MARIPOSA
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MARIPOSA

THE CALOCHORTUS SOCIETY NEWSLETTER

JULY, 1991

ADVISORS: C. BACCUS, S. FARWIG, V. GIRARD, AND B. NESS

I. Announcements

What a great year for *Calochortus* trips this has been! The Mariposas have been particularly numerous and colorful. Karin and I have spotted some unusual specimens both last year and this, including some never before reported.

A.1. Last year, Karin called our attention to a light greenish-yellow pussy ear that was found in a field of *C. tolmiei* in the foothills of the Cascades. We determined that this was a hybrid cross between *C. tolmiei* and *C. monophyllus*. This year, we saw some of these crosses again, in a different location, and Jim and Georgie Robinett have seen them as well. Jim added that he has also seen what appears to be an all-white version of *C. tolmiei*.

2. In the San Jacinto Mountains of Riverside County, I spotted a cream-colored form of the species *C. concolor*. We checked the botanical literature, and no color forms of *C. concolor* are listed. To our knowledge, no others have been catalogued.

3. Karin spotted a new variety of *C. leichtlinii* in the southern Sierras. It keys out to *C. leichtlinii*, except for the absence of the dark purple spot above the gland, which is the more typical form. Your editor would like to name it *"Karinae"* after the spotter, but she demurs and insists it is more descriptive to call it *"C. leichtlinii var. sinepurpurei"*.

4. Ron Parsons, **ACS** member and avid photographer, was photographing a population of *C. striatus* when he came across a completely white specimen--one without lavendar or pink! It also was very hairy.

B. **VOLUNTEERS NEEDED!**

Anyone willing to keep a species for the Society as part of a seed exchange, please contact us at the above address. What would be required is to keep one flat of a particular species in isolation. Once we have the seed exchange volunteers, we can either publish them in a separate list or as part of a future newsletter. This way, members can help become part of a vital network to keep these species in cultivation, should their wild stands become further threatened.

C. Notes on *C. macrocarpus*:

Jim Robinett recommends bottom-watering of the pots, and has had some success. Last issue, I also forgot to mention that the mature (one year or older) *C. macrocarpus* bulbs can be kept dry in the refrigerator, or outside, dry, in the cold prior to watering in January. This will keep the plants dry during autumn rains in high rainfall areas. In high rainfall areas, only spring rains are needed to equal the total annual rainfall requirements of the plant. Fall rains are not necessary for the bulb to put out roots. As with tulips, the bulb itself can be cold-stored for six-eight weeks and then planted out.

II. Trips

All in all, it was a good year for Mariposas in general. We saw many species, and took many trips, although our *Calochortus* trips are sadly coming to an end. What lovely plants we've been privileged to see! One of the most beautiful species we've seen has been *Calochortus venustus*. *"Venustus"* is Latin for "beautiful," and the show it gave us this year more than hinted at the appropriateness of its name.

You'll probably remember from the January 1991 issue that this *Calochortus* has a U-shaped range, from the southern Sierras in the east of California, across the Tehachapi Mountains to the south, and then culminating in the southern Coastal Ranges to the west. (They obviously don't seem attracted to the Central Valley's heat!)

The trip itself was wonderful, as we rode through high mountains, studded with tall conifers and rocky outcrops, majestic in the clear California sunshine. As we rode, we saw lovely vistas of canyons, tranquil lakes, and the rise of nearby ranges. Even in late June and early July, we saw snow capping many a distant peak.

You may recall from that same issue that there are various reported color forms of this species: cream, yellow, pink, lavendar, purple, red, copper, and bicolor. Not only did we see gorgeous individuals in all these categories, but in a few more as well. In the brown family, we saw chocolates and mahoganies. In the purple family, we saw purple-reds, deep lavendars, and deep blue-purples with bright yellow nectar guides. The metallic colors we saw did include copper, but we also spotted light gold, antique gold (with dusty rose nectar guides--like lovely old antique slipcovers!), bronze, and a dark silver. The yellows we spotted ranged from a dark cream through a lemon yellow and on to one that was the color of butter. The reds showed up as garnets, burgundies, cherry-reds, and blood reds. There were even some orange ones this year! Here and there, we found a lovely red or purple picotee--a *venustus* of dark coloration, with a light color lightly surrounding each petal. Magnificent!

We couldn't take all of you with us on our trips, so we decided to write them up for you instead, hoping to at least share them in this manner.

III. Germination Tests--C. Baccus

[One of our eminent advisors, Mr. C. Baccus has been successful in growing Calochorti from seed for at least twenty years. Many of us who have more recently started our *Calochortus* gardens could not have begun without him--his seeds, bulbs, and generously offered advice. Readers **are** advised that some seed will germinate at later times than others in the same batch, up to one year later, even in the presence of moisture. There does seem to be a genetic proclivity of *Calochortus* seedlings never to germinate all at once, but rather some in one year and some in the next. This may aid survival in circumstances where it may not be wet enough for the seeds to survive in the first year.--**Ed.**]

Data includes representatives from each section, although not all species are used:

Species	**Cold Stratification[1]**	**Planted**	**Emerged**	**Days**
A. Section *Calochortus*				
1. Fairy Lanterns:				
C. amoenus	[not needed]	12/89	2/21/90	60
C. raichei	[not needed]	1/18/9	03/29/90	60
2. Pussy Ears:				
C. apiculatus	12/10/89-2/16/90	2/16/90	3/7/90	36 + 20
C. elegans	12/10/90-2/16/90	2/16/90	----	36
C. lyallii	12/15/90-2/7/90	2/7/90	2/24/90	50 + 20
C. monophyllus	[not needed]	1/18/90	2/25/90	35
C. subalpinus	1/15/90-3/18/90	3/18/90	4/9/90	60 + 20
C. tolmiei	[not needed]	12/89	3/10 +3/15/90	85
3. Star Tulips:				
C. nudus	[not needed]		---	
4. *Nitidi:*				
C. eurycarpus	12/10/89-2/6/90	2/6/90	6/7/90	56

Species	Cold Stratification[1]	Planted	Emerged	Days
4. *Nitidi* (continued):				
C. eurycarpus	1/15/90-4/4/90	4/4/90	---	75
C. greenei	12/10/90-1/4/90	1/4/90	1/28/90	35 + 24
C. howellii	12/9/89-1/29/90	1/29/90	3/1/90	50 + 20
C. persistens	1/30/90-3/7/90	3/7/90	5/90	21 + 30
5. Miscellaneous:				
C. tiburonensis	[not needed]	12/23/89	---	

[We will include Sections *Mariposa* and *Cyclobothra* in the next issue.--**Ed.**]

1. **Cold Stratification means refrigeration under moist conditions. This treatment is not needed in temperate climates.**

V. Horticultural History of *Calochortus*-7th Installment

Rockwell, F.F.: **The Book of Bulbs**, N.Y.: Macmillan, 1927. This is the third segment from this extensive article.

"*Burying Bulbs Out of Doors to Develop Root Growth* So far as the development of the roots is concerned, the simplest method of burying would be merely to dig a hole or trench in some well-drained place, and cover the bulbs in with four or five inches of soil; but convenience is also to be considered. Where a very considerable number of containers have been prepared, and where it is planned to "bring them in" at intervals during fall and winter, this matter of being able to get at them quickly and handily is very important...My own preference is to fill in and around the containers, and to cover them about half an inch above the pots with peat, which is made thoroughly moist after being put in place; then put on four or five inches of coal ashes over this. A dollar's worth of peat will cover a considerable number of bowls and pots, and is, of course, just as good as ever for soil improvement after it has served this purpose. Where peat is not available, leafmold may be used. In addition to being cleaner and more convenient in taking the bulbs out, the peat has also the extra advantage of holding a greater reserve supply of moisture.

If a well-drained, empty frame is available for burying the bulbs, no better place need be sought. If not, they can be put in a trench about ten inches deep, with a two-inch layer of cinders in the bottom, to insure perfect drainage, or in a narrow bed made for the purpose against the shady side of a wall. This bed need only be a foot to two feet in width, and may either be made directly on the surface, or dug out a few inches deep, the outer edge being formed by a board held in position by small, neat stakes. A bed so located will be protected from the sun when the bulbs are buried in the fall, and will usually be convenient to get at any time during the winter...

A small but important detail which is often overlooked in most of the articles and books on this subject...is this: label each pot as you plant it.

Bringing in from the Rooting Bed How long can the bulbs be left before they can be brought in?...as a general rule, it is best to give...six weeks, and still better...eight weeks. Where one is in a hurry, a sample pot or pan may be examined at the end of four weeks..."

V. Conservation: *Calochortus Plummerae*

Last year, your editor became concerned over the plight of *C. plummerae*, since it seemed not to be

abundant at all, and it appeared to be in the path of development as well. This year, Karin and I twice went to southern California to seek out more of the stands. In addition to the historical stands, we visited documented newer stands. What we found was not encouraging at all. Many stands at lower altitudes seemed to have been eradicated by development. Where we did find a stand, it often had few individuals. One stand had a solitary plant, despite our having looked intensely for others.

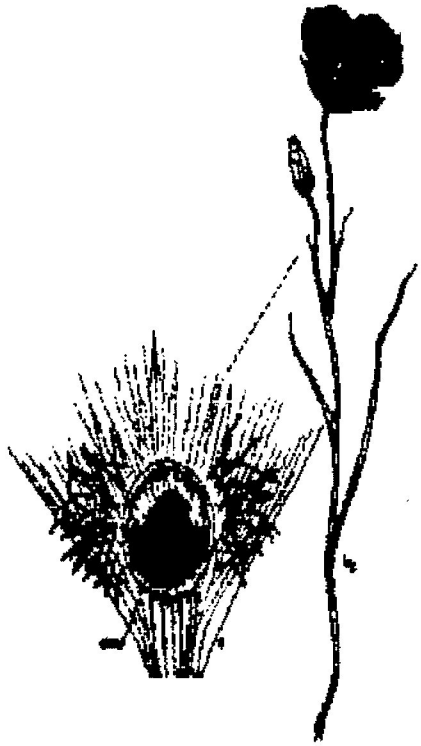
We shared our concern over this species with our advisors Stan Farwig and Vic Girard, as well as Mr. Geoff Burleigh of southern California. All told, it seems that there are less than a thousand plants left remaining in the wild, at a liberal estimate. It seems to us that this qualifies *C. plummerae* for the **CNPS** "Watch List." We'll be sending out our report to them as this issue gets published. Please take a moment to write them of your concern for this plant, and ask that they investigate the matter further.

The address is: **Dr. Mark Skinner, CNPS Botanist, Data Base, 909 Twelfth St. Suite 116, Sacramento, Ca. 95814.**

VI. Species This Issue: *Calochortus kennedyi*

Range: A large area of the southwest from southern California east to Texas, and from southern Nevada and northern Arizona to just over the border in Sonora Mexico.

Botany: The brilliant desert Mariposa, *C. kennedyi*, is the first of the sego lily types we will cover in this newsletter. Like the *venustus*, it is distinguished from section *Calochortus* by its groved leaves, narrower seed pods, larger and flatter seeds, and its chromosome count. From section *Cyclobothra* it is distinguished by its bulb coat, leaves, and chromosome count. The sego types differ from the other Mariposas in chromosome count as well, with a haploid count of 8. Their glands or nectaries are generally more "depressed," which means that there is a sunken reservoir of nectar which sticks out from the petal back. Their leaves, stem, and capsules are more usually gray-green, rather than medium green. The seed capsules are often larger than those of other Mariposas. Finally, the segos have a membrane surrounding the nectary, which is more apparent under magnification.



Calochortus kennedyi

adapted by K. Stokkink from

Intermountain Flora by Cronquist, Holmgren, **et. al.**, Vol. #6; NY: NY Bot. Gdn./ Columbia Univ. Press, 1977.

While botanists such as Watson, Abrams, Jepson and Ownbey agree in the fairly clear cut characters separating the segos from other sections and subsections, differences within the segos are more difficult to determine. *C. kennedyi* is distinguished from the other segos (*Nuttallianii*) in habitat, color, range, markings, and other features. From *C. nuttallii* it is distinguished by its more southerly range, drier habitat, color, and the lack of a contrasting band of color above the nectary area of the petal. Also, its gland is circular, not oval.

while its stem is usually unbranched, and only rarely carries offset bulbs. From *C. aureus* it differs in chromosome count (*C. aureus* is tetraploid), color and range. From *C. invenustus* it differs in range, habitat, color, and the frequent lack of offsets. The same traits distinguish it from the wet meadow grower from eastern California, *C. excavatus*, although the latter looks like a white form of *C. kennedyi*. *C. concolor* differs in range, habitat (somewhat higher and more southwesterly) and in the presence of more hairs on the petal, and, sometimes more markings. Finally, *C. clavatus* is distinguished by its range, bulbifery, and clavate hairs on the petals.

C. kennedyi is a lovely vermillion in S. California, orange in SE California into W Arizona and yellow from SE California into Arizona. The ranges of the color forms overlap in the middle, and intermediate color forms, such as apricot are encountered. There are few sights more breathtaking than to see a large stand of mixed color forms rising above the surrounding desert vegetation. The flowers are funnel- to upright bell-shaped, some with rounded and some with pointed petals. There is also a large dark spot at the base of the petals which surrounds the nectaries. The flowers close at night.

History: *Calochortus kennedyi* was named by Porter in 1877.

The yellow form was discovered by Jepson in the 1920's. It is considered only a color form, as it occurs with the other color forms in SE California, and has no other distinguishing features which could be a basis for varietal status.

Horticulture: By many accounts, published and not, this is one of the hardest species to grow. It is not, however, impossible; Mr. C. Baccus has grown it for years. If its native conditions are kept in mind it will prove a challenge with a rewarding outcome, for it is a lovely species. The plant receives less than 15" (40cm.) of rain per year. The problems encountered in growing this plant are almost never the result of lack of water, but, on the contrary, too much water. This is a hard lesson to learn for horticulturalists like myself, who instinctively think of water as good for plants. Water is good, but it depends on how much. In the case of *C. kennedyi*, it is very little. The 15" or less averaged out over its growing season of ±26 weeks works out to about 1/2" per week. In the desert, however, rain, when it comes, tends to arrive in torrents. Thus it is better to thoroughly soak the plant with about one inch (2.5cm.) of water and then resist the urge to water it for two weeks (or even more in humid or overcast areas with lower evaporation rates: in the desert the bright sunlight, high winds, and dry conditions increase evaporation). Bottom watering (see sect I on *C. macrocarpus*) may also be advised as the desert plants may not like water on their foliage.

Another thing to keep in mind is that *C. kennedyi* does not really like heat. Deserts conjure up pictures of the Sahara in August with sand ergs, flies and searing temperatures. However, *C. kennedyi* grows at middle to high elevations, and is in flower long before the stifling heat of summer. A late winter or spring grower, it prefers cool or slightly warm temperatures. Indeed, the high altitude strains from California and Arizona may require cold stratification in warm climates, particualrly the yellow form. I have seen stands at 7000' (about 2300 meters) which must tolerate 0°F (-15°C) with little snow cover. Thus the altitude at which the plant was collected is important in determining whether the plant needs cold stratification or not. Greenhouse conditions are **not** advised.

In the wild, the plant likes to bury itself deeply, especially in dry areas where water tables may be low, or hot areas where a thick soil layer may insulate the bulb through the heat of summer, when it is dormant. Thus a deep pot is advised, of at least 1 and 1/2 feet (about 1/2 meter). U.C. Davis mix (1/2 sand, 1/2 spmoss) works, but a somewhat sandier or grittier mix may be advised in wet or humid areas. Fertilizer is o.k. The seeds should be buried 1/4" (7mm), watered weekly until germination and then watered bimonthly until dormancy. They flower April-June.

While very occasional watering may be tolerated in summer, complete drying out is advised from May-November. Actually, the plant is one of the most trouble-free, since it will survive on nothing but rainfall in even the driest areas of California. The plant may be grown as a spring grower in high rainfall areas (*cf.* **I, C**). Water only from January on to dormancy, keeping the plant cool.