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REDESCRIPTION AND DISTRIBUTION OF *MUILLA CORONATA* (LILIACEAE)

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INTRODUCTION

Muilla coronata Greene was first collected by the botanical pioneer C. C. Parry in March 1888, Mojave Desert (near Landcaster), Los Angeles County, California. Described by Edward Greene (1888) in the same year, this relatively rare species was known only from the type specimen for 34 years.

During a May 1983 collecting trip on the Kern Plateau, southern Sierra Nevada of Tulare County, the author discovered a population of several thousand *Muilla coronata* plants. At that time it was assumed that these plants would prove to be a new subspecies. This assumption was based on two primary morphological characters: the presence of only one leaf per plant and perianth segments nearly twice as long as described. This new material, however, matched perfectly with plants labelled as *Muilla coronata* in California herbaria.

One possible explanation for these inconsistencies could be that Greene was compelled to work from a single fragmentary specimen (i.e., corms, leaves, flowers not attached). His reconstruction of the specimen would have been partially based on Sereno Watson's description of the genus *Muilla.* Other species in the genus were known to have several leaves. However, the type specimen (ND) contains four plants, two with corms attached to the scape which contain but one leaf. An alternative explanation could be that the type was a different taxon than the specimens attributed as *Muilla coronata* in California herbaria. However, the material in the herbaria labelled as *M. coronata* resemble the type specimen. Another possible explanation is that Greene thought that some of the leaves were detached and lost during the collection of the Parry specimen. Evidence of detached leaves from the corm would be nearly impossible to detect or refute. The author speculates that this may have been the source of the error.

Greene's description, though extremely accurate in the discussion of the greatly dilated petaloid filaments, assumed other characters that are not evident from the Parry collection. These erroneous features have been perpetuated in both monographic and floristic works (Abrams 1923, Ingram 1953, Munz 1959 and 1974). Greene (1888) makes reference to Watson's well-proposed genus *Muilla* while describing *M. coronata.* The other two species known at that time [*M. maritima* (Torr.) Watson and *M. transmontana* Greene] both have several leaves arising from a fibro-membranous

Fig. 1. Close-up of *Muilla coronata* flowers displaying the crown of petaloid filaments. The diminutive size of this lily is readily apparent when compared to the quarter used for scale which is 23 mm in diameter. Scape is less than 3 cm above the sandy granitic gravels and the plant has only one leaf. (Bar, upper right = 5 mm.)

coated corm. Though the type of *M. coronata* (ND) shows no indication that the leaves are "several," Greene nonetheless states "leaves 2–3" in the original description.

Review of herbarium material also strongly contradicts the leaves 2–3 statement. Only one plant was observed with two leaves (*Mason 14259,* UC) with the second leaf being rudimentary. Field observations of several thousand plants from the Kern Plateau failed to find even one plant with two leaves. Though Ingram (1953) describes 2–3 leaves per plant, the three cited collections of *M. coronata* in his monograph contain plants with a single leaf. Abrams (1923) also described *M. coronata* with leaves 2–3 in the description, but the illustration (Abrams 1923:398) reveals only one leaf. In addition, the illustration displays the strongly dilated petaloid filaments radiating outward against the perianth segments. However, in nature the filaments are erect though wholly distinct from one another forming a cylindrical crown reminiscent of several *Triteleia* species (Fig. 1).

Other characteristics in the original description that require clarification are the number of flowers per umbel, length and color of perianth segments,

and the length of the scape. Greene (1888) states that *M. coronata* is 3–10 flowered. The type specimen contains four plants, three of these with four flowers per umbel and the remaining one with six flowers. The majority of *M. coronata* examined have 2–5 flowers, though rarely, a robust individual will contain up to 8(–11) flowers. The perianth segments are described as 1.5–2 lines long (approx. 3.2–4.3 mm) though the dried specimens and live material studied range from 5 to 9 mm. Greene further states the color of the perianth from light blue or nearly white within and exteriorly green with bluish margins. All plants observed by the author are white with a broad green line on the exterior of the perianth segments which darkens nearly black on dried specimens. Corms can be 2.5–8 cm below the surface depending on soil type and composition. The scape of *M. coronata* above ground is very short compared to other *Muilla* species. Generally, in *M. coronata,* the scape is less than 3 cm, with robust plants to 5 cm above the ground. The leaf is 2–2.5 times as long as the scape. On dried specimens, there is a distinct band marking on the scape showing that portion which occurred above and below the ground surface.

REDISCRIPTION OF *MUILLA CORONATA*

Corm 1–2 cm thick, 2.5–8 cm below ground surface; scapes very slender, less than 3(–5) cm above ground; leaves one (rarely two), narrowly linear, semiterete, 2–2.5 times as long as the scape, the margins retrorsely scabrous; umbels 2–4 bracted with 2–5 rarely 8(–11) flowers; perianth rotate, the segments 5–9 mm long, white with a green line on the exterior; filaments greatly dilated, hyaline-petaloid, cuneate oblong in outline, obtuse, retuse or almost obcordate above, forming a cylindrical crown; anthers subsagittate, erect, fixed by the middle or a little above it to an incurved median acumination of the broad filament. Capsules globose, 3-angled, loculicidal; seeds black.

KEY TO THE SPECIES OF *MUILLA*

Perianth white, never yellow
- Leaves several, equaling or slightly longer than the scape; filaments filiform, subulate or dilated at base
  - Filaments filiform to subulate, not dilated at base; anthers generally purplish (though occasionally pale yellow) *M. maritima*
  - Filaments dilated at base forming a cuplike corona; anthers yellow *M. transmontana*
- Leaves one (rarely two) 2–2.5 times as long as the scape; filaments petaloid, widely dilated, forming a cylindrical crown; anthers yellow *M. coronata*

Perianth yellow, never white *M. clevelandii*

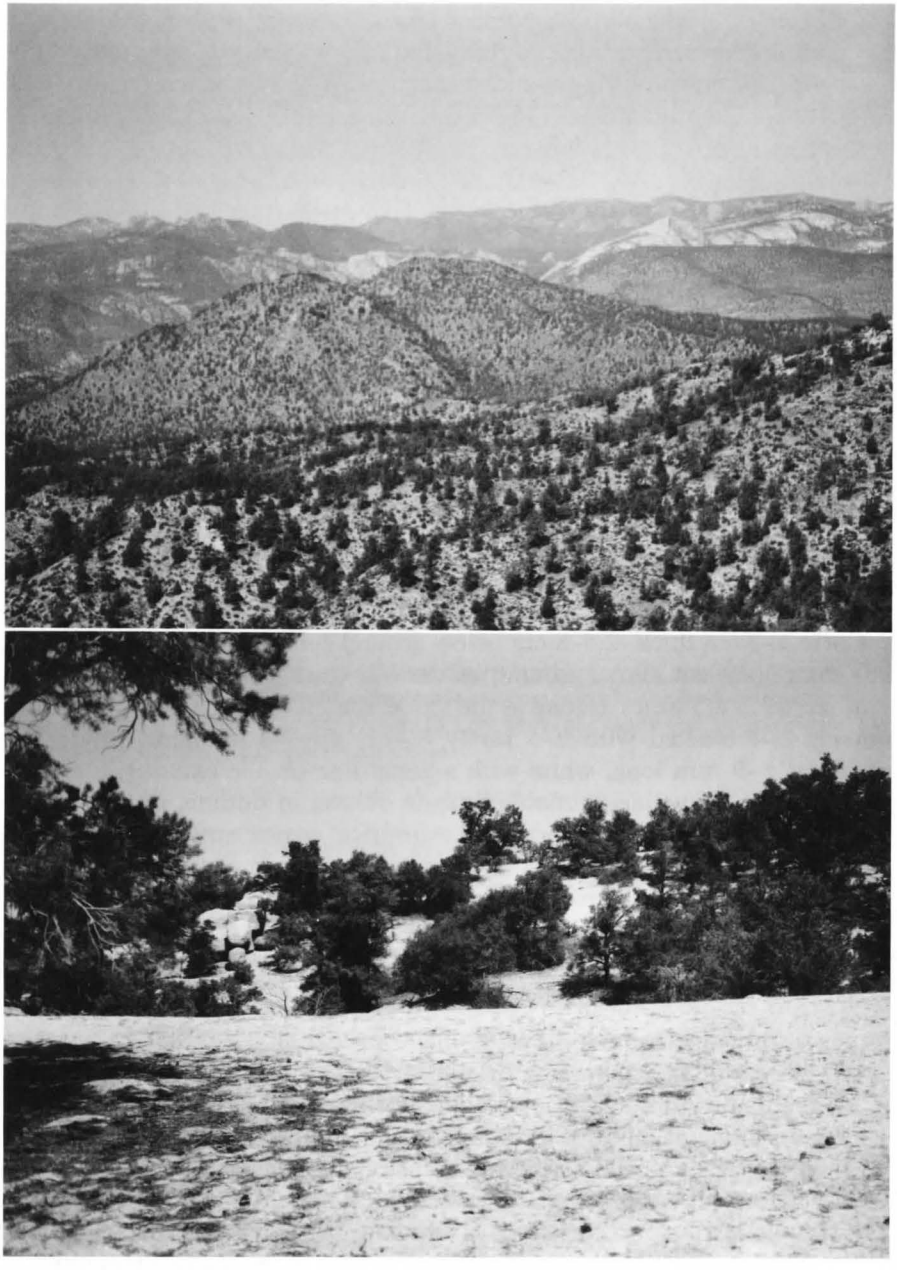

Fig. 2–3.—2. Typical habitat for *Muilla coronata* in a pinyon pine woodland on the Kern Plateau, Tulare County. Populations occur on the gentle sloping ridgetops in the foreground with the Dome Land Wilderness, Sequoia National Forest in the distance.—3. More detailed

DISTRIBUTION

The distribution of *Muilla coronata* is primarily restricted to the Mojave Desert in a shadscale scrub and Joshua tree woodland (Munz 1959). Botanical field work in the Owens Valley and adjacent areas by Mary DeDecker has located populations of *Muilla coronata* in a creosote bush and sagebrush scrub community. Recent collections in the New York Mts. (*Thorne 43338,* RSA), Scodie Mts. (*Shevock 10796,* CAS), and the southern Kern Plateau (*Shevock 10454,* CAS, MO, ND, NY, RSA, SBBG; *Shevock 10809,* CAS, MO, RSA; and *Shevock 10824,* CAS, JEPS, LAM, RSA) extend the habitat into a pinyon-juniper woodland community (Fig. 2–3). The upper portion of the population on the Kern Plateau contains an occasional weather-beaten Jeffrey pine. Populations are known for Inyo, Kern, Los Angeles, San Bernardino, and Tulare counties, California, eastward to Clark County, Nevada, ranging from 701 to 2012 m in elevation.

Representative specimens: CALIFORNIA. Inyo County: Devils Kitchen S of Coso Rd., *Zembal 520* (RSA); 1 mi W of Independence, *Kerr 488* (CAS); 1.5 mi N of Independence, *Munz s.n.* (Lenz 1975); SE of Mt. Whitney Fish Hatchery, *DeDecker 84* (pers. herb.); Kern County: Iron Canyon, El Paso Mts., *Weston s.n.* (CAS); near Muroc Dry Lake, *Heckard & Moe 4539* (JEPS); Indian Wells Valley, *DeDecker 796* (pers. herb.); 2 mi W of Lamont Peak, Kern Plateau, *Shevock 10809* (CAS, MO, RSA); 4.5 mi SW of Long Valley, Dome Land Wilderness, Sequoia Nat'l. Forest, *Shevock 10824,* (CAS, JEPS, LAM, RSA); 1 mi NE of Pinyon Peak, Scodie Mts., Sequoia Nat'l. Forest, *Shevock 10796* (CAS); Los Angeles County: Mojave Desert, *Parry s.n.* (ND) and *Sherwood s.n.* (LAM); Ave. J & 170 St. near Joshua Tree State Park, *Wilson s.n.* (Lenz 1975, and pers. comm.); San Bernardino County: Mouth of Deep Creek, Hesperia Lake Arrowhead Rd., *Jaeger s.n.* (CAS); N of Kramer, *Mason 11727* (UC) and *Mason 14259* (UC); Caruthers Canyon, New York Mts., *Thorne 43338* (RSA); Tulare County: 7.2 mi W of Lamont Mdw. on rd. to Long Valley, Kern Plateau, *Shevock 10417* (CAS, MO, ND, NY, RSA, SBBG) and *Shevock 10454* (CAS, MO, ND, NY, RSA, SBBG). NEVADA. Clark County: Red Rock Canyon, Spring Range, *Bacigalupi & Ferris 6263* (JEPS).

Other *Muilla coronata* populations discovered by Mary DeDecker where collections were not obtained include: Inyo County, N of Fort Independence, 4 mi N of Independence Courthouse; about Owens Lake, 0.5 mi N of Cottonwood Charcoal kilns; and SE of Carricut Lake, Naval Weapons Center.

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view of the habitat containing *Muilla coronata* as seen in Fig. 2. The majority of the *Muilla* plants is located in the relatively barren flats and ridges surrounded by pinyon pines, canyon live oaks, and an occasional western juniper.

The relatively few collections and observations of *M. coronata* within its wide range of potential habitat are probably due to the small habit of the plant, limited flowering time, and infrequent flowering in response to highly variable rainfall, characteristic of arid and semiarid regions. The collection from the New York Mts. obtained by Thorne followed the favorable precipitation winter of 1972–73 (Lenz 1975). Populations located on the Kern Plateau discovered in May 1983 comprised several thousand plants all on sandy granitic soils. The 1982–83 season was perhaps the wettest in the past 100 years for this portion of the southern Sierra Nevada. This may account for the discovery of *M. coronata* for this range. Plants flowering on sandy granitic soils are exceedingly hard to locate, becoming even more difficult to see when in fruit or vegetative state. The population of *M. coronata* on the Kern Plateau had already flowered by mid-May at 2012 m, probably flowering shortly after snowmelt. Nearly all of the wildflower display at that time occurred 800 m lower in elevation. Associated species with *M. coronata* at this site in mid-May were *Allium burlewii* A. Davids, *Anisocoma acaulis* T. & G., *Cryptantha circumscissa* (H. & A.) Jtn., *Eriophyllum pringlei* Gray, *Layia glandulosa* (Hook.) H.& A., *Lewisia disepala* Rydb., *Linanthus nudatus* Greene, *Madia minima* (Gray) Keck, *Microsteris gracilis* (Hook.) Greene, and a very small disjunct colony of *Oreonana clementis* (Jones) Jeps. The probability of locating additional populations of *Muilla coronata* on the eastern Kern Plateau and the Scodie Mts., southern Sierra Nevada, is relatively high.

ACKNOWLEDGMENTS

I wish to thank Dr. Lee Lenz (RSA) for reviewing live material of *Muilla coronata* obtained from Tulare County which initiated this study and for providing information generated from cultivating *Muilla* spp. Mary DeDecker and Ruth Wilson kindly provided me with *Muilla coronata* distribution and habitat information. I would also like to thank Dr. Bruce Bartholomew (CAS) for acquiring the type of *Muilla coronata* from ND. Without critical examination of the type specimen, this study could not have been completed.

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Botanical Systematics Symposium

The Rancho Santa Ana Botanic Garden will sponsor and host a symposium on Trends in Systematic and Evolutionary Botany on May 25th and 26th, 1985, at the Garden in Claremont, California. The purpose of this symposium is to examine current trends and, if possible, suggest needs for and identify promising trends in systematic and evolutionary botany in the coming decade. Invited papers will be presented on pollination biology (H. Baker), chemical systematics (T. Swain), morphology (J. Skvarla), cladistics (M. Donoghue), physiological ecology (P. Rundel), aspects of modern floristics and traditional systematics (G. Prance), and research in botanical gardens (P. H. Raven). Low-cost housing will be available at nearby Pomona College. Attendance will be limited. For further information write: Systematics Symposium, Rancho Santa Ana Botanic Garden, 1500 North College Avenue, Claremont, California 91711.

This will be the first of an annual series of symposia planned at the Rancho Santa Ana Botanic Garden and is intended to provide a forum primarily for botanists in the southwestern United States and adjacent regions of Mexico.