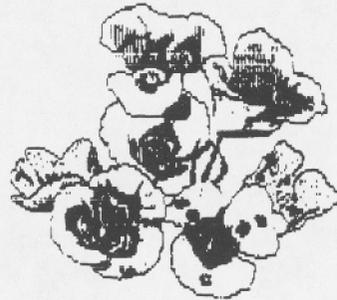


**MARIPOSA**

VOL. VII, #3

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

JANUARY, 1996

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

1. Your editor took a trip to Arizona and New Mexico this summer to see the color forms of *Calochortus gunnisoni* for the first time. These color forms bloom later than the predominant, white or bicolor, variety and thus require a separate trip. They are worth the trip as they are quite lovely color forms. The purplish or bluish form grows in the mountains of eastern Arizona, where its probable genetic isolation from the predominant color form has allowed the color form to emerge and develop separately so that it is the predominant form in the area. Similarly, the yellow form grows in one isolated section of the southeast Rockies in New Mexico. In the latter case, I had to hike in a number of miles at about 9000' elevation in order to see the plant. That was quite an experience for this sea-level dweller--I wasn't in as good shape as I thought! Both of these color forms are threatened by grazing, especially the latter, yellow form, var. *perpulcher*, which is known from only three stands, all in the same area. The Forest Service allows grazing in the area, for summer forage, and all the stands I visited had been extensively grazed. In the case of one stand of the purple/blue form, the area had clearly been overgrazed, and there were only two plants in evidence, one in bloom.

I'm working on getting the Forest Service to do more to protect the stands, but not much luck so far; it seems cattle have more clout than flowers.

2. Mr. James Robinett has remarked that in addition to the characters listed in the key to classification and separation of the cat's ears in Vol. V. #1, there are differences in seed color. Specifically, the seeds of *Calochortus tolmiei* are consistently dark, while those of *C. coeruleus* are lighter. This observation aids in identification of these two species in the field when the flowers are not in bloom. More, it is a determinate test for separation of two look-alike species, which are often confused, and sometimes difficult to distinguish.

**II. Trips**

Pictures by Sunset, Camping by Moonlight, or 24 Calochorti in 9 Days (Dr. Bob Werra's 5th instalment).

"Day 6: Off to an early start on a bright, sunny day that would prove to be a scorcher. In an open, grassy meadow in Josephine Co., Oregon, we found *Calochortus howellii*. Its blossom is as large as a Mariposa, open-faced, hairy and white with a darkish center. Very attractive. Right across the road we stumbled onto the brick red *Lillium bolanderi* growing out of clumps of brush.

"Then we pushed into northern California and a site of the rare *Calochortus greenii*. We found only one specimen of this medium lavender, attractively marked cup. It seems this drought year [1994-ed.] hasn't fostered Calochorti blooming. But then in the parching 95°+ sun came the climax of Northern California: *Calochortus persistens*, another rare species. This low-growing, quite open-faced, large, pink and yellow flower grows well up on rocky ridges. It resembles a gorgeous, Mediterranean species tulip, *Tulipa saxatilis*, which grows in the steep rocks of Crete. Needless to say, we each shot up a roll of slides, creating our own unique perspective of this gem. And we weren't the only visitors; there were footprints before us.

"Thence, south across the 100° northern Central Valley, basking in Hugh's comfortable air-conditioned van, enjoying wonderful music tapes, ranging from beautiful requiem masses to

musicals to dixieland. Arriving home, we took a day of rest (and we needed it)."

### III. Horticulture

"*Calochortus*, Easier to Grow Than You Think!" [Second Installment by member Norman Young continued from last issue.]

"They [*Calochorti*] range from 2" [5 cm] to 30" [about 75 cm] in height, the taller ones having to grow through other plants and shrubs, hence their height. If showing these taller ones, they must be tied to canes until staging and then fingers kept crossed that they do not bend over until after judging.

"A very limited number of species are available as bulbs in this country [United Kingdom-ed.], although seed for most species is available from specialist seed suppliers. Both are expensive and it is cheaper to buy them from America and pay postage etc. (that's me off the Christmas card list of several nurseries!)

"Most seed germinates like Mustard and Cress, though not quite as quickly, very satisfying until they start to damp off just as quickly. Some species seem more susceptible to this than others and anti-fungal powders do not seem to make much difference when watered on or mixed with the compost. The seed is sown as soon as received and as they usually arrive in the autumn and most germinate within a month, the seedlings have to be nursed through the winter especially if there are frosts. These include two Mexican species which according to the experts should not have germinated until next summer! Seed germinates and grows in a range of composts as long as it holds moisture and is free draining. I have found the seeds need a covering of compost before being top-dressed with grit as with only a grit covering they sometimes germinate, produce seed leaves, but not bulbs or roots; this never happens with a compost cover." [Continued next issue]

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

[Sixth Installment of the Article by Chickering from 1938]

"I now come to *Calochortus catalinae*, the "Common Mariposa" of some parts of Southern California. Although quite plentiful in parts of its range, this beautiful flower has a rather restricted range...This flower flourishes especially after a fire. I recall one brush covered mountain in Ventura County which was burned one fall. The following spring the whole mountain side was covered with the most beautiful and luxuriant *C. catalinae*, but the next year, when the brush had started to grow again...*C. catalinae* was scarce and later almost entirely disappeared. It is an interesting query as to how all the mature bulbs which produced the flowers in the spring following the fire happened to be there ready to bloom when their opportunity arrived. My theory is that these hills have been burned from time to time for years and that the bulbs simply shoot up the leaves each year and then die down until the next fire...*C. catalinae* is white with a small maroon colored eye at the base of each petal and a stalk is likely to have many flowers. It is readily grown both from bulbs and from seed and does not mildew in my garden...it takes...4 years for it to...bloom...This species grows naturally in a region where the soil is largely of sandstone origin...

"*Calochortus dunnii*..grows...in a rocky soil amid low brush...While this flower is easy to grow, I do not recommend it as it is quite scarce and its habitat is very local..."

### V. Conservation

Rare, Threatened and Endangered: Reflections upon the Categories of Botanical Scarcity (Part Five)

In summary, rarity may reflect environmental conditions independent of human intervention. These include environmental factors, such as rarity of habitat or suitable climate, and also limiting biological factors, such as an inability to compete with more aggressive plants. Further, there may be unknown factors limiting the spread of the plant, despite seemingly suitable and available habitat. Rarity can be adjudged not only from the actual rarity of numbers of a species, but also from lack of suitable habitat, climatic conditions or other favorable conditions for a species. Rarity is not an arbitrary concept then, a convention. It may be intrinsic to a species, given its conditions of life. Rarity can be established not

only in relation to other species, in terms of relative quantity, but also in qualitative terms with respect to environmental and biological limitations.

## VI. Species This Issue: *Calochortus ghiesbreghtii*

(For the key to the *Ghiesbreghtiani*, see V. III, #4, 4/92)

*Calochortus ghiesbreghtii* (pronounced khees-BREKH-tee-yi; the kh sound as in the Scottish *loch* or the German *ach*), Ghiesbreght's Cyclobothra, was named by Watson in 1879 for the Dutch botanist who first collected the plant from southern Mexico. I have been unable to determine the local name for the plant.

**Range and Habitat:** This species is known from three Mexican states, Queretaro, Hidalgo, and Chiapas, and also Guatemala. Thus it is the southernmost known species in the entire genus. The range forms a northwest to southeast line from Queretaro to Guatemala, with a gap in Puebla and Oaxaca. The altitude (about 1600m [5000']) and habitat are similar in Hidalgo and Queretaro. The terrain in these areas is rugged, and difficult to explore thoroughly, so it may be that there are intervening populations in similar habitat in Puebla and Oaxaca which have yet to be discovered. In its northern extension, the species inhabits the leeward side of the Sierra Madre Oriental just over the summits formed by the highest peaks. Here it obtains generous rains, but not the deluge which plants on the windward side must endure. The plant was on northern slopes in the five populations which I have seen, and under the shade of other plants as well, both shrubs and trees. It seems to be a shade grower, then, although the flower itself grows up through the subtropical canopy into the sunlight for parts of the day. The climate is that of subtropical uplands, which have cooler temperatures than the steamy coast. In the northern populations, the winter temperatures are quite cool, at least at night, and may occasionally dip below freezing. In general, however, the species occupies a subtropical range, with cool but not frigid winters, and warm but not scalding summers. In the north, the rains cease almost entirely by the end of October, and do not return in quantity until May. However, the southern populations may receive a little winter rainfall.

**Botany:** The fibrous-reticulate bulb-coat marks this species as within Ownbey's section Cyclobothra. However, its connection with the three other species which, following Pringle, he placed with it in his subsection *Ghiesbreghtiani* is, as he noted, "remote." Despite its upright flowers, it is a much larger plant than *Calochortus venustus*, *C. exilis* or *C. fuscus*, sometimes as much as four or five times taller, up to one meter (3.3'). Further, the plant itself is not a simple one leaf, few stem affair, like the other three, but exhibits much branching, such that its overall habit is much fuller. Finally, its flowers are partially to nearly fully covered by hairs, giving them a more than casual resemblance to the cat's ear group in California and the Northwest. How this design got duplicated for two groups of plants with thousands of miles of intervening distance is a mystery. *C. ghiesbreghtii* also differs from the other three species of Ownbey's subsection in the shape of the nectary, a distinctive, slightly depressed, horseshoe-shaped arc (see photo) which is covered by a membrane and surrounded by hairs. It is quite distant from *C. venustus* and *C. fuscus* in range. Although both *C. exilis* and *C. ghiesbreghtii* grow in Hidalgo, they are not known to grow in the same area. The species has been reported to be "purplish" or "yellow" in color, but this was based on dried specimens, which tend to fade to darker shades as they age. In the field, we encountered only white petals and mostly white sepals, although there are occasional light green or light yellow ones. Many plants have a reddish area at the base of the flower in the area around the nectary, and the petal hairs can be red, yellow or white. As we noted in V. IV, #3 of *Mariposa*, 1/93, it may be that it should be placed in a new subgroup with *C. pringlei* and the yet to be published *C. ownbeyi*. Unlike *C. pringlei*, it produces bulbils in the axils of the leaves and bracts, as many as 15 per plant per year. It also differs in color and range from *C. pringlei*. From *C. ownbeyi* this species differs in the larger cauline leaves, a much smaller bilbil production, different nectary shape and range. Finally, its upright, open flowers distinguish it at once from the nodding species, and the narrow leaves and hirsute petals and sepals from most of the *Purpurei*.

*Calochortus ghiesbreghtii* was recognized by Watson in 1879, based on a few specimens from Chiapas collected by Ghiesbreght, and upheld since by Pringle and Ownbey.

**Horticulture:** This is a summer growing species which tends under cultivation to come up later than the other Mexicans, to bloom later and to go dormant last. It blooms in September and October in the wild, but as late as November in Berkeley. I had trouble growing it from seed and bulbils in the springlike summer of Berkeley until I put the seed flat in the hothouse, where they have thrived. As the atmosphere gets quite warm in summer, hot conditions are indicated for optimum growth, although as indicated, in its native, upland range the temperatures do not get tropical during the summer. Shade is also required, except perhaps in areas with very frequent overcast, or for small parts of the day.

I have no experience growing the plant in the ground as its winter dormancy precludes in-ground growing in California. As an experiment, I left out a pot of two-year old plants during the very wet winter of 1994-1995, to see whether they would tolerate the winter rains. The plants of this species did not survive, although those of some other Mexican spp. did. Drying off during the winter is indicated, preferably under cool but not frigid conditions. In Coastal California, this species is hardy, and I simply dry it out in its containers. In temperate areas, however, it may be best to store it over the winter in a dry, cool area, which will not get frigid, e.g. a basement. It is apparently grown in England, and I think it can be grown anywhere if it is kept from freezing in winter. It does fine for me in our standard UCD mix, and does not seem to need an annual transfusion of fertilizer to bloom every year. However, a slow release fertilizer was mixed in when I first planted this species. It also tolerates a bit of "lava rock" substituted for sand in the UCD mix, but does not seem to require it.

## VII. Letters from Michael Mace

[This is a composite of several letters sent by member Michael Mace in which he documents his experience in growing *Calochortis* in San Jose, Ca. All these species are rare and some endangered; Mr. Mace got his seed of *C. persistens* through the native garden at Tilden Park in Berkeley, and those of *C. striatus* from the one time offer of TCS, and not in the wild.-ed.]

"I should tell you how the *Calochortus striatus* seeds are doing. To increase my chances of success, I tried them in three different soils. Most of them went into either the local soil here (primarily clay) a pot with 50% sand and 50% vermiculite and some Lily Miller bulb fertilizer. I figured that mixture would come close to the absorbency of peat/sand but without the acid). I also tried a couple of seeds in the normal peat/sand mixture, just to see what would happen.

The seeds in the local soil did not germinate well. Only a couple of plants emerged, and just two survived. The seeds in the vermiculite/sand mixture did very well, and to my surprise, so did the ones in the peat mixture [UCD-ed.]. The success with peat leads me to wonder if *C. striatus* is tolerant of acidity after all.

Also, I wanted to report that my seeds of *Calochortus persistens* grew beautifully this season. I had close to 100% germination and they grew enthusiastically..."

"My one interesting discovery for the year was that *Calochortus persistens* apparently doesn't need to be refrigerated here every year. I have it growing in two pots, one of which I forgot to refrigerate. To my surprise, the bulbs in the refrigerator and the ones outside sprouted at exactly the same time and grew equally well. We get quite a bit more frost here than you would in either Hayward or Berkeley, and I presume this made the difference. It will be one more year before the bulbs are big enough to bloom; perhaps they'll need refrigeration to do that. I'll experiment and let you know."

"I am proud to say I resisted the urge to collect seeds from *Calochortus tiburonensis* this summer. I saw them in bloom for the first time this year [1995-ed.], and they certainly are interesting--they looked kind of like flesh-colored radar dishes covered in fur.

"I was surprised that they were so easy to find...It's amazing how close they are to houses, and how easy it is to get to them. I expected to see a fence, or at least a sign warning people away. But maybe the flowers are safer if no one draws attention to them.

"They raise a lot of questions. The flowers I saw were lower growing than the ones in the spec description, and bigger relative to the stem. I'm wondering if they vary from year to year, or are there separate enclaves of them with different characteristics? How did they get there? Why Tiburon? Why don't they grow anywhere else? What did they evolve from--they look almost like an overturned

*Calochortus amabilis*, but with huge modifications. Why are they so pale-colored? (I should have thought to smell them--they look a little like some *Tigridia* species that smell nasty and use flies for pollination.)

"And why are they supposedly so hard to grow? They were growing among *Allium* and *Brodiaea* species that I think are fairly common. The only unusual thing I noticed was that the *Calochorti* only grew in serpentine areas that were covered with a thin layer of brown, weathered soil. There were some patches of bare serpentine, and the *Allium* and *Brodiaea* grew fine there. But no *C. tiburonensis*."

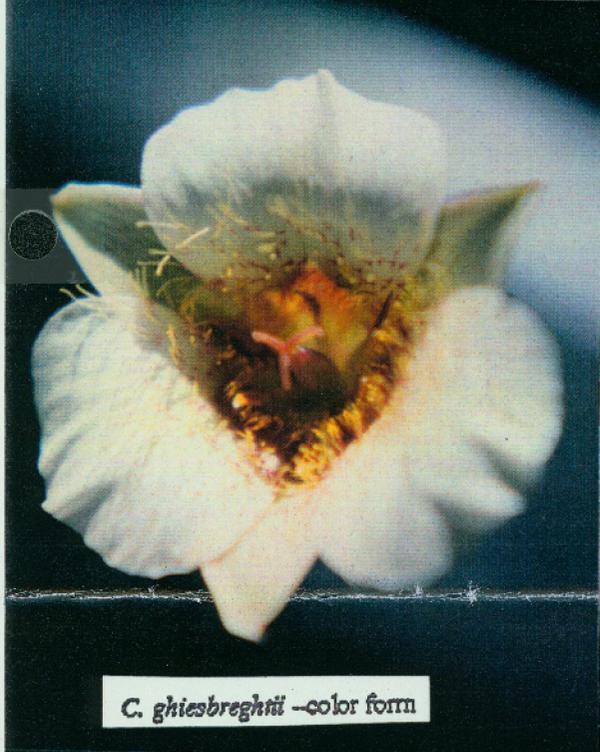
All photographs by H.P. McDonald



*Calochortus venustus*



*C. venustus* in habitat



*C. ghiesbreghtii* -color form



*C. ghiesbreghtii* in habitat



*Calochortus ghiesbreghtii*



*C. ghiesbreghtii* -outer