

**MARIPOSA**

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PUBL. QUARTERLYEDITORIAL ADDRESS:  
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BERKELEY, CA 94701-1128**MARIPOSA**THE *CALOCHORTUS*  
SOCIETY NEWSLETTER

JULY, 1994

ADVISORS:  
C. BACCUS  
AND  
B. NESS**I. Announcements**

1. Member Peter Asco, who has taken outstanding photos of some of the southern California wildflowers, has produced T-shirts and postcards on which the flowers have been carefully printed. One of these is a stunning reproduction of *Calochortus clavatus*, beautifully reprinted on both the cards and the T-shirts. Also available are the flowers of the hedgehog cactus and the Leopard Lily. The attention to detail on these items is meticulous, and the finished product is of excellent quality. Interested members may order through Mr. Asco at Flora Power, P.O. Box 64576, L.A., Ca., 90064. Highly recommended!

2. ANOTHER SPECIES? Many botanists have divided *Calochortus splendens*, the splendid Mariposa, into two or even more species. One of these has a strong claim to specific status, as it is consistently distinct in several respects from *C. splendens*. The variety was called *Calochortus davidsonianus* by Prof. L. Abrams; and this nomenclature will be followed here. This plant differs from *C. splendens* in its less hairy petals, with shorter hairs, grouped mainly around the nectary; its shorter habit; its more southern range and generally grassy rather than chaparral habitat; and in its genetic chromosome number. This was determined by the late Prof. M. Ownbey and his collaborator, Prof. Beal to be fourteen, rather than the usual number for the subsection *Venusti*, seven (1943). It is probable, then, that *C. davidsonianus* is a tetraploid, while *C. splendens* is known to be a diploid.

3. Another type of association in *Calochortus* is hill and meadow associates. Two of the wet-dry pairings mentioned last issue are also hill-meadow associates, while the other two often are. In this type of pairing, one species favors growing on slopes of hills or mountains, while the other prefers flatter meadows. For example, one dry species discussed last issue, *C. kennedyi* is generally found on slopes, while the associated wet grower, *C. striatus*, is generally found in flatlands. However, there are other species which are both wet growers, but which occupy different habitats in the same area. For example, *C. amabilis* and *C. uniflorus* both occur in wet Northwest California, and often grow nearby one another, but the former grows on hillsides, while *C. uniflorus* prefers flatter meadows. Again, *C. umbellatus* and *C. uniflorus*, which are closely related species in the same section, are hill and meadow associates. In Southern California, there are dry growers which are paired for hill and flat habitats. Even within a species, the plants may occupy slopes in the wetter part of their range, generally to the north and west; but flat areas in the drier south. Examples are provided by *C. superbus* and *C. venustus*, which generally grow on slopes in the north of their range, but in flatter areas to the south.

**II. Trips: Gathering Seed**

For those of you who may never have been to the San Francisco Bay Area, let me give you a very brief idea of where we gathered the seed. We live in the east side of San Francisco Bay or the East Bay. The Diablo Range is just east of us with its majestic mountains topped by Mt. Diablo to the north and Mount Hamilton further south. Mt. Hamilton is the home of the Lick Astronomical Observatory, associated with the University of California. On a recent trip we went into the Diablo Range to collect

seed. At one high spot, we had a lovely view of San Jose on one side and the East Bay cities along the way on the other. Further down in elevation, it seems as though time has stood still, for there are few houses, and ranching is still a way of life.

This was the general area in which we gathered the seed. We looked high and low, because we had specific criteria for gathering. First of all, we needed to gather the seed from healthy stands with many thriving individual plants. In order to ensure that the stand would remain healthy, we only took about ten percent of the seed of a large stand. We also wanted only a specific kind of plant. Therefore, ideally, we would find plants with one or two seed capsules and at least one flower still in bloom. This way, we could tell if we had the right kind as we gathered the seed.

While it was sometimes difficult to keep to the criteria, we were rewarded in several ways. First of all, we were lucky enough to see a lot of beautiful *Calochorti*. Further, we saw lovely vistas from the higher elevations, and interesting dry habitats, with their alkali deposits and sagebrush associates. The diversity of habitats in these mountains was quite something: oak and conifer woodlands, chapparal, rocky outcrops, bunch-grass slopes, riparian areas, serpentine "barrens" and mountain meadows.

At one place, we gathered seed of *C. luteus* for a member in Sunol, California. This gentleman had written us that he had once seen a stand of *C. luteus* near his home, but that it was now gone. As Hugh reported in an earlier issue, one of the advisors had suggested re-seeding places where *Calochorti* once stood, but which might have been diminished or destroyed. Our friend had been willing to do just that, so we collected a bit of *C. luteus* seed for him, as this stand was in the same general area, and would probably do well near his home.

### III. Germination Tests--16th Installment: Potting Media

[Second half of the media trials. Part of a continuing series on various growing trials conducted with *Calochorti* to gather evidence on optimum growing conditions.]

In presenting the outcomes of the media trials, it should be noted that the results obtained are only evidence, not proof. It may well be that other factors influenced the outcomes, and that if the species are grown under radically different conditions, e.g. less watering, greater rainfall, hotter or colder temperatures, etc., that the outcomes for other media would be more favorable. Further, the results are generalizations. Not only did individual species do better in different, contrasting mixes; in some cases the outcomes were ambiguous or inconclusive. Nevertheless, the results for the species in sections *Calochortus* and *Mariposa* were surprisingly alike, and less formal testing with other species from these sections have largely corresponded with the results of the media tests.

The outcome of testing the various media was that the best mix has proven to be the U.C. Davis mix, consisting in one-half sphagnum peat moss and one-half sand (by volume). Although UC Davis recommends that it be used with fertilizer, it has proven best even without fertilizer. The mix has proven superior for a wide range of species. The exceptions were that:

- (1) *C. weedii* did best in the UC Davis soilless.
- (2) *C. macrocarpus* did best in modified sand (two-thirds sand, one-sixth clay soil, one-sixth sphagnum peat moss).
- (3) *C. barbatus* and *C. venustus* and the Mexicans generally do better in the modified UC Davis mix, i.e. with one-eighth lava substituted for the same amount of sand.

The second best mix was UC Davis soilless, which was better for some species. Surprisingly, the pure sand came in third, even for relatively wet growers like *C. tolmiei* and *C. uniflorus*. The heavily organic mix did poorly, although the watering schedule was not that for which this mix was formulated. The modified sand did worst of all, except in the case of *C. macrocarpus*, which grew best in it. The mixes utilizing commercial potting mixes did poorly. The mixes with lime all did poorly, which is perhaps strange, considering that *Calochorti* often grow in alkali soils (lime tends to "sweeten" or



reduce the acidity of soils. Thus it is an alkalizing agent).

The sand substitution test conducted with *C. albus* and *C. venustus* in which other gritty, inert materials were substituted for sand in the UC Davis mix, resulted in good yields. This is evidence that the peat is the more important element in the mix as both lava rock and green fines (ultramafic rock) proved to be about equal to the sand in combination with peat with respect to yield. The other mixes with lava rock did poorly except the modified UC Davis with the Mexicans (see #3 above). These gritty materials provide drainage; apparently one inert material may be as good as the next.

The best overall mix, then is the UC Davis mix. All species will grow in it if proper amounts of water are applied. It is this mix that is recommended for pot culture. However, red lava rock should be substituted for one-quarter of the sand in the UC Davis mix when growing the Mexican species (one-eighth of the overall mix as sand constitutes half of the mix).

#### IV. The Horticultural History of *Calochortus*

[Faced with a rather elaborate *Calochortus* key (see Species This Issue), as well as a lengthy horticultural piece by Chickering that defies editing, we opted to hold off on this section until our next issue. Thanks for your patience.--Ed.]

#### V. Conservation--Letter from Tim Walker

"...Concerning your endangered species, I don't think *Calochortus hartwegii* is in that category at all. We have personally found it in a variety of locations and even at the edge of sugar cane fields, almost invasive in grassy clearings. But it also grows in the woods...We've been going to Mexico since the early sixties and have hiked many miles in those hills, and the more hiking you do, the less endangered you realize those species are, and considering all the forested mountains there are around those parts, I would say it's not at all endangered. The same is true of *Calochortus fuscus*, which is extremely abundant in Jalisco. The other Mexican species I'm not familiar with, but the main thing to consider in Mexico is the magnitude of the roadless wilderness in those mountains. You just can't say something is endangered without knowing the facts. One of the reasons there are so few records for *Calochortus* in Mexico is that unless you're there in September you won't see them, and by September most of the American botanists are back at the university to teach, whereas the June, July and August flowers are well documented. Nor do I ever equate bulb collecting with responsible seed collecting. They're as different as night and day, because responsible seed collecting will have zero impact on a plant community. If I feel that something is endangered, I won't have it in the catalogue, which is the case with *Tigridia venusta*, which I personally consider to be endangered, although I've never seen any official mention of the fact, and we dropped it from the catalogue many years ago. Another is *Rigidella flammea*, which I won't collect." [I hope Mr. Walker is right about *C. hartwegii*, which has been eliminated from some of its range in Nayarit by corn production. As he states, there is much unexplored wilderness in the nearby mountains, and *C. hartwegii* has a wide range.-ed]

#### VI. Species this Issue: *Calochortus Palmerae*

[As the key for the Venusti is so lengthy, the treatment of this species will be spread out over two issues.--Ed.]

#### Genus *Calochortus* Key:

##### A. Section *Calochortus*

##### B. Section *Mariposa*

- 1 Subsection Venusti-medium to tall habit, usually bulbiferous with narrow, grooved, linear leaves; erect campanulate flowers; nectaries not depressed, and not surrounded

by a membrane; erect capsules with flat, ovoid, straw-colored seed; basic chromosome number usually seven.

a. Flowers "subumbelate" (Ownbey) and often elaborately marked

i. Habit short to tall, usually not bulbiferous, petals white with purple to pink striations nectary oblong and covered with long hair-like processes, habitat in alkali meadows

..... *C. striatus*

(ii. Habit tall, bulbiferous, petals white or pink, not striate, with a dark red spot above the nectary, nectary oblong and covered with long hair-like processes, may be extinct

..... *C. monanthus*)

iii. Habit short to tall, bulbiferous, petals usually white, not striate, usually with a dark, often black spot above the nectary, nectary triangular and covered with short yellow hairs, anthers sagittate..... *C. leichtlinii*

iv. Tall habit, bulbiferous, petals extremely variable in color, often with contrasting colors on front and back, elaborately marked with spots and kaleidoscopic markings, and often with a red spot at mid petal, nectary quadrate and covered with short hairs..... *C. venustus*

v. Medium to tall habit, bulbiferous; petals variable in color, often with contrasting colors on front and back, elaborately marked and often with a large brown spot at mid-petal, banded with yellow; nectary V-shaped and covered with short hairs

..... *C. superbus*

vi. Medium to tall habit, bulbiferous; petals usually yellow, sometimes white [but this may be hybrids with *C. superbus*-Ed.], less elaborately marked with brown lines, some with brown spot at mid-petals, especially in the northern and eastern part of its range; nectary lunate and covered with short yellow processes..... *C. luteus*

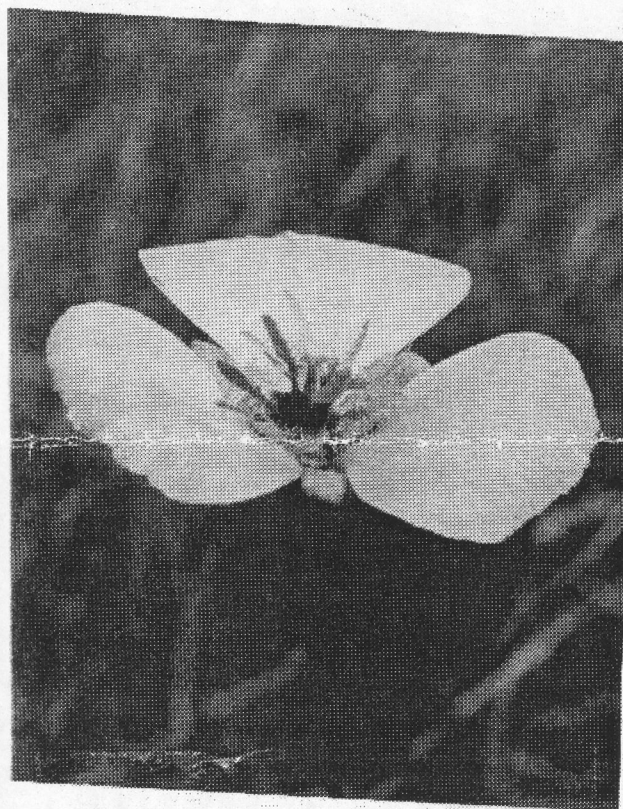
vii. Medium to tall habit, very bulbiferous; petals variable in color, from white to purple, often with contrasting colors on front and back, elaborately marked, some with lavender spots at mid-petal; nectary lunate to rectangular, variable, covered with short processes..... *C. argillosus*

α Short habit, petals less elaborately marked, but with red markings at base, otherwise as in the species

..... var. *hooverii*

[undescribed new variety]

viii. Tall habit, very bulbiferous; petals variable in color, usually white, often with a contrasting color on the back, elaborately marked, some with a large brown spot at mid-petal; nectary doubly lunate or M-shaped and covered with short processes; genetic tetraploid..... *C. vestae*





b. Inflorescences "distinctly monochasial" (Ownbey) and the petals often less elaborately marked.

ix. Tall habit, bulbiferous; petals usually white or lavender, often with a contrasting color on the back, and a large dark spot at the inner base around the nectary; nectary oblong and covered with short processes; capsule thick, elliptic.....*C. catalinae*

x. Tall habit, bulbiferous; petals usually white or pale yellow, often with a contrasting color on the back, and a reddish spot at the base of the inner petal around the nectary; nectary usually quadrate and covered with short processes; capsule thin, linear.....*C. simulans*

xi. Habit short or, if tall, often twining about nearby plants, occasionally bulbiferous; petals white, lavender or yellow, some bi-colored, and a yellow or white area near the base, above the nectary; nectary lunate to circular and covered with short processes; capsule thin, linear.....*C. flexuosus*

xii. Habit short to medium, not bulbiferous; petals white usually with a brown spot at the inner base above the nectary; nectary variable: chevron, quadrate or round in shape, and covered with short hairs, which also are on either side of the nectary; capsule thin, linear.....*C. dunnii*

xiii. Habit tall, not bulbiferous; flowers generally more closed at top; petals lavender to pale purple, some with a purplish spot at the base, around the nectary, and covered over the bottom, inner half by long branched hairs; nectary round or missing; capsule thin, linear; genetic diploid.....*C. splendens*

xiv. Habit medium, not bulbiferous; flowers generally more open at top; petals lavender, covered by short hairs only near the nectary; nectary rounded; genetic tetraploid; habitat often in grassy meadows.....*C. davidsonianus*

xv. Habit medium to tall, bulbiferous; petals white, pink or lavender; nectary round and covered by short yellow processes; habitat in wet meadows (cienegas).....*C. palmerae*

α Not bulbiferous; otherwise as in the species

.....var. *munzii*

2. Subsection *Macrocarpi*

3. Subsection *Nuttalliani*

4. Subsection *Gunnisoniani*

C. Section *Cyclobothra*

HABITAT

IN

SAN

BERNARDINO

COUNTY

