



C. amabilis

MARIPOSA

the newsletter of the *CALOCHORTUS SOCIETY*

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Time for subscription renewals –

This is the last issue of Volume XIII (July 2001 through April 2002), and it's time to renew your subscription to *Mariposa*. Sadly, I find it necessary to raise the subscription price for the first time since Volume XI. Both printing and mailing costs have gone up several times in the past three years, increases so far absorbed without asking more from our readers. Now the U.S. Postal Service is warning us that postal costs are about to rise by another 10 percent. Please send your renewal to *Mariposa*, P. O. Box 1993, Brookings, OR 97415 USA. **If you already have credit for Volume XIV, this box will be checked.** → ☐

For all others, the new rates are given below.

Domestic Rate - \$10.00

Overseas Rate - US\$ 12.50

Species of the Issue – *Calochortus catalinae*

Background – *Calochortus catalinae* was first described by Sereno Watson, in the *Proceedings of the American Academy*, Vol. XIV (1879), p. 268, from plants collected in capsule on Santa Catalina Island. Seven years later, Watson announced "*Calochortus lyoni*" in Vol. XXI (1886) of the same Academy publication (p. 455), based on flowers collected at bloomtime in Los Angeles and Newhall by botanist Dr. Asa Gray and naturalist W. S. Lyon. According to Carl Purdy (in "A Revision of the Genus *Calochortus*," *Proceedings of the California Academy of Sciences*, Third Series: Botany, Vol. II, No. 4, published in 1901, p. 145), it was left to another botanist, a "Dr. Davidson of Los Angeles," to demonstrate that *C. catalinae* and *C. lyoni* were one and the same, in an article in *Erythea* (no date given). This is an example of the risks associated with trying to identify plants seen only in seed or only in flower. Purdy comments, "there is no doubt of [*C. lyoni*]'s identity with *C. catalinae*" – they were found in the same places; when in flower the petals were colored alike and bore identical markings; and perhaps most telling, both had the same capsule shape – one which is unique among the mariposas.

In his 1901 "Revision....," Purdy organized the *Calochortus* using an approach quite different from what since has become accepted – that used by Ownbey in his comprehensive 1940 monograph. Ownbey's method was based primarily on plant morphology – the most important factors being gland shape; capsule (erect or nodding, and overall shape); bulb coat (membrane-like or fiber-like); the presence or absence – and if present, location – of small bulbs or bulblets in the upper or lower leaf axils (where they are attached to the stems); leaf (single at the base or including smaller leaves along the stem, and persistent or withering at flowering time); the extent of "hairs" on the petal surfaces; and chromosome counts. He used these attributes to divide the *Calochortus* species into 12 subsections within his three major sections: EUCALOCHORTUS (now called Section CALOCHORTUS), MARIPOSA, and CYCLOBOTHRA.

Purdy's organization, on the other hand, proposed only two sections – EUCALOCHORTUS and MARIPOSA – and within the two, a total of 11 groups, as follows:

- Section EUCALOCHORTUS 1. Globe Tulips
2. Star Tulips [including the “catsears”]
- Section MARIPOSA 1. Oregon Mariposas
2. Rocky Mountain Mariposa
3. Weed's Mariposa
4. Golden Bowl Mariposas
5. [unnamed; it consisted of *C. kennedyi* and *C. aureus*]
6. Butterfly Tulips
7. Lilac Mariposas
8. Green Banded Mariposa [i.e., *C. macrocarpus*]
9. Sego Lilies

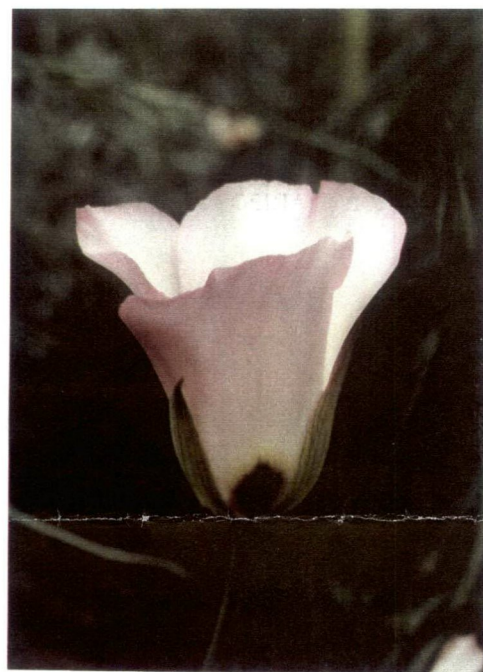
Thus geographic location (“Oregon”, “Rocky Mountain”) and flower color (“Golden Bowl”, “Lilac”, “Green Banded”) were important elements in his approach; although in his introductory remarks, Purdy seems to stress horticultural performance (p. 107): “I long since became convinced that it is only in the garden, where plants from different localities can be grown under identical conditions, that the relationship between apparently different forms can be satisfactorily determined.” All these elements – geographic location, flower color, and horticultural requirements – were largely ignored by Ownbey in constructing his own scheme, although color and geography were given weight where they might help distinguish among species, or to separate one variety or race from another within a species.

C. catalinae was classified as one of the “Lilac Mariposas” in Purdy's arrangement, as were *C. splendens*, *C. palmeri*, *C. invenustus*, *C. excavatus*, *C. flexuosus*, and *C. dunnii*. His description of the group was as follows: “Petals white, lilac, or purplish, not oculated [i.e., petals not marked with a spot surrounded by a zone of contrasting color—*Ed.*], more or less hairy; gland small, round, and densely hairy; leaves linear, channeled.” While not in obvious error, a modern taxonomist would find this assemblage made for a few “strange bedfellows,” in terms of chromosome counts – knowledge of which Purdy of course was entirely innocent. Ownbey, on the other hand, included *C. catalinae* in his subsection VENUSTI, the other members of which were *C. dunnii*, *C. flexuosus*, *C. leichtlinii*, *C. luteus*, *C. monanthus* (the apparently extinct mariposa from north of Mount Shasta), *C. palmeri*, *C. splendens*, *C. striatus*, *C. superbus*, *C. venustus*, and *C. vestae*. Several species not described until after Ownbey's work – *C. simulans*, *C. syntrophus*, and all three forms of *C. argillosus* – belong in this same subsection.

Description – Ownbey characterized the flowers of *C. catalinae* as follows: “...large, erect, white to lilac, usually with a purple spot at the base of each petal...and a similar spot on each sepal at the base...sepals shorter than the petals...petals naked except for a few slender hairs near the base...gland not depressed, densely covered with long, slender processes [“hairs”—*Ed.*]...” In his unpublished writings, Vic Girard provided useful additional comments –

C. catalinae is one of the least variable of the Mariposas. While in a stand of *C. venustus*, one has to look long and hard to find two flowers nearly identical, in a stand of *C. catalinae*, one has to look long and hard to find a flower that differs even in minor features from all the others. The only true distinctiveness to be noted is in the coloration of the petals: some flowers will have pure white interiors with purplish backs; others will be white with a slight purplish flush at the top margin; and still others will have various degrees of purplishness throughout the interior face of the petal, the darkest hues

Calochortus catalinae –



always appearing at the top margin. All flowers have an almost opalescent quality to the petals, reminiscent of slipper satin, and of considerable substance. ...Ownbey says that the flowers “usually” have a purple spot at the base of each petal. While I cannot state categorically that Ownbey was in error, I have never seen an example of *C. catalinae* in which this feature was lacking.

This last statement holds true for the plants Jim and I saw as well, although our encounters were limited geographically, to a few locations in the Santa Monica Mountains, the Santa Ynez Mountains, and Figueroa Mountain north of Santa Barbara. In a private communication, Frank Callahan reports similar experience with the uniformity of the flower, “varying slightly only in petal shading,” and he has seen other stands, for example at the Reagan Ranch near Santa Barbara, and at the base of the “Hollywood” sign in the Hollywood Hills. Frank believes this very uniformity of flower supports the idea that *C. catalinae* is a very old, stable species, quite unlike *C. venustus* or the northern and central forms of *C. argillosus*, whose variabilities suggest they are younger species, still in transition. I would welcome comments from readers on this issue of age and stability, or who have seen other, more disparate stands of *C. catalinae*.

The other point of interest is the shape of the capsule. Ownbey described it as “narrowly 3-winged” which, he stated, “connect[s] it directly with the section EUCALOCHORTUS,” while noting that *C. catalinae* “unquestionably belongs in the section MARIPOSA.” Here again, I can do no better than to quote Vic Girard –

Much has been made of the shape of the capsule, unique to the section MARIPOSA. ...[Ownbey’s] statement is misleading. The capsule is not “narrowly 3-winged”; it is, in cross section, nearly cylindrical, the three locules not at all *distinctly* [emphasis in original] set off. While all other members of section MARIPOSA have...the broadest portion at the base and gradually...[taper] to a very narrow beak...the capsule of *C. catalinae* tends to be very nearly cylindrical in its entire length, the top end of the capsule being rounded or even truncate. There is nothing about this particular plant to place it even remotely close to section EUCALOCHORTUS: its capsule is quite different in both outline and cross section; the seed is wafer-like and has epigeal germination.

The capsules of *C. catalinae* Jim and I saw and Frank saw always matched Vic’s description of them, rather than Ownbey’s. Further, the chromosome counts differ: $N = 10$ for EUCALOCHORTUS; $N = 7$ for MARIPOSA.

Distribution, habitat, and risks – *C. catalinae* is – or was – widely distributed on the southern California coast, from southern San Luis Obispo county near Pismo Beach, to San Diego county near Ramona; and on the islands of Santa Cruz, Santa Rosa, and Santa Catalina. It has also been reported more inland, in San Bernardino county near Upland and Chino. There has been some dispute about the reported San Bernardino county locations, but they apparently were confirmed more than once in the early 1900’s by several different people. However, none of the three most recent editions of the California Native Plant Society’s *Inventory of the Rare and Endangered Plants of California* includes San Bernardino county as a location. While we did not explore the area around Upland and Chino in depth, Jim and I certainly never saw it there. I can imagine two possible explanations: first, that it did exist there historically, but has disappeared under the pressure of development and habitat destruction; or second, that well-meaning but not well-informed explorers mistook other species for *C. catalinae*. That area offers (or offered) appropriate habitat for both *C. splendens* and *C. plummerae* – although *C. plummerae* would be even more difficult to confuse with *C. catalinae*, with the lower half of its petals bright golden yellow and very hairy and its very narrow, WEEDIANI-type capsules, than would *C. splendens*, with its MARIPOSA-type capsules. (Readers’ reports of inland locations would be welcomed.) *C. catalinae* is generally found on open slopes, either grassy or scrubby, and either well within the fog belt, or in north-facing areas, or both. Both the new *Jepson Manual* and the CNPS *Inventory* give its altitude range as “<700 meters” (2300 feet). Jim and I saw it blooming on the northern side of Figueroa Mountain at a little above 2000 feet; otherwise, the stands we saw were near or below 1000 feet.

Much of the area within the range of *C. catalinae* has, of course, been heavily developed, and it is safe to assume that there are now many fewer plants than there once were. CNPS's newly published 6th edition of its *Inventory* (2001) has placed this species on its "List 4" – ("Plants of Limited Distribution – a Watch List") with a "R-E-D" code of **Rarity** = 1 ("rare in California but found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time"); **Endangerment** = 2 ("fairly endangered in California"); **Distribution** = 3 ("endemic to California").

Cultivation – Jim got good germination from seeds of *C. catalinae* collected from several different locations, but found it challenging to grow them to blooming size. He did succeed in getting perhaps 5% or 10% of what he planted to blooming in 5 years. We speculated that, as a primarily Southern California coastal plant, *C. catalinae* was not entirely happy with being grown outdoors in Sonoma county, where we could count on about 20 nights of light to moderate frost each winter. Readers wanting to try it from seed would be well advised to take a look at Diana Chapman's suggestions in the last issue of *Mariposa*.

Recent Publicity for *Calochortus*

The genus *Calochortus* has enjoyed a recent spurt of publicity. Below are brief summaries of the three items which have come to my attention. (Readers are more than welcome to add their own comments for the **Readers Forum**, or write us about other instances of publicity.)

Herbertia – This is the annual journal of the International Bulb Society (IBS). The most recently published issue – Volume 55, dated 2000 – includes an article by Hugh P. McDonald (who has a PhD in Philosophy and who founded this newsletter). It is a formal revision of Section CYCLOBOTHR in a format designed to meet academic botanical literature requirements, including portions in Latin, although it omits the usual citations crediting the person who first announced each species. Hugh has constructed a key to all members of the section, covering the California natives *C. obispoensis*, *C. plummerae*, *C. tiburonensis*, and *C. weedii* (and vars.), as well as all of the Mexican species. He proposes the elevation of the plant that has been known as *C. weedii* var. *vestus* to full specific status as *Calochortus fimbriatus*. This plant was our "species of the issue" for Vol. XII, No. 2 (October 2000), and arguments supporting such an elevation were given there. However, Stan Farwig, Frank Callahan, and I all believe the name Hugh has chosen presents a problem, as the term "*fimbriatus*" is already in use within the genus – the appellation *C. coeruleus* var. *fimbriatus* for one of the catsears is widely accepted – and botanists generally prefer to avoid repetition of a name within a genus. The name *C. vestus* ordinarily would be preferred, since it links directly with the plant's chronological and botanical history. But there is potential for confusion with the mariposa *C. vestae*. In a private communication, Frank Callahan has suggested instead the name *C. sutus*, which carries much the same meaning in Latin as does *C. fimbriatus* (i.e., "fringed"), and I agree that this would be a better choice. As part of his article, Hugh has also reorganized the Mexican species within the section. Since I am not familiar with the Mexican species, I am unable to judge the value of his proposal. The article is accompanied by a brief bibliography (although the usual references for each species to the original author are omitted), as well as small color plates of 16 of the 22 named species and vars. Readers interested may reach IBS at P. O. Box 92136, Pasadena, CA 91109 USA – or on-line at <<http://www.bulbsociety.org>>. A one-year membership is \$40 in the U.S., or \$45 / \$50 outside the U.S. (surface / air), and includes a subscription to their semi-annual magazine "**Bulbs**" and participation in the annual seed exchange, as well as the annual "**Herbertia**."

NARGS – The North American Rock Garden Society has recently published a volume, "**Bulbs of North America**," intended to cover all native North American bulbs, including *Allium*, *Bloomeria*, *Brodiaea*, *Dichelostemma*, *Triteleia*, *Erythronium*, *Fritillaria*, and *Lilium*, as well as *Calochortus*. Some of these genera are currently undergoing revision, as a result of DNA and other analyses; but the book remains a very useful

general reference. The chapter on *Calochortus* was written by Frank Callahan and recognizes a total of 71 species and 15 varieties. While he follows the overall outline of Ownbey's treatment of the genus, Frank includes revisions made since 1940, such as modern nomenclature, recognition of "vars." since elevated to full species status, and inclusion of new species identified in the last sixty years. It is very "readable"; it contains no Latin and offers guidance to botanical terms such as "clavate" and "dendritic," with simple drawings. The descriptions of each species and variety are fairly brief but sufficient for field identifications; and attribution is given to the botanist or naturalist originally describing each plant. A generous bibliography is provided. Although only 19 of the species and varieties are depicted in color photographs, the quality of the pictures is outstanding. The Native Plant Society of Oregon has reviewed the book (in an article written by Ken Chambers of the Corvallis Chapter), quoted in part below:

As described in the forward by Brian Mathew, this multi-authored volume is "surprisingly, the first comprehensive work on the North American bulbs," in comparison, that is, with the many publications available on Mediterranean and Middle Eastern bulbous plants... In my opinion, the authors have, for the most part, handled their assignments very well. All are experts on their individual groups, with extensive field knowledge as well as experience in cultivating the species commercially or in home gardens. ... [T]he book aims at assisting growers and bulb fanciers to identify species they may have under cultivation, as well as describing the plants' native habitats and suggesting the conditions needed for successful cultivation. A very attractive feature is the section containing 55 pages of photographs – beautiful and often spectacular flower portraits, including 25 species of *Allium*, 19 species of *Calochortus*, 13 fritillaries, and 9 fawn-lilies. ... [This] book contains a great deal of useful information and should be a valuable source...both for gardeners and for professional horticulturalists.

The book is available from Timber Press (133 S.W. Second Avenue, Suite 450, Portland, OR 97204 USA; or 2 Station Road, Swavesey, Cambridge CB4 5QJ, U.K.; or via e-mail at <orders@timberpress.com>). The price is US\$ 34.95.

Better Homes and Gardens – Thanks to a correspondent I learned that the Spring 2002 issue of **BH&G**'s "Special Interest Publication" **Perennials** included an article on *Calochortus* written by Steve Junak, a botanist at the Santa Barbara Botanic Garden, entitled "Enchanting Elegance." The article provides good-to-excellent photographs of 15 species, some in extreme close-up which clearly show petal "hairs" or glands or sexual parts. The text is introductory, for the general reader, but provides some basic clues to cultivation, including identification of growing zones, suggestions for soil amendments, the advantages of pot cultivation and of cultivation from seed, and the need to keep many of the bulbs dry during dormancy. I found only one statement I would disagree with: "Most species...usually do not need...fertilizers." Maybe they don't need it; but Jim always found that all the *Calochortus* bulbs he grew successfully reached blooming size faster, and bloomed more frequently, when he routinely gave them half-strength feeding with a general fertilizer (such as Miracle-Gro®) every 2 to 3 weeks. Many of us have enjoyed the experience of seeing a *Calochortus* species respond to the "natural feeding" (primarily of potassium) which occurs after a serious fire – *C. obispoensis* and *C. clavatus* var. *clavatus* at Cuesta Ridge; or *C. superbus* at Round Mountain; or *C. clavatus* var. *avius* north of Highway 50 on Peavine Ridge – to name a few instances. (A similar "explosion" can occur in desert habitats, when there is a significant rainfall event after some years of drought – *C. excavatus* in the White Mountains is an example – although this has more to do with the ability of bulbs and other geophytes to slowly but surely build up reserves of nutrients during dry years, then take advantage of the rain when it finally comes, rather than with "feeding" per se.) I do not know the cost of this specific publication; but other **BH&G** "Special Publications" seem to be available for prices ranging from US\$5.00 to 7.00 (which covers postage and handling within the U.S.) from Special Interest Publishing Group of Meredith Corp., 1716 Locust Street, Des Moines, IA 50309-3023 USA; there is "an additional charge for postage" outside the U.S. They also can be ordered at 1-800-867-8628 with a credit card.