



# OREGON FLORA NEWSLETTER

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## Lincoln Constance (1909-2001): the Oregon years by Rhoda Love

In last September's *Jepson Globe*, Berkeley botanist Bruce Baldwin wrote, "June brought the end to an era at the Jepson Herbarium and U. C. Berkeley, with the loss of our dear friend and invaluable colleague professor Lincoln Constance, at 92." An earlier announcement of Dr. Constance's death stated, "Lincoln was the patriarch of Botany at Berkeley and foremost expert on Umbelliferae/Apiaceae systematics. He was immensely influential in shaping the modern history of the University of California and of systematic botany on a world level. ... He was Curator of Seed Plants in the University Herbarium beginning in the 40s, Chair of the Department of Botany in the early 50s, Dean of the college of Letters and Science from the mid-50s to early 60s, Vice Chancellor of Academic Affairs from the early to mid 60s, Director of the University Herbarium from the early 60s to mid-70s."

Indeed Lincoln Constance had a long and illustrious career in California, but I wonder how many *Newsletter* readers realize that the great man's interest in botany began here in Oregon? A delightful reminiscence by Constance makes it clear that the seeds of his lifelong love affair with botany were planted and nurtured here in our own state. In his 1988 article "Plant Taxonomy in My Time" (*Aliso* 12:1-5).

See *Constance*, page 10



Lincoln Constance age 17, High School graduation photo, Eugenean, 1926. Courtesy Lane County Historical Museum.

## Portulacaceae—reconciling DNA with taxonomy, or vice versa by Kenton L. Chambers

Members of Portulacaceae are succulent annual or perennial herbs, taking their family name from the weedy potherb *Portulaca* (purselane) and represented in Oregon's flora by several small or medium sized genera such as *Lewisia*, *Montia*, *Claytonia*, *Calandrinia*, and *Calyptidium*. *Lewisia*, in particular, is of considerable interest to rock garden enthusiasts, who have developed numerous interspecific hybrids from crosses among its 19 species (see *Lewisias*, by B. LeRoy Davidson, Timber Press, Portland OR, 2000). The family and its closest relatives form the core of the order Caryophyllales (called the "Centrospermae" in older taxonomy textbooks). This core group includes such common families as Caryophyllaceae (pink family), Chenopodiaceae (goosefoot family), Amaranthaceae (pigweed family), Nyctaginaceae (four-o'clock family), Aizoaceae (iceplant family), and—surprisingly—Cactaceae (cactus family). In addition to the succulent leaves and stems of many genera of Caryophyllales, there are similarities in the biochemistry (frequent absence of anthocyanin pigments, presence of CAM and C4 photosynthesis), the morphology of embryos, seeds, and pollen grains, the cellular ultrastructure of phloem tissue, and the placentation of the ovary, which make this one of the most "natural" orders of angiosperms.

Beginning in 1984, taxonomists have used modern, computer-assisted cladistic methods to solve the question of phylogenetic relationships within order Caryophyllales. Although the earliest of these phylogenetic studies, based only on morphology and biochemistry, was inconclusive, later work using DNA data has given us many new and surprising insights for the group. Several genes have been "sequenced" from the chloroplasts and nuclei of a wide selection of species. From the gene mutations that are shared among related taxa, computer programs can produce "cladograms," which are tree-like charts showing the most probable hypotheses of evolutionary relationships. These DNA phylogenies are independent of the morphological traits traditionally used in plant taxonomy, and when properly interpreted, they can untangle the evolutionary parallelism and convergence that so often occur in morphological features.

Some of the conclusions that have come from the DNA studies are the following:

1. The largest core families of Caryophyllales are those listed

See *Portulacaceae*, page 11

Dr. Constance recalls his boyhood days in Eugene, the influence of his parents, and his meeting with University of Oregon botanists, Albert Sweetser, Ethel Sanborn, and especially Louis F. Henderson, and the role they played in his eventual choice of career.

Lincoln was born in the Willamette Valley February 16, 1909. He later told David Wagner of the University of Oregon that every year he and his family would search the woods for the first blooming spring beauty (then *Dentaria tenella*, now *Cardamine nuttallii*) on the anniversary of his birth. He writes that his parents encouraged an interest in natural history and that he experimented with taxidermy and butterfly collecting before his meeting with Henderson. In the *Aliso* article he writes, "The first scientific name I learned was *Osmaronia cerasiformis*, which unfortunately has had to give away to *Oemleria*, a word that evokes no nostalgia whatever." He goes on, "Reportedly, odor is the most potent stimulus of memory. For me, the red-flowered *Ribes* yield the true smell of spring."

See Constance page 13

Illustrations of *Erythronium oregonum* on the front and back covers by Linda Ann Vorobik.

The Oregon Flora Newsletter is published three times a year by the Oregon Flora Project and the Oregon State University Herbarium. The Editor is Rhoda Love and the Production Assistant is A. Paige Kruger.

**Oregon Flora Project Coordinator:**

Scott Sundberg

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Lucile Housley	Andy Robinson	Belinda Vos
Jerry Igo	Charlene Simpson	

**Address correspondence to:**

Scott Sundberg  
Department of Botany & Plant Pathology  
Oregon State University Cordley Hall 2082  
Corvallis, OR 97331-2902  
E-mail: sundbers@bcc.orst.edu  
(541) 737-4338; FAX (541) 737-3573  
<http://www.oregonflora.org>

**Dwarf rue-anemone: right in our own backyard**

by Charlene Simpson

Emerald Chapter, NPSO, has recently published the long awaited *Vascular Plants of Lane County, Oregon: An Annotated Checklist* (OFN, Feb. 2002). As we neared the final stages of our project we thought we had recorded every native and naturalized vascular plant species known in Lane County. However, there was a late surprise right in our own backyard.

This spring Dave Predeek, Emerald Chapter member, avid naturalist, and enthusiastic volunteer, led us to *Enemion stipitatum* (A. Gray) J.R. Drumm. & Hutch. (= *Isopyrum stipitatum* A. Gray), a tiny anemone-like perennial herb in the Ranunculaceae. A year earlier he had discovered the early blooming dwarf rue-anemone while doing volunteer work for a restoration project at Howard Buford Recreation Area, east of Eugene. Dave reported his "find" to Emerald Chapter members and to Ed Alverson, Willamette Valley Stewardship Ecologist for the Nature Conservancy. Emerald Chapter members John Koenig and Rhoda Love verified Dave's ID this year. We estimated 1,500-2,000 individual plants at the site.

The plants are growing in the alluvial floodplain of the Coast Fork of the Willamette River under an open canopy of bigleaf maple. The area has a long history of disturbance, particularly cattle grazing when the site was in private ownership. The understory had been dominated by Himalaya blackberry, but as part of the restoration regimen much of the blackberry cover was removed during the summer of 2001. The *Enemion* plants appear to have benefited from the resulting reduction in competition.

*Enemion stipitatum* rises on a 3-12 cm stem from tuberous roots. Diminutive white flowers of 3-5 tepals (usually with 10 stamens) are borne on peduncles that do not exceed the leaves. The solitary flowers open in late winter or early spring. Previous workers (Hitchcock, *et. al.*, 1964; Calder and Taylor, 1963) placed this and the related *Enemion hallii* in the genus *Isopyrum*. However, the Oregon Flora Vascular Plant Checklist follows the nomenclatural treatment used in the *Flora of North America* (1997) and places it in the genus *Enemion*.

The species is on the Oregon Natural Heritage Program's List 2 (taxa that are threatened with extirpation in Oregon). It was also one of the species identified as a Lane County

See *Enemion* page 12



Dave Predeek examining *Enemion stipitatum* east of Eugene. Photo: Ed Alverson. Insert: *Enemion stipitatum*. Photo: Charlene Simpson.

in my first paragraph, plus the Phytolaccaceae (pokeweed family) and Molluginaceae (carpetweed family), which are minor elements in Oregon's flora.

2. Related families that are outside this "core" group but connected to Caryophyllales include the knotweeds (Polygonaceae), plumbagos (Plumbaginaceae), goatnut (Simmondsiaceae), tamarisk (Tamaricaceae), and sundews (Droseraceae)—families that, in previous angiosperm classifications, were thought to be remote and unrelated.

3. Amaranthaceae and Chenopodiaceae are very closely related and could well be merged into a single family. However, the genus *Sarcobatus* (greasewood) is unrelated to other Chenopodiaceae and should form its own family, close to Nyctaginaceae.

4. The large and distinctive family Cactaceae, which previously was placed in its own order Cactales, is phylogenetically connected directly to the Portulacaceae, having *Portulaca* (purselane) as one of its closest relatives.

5. Various western North American genera of Portulacaceae, such as *Lewisia*, *Claytonia*, *Montia*, *Calyptridium*, and the single Oregon species traditionally referred to *Talinum*, are phylogenetically separate from *Portulaca*, *Talinum*, and the Cactaceae. As a group, their closest relatives are in far off regions like South America, South Africa, Madagascar, and Australia—a most unusual geographical pattern.

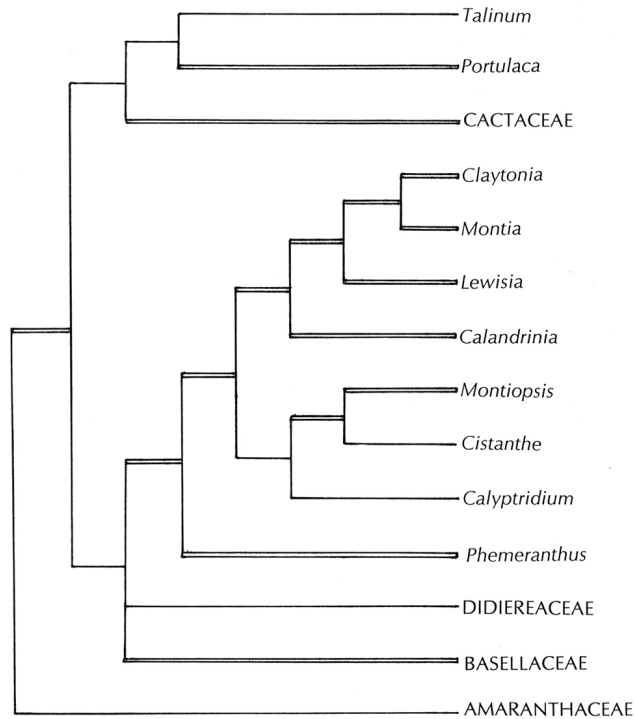
The accompanying chart is a simplified version of DNA cladograms by Hershkovitz & Zimmer (2000) and Applequist & Wallace (2001), showing relationships among members of the so-called "portulacaceous cohort" of genera. Arising within this cohort are the families Cactaceae, Didiereaceae (in Madagascar), and Basellaceae (pantropical). *Lewisia*, *Claytonia*, *Montia*, *Calyptridium*, and *PheMERANTHUS* are mainly North American; *Calandrinia*, *Cistanthe*, and *Montiopsis* are principally South American; and *Talinum* is in tropical America and Africa.

Several taxonomic changes have been proposed for western American genera, based partly on these new studies. *Calyptridium* must be expanded to include the genus *Spraguea*, and the former *Spraguea umbellata* should be divided into two species, *Calyptridium umbellatum* (Torr.) Greene and *C. monospermum* Greene (as was done in *The Jepson Manual*, 1993). Two species of *Calandrinia* in California should be moved to *Cistanthe* (*C. ambigua* and *C. maritima*). *PheMERANTHUS* is recognized as a genus separate from *Talinum*, to include 16 species in North

America; in Oregon we have *P. spinescens* (Torr.) Hershkovitz, formerly called *Talinum spinescens* Torr. The Washington species known as *Talinum okanoganense* in *Flora of the Pacific Northwest* is renamed *PheMERANTHUS sediformis* (Poelln.) R. W. Kiger. Several species of *Montia* have been transferred to *Claytonia* (see *The Jepson Manual*).

A problem for the future is what to do with the family name Portulacaceae, since the name-bringing genus *Portulaca*, along with *Talinum* and family Cactaceae, is on a separate evolutionary branch from the branch with *Lewisia*/*Claytonia*/*Cistanthe*/*PheMERANTHUS*, etc., plus families Basellaceae and Didiereaceae. If this latter group is recognized as a separate family, its name would have to be the earliest one that is


based on one of the included genera. When I find out what this name is, I'll let you know.



Simplified cladogram of the "portulacaceous cohort" derived from analyses of nucleotide sequences of the chloroplast *ndhF* gene and nuclear ribosomal RNA (rDNA) gene. Amaranthaceae is the outgroup taxon. Family names are capitalized; genera of Portulacaceae are italicized. Double lines lead to presumed monophyletic groupings that were consistent in 90 percent or more of the phylogenetic analyses. Groups with less than 90 percent support are indicated by single horizontal lines.

#### References

- Applequist, W. L. & R. S. Wallace. 2001. Phylogeny of the portulacaceous cohort based on *ndhF* sequence data. *Syst. Bot.* 26: 406-419.
- Hershkovitz, M. A. & E. A. Zimmer. 2000. Ribosomal DNA evidence and disjunctions of Western American Portulacaceae. *Molec. Phylogen. Evol.* 15: 419-439.

Note: CAM = crassulacean-acid metabolism; C4 photosynthesis involves carbon dioxide being fixed first as a 4-carbon, rather than 6-carbon, compound. 



leapfrogger (OFN, June 2000). These are species known from sites both to the north and south of Lane County but not known from our area.

Ed Alverson (1989. *Madroño* 36:217) reports only three other occurrences in the Willamette Valley: Yamhill County, along Willamina Creek, north of Willamina; Polk County, along Mill Creek in Buell County Park; Benton County, Marys River, south of Corvallis (this population has not been relocated and is believed to be extirpated).

There are also collections from Douglas County and south from the Siskiyou region of Oregon and California. Although located thus far in only four counties in the Willamette Valley, *E. stipitatum* should be sought in other Willamette Valley counties as well. In the Willamette Valley it is found only in moist deciduous woods, on rich alluvial soils.

We have questions. Why is *Enemion* so infrequently encountered in the Willamette Valley? Does loss of suitable habitat explain dwarf rue-anemone's rarity here? We also wonder why the Buford Park population was not discovered earlier. The Yamhill and Polk County sites were identified in the late 1950s and the Benton County site in 1980. Twenty-two years later we add Lane County. (For full references, see the Oregon Flora website.) 🌱

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### Illustration workshop a great success by Linda Hardison

In early May, fifteen people from throughout the Willamette Valley enjoyed a weekend of botanical illustration taught by Anne Jaster. The workshop was held in Eugene, and began with a reception and impressive slide presentation on the history of botanical illustration. Participants then enjoyed two days of drawing, both in the classroom and at the wildflower-filled Mt. Pisgah Arboretum. Comments from the class were glowing: "I learned all I had hoped to and more," wrote one participant. "This is a great way to get native plant enthusiasts together!" said another. "Anne...was wonderful. I know I want more of this!" commented a third.

The class, offered by the Friends, brought in \$1,350 to the Oregon Flora Project. We extend our thanks to Anne Jaster, Lane Community College, and the Mt. Pisgah Arboretum for their generosity in this very successful fund-raising endeavor for the Flora Project!



Photo: Rhoda Love

Participants in the Illustration Workshop smile for the camera. Instructor Anne Jaster is on the far right.

### New records for Oregon by Scott Sundberg

Here we continue to report on plants "new" to Oregon. *Fauria crista-galli* (Menzies ex Hook.) Makino (Menyanthaceae) = *Nephrrophyllidium crista-galli* (Menzies ex Hook.) Gilg. deer cabbage (native)

**General distribution:** Oregon and Washington (Olympic Mountains and North Cascades) to Alaska, British Columbia, eastern Asia.

**Oregon locality:** Linn Co., north of Snow Peak, 3,600 feet; wet meadow.

**Comments:** Deer cabbage is a perennial herb in the Menyanthaceae, with white flowers and reniform, somewhat fleshy leaves up to 12 cm. broad. It was discovered by Rachel Schwindt during vegetation surveys she conducted in 1999, and identified by Scott Sundberg. Wilbur Bluhm, along with Claire Hibler and other BLM botanists later visited the site and found large populations of the plant.

*Elaeagnus umbellata* Thunb. (Elaeagnaceae)  
autumn olive (exotic)

**General distribution:** Native to China, Taiwan and Japan, escaping cultivation in many areas.

**Oregon localities:** Clatsop Co., Columbia River, Fitzpatrick Island, sandy dredge spoils; Lane Co., west of Eugene, along a fencerow.

**Comments:** Autumn olive is considered an invasive plant in many areas. In the *Manual of the flowering plants of Hawai'i* (Wagner and Sohmer 1999) it is described as "growing rapidly into an impenetrable, thorny thicket, usurping space from more valuable species. The shrub can dominate almost any landscape type, from fencerows to meadows to open woods, even sand dunes and mine spoils." The species was found naturalized in two places in Oregon, but it is uncertain whether or not it can become as invasive here as it can be in the much milder climate of Hawaii.

Autumn olive is a deciduous and often spiny shrub to 12 feet tall with elliptic leaves to three inches long. It was first collected outside of cultivation in Clatsop Co. by Cathy Maxwell, in 1992. Dick Brainerd found it near Eugene in 1998. Both specimens were identified by Scott Sundberg while preparing the Elaeagnaceae treatment for the Oregon Checklist. 🌱

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### Project news by Scott Sundberg

From time to time I sit back and rummage through the many databases that the Oregon Flora Project maintains. Today I got into the "Students" database, where we record the names of students who have worked for us over the years, and found that there have been an astonishing 62! Volunteers go into another database. This summer I am fortunate to have help from Thea Cook and Ann Willyard, who are doing almost all student and volunteer supervision. Their challenge is to keep track of 18 students with different tasks and work schedules. On top of this, the students are usually scattered among four rooms on two floors of Cordley Hall. This task is somewhat easier on hot days, as only one of the rooms has air conditioning...

As you might guess, the project is moving along at a rapid clip. Students are entering label data from 1,800 specimens per week. These data will be used by the Flora project in many ways, and are valuable records for the online Atlas. We have begun work on a morphology database (yes! work on the Flora itself). Ken Chambers recently turned in checklists for 25 grass genera. Henny Chambers and others have been working steadily through a number of other groups. We're also busy with the rare plant guide prototype, the photo gallery, and on and on and on... it's an exciting time for the project! 🌱

Continuing to recall his youth Constance goes on, "While still in high school, I discovered the University of Oregon's Botany Department and became acquainted with its staff: Albert Sweetser, ... Ethel Sanborn, the sister of my high school biology teacher, and Lois F. Henderson, botanist turned orchardist and back to botanist, who became my mentor and role model." Elsewhere, Constance has written that the elderly Henderson looked "remarkably like Santa Claus, white beard, rosy cheeks." He recalls that Henderson "was the recipient of all plants sent in for identification, and I was indulgently allowed to participate in this activity... Thus, I was already a part of the botanical establishment."

Because of this early experience, "It was preordained that when I entered [the University of Oregon] I should declare a Botany major..." In 1928, Henderson sent the 19-year-old Constance, to botanize in rugged Klamath and Lake Counties. Of the experience he wrote, "Despite the heat, the voracious mosquitoes, and the ominous rattlesnakes, it was distinctly a 'learning experience.'" When Henderson later published a new species of *Silene*, adding the words: "Collected by L. Constance, a student at the University of Oregon," Constance admits that he was, in his words, "irretrievably hooked."

Constance graduated from the UO in 1930 and entered Berkeley for graduate work under the legendary Willis Linn Jepson, completing his thesis on the genus *Eriophyllum* in 1934. During that time, he put his knowledge of the Oregon flora to good use when he worked several summers as a ranger-naturalist at Crater Lake National Park. Upon receipt of his advanced degree he accepted a three-year appointment at Washington State College in Pullman; however, he continued to visit his elderly mentor in Eugene when he traveled home to see his parents.

In 1940 Constance had what was undoubtedly his final meeting with Henderson when both attended a meeting of the American Association for the Advancement of Science in Seattle that June. At that time, Constance introduced Henderson to Jepson. The two men had corresponded for many years, but this was their first and only meeting. Henderson died two years later at the age of 89. Constance had returned to Berkeley in 1937 and remained there for the impressive career in botany and administration outlined

above. Jepson died in 1946 but not before appointing Constance a Trustee of the Jepson Herbarium. It has been reported by Bruce Baldwin that until close to the end of his life, Lincoln Constance, like Henderson, worked long hours in the Herbarium at least six days a week. It is universally agreed that he was both a scholar and a gentleman, words which have also been applied to his friend and role model, Louis F. Henderson of Oregon. ☞

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Errata: In our "Did you know" column in February it was erroneously stated that meadow knapweed was found at Linnton on the Columbia. The plant in question was black knapweed and Linnton is on the Willamette River. We apologize for the errors.

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### Thanks

Name \_\_\_\_\_

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\_\_\_\_\_

\_\_\_\_\_

Phone and/or e-mail \_\_\_\_\_

Mail to:

Scott Sundberg  
Oregon Flora Project  
Dept. of Botany & Plant Pathology  
Oregon State University  
2082 Cordley Hall  
Corvallis, OR 97331-2902

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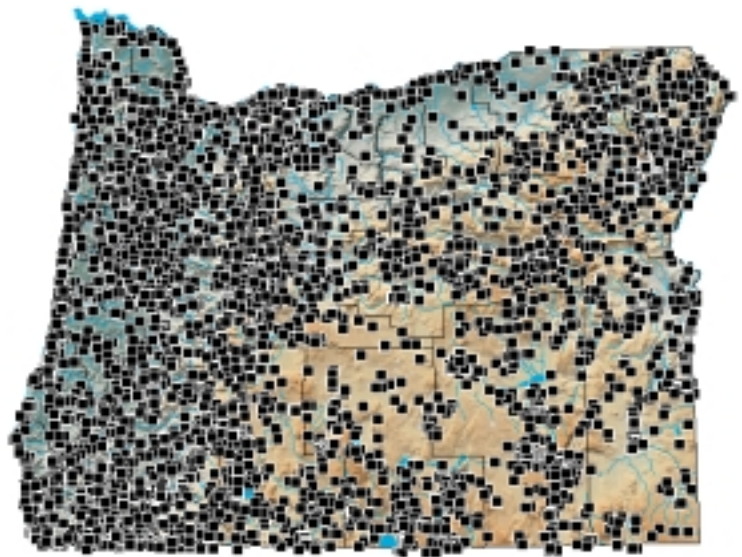
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### Did you know?

- Lincoln Constance was a naturalist at Crater Lake during the summers of 1931 and 1932 and published various "Nature Notes" about Park plants. There he had his first experience as a lecturer, addressing guests in front of the huge stone fireplace at Crater Lake Lodge. Sixty years later he recalled that as the fire grew hotter the tempo of his spiel accelerated!
- Constance was first introduced to the Park by Frederick Wynd (1904-1987), another Henderson student who worked there from 1925-1929. Wynd published a number of articles on the botany of the Park and later became an administrator at the University of Oregon. Wynd's papers have recently been acquired by the OSU Herbarium.
- Here is the Crater Lake website where readers can see all the "Nature Notes" written by Lincoln Constance when he worked at the National Park.

<http://www.nps.gov/crla/notes/nn-title.htm>



### Oregon specimens with locality coordinates.

*The OSU Herbarium database currently has complete label data from over 40,000 specimens. We have added mapping coordinates for 16,771 of these, as shown above.*