Volume 47 Number 1 - February 2021

Nevada Native Plant Society

Spiranthes diluvialis by JD Johnson

Artificial Key to Orchids of Nevada

Dominic M. Gentilcore, Ph.D.
Botanist, Desert Research Institute

photos by the author unless noted

Nevada is a diverse state with more than 2,800 species of vascular plants occupying a variety of habitats representing the Great Basin, Mojave, and influence from surrounding ecosystems. In Nevada, there are six recognized orchid genera, twelve species, and two significant varieties. The distribution of Orchids in the state exemplifies the diverse habitats found in Nevada even though only 13 taxa of the approximately 20,000 species in the family occur in the state. Attempting to visit each one in the field is a great excuse for trips that will take you to each corner of the state. The species tend to be restricted to wet areas and or high mountains like the Carson Range, Snake Range, or Central Nevada Ranges. Elko County, with the Jarbidge Mountains and Ruby Mountains, contains the most orchid taxa: 8. This family also contains one of our Nevada endemics, Ash Meadows lady's tresses.

Orchids are myco-heterotrophs in an obligate relationship with soil microbes for some or all of their lifecycle. Their bilateral flowers are highly specialized to attract co-evolved pollinators. Both factors contribute to the high degree of endemism in the group. Many of our species blend into the background with relatively small flowers, but a careful eye and close look reveals their intricate details. The following is a key to aid in identifying Nevada's orchids.

The author's detailed study on this topic, ***Biogeography of the Orchids of Nevada***, is available to members on the **Newsletters page on NVNPS.org**.

County Abbreviations (Number of Orchid Taxa in County)

CC – Carson City (3)
CH – Churchhill (0)
CL – Clark (2)
DO – Douglas (5)
EL – Elko (8)
ES – Esmeralda (2)
EU – Eureka (0)
HU – Humboldt (4)
LA – Lander (3)
LI – Lincoln (4)
LY – Lyon (1)
MI – Mineral (3)
NY – Nye (5)
PE – Pershing (2)
ST – Storey (1)
WA – Washoe (6)
WP – White Pine (6)

Other Abbreviations

Gr. – Greek
L. – Latin
FWS – US Fish and Wildlife Service
NV – Nevada
NVNHP – NV Natural Heritage Program
US – United States of America
NA – North America

Taxa description format

Genus species Author Citation. Common name [Specific epithet translation] Multi-sentence description. Elevation range in m. Dates of collection of flowering specimens. Occurrence by county in NV using two letter county abbreviations. Rarity/listings (if applicable). (Number of representative NV herbarium specimens). Total species distribution.

ORCHIDACEAE – Orchid Family

All orchids in Nevada are rhizatomous perennial herbs; leaves linear to ovate; perianth bilaterally symmetric, 6-parted, dorsal sepal forming hood, lateral sepals spreading to appressed to hood, lateral petals spreading to appressed to hood, ventral petal modified into lip sometimes spurred basally; stamens and pistils fused into column; fertile anthers 1, staminode sometimes present; pollen sacs 2, often separated; stigmas 3, often 1 modified into a rostellum between stigmas and anthers in column; pollen usually viscid; fruit a capsule; seeds minute, undifferentiated germ plasm, dust-like, easily wind-blown. Orchidaceae is the second most diverse plant family in the world containing around 800 genera and 20,000 species. NV has 6 orchid genera and 13 taxa. The species are believed to have obligate relationships with mycorrhizal fungi. They tend to prefer wetter areas in the state: springs, streams, meadows, and/or higher elevation forests.

1. Herbage purple; mycoheterotrophs lacking green pigment .....*Corallorhiza* 2 spp
1. Herbage green; photosynthetic autotrophs.
    2. Leaves opposite, cauline, 1(2) pair; lip cuneate, tip notched ..... *Listera convallarioides*
    2. Leaves alternate, basal and sometimes also cauline; lip otherwise
        3. Perianth heterochromic with green, yellow, or purple; lip with raised purple lines ..... *Epipactis gigantea*
        3. Perianth ± homochromic, green to white to cream; lip without raised lines
            4. Leaves basal; inflorescence scapose ..... *Piperia unalascensis*
            4. Leaves basal and cauline; inflorescence a terminal spike or raceme.
                5. Stems ± leafy; lip spurred basally with slender or saccate appendage .... *Platanthera* 4 spp
                5. Cauline leaves highly reduced apically; lip not spurred.....*Spiranthes* 4 spp

Corallorhiza

[Gr. coral root]

1. Lip with 2 lateral lobes near base, white with purple spots, margins wavy ..... *C. maculata*
1. Lip entire, cream to pale with purple stripes, margins upcurved..... *C. striata*

Corallorhiza maculata Raf. Spotted coralroot [L. spotted] One of the more broadly distributed orchids in NV and can be locally common. It occurs throughout the Sierran and Great Basin provinces of the states as well as the Jarbidge Mountains, Ruby Mountains, and White Rock Range. It prefers growing in litter under dense tree cover in Ponderosa Pine, Aspen, or Mixed Conifer Forests. 1768 – 2805 m. 22 June – 25 August. EL, LA, NY, WA, WP, HU, DO, LI. (35). Widespread across NA.

Corallorhiza striata Lindl. Striped coralroot [L. striped] Known from Northeasten NV in the Ruby Mountains and the Snake Range. It has a similar habitat to *C. maculata*, but is much less common. 2134 – 2438 m. 28 June – 8 July. EL, WP. (3). Western US, Northern Midwest, and Canada.

Corallorhiza maculata

Epipactis

[Gr. plant used to curdle milk]

Epipactis gigantea Douglas ex Hook. Stream orchid
[L. gigantic] Broadly distributed across NV and occupies the widest elevational range of any of the NV orchid taxa. It occurs mostly around springs, seeps, and streams. It seems to prefer protected sites near rocks, but can also be found growing in full sun along watercourses. In Southern NV, it is a common member of the azonal hanging garden community type. 600 – 2439 m. 11 April – 25 July. CL, DO, NY, MI, PE, WP, HU, LI. (50). Western NA.


Epipactis gigantea

Listera

[for Martin Lister (1639-1712), English botanist]

Listera convallarioides (Sw.) Nutt. Broad-leaved twayblade [Gr. looks like lily of the valley] In NV, the species has a disjunct distribution in the Ruby Mountains, Sierra and eastern Great Basin, but not known from any central NV ranges. It likes to grow in moist soil along the edges of forested streams. *L. convallarioides* is the only member of the genus in NV despite some previous misidentifications of this species as *L. cordata* which have since been corrected. 1737 – 2590 m. 2 July – 23 August. WA, DO, EL, CC, WP. (16). Western US, Northern Midwest and Canada.


Piperia unalascensis

Piperia

[For Charles V. Piper (1867-1926), American botanist]

Piperia unalascensis (Sprengel) Rydb. Alaska rein orchid [from Unalaska, Alutian Island] Known from the Ruby Mountains as well as one site in Esmerelda County. Prefers subalpine springs and seeps. 2164 – 2590 m. 15 July – 30 July. EL, ES. Rare. (3). Western US, Northern Midwest and Canada.

Platanthera

[Gr. *plat-*, flat and *-anthera*, anther]

1. Perianth mostly white.
   2. Spur less than 2/3rds length of lip, ± straight ..... *P. dilatata* var. *albiflora*
   2. Spur longer than lip, curved ..... *P. dilatata* var. *leucostachys*
1. Perianth green to yellow.
   3. Column large, ≥ ½ height of hood; Carson Range ..... *P. sparsiflora*
   3. Column small, < ¼ height of hood; Central/Eastern/Southern NV..... *P. tescamnis*

Platanthera dilatata (Pursh) Lindl. ex Beck **var. *albiflora*** (Cham.) Ledeb. Scentbottle [L. *dilatata*, dialated; *albi-*, white; and *-flora*, flower] Known only from the Ruby Mountains further emphasizing their uniqueness in the state and helping make Elko the most orchid-diverse NV county. 2012 – 2988 m. 14 July – 12 August. EL. (3) Pacific Northwest.

Platanthera dilatata (Pursh) Lindl. ex Beck **var. *leucostachys*** (Lindl.) Luer. White bog orchid [Gr. *leuco-*, white and *-stachys*, spike] The most common orchid in NV. It occurs in many Great Basin sky island mountain ranges as well as the Sierras, Jarbidge Mountains, and Ruby Mountains. It has a more connected range in the state occurring in several of the central NV ranges possibly due to its tolerance of slightly lower elevations than some of the other species. 1455 – 3050 m. 1 June – 18 September. WA, EL, HU, WP, CC, ST, MI, DO, LY, NY, LA, PE. (124). Western NA.

Platanthera sparsiflora (S. Watson) Schltr. Sparse-flowered bog orchid [L. sparsely flowered] Known only from the Carson Range in NV (a spur of the Sierra Nevadas) under the new species concepts developed since the description of *P. tescamnis* (Sheviak and Jennings 2006) which moved most of the specimens in the state into that species. However, many of the P. sparsiflora in the herbaria remain yet to be officially redetermined. More work may be needed to confirm the range boundary. The herbaria examined contain 15 specimens assuredly known to still be *P. sparsiflora*. 1981 – 2957 m. 12 June – 6 September. WA, CC. (15). West Coast of NA.

Platanthera tescamnis Sheviak & W.F. Jenn. Intermountain bog orchid [L. *tesca-*, desert and *-amnis*, swift-flowing stream] A recently described species that occurs commonly throughout the Great Basin and Mojave. It was separated from *P. sparsiflora* due to different column morphology (related to different pollinators) and the occupation of much drier habitats (Sheviak and Jennings 2006). 1310 – 2900 m. 22 June – 9 September. EL, CL, MI, NY, ES, LA, WP, DO, LI, HU. (67). Southwestern US.


Platanthera dilatata var. *leucostachys*


Platanthera tescamnis

Spiranthes

[Gr. coil flower]

1. Lip pandurate (violin shaped).....*S. romanzoffiana*
1. Lip elliptic, ovate, lanceolate, or oblong without central constriction.
    2. Leaves to 3.5 cm wide; Sierra Range above 1750 m.....*S. porrifolia*
    2. Leaves to 1.5 cm wide; NY, LI below 1450 m.
        3. Spikes with 4 or more flowers per cycle; lip broadest near middle; Ash Meadows endemic. ..... *S. infernalis*
        3. Spikes with 3 flowers per cycle; lip broadest near base; In NV, known only near Panaca ..... *S. diluvialis*

Spiranthes diluvialis Sheviak. Ute's lady's tresses [L. of the flood] Known in NV only from a single location near Panaca. The original collection at the site was made in 1936. For many years, it was presumed extirpated. In 2005, it was rediscovered by the Greater Las Vegas Orchid Society. It has been observed again in 2006 and 2011. 1440 – 1445 m. 29 July – 30 July. LI. FWS Threatened. NVNHP At-Risk Species. (2). Rocky Mountains.

Spiranthes infernalis Sheviak. Ash Meadows lady's tresses [L. hellish] Occurs only in around a half dozen small streams and pools all within Ash Meadows National Wildlife Refuge. The first time the species was collected by Reveal and Beatley in 1968, it was incorrectly identified as *S. romanzoffiana* before realizing a new species had been discovered. When Sheviak went to recollect a type specimen, it had been extirpated from the original collection location. Some nearby populations were located in other pools which became the type location, but the original population has never been observed again (Sheviak 1989). 668 – 671 m. 19 June – 4 July. NY. NVNHP At-Risk Species. (6). Endemic.

Spiranthes porrifolia Lindley. Western lady's tresses [L. *porri-*, leek green and *-folia*, leaves] Occurs only in Tahoe Meadows and few other meadows in that area. 1753 – 2782 m. 24 July – 21 August. WA. (4). West Coast of NA.

Spiranthes romanzoffiana Cham. Hooded lady's tresses [For Count Nicholas Romanzoff (1750–1826), Russian nobleman and benefactor of scientific exploration] Occurs in the Sierran floristic province, the Ruby Mountains, and the Jarbidge Mountains. It is not known to occur in Nye county despite some sources still listing it as present due to Reveal's original determination of *S. infernalis*. 1737–3050 m. July – 8 Sept. EL, WA. (15). Western US, Northern Midwest and Canada.

Spiranthes romanzoffiana

References

Ackerman, T.L., Bair, J., and Tiehm, A. 2003. A Flora of the Desert National Wildlife Range, Nevada. *Mentzelia*. Number 7.

Armstrong, J.D. 1969. Vegetation of the Virgin Mountains, Clark County, Nevada, M.S. thesis UNLV.

Baldwin, B.G. and Goldman, D.H., 2012. *The Jepson manual: vascular plants of California*. Univ. of California Press.

Barkworth, M. 2016. Personal Communication.

Beatley, J.C., 1976. *Vascular plants of the Nevada Test Site and central-southern Nevada: ecologic and geographic distributions* (No. TID-26881). California Univ., Los Angeles (USA). Lab. of Nuclear Medicine and Radiation Biology.

Bostick, V. 1973. Vegetation of the McCullough Mountains, Clark County, Nevada. M.S. thesis, UNLV.

Coleman, R.A., 2002. The wild orchids of Arizona and New Mexico. Cornell University Press.

Consortium of Intermountain Herbaria. 2016. **http://intermountainbiota.org/portal/index.php**. Accessed on 31 January.

Clifton, G. 2012. *Flora of the North and South Snake Ranges*. Great Basin National Park website. **https://www.nps.gov/grba/**. Accessed 31 January 2016.

Cronquist, A., Holmgren, A.H., Holmgren, N.H., Reveal, J.L. and Holmgren, P.K., 1977. *Intermountain flora. Vascular plants of the Intermountain West, USA Volume six. The monocotyledons*. Columbia University.

Flora of North America (FNA) Editorial Committee, eds. 1993+. Flora of North America North of Mexico. 19+ vols. New York and Oxford.

Holland, J.S., 1982. *A floristic and vegetation analysis of the Newberry Mountains, Clark County, Nevada*. Cooperative National Park Resources Studies Unit, University of Nevada, Las Vegas, Department of Biological Sciences.

Knight, T.S., 1983. Vascular flora of the Muddy Mountains, Clark County, Nevada. *Madroño*, pp.31-51.

Lloyd, R.M. and Mitchell, R.S., 1973. *A flora of the White Mountains, California and Nevada*. Univ. of California Press.

Niles, W.E. and P.J. Leary. 2013. The Flora of the Spring Mountains. DRAFT. Unpublished.

Sheviak, C.J., 1989. A new Spiranthes (Orchidaceae) from Ash Meadows, Nevada. *Rhodora*, pp.225-234.

Sheviak, C.J. and Jennings, W.F., 2006. A new Platanthera (Orchidaceae) from the intermountain west. *Rhodora*, 108(933), pp.19-31.

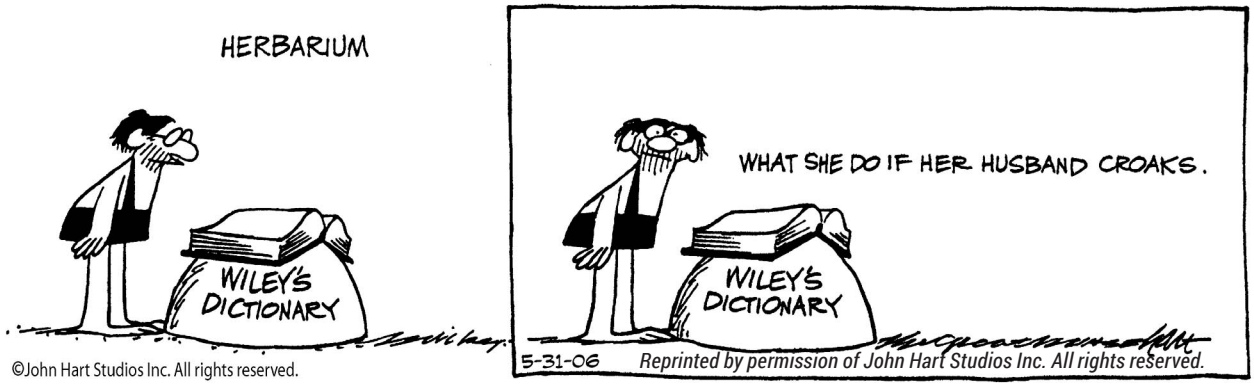
Tidestrom, I., 1925. Flora of Utah and Nevada. *Contributions from the United States National Herbarium* Volume 25.

Tiehm, A., 1996. Nevada vascular plant types and their collectors. *Mem. New York Bot. Gard, 77*.

Tiehm, A. 2016. Personal Communication.

Train, A.S., 1980. Nevada through Rose Colored Glasses: The Fossil and Plant Collecting Percy Trains, 1928-1942.

Epipactis gigantea by JD Johnson



Herbarium. *The Quest to Preserve and Classify the World's Plants.* By Barbara M. Thiers. Timber Press, Portland, OR. 279 pp. ISBN 978-1-60469-930-2. $40.
Review by Arnold Tiehm

I suspect some people mystified by this comic checked how Mr. Webster defines *herbarium*: "A collection of dried plant specimens usually mounted and systematically arranged for reference." When asked, I always refer to an herbarium as, "a library of plant specimens." From the dust jacket on Barbara Thiers' marvelous book, ***Herbarium***, comes the following quote: "Since the 1500s, scientists have documented the plants and fungi that grew around them, organizing the specimens into collections. Known as herbaria, these archives helped give rise to botany as its own scientific endeavor." Herbaria are indeed archives – historical accounts of plants collected over time. Comparison of historical collections and modern collections allows for positive identification. Historical collections show which plants occurred in an area before alteration by humans. Reports of plants for any area are based on documentation of herbarium specimens.

In ***Herbarium***, Barbara Thiers, director of the Herbarium at the New York Botanical Garden, takes us on a trip through the history of herbaria. The book's five major sections are *The Origin of Herbaria*, *Herbaria and the Age of Botanical Exploration*, *Development of Herbaria in the United States*, *Development of Herbaria Around the World*, and *The Future of Herbaria*.

From *The Origin of Herbaria*, we learn that the first herbaria were developed by herbalists and apothecaries. The modern herbarium dates to the early 1500s and starts in Italy with Renaissance man Luca Ghini who taught medicine at the University of Bologna and subsequently added a course in plants. To allow the study of plants throughout the year, he pressed plants and glued them to the pages of a blank book. It is a short stretch to imagine how books and portfolios of plant specimens were converted to the modern herbarium method of plant specimens on loose sheets of paper filed in a systematic order. Unfortunately, Ghini's herbarium no longer exists.

Herbaria and the Age of Botanical Exploration tells of European expeditions in the 1700s and 1800s to the ends of the world. This was the golden age of colonialism and these expeditions also sought out plants that could be used in commerce, such as spices, crops, and medicines, or to adorn the grounds and greenhouses of the aristocracy.

One fascinating story in this section is about a French expedition sponsored by Louis XV. It was led by Louis-Antoine de Bougainville. His name is familiar because of his namesake, the striking South American genus Bougainvillea. The naturalist on the voyage was Philibert Commerson. He hired an herb lady, Jeanne Baret, his mistress, as his assistant. At the time women were banned from sailing on French ships, so Commerson had Baret dress and act like a man. She also used the name Jean to further cloud the issue. She stayed away from the captain and crew and claimed to be a eunuch. Seeming to be ashamed of this mutilation she was allowed to use the ship's head and bathe alone. The expedition went,

among other places, to South America, Tahiti, Samoa, New Hebrides, and New Guinea. With their return to Europe, Baret became the first woman to circumnavigate the world.

Development of Herbaria in the United States tells how the early collections from America were sent to museums and sponsors in Europe. As more people poured into America, more Universities and Colleges were established, more science was taught, and more natural history museums were created. Stories include the twisted tale of Lewis and Clark's botanical specimens; the establishment and development of major herbaria at Harvard, the New York Botanical Garden, and the Missouri Botanical Garden; and the rise of herbaria at the California Academy of Sciences and UC Berkeley.

In *Development of Herbaria Around the World*, the reader explores the development of herbaria in Australia, Brazil, the People's Republic of China, and South Africa. These fascinating tales about herbaria left me wanting more. In the preface the author laments, "I could not focus equal attention on herbaria worldwide – a realization that saddened me greatly." After all, there is a story behind every herbarium: how, when, and why did it start? Who were the people that supported and contributed to its existence? Who were the collectors who braved sometimes uncomfortable and dangerous conditions to make interesting collections in remote locations to be preserved in perpetuity?

The Future of Herbaria begins with an accounting of the current state of herbaria worldwide: 3,300 collections scattered across 178 countries containing as many as 390 million specimens. Thiers explains how recent innovations that allow us to see things at both the molecular level and on a global scale can be applied to herbaria specimens, helping us to understand how the world's flora is changing and to address some of the most critical problems facing us. The author delves into studies of DNA extracted from herbarium specimens, such as one collected in 1835 and housed at the New York Botanical Garden (the oldest specimen at the Botanical Gardern from which DNA has been successfully extracted so far). Other studies of herbarium specimens range from phenological changes to the occurrence of air borne pollutants such as heavy metals. She also addresses threats to herbaria, how they can be preserved, and how you can help.

Included in this section is an image I am grateful to see: the cold storage room at the New York Botanical Garden. Here are both specimens waiting their turn to be mounted on archival paper and expedition specimens that are being processed. The room is kept cold to prevent insect infestations damaging the collections. I vividly remember the first time I was shown this room and how much I was in awe with it. When I was working at the Garden, the cold storage room was always included on guest tours and was always a highlight. The book's image shows shelves containing expedition specimens that have been organized by collector and plant family. In the background are more shelves loaded with specimens to be mounted. The photo does not convey the expansive size of the room or the rows upon rows of shelving units it holds. I showed this photograph to a student who remarked it was sheer chaos. To the uninitiated eye this is understandable, but within the visual clutter lies order governed by color-coded drop tags and a strict system of organization – the very qualities that make herbaria such invaluable warehouses of information.

Herbarium is impeccably researched and written with an envious clarity of prose. It is a fascinating enquiry into this unique field of plant biology, exploring how herbaria emerged and have changed over time, who promoted and contributed to them, and why they remain such an important source of data for understanding our impact on the planet. At its heart, ***Herbarium*** is a compelling reminder of one of humanity's better impulses: to save things – not just for ourselves, but for posterity. In short ***Herbarium*** is a marvelous book about the ages, for the ages.

Nevada Native Plant Society
PO Box 8965
Reno NV 89507-8965

RETURN SERVICE REQUESTED

NEVADA NATIVE PLANT SOCIETY

MEMBERSHIP APPLICATION

Name_____

Phone_____

Mailing Address_____

City_____ State_____ Zip_____

Email_____ □ Renewal

Newsletter preference: □ Paper □ Electronic

- Individual, family or group for one year $20.00
- Individual, family or group for three years $50.00
- Student or senior citizen, each year $15.00
- Life membership $500.00

Dues are for the calendar year in which you join. Membership expiration dates are on the mailing labels.

Gifts, and bequests are tax deductible.
Your donation in any amount is appreciated $_____
Please make checks payable and mail to: NNPS • P.O. Box 8965 • Reno, NV 89507