveys for *Hexalectris* species, specifically *H. arizonica* and *H. colemanii*, in southeastern Arizona since 2010. Janet Fox has been involved in the *Hexalectris* surveys since 2010 as a member of WestLand's field team. On 1 May, 2015 Fox observed an orchid in the

Dragoon Mountains in Cochise County, AZ that she did not recognize as any of the three *Hexalectris* species then known to occur in southeastern Arizona. There were three patches of the unknown orchid totaling just over 30 plants.

Table 1. <i>Hexalectris</i> Species in the United States	
Species	Approximate Distribution
<i>Hexalectris arizonica</i>	AZ, NM, TX and Mexico
<i>Hexalectris colemanii</i>	AZ, NM
<i>Hexalectris grandiflora</i>	TX and Mexico
<i>Hexalectris nitida</i>	NM, TX, and Mexico
<i>Hexalectris parviflora</i>	AZ
<i>Hexalectris revoluta</i>	TX and Mexico
<i>Hexalectris spicata</i>	Wide spread in eastern US to Big Bend National Park in western TX
<i>Hexalectris warnockii</i>	AZ, TX and Mexico

On 7 May, 2015, WestLand Resources, Inc. contacted Ronald Coleman and requested help identifying the unknown orchid. Coleman is familiar with the other *Hexalectris* in the United States, having studied and photographed them all in habitat, and is a contributing author to the treatment of *Hexalectris* in the Flora of North America (Goldman et al. 2002). Coleman visited the site in the Dragoon Mountains on 8 May, 2015 and immediately recognized this was a *Hexalectris* species new to the United States, but which one?

The spikes and flowers of the unknown orchid were distinctly different from those of *H. colemanii*, a patch of which was growing about two meters away. The primary differences between the two



Fig. 1



Fig. 2

were that the unknown orchid was markedly smaller than *H. colemanii*, the sepals were not coiled back 360 degrees or more as in *H. colemanii*, and the plants were dark purple-red with the lip lacking white background as in *H. colemanii*.

Coleman reviewed the Kew World Checklist of Selected Plant Families (WCSP 2015) which showed three *Hexalectris* species not known from the United States: *H. brevicaulis*, *H. fallax*, and *H. parviflora*. *H. fallax* is now considered a synonym of *H. parviflora* (Kennedy and Watson 2010), and was eliminated as a possibility. The task became determining whether or not the newly discovered plant keyed out to either *H. brevicaulis* or *H. parviflora*.

Lewis O. Williams' (1940) description of *H. brevicaulis* and *H. parviflora* differentiates them by the size of the plants. He describes *H. brevicaulis* as the largest *Hexalectris* and *H. parviflora* as the smallest in the genus. The size of the flowers on the unknown orchid closely matched William's description of *H. parviflora*. Ames and Correll (1953) and McVaugh (1985) have also described *H. parviflora*. All three descriptions supported an identification of Fox's discovery as *H. parviflora*.



Fig. 3

Coleman examined the three specimens of *H. parviflora* stored at the University of Arizona Herbarium. Details of the pressed specimens, particularly the color of the lip, matched the orchids that Fox and Coleman had observed in the field. Based on the original species description, supported by Ames and Correll (1953) and McVaugh (1985), and examination of the herbarium material, Coleman determined the unknown orchid was *Hexalectris parviflora* (Fig. 1). Images of the plants were sent to Aaron Kennedy, a national authority on *Hexalectris*, who supported Coleman's determination (Kennedy personal communication). This is the first record of *H. parviflora* in Arizona and the United States.

Three characters support the identification as *H. parviflora*:

Size is a clear discriminant. Williams (1940) said *H. parviflora* was "much the smallest of the genus." However, *H. nitida* (Fig. 2) had not yet been described. Most flowers of both *H. nitida* and *H. parviflora* are well under 2 cm natural spread. If you find a *Hexalectris* with small flowers it is most likely one of these two taxa. Differences in lip structure separates these two species.

The color of the mid-lobe of the lip is diagnostic. The midlobe of *H. parviflora*

is entirely solid magenta in color (Fig 3). All other *Hexalectris* have a mid-lobe with colored crests and a background that is mostly white, or have a spot in the center of the mid-lobe where both the central crest and the background are white.

The side-lobes of the lip are smaller on *H. parviflora* than other members of the genus, both in length and width.

The *H. parviflora* observed in the Dragoon and Peloncillo Mountains were dark purplish-red with the central lobe of the lip and lamellate calli bright magenta with white side-lobes, as described by Ames and Correll (1953). The spikes were diminutive, measuring 3 mm. in diameter at the base and ranging from 13 cm. to 22 cm. in height. Natural spread of the flowers ranged from 1.3 cm. to 2 cm. across the lateral sepals.



Fig. 4

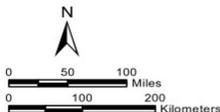
Image Source: ESRI Online - National Geographic

Legend

- New Discovery
- Previously Known Location

Hexalectris parviflora
Locations

WestLand Resources, Inc.
Tucson • Phoenix • Flagstaff
4001 E. Paradise Falls Drive
Tucson, Arizona 85712 (520) 306-4989



L. O. Williams (1940) described *H. parviflora* based on plants from Sonora, MX, and described the range extending to Guatemala. Kennedy and Watson (2010) provided greater definition of the range of *H. parviflora* showing it extend-



Fig. 5



Fig. 6

ing along the Sierra Madre Occidental into northern Mexico. The discoveries in the Dragoon and Peloncillo Mountain Ranges in Southeastern Arizona represent northern range extensions of 264 miles and 224 miles respectively, from the closest plants in the Sierra Madre Occidental in Mexico (Fig. 4). The locations in Mexico and Guatemala are from Kennedy and Watson (2010).

The *H. parviflora* in the Dragoon Mountains were in mixed oak/pine woodland of about 50% canopy cover (Fig. 5). Plants growing nearby included: Oak species (*Quercus arizonicus* and *Q. grisea*), Border Piñon Pine (*Pinus discolor*), Gum Bumelia (*Sideroxylon lanuginosum*), Madrean Yucca (*Yucca madrensis*), Evergreen Sumac (*Rhus virens* ssp. *choriophylla*), Beargrass (*Nolina microcarpa*), Silktassel Tree (*Garrya wrightii*), and Arizona Grape (*Vitis arizonica*). Two other members of the genus *Hexalectris* were in the area. *H. colemanii* (Fig. 6) was just coming into bloom, some growing within 2 meters of the *H. parviflora*, while *H. arizonica* (Fig. 7) was in early spike about 100 m away. This is the only location in AZ where three *Hexalectris* species are known to occur together.

On 27 May, 2015 another *H. parviflora* was observed by Teague Embrey of

WestLand Resources Inc., in the Peloncillo Mountains of southeastern Cochise County which further extended the range of *H. parviflora* (Fig. 8). The *H. parviflora* in the Peloncillo Mountains were also growing in oak woodland of about 50% canopy cover. Plants growing nearby included: Arizona oak (*Quercus arizonicus*), Emory oak (*Q. emoryi*), Toumey Oak (*Q. toumeyi*), Mountain Yucca (*Yucca schottii*), Skunkbush Sumac (*Rhus aromatica* ssp. *trilobata*), Cane Cholla



Fig. 7



Fig. 8

(*Cylindropuntia spinosior*), Beargrass (*Nolina microcarpa*), Pointleaf Manzanita (*Arctostaphylos pungens*), and Bullgrass (*Muhlenbergia emerslyi*). A patch of *H. colemannii* occurs in the same canyon about 200 meters northeast of the *H. parviflora*.

Based on these observations the blooming season for *H. parviflora* in Arizona is fairly short. Blooming plants were observed on 1 May and on 27 May, which suggests additional obser-



Fig. 9

vations could extend the blooming season from late April to early June.

Premature bud blast was observed on the plants in the Dragoon Mountains. On 13 May, 2015, Coleman found an open flower on a plant that had only buds on 8 May, indicating it was developing as expected. A second flower on that stem appeared to be opening. Coleman returned on 20 May, 2015 and found that all the remaining buds on all plants had withered without opening (Fig. 9). The *H. colemanii* in the area were showing the same phenomena, with most of the flowers withering without opening. None of the *H. arizonica* in the area developed buds to blooming stages. Bud blast is common among *Hexalectris* in Arizona. Coleman (2002) reported that both *H. colemanii* (believed at the time to be *H. revoluta*) and *H. warnockii* often fail to fully flower. The reason for this aborting of the flowering season remains undetermined.

Reuben Gay of the Douglas Ranger District accompanied Coleman to the Dragoon Mountains site on 13 May, 2015 and collected above ground portions of a plant for a voucher specimen that has been housed at the University of Arizona Herbarium as collection specimen number AZ 422980. Janet Fox collected a photographic voucher of the plant in the Dragoon Mountains, which is stored in the Southwest Environmental Information Network (SEINet 2015) as General Observation Janet Fox 006. Teague Embrey collected a photographic voucher of the plant in the Peloncillo Mountains, which is stored in SEINet as General Observation Teague Embrey 190 (SEINet 2015).

References

- Ames, O. and D. S. Correll. 1953. Orchids of Guatemala. *Fieldiana*. Vol 26 (2) p 476.
- Catling, P. 2004. A Synopsis of the genus *Hexalectris* in the United States and a New Variety of *Hexalectris revoluta*. *The Native Orchid Conference Journal*. 1(2): 5-25.
- Coleman, R. A. 2002. *The Wild Orchids of Arizona and New Mexico*. Cornell University Press. Ithaca and London.
- Goldman, D., R. Coleman L. Magrath and P. Catling. 2002. *Hexalectris*. In *Flora of North America*, Vol 26. Oxford University Press, pp 603-605.
- Kennedy, A. and L. Watson. 2010. Species Delimitations and Phylogenetic Relationships within the Fully Myco-heterotrophic *Hexalectris* (Orchidaceae). *Systematic Botany*. 35(1): pp 64-67.
- McVaugh R. 1985: *Flora Novo-Galiciana*. The University of Michigan Press. p 157
- Williams, L. O. 1940. Two New Species of *Hexalectris* From Mexico. *American Orchid Society Bulletin*. Vol 9: p 126.
- Southwest Environmental Information Network (SEINet). 2015. <http://swbiodiversity.org/seinet/index.php>. Accessed on September 25, 2015.
- WCSP 2015: *World Checklist of Selected Plant Families*. Facilitated by the Royal Botanic Gardens, Kew. Published on the Internet; <http://apps.kew.org/wcsp/> Retrieved 9 May, 2015.

