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In the following pages abbreviations for herbaria used in citing specimens are those listed below:

California Academy of Sciences (CAS)
Stanford University (DS)
Pomona College (POM)
Rancho Santa Ana Botanic Garden (RSA)
University of California, Berkeley (UC).

To the curators of the above institutions I express appreciation for the privilege of examining specimens in their charge. I am grateful also to Mr. George R. Proctor of the Academy of Natural Sciences at Philadelphia for information concerning the type of *Monolopia Heermannii* Durand, also to Mr. John Thomas Howell of the California Academy of Sciences and to Mr. Frank W. Peirson of Altadena for material of and notes on *Oenothera heterochroma*.

**BLEPHARIDACHNE KINGII** (Wats.) Hack. in DC., Monogr. Phan. 6: 261, 1889.

*Eremochloe Kingii* Wats. in King, Geol. Expl. 40th Par. 5: 382, pl. 40, f. 10-16, 1871.


In 1934 Miss Eastwood reported this species from Sonoma County, California (Leafl. W. Bot. 1: 131), where it had been established for some years. A native of the Mediterranean region, it has recently been discovered in Orange
Plate XII.

Fig. A. Eriogonum fasciculatum subsp. foliolosum. Flower 9 mm. long from base of pedicel to tip of stamens; involucre 4 mm.; bract 2.5 mm.
Fig. B. Eriogonum giganteum. Flower 8 mm. long; involucre 6 mm.; bract 3.5 mm.; pistil 1 mm.
Fig. C. E. fasciculatum foliolosum x E. giganteum. Flower 8 mm. long; involucre 3 mm.; bract 4 mm.; pistil 1 mm.; leaf 30 mm.
Fig. D. Eriogonum parvifolium subsp. typicum. Involucre 3 mm. long; leaf 25 mm.
Fig. E. E. parvifolium subsp. Paynei. Flower 7.6 mm. long; involucre 3 mm.; leaf 30 mm.
Fig. F. Pseudobahia Peirsonii. Disk flower 6.5 mm. long; ray flower 9 mm.
County. Mr. E. L. Paddock has found it naturalized in walnut groves in Santa Ana at two locations: north side of Manchester Street midway between Flower and Main streets, and on East Seventeenth one fourth mile east of Grand Street. A specimen by him, no. 12289 (CAS, RSA) was taken April 19, 1948, at which date it was in full flower. I am indebted to Mr. John Thomas Howell and Miss Elizabeth McClintock of the California Academy of Sciences for verifying my identification.

**Eriogonum fasciculatum** subsp. *foliolosum* (Nutt.) Stokes x *E. giganteum* Wats., hybr. nov.

PLATE XII, FIG. C; XIII, FIG. A.

An undershrub about 1 m. high, erect, with a spread somewhat less; stems several from base, 3 cm. thick, with brown exfoliating epidermis, freely branched, each main branch 6-10 mm. thick below and ending in a broad cyme; internodes mostly 1-1.5 cm. long, gray-tomentose when young, later glabratus; principal leaves mostly 2-3 cm. long, seemingly rather crowded because of fascicles or short axillary leafy branches; petioles winged, 3-6 mm. long; blades oblong-elliptic, 15-25 mm. long, 6-10 mm. wide, rather thick in texture, light green and glabrous above, densely white-tomentose beneath, quite revolute, acute at both ends; peduncles 10-16 cm. long, inconspicuously and closely tomentose; inflorescence cymose, 15-30 cm. across, with few widely divaricate branches, also closely tomentose; lowest bracts scarcely 1 cm. long, sessile, subelliptic, acute at both ends; upper bracts reduced, lance-oblong, 4.5 mm. long, strongly revolute, tomentose especially beneath; involucres rather crowded toward ends of branchlets, sessile, narrow-campanulate, tomentose, 3 mm. long, the teeth scarcely exserted from the connecting membrane; each involucre bearing a subspherical cluster of flowers which is about 6-7 mm. in diameter; calyx white with green base and midribs, somewhat loosely hairy on outer surface, about 3 mm. long, the lobes oblong-obovate, drying white or brown; stamens 7-9, white, 3.5-4 mm. long, with spreading hairs near base, anthers salmon-red; style white.

Suffrutex, 1 m. altus, erectus; caulibus ramosis, inferne 6-10 mm. crassis, tomentosis, tarde glabratibus; foliis principalibus 2-3 cm. longis; petiolis alatis, 3-6 mm. longis; laminis oblongo, ellipticis, 15-25 mm. longis, 6-10 mm. latissimis, supra glabris, infra tomentosis, revolutis, acutis; pedunculis 10-16 cm. longis; inflorescentia cymosa, 15-30 cm. lata, cum ramis divaricatis; involucris angustocampanulatis, tomentosis, 3 mm. longis; calycibus albis, pubescentibus, 3 mm. longis, cum lobis oblongo-obovatis.

Type, Aug. 25, 1946, *P. A. Munz* 11530, Rancho Santa Ana Botanic Garden Herbarium no. 39310; isotypes, CAS, DS, NY, WTU.* The type plant is a single adventive occurring in the Botanic Garden; the plant is still growing in December, 1948. In its erect habit, this plant suggests *E. giganteum*, as well as in the large inflorescence and in the tufts of flowers. The strongly revolute and smaller leaves, which are green above, are more like those of *E. fasciculatum*, although somewhat wider than in that species. The dried inflorescence makes a very attractive winter bouquet, with a rust-brown color as does *E. giganteum*.

*NY is New York Botanical Garden; WTU is University of Washington (Seattle).
**Eriogonum parvifolium** Smith subsp. **Paynei** Wolf, subsp. nov.

*Plate XII, Fig. E.*

Subshrub, about 6 dm. high, 6-9 dm. across, diffusely branched, the inflorescences 1-2 dm. across; internodes 2-5 cm. long; leaf-blades rather thin in texture, light green and glabrate above, pale-tomentose beneath, broadly lanceolate, slightly revolute, 15-30 cm. long, 5-10 mm. wide, acute at apex, cuneate at base; petioles mostly 4-10 mm. long; flowers much as in ssp. *typicum* but the calyces mostly white, the bracts subtending the involucres about one-half to two-thirds as long as the latter; flower-clusters scarcely 1 cm. thick.

Suffrutex, 6 dm. altus, 6-9 dm. latus, ramoso; inflorescentia 1-2 dm. lata; internodiis 2-5 cm. longis; laminis foliorum supra glabratis, infra tomentosis, late lanceolatis, subrevolutis, 15-30 mm. longis, 5-10 mm. latis, apice acutis, base cuneatis; petiolis 4-10 mm. longis; floribus eos subspeciei typicae simulantibus.

Type, from about 2 miles west of the summit of grade in Santa Paula Canyon, and about 5 miles above Santa Paula on the Ojai road, Ventura County, California, at 600 ft. elevation, *Theodore Payne 9534*, July 22, 1939, Rancho Santa Ana Botanic Garden 23576. It grew in shale on a steep cliff with a little seepage. Additional collections from the same place are: C. B. Wolf & P. C. Everett 9541, Oct. 18, 1939 (RSA) and *Wolf 10958*, July 2, 1941 (RSA). The general appearance of these plants is quite different from that of typical *E. parvifolium*, as well as from ssp. *lucidum* Stokes, in being more diffusely branched, with thinner and longer leaves, longer petioles and whiter flowers. In the coastal *E. parvifolium* the inflorescence is usually less than 1 dm. wide, the internodes 1-2 cm. long; petioles 3-6 mm. long; leaf-blades 6-12 mm. long, of thicker texture, crowded, abruptly contracted at base so as to be truncate or even subcordate. The calyces are often pink, and the bracts subtending the involucres tend to be less than half as long as the involucres, while the flower-clusters may be 1-2 cm. thick.

The Santa Paula plants are approached by a number of collections from farther north in California, such as Monterey County: San Jose Canyon, Monterey Peninsula, *J. D. Randall in 1909* (DS); Carmel River, *J. McMurphy in 1906* (DS); cliffs of Carmel Creek, *S. G. Stokes 97* (RSA). Santa Barbara County: Gaviota Pass, *H. L. Mason 422* (DS); sea-bluffs 20 miles northwest of Santa Barbara, *Munz 9288* (POM). Ventura County: dry hillside, 8 miles north of Ventura, *J. B. Feudge 1039* (POM). The last two collections named have long petioles and leaf-blades and lax inflorescence and approach *Paynei* quite closely. This subspecies has some horticultural value, making rather attractive low rounded bushes of a light color and requiring little attention or care.

**Cercidium floridum** x **C. microphyllum**, hybr. nov.

*Plate XIII, Fig. B.*

*C. floridum* Benth. is a tree characterized by its blue-green color, its nodal spines about 6 mm. long, the secondary leaflets 5-8 mm. long and in 1-3 pairs; pods flattened, 9-15 mm. wide, scarcely constricted between the seeds, straw-colored but not stiped or beaked; seeds brown, scarcely flattened in cross-section, rounded at both ends, 8-9 mm. long and about 5 mm. wide.
C. microphyllum (Torr.) Rose and Johnston has an olive-green color, no nodal spines, but the individual branchlets become thorny-tipped and about 10 cm. long; the secondary leaflets are 1-2 mm. long and in 4-7 pairs; the pods are scarcely flattened, are 9-10 mm. wide, brown in color, with well developed stipe and beak; seeds are flat, subtruncate at both ends, 8-10 mm. long by about 7 mm. wide.

Both these species grow in the Colorado Desert in the eastern part of California, at the base of the Whipple Mts., where they were studied by C. B. Wolf in July, 1940, at a point near the Colorado River and about 11 miles above Earp on the road to Parker Dam, San Bernardino County. Not at flower at that season, they were in good fruit. A single tree was found, Wolf 9722 (RSA), which combined characters of the two species in an interesting way and suggested a hybrid. With the olive-green color of C. microphyllum, it had solitary nodal spines 5-6 mm. long, 3-5 pairs of secondary leaflets 2-3.5 mm. long. The pods were brown, 9-11 mm. wide, somewhat flattened and intermediate as to constriction, and with some development of stipe and beak. Seeds were flattened, subtruncate, and about 10 mm. long by 7 mm. wide.

Spinae nodorum solitariae, 5-6 mm. longae; paribus foliolorum 3-5; foliolis 2-3.5 mm. longis; fructibus brunneis, 9-11 mm. latis, subplanis, leviter constrictis; seminibus planis, subtruncatis, 10 mm. longis, 7 mm. latis.


Dr. Wolf wrote, op. cit. 38, that he had not been able to determine the color of the fruits of this subspecies, but if it was true, as suggested in the literature, that they were black and bilocular, the plant might be worthy of specific rank. Since that time a few seeds were obtained from a collection made at Las Cuevas, Baja California by F. P. Cronemiller, no. 3044, May 12, 1941. Plants grown from these under Propagation No. 4469 have yielded fruit and were reported by P. C. Everett to be red. Five young fruits examined showed 1, 2, 2, 3, 3 ovules, so that there is no great departure from the number found in R. crocea, for which Wolf gave 2 or 3 nutlets.

Oenothera deltoides Torr. & Frem. var. Howelli, var. nov.

Apparently short-lived perennial, forming large tufts with coarse drooping stems 4-8 dm. long, much branched; leaves runcinate-pinnatifid, lanceolate in outline, 3-12 cm. long, 1-3 cm. wide, grayish with numerous short and fewer longer hairs; sepals 2-3 cm. long, densely more or less glandular-pubescent and with few to many fine wavy hairs 1-3 mm. long, free sepal-tips 1-3 mm. long; petals 2-3 cm. long; capsule 3-4 mm. thick at base.

Folia runcinato-pinnatifida, lanceolata, 3-12 cm. longa, 1-3 cm. lata, cinerea; apicibus sepalorum libris, 1-3 mm. longis.

Type, sand dunes at Antioch, Contra Costa County, California, April 19, 1936, Alice Eastwood & John Thomas Howell 2147, Rancho Santa Ana Botanic Garden No. 34667; isotypes at California Academy of Sciences and Pomona College. Other collections seen are: Antioch, C. F. Baker 2873 (POM),
Fig. A. *Eriogonum fasciculatum foliolosum* x *E. giganteum*. Plant 1 m. high.

Fig. B. Pods and seeds of *Cercidium floridum* to left, of *C. microphyllum* to right, of hybrid in center.

Fig. C. *Pseudobahia Heermannii*. Plants of Crum 2108 for habit.

Fig. D. *P. Peirsonii*. Plant of Wolf 6405.

**Plate XIII.**
P. A. Munz 12201 (RSA), V. Rattan in 1879 (DS), K. Brandegee in 1892 (DS, UC).

In my treatment of the subgenus Anogra (Am. Jour. Bot. 18: 309-327, 1931) I included the proposed variety under var. cognata, which occurs in the Interior Valley of California from Sacramento to Bakersfield. In that variety, however, the leaves are coarsely sinuate-dentate and the buds obtuse, while in var. Howellii the former are pinnatifid and the latter rather long-pointed. A collection from Fresno, J. W. Congdon (DS), is somewhat intermediate between the two, otherwise the plants from the sand hills at Antioch seem quite definite and distinct. Plants grown at the Botanic Garden from seed of Munz 12201 have maintained their characters and look very different from plants of var. cognata. It is a pleasure to name this variety for Mr. John Thomas Howell of the California Academy of Sciences, who called it to my attention some years ago.


When first described this calciphilous species was known to me from three collections from Clark County, southern Nevada. One of these was very near the eastern border of California. I have now seen additional material which modifies somewhat the characters as originally given and which considerably extends the range. The petals instead of being only 8-12 mm. long, run to as high as 24 mm.; sepals and other floral parts vary accordingly. The following Arizona specimens can be cited from the region immediately to the east of earlier records: Coconino County, 10 miles north of Navajo Bridge, May 6, 1942, Mrs. H. C. Cantelow (CAS); 6 miles west of Grand Canyon Bridge, Marble Canyon, S. B. Benson, June 3, 1933 (UC); Havasu Canyon, C. F. Deaver 1305, April 14, 1946 (CAS); Hermit Trail, Grand Canyon, A. Eastwood 5970, April 9, 1917 (CAS).


When I published the revision of the subgenus Chylismia in 1928 (Am. Jour. Bot. 15: 223-240), I had very little material of this species. As more has become available, it is evident that the species is not at all uniform, but can be divided as follows:

A. Hypanthium 7 mm. long; sepals 5-6 mm. long; petals 1 cm. long.

AA. Hypanthium 2.5-3 mm. long; sepals 2.5-3 mm. long; petals 3-5 mm. long.

B. Stems glandular-pubescent throughout, usually conspicuously so.

BB. Stems glabrous except sometimes on smaller branches of inflorescence, more or less glaucous.

Oenothera heterochroma Wats. var. typica Munz, nom. nov.

Oe. heterochroma Wats., l.c.

Stems glandular-pubescent, usually greenish.

Exemplified by the following specimens. NEVADA: Elko County, Palisade, Aug. 11, 1909, Heller 9943 (CAS). Lincoln County: 10 miles east of Groom Dry Lake, on

**Oenothera heterochroma** Wats. var. megalantha Munz. Leaf. W. Bot. 3: 52, 1941.

Known from a single collection from Cain Spring, Skull Mts., Nye County, Nevada, P. Train 2358 (POM, CAS).

**Oenothera heterochroma** Wats. var. monoensis Munz, var. nov.

Caules subglabri, glauci, saepe rubri; hypanthio 2.5-3 mm. longo; sepalis 2.5-3 mm. longis; petalis 3-5 mm. longis. Type, from Sherwin Grade, north of Bishop, Mono County, California, at 5,500 ft., Aug. 16, 1947, J. T. Howell 24172, California Academy of Sciences Herbarium 342092; isotype at Rancho Santa Ana Botanic Garden.

Other specimens examined are, CALIFORNIA: Mono County, Negit Island, A. D. Gifford 852 Aug. 19, 1937 (POM, UC); Sherwin Grade, F. W. Peirson (Peirson Herb.); Crooked Creek, White Mts., Peirson 795 (Peirson Herb.); Sherwin Grade, Howell 14369 (CAS). Inyo County, 7.7 miles east of Laws, White Mts., P. A. Munz 12693 (RSA).

**Pseudobahia Peirsonii** Munz, spec. nov.

Plate XII, Fig. F; XIII, Fig. D.

Floccose annual; stems erect, 2-6 (7.5) dm. high, 1.5-4 mm. thick, mostly branched above the base, the branches suberect to somewhat divaricate, green to reddish, the internodes usually 1-4 cm. long; leaves alternate, triangular-ovate in outline, gradually reduced up the stem; petioles 0.5-4 cm. long, somewhat flattened; blades mostly 1-3.5 cm. long, almost as wide, grayish-tomentose or -floccose, sometimes glabrate above, bipinnatifid into linear-oblong obtuse segments 1-5 mm. wide and somewhat revolute; peduncles solitary at the ends of the branches, tomentose, 2-10 cm. long; involucres semi-globose, whitetomentose to -floccose, 6-8 mm. high, 1-1.5 cm. broad in pressed specimens, the bracts about 8, in 1 series, ovate-lanceolate, scarcely united, acute; ray-flowers pistillate, fertile, generally 8, the tube about 2 mm. long, somewhat glandular-puberulent, the ligule 4-8 mm. long, almost or quite as wide, yellow, subtruncate at both ends; disk-flowers many, perfect, the corolla about 3 mm. long, the tube about 1 mm. long, narrow, glandular-puberulent, with longer hairs at the base of the throat, lobes ovate, acute, glabrous; anther-tips ovate; achenes cellular-punctate under a lens, almost black, rounded apically, subclavate, angled, about 3 mm. long, those from the ligulate flowers flattened on the back, the others somewhat compressed; pappus wanting or sometimes corona-like on disk-achenes.
Annua, floccosa; caule erecto, 2-6 dm. alto, 1.5-4 mm. crasso; ramis sub-erectis aut divergentibus; foliis alternatis, dentato-ovatis; petiolis 0.5-4 cm. longis; laminis 1-3.5 cm. longis, 1-3 cm. latis, bipinnatifidis, lobis lineare-oblongis, obtusis, revolutis, 1-5 mm. latis: pedunculis 6-8 mm. altis, 1-1.5 cm. latis; bracteis circa 8, ovato-lanceolatis, sublibris, acutis; floribus marginalibus pistillatis, fertilibus, circa 8, tubo 2 mm. longo, glanduloso-puberulente, ligulo 4-8 mm. longo et lato, luteo, in apicibus ambis subtruncato; floribus disci multis, perfectis, corolla ca. 3 mm. longa, tubo 1 mm. longo, angusto, glanduloso-puberulente, base faucis subvillosa, lobis ovatis, acutis; acheniis sublente celluloso-punctatis, atris, angusto-clavatis, angulatis, ca. 3 mm. longis, subplanis; pappo absente aut coronam simulante.

Type, from grassy flat, Ducor, Tulare County, California, March 20, 1925, P. A. Munz 9038, Pomona College Herbarium 97262. Collected at the same time and place was Peirson 5550 (CAS, Peirson Herb.), the label reading "Roadside, Ducor to Terrabella, Tulare Co." Other specimens seen, all from CALIFORNIA: Tulare County, Lindsay, Mrs. Mildred E. Hather, March, 1928 (CAS); 5 miles northwest of Lindsay, March 28, 1936, L. Benson 7577 (POM); Tulare, J. Burtt Davy, April, 1897 (UC); Exeter, H. E. & S. T. Parks, April 1, 1930 (UC); Dinuba, A. B. Bevans, April 11, 1927 (CAS); Porterville, April 12, 1922, Junea Kelly (CAS), Kern County, 9.5 miles west of Woody on the Delano road, C. B. Wolf 6105, April 16, 1935 (RSA). A plant from farther north is Merced County?, Snelling to Oakdale, J. W. Congdon, March 30, 1894 (UC). It is a pleasure to name this species for Frank W. Peirson of Altadena, California, with whom I first saw it growing in March 1925.

Specimens of this new species have been included in P. Heermannii (Durand) Rydb. or Monolopia Heermannii Durand or Eriophyllum Heermannii (Durand) Greene, depending on the generic position given that species. It does resemble that plant in having divided leaves, but is markedly different in its coarser stems (1.5-4 mm. thick as against 1-1.5 mm.), longer leaves (2-6 cm. as opposed to 1-2 cm.) with broader ultimate divisions (1-5 mm. wide instead of 0.5-1.5 mm.). The leaves are mostly bipinnatifid instead of pinnatifid, involucres 6-8 mm. high rather than 4-5 mm., and divided almost to the base as against one-half to two-thirds the way. The involucres lack the callosities at the sinuses usually evident in P. Heermannii. The ligules are almost as wide as they are long above the tube, while in P. Heermannii they are longer than wide. P. Heermannii is a plant of the foothills of the Sierra Nevada and is found at elevations of 1,000 to 3,800 ft., from Calaveras to Tulare counties, while P. Peirsonii seems to come mostly from grassy flats and rolling hills below 1,000 ft. and mostly from Tulare and Kern counties. P. Heermannii flowers mostly from April 15 to May 15, to judge from herbarium material, and P. Peirsonii in March and early April.

The generic position is somewhat difficult to determine. The absence of a tooth or ligule in the ray-corollas keeps it out of Monolopia, as that genus was treated in the revision by Dr. Ethel Crum (Madroño 5: 250-270, 1940). Constance in his study of Eriophyllum (Univ. Calif. Pub. Bot. 18: 69-136, 1937) excludes the Heermannii group, although Jepson (Man. Fl. Pls. Calif., 1117,
1925) does include that species. I am therefore following Crum and also Rydberg (No. Am. Fl. 34: 83, 1915) and putting the species Heermannii in Pseudobahia. The new species then goes in this same genus because of its lack of pappus and somewhat flattened achenes, to separate it from Eriophyllum, and because of the lack of black-pigmented hairs on involucral bracts, glabrous corolla-lobes, and absence of tooth opposite the ligule, to separate it from Monolopia.

Through the kindness of Mr. George R. Proctor of the Philadelphia Academy of Sciences, I have the following information concerning the type of Monolopia Heermannii Durand. He wrote that it "is indeed the smaller, slenderer plant that you describe as the foothill form, from which you are separating a larger valley species. Unfortunately, Dr. Heermann's specimens lack any information on date and altitude, the original label merely giving 'Caleveras (sic) Co. Calif.' for a locality."