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NEW SPECIES FROM THE SIERRA NEVADA MOUNTAINS OF CALIFORNIA.

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MOST of the plants described below were collected on a trip to the south fork of Kings River from Millwood to the Kings-Kern Divide (Harrison's Pass), and to Kearsarge Pass. The trail lies near the boundary of Fresno and Tulare counties, and is one of the best known of the southern Sierra Nevada.

It is a country of magnificent forests, beautiful mountain meadows, rocky slopes down which dashing torrents rush, and cañons through which the river flows serenely but swiftly. The upper elevations are characterized by jagged peaks and ridges which are clothed with everlasting snow and enormous granite boulders, and are gemmed with little lakes of great beauty.

The collection was made between July 2nd and 12th, 1899. To the care and assistance of Messrs. Pierson Durbrow, S. L. Berry, and Benjamin Brooks, members of the party, the success of the trip is due.

The types are in the Herbarium of the California Academy of Sciences.

1. *Streptanthus gracilis*, sp. nov.

Annual or biennial from a slender tap-root, with delicate branches, chiefly from the base, 1-2 cm. high, glabrous, glaucous. Basal leaves orbicular to narrowly elliptical or spatulate, sinuatedentate to obtusely lobed or lyrate, tapering to long slender petioles as long as or twice as long as the blades, together 1-3 cm. long; cauline leaves linear-oblong to ovate, entire to crenately lobed, 5 mm. to 2 cm. long, auriculate at base, either sessile or on very short petioles. Racemes few-flowered, those from the slender basal branches one- to six-flowered; pedicels erect, 1-5 cm. long, generally shorter than the calyx; bracts wanting except with the lowest flowers, which are in the axils of the

upper leaves. Calyx rose-purple, urceolate, narrowed under the spreading lobes; the lobes obtuse, membranously margined, and undulate, becoming as long as the tube formed by the united sepals; disk-like receptacle conspicuous. Petals rose-pink, the slender claws exerted, blades spatulate to obovate-orbicular, half as long as the claws (3 mm.), and more than twice as broad (2 mm.), sinuate. Stamens in three pairs, with filaments all distinct, one pair with filaments 1 mm. long, the next pair 2 mm., and the third 5 mm.; the anthers of the two shorter pairs 3 mm. long, those of the longest pair not quite 2 mm. Pods (immature) erect, linear, glabrous, tipped with a broad, sessile stigma; the largest 1.5 cm. long, 1 mm. wide. Seeds not known.

This delicate little plant was collected by the author below timber line on the trail from East Lake to Harrison's Pass (the type locality), and by Miss Catherine E. Wilson, in 1898, on the trail to Bull-frog Lake. It seems to be rare.

2. *Polygonum exile*, sp. nov.

Annual, with slender, wiry stems, erect, four-ribbed, about 3 dm. high, glabrous or minutely puberulent, especially near the top, with few erect, virgate branches from near the base. Leaves erect, linear-lanceolate, or terete from the inrolling of the margins, jointed to the ochreæ, cuspidate, the upper surface minutely dotted; lowest leaves 2 cm. long, diminishing upwards, shorter than the internodes; ochreæ with three hyaline, long-acuminate divisions. Flowers solitary or few at the nodes, erect, sessile, or on short pedicels; divisions of the perianth extending to below the middle; white, pinnately veined with green or rose-colored veins, elliptical, hooded at apex, 2.5 mm. long, investing the ripe seed. Stamens three, with ovate, long-acuminate filaments half as long as the perianth; anthers minute. Akene three-angled, rhombic in outline, acute at each end, 2.5 mm. long, brown, glossy, minutely papillate; styles very short, deflexed.

This is similar in general appearance to *P. douglasii* Greene, but differs in having but three stamens and in the erect flowers.

Collected by the author in Kings River Cañon, July 4, 1899.

3. *Eriogonum scapigerum*, sp. nov.

Caudex branched, the divisions clothed with the dead brown bases of former leaves. Leaves all radical, oblong to orbicular, 5-15 mm. long, densely white-matted-tomentose on the lower surface, becoming somewhat glabrate on the upper, with undulate margins, obtuse apex, and cuneate base, tapering abruptly to the long petiole; petiole 3-5 cm. in length, flat, with a central rib, and broadening at base for about half the length. Scapes many, very slender, glabrous, 5-17 cm. high, terminated by a solitary head

not more than 1 cm. in diameter. Bracts united, ternate, the lobes deltoid-acuminate, dark red, glabrous, except for the long, white-woolly hairs on the margin; bractlets at base of involucre similar but smaller, with the lobes more deeply divided on one side. Involucres turbinate, glabrous, indistinctly ribbed, woolly-ciliate along the entire to undulate margins; pedicels exerted, distinctly jointed to the perianth at apex; divisions orbicular to obovate, hooded at apex, glabrous on the outside, hairy within at the base; the outer ones broader, 2 mm. long. Stamens slightly exerted, anthers two-lobed, suborbicular. Akenes threesided; styles spirally coiled.

This is near *E. nudum* Douglas, of which it may be only an alpine variety. It looks quite different from the common form as found in the Coast Mountains.

Collected by the author on Harrison's Pass, above timber line, at an elevation of almost 14,000 feet, July 9, 1899.

4. *Garrya pallida*, sp. nov.

Branching shrub, several feet in height; older stems glabrous, dark brown; younger ones cinereous, with densely appressed, silky pubescence. Leaves oval, elliptical, ovate, or obovate, becoming stiff and thick with age, pale green and glaucous, strongly veined, cinereous, with an appressed pubescence of fine silky hairs on both surfaces but denser on the lower, and becoming sparser with age; tapering somewhat at each end, the apex abruptly acuminate, with the point recurved, margin entire, thickened, rarely slightly undulate; blade 3-7 cm. long, 2-4 cm. wide; petiole stout, .5-1.5 cm. long. Pistillate spikes pendent, solitary or clustered, 4-6 cm. long; lowest bracts deeply cleft, long-acuminate, upper ones cleft above the middle, abruptly acuminate, silvery, silky canescent from the densely appressed hairs; ovaries ovate, on short, thick pedicels, with pubescence similar to that of the bracts; styles divaricate; berries becoming almost glabrous. The staminate flowers have not been seen.

This species is nearest to *G. fremonti* Torrey, and is found in the southern Sierra Nevada. The type was collected in Kings River Cañon, July, 1899. Specimens from San Emidio Cañon, Tejon Pass, and Tehachapi, all in Kern County, also from the region of the Kaweah River, in Tulare County, seem to be the same species.

5. *Convolvulus berryi*, sp. nov.

Stems perennial, trailing but scarcely twining, 5 dm. or more long, with few branches from near the root, densely white-woolly throughout, with fine, spreading hairs. Lower leaves on petioles longer than the blades; upper shorter, 1-4 cm. long, broadly deltoid, with spreading sinus or sagittate with the sinus less open, apex mucronate, the two basal angles

lobed with mucronate or obtuse lobes, 2-6 cm. wide at base, 2-5 cm. long. Flowers chiefly near the base, on long peduncles surpassing the leaves, often upwardly curving, 5-8 cm. long; bracts similar to the upper leaves, close under the flower, 1 cm. wide, 1.5 cm. long. Sepals ovate-oblong, unequal in breadth but of the same length, hairy with appressed hairs except on the membranous margins of the inner ones, mucronate, 14 mm. long, the broadest 10 mm. wide. Corolla yellowish white, hairy on the angles and at their tips, 4 cm. long. Stamens with narrow sagittate anthers, 7 mm. long; filaments hairy below, attached to the corolla for half their length. Style as long as the stamens (2.5 cm.), with ovate-lanceolate stigmas, 3 mm. long, 1 mm. wide.

This beautiful species comes nearest to *C. villosus* Gray, from which it differs in the bracts, peduncles, and stamens, also in the broader leaves and longer peduncles. The pubescence is less velvety. It is also near *C. tomentellus* Greene, from which it differs in almost the same organs.

Collected at Millwood by the author, July, 1893 and 1899, also near Converse Basin. The plant is named in honor of Mr. S. L. Berry.

6. *Castilleia brooksii*, sp. nov.

Perennial, branching from the base, but with a few short branches above, 3 dm. high, glandular, viscid throughout and with a pubescence of uneven, silvery, weak, jointed hairs. Leaves sessile, linear-oblong, entire to three-lobed, about 2 cm. long, less than 5 mm. wide; lobed leaves generally subtending the branches, the divided portion half the length. Branchlets terminated by short, compact spikes, with subsessile flowers; bracts variously and unevenly lobed, with the tips colored. Calyx a little longer than the corolla tube, obliquely gibbous at base, equally cleft before and behind, with divisions shorter than the tube, each two-cleft, with unequal, triangular-subulate, one-nerved, obtuse divisions, 3 mm. long. Corolla 2.5 cm. long; galea longer than the tube, straight at first but later curving outwards, having three blunt teeth at apex, the middle one smallest; lower lip truncate, 3 mm. long, 2 mm. wide, the sharply acute teeth incurved, folds noticeable. Stamens exserted, with filaments smooth and anthers narrowly linear, with unequal cells. Ovary glabrous, obliquely acuminate; stigma clavate, exserted from the top of the galea.

This comes under the group to which belong *C. parviflora* Bongard, and *C. miniata* Douglas, with neither of which it agrees. The flowers are yellowish red but probably variable in color, as in most species of this genus.

Collected by the author on the trail up Bubbs Creek, early in July, 1899, and named in honor of Mr. Benjamin Brooks.

7. *Castilleia disticha*, sp. nov.

Perennial, erect, 6 dm. high, branching from the base and also above with generally short, slender, spreading branches; somewhat viscid and with a close, often somewhat scanty, cinereous pubescence mixed with longer, jointed hairs. Leaves linear, acute or obtuse, the lower 4 cm. long, 3 mm. wide, diminishing upwards, sessile by a truncate or subauriculate base, distinctly three-veined, the middle vein most conspicuous; margin entire or undulate-crisped. Inflorescence spicate, elongating in fruit, especially on the main stem, 1-2 dm. long; flowers after anthesis distichous, becoming more or less remote, sessile or almost so, with the capsule appressed to the stem, the calyx and corolla persisting and spreading; bracts foliaceous, the upper ones, only, colored, variously toothed, with the middle tooth longest, equalling or shorter than the corolla. Calyx slightly surpassing the corolla tube, about equally cleft before and behind for half the length; each division tipped with red, two-cleft, with triangular, subulate, unequal lobes, 2-3 mm. long, three-nerved, thin in texture, somewhat gibbous, but not broadest at base. Corolla red, 3 cm. long, with galea as long as the tube, truncate or emarginate at apex; lower lip three-toothed, the middle tooth much smaller than the lateral, separated by a broad sinus, thin, not callous. Stamens exerted, filaments glabrous; anthers narrow, with unequal cells, more than 2 mm. long. Stigma exerted from the summit of the galea, capitate. Capsule obliquely oblong-ovate, 8-10 mm. long, chartaceous; seeds elliptical to orbicular, light brown, invested with a membranous, foveolate outer coat.

This is more closely allied to *C. minor* Gray and *C. stenantha* Gray than to any of the perennial species. Its sessile or almost sessile flowers, more brightly colored and differently shaped, together with the different habit of growth, mark it as distinct.

The type was collected by the author at Converse Basin, on the trail to the south fork of Kings River, July, 1899. The species is also found at Millwood, where it was collected the same year by the author, and by Mr. T. S. Brandege, July 19, 1892.

8. *Castilleia nana*, sp. nov.

Low, 3-6 cm. high, with several stems from a woody caudex, which is thickly clothed with the dead stems of former seasons; somewhat cinereous and viscid, the pubescence of the inflorescence of longer, jointed, arachnoid hairs. Leaves simple and linear or three- to five-divided, with narrow, linear, acuminate lobes which are shorter or longer than the undivided portion, together 1-2 cm. long. Flowers in heads terminating the stems; bracts broad, similar to the upper leaves, embracing the sessile flowers and more than twice as long; the division terete from the involute margins, once and a half to twice as long as the lower, undivided part, which is 4 mm. wide

and 5 mm. long. Calyx glandular, subequally cleft before and behind, with the divisions twice as long as the tube, surpassing the corolla, each with two narrow, linear lobes 5-6 mm. long, extending below the throat of the inconspicuous corolla. Corolla 7 mm. long, the lower lip longer than the galea, the three lobes thin, ovate-orbicular, obtuse, 2 mm. wide, somewhat saccate below; galea with the middle portion of thicker texture than the membranous sides, three-toothed at apex. Stamens with the upper pair of anthers exerted, the lower included, each distinctly two-celled, clothed with a few long hairs at base. Pistil capitate, .5 mm. in diameter, exerted; ovary lanceolate. Fruit and seeds unknown as the plants were too young.

This is an alpine species found only above timber line. It is related to the group formerly included under *Orthocarpus*, section *Castilleioides*, but differs from all other species in the peculiar corolla, it being the only species described with the galea shorter than the lower lip.

Collected by the author on Harrison's Pass, above East Lake, July 9, 1899.

There are either one or two other low, alpine species in the same region which seem to be related to *C. pallida* Kunth, but the material is too scanty for satisfactory determination.

9. *Mimulus bioletti*, sp. nov.

Annual, branching diffusely, chiefly from the base, about 2 dm. high, glandular-villous throughout, except the corolla. Leaves near the root spatulate; cauline leaves rhombic obovate to lanceolate, thin, tapering to a broad petiole, or sessile, sparingly serrulate or entire, 2-4 cm. long, 2-15 mm. broad. Flowers axillary, on slender, upward-spreading peduncles, almost as long as the internodes, generally shorter than the subtending leaves. Calyx tubular, 8 mm. long when in flower, 12 mm. in fruit, often purplish-dotted below the middle, plicately carinateangled, the ribs rugose, rounded; divisions deltoid, with the margins involute, the obtusely pointed apex spreading outwardly. Corolla as long again as the calyx, with ampliate throat and scarcely two-lipped border, crimson, the upper lip with a yellow blotch dotted with crimson in the throat; limb 12-15 mm. across, with divisions rounded, crenulate, or entire. Stamens and style included; the former four in two sets, each united by the anthers, one set longer than the others; anthers ciliate, explanate, one above the other; stigma bilammelar, cuneate in outline. Capsule included in the rigid calyx-tube, obtusely four-ribbed, opening at the sides from the base up; placenta free, except at the top; seeds numerous, minute.

This belongs to section *Eumimulus* Gray, and is most closely related to *M. palmeri* Gray. It differs chiefly in the larger flowers and different calyx.

Collected in Hetch-Hetchy Valley, Tuolumne County, by Mr. F. T. Bioletti, in July, 1900.

10. *Phacelia stimulans*, sp. nov.

Stems tall, simple from a branched caudex, becoming 5-6 dm. high, erect, sparsely leaved, generally flowering from the middle, viscid-pubescent, and clothed besides with fine, long, stinging hairs. Radical leaves forming a rosulate cluster, simple or with a few lobes at base, ribbed between the hispid veins, elliptical, acuminate, 3 cm. long; petioles very hispid with spreading hairs. Spikes of the panicle simple, the lowest and uppermost geminate, horizontally spreading, somewhat distant, 5-6 cm. long; peduncles very glandular, becoming shorter near the top; pedicels capillary, half as long as the calyx. Divisions of the calyx oblong-spatulate, hispid, net-veined, shorter than the corolla, surpassing the capsule. Corolla tubular, the lobes conniving after anthesis and persistent, held to the calyx by the tangling together of the long, persistent stamens and style. Filaments exerted, conspicuously clothed with long white wool. Capsule ovate-acuminate, hispid; seeds ovate, brown, not glossy, pitted.

This is allied to *P. circinata* Jacq. f., but is entirely unlike any of the described species which were formerly included under that species. On account of the stinging hairs of the stems and leaves it might be confused with *P. nemoralis* Greene; but this has an altogether different habit, pubescence, and inflorescence.

Collected by the author, July, 1899, in Kings River Cañon, not far from the swampy meadow near which campers stop on the way to Bubbs Creek.

11. *Gilia sparsiflora*, sp. nov.

Annual, a foot or so high, branching above, with slender, spreading stems, minutely glandular-pubescent. Leaves few, terete from the infolding of the margins, about an inch long, tipped with a short bristle. Flowers few, terminating the branchlets, two to three in the clusters, sometimes solitary in the upper axils; bracts keeled at base, three-lobed, the middle lobe much larger than the lateral, all subulatearistate, surpassing the flowers. Calyx membranous between the ribs, clothed with dense, white, cottony wool, the unequal, aristate-subulate divisions as long as the corolla tube. Corolla salverform, 1 cm. long, white with some purple dots in the funnel-form throat; the divisions elliptical-obtuse, half as long as the tube. Stamens equally inserted, with arrow-shaped anthers, obtuse at apex, exerted from the throat of the corolla. Capsule oblong, 1 cm. long; seeds few, oblique at base, three-sided, generally with rounded angles, developing mucilage and spiracles.

Gilia sparsiflora belongs to the same group as *G. virgata* Steud.

Collected by the author in Kings River Cañon, in July, 1899; and also along Bubbs Creek trail.

12. *Cryptanthe vitrea*, sp. nov.

Annual, with several stems from a tap-root, 1-2 dm. high, very hispid throughout with white bristly hairs which are pustulate at base. Leaves linear, 1-2 cm. long, 2 mm. wide, strongly nerved. Flowers sessile, in numerous short spikes from almost the lowest axils, on slender peduncles. Calyx 3 mm. long, the sepals conniving to form a tube around the nutlets, the tips free, densely clothed with long stiff bristles, 3 mm. long, and also a fine, white, hispid pubescence. Corolla only about 2 mm. long, with a small limb. Nutlets, only two maturing, ovate, obtuse, almost 2 mm. long and 1 mm. wide at base, very glossy brown mottled, sharply tuberculate, attached to the gynobase for the entire length, the groove closed except at the forks.

The species comes nearest to *C. muriculata* Greene, but the nutlets are broader, the flowers much smaller, and the entire plant so floriferous that in the dried specimen it is almost impossible to distinguish the peduncles.

Collected by the author on Bubbs Creek trail, July 5, 1899.

13. *Aster durbrowi*, sp. nov.

Stems erect, perennial from creeping root-stocks, disposed to grow in tufts, 1-3 dm. high, sparingly leafy, erect, branching only at the inflorescence, glabrous and green except for some white woolly hairs which are sparse on the lower part, but which make the upper part almost cinereous. Radical leaves on long winged petioles which are dilated and clasping at base, lanceolate, the blades about as long as the petiole, together 5-8 cm. long, 5-10 cm. wide, entire or distantly serrate, ciliate on the margin, the hairs becoming longer towards the base of the petiole and decurrent on the stem; cauline leaves similar but sessile by an auriculate or cordate clasping base, the upper ones broadening and becoming shorter and more pointed, the lower ones narrowing towards the insertion. Heads cymose, the branchlets terminated by one to four middlesized heads, 1-2 cm. across, on short bracteate pedicels; involucre of six rows of imbricated bracts with green, foliaceous tips, not spreading, the inner ones with purplish acuminate tips, the outer linear, mucronate, glabrous except for the ciliate margins, distinctly one-nerved and chartaceous at base; rays pistillate, reddish purple, 1 cm. long, 1.5 mm. wide, dentate at apex, sparingly ciliate on the lower part; disk flowers purplish; corolla shorter than the pappus, which extends

about to the exserted style and stamens; the tube slightly pubescent. Akenes (immature) hispid with dense, white, upwardly appressed hairs; pappus simple, scabrous.

This is near *A. yosemitanus* Greene (*A. ascendens yosemitanus* Gray), of which it may prove to be a variety. The habit of growth is quite unlike that of the above species, while its larger heads, sparingly leafy stems terminated by few heads, and the auriculate- or cordate-clasping cauline leaves make it appear even more distinct. It is the common aster of the wet meadows at the upper altitudes in this region.

Collected in Horse Corral Meadow, July 11, 1899, and named in honor of Mr. Pierson Durbrow.

14. *Madia villosa*, sp. nov.

Stems simple, erect from an annual root, about 3 dm. high, slender, villous with long, white, soft, spreading hairs, also becoming glandular near the top with black, stipitate glands. Lower leaves generally opposite, upper alternate, linear or the lowest oblanceolate, sessile, entire, or glandular-serrate with distant teeth, revolute, strongly ribbed, villous, with the hairs finely pustulate on the older leaves, obtuse at apex, 4-7 cm. long, 2-5 mm. wide. Heads few, terminating slender peduncles near the top of the stem, the uppermost first in bloom, clothed with few small bractlets; outer bracts of the involucre 8 mm. long, the foliaceous tips equalling that which encloses the akene, linear acuminate, villous and glandular, half as long as the deeply three-lobed rays, these often with a reddish-brown spot at base; inner bracts scarious with short foliaceous tips; disk flowers all sterile, the corollas as long as the abortive akenes, together 8 mm. long, the tube somewhat villous and the lobes clothed at tip with spreading hairs; fertile akenes flattened laterally, semilunate, black and brown mottled, minutely papillate in rows, 1.5 mm. wide, 4 mm. long, glabrous; anthers purple and exserted, giving a purplish color to the disk.

This is nearest to *Madia corymbosa* DC. (*Madaria corymbosa* Greene). It is also close to *M. hispida* Greene, and really seems to be intermediate between the two species.

The type was collected at Converse Basin, July 12, 1899. It was also found on Bubbs Creek trail.