

8. *Eriodictyon* Benth.

Upper leaf-surfaces dark green, glutinous, glabrous.

Leaves narrowly linear, with revolute margins, entire 1. *E. altissimum*.

Leaves oblong or lanceolate to ovate, not revolute, usually serrate

..... 2. *E. californicum*.

Upper leaf-surfaces from green and thinly pubescent to white-tomentose, not glutinous.

Calyx not glandular; corolla with open throat, the lobes gradually spreading

..... 3. *E. crassifolium*.

Calyx glandular; corolla constricted at throat, the lobes abruptly spreading.

Calyx-lobes dark-colored, thinly hairy on upper part, ciliate below; corolla

5 to 8 mm. long 4. *E. Traskiae*.

Calyx-lobes white-hairy throughout; corolla 3 to 4 mm. long

..... 5. *E. tomentosum*.

1. *E. altissimum* Wells. On sandstone, a local component of chaparral on Indian Knob Ridge between San Luis Obispo and Pismo Beach. A remarkable, highly localized endemic.

2. *E. californicum* (H. & A.) Torr. MOUNTAIN BALM. YERBA SANTA. Mountain north of Arroyo de la Cruz (*Susan Allison* in 1966).

3. *E. crassifolium* Benth. var. *denudatum* Abrams. Along Cuyama River at upper end of Cuyama Canyon (near Gypsum Canyon).

4. *E. Traskiae* Eastw. Locally plentiful on white shale, ridge southeast of Cuesta Pass.

5. *E. tomentosum* Benth. Dry hilly areas, east slope of Santa Lucia Range west of Paso Robles; Salinas River eastward to La Panza Range, where notably abundant.

Boraginaceae. BORAGE FAMILY

Corolla not yellow, usually white, sometimes blue or purplish.

Leaves of fleshy texture; ovary not deeply 4-lobed, the fruit splitting into 4 nutlets; stigma sessile on top of ovary 1. *Heliotropium*.

Leaves not fleshy; ovary deeply 4-lobed, the nutlets distinct from the first (some of them often abortive); style present, not connected with nutlets.

Nutlets with barbed or hooked prickles.

Erect to prostrate annuals with narrow leaves; corolla white, inconspicuous; nutlets flat, the margin with hooked prickles or bristles

..... 2. *Pectocarya*.

Erect perennial with broad leaves; corolla blue; nutlets subglobose, prickly all over 3. *Cynoglossum*.

Nutlets without prickles (or minute ones in *Allocarya*:—annuals with small flowers, erect nutlets, and the lower leaves opposite).

Corolla blue, 15 to 20 mm. wide 4. *Borago*.

Corolla white, not over 8 mm. wide.

Basal leaves forming a rosette, distinctly larger than the cauline leaves 5. *Plagiobothrys*.

Lowest leaves not forming a clearly defined rosette.

Calyx circumscissile, the upper part falling away; flowers each in the axil of a bract, crowded in very short spikes

..... 6. *Greeneocharis*.

Calyx not circumscissile; flowers in more or less elongate "spikes" (hellicoid cymes), usually bractless or with bracts fewer than flowers.

Nutlets keeled on ventral side.

Lower leaves opposite; nutlets without a stipe

..... 7. *Allocarya*.

Leaves all alternate; nutlets attached by a stipe near middle of ventral side 8. *Echidiocarya*.

Nutlets not keeled on ventral side, with narrow ventral groove 9. *Cryptantha*.

Corolla orange or yellow 10. *Amsinckia*.

1. *Heliotropium* L. HELIOTROPE

1. *H. curassavicum* L. var. *oculatum* (Heller) Johnston. Common in saline, alkaline, or moist ground in the valleys and along the seashore.

2. *Pectocarya* DC.

Nutlets divergent in pairs, those of a pair less widely separated than are the pairs.

Stems widely spreading or nearly prostrate; nutlets elongate.

Wing of nutlet bordered by triangular teeth tipped with a short hooked bristle 1. *P. linearis*.

Wing of nutlet not toothed, or with a very few broad teeth near base, with hooked bristles at apex and sometimes a few below 2. *P. penicillata*.

Nutlets all approximately alike, wing-margined var. *penicillata*.

One nutlet of each pair with very narrow wing or none; nutlets near base of plant often all unmargined var. *heterocarpa*.

Stem erect; nutlets orbicular to obovate 3. *P. setosa*.

Nutlets divergent at equal angles from center 4. *P. pusilla*.

1. *P. linearis* DC. var. *ferocula* Johnston. Dry sandy or gravelly places in eastern part; in 1948 noted as very abundant along San Juan River south of Shandon (7464).

2. *P. penicillata* (H. & A.) A. DC. var. *penicillata*. Common in sandy soils, Salinas Valley eastward to Temblor Range. There is no record for this species in our coastal region, although it may be there. Most specimens from the county have nutlets more or less heteromorphic, thus varying toward var. *heterocarpa*.

Var. *heterocarpa* Johnston. Common in eastern part.

3. *P. setosa* Gray. Sandy or gravelly soils, north of Pozo; more frequent eastward to Cottonwood Pass and Temblor Range.

4. *P. pusilla* (A. DC.) Gay. Local in seepage spot, between Rocky Butte and Pine Mt., Santa Lucia Range (7899).

3. *Cynoglossum* L.

1. *C. grande* Dougl. HOUND'S TONGUE. In woods, summit between See Canyon and Coon Creek in San Luis Range; Santa Lucia Mts. from Lopez Canyon northward, where often locally abundant.

4. *Borago* L.

1. *B. officinalis* L. BORAGE. Escaped from cultivation: weedy roadside, Cambria; *J. T. Howell* 40,817 in 1964

5. *Plagiobothrys* F. & M.

Calyx circumscissile, the lobes curved inward over fruit; nutlets in most flowers fewer than 4.

Spikes solitary, usually with a few bracts; nutlets strongly arched in side view

..... 1. *P. arizonicus*.

Spikes mostly paired or in 3's, bractless or sometimes with a bract at base; nutlets not strongly arched 2. *P. nothofulvus*.
 Calyx not circumscissile, the lobes erect or somewhat spreading; nutlets in most flowers 4.

Nutlets with narrow transverse ridges separated by broader flat intervals, or in *P. infectivus* without clearly defined transverse ridges.

Calyx with reddish-brown hairs.

Herbage staining paper violet; midribs and margins of leaves not conspicuously dark; spikes bractless or with bracts only near base

3. *P. fulvus*.

Herbage staining paper reddish-purple; midribs and margins of leaves conspicuously dark on lower side; spikes bracteate throughout

4. *P. infectivus*.

Calyx white-hairy, or only slightly brownish.

Stems over 12 cm. long, or rarely less; calyx 4 to 6 mm. long in fruit

5. *P. canescens*.

Stems less than 12 cm. long, or rarely more; calyx 2.5 to 3 mm. long in fruit 6. *P. myosotoides*.

Nutlets with low broad transverse ridges separated by narrow grooves.

Spikes bracteate; fruiting calyx 6 to 7 mm. long 7. *P. shastensis*.

Spikes not bracteate or only at base; fruiting calyx 3 to 4 (rarely to 6) mm. long 8. *P. tenellus*.

1. *P. arizonicus* (Gray) Greene. Hills near our eastern border, in sand or crumbling shale: Cottonwood Pass; according to Twisselmann, "common throughout the Temblor Range."

2. *P. nothofulvus* Gray. POPCORN FLOWER. Grassland or thinly wooded areas: occasional on coastal hills; abundant at many places in Santa Lucia Range and in upper Salinas Valley; rare or apparently absent east of La Panza Range.

3. *P. fulvus* (H. & A.) Johnston var. *campestris* (Greene) Johnston. Locally common in upper Salinas Valley from Santa Margarita to Pozo, and eastward to La Panza district.

4. *P. infectivus* Johnston. Hillside patches of clay soil which probably contain lime or gypsum: occasional from vicinity of Cammatti Creek eastward.

5. *P. canescens* Benth. In more or less sandy soils, common from Salinas Valley eastward; infrequent westward (San Luis Obispo) or at least seldom collected. Along our eastern border (Cottonwood Pass to Cuyama Valley) are plants which somewhat imitate *P. shastensis* in aspect. They have fewer and more erect branches than most specimens of *P. canescens* and are less conspicuously white-hairy. The characters of their nutlets, however, place them in *P. canescens*.

6. *P. myosotoides* (Lehm.) Brand. Rare in Santa Lucia Mts.: 9 miles northwest of Adelaida, *Eastwood & Howell* 2370 in 1936.

7. *P. shastensis* Greene. Local in red gravelly clay, 18 miles east of Creston on La Panza road (7589, 7618).

8. *P. tenellus* (Nutt.) Gray. Common in sandy soils of the interior, but apparently absent from the driest localities. Perhaps present also near coast, but records are lacking.

6. *Greeneocharis* Guerke & Harms

1. *G. circumscissa* (H. & A.) Rydb. Occasional in dry sand in interior: north of Pozo; San Juan River basin; north end of Elkhorn Plain.

7. *Allocarya* Greene

Stems spreading or ascending; calyx symmetrical or nearly so.

Scar of nutlet small, not deeply hollowed, basal, or ventral and extending from base upward.

Scar of nutlet exactly basal 1. *A. stipitata*.

Scar of nutlet ventral or obliquely basal.

Nutlets with linear scar.

Ventral keel of nutlet lying in a groove 2. *A. Chorisiana*.

Ventral keel of nutlet not in a groove 3. *A. undulata*.

Nutlets with ovate or oblong scar.

Nutlets with smooth transverse or oblique ridges.

Ventral keel of nutlet not in a groove; scar obliquely basal

4. *A. bracteata*.

Ventral keel of nutlet in a groove; scar ventral but reaching base 5. *A. californica*.

Nutlets with rough-edged or dentate transverse ridges

6. *A. trachycarpa*.

Scar about $\frac{1}{3}$ length of nutlet, deeply hollowed, situated on ventral side above base 7. *A. acanthocarpa*.

Nutlets bearing minutely barbed spines var. *acanthocarpa*.

Spines of nutlets few and reduced, or absent var. *oligochaeta*.

Stems prostrate; calyx-lobes all directed toward upper side.

Fruiting calyx 4 to 6 mm. long; nutlets attached at base, the scar circular, not bordered by a ridge 8. *A. leptoclada*.

Fruiting calyx 6 to 10 mm. long; nutlets attached on ventral side near base, the scar ovate or deltoid, bordered by a ridge 9. *A. humistrata*.

1. *A. stipitata* Greene var. *micrantha* (Piper) Macbr. Drying beds of vernal pools near Creston and perhaps elsewhere. A record from Cholame Valley (Jepson, Fl. Cal. 3: 360) is perhaps based on an incorrect identification.

2. *A. Chorisiana* (Cham.) Greene var. *Hickmanii* (Greene) Jepson. San Simeon, *K. Brandegee* (Jepson, Fl. Cal. 3: 359).

3. *A. undulata* Piper. In the bed of a vernal pool, 4 miles southeast of Santa Margarita (8757).

4. *A. bracteata* Howell. Frequent in Salinas River basin, in places which are moist during growing season: 7 miles east of Adelaida; near Estrella; between Santa Margarita and Pozo.

5. *A. californica* (F. & M.) Greene. Moist depressions in coastal region: Los Osos Valley (9030); possibly at Cambria. The identity of our plants is uncertain, largely because *A. californica* and *A. trachycarpa* are difficult to tell apart when mature fruit is lacking.

6. *A. trachycarpa* (Gray) Greene. Moist clay soils in widely scattered localities: San Miguel; 4 miles southeast of Santa Margarita; 3 miles east of Pozo; Laguna near San Luis Obispo.

7. *A. acanthocarpa* Piper var. *acanthocarpa*. Frequent in clay soils in interior: west base of La Panza Range near Pozo; Carrizo Plain and Temblor Range.

Var. *oligochaeta* (Piper) Jepson. At scattered localities within the range of the species: Carrizo Plain, *Condit*.

8. *A. leptoclada* Greene. Frequent in valleys of eastern part in clay, usually alkali soils, Cholame Valley to Carrizo Plain; probably also in Cuyama Valley.

9. *A. humistrata* Greene. Rare in low places flooded during rains: 18 miles east of Creston on La Panza road (7592, 7620).

8. *Echidiocarya* Gray

1. *E. californica* Gray var. *fulvescens* (Johnston) Hoover, n. comb. *Plagiobothrys californicus* (Gray) Greene var. *fulvescens* Johnston, Contr. Gray Herb. 68: 74. 1923. Infrequent in sandy soils, often appearing after fire: bluffs near Ragged Point; Oak Park district near Arroyo Grande; Navajo Creek, La Panza Range; Huasna district.

9. *Cryptantha* Lehm.

Nutlets tuberculate, granulate, papillate, or muricate.

Nutlets, or at least most of them, bordered by a white erose wing.

Corolla 4 to 7 mm. wide 1. *C. oxygona*.

Corolla 1 to 2 mm. wide 2. *C. pterocarya*.

Nutlets not wing-margined.

Nutlets normally 4 (sometimes a few flowers with not all of nutlets developing).

Calyx in fruit 1 to 1.5 mm. long, with fine hooked bristles; one of nutlets smooth and slightly larger than others 3. *C. micromeres*.

Calyx in fruit 3 to 8 mm. long, the bristles not hooked; nutlets alike.

Calyx narrowed above a ventricose base, 4 to 8 mm. long; nutlets ovate-lanceolate.

Calyx mostly 4 to 6 mm. long, with short appressed hairs and longer bristles; leaves narrowly linear even on vigorous plants; lower part of stem strigose as well as spreading-bristly

4. *C. intermedia*.

Corolla 3 to 7 mm. wide var. *intermedia*.

Corolla 1 to 3 mm. wide var. *rigida*.

Calyx mostly 6 to 8 mm. long, with copious long hairs on lower part; leaves on vigorous plants linear-oblong; lower part of stem hispid, with few or no appressed hairs

5. *C. barbiger*.

Calyx broadly ovoid or subglobose, 3 to 4 mm. long; nutlets triangular-ovate 6. *C. muricata*.

Corolla 4 to 7 mm. wide var. *muricata*.

Corolla 1 to 4 mm. wide var. *Jonesii*.

Nutlet solitary 7. *C. corollata*.

Nutlets smooth.

Hairs on calyx straight, those on lower part not deflexed.

Hairs on upper part of calyx-lobes ascending or spreading.

Leaves mostly oblong or oblanceolate; spikes bracteate

8. *C. leiocarpa*.

Leaves mostly linear to lanceolate; spikes bractless except sometimes at base.

Fruiting calyx 2 to 5 mm. long; style more than half as long as nutlets, usually equalling them; nutlets 1 to (usually) 4

9. *C. Clevelandii*.

Corolla 1 to 2 mm. wide var. *Clevelandii*.

Corolla 2 to 5 mm. wide var. *hispidissima*.

Fruiting calyx 1 to 2 mm. long; style less than half as long as nutlets; nutlet solitary 10. *C. microstachys*.

Hairs on upper part of calyx-lobes retrorse 11. *C. nemaclada*.

Hairs on calyx curved, those on lower part deflexed 12. *C. flaccida*.

1. *C. oxygona* (Gray) Greene. On crumbling shale or sandy slopes and in sandy washes: Cottonwood Pass, Temblor Range, and Cuyama Valley. Reaches its maximum abundance on north-facing slopes in the southern Temblor Range. In this area *C. oxygona* is not clearly differentiated from *C. pterocarya* and probably should be made a variety of it.

2. *C. pterocarya* (Torr.) Greene. Occasional in Temblor Range and washes issuing from it. Small-flowered plants are scarce here as compared with *C. oxygona*.

3. *C. micromeres* (Gray) Greene. Sandy soil in wooded or chaparral areas, generally appearing after fire: Oak Park district near Arroyo Grande (6765).

4. *C. intermedia* (Gray) Greene var. *intermedia*. Common in sandy soils, except very near the sea, inland to Palo Prieto Canyon and western edge of Carrizo Plain.

Var. *rigida* (Johnston) Brand. Common in eastern part, in sands, gravels, and crumbling shale; intergrading with typical *C. intermedia* where their ranges come together. Also very similar to narrow-leaved plants of *C. barbiger*, from which it differs in its strigose rather than spreading-hirsute stems. The two species, when growing together at Cottonwood Pass, looked much alike but were distinct.

5. *C. barbiger* (Gray) Greene. Gravelly or sandy soil, occasional in eastern part: Cottonwood Pass; just west of San Juan River, La Panza district; north end of Elkhorn Plain. Also Santa Maria River bed, *Eastwood* in 1906; an occurrence which would seem improbable except that many other species of the desert interior are likewise carried down toward the coast.

6. *C. muricata* (H. & A.) Nels. & Macbr. var. *muricata*. Rocky places, notably plentiful after fire or clearing: Common in Santa Lucia Range, eastward to La Panza Range and Cuyama Canyon; rare in Red Hills near Shandon.

Var. *Jonesii* (Gray) Johnston. Associated with typical *C. muricata* in Santa Lucia Mts., and intergrading with it; rare on Caliente Mt.

7. *C. corollata* Johnston. On rocky or gravelly slopes: Santa Lucia Range (Lopez Canyon); La Panza Range; Suey Creek (*Eastwood 122*); notably abundant on north side of lower Cuyama Valley.

8. *C. leiocarpa* (F. & M.) Greene. Occasional on coastal dunes: Point Sierra Nevada; north end of Morro Bay; Oceano Beach; Oso Flaco Lake.

9. *C. Clevelandii* Greene var. *Clevelandii*. As distinguished from var. *hispidissima* by its very small corollas, rare and sporadic: coastal bluffs near Ragged Point; Cottonwood Pass; Tassajera Peak and southeast of Cuesta Pass in Santa Lucia Mts. The variety *hispidissima* is variable, however, and many plants are intermediate.

Var. *hispidissima* (Greene) Johnston. Very common in sandy or rocky soils, often on serpentine, from coast eastward to La Panza Range. Especially vigorous and abundant after fires.

10. *C. microstachys* Greene. Gravelly or sandy soils in chaparral or open woods, growing most commonly among *Adenostoma* and thriving after fire, from coastal hills eastward to La Panza Range.

11. *C. nemaclada* Greene. Barren clay or rocky slopes in interior: Paso Robles (Jepson, Fl. Cal. 3: 352); Cottonwood Pass to Temblor Range and Caliente Mt., where locally abundant.

12. *C. flaccida* (Dougl.) Greene. Rare in the county, and known only in eastern part, in sandy soils: hills west of Carrizo Plain; Temblor Range.

10. *Amsinckia* Lehm. FIDDLENECK

Calyx-lobes mostly 2 wide and 1 narrow, or 1 wide and 3 narrow.

Leaves glaucous, ciliate, pustulate but scarcely hairy on surfaces, nutlets smooth

1. *A. vernicosa*.

Corolla 8 to 12 mm. long, 2 to 8 mm. wide; ventral groove of nutlet not forked at base var. *vernicosa*.

Corolla 12 to 18 mm. long, 8 to 14 mm. wide; ventral groove of nutlet forked at base var. *furcata*.

Leaves not glaucous, hairy with mostly pustulate-based hairs; nutlets tuberculate or tessellate.

Corolla 6 to 14 mm. wide.

Flowers heterostylic (some plants with short style and stamens attached high in corolla-throat, others with long style and stamens attached low in corolla-tube); corolla 15 to 20 mm. long, 10 to 14 mm. wide

2. *A. Douglasiana*.

Flowers homostylic (plants approximately uniform with regard to length of style and attachment of stamens); corolla 12 to 16 mm. long, 6 to 9 mm. wide 3. *A. tessellata* var. *gloriosa*.

Corolla 2 to 6 mm. wide.

Calyx and upper stem densely bristly and densely to sparsely appressed-hairy; stem (except under drought conditions) branching throughout

3. *A. tessellata* var. *tessellata*.

Calyx densely covered with soft appressed brown hairs, the bristles few and short; stem simple or with short strictly ascending branches above

3. *A. tessellata* var. *elegans*.

Calyx-lobes 5, all narrow (partly fused toward base in *A. spectabilis*).

Leaves mostly irregularly dentate, each tooth ending in a hair, the leaves otherwise sparsely hirsute; nutlets dark brown, 1.5 to 2 mm. long ... 4. *A. spectabilis*.

Some of calyx-lobes usually partly fused; corolla 8 to 12 mm. long

var. *spectabilis*.

Calyx-lobes distinct to base or nearly so; corolla 12 to 16 mm. long

var. *microcarpa*.

Leaves entire or obscurely denticulate, moderately to densely hirsute or strigose; nutlets whitish, grayish, or light brown, 2 to 3.5 mm. long.

Corolla 7 to 11 mm. long; stem hirsute but not strigose or sparsely so.

Corolla with open throat, the stamens exerted from the tube

5. *A. intermedia*.

Corolla constricted at throat, which is closed by hairy swellings; stamens included in corolla-tube 6. *A. lycopsoides*.

Corolla 5 to 7 mm. long; stem usually finely strigose as well as hirsute

7. *A. Menziesii*.

1. *A. vernicosa* H. & A. var. *vernicosa*. Frequent in crumbling shale or white clay, usually on steep slopes and often where the soil is rich in gypsum, from 9 miles east of Creston (8099) eastward. On east slope of Santa Lucia Range in Monterey Co., and therefore to be sought west of Paso Robles. The plants reported by Twisselmann as var. *furcata* are actually of the typical form of the species. A local race with larger corollas (5 to 8 mm. wide) is frequent in the vicinity of Cholame. Such plants vary toward var. *furcata* in flower-size but lack the forked groove of the nutlet, which is the distinctive feature of that variety.

Var. *furcata* (Suksd.) Hoover. The type is labelled as collected on the "white hills" on the northern side of Cuyama Valley. Because no recent observer has been able

to confirm this record, the possibility of an error is to be considered. This very showy plant, if present, should be easy to find. Otherwise it occurs in western Fresno and Kings Counties, some distance to the north of the recorded type locality.

2. *A. Douglasiana* A. DC. As defined by Ray and Chisaki (Am. Journ. Bot. 44: 529-536), this species is relatively rare, occurring as dense but small colonies at widely scattered places: near Fernandez Creek between La Panza and Creston; La Panza district. It is somewhat more widespread in Monterey Co. The large, brightly colored flowers form splashes of color on the hillsides which greatly enhance the character of the dry country where they are found. *Amsinckia Lemmonii* Macbr., based on a collection from Cholame, is included here by Ray and Chisaki; however, all collections seen from the vicinity of Cholame seem rather to belong to the species which Ray and Chisaki called *A. gloriosa*.

3. *A. tessellata* Gray var. *tessellata*. From Salinas Valley eastward, growing in sandy soils, friable clays, or crumbling shale. The small-flowered densely bristly plants ("typical" *A. tessellata*) are widespread but not so numerous in this area as the larger-flowered ones called *A. gloriosa* in recent references. A large proportion of the plants are intermediate.

Var. *gloriosa* (Eastw. ex Suksd.) Hoover, n. comb. *A. gloriosa* Eastw. ex Suksd., Werdenda 1: 103. 1931; type locality White Hills, Cuyama. Very abundant in the same areas where var. *tessellata* occurs, although apparently absent from the southern Temblor Range and hills bordering Cuyama Valley. One of the very few native plants which in this region can be properly regarded as a weed. Although Ray and Chisaki maintained *A. gloriosa* as a species, they stated that it and *A. tessellata* have the same chromosome number and are interfertile (Am. Journ. Bot. 44: 537, 539). The prevalence of intermediates prevents the segregation of San Luis Obispo Co. plants into distinct groups. I suspect that the correct name for var. *gloriosa* may be *A. tessellata* var. *Lemmonii* (Macbr.) Jepson, because of the prevalence of such plants around Cholame, the type locality of *A. Lemmonii*; but Ray and Chisaki have listed that name as a synonym of *A. Douglasiana*. No large-flowered plants could be found in the white hills on the north side of Cuyama Valley in 1967, although small-flowered *A. tessellata* was abundant. There is thus reason to suspect, as with *A. furcata*, that the type collection is erroneously labelled.

Var. *elegans* (Suksd.) Hoover, n. comb. *A. elegans* Suksd., Werdenda 1: 103. 1931. *A. Douglasiana* var. *elegans* Jepson & Hoover in Jepson, Fl. Cal. 3: 321. 1943. Locally abundant on Carrizo Plain (9757), and found at scattered localities northward to Contra Costa Co. Ray and Chisaki separated *A. gloriosa* and *A. tessellata* because of a difference in size of the corolla, along with associated differences in flower structure. If the whole plant be considered, rather than the flowers only, a somewhat different classification is suggested. Although in flower-size var. *elegans* matches typical *A. tessellata*, the stems have a few strictly ascending branches or are branched only at the top. The calyx is not conspicuously bristly but is densely covered with appressed rusty-brown hairs. As long as the chromosome number of var. *elegans* remains unknown, the possibility should be kept in mind that it may be a diploid, like *A. Douglasiana*. There is, however, apparent intergradation with the tetraploid *A. tessellata*.

4. *A. spectabilis* F. & M. var. *spectabilis*. Sandy soils near the sea, at least from Toro Creek northward.

Var. *microcarpa* (Greene) Jepson & Hoover. Plentiful on south side of Morro

Bay, and from Pismo Beach southward, extending inland to sandy hills on south side of San Luis Valley.

5. *A. intermedia* F. & M. FIDDLENECK. Grasslands and open woods from coast to vicinity of La Panza Range. Probably very common; although, in the absence of extensive collections, it can not now be determined how many of the plants so often seen and assumed to be this species may instead be *A. lycopsoides*. "Fiddleneck" is the usual English name for any *Amsinckia* in the San Joaquin Valley and elsewhere. Locally *A. tessellata* and its varieties have frequently been called "fireweed," but that name has long been established in the English language as the designation for *Epilobium angustifolium*.

6. *A. lycopsoides* Lehm. From Salinas Valley eastward to Carrizo Plain, often locally plentiful. Readily confused with *A. intermedia* and *A. Menziesii*, so perhaps more widely distributed.

7. *A. Menziesii* (Lehm.) Nels. & Macbr. At least from summits of Santa Lucia Range eastward to Temblor Range, often abundant.

Verbenaceae. VERBENA FAMILY

Stems erect to spreading, not rooting at nodes; calyx 5-toothed 1. *Verbena*.
Stems creeping, rooting at nodes; calyx 2-lobed 2. *Phyla*.

1. *Verbena* L.

Bracts shorter than calyx or barely equalling it.

Leaves soft-pubescent; nutlets not papillate on inner surface 1. *V. lasiostachys*.

Calyx-teeth about 1 mm. long var. *lasiostachys*.

Calyx-teeth nearly obsolete var. *Abramsii*.

Leaves scabrous; nutlets densely papillate on inner surface 2. *V. robusta*.

Bracts longer than calyx 3. *V. bracteata*.

1. *V. lasiostachys* Link var. *lasiostachys*. Common in dry to moist places from coast inland to La Panza Range; also summit of Palo Prieto Canyon (*Twisselmann 4887*), grading toward var. *Abramsii*. This species is evidently the one which *Twisselmann* reported under the name *V. menthaefolia* as occurring in the Choice Valley Hills. Sometimes the flowers are white instead of the usual violet color. Some of the specimens have been identified by H. N. Moldenke as var. *septentrionalis*, which is described as having a shorter calyx, but measurements of the calyx on such specimens show no difference from those plants which Moldenke identified simply as *V. lasiostachys*.

Var. *Abramsii* (Moldenke) Jepson. Hills at summit of Palo Prieto Canyon, in a vernal pool bed (*Twisselmann 7422*).

2. *V. robusta* Greene. Frequent along streams and around springs in coastal area, often in areas of serpentine; rare on east slope of Santa Lucia Range and not observed farther inland. No specimens have been seen to verify *Twisselmann's* report of this species as "occasional in the Choice Valley hills." Probably the report was based on plants of *V. lasiostachys* or its var. *Abramsii*.

3. *V. bracteata* Lag. & Rodr. Low places in interior, where subject to occasional flooding: Owen's Lake at summit of Palo Prieto Pass; Grant Lake; Salinas River near Templeton; Atascadero Lake; between Santa Margarita and Atascadero.

2. *Phyla* Lour.

1. *P. nodiflora* (L.) Greene. Presumably escaped from cultivation in low valleys: Paso Robles (*Chester Dudley* in 1926); Laguna near San Luis Obispo; Nipomo

Creek. The Dudley collection is identified by H. N. Moldenke as var. *canescens* (H.B.K.) Moldenke.

Labiatae. MINT FAMILY

Corolla-lobes unequal, arranged in 2 lips.

Flowers in reduced cymes or solitary in the axils of the upper leaves or bracts (sometimes forming a "panicle" when bracts are very small); pedicels nearly always present though sometimes very short (*Melissa* and to some degree *Satureja mimuloides* have flowers in whorls but with evident pedicels).

All or most of axils bearing few-flowered cymes.

Stamens 4, extending far beyond longer corolla-lip; leaves not white-felted 1. *Trichostema*.

Stamens 2, not extending beyond longer corolla-lip; leaves covered with a close white felt 9. *Salvia*.

Flowers solitary in the axils, or sometimes a few of the axils bearing one or few additional flowers (*Melissa* has more than one flower in most axils).

Herbs; corolla with 2 lobes in upper and 3 in lower lip.

Calyx 2-lipped with entire lips 2. *Scutellaria*.
Calyx-teeth 5.

Calyx-teeth unequal, forming 2 lips 3. *Melissa*.

Calyx-teeth equal or slightly unequal 4. *Satureja*.

Shrubs; corolla with 4 short lobes and 1 long lower lobe 5. *Lepechinia*.

Flowers in whorls; pedicels absent or nearly so (see *Melissa* above).

Perennials (our species), with rhizomes, or with stems clustered from a woody base, or a few shrubby.

Flower-whorls crowded to form a single dense terminal "spike," the bracts (except the lowermost) hidden by the flowers.

Calyx-tube with about 12 to 15 longitudinal veins; calyx-teeth purple 6. *Agastache*.

Calyx-tube with 5 evident veins; calyx-teeth green 8. *Stachys pycnantha*.

Flower-whorls separated, with evident bracts.

Calyx-teeth 10, hooked 7. *Marrubium*.

Calyx-teeth 5, or fused to appear fewer, not hooked.

Calyx not 2-lipped, with 5 subequal teeth 8. *Stachys*.

Calyx 2-lipped 9. *Salvia*.

Annuals (our species) with slender tap-root.

Bracts not conspicuously veined, not translucent or with marginal spines.

Leaves pinnatifid or bipinnatifid; bracts spine-tipped; corolla blue or violet 9. *Salvia*.

Leaves entire to crenate or serrate; bracts not spine-tipped; corolla rose-red or purple.

Bracts about as broad as long, crenate 10. *Lamium*.

Bracts much longer than broad, more or less widened upward; entire 11. *Pogogyne*.

Bracts conspicuously veined, translucent, bearing spines on the margin 12. *Acanthomintha*.

Corolla-lobes approximately equal, the corolla from 2-lipped to almost regular.

Flowers in heads terminating the branches, surrounded by bracts

..... 13. *Monardella*.

Flowers in whorls in the upper leaf-axils or in interrupted terminal spikes

..... 14. *Mentha*.