

NEW SPECIES OF CALIFORNIAN PLANTS.

ALICE EASTWOOD.

(WITH TWO FIGURES)

✓ *Zygadenus exaltatus*, n. sp.—Bulb large, pear-shaped, covered with brownish, membranous coats, about 10^{cm} long, and half as wide: radical leaves forming a conspicuous bunch sheathing the base of stem, 6^{dm} or more long, 2^{cm} wide, veins prominent, midrib conspicuous on lower part of leaf, less so above, glabrous except for the short, rather thick cilia on the margin: stem tall and stout, hollow, 7–8^{dm} high, 1^{cm} in diameter at base, leafy to the inflorescence: upper leaves merging into the bracts, lower cauline with broad clasping base, 3–4^{dm} long and as broad as the radical leaves: inflorescence paniculate, 2–3^{dm} long, the upwardly spreading branches varying in length at different stages of development, the lower branches generally bearing only staminate flowers, the perfect flowers principally borne on the main stem above the branches; staminate racemes with peduncles shorter than the bracts; bracts attenuate; bractlets white, membranous, longer or shorter than the slender pedicels, ovate-attenuate: perianth 17^{mm} in diameter, outer divisions sessile, elliptical, obtuse, the gland 2^{mm} from the base with parallel veins below forming a margined claw, veins on the upper part proceeding from the teeth of the gland, branching; inner divisions of the perianth with claw 2^{mm} long, 1^{mm} wide, the gland oblong, obtuse, veins as in the outer division; filaments broadening towards the base, 5^{mm} long, attached to base of perianth, anthers oblong, becoming explanate in age: fruit becoming 2^{cm} long, including the rostrate styles, tapering a little more at base than at summit.

Type collected by *F. E. Blaisdell* at Prindle's ranch, above Mokelumne Hill, Calaveras County, California, at an altitude of 425^m, in April 1900. The other specimens in the Herbarium of the California Academy of Sciences are Amador, California, May 1886, *M. K. Curran* (specimen with root); Soda Creek, Tulare County, *C. A. Purpus*, June 1896, no. 1549; Hindeman's Trail over Coyote Pass, Tulare County, California, July 19, 1903, collected by myself. I also saw it on the trail on the way to Little Kern. In habit of growth and

size of bulb it is related to *Z. paniculatus*, but it has flowers much larger and all the floral organs differently shaped. It is probably the largest species of *Zygadenus* known. It is probable that there is no *Z. paniculatus* on the western slope of the Sierra Nevada.

✓ ***Silene deflexa***, n. sp.—Stems several from a creeping rootstock, about 2^{dm} high, erect, glandular-puberulent especially above: radical leaves spatulate, 1–2^{cm} long including the margined petioles, rather thick in texture, obtuse; cauline leaves 3–4 pairs, the uppermost very small, not more than 3^{mm}, the lowest oblanceolate to oblong, obtuse, 2^{cm} long, connate-clasping and nodose at base: flowers solitary in the lower leaf-axils, pedicels erect and close to stem, flowers curved-deflexed in anthesis, erect in fruit; terminal flowers few, cymose, pedicels capillary, 7–12^{mm} long, generally shorter than the flowers; calyx narrowly cylindrical in flower, enlarging and breaking apart with the expanding capsule, 10-ribbed, 9^{mm} long, divisions rounded at apex, oblong, sometimes uneven, membranously margined, 1.5^{mm} long; petals with the claws united to the stamens and the stipe of the ovary at base, woolly, gradually enlarging to the blade, not auricled, blade 4-cleft into linear lobes, the two middle 2^{mm} long, 0.5^{mm} wide, the two lateral narrower and shorter, appendages oblong, reaching the base of divisions, retuse with one side pointed; stamens and styles apparently not surpassing the petals, the latter three and the upper thick part of the ovary splitting into three valves, lower part of ovary thin cylindrical, all together 4^{mm} long; stipe 1^{mm} long and almost as thick: seeds suborbicular, brown, strophiolate.

Type collected in the Hudsonian Zone above the lakes, Canyon Creek, Trinity County, California, by *Vernon Baily*, August 25, 1899.

It is related to *S. Lemmoni*, but differs in the foliage, the shorter filaments and styles, the close inflorescence, and the differently shaped floral organs. It really resembles that species only in having the flowers pendent and the blades of the corolla with four divisions.

✓ ***Silene lacustris***, n. sp.—Cespitose from creeping rootstocks, slender, erect, 1–1.5^{dm} high, glandular-puberulent throughout especially the inflorescence, flowering from the lowest axils: radical leaves narrowly oblanceolate, acute or obtuse, tapering to a long margined petiole, all together 2^{cm} long; cauline leaves 2–3 pairs, linear, obtuse, connate-clasping at base, 1–2^{cm} long, 1–2^{mm} wide:

calyx broadly cylindrical, 1^{cm} long, thin, with ten purple nerves, the divisions rounded, 2.5^{mm} long, 2^{mm} wide; petals with claws woolly and cohering round the thick stipe, gradually broadening to the membranous laciniate auricles, 4^{mm} at top, blades purple, 2-cleft with rounded divisions, the lateral teeth short or none, the appendages bifid and laciniate, 1^{mm} long; stamens and styles exerted; ovary oblong, 4^{mm} long: fruit unknown.

Type collected by the author at Monarch Lake near Mineral King, Tulare County, California, July 21, 1903.

This species belongs to the group of high mountain *Silenes*, including *S. Grayi*, *S. Watsoni*, and *S. Suksdorfii*. In appearance and shape of leaves it most closely resembles the first, but differs from this and the others in the broader auricles, and the bifid, laciniate appendages of the corolla.

✓ ***Silene pacifica***, n. sp.—Perennial, with thick woody rootstocks; stems generally several, erect, 4.5^{dm} high, viscid throughout, especially the inflorescence, nodes prominent: leaves rather thin, radical and lower cauline oblanceolate to obovate or elliptical, tapering at base and decurrent on the long petiole; blade 5–6^{cm} long, 2–3^{cm} wide, slightly ciliate, sparingly pubescent, obtuse or acute; petioles margined, dilated and sheathing at base; cauline leaves connate-clasping at base, 4–5^{cm} long, the uppermost leaves lanceolate, sessile: flowers verticillate in the axils or cymose on short peduncles, pedicels 0.5–2^{cm} long, the longest equaling the longest floral leaves: calyx truncate at base, tubular, becoming somewhat turbinate with the enlarging capsule, very viscid, prominently green or purplish veined, the divisions deltoid, obtuse or acute, 4^{mm} long, green with white or purplish membranous margins, entire calyx 1.5^{cm} long; corolla claret color, the claws of the petals white or tinged with claret, 1.5^{cm} long, attenuate at base and broadening at truncate summit to 4^{mm}, exerted 5^{mm}, blade deeply cleft, each part entire, laciniate, or bilobed, the prominent divaricate teeth on each side almost as long as the divisions, more than 1^{mm}, appendages laciniate-dentate, 1.5^{mm} long; stamens monadelphous at base, encircling the stipe and pubescent, glabrous above, varying in length: pod 11^{mm} long, the tips of the three valves stellately reflexed and often splitting into five or six over the calyx when the seeds are ripe; stipe stout: seeds light brown, slightly pitted, reniform, 2^{mm} wide.

Type collected by the author along the south side of Rodeo Lagoon, not far from the ocean, Marin County, California, July 4, 1905. The species seems to be isolated, as the number of plants is small and it is not elsewhere to be found in the region. It is also in danger of extermination on account of the improvements that are now going on in the vicinity of the military post.

This is most closely related to *S. grandis* Eastwood from Bodega Head, likewise a maritime species. It differs in having claret-colored flowers, a differently shaped calyx, the simpler inflorescence, thinner and different leaves, and entire lack of the velvety pubescence so noticeable on *S. grandis*. A smaller and more slender plant.

✓ ***Horkelia mollis***, n. sp.—Stems several, ascending from the sheathed caudex, red-purple, villous with fine silky spreading hairs, about 2^{dm} in height: radical leaves 6–9^{cm} long, less than 1^{cm} wide, the petiole less than half the entire length, often with a few scattered simple leaflets near the base; leaflets crowded towards the top, pinnately divided but apparently pedate on account of the lower divisions surpassing the upper, the divisions linear-spatulate, 3–4^{mm} long, finely villous; stipules adnate for 8^{mm}, the free tips filiform-attenuate, about 4^{mm} long, villous; cauline leaves similar but with petioles becoming shorter as they ascend, stipules often incised and always broader than those on the radical leaves: flowers corymbose-capitate, terminating the stems, a few solitary ones or few-flowered clusters in the axils of the upper cauline leaves; hypanthium campanulate, 5^{mm} long, the bractlets linear, about as long as the subulate sepals; petals yellow, the blades broadly spatulate, 1^{mm} wide, a little longer, slightly shorter than the linear claw; stamens 15 in three rows; ovaries 5–20, glabrous, the slender styles tuberculate at base.

The type is 4405 of *Carl F. Baker's* distribution, collected by *Culbertson* July 19, 1904, at Hockett's Meadows, Tulare County, California. In the herbarium of the California Academy of Sciences are specimens of the same, collected by the author along Volcano Creek in the same region, July 17, 1903.

This species probably is most closely related to *Horkelia campestris* (Jones) Rydberg. A comparison with a duplicate of the type of the latter shows *H. mollis* to be a larger, more villous plant, the appendages of the hypanthium longer, the divisions more pointed, the petals more exerted and with blades orbicular and claws more pronounced. In general the flowers are larger.

✓ **STYRAX CALIFORNICA fulvescens**, n. var.—Shrub a meter or so high, with stiff divaricate branches; older stems gray-black,

younger white or tawny with dense stellate tomentum: leaves orbicular-cordate, the apex obtuse or abruptly acuminate, generally slightly longer than broad, 3-6^{cm}, both surfaces stellate-tomentose, the upper less than the lower, the fulvous hairs often outlining the veins on lower surface; petioles 5-10^{mm} long: flowers 1-3, cymose, pendent, the pedicels as long as the peduncles; calyx campanulate, cuneate at base, the margin truncate but marked with 5-6 short obtuse scattered teeth, densely clothed with white or rufous tomentum; stamens 12, almost equaling the petals, attached almost the entire length of the corolla tube, filaments glabrous, ribbonlike, anthers with cell divisions white, the connective yellow, thick; style thick, broadening at base, lower half tomentose, stigma 2-lobed, surpassing the corolla.

The type of this variety was collected by the author May 17, 1904, near the Painted Cave Ranch in the Santa Inez Mountains back of Santa Barbara, California. Mr. *T. S. Brandege* collected the same in the same mountains probably near San Marcos Pass in 1888. There is a specimen also of what seems the same collected by *J. G. Lemmon* near San Bernardino, May 1878. Near the head of Mission Creek a second collection was made by the author. This bush grew in the shade and was taller and less rufous than the others on the open hills.

This differs from the typical *S. californica* in the broader, rounder leaves, heart-shaped at base, the much denser stellate tomentum, and the general prevalence of rufous hairs especially on the calyx.

✓ ***Diplacus calycinus***, n. sp.—Suffrutescent, viscid-arachnoid throughout, the young stems light brown, branching diffusely: leaves elliptical to oblong, narrowed at each end, apex obtuse, base cuneate, margin revolute, entire or somewhat sinuate-denticulate, upper surface glabrous, often viscid, lower tomentose and viscid, 2-6^{cm} long, 1-2^{cm} wide; petioles very short, revolutely margined, woolly at junction: flowers axillary, the peduncles 5-7^{mm} long; lower part of fruiting calyx cylindrical, 2^{cm} long, 5^{mm} in diameter, 5-ribbed, upper half dilating abruptly to thrice the diameter of the lower, with 5 strongly keeled almost equal divisions 7^{mm} long, 3^{mm} wide at base when folded, 1^{mm} at the rounded apex, total length of calyx 3.5^{cm}; corolla light yellow, the tube curved, uniformly slender for 1.5^{cm}, dilating above, the divisions having a spread of 1.5-2^{cm}, exerted from the calyx.

This was first collected by Mr. *T. S. Brandegee* in Kaweah Canyon, Tulare County, California, July 26, 1892. The type is 4407 of *C. K. Baker's* distribution collected by *Culbertson* in the south fork of Kaweah River, 1800^m altitude, July 22, 1904.

This species is distinguished from allied species by the peculiar foliaceous calyx described above. The corolla in the dried specimens cannot be satisfactorily described, as in both collections the specimens are a little old.

✓ ***Orthocarpus Copelandi***, n. sp.—Stems about 1^{dm} high, simple or divaricately branched, minutely scabrous with short, curved hairs: lowest leaves narrowly linear-lanceolate, obtuse, 3–4^{cm} long; upper on main stem as long but twice as broad; uppermost on branches falcate, alternate or opposite: spike short and dense; lowest bracts green, the middle division like the broadest leaves, the lateral divisions spreading and very slender, about one-third as long as the middle; upper bracts shorter and broader, elliptical, rose-tipped: calyx thin and membranous, becoming globular-inflated, pink with green ribs, cleft half in front, deeper in the back, villous with short gland-tipped hairs, 7^{mm} long, 4^{mm} broad, with divisions triangular attenuate; corolla minutely glandular, 13^{mm} long, galea straight, obtuse, rose-color, ciliate, 6^{mm} long, lower lip yellow, the three sacs inflated somewhat, 5^{mm} long, middle tooth much larger than the other two: capsule bright brown, 5^{mm} long, 3.5^{mm} wide, obovate with obcordate apex, with few (apparently only two) seeds.—FIG. 1.

Collected on Mount Eddy, August 18, 1903 at an altitude of 2130^m by Dr. *Edwin Bingham Copeland*, in whose honor it is named. It is a beautiful species related to *O. imbricatus* and that group which contains so many closely related species. *H. E. Brown's* number 449 from the north side of Mt. Shasta is the same but very immature.

✓ ***Veronica Copelandi***, n. sp.—Perennial from slender, running rootstocks, about 1^{dm} high, simple, glandular-villous throughout: leaves five or six pairs, crowded on the lower part, sessile, oblong-elliptical, entire, acute, veinless, 1–1.5^{cm} long, 4–8^{mm} wide: racemes sometimes becoming 8^{cm} long, 5–15-flowered, the highest leaves often with one or two axillary flowers; bracts lanceolate, the lowest opposite, others alternate, shorter than the pedicels; peduncles 1–2^{cm} long, sometimes scarcely apparent; pedicels filiform, 5^{mm} long, a small bractlet immediately below the calyx appearing like another



FIG. 1.—*Orthocarpus Copelandi* Eastw.

sepal: sepals 4, oblong-ovate, obtuse, 3^{mm} long; corolla purple, glabrous, 9^{mm} across, the three larger divisions orbicular, entire, 4^{mm} in diameter, the smallest ovate-obtuse, 3^{mm} wide; stamens exserted, 4^{mm} long, filiform, anthers obtuse and obtusely sagittate at base, 1.5^{mm} long; stigma exserted from the opening bud, obscurely bilobed, style 7^{mm} long, filiform at base, flattening and slightly broadening towards the apex: capsules becoming almost twice as long as the calyx divisions, broadly oblong, 5^{mm} long, 3.5^{mm} wide, emarginate, the lobes and sinus obtuse; style persistent.—FIG. 2.

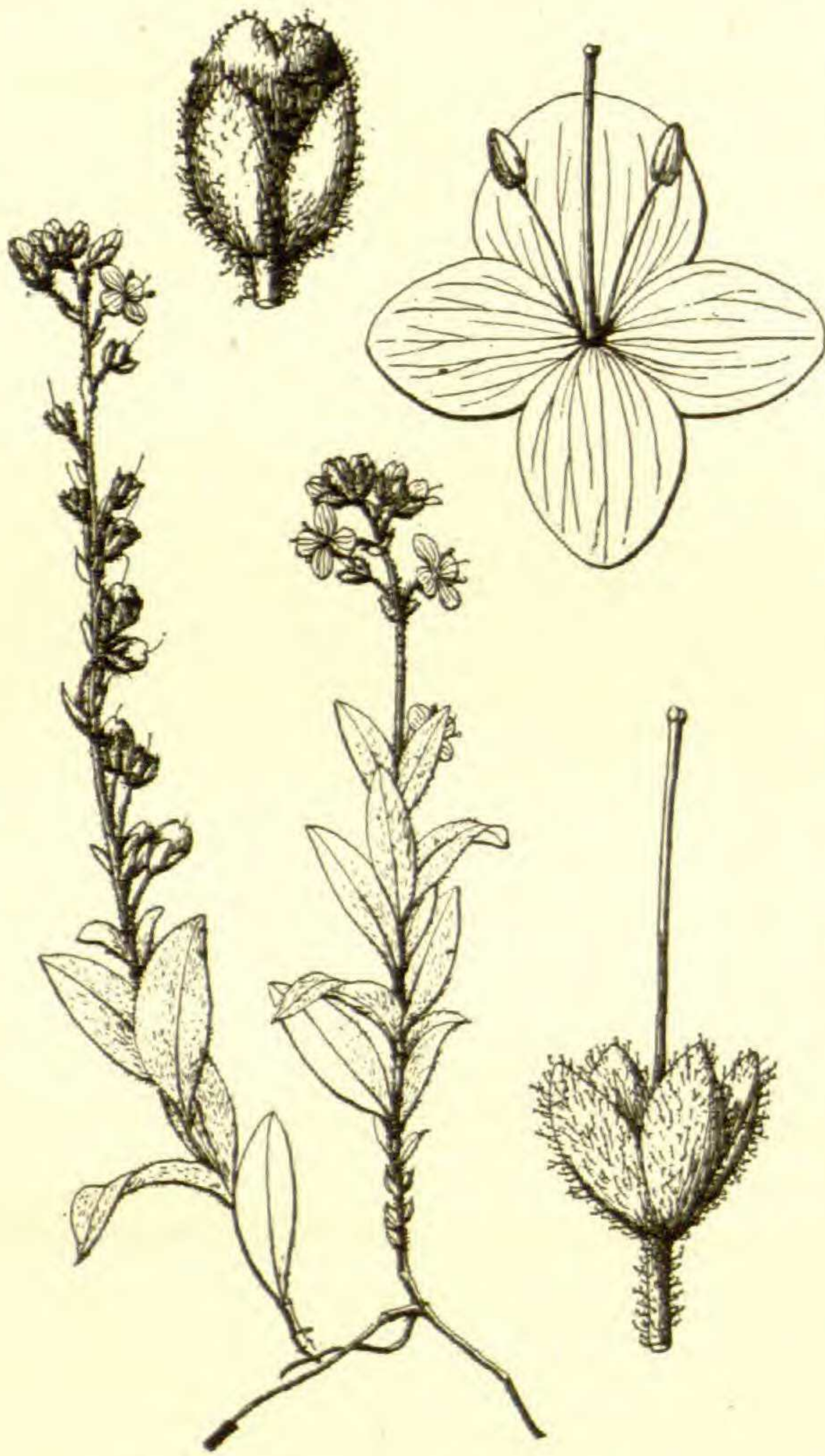


FIG. 2.—*Veronica Copelandi* Eastw.

canescent with short appressed hairs which are glandular at base (under a lens): leaves oblanceolate to spatulate, sessile, obtuse, apparently veinless, $5-15^{\text{mm}}$ long, $3-5^{\text{mm}}$ wide, with pubescence similar to the stems: heads few, rayless, 7^{mm} high, terminating short branchlets, which are leafy near the junction with the stem and have a few scattered minute bracts on the upper part; scales of the involucre in four series, glandular-puberulent, outer ones small, reflexed-spreading, inner green-tipped, ribbed, membranous at base,

This was collected on Mount Eddy at an elevation of 2500^{m} by Dr. *Edwin Bingham Copeland*, August 18, 1903, distribution of *C. E. Baker*, 1903. no. 3931. It is near to *V. Cusickii* Gray, differing in pubescence, shape of leaves and sepals, and a larger and more open-spreading corolla.

✓ ***Erigeron decumbens***, n. sp.
—Stems several, from slender creeping rootstocks, decumbent or ascending, $1-1.5^{\text{dm}}$ high, scabrous and somewhat

linear-lanceolate, acute, 6^{mm} long: corolla yellow, tubular, abruptly narrowed 1^{mm} above the base, the border consisting of five short, obtuse, incurved teeth; style branches exerted, the hairy tips very short: akenes slightly hairy at top; pappus simple, barbellulate, as long as the corolla.

Collected by Dr. *Edwin Bingham Copeland* on Mount Eddy, Siskiyou County, California, at an altitude of 1400^m, August 17, 1903. It belongs to the group which includes *E. miser* Gray, as well as many species described by Dr. E. L. Greene in *Flora Franciscana*, p. 394; but it agrees with none.

✓ **Erigeron Copelandi**, n. sp.—Cespitose from an underground, branched caudex, covered with black, scale-like, imbricated bases of old petioles: radical leaves spatulate, subcanescent, with closely appressed very short pubescence; petioles equaling or longer than the blades, together 1-3^{cm} long, 4-8^{mm} wide, the petioles dilated and closely imbricated at the reddish-purple base: stems 1-flowered, 5-10^{cm} high, sparsely leaved with narrow linear or linear-oblan-ceolate leaves 5-10^{mm} long, becoming minute and bract-like on the glandular-puberulent upper part which is like a peduncle: heads about 6^{mm} high exclusive of the numerous, very narrow, lilac to violet rays, which are 5^{mm} long; scales of the involucre in three series, glandular-puberulent, the outermost shorter, clothed with some scattered hairs, innermost linear-attenuate, sparsely ciliate, green-ribbed, membranously margined, about 5^{mm} long; disk flowers numerous, yellow, 2.5^{mm} long, narrowed 1^{mm} above the base, glandular on the lower part, the border of five short acute incurved teeth: pappus upwardly barbellulate, simple, that of the ray flowers shorter than that of the disk, none as long as the corolla; akenes clothed with upwardly spreading hairs; stamens exerted in some flowers, pistils in others; fertile and sterile flowers in the same head, ray-flowers sterile.

Collected on Mt. Eddy, Siskiyou County, California, at an altitude of 1250^m by Dr. *Edwin Bingham Copeland*, in whose honor it is a pleasure to name this pretty plant. It is related to *E. pygmaeus* Greene and others of that group, but differs from all in caudex, pubescence, leaves, and heads.

✓ **Chrysopsis gracilis**, n. sp.—Stems slender, simple, 3^{dm} high, loosely and sparingly villous-arachnoid, terminated by 2-4 cymose heads: leaves thin, linear-lanceolate, narrowly acuminate, 3-4^{cm}

long, 6^{mm} wide, sessile, the upper surface somewhat dotted, lower surface arachnoid (under a lens): peduncles with pubescence like the stem but also somewhat viscid, bracts few, narrowly linear: involucral scales in about 5 ranks, the outer narrowly linear-attenuate, the others lanceolate, acute, tipped with a green and glandular spot, below yellowish, chartaceous, keeled, the innermost sometimes tinged with purple and considerably surpassing the others; heads with about 15 flowers, rayless: corolla straw color, about as long as the pappus, trumpet-shaped, gradually narrowed to the base, border with acute teeth, 1^{mm} long; style branches filiform, exserted, twining around each other at base; pappus thick, with an outer shorter row, barbellulate; akenes flat, villous, white.

Collected on Mount Eddy at an elevation of 2225^m by Dr. *Edwin Bingham Copeland*, August 17, 1903.

This comes very near *C. Breweri* Gray, of which it may prove to be only a variety. It differs however, in the simple instead of much branched stems, more finely arachnoid pubescence, and leaves of different outline. The involucral scales are the most distinctive; in *C. Breweri* they are attenuate and not keeled; in *C. gracilis* they are broader, acute, keeled, conspicuously green-tipped and glandular; the corollas are paler and the pappus not so rough.

✓ ***Psilocarphus tenuis***, n. sp.—Sparingly clothed with long loose white woolly hairs; stems filiform, erect or ascending, 3–5^{cm} high, with few slender divaricate branches: leaves oblong to elliptical, 5–10^{mm} long, 3^{mm} wide, veiny and submembranous, mucronate at apex, the base of the opposite leaves connate-clasping: heads in the forks and at the ends of the branches, the involucral leaves 4, ovate-oblong, folding over and almost concealing the flowers within, texture similar to the other leaves: fertile flowers few or many, completely enclosed by the obliquely-cuneate bracts, these gibbous, veiny, membranous, slightly woolly, 2.5^{mm} long, the apex orbicularly truncate or concave, the exserted membranous tips brownish, conspicuous, generally curved upwards: akenes shortly stipitate, narrowly obovate, 1^{mm} long: sterile flowers few, the corolla attenuate to the base, divisions reddish-brown.

Type collected at Monterey, California, by Mrs. *Joseph Clemens*, July 1905. What seems to be the same, but too young for certainty, was collected by the author at Bakersfield, Kern County, California, April 4, 1893, and at Kaweah, Tulare County, California, April 27, 1895.

This seems most distinct from all the other species in having the involucre leaves almost closing over the flowers, the peculiar concave or truncate top to the bracts enclosing the fertile flowers, and in the more veiny and membranous foliage, less woolly pubescence, and more slender habit.

✓ **Senecio Millikeni**, n. sp.—Stems tall, glabrous, hollow, ribbed, paniculately branched, the slender virgate branches leafless in the lower part: leaves linear-lanceolate, narrowed at both ends, with acute apex, sessile base, margin dentate with small uneven obtuse teeth, the lower 12^{cm} long, 2.5^{cm} wide, diminishing upwards: panicle thrysiform, the peduncles and pedicels slender, bracts and bractlets attenuate, equaling or longer than the slender pedicels: heads 1^{cm} high, bracteate at base, the involucre 5^{mm} high, with glabrous scales tipped at apex with a tuft of tomentum; rays 6, 3-toothed, 7^{mm} long, style exerted 3^{mm}; disk flowers 7^{mm} long, the acute triangular teeth of the corolla slightly granular, stamens exerted but style branches surpassing them: akenes glabrous; pappus soft and abundant, about as long as the corolla.

Type collected in Natural Bridge Meadows, Tulare County, California, by *Culbertson*, Aug. 10, 1904, *C. F. Baker's* distribution 4268. It is named in honor of Mr. Culbertson's assistant.

This belongs to the polymorphous group of which *S. triangularis* was the first described. It differs from all in the narrowed bases of the leaves, the thrysiform inflorescence, and the smaller heads.

SAN FRANCISCO, CALIFORNIA.