

MARIPOSA

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THE *CALOCHORTUS*
SOCIETY NEWSLETTER

JULY, 1995

ADVISORS:

C. BACCUS AND B. NESS

I. Announcements

1. As a result of the vote of the members, we are including our first color copies this issue. In accordance with the majority, the newsletter will contain one color page, and there will be a dues increase of \$4.00 per member per year to cover the costs of color copies. I hope that those who voted against color will remain with us but the vote was lopsidedly in favor of color. If your four dollar increase is not received in time for the third issue, i.e. by the end of December, we will presume you are dropping your subscription, and your name will be deleted from the membership rolls.

2. The rains on the Pacific Coast were phenomenal this year. Almost every part of the state got 200% of normal. This meant that the desert flora was particularly abundant, as good rains reached areas of the state which have been quite dry in recent years. *Calochortus kennedyi* was up almost everywhere, it seems. However, the rains seemed to be too much for certain species, at least in the wetter parts of their range. *C. venustus* was abundant in the Inner Coast Ranges, where rainfall totals are normally low, and where the abundant rains this year caused local flooding. However, it was less abundant in the central Sierra Nevada, one of the wettest parts of its range. It seems as if the rains were too abundant for it and it did not bloom well.

3. NEW SPECIES! When Mr. F. Callahan announced a new species from Northern California, I was sceptical at first. How could a plant right out in the open by a roadside been missed by all the botanists who have explored California? But, having seen the plant, I must admit that it is a new species. *Calochortus syntrophus* has been placed with the Venusti subsection, and has a lovely white flower with a yellow throat and a median red petal mark (see photo p. 5). It is intrinsically rare, being known from only one area of Shasta Co., Ca. Mr. Callahan's description of the species is in *Herbertia*, Vol. 49.

4. Members who wish to receive an informative newsletter which covers bulbs from all genera would do well to subscribe to *The Bulb Newsletter*, edited by Mr. and Mrs. Brian Mathew. Mr. Mathew is an expert on Irises and Crocuses, having written books on each of these. Their newsletter is an excellent resource for keeping up with new developments in the world of bulbs, and contains news on new species of bulbs, Bulb Societies, Seed Sources, Cultivation Notes, etc. Write to Mr. Mathew at 90 Foley Rd., Claygate, Esher, Surrey KT10 ONB, Unit. Kingdom.

II. Trips:

Pictures by Sunset, Camping by Moonlight, or 24 Calochorti in 9 days

[The third installment of Dr. Bob Werra's fascinating trip through "calo-space"--ed.]

Day 4--The next day we headed north toward the Canadian border in a light rain. We found the furry, white, open-faced *Calochortus apiculatus* in a dampened condition. It dotted the junction of the highway verge with the conifer forest [in northern Idaho]. From there, we headed west out of the rain into the hot and dry sage of western Washington state. We entered the forests west of Wenatchee and found the delicately marked, open cat's ear, *C. lyallii*, near an area to be ravaged by the Lake Chelan fire a month later. We picked up supper at a dell, and crossed much of the state of Washington before we bedded down at our usual 10-11 pm.

On day five we awoke to *Lilium columbianum* blooming at our campsite. It was a good omen for the four Calochortus species we found this day. First was the unexpected surprise of the pink, hairy-cupped

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C. longebarbatus blooming in a small, moist meadow in sight of Mt. Adams. Then we followed a fifty year old sight description which led us true to *C. subalpinus*. This fuzzy white-to-ivory, moderate sized, open-faced blossom was in open ponderosa forests in Klickitat Co., Washington. Then back to the freeways across most of Oregon to the sight of *C. umpquaensis*. This recently recognized *Calochortus* was past blooming but some large seed pods dotted the hillside above the road. [Continued next issue]

III. Horticultural Tests--20th Installment: Winter and Spring Germination

(This section reports the results of various trial growing tests conducted on *Calochortus* 2nd of two parts.)

This trial was to determine whether species could be planted out of season by growing one species from each section out of season. Records were kept of when each species germinated under normal conditions to determine both its optimum growth time and the preponderance of its growth period.

The results were that although spring (March) planted seed of California species germinated, they did not survive over the dormant summer period. All of the spring planted seed failed to re-emerge the following autumn. We can speculate, based on the results, that the shorter growing season in spring in coastal California was insufficient to allow the plants the necessary growth time to develop a first year bulb. The early spring heat sent the plants into early dormancy, and their growing period was too short. In their native habitat, which is at higher altitudes, they would have had a longer spring. Even if they germinated late, then, they might have survived.

The winter planted seed of the Mexican, summer growing species, *C. barbatus* did not all germinate, and what did soon perished.

If seed of *Calochortus* species is to be planted out of season, it should be given conditions like those in its native range for as long as possible. Thus planting winter growing species in spring requires cool conditions of growth, while planting summer growers in winter may require a heated greenhouse.

IV. The Horticultural History of *Calochorti*

[Fourth Installment of the article by Allen Chickering from 1938--ed.]

"I will next take up the group of which *C. weedii* is the head...This group differs from other Mariposas in that the bulbs of all of its members are covered with a coarse dark-colored fiber which extends up to or slightly above the surface of the soil. The petals of all of them are very hairy, and the stalk is heavy and persists for two or three years after drying up. Typical *C. weedii* occurs in Lower [Baja] California, where I have found it growing on rocky ridges at least 150 miles south of the international boundary...It is a large strong Mariposa, yellow in color and speckled inside of the petal with small dark dots, from each of which grows a hair. Its petals are sometimes edged with a brown...rim. It is very lovely in San Diego County and seems to be equally at home...on the coast and high up on [the] mountains, and in sandstone formation as well as in granite. Somewhere in...southern Orange Co...it gives way to a related form [var. "*intermedius*"-ed.] ...whitish with faint yellow edging...*C. plummerae* [is] lavender to pink in the upper part of the petal and yellow in the lower...altitude doesn't seem to bother any of the members of this group. Like...*C. weedii*, [*C. plummerae*] is a late bloomer. I have found June 20 to the early part of July to be the best time for both...

As we proceed north along the Coast of California and reach Ventura Co., we pass through the variation of *C. plummerae* from a light color to a pink or purple upper petal and reach what I term the 'Santa Barbara Co. form of *C. weedii* sometimes referred to as 'var. *vestus*'. This variety is even more hairy...and the sepals increased. It is an even later bloomer...The color is not fixed or firm. Its

foundation color is white blotched with pink, and yellow at the base of the petal inside. They have such a quantity of small hairs...that they gather at the tips something like the tufts of hairs at the tips of a lynx's ears...They...grow in the brush like the rest of [the Weediani]...and delight in burned areas. Proceeding north we next find... *C. obispoensis* In this...species the petals are almost gone and the sepals exaggerated. Their vestigial petals are simply hidden in brown hair, which, as the sepals are yellowish inside, makes a rather attractive looking flower, somewhat suggesting an orchid. This, as its name suggests, is found in San Luis Obispo Co.

All the members of this group are inclined to grow in brush...possibly [for] shade and protection from stock. They are readily grown from bulbs or seed, and do not mildew, but the soil should be loose and well drained, which means rocky, gravelly and sandy...While I have said that this group will grow well from seed, one must have great patience to do it, since the first bloom I got from planting some 1928 seed was six years after the seed was planted and the majority did not bloom until the next year. This particular seed was from the Santa Barbara Co. form and I have succeeded in getting a nice lot of blooming bulbs...I have had success with all members of this group, but my success with typical *C. weedii* has been less marked than with the others.

To summarize, I believe that this is a most satisfactory group and will repay the effort required to grow it, even to growing a little brush for it to come up through."

V. Conservation

Rare, threatened and endangered: reflections upon the categories of botanical scarcity. (Part three)

Rarity of habitat is not the only limiting factor on plant distribution. There are factors which are related to a specific species, rather than its environment, and may be termed botanical or biological limitations. Some species produce large numbers of non-viable seeds, e.g. the Coast Redwoods. Annual species produce more seed than bulb species, as they must reproduce themselves annually to survive. They may outcompete the bulbs, as they aggressively take over a habitat. Poison plants and plants with unpleasant odors, such as alliums, may be better able to keep predators away. None of these are environmental factors, for they are characteristics of the plant themselves. The quantity of a plant may reflect its biological ability to reproduce and compete, not the availability of habitat.

Another factor is endemism, that is the localized distribution of a plant, often for unknown reasons. *Calochortus weedii* does not grow north of southern Orange and Riverside Counties, while *C. albus* which grows near *C. weedii* in San Diego Co., gets as far north as San Francisco Bay. The chaparral and sandstone habitat of *C. weedii* continues along the coast for hundreds of miles, and the rainfall does not vary significantly to the north. Yet *C. weedii* does not grow in these areas. The reason for this is not clear, and there are other localized endemics whose scarcity or limitations in range are also unexplained in terms of habitat. [Continued next issue.]

VI. Species This Issue: *C. gunnisoni*

Genus *Calochortus* Key (composite based on the botanical literature of *Calochortus*)

I. Section *Calochortus*

II. Section *Mariposa*

A. Subsection *Venusti*

B. Subsection *Macrocarpi*

C. Subsection *Nuttalliani*

D. Subsection *Gunnisoniani* Bulbs ovoid with membrane coat; stems simple, rarely to often bulbiferous; leaves grooved; inflorescence subumbellate; flowers large, erect, obovate and usually rounded at apex; sepals shorter than petals; petals with ring of distally branched, gland tipped trichomes surrounding nectary; nectary depressed, oblong, surrounded with a discontinuous membrane; seed capsules three-angled, linear-oblong, with flattened seeds.

1. Stems often bearing offsets; petals with shorter nectary, often lunate or rounded; anthers

obtuse, often pinkish or maroon..... *C. ambiguus*

2. Stems rarely bearing offsets; petals with longer nectary, arched across petal; anthers acute to acuminate, often yellowish to cream colored..... *C. gunnisoni*

III. Section Cyclobothra

Calochortus gunnisoni, the Rocky Mountain Mariposa, was named for Gunnison, an explorer whose expedition was the first to gather the plant in 1853. The plant was known to the Native Americans of the region, who used the bulb as a food source and would spread the seeds of the species to increase the crop. It is often confused with *C. nuttallii*, but has a more eastern range and different coloration.

Range and Habitat: This is a very widespread species, growing from Montana and South Dakota south to Arizona and New Mexico, and covering both the Northern and Southern Rockies. *Calochortus gunnisoni* is a montane species, growing in open mountain meadows and grasslands, high altitude sage lands and occasionally in conifer woods. In altitude, the plants grow from 1200 meters and up, and have been gathered at above 3300 meters (10000 ft.). The range is clearly temperate, and the plant is among the hardiest in the genus, enduring -40°F or -40°C in parts of its range. *C. gunnisoni* grows in moderately wet habitat. Alone among the U.S. and Canadian species, it usually receives the majority of its water during the warm months.

Botany: The membrane-covered bulb, narrow, grooved leaves, upright flowers and narrow capsule of this species mark it as a Mariposa. The small sepals, band of gland-tipped hairs on the petals surrounding the transverse, depressed nectary mark it as within Ownbey's subsection *Gunnisoniani*. These hairs are yellow, and form a ring around the central part of the inner flower; under magnification they can be seen to be dripping with nectar. The subsection was named after this species, the first one of the two discovered.

Calochortus gunnisoni is distinguished from the one other species in this subsection, *C. ambiguus*, by range, the shape of the nectary, and the anthers. *C. gunnisoni* occupies a more northern and eastern range, and is much more widespread than *C. ambiguus*. Its range falls within a more temperate and wetter habitat, with generally colder winters, and more precipitation than the Arizona Mariposa. The nectary of Gunnison's Mariposa is wider than that of *C. ambiguus*, and is more consistently rounded at its ends. Finally, the anthers of *C. gunnisoni* are usually yellow or cream colored, while those of *C. ambiguus* are pinkish or maroon. In color, both species can be white, lavender, pink, bluish or purple, but *C. gunnisoni* has a yellow color form in New Mexico.

Although it is sometimes confused with *Calochortus nuttallii*, it was recognized as a distinct species almost from the time it was discovered. *C. ambiguus* was taken to be a variety of it up until Ownbey separated them in 1940.

Horticulture: I have gotten *C. gunnisoni* to flower in coastal California, but it was not easy. This species grows in a climate which is so radically different from our gentle California climate that it is not at home here, and suffers for being away from the icy, lofty habitat in which it evolved and in which it is fairly common. Even refrigeration over a nine month period is not quite like the winters of Colorado, where the species is centered. The plants are dormant for much of the year in their native range, as snows are early in the Rockies and melt late. The melting snows germinate the seeds and trigger the beginning of growth for the bulbs. The species flowers late, usually in July, and as late as August at higher altitudes. The seeds will not germinate without cold stratification, i.e. storage in a refrigerator at temperatures near freezing in a wet medium. It helps to place ice on top of the potting mix and have it slowly melt, simulating the snow melt of late spring. The seeds can also be placed in wet peat in a sealed plastic bag and cold stratified until germination. Once the seeds germinate, they will tolerate average water, one inch per week, but must be refrigerated again each winter for at least six months, and preferably more. Thus while this species is not suitable for growing in California, except with great devotion, it is well suited to temperate climate areas which receive good deal of winter snow: the northern and northeastern states of the U.S., for example, or the

provinces of Canada. It is known to be extremely hardy, and tolerates summer rains in its native range. It should probably be kept on the dry side during the later part of its growing cycle, and dried out during dormancy. Apart from these comments, it can be treated the same as other Calochorti, i.e. grown in UC Davis mix with bulb fertilizer, etc. In its native haunts, it grows in part shade, often with only the flower in sun, but at low altitudes even greater shade may prove necessary. I have no experience growing it in the ground, as the necessity for refrigeration in California precludes in-ground trials, but a species with such a wide range should prove adaptable, and the bulbs can probably be left in the ground in temperate areas if these do not receive too much rainfall. Taylor, in his *Guide to Bulbs*, remarks that this species is "the most satisfactory" in the East.

Photos by H.P. McDonald, except *C. gunnisoni*--color form by R. Weera.



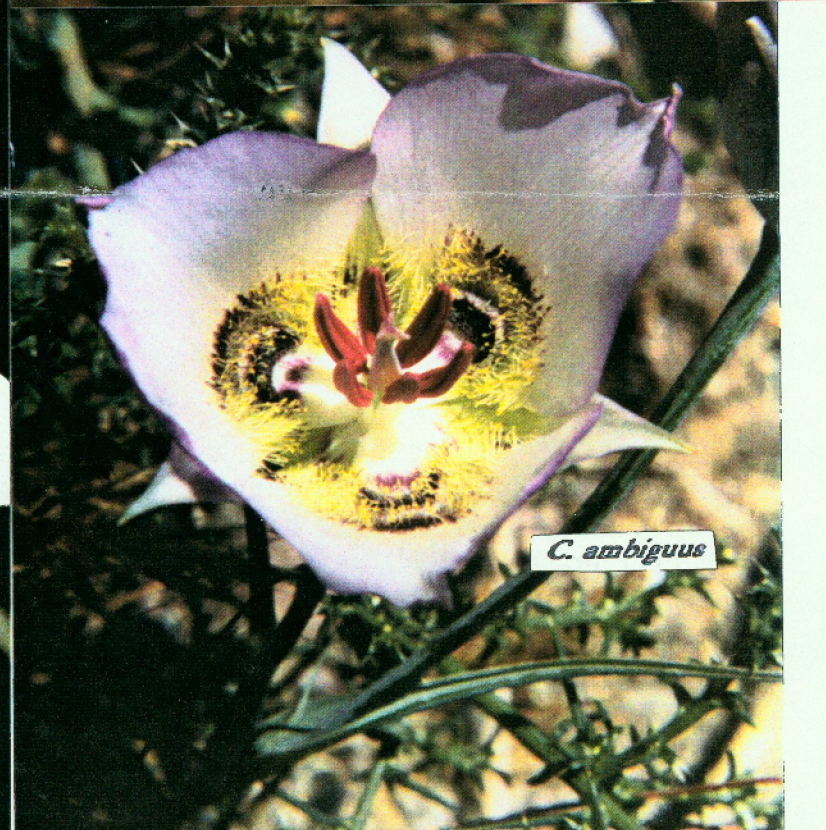
C. gunnisoni



C. syntropus



C. gunnisoni--color form



C. ambiguus