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EDITORS:H.P. MCDONALD
AND K. STOKKINK
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EDITORIAL ADDRESS:
P. O BOX 1128
BERKELEY,CA 94701-1128

MARIPOSA

THE *CALOCHORTUS* SOCIETY NEWSLETTER

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

I.Announcements

Unfortunately, the largest stand of the red form of *C. venustus*, which grows in SE Kern Co., California is on land which is for sale, and may be developed over. Although it is not the only stand with red flowers, it is the largest, with the greatest number of red flowers. Also, the red form is rare, and only grows in a few places, of which this is easily the finest. It would be a shame to lose this stand to vacation or retirement homes. If any member can think up a way to preserve it, especially financial, suggestions are welcome.

Free Seed Offer

This year we are offering more seed from N. California. Due to the abundant rains in '92-'93, there were many flowers in this area, with equally abundant seed set. Each member can order two California species and one Mexican species, for a total of three species. However, certain species are more suitable for certain areas, and members should keep in mind the indigenous growing conditions for each species before ordering. The species from the high desert require chilling, and will not germinate or grow in mild climates without refrigeration each year. The tropical species, *C. balsensis*, is probably not hardy, although it has survived in the Bay Area (30°F, -1°C at night). Members from areas with significant cold should have an area to store it during the winter, where it will not freeze. Send a SASE to our address. The species offered are:

A. Species from areas with cold winters:

1). *C. longebarbatus*, which grows by streams on the eastern side of the Cascade mountains. Lovely, pink to purple. Requires winter chilling, WET conditions, tolerates summer rains, part shade. If any species is suitable for wet, temperate conditions, such as the NE US, it is this one, but it also tolerates summer drought.

2). *C. leichtlinii*, a montane species from the Sierras, grayish-white with a black and yellow blotch on the base of the petals. Moderate water, summer dry, requires winter chilling, part shade. Can be grown like a species tulip.

3). *C. macrocarpus*, a lovely high desert species, with a color range from very light lavender to purple. Requires winter chilling, **dry** conditions, but tolerates a little summer rain. Full sun except in the desert.

B. Species from areas with more mild winters:

4). *C. amabilis*, a pretty, yellow fairy lantern, from NW California. Fairly hardy, lots of water, shade, summer dry but tolerates a little summer water. Can be treated as a spring grower in frigid areas.

5). *C. uniflorus*, a lavender star tulip from meadows of California and Oregon. Fairly hardy, lots of water, summer dry, sun to part shade, bears offsets.

6). *C. venustus*, Sierra form, white to lavender, some bicolor, with blotches of color on the petals. Seed from an area which will germinate in coastal California, but is also fairly hardy. Plenty of spring water, summer dry, part shade, to full sun on coast. Gorgeous.

C. Species from Mexico (caution: hand pollinated; may not be pure)

7). *C. exilis*, which did not set seed last year, but was more cooperative this year. However, there isn't much of it anyway. White with reddish outer sepals. A montane sp. which gets some winter snow, and thus is hardy. Summer grower, moderate water, part shade, keep on dry side in winter.

POOR BLOOMS IN S. CALIF. THIS YEAR BUT NOT IN E. CAL! C. MACROCARPUS, C. PRUINOSUS, C. LEICHTLINII & C. LONGEBARBATUS WERE LIKE WEEDS! BEST WISHES H.

8). *C. pringlei*, a pretty red species from subtropical woodlands. Summer grower, moderate water, light shade.

9). *C. balsensis*, a TROPICAL sp. from S. Mexico. Requires humid, hot conditions, plenty of water in summer, mild, dry winter. First time offered. GREENHOUSE RECOMMENDED in temperate areas (OK in coastal California outside, but requires lots of summer water).

We also have seed of *C. bruneaunis*, a high desert spp. from E. Cal., available; and bulbils of *C. spatulatus*, a Mexican subtropical, if anyone would prefer those spp.

II. Trips

Because eastern California and western Nevada had been blessed with abundant rains this year, after a very long drought, we headed that way on one of our trips. We were especially interested in *C. bruneaunis* and *C. excavatus*, and we were not disappointed. In sandy washes, the tall stalks of *C. bruneaunis* showed off their magnificent blooms, through the shady screens of grey-green sagebrushes. Many of the numerous ones we found had delicates light-brown markings on the outer petals, as if they had been antiqued, or drizzled lightly with chocolate from the famous chocolate factory in Nevada's in Clark County. Some had brown, not only on the outside, but on the inside, as well. These were quite striking, as they had the yellow and purple markings of their species at the lower portions of the inside petals, and often had barely detectable "chevron stripes" in light green to offset the outer petals.

We found *C. excavatus* in some places we had searched fruitlessly in prior years. In one case, we found the Calochorti, nestled sweetly in a strange, alkali wash (we **almost** thought we were on Mars!), along with other hardy native grasses. All were growing near a meandering slough, ringed by huge volcanic peaks, under a cyan sky.

As we flew along interstates and trudged through dirt roads, looking for these more elusive Calochorti, we were greeted further south by a *C. kennedyi*, here and there, showing off its vermillion, orange or yellow.

III. Germination Tests--13th Installment: Watering

(This is the second part of the installment on watering, begun last issue.)

The water was not applied all at once, but with a watering can (except if rainfall was received). Each pot was watered in part in a consecutive sequence and then again until one inch total was applied. This was to prevent the seedlings from being deluged all at once, which can wash the seedlings out of their place. Also, the twice a month schedule proved too little to germinate the seeds. Thus the twice a month batch was watered once a week in order to germinate the seeds, and then bimonthly.

The results were that a twice a week schedule proved to be too wet, while a twice a month schedule was too little for optimum survival. Most spp. did best if watered once per week with one inch of water, with qualifications. However, a few plants of each species survived in the pots grown with a twice a week schedule (except *C. macrocarpus*); and a few in the twice a month schedule. This points to a range in how much water each species can tolerate.

In the wild, each species may encounter changing conditions from year to year and also over longer periods of time. As some of the seeds of most species survived the relatively wet and dry watering schedules, they could also adapt to changing environmental conditions.

Be this as it may, the desert species proved to be an exception to the rule. None survived the twice a week schedule, and after an initial period of once a week watering for germination, they clearly

preferred a twice a month schedule. Also, section *Calochortus* did almost as well on a wet schedule as on a moderate one. This makes sense, as the desert spp. receive an average of less than one inch per week in the wild, while the species of section *Calochortus* which were tested receive more than one inch per week.

In summary, the genus in general does best with a one inch, once-per-week watering schedule, except for the desert species, which prefer twice a month after germination.

It should be re-emphasized that the California spp. should be kept dry during dormancy. The species from the Northwest and the Rocky Mountains receive summer rain, but are perhaps best kept barely moist out of their native range during their dormant period (some will tolerate complete drying out during dormancy). In general, the further east and north the predominant range of the species, the wetter its summer; and also the higher in altitude, the wetter. Thus *C. gunnisoni*, a high altitude species centered in Colorado, receives considerably more summer rain than *C. flexuosus*, a desert spp. from the Southwest. However, the ranges of the two species overlap, and the stands in the area of overlap receive similar amounts. The Mexican species should be kept barely moist or dry during their winter dormancy, but the more tropical spp. from the south do not like complete drying out.

IV. The Horticultural History of *Calochortus*-15th Installment

Wood, Allen H. Jr., *Bulbs for Your Garden*, Boston: Houghton-Mifflin, 1936. From ch. on "Western Bulbs for Eastern Gardens," pp. 148-151.

"...The [fairy lanterns, cat's ears and star tulips] are not at all difficult in the East; the [Mariposas] require more cultural skill...Plants of the butterfly tulips bloom in Boston during late May, June and into July. The large flowers crown one to two-foot stems which usually require support...The corms should be planted in November in gritty soil rich in leaf mold, and mulched with several inches of marsh hay. A location where the sun bathes the foliage for half the day is beneficial. Plant the corms four inches apart and twice their own depth.

"The species recommended as those most likely to succeed in the East are as follows: *C. venustus...C. superbus...C. vestae...C. nuttallii...C. gunnisoni...C. nitidus* has proven hardy, and I see no reason why the other species [of subsection *nitidi*] should not as well...Globe and star tulips [including cat's ears]...also have the added advantage of being more amenable to eastern culture...their small stature makes them excellent rock garden subjects. Three good species to grow are: *C. monophyllus, C. tolmiei and C. uniflorus...*

"The globe tulips, or fairy lanterns...grow in shady woodlands in their native terrain, [but] appreciate more sun in the East, and seem to prefer locations in sunny rock gardens which enjoy only a light shade during the day. The soil wherein the corms are to be planted may be either light or heavy, but should include a copious supply of nourishment. The...species are hardy in the East."

V. Conservation: Reply to Letter from Mr. Robertson

(This is in response to Ian Robertson's letter, printed in MARIPOSA IV, 4, about the difficulty of growing various *Calochortus* spp. in W. Australia. The section below concerns *C. greenei*)

C. greenei occupies a niche between the wet coast and the high desert. Its habitat gets considerably colder than that of W. Australia, to 0oF (about -18oC). I am not surprised that it did not like the relatively mild winters of W. Australia, although I am surprised that the seed of a rare and endangered species got all the way there. As the seed has not yet germinated, it may yet be viable, as Calochortus seed remains viable over several years (Mr. Baccus just germinated some 1986 *C. luteus* seed).

would recommend that it be refrigerated in mild climates for about eight weeks, with ice on the top for seeds (this can be eliminated in the second and subsequent years). The temperature of the refrigerator should not be arctic, but set just above freezing so that the ice slowly melts. This simulates melting snow at the end of winter. The refrigeration should be at the middle of the wet season, after some rain has fallen (e.g. Jan.-Feb. in California, after the Nov.-Dec. rains). Although it grows in sun in its native area, it should be grown mostly in shade in areas with mild or hot climates, with a little direct sun at the beginning or end of the day (e.g. on the north side of the house/south side in the Southern Hemisphere?). The sp. tolerates the rain of the early and late seasons provided by giving it this dormant period in the middle, but gets only about 20-25" (44-55 cm.) in its native range. Like other California natives, it does not get any summer rainfall to speak of. As it is a rare and endangered species, I would not recommend it for beginners with *Calochortus*, and otherwise only for those willing to give it conditions similar to those it is used to, such as the winter chilling. Other N. California spp. can be given more "chill" in mild climates by similarly growing them on the shadiest side of a building.

VI. Species this issue-- *Calochortus umbellatus*; the Oakland Star Tulip

Genus *Calochortus* Key

I. Section *Calochortus*

A. Subsection *Pulchelli*

B. Subsection *Eleganti*

C. Subsection *Nudi*

Stems short, rarely bulbiliferous; flowers erect, spreading, open and campanulate; petals with few hairs on inner surface, the hairs mostly confined to the base of the petal near the nectary.

1. Nectary generally straight, transverse

i. short stems, flowers white, small, petal ends pointed, capsule nodding ..... *C. minimus*

ii. longer stems, flowers lavender to purple, petal ends rounded capsule erect..... *C. nudus*

2. Nectary generally rounded at base and slightly depressed

iii. usually bulbiliferous, shorter stems, generally unbranched, flowers lavender, habitat in wet meadows ..... *C. uniflorus*

iv. rarely bulbiliferous, longer stems which are often branched, flowers usually white, habitat on hillsides ..... *C. umbellatus*

D. Subsection *Nitidi*

II. Section *Mariposa*

III. Section *Cyclobothra*

The common name for this species is the Oakland Star Tulip, as it was originally discovered in Oakland, Ca. and was fairly common in the hills there at one time, before extensive development wiped out many of the stands. The species is not confined to Oakland Hills, nor to Alameda Co., fortunately. It is generally white in the East Bay, but there are color forms to the north.

Range: The range of the species is in the area around San Francisco Bay, and nearby counties. Although there are early reports of stands in Mendocino Co., the known range is from Lake Co. south to Santa Clara Co. The majority of the stands are in the north Bay and the east Bay.

Botany: *Calochortus umbellatus* has been placed in the Nudi subsection of section *Calochortus*. This group has the least hairy petals of any in the section. *C. umbellatus* follows this pattern, with hairs confined to the base of the petals around the nectary. *C. umbellatus* can be distinguished fairly easily from the other Nudi. Two of the species, *C. nudus* and *C. minimus*, grow primarily in the Sierra-Cascade Ranges, far from the range of *C. umbellatus*. The only other star tulip in the vicinity is *C. uniflorus*; that species is generally bulbiliferous. Thus for all practical purposes, a star tulip growing in the central Coast ranges around SF Bay is *C. umbellatus* unless it is bulbiliferous.

There are other differences between these species, however, which allowed botanists to distinguish them in the first place. *C. umbellatus* is generally larger than *C. minimus*, with a more cup-shaped nectary (gland). While *C. minimus* is generally white, like *C. umbellatus*, the latter often has lavender or purple spots at the base of the petals, and, at least in one stand, pink and lavender stripes. From *C. nudus*, *C. umbellatus* is distinguished by color, range, habitat and other characters. *C. nudus* is a fairly high altitude species from N. California, lavender or purple, with a transverse, straight nectary and an erect seed capsule. Finally, *C. umbellatus* differs from *C. uniflorus* in rarely producing leaf axil bulbils (I've never seen one), in color, in its more branching habit, its taller stems, somewhat smaller flowers, and habitat.

History: This species was recognized early. It was named by Wood in 1868, and has generally been separated since, although Watson seems to have included it in *C. uniflorus*.

Habitat: *C. umbellatus* occupies hillsides and slopes with slight inclines. Some stands are under conifers, oaks or shrubs, while others are in grasslands. Rainfall is moderate to wet, 3/4 to 1 1/2 inches (about 2-4 cm.) per week. Winters are mild to cool: USDA zone 9-10. The species endures about 20°F (about -6°C) in its native range. The growing season is from mid-winter to about April or May when the plant generally flowers. The hillside habitat may either aid drainage or add moisture, as the prevailing winds, from the West, generally drop more at higher altitudes.

Horticulture: I have had no problem growing this species, but this is not surprising, given that it is the most local species. It does well in UC Davis on a once per week watering routine. The species does well both in pots and in the ground; with or without fertilizer. Away from the Coast light shade is probably better, although the plant likes full sun near the Coast. It is not fussy here on its home ground about soils, as far as I can tell. It is easily grown from seed here.

Conservation: This species is on the "Watch List" of the Calif. Native Plant Society, as many of its historic stands now lie under housing tracts. It is not yet considered rare and endangered, since it still survives in pockets, but is threatened in many areas. Members are urged to inquire of seed dealers whether they have obtained permission to collect seed of threatened spp., and to buy only from ethical collectors, such as the Robinetts and the Walkers (Southwestern Native Seed). Bulbs of such species should never be dug, but can be appreciated in the wild, or with slides and photographs, or grown from seed collected in a responsible way.