



MARIPOSA

the newsletter of the *CALOCHORTUS SOCIETY*

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C. luteus

Seed Available

We have wonderful choices this year, both garden-grown and wild-collected – and most in good quantity – including some “firsts.” Seeds were contributed by Diana Chapman of Arcata (and Telos Rare Bulbs – <rarebulbs@earthlink.net>); Nancy and Ames Gilbert of Grass Valley (and the Far West Bulb Farm – <www.californianativebulbs.com>); Bob Werra of Ukiah, CA, north of the Bay Area; Helen Means from Carlsbad, CA, just north of San Diego; and Nathan Miller of Newberg, OR, near Portland. Despite some fire problems, I too was able to collect a little seed. The *C. luteus* choices in particular come from a wide range of climates. The origin of each lot is given. Garden-grown seed is usually “tamer” and more likely to respond well to pot culture, while wild-collected seed offers more genetic diversity. The last column gives the approximate number of seeds available in each lot. Please send your “wish list” of the items you want, using the lot numbers shown. I will divide the seeds available among those requesting them, and will send you at least 12 seeds (and almost always more) of each lot you request – as long as supplies last! – with cultivation advice. Domestic members, please send a total of \$1 to cover mailing and packaging costs; Canadian and overseas members, a total of US\$3 for air mail shipping and packaging costs.

Lot #	Species	Source	Approximate # Available
1	<i>C. albus</i> “Sierra form”	Mariposa Co., 2000', collected by the Gilberts	> 500
2	<i>C. albus</i> form “rubellus”	Garden-grown by Nathan Miller in the Willamette Valley, OR	280
3	<i>C. amabilis</i>	Collected in Lake Co., CA, by the Gilberts, 2100'	> 500
4	<i>C. amabilis</i>	Collected in Mendocino Co., CA, by Bob Werra, 900'	> 500
5	<i>C. amoenus</i>	Garden-grown seed from Bob Werra, Mendocino Co., CA	> 500
6	<i>C. argillosus</i> northern form	Collected in San Mateo Co., CA, by the Gilberts, 800'	> 500
7	<i>C. bruneaunis</i>	First time in 8 yrs! Collected by Diana Chapman, Inyo Co., 7650'	> 500
8	<i>C. catalinae</i>	Garden-grown seed from Helen Means, north of San Diego	230
9	<i>C. clavatus</i>	From Bob Werra's garden, Mendocino Co., CA	150
10	<i>C. invenustus</i>	All-time first! Collected by Diana Chapman, Ventura Co., 8800'	480
11	<i>C. kennedyi</i>	Collected by Diana Chapman, Ventura Co., CA, 5300'	> 500
12	<i>C. luteus</i>	Garden-grown, from Helen Means, north of San Diego, CA	250
13	<i>C. luteus</i>	Collected in Yuba Co., CA, by the Gilberts, 1200'	> 500
14	<i>C. luteus</i>	From Nathan Miller's garden, Willamette Valley, OR	300

(More seeds listed on the next page)

Lot #	Species	Source	Approximate # Available
15	<i>C. monophyllus</i>	Collected by the Gilberts, Nevada Co., CA, 2700'	400
16	<i>C. monophyllus</i>	Garden-grown from Bob Werra, Mendocino Co., CA	125
17	<i>C. nudus</i>	Collected by me, Siskiyou Co., CA, 4000'	> 500
18	<i>C. obispoensis</i>	From Bob Werra's garden, Mendocino Co., CA, 1000'	400
19	<i>C. palmeri</i>	Another first! From Diana Chapman's North Coast, CA, garden	> 500
20	<i>C. plummerae</i>	Garden-grown from Bob Werra, Mendocino Co., CA	480
21	<i>C. splendens</i>	From Helen Means' garden, north of San Diego, CA	450
22	<i>C. subalpinus</i>	First time in 8 yrs! Collected by me, Mackenzie Pass, OR, 4700'	> 500
23	<i>C. superbus</i>	Collected by the Gilberts, Nevada Co., CA, 2300' - "beautiful with a hint of pink"	> 500
24	<i>C. syntrophus</i>	Collected by me, Shasta Co., CA, 1800'	240
25	<i>C. tolmiei</i>	Collected by the Gilberts, Butte Co., CA, 2650'	225
26	<i>C. umpquaensis</i>	Collected by me, Douglas Co., OR, 850'	240
27	<i>C. uniflorus</i>	From Bob Werra's garden, Mendocino Co., CA	180
28	<i>C. venustus</i> (white)	Garden-grown from Nathan Miller, Willamette Valley, OR	300
29	<i>C. venustus</i> (mixed colors)	Collected by the Gilberts, Fresno Co., CA, 4700'	> 500
30	<i>C. venustus</i> (red)	Collected by Diana Chapman, Kern Co., CA, 6300'	> 500
31	<i>C. vestae</i>	Collected by the Gilberts, Lake Co., CA, 1500'	> 500
32	<i>C. vestae</i> (colored)	Collected by the Gilberts, Mendocino Co., CA, 2050'	400
33	<i>C. weedii</i> var. <i>vestus</i>	Yet another first! Collected by me, Santa Barbara Co., CA, 1700'	> 500
34	<i>C. weedii</i> var. <i>weedii</i>	Garden-grown by Bob Werra, Mendocino Co., CA	200

Species of the Issue – *Calochortus leichtlinii*

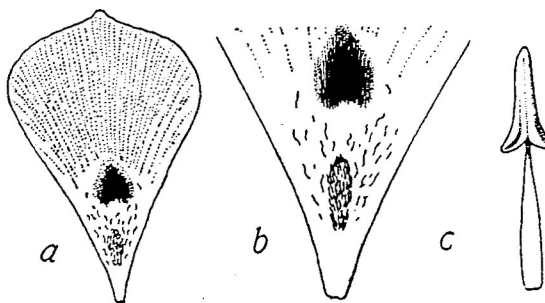
Background – Initially not recognized as a separate species, *C. leichtlinii* was first collected in 1855 at "Nobles Pass" in Lassen county (the historic access to Lassen National Park near the small town of Viola, along what is now the north entrance road up Manzanita Creek) by the eminent 19th century botanist Dr. John Torrey of Columbia College (now University) in New York. This collection was announced by Dr. Torrey and Asa Gray as "*C. nuttallii*" in 1856, in the *Report of the Pacific R.R. Survey 2* (a work cited in Ownbey's 1940 monograph as "Bot. Beckwith's Rept. p. 24"). Dr. Torrey again found this plant in 1865, at "High Mountain" north of Donner Pass in Sierra county. Although specimens from this collection were apparently provided to several herbaria. Vic Girard's unpublished writings indicate he was not successful in tracking down any publication of this second collection, under either species name. In June 1868, Alphonso Wood repeated the erroneous identification of the plant as "*C. nuttallii*" in the *Proceedings of the Academy of Natural Sciences of Philadelphia* (p. 12), citing Torrey's first collection as coming from "Noble's Pass" and quoting Torrey's description of the plant. [Interestingly, this erroneous identification as "*C. nuttallii*" continues today in some popular publications – e.g., Roger Phillips & Martyn Rix, *The Random House Book of Bulbs* (New York, 1989), p. 153: the referenced picture on p. 152 clearly is of *C. leichtlinii*.]

Calochortus leichtlinii –



Finally, in 1870, J. D. Hooker published the plant as *C. leichtlinii*, in the *Botanical Magazine* (Series III, No. 26, Tab. 5862). In 1874, J. B. Baker accepted *C. leichtlinii* as a separate species, in his enumeration of the *Calochortus* in *The Journal of the Linnean Society* (Vol. 14, p. 310), citing a collection by Roehl (undated) and referring to specimens at Leichtlin's herbarium and at the Kew herbarium of the Royal Horticultural Society (were these from Torrey's second collection? – I don't know). The cited specimens are apparently the closest thing to a "type specimen" for *C. leichtlinii*; Ownbey does not list a "type specimen" for it in his 1940 "A Monograph of the Genus *Calochortus*," in the *Annals of the Missouri Botanical Garden* (Vol. 27, No. 4). In 1900, in an article on *Calochortus* signed by Carl Purdy and L. H. Bailey, the *Cyclop. Hort.* (p. 635) listed *C. leichtlinii* as a separate species, adding: "by some regarded as a form of *C. nuttallii*." Purdy's own treatise on the entire genus ("A Revision of the Genus *Calochortus*," *Proceedings of the California Academy of Sciences. 3rd Ser. Botany*, Vol. II, No. 4, p. 149, 1901) also separated *C. leichtlinii* as distinct from *C. nuttallii*. Ownbey cites a 1908 publication by "Jones" as *C. nuttallii* var. *subalpinus*, appearing in *Contributions in Western Botany* (No. 12, p. 8), which I have not seen. But all other authors after 1870 called the plant *C. leichtlinii* and gave "first announcement" credit to Hooker, since the earlier publications had used an incorrect name.

Description – As noted above, Wood's 1868 listing, though labeled "*C. nuttallii*," quotes Torrey's 1856 description, which was clearly of *C. leichtlinii*: "petals...rounded at the summit, white except the yellow base, with an oblong dense tuft of hairs on the claw, a purple spot just above, and a few scattered hairs." Baker in 1874 characterized the flowers as "smoky white...and marked with dark brown," while Jepson's original *Manual of the Flowering Plants of California* (1925, p. 232) states: "...smoky blue outside, inside yellowish...with yellow base and a smoky blue or inky spot above the gland." The very detailed drawings of *C. leichtlinii* in Jepson's original *Manual* are reproduced here, slightly enlarged. Ownbey's 1940 "magnum opus" described the flowers as "white or smoke-colored, often tinged with pink or lavender, with a red to nearly black spot on each petal above the gland" (p. 477). Munz's 1959 *A California Flora* (p. 1351) says: "white to smoky-blue, often tinged pink, each petal with a red to dark spot above the gland."



C. leichtlinii, Illus. # 266, Jepson, *Manual...*(1925), p. 232

Jim and I were somewhat confused by these varying descriptions, and it took us several sightings to feel certain that the plants we were looking at were indeed *C. leichtlinii*. I find "white or smoke-colored" to be a pretty accurate portrayal of most of the flowers we saw, with the spot just above the gland (often but not always triangular in shape) seeming to vary from population to population, from a gray so dark it was almost black, to brownish-purple, to a deep cerulean blue-black. However, the golden-yellow claw was consistently present and provided a striking contrast to whatever colors appeared on the rest of the petal.

Other issues – There are interesting comments from two of the authors cited above. In 1900, Purdy noted: "There is another variety of this dwarfed alpine *Calochortus* also found in the Sierras, but the description of this form will be reserved until there is fuller material to draw from." However, neither Vic Girard nor I were able to locate any further discussion of this reported "variety," from any author. I cannot help wondering if Purdy may have been confused by the varying heights to be found among populations of *C. leichtlinii*. As a general rule, those at greater altitude tend to be rather short, with most of the flowers 8 inches or less above

the ground. Ownbey notes: "At high elevations, it is often nearly acaulescent [i.e., almost "stem-less"—*Ed.*], but under favorable conditions it is nearly as tall as any of its allies." Examples of this shorter form can be found in the Tuolumne Meadows area of Yosemite Park in Mariposa county; in the Kaiser Pass area of Fresno county; above Lake Alpine on Highway 4 in Alpine county; on Highway 88 near the Carson Pass area in Amador county; and a little west of Donner Summit along Soda Springs Road just south of I-80, in Placer county. All these locations are well above 7000 feet in altitude, some above 8000 feet. At lower elevations – for instance, along Big Creek Road above Huntington Lake, and continuing along Stump Springs Road in Fresno county (5200 to 6200 feet); along Mormon Emigrant Trail, between Highway 50 and Highway 88 in El Dorado county (about 6400 feet); along the road to Butte Meadows from Highway 32 in Butte county (about 4300 feet); and along Forest Service Road 60 above Little Grass Valley Reservoir in Plumas county (about 5200 feet) – we usually found the flowering plants to be 12 to 18 inches high – quite comparable with other mariposas.

The other comment of interest comes from Ownbey, the only author to address the early misidentification of *C. leichtlinii* as *C. nuttallii*. He writes: "*C. leichtlinii* is well separated from its allies by reason of its sagittate ["arrow-head-shaped"—*Ed.*] anthers and inflated seed-coats [i.e., "puffy"-looking seeds—*Ed.*]. In the petal markings, it approaches *C. nuttallii*, but is distinguished from that species by its lack of a gland-membrane, as well as by the anther character." It is not clear to me why he fails to discuss the difference in chromosome number between the two species, since that is so important to his scheme of sections and subsections within the genus *Calochortus*. *C. leichtlinii* is classified as a member of subsection VENUSTI, in which all species have chromosome counts based on the number 7; while *C. nuttallii* is placed in subsection NUTALLIANI, where chromosome counts are (largely) based on the number 8. Interestingly, in "Chromosomes of the California LILIACEAE," (*University of California Publications in Botany*, Vol. 57, 1970), Cave reports results from two different samples of *C. leichtlinii*, one of them diploid (2N=14) and the other "apparently tetraploid" (2N=28). Her work did not include *C. nuttallii*, which is not known to occur in California. Earlier, however, in 1939, J. M. Beal had reported that *C. nuttallii* was diploid (2N=16), in "Cytological Studies in Relation to the Classification of the Genus *Calochortus*" (*Botanical Gazette*, Vol. 100, pp. 528-47). Ownbey and Beal referred to Beal's results in their 1943 article, "Cytological Studies in Relation to...*Calochortus*. III," (*Botanical Gazette*, Vol. 104, pp. 553-62). Ownbey clearly had Beal's 1939 work "in hand" when writing his 1940 monograph, since he specifically cites it.

***C. leichtlinii* "on-line"** – In an Internet search, I found several websites featuring *C. leichtlinii* –

- < [elib.cs.berkeley.edu/cgi/img_query?...> – the "CalPhotos" section of the Berkeley Digital Library Project has at least 27 pictures from various sources of *C. leichtlinii*. One additional photo, however, in fact may be *C. syntrophus*; the colors and markings are more like the latter than the former.](http://elib.cs.berkeley.edu/cgi/img_query?...)
- < www.state.nv.us/nvnhp/images/calep169.jpg > – the Nevada Natural Heritage Program website offers a nice photo of *C. leichtlinii* by Gary Monroe; location not identified, but presumably in Nevada.
- < www.californiagardens.com > – provides a clear "face-up" photo by Martin Fletcher, with a brief discussion.
- < www.life.umd.edu/flower/1921b.jpeg > – there is a charming photo by James Reveal of *C. leichtlinii* at Leavitt Lake, Mono county, CA, with a bug (presumably a pollinator?) in it, at the website of the Texas A&M Bioinformatics Working Group.
- < www.renyswildflowers.com > – a barely opened *C. leichtlinii* from the Mono/Alpine county line, CA, on a privately sponsored website devoted to wildflowers.
- < www.calacademy.org/research/botany/wildflow/names/20223.htm > – succeeding close-ups of a single *C. leichtlinii*, with a brief discussion, at the website of the California Academy of Science.

Habitat and occurrence – As may be inferred from the wide array of altitudes and locations listed above, *C. leichtlinii* occupies a variety of habitats. Most often, in our experience, it can be found growing on open gravels and scree. But sometimes it appears in thinly wooded areas (as on Mormon Immigrant Trail); and sometimes it grows up through low mats of *Ceanothus* in open areas (Forest Service Road 60) or in thin woodlands (the road to Butte Meadows). Sometimes it shows up on bare dirt (Lake Alpine or Big Creek Road); and then again it may grow in open, thinly grassed locations (Stump Springs Road), or among thin grasses in thinly wooded areas (Kaiser Pass area). In short, it is apparently adapted to and tolerates a fairly wide diversity of circumstances.

Obviously, it also tolerates a variety of altitudes. The “new” *Jepson Manual* gives its range as 1300 to 4000 meters (4300 to 13,200 feet). I am in no position to dispute that upper limit, but I will dispute the lower one. Washington Road runs north of Highway 20 in Nevada county, down to the community of Washington on the South Fork of the Yuba River, descending from about 4200 feet to about 2500 feet in the process. In so doing, it passes through a large serpentine barren area, easily identifiable by its wealth of serpentine-loving plants, including bulbs. On this barren, we found *C. leichtlinii* in good numbers, blooming over a range from about 3400 to about 3700 feet. (We also found *C. monophyllus* in this same area, but blooming about 6 weeks earlier than the *C. leichtlinii*.)

Risks – *C. leichtlinii* enjoys little risk of extirpation at this time, at least in California. First, it ranges up to altitudes not very likely to be threatened by agriculture or animal husbandry, let alone by urban building. There is, of course, recreational development along major highways crossing its territory, such as I-80 – but even here, Jim and I found it still growing and blooming along Soda Springs Road, amid a well developed grid of cabins and chalets serving Norden, Boreal, Donner Ski Ranch, Sugar Bowl, and the Royal Gorge Cross-Country Ski Area. Obviously, if this area continues to increase in popularity, the *C. leichtlinii* may finally disappear from it. But this is just one site. Ownbey’s monograph provides a list of locations covering more than two pages – and that list does not include all the places where Jim and I found it. The only other possible source of risk might be logging, but logging of course does not happen above the tree line, and clearly it grows well above the tree line. In addition, while it does grow in thin woodlands sometimes, we found it more often in open areas.

C. leichtlinii is common enough in California that the California Native Plant Society’s *Inventory of Rare and Endangered Plants of California*, 6th ed. (2001) does not even consider it for listing. Were I pressed to assign it a CNPS “R-E-D” code, I would respond as follows: **Rarity** = 0 (not rare); **Endangerment** = 1 (“not endangered”); **Distribution** = 2 (“rare outside of California”). It extends into Nevada, but just barely, and that primarily in the Lake Tahoe area: the Nevada Natural Heritage Program has placed it on the Nevada “watch list,” classified as **S3** (“Rare and local throughout its range, or with very restricted range, or otherwise vulnerable to extinction” [i.e., in Nevada–*Ed.*]). Moreover, while conducting surveys for the Bureau of Land Management, Frank Callahan found a tiny population (16 plants) in southeastern Jackson county, Oregon, on the northeast slopes of Henry Mountain, just above 5900 feet [announced in Vol. XI, No. 2 (October 1999) of *Mariposa*]. Such a miniscule population is clearly at risk, and its formal Oregon status is in the process of being considered by the Oregon Natural Heritage Program.

Cultivation – Jim tried growing *C. leichtlinii* seeds collected from a number of locations, but found it quite impossible to sustain them in Sonoma county at 250 feet, 8 air miles from the ocean. He could get the seeds (especially those from elevations below 6000 feet) to germinate by stratifying them in a refrigerator: but the seedlings never reappeared for him in their second year. Diana Chapman’s efforts (as reported in Vol. XIII, No. 3) have been more successful. Those interested in trying *C. leichtlinii* would be well advised to review her recommendations closely.