

LIST OF PLANTS COLLECTED BY DR. EDWARD PALMER IN WESTERN MEXICO AND ARIZONA IN 1890.

By J. N. ROSE.

The plants upon which this report is based were collected by Dr. Palmer, in 1890, in Mexico and Arizona. Dr. Palmer returned to Guaymas March 18, after finishing his collection at Santa Rosalia;¹ from this place he went to Alamos, remaining three weeks, and then returned to Guaymas; from here he proceeded to Arizona, staying three months, and then went to San Francisco and remained until August 23, when he again left for the Gulf of California, expecting to land at Carmen Island, but owing to some regulations of the custom officials of Mexico he was carried to Guaymas. He was planning again to visit Carmen Island,² when an opportunity offered to return to Alamos, and as he was desirous of getting the summer as well as the winter flora, he postponed the trip to Carmen Island and embarked by steamer for Agiabampo, the seaport of Alamos. This second trip to Alamos lasted two weeks, and was very successful, notwithstanding it was interrupted by a severe attack of intermittent fever, which compelled him to return to the seacoast.

The total number of new species collected by Dr. Palmer and reported in this paper is 45, with several new varieties.

The following table will show the places visited, with the date of collection and the number of plants:

Places visited.	Date of collection.	Number collected.
Alamos and Alamos Mountain.....	March 26 to April 8..	276-414 (inclusive).
Camp Huachuca, Arizona	April 26 to May 21...	416-478 (inclusive).
Willow Springs, Arizona	June 10 to 20	479-574 (inclusive).
Fort Apache.....	June 21 to 30.....	575-613 (inclusive).
Willow Springs.....	July 5 to 6.....	613-626 (inclusive).
Alamos.....	September 16 to 30...	627-751 (inclusive) and 812.

¹The report of this trip is to be found on pp. 80 to 87.

²It will interest those who have been following Dr. Palmer in his valuable work in lower California and Mexico, to know that he has since visited Carmen Island and made large collections at Agiabampo and in the State of Colima, which will be reported upon in a future number of these contributions.

[June 30, 1891.]

I wish to express here my thanks to Dr. George Vasey, Botanist of the Agricultural Department, under whose direction this report has been prepared, and whose ready familiarity with North American plants has been a great source of help; to Dr. Sereno Watson and his assistant, Dr. B. F. Robinson, for courtesies shown me while at Gray Herbarium; to Mr. Wm. M. Canby for the generous loaning of many plants, and for aid in difficult determinations; and to various specialists, both at home and abroad, who have given help in their separate lines, which is credited in the proper place in the text.

PLANTS COLLECTED AT ALAMOS.

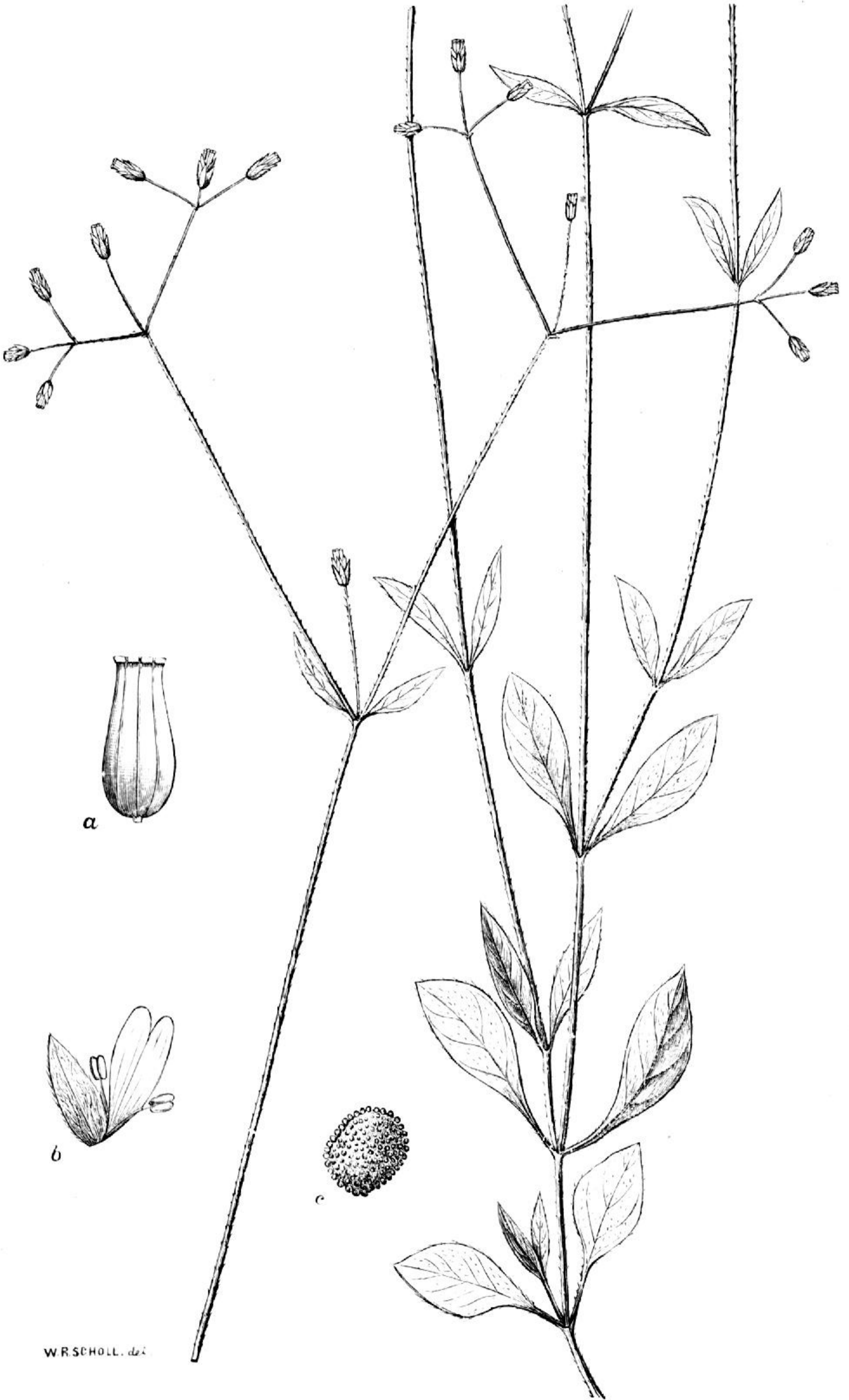
Alamos or Los Alamos is a mining town of about 10,000 inhabitants, situated 180 miles southeast from Guaymas. Its altitude is 1,275 feet above sea level. Two visits were made here, one in the dry season, March 26 to April 8; the other during the rainy season, September 16 to 30. The flora of the two seasons is very different, and only 8 or 10 species are duplicated in the two collections. The collection in the spring yielded about 130 species (Nos. 276 to 414); of these, 18 are new. The fall collection contained about 120 species, 25 of which are new. The following interesting facts are gathered from Dr. Palmer's notes. The beginning and ending of the rainy season varies somewhat; generally it commences in July and lasts until the first week of October. After the first good rains vegetation springs up as by magic, grows rapidly, then disappears nearly as quickly as it came; it is at its best in August. The soil is mostly poor and rocky except in the valley.

While at Alamos, Dr. Palmer visited the Alamos Sierra or Sierra de los Alamos, a mountain 6 miles due south of the town of Alamos. Of the 75 species collected here 13 were indeterminable; of the 62 remaining ones 18, or more than one-fourth, are new. The total number of species collected at Alamos and vicinity was 263, of which 36 were indeterminable¹, and of the 227 remaining 43 are new. Among the plants of this collection are many very beautiful ones which should claim the attention of cultivators. Of these we cite: *Heteropterys Portillana*, a recent species described by Mr. Watson. This is especially attractive for its large clusters of red fruit. It is very common at Alamos and could easily be obtained for cultivation.

Galphimia Humboldtiana, a rare plant in herbaria, is a common and attractive shrub of the mountains here. It is 6 to 8 feet high, with a handsome top, large racemes of yellow flowers, and attractive foliage.

Cordia Sonora is a new species, a very beautiful shrub or small tree, and an abundant bloomer.

¹ It is proper to state here that the reason so many of these plants are not determined is because Dr. Palmer collected a number in the dry season, which were not in a proper condition, hoping to supplement them in the rainy season; but he was unable to recollect them.



WRSCHOLL. del.

STELLARIA MONTANA, n. sp.

Tababouia Palmeri, another new species, is a conspicuous tree of this region. It grows to the height of 25 feet and produces large clusters of flowers.

Three or four of the *Ipomœas* are very attractive; one is a tree 30 feet high; another is a climbing shrub (*I. bracteata*) with large conspicuous bracts which give the plant a very showy appearance; two other new species are high climbing vines.

Clematis Drummondii T. and G. Very common, climbing over trees, bushes, and fences along water courses at Alamos. March 26 to April 8. No. 294.

Sisymbrium, sp. A little annual 3 to 5 inches high, with the foliage of *S. canescens*, but glabrous; flowers white. Seed collected at Alamos in September. Letter F. Plants grown in greenhouse at Washington. The seed is called "Pamita:" mixed with *Salvia* seed, steeped and sweetened, it forms a cooling drink.

Helianthemum glomeratum Lag. This plant grows under pines at the summit of the Alamos Mountain. March 26 to April 8. No. 342.

Polygala glochidiata H. B. K. Upper leaves alternate; flowers rose-color. Grows among grass and other plants in the shade of a wall. Alamos, September 16 to 30. No. 743.

Stellaria montana, n. sp. Slender, diffuse, about 1 foot high, glandular-pubescent: leaves $\frac{1}{2}$ to $1\frac{1}{2}$ inches long, spatulate to oblanceolate, acute to abruptly acuminate: inflorescence open; pedicels slender: sepals 5, ovate, $1\frac{1}{2}$ lines long: petals white, bifid, 2 lines long: stamens 10: styles 4: capsule a little longer than the petals, 8-cleft, the carpels rolled back: seeds numerous, tuberculate.—Moist places near water courses from the Alamos Mountain. March 26 to April 8. No. 293. A species much resembling *S. prostrata*, but with very different leaves, pubescence, etc.

EXPLANATION OF PLATE II.—The lower part of plant and a branch showing inflorescence; *a*, capsule; *b*, calyx, petal, and 2 stamens; *c*, seed. Dissections all much enlarged.

Fouquieria spinosa H. B. K. A small tree producing large bunches of scarlet flowers at the end of the branches. It is called "Torote Verde." The Indians and poorer people use the bark instead of soap, especially for washing blankets and woolen goods. Dr. Palmer thinks this plant is different from the Santa Rosalia plant, which I have (Cont. Nat. Herb. I. 81) referred to the above species. Near Alamos, March 26 to April 8. No. 306.

Sida Alamosana Watson, n. sp. ined. "Flowers orange-color." A single plant with few stems was found in the shade of rocks of a cañon. Alamos, Sept. 16 to 30. No. 683.

Sida cordifolia L. A foot and a half to three feet high, compact, bushy, with short and dense stellate pubescence and long silky hairs: leaves densely stellate-pubescent, about the length of the petiole or longer, 1 to $1\frac{1}{2}$ inches long, cordate, crenately-toothed; stipules long, setaceous, early deciduous: flowers on short peduncles or in small glomerate clusters: calyx 3 lines long, cleft to the middle, its lobes ovate and 3-nerved: petals glabrous, 4 lines long, creamy yellow, with a light brown or scarlet base: styles 5 or 6: carpels 5 or 6, slightly reticulated, obtuse, 1 line long.—Grows in good soil, in shade, at the base of the Alamos Mountain. March 26 to April 8. No. 301. Also, September 16 to 30. No. 752.

It differs from *S. cordifolia* in having but 5 to 6 carpels, obtuse, and reticulated, while the true *S. cordifolia* has 10 to 12 carpels hardly reticulated and either bi-aristate or bi-dentate.

Sida diffusa H. B. K. Its long stems lie prostrate upon the ground: flowers yellow. It grows on stony ridges near Alamos. Sept 16 to 30. No. 713.

Abutilon Jacquini Don. (?) Collected near Alamos. September 16 to 30. D.

- Abutilon incanum** Don. Flowers lavender; common in shade of bushes and rocks along wooded hillsides; near Alamos. March 20 to April 8. No. 381.
- Abutilon incanum** Don. Two and one-half to three feet high; flowers very numerous and somewhat variable in color; petals mostly purple at base, but either white, orange, or purple above. A very common plant about Alamos. September 16 to 30. Nos. 650, 651, 653.
- Waltheria Americana** L. About 3 feet high: flowers yellow. This plant is very common on the grassy bottoms about Alamos. September 16 to 30. No. 643.
- Waltheria detonsa** Gray. Flowers orange-colored. A small plant about a foot high. Alamos. March 26 to April 8. No. 390.
- Ayenia pusilla** L. Grows sparsely in shady woods near Alamos. September 16 to 30. No. 662.
- With this is a very narrow leaved form. No. 661.
- Ayenia paniculata**, n. sp. A shrub about 2 feet high: leaves $2\frac{1}{2}$ to 3 inches long (on petioles $1\frac{1}{2}$ inches long), oval and obtuse to ovate and acute, truncate at base and coarsely serrate; pubescence beneath white, dense, close, and stellate; above green and scanty: flowers either in the axils of the leaves or in naked panicles above: sepals brown, linear to narrowly lanceolate, $3\frac{1}{2}$ lines long: petals orbicular, 2-lobed, each lobe 2 to 3-dentate: anthers 3-celled: fruit 4 to 5 lines broad, 5 to 7-lobed, covered with short, blunt prickles, shorter than in *A. glabra*.—Very rare at Alamos. September 16 to 30. No. 644 in part.
- Ayenia truncata**, n. sp. Shrubby: leaves ovate, slightly acuminate, truncate at base, 1 to $1\frac{1}{2}$ inches long, crenately toothed, nearly glabrous: pedicels 3 to 4 lines long: fruit about 3 lines in diameter, clothed with a fine stellate pubescence and short blunt spines: seeds oblong, black, $1\frac{1}{2}$ to 2 lines long, less rugose than in *A. filifolia*.—Very rare at Alamos. September 16 to 30. No. 644a. It is nearest *A. glabra*, but has smaller leaves and these truncate at base and less acuminate at tip, etc.
- Triumfetta semitriloba** L. Grows under bushes about Alamos. September 20 to 30. No. 642.
- Heliocarpus attenuatus** Watson. Proc. Amer. Acad. xxi. 420. A small tree 10 feet high, 2 inches in diameter, with a compact top. On stony mountain side near Alamos. No. 732 (only in fruit). No. 647 (just past flowering).
- Another plant, of which but one specimen was seen, having the leaves and inflorescence of this species, seems to be the same, but it is a small bush with white flowers and 20 stamens. Collected on a hillside near Alamos. September 16 to 30. No. 733.
- Heliocarpus polyandrus** Watson. Proc. Amer. Acad. xxi. 420. A large shrub 8 feet high: the stem with brown flaky bark: larger leaves, 6 inches or more long by 4 inches broad, on petioles 3 to 4 inches long: sepals $3\frac{1}{2}$ lines long, greenish yellow: petals 2 lines long: stamens 45, long and conspicuous.—Alamos. September 16 to 30. No. 629.
- Bunchosia Sonorensis**, n. sp. Five to ten feet high, with many woody branches; older branches glabrate and with reddish-brown bark; younger branches, leaves, and inflorescence with short soft pubescence: leaves glandless at base but with a few scattered glands on the lower surface, oval and obtuse to lanceolate and acute, $1\frac{1}{2}$ to 2 inches long: racemes 1 to 4 inches long; peduncles 3 to 8 lines long; pedicels thick, 2 lines long, in fruit 4 lines long, glandular at base: calyx small with 5 ovate lobes, bearing 10 large glands: corolla yellow; petals 3 lines long, with long claws: stamens 10, glabrous, connate at base: styles united: ovary sericeous-pubescent: drupe $\frac{1}{2}$ inch in diameter, somewhat 2-lobed, 2-pyrenous, "light amber," becoming dark red.—On level places and ridges where there is plenty of soil. Alamos. No. 322. Dr. Palmer says this plant is a large bush with numerous yellow flowers. It is considered poisonous and is not eaten by man, bird, or beast, but at night a large moth feeds upon its delicate juices.

- Echinopterys Lappula** Juss. The leaves of this plant are quite variable, sometimes obtuse, again the upper ones acuminate. This is the same as Palmer's Guaymas (1887) plant referred here by Watson, differing only slightly from his description. Our plant differs considerably in habit, being a climbing shrub covering the tops of surrounding bushes. Alamos. No. 404.
- Galphimia Humboldtiana** Benth. Dr. Palmer says: "It is the most beautiful plant of the mountain, forming a conspicuous object along the arroyos. It grows 6 to 8 feet high with one or more stems and a compact top of numerous racemes of bright yellow flowers as if polished, changing by age to light brown; this double coloring of the flowers contrasts strongly with the dark green of the leaves and gives it a just claim for cultivation." Mountains about Alamos. March 20 to April 8. No. 284.
- Heteropterys Portillana** Watson, Proc. Amer. Acad. xxii. 402. This species was described from flowering specimens only, and as both flowers and fruit are now at hand additional characters are here appended. Flower buds pink to rose-colored: styles 3: samara puberulent, 1 to 3 mostly 2, rarely 3, with several lateral crests; the dorsal wing 9 lines long. Dr. Palmer says the fruit, which is of a shiny brick-red color, grows in large masses, making it very attractive, and he considers it a valuable plant for cultivation. A very common plant about Alamos growing over brush and bushes especially along water-courses and in cañons. September 16 to 30. No. 655 in flower and No. 656 in fruit. The only other time it has been collected was by Dr. Palmer at Baranca, Jalisco, in 1886.
- Tribulus maximus** L. Called "goconduna" and is used for the cure of insect and reptile bites. Common at Alamos but not collected; grows on rich bottom at Agiabampo. October 3 to 15. No. 786.
- Tribulus grandiflorus** B. & H. Flowers orange with red blotches at base. In rich bottom, common at Alamos but not collected. Agiabampo. October 3 to 15. No. 783.
- Geranium** sp. The single specimen is without flower or fruit. Collected in a shady ravine near the top of the mountain. No. 357.
- Wimmeria confusa** Hemsley, Diag. Pl. Nov. Fasc. i. 6. A large shrub or small tree, sometimes 4 inches in diameter. Alamos. September 16 to 30. No. 648.
- Ceanothus buxifolius** Willd., *vide* Mrs. Brandegee. Alamos Mountain. March 25 to April 8. No. 336.
- Gouania Domingensis** L. A climbing shrub. Plants mostly in fruit, only a few flowers were found and those were canary color. Common along cañons and water-courses. Alamos. September 16 to 30. No. 675 (flowers). No. 676 (fruit). Collected also in fruit, March 25 to April 8. No. 323.
- Serjania Mexicana** Willd. A climbing plant with long slender stems with scattered short prickles: flowers sweet-scented, white, in racemes 3 to 4 inches long. Dr. Palmer says the Mexicans use the stem to tie wood, grass, etc., into bundles, its strength and pliability making it very applicable for such purposes. It is called "quirote culebra." Alamos. March 26 to April 8. No. 383.
- Vitis Arizonica** Engelm. Probably this species. Only collected in flower. The fruit is said to be of no value. Only two plants seen. Found climbing over rocks, along a water-course, half way up the Alamos Mountain. March 26 to April 8. No. 296.
- Rhus Palmeri**, n. sp. Large shrub or small tree, 5 inches in diameter, 6 to 15 feet high, with large loosely-hanging top; branches puberulent: leaves pinnate; rhachis not winged; leaflets 5 to 13 mostly 9 to 11, elliptical-oblong, 1½ to 2 inches long, acute, mucronate-tipped, appressed, pubescent: panicle terminal, 3 to 5 inches long: flowers unknown: berries glabrous, red, 3 to 5 lines in diameter, acid, very viscid.—Along a water-course half way up the Alamos Mountain, March 26 to April 8. No. 321. Although not in flower this is evidently a *Rhus* and seemingly nearest *R. juglandifolia* Willd. of Southern Mexico, but the leaflets are smaller and pubescent.

Crotalaria ovalis Pursh. Alamos. September 16 to 30. No. 712.

Indigofera Anil L. This is a small plant 1 to 1½ feet high with dark bronze colored leaves. Pods few, shorter than in our herbarium specimens, and almost straight. Collected under pines and oaks on the summit of the mountain March 26 to April 8. No. 358. Common along ravines at Alamos, March 25 to April 8. No. 311.

Hosackia Alamosana,¹ n. sp. Procumbent, rooting at the joints, glabrous or the younger parts with appressed hairs: leaves 3 to 5-pinnate; stipules 1 to 2 lines long, foliaceous, ovate, acute; leaflets obovate, obtuse, 2 to 5 lines long: peduncles slender, 2 to 4 inches long, 1 to 4-flowered, mostly 2: bracts 1, setaceous: flowers small 2 to 3 lines long: calyx tube less than a line long; its lobes almost as long and very narrow: corolla yellow: pods 10 to 15 lines long, terete, erect, 12 to 15-seeded; seeds turgid, oblong, lucid.—Half way up the mountain in a wet spot. Alamos. March 26 to April 8. No. 400. Dr. Palmer says: "The plant roots at every joint and forms a thick sod." The plant is nearest *H. angustifolia* of Mexico, but differs from it especially in its procumbent habit; its fewer and obtuse leaflets; smaller flowers and bracts. It is questionable, whether Seemann's (No. 121 of Botany Herald) broader leaved form from this same range of mountains may not really be our plant. Mr. Hemsley (Biol. Cent.-Amer. i. 234), who has probably seen Seemann's plant, however, kept it as a possible variety of *H. angustifolia* and refers to it Parry and Palmer's No. 140, which is a very different plant from ours.

It differs from *H. repens* Don. (which species Mr. Hemsley has omitted in the Biol. Cent.-Amer.) in its fewer leaflets (1 to 3 pairs), and these not mucronulate; heads fewer flowered (mostly 2, rarely 4); and glabrous calyx.

Hosackia puberula Benth. A slender plant, under oaks and pines. Alamos Mountain. March 26 to April 8. No. 343.

Eysenhardtia orthocarpa Watson, Proc. Amer. Acad. xvii. 339. A small tree 10 to 15 feet high, sometimes 6 to 8 inches in diameter: flowers white. Called "Palo dulce." The wood steeped in water makes a sweet, refreshing drink, much relished by fever patients. In the Alamos Mountain. March 26 to April 8. No. 354.

Dalea nutans Willd. Three to five feet high, with slender hanging branches. Very common in the upper portion of the mountain. The branches are often used by the Mexicans for brooms. Alamos. March 26 to April 8. No. 385.

Dalea Wislizeni Gray. Three feet high, with drooping tendency: flowers of a bright mauve color. Not common. Collected in the upper part of the Alamos Mountain, March 26 to April 8. No. 282.

Dalea Domingensis DC. Two to three feet high: leaflets somewhat larger than in type. Only a few plants seen near Alamos. March 26 to April 8. No. 380. Also September 16 to 30. Letter C.

Dalea calycosa Gray. It grows on stony ridges close to the ground, almost hidden from view in the grass. Flowers white at first, becoming pinkish when drying.

Dalea lævigata Gray. (?) Four to five feet high, without leaves: flowers white. Very common in the mountain. Dr. Palmer says that the branches are made into brooms by the Mexicans and sold in the markets at Alamos. March 25 to April 8. No. 853.

Dalea Parryi Torr. and Gray. A loose growing plant about 3 feet high. Common on hillsides about Alamos. September 16 to 30. No. 739.

Brongniartia podalyrioides H. B. K. A shrub 8 to 10 feet high, 3 to 4 inches in diameter: leaflets 5 to 7 pairs. Alamos. September 16 to 30. No. 658.

It differs from *B. galegoides*, which it resembles somewhat in the flowers being axillary not racemose; the leaflets larger, with cuneate base.

¹If *Hosackia* is to be referred to *Lotus* as advocated by Mr. E. L. Greene, Pitt. II. 133, this should be *L. Alamosanus*.



DIPHYSA RACEMOSA, n. sp.

Brongniartia Palmeri, n. sp. Shrub, $1\frac{1}{2}$ to $2\frac{1}{2}$ feet high, glabrous; branches villous-pubescent: leaves 2 to 3 inches long; stipules large, 6 to 8 lines long, ovate; leaflets 6 to 8 pairs, oblong, appendiculate, glabrous above, with villous hairs along the margins and midrib below: inflorescence in a terminal raceme; flowers mostly 3 to 5 in the axils of stipular bracts: peduncles 9 lines long, enlarged below the calyx: calyx 6 lines long; its two upper lobes high connate: petals purplish: pods $1\frac{1}{2}$ to $2\frac{1}{2}$ inches long, glabrous and glaucous, oblong, tapering at base, 3 to 6-seeded: seeds 3 to 4 lines long.—Rare, only a few plants seen near the base of the mountain. Alamos, March 26 to April 8. No. 300. In *B. galeoides* the upper bracts are small, leaflets larger, etc.

Diphysa racemosa, n. sp. Five to ten feet high, the younger parts, foliage and inflorescence, very viscid, granular: leaflets 9 to 17, oblong, small, 3 lines or more long: racemes axillary 8 inches or more long: pedicels 4 lines long: 2 bractlets at base of flowers, oval, 3 lines long: calyx about 6 lines long, the slender tube below the disk 2 lines long: legume on a stipe 6 lines long, oblong, $1\frac{1}{2}$ inches long, $\frac{3}{4}$ inch broad.—Hill-slopes, in deep soil near Alamos. March 26 to April 8. No. 295. The wood is very hard and yellowish, covered with a dark-brown bark abundantly spotted with many horizontal lenticles. This is both in flower and fruit. It is almost gummy and emits a most disagreeable odor.

EXPLANATION OF PLATE III.—Shows racemes and foliage; *a*, legume; *b*, section of stem with lenticles. All natural size.

Coursetia glandulosa Gray. A large scraggy bush with several stems. The stems are often covered with a thick coating of gum. Dr. Palmer says it has great medical value. The gum dissolved in water with sugar is used as a drink in cases of colds and fevers, and as a remedy for consumption it is highly extolled. It is sold in the drug stores at a dollar per pound, under the name of "Guma Sonora." The plant is known as "Samo prieto." It grows at the base of the mountains in the gulleys. Alamos. March 26 to April 8. No. 333.

Willardia, n. gen. Calyx truncate with small equal teeth. Petals equal; vexillum orbicular spreading; wings falcate-oblong; keel slightly incurved. Vexillary stamen connate into a tube with the others except at base; anthers uniform. Ovary sub-sessile with several ovules; style incurved, glabrous or with a few hairs at base; stigma capitate, minute. Legume linear-oblong, strongly compressed, continuous within: seeds reniform, strongly compressed. A small tree: leaves imparipinnate; leaflets definite, entire, exstipellate. Stipules obsolete. Racemes axillary. Flowers "lilac."

This plant was first named and described as a *Coursetia* by Dr. Watson, to which genus it is closely related. The type specimens, however, were only in fruit and it was doubtfully referred as above. The collection by Dr. Palmer of an abundance of flowers shows a still greater divergence and demands the establishment of a new genus.

It differs from *Coursetia* especially in its truncate calyx and glabrous style. Its position, however (according to Dr. P. Taubert¹), seems nearest *Lennea*, from which it differs in its style and more membranaceous pod.

It resembles *Sabinea* in its calyx but differs in having racemes of flowers, and also from this as well as all the other *Robinieæ* except the above two, in its connate stamens.

At the request of Dr. Edward Palmer I have named this genus for his old and valued friend, Hon. Alexander Willard, who for twenty-five years has represented our Government as consul at Guaymas, and has aided Dr. Palmer with his various collections from this region.

¹ I am under many obligations to Dr. P. Taubert, of Berlin, who is preparing and will soon issue the Leguminosæ in Die Natürlichen Pflanzenfamilien, for confirming my observations and adding new information.

Willardia Mexicana. Small trees 10 to 30 feet high, very straight, with smooth bark and 1 foot or more in diameter: leaves (only a few of the old ones remaining) 4 to 7 pairs, oblong-elliptical, obtuse at each end or subemarginate, 8 to 15 lines long, 6 to 8 lines broad, finely and softly pubescent, especially beneath: racemes somewhat paniculate many-flowered:¹ calyx 2 lines long with very short teeth: petals 5 lines long: stamen tube truncate at apex: ovules 8 to 10; pods very thin, narrowed at each end, 2 to 5 inches long, 4 to 6 lines wide, more or less constricted, dehiscent: seeds 5 lines long, smooth and shining, pale salmon color.—In flower March 25 to April 8 (No. 332), in fruit September 16 to 30 (No. 717). Also collected in SW. Chihuahua in 1884 by Palmer. *Coursetia* (?) *Mexicana* Watson. Proc. Amer. Acad. XXI. 424.

Called "Nesco" or "polo piojo."

Common in the Alamos Mountain, where it is much used by the miners for "props." Only two trees seen near the base of the mountain. The trees near the settlements are mostly destroyed.

Desmodium plicatum Schl. and Ch. The plant has two or three slender stems and a few loose, hanging branches: racemes axillary or terminal, 6 to 8 inches long: flowers in verticillate clusters, crimson, becoming dark purple when dry. On the side of a ravine in the upper portion of the Alamos Mountain. March 26 to April 8. No. 347. We have not seen a description of this plant, but it corresponds with Bourgeau's plant referred here by Hemsley.

Rhynchosia precatória DC. (?) This plant seems to belong to this species and to be different from *R. phaseoloides*, to which it is often referred by authors. The latter species can be distinguished by its glabrous shining pods and large flowers. Several very similar forms have been referred to *R. phaseoloides* by Mr. Watson, and while the two, as represented in the National Museum, seem distinct, a fuller representation may show they are the same species. Along a river bank near Alamos. March 26 to April 8. No. 378.

Eriosema grandiflorum Seem. About 1 foot high. Only a single plant seen. At the base of the Alamos Mountain. March 26 to April 8. No. 360.

Nissolia Schottii Gray. A climbing shrub, glabrous, leaves alternate; leaflets 5, thin, oblong to obovate (6 to 10 lines long), obtuse with appendiculate tip: flowers axillary, 2 to 5 (?) in a cluster: fruit 10 lines long, 1 to 2-seeded. This shrub was found climbing over fences, etc., about Alamos. September 16 to 30. No. 638.

Piscidia mollis, n. sp. Apparently a second species of this genus. A tree 15 to 25 feet high, a foot in diameter: leaves 11 to 13 pinnate; leaflets elliptical or broad lanceolate, acute, hoary, veins prominent beneath, indistinct above: fruit 4-winged, 2 somewhat abortive.—Common on ridges and plains about Alamos. March 26 to April 8. No. 355. Called "palo blanco," from the excessively white appearance of the tree.

Parkinsonia aculeata L. Called "Guacoporo." A shrub 10 to 15 feet high. Common along river banks, ravines, etc. Alamos. March 26 to April 8. No. 375.

Cassia Tora L. One of the commonest plants of the region and found everywhere in waste places, especially in sandy soil. Alamos. September 16 to 30. No. 738.

Cassia biflora L. One to one and a half feet high. Grows on wooded hills about Alamos. March 26 to April 8. No. 393. September 16 to 30. Letter B.

Cassia emarginata L. A small tree 10 to 15 feet high, with a very large top. The abundance of orange-colored flowers makes it an attractive tree. This is the same as Palmer's No. 210, Chihuahua, 1885. Near Alamos. March 26 to April 8. No. 299.

¹All the flowers were more or less infested by a little encysted insect which Mr. L. O. Howard has described as a new genus *Tanaostigma*. For a description and an interesting account of this insect see *Insect Life*, vol. II.

- Mimosa (Leptostachyae) Palmeri**, n. sp. Large, bushy shrub, 8 to 10 feet high, thornless or with a few infra-stipular spines; the younger branches fuscous-pubescent: leaves large, with setaceous stipules; rhachis 4 to 8 inches long, deeply grooved; pinnæ with small stipels, 6 to 16 pairs, oblong-oblique $1\frac{1}{2}$ to $2\frac{1}{2}$ lines long, appressed pubescent above and below: spikes (2 to 4 inches long) axillary or racemose, corolla pinkish, its lobes pubescent and spreading: stamens 10: ovary with reddish-brown pubescence, tipped with a long, slender style.—This shrub was only found in flower, and these mostly in terminal racemes 6 to 8 inches long. The buds and flowers are pink and very showy and sweet-scented. Near Alamos. September 16 to 30. No. 628. This plant comes nearest to *M. Wrightii*, but with larger and more open leaves and with different pubescence.
- Acacia pennatula** Benth. In these specimens the peduncles are very short (3 to 6 lines long), while those of Pringle from Jalisco (1889), referred here by Mr. Watson, have peduncles sometimes $1\frac{1}{2}$ inches long. No fruit accompanies these specimens. Commonly called "Algaroba." It is a small tree with a very broad top. The flowers are very numerous, orange-colored, and very fragrant.
- Acacia malacophylla** Benth. var. *microphylla* Watson. Our plant seems to be the same as Pringle's Sonoran specimens collected in 1884. We have not seen Mr. Watson's description of this variety. Dr. Palmer says it is a small tree resembling the mesquit. It is nearly exterminated; about settlements it is much used for fuel. Near Alamos. March 26 to April 8. No. 315.
- Acacia (?) sp.** A large bushy shrub with several stems, 8 to 10 feet high, with a large top, somewhat thorny: pinnæ 4 to 8 pairs; leaflets 8 to 10 pairs, oblong, 2 to 3 lines long: heads on peduncles $\frac{1}{2}$ inch long: pods with 6 to 10 deep constrictions, margin thick and breaking away from the valves. Alamos. September 16 to 30. No. 627. This shrub is probably of this genus, but as it is only in fruit its generic position is doubtful. The pods seem to ally it with *A. constricta*.
- Leucæna lanceolata** Watson., Proc. Amer. Acad. XXI. 427. A large bushy shrub 8 to 10 feet high, glabrous or nearly so throughout: pinnæ 4 to 6 pairs with a small gland between or at the base of the upper pair; leaflets 3 to 6, glabrate or nearly so: pods erect, 6 inches long tapering at base into a stipe (6 to 8 lines long) glabrous, marked with cross partitions. *L. lanceolata* was described from flowering specimens and ours is in fruit. It seems nearest that species but differs from the description in most of the above particulars and lacks the large gland on the petioles. In a cañon near Alamos. September 16 to 30. No. 718.
- Lysiloma Watsoni**, n. sp. A small tree 10 feet high, 3 inches in diameter; branches, rhachis and leaflets densely cinereous-pubescent: leaves large; rhachis 5 to 6 inches long; pinnæ 8, 2 to 5 inches long; leaflets 30 to 45, thick, oblong, 2 to 4 lines long, obtuse, with midrib somewhat excentric: legumes single or two or three in a cluster, oblong, 5 to 8 inches long, 10 to 12 lines broad, tapering at base into a stipe, 6 to 12 lines long and abruptly narrowing into a spiny tip 6 lines long; the exocarp first breaks away from the persistent margin: seeds oblong-oval, $4\frac{1}{2}$ lines long, brownish with a darker elliptical mark on each side. Alamos. September 16 to 30. No. 664.—Dr. Palmer says this tree has a symmetrical top. It was only seen in fruit. With this species I am inclined to refer Palmer's No. 88 (1886) from Baranca of the State of Jalisco referred to "*Lysiloma (?) sp.*" by Mr. Watson in Proc. Amer. Acad. XXII. 410. Palmer's No. 88 is simply in flower and the leaflets, immature, are smaller and described as glabrous. Even in fruiting specimens there is considerable difference in the size of the leaflets. The pubescence is developed by age. No. 88, which appears to be glabrous even under an ordinary lens, shows under the high power the nascent pubescence. The stipules are wanting in my specimens, and the tips of the leaflets are a little different from Mr. Watson's specimen but in other respects it seems to be the same. This well-marked new species belongs to Mr. Bentham's second section of this genus. It may well bear the name of Mr. Watson, who has characterized but not named the species.

Lysiloma Acapulcensis Benth., var. *brevispicata*, n. var. A large tree, 30 to 40 feet high, 1 foot or more in diameter: spikes very short, 6 to 10 lines long.—Our specimens are without fruit but seem to differ from this species only in the very short spikes of flowers. Near Alamos. March 26 to April 8. No. 317. Palmer's plant from Jalisco (1885) is a shrub only 12 feet high. Pringle (1889) has collected the species in fruit from the same region. The trees are fast disappearing. Dr. Palmer says it resembles the Mesquit and is a good durable wood and makes a fine shade tree. Called "Tepebuaje."

Pithecolobium Mexicanum, n. sp. Small tree, 15 to 20 feet high, 1 foot in diameter: leaves with straight stipular spines (sometimes wanting) 1 line long; pinnae 2 to 5 pairs; leaflets 5 to 10 pairs, oblong, 2 to 4 lines long, midribs a little eccentric, puberulent, as is also the rhachis and branches: inflorescence paniculate; flowers in heads, pedicellate; pedicels 1 to 2 lines long: calyx $\frac{1}{2}$ line long: corolla $1\frac{1}{2}$ lines long; the petals spreading or reflexed: stamens long, numerous: legumes oblong, somewhat constricted, 3 to 4 inches long, 1 inch broad, straight, its valves not elastic nor revolute: seeds 2, oval, 2 to 4 lines long.—In the Alamos Mountain. March 26 to April 8. No. 297. Seeming nearest *P. albicans* Benth., but peculiar in its pedicelled flowers. Commonly called "Chino." The tree has much the habit of the Mesquit and is valuable for its wood; it is now rarely seen and is fast becoming exterminated.

Sedum Alamosanum Watson. Proc. Amer. Acad. xxv. 148. This is the type, the descriptions being drawn from the vegetative plant. The floral characters are here appended: Racemes 2 to 8-flowered: flowers pinkish; sepals 1 line long: petals $1\frac{1}{2}$ to 2 lines long: stamens 10. Collected on the side of a ravine, half way up the mountain. Alamos. March 26 to April 8. No. 273.

Gronovia scandens L. This plant climbs over bushes and to the tops of the highest trees. Alamos. September 16 to 30. No. 630.

Cuphea calcarata Benth. (?) Alamos. September 16 to 30. No. 729.

Schizocarpum Palmeri Cogniaux and Rose, n. sp. Stem long and slender with short close pubescence, intermixed with long scattered hairs, or becoming glabrate: leaves 1 to 4 inches long, on petioles of about equal length, entire to deeply 3-lobed: male flowers on peduncles 1 inch or more long, large, solitary, axillary, yellow; calyx short, tubular below, its lobes filiform; corolla funnel-form; stamens 3 with distended filaments and with anthers elongated, more or less curved; pistil none: fertile flowers subsessile; calyx and corolla as in male-flower; ovary glandular-pubescent, oblique, oblong, long rostrate, two-celled, each cell with 10 locelli in two rows; style slender 2 to 3 lines long, with large bilobed stigma; ovules in the locelli, solitary ascending (!); fruit $1\frac{1}{2}$ inches long, turgid, ovoid, indehiscent or bursting irregularly, glabrous; seeds 3 to 4 lines long, glabrous, black, flattened, tapering to an obtuse apex.—Climbs over fences and bushes along water-courses and in cañons near Alamos. September 16 to 30. No. 725.

Echinopepon¹ *cirrhopedunculatus*, n. sp. Stems slender, climbing over bushes, glabrous except a bunch of white hairs at the nodes: leaves variable from orbicular with deep sinus and shallow lobes, to ovate with deep lobes and almost truncate base; the lobes and apex spiny tipped; the upper surface white papillose with short spiny hairs on the veins, below somewhat scabrous; petiole about the length of the leaves, spinescent with a cluster of white hairs at the base of the

¹There is still considerable difference of opinion among botanists as to the claims of this group to generic rank. As held by Cogniaux and other distinguished botanists this should be referred to *Echinocystis cirrhopedunculata*. He says, however, there is reason for either course—"vous verrez que j'ai été longtemps indécis avant de réunir ces deux genres dans ma monographie: on peut donner de bonnes raisons pour la réunion, et aussi pour la séparation." Still others would refer this to *Micrampelis cirrhopedunculata*, claiming that Rafinesque's genus should be substituted for *Echinocystis*. See Pitt. II. 127, etc.



ECHINOPEPON CIRRHOPEDUNCULATUS, n. sp.

blade sterile flowers on racemes with slender peduncles longer than the leaves: pedicels filiform 6 to 9 lines long: flowers small ($1\frac{1}{2}$ to 2 lines broad), white, anthers 5, with straight cells: female flowers solitary on long thread-like pedicels (3 to 6 inches long) which coil like a tendril: fruit including the beaked operculum (glabrous, deciduous) 8 lines long; the base covered with long slender spines: cells 2, each containing 2 seeds: seeds ascending, $2\frac{1}{2}$ lines long.—Common about Alamos, climbing over bushes and fences. September 16 to 30. No. 634. A peculiar species in its long cirrhiform peduncles. Prof. A. Cogniaux, who has kindly looked over my plant, makes the following note: *Votre Echinopepon nouveau est bien curieux et diffère beaucoup de tous les autres, surtout par son très-long péduncule filiforme. Je crois qu'il faudra le placer près de mon Echinocystis torquata (Monogr., p. 803), avec lequel il n'a cependant pas trop de rapports.*

EXPLANATION OF PLATE IV.—The plant is shown natural size; *a*, seed; *b*, flower; both much enlarged.

- Sicyosperma gracile** Gray. This plant is found along water-courses, climbing over bushes and fences. Alamos. September 16 to 30. No. 723.
- Sechiopsis triquetra** Naud. Alamos. September 16 to 30. No. 736.
- Begonia Palmeri** Watson. Proc. Amer. Acad. xxi. 429. Leaves not lobed: flowers white. Grows in a mountain cañon near Alamos. September 16 to 30. No. 708.
- Cereus**, sp. About 4 feet high: flowers salmon-colored, very numerous. Quite common at Alamos. March 26 to April 8. No. 335.
- Eryngium nasturtiifolium** Juss. The fruit of this species is covered with small, linear scales, except at the top; here they are broad, ovate, mucronate; the apex is extended into a beak as long as the ovary. Only a few plants found in moist places near Alamos. March 26 to April 8. No. 302.
- Aralia pubescens** DC. ? Tree-like plant 5 to 7 feet high, $1\frac{1}{2}$ inches in diameter with thick corky bark; branches few, horizontal: branches and inflorescence puberulent: racemes terminal, compound, 3 to 6 inches long: styles 5, tardily separating: fruit 2 lines in diameter. Alamos Mountain. March 26 to April 8. No. 351. *A. pubescens* has been considered by Benth. & Hook., Gray and Watson, and most other writers as simply a form of *A. humilis* and our plant may properly belong to that species. In the absence of leaves, however, it is difficult to decide just what species it is, and if distinct from *A. humilis* I am not altogether sure that it is *A. pubescens*.
- Chiococca racemosa** L. An upright-growing shrub, 6 feet high. The leaves are somewhat smaller than any specimens in the National Herbarium. Grows on hillside near Alamos. Sept. 16 to 30. No. 735.
- Spermacoce asperifolia** Mart. & Gal. Collected near Alamos; without number (distributed under letter *C*). Sept. 16 to 30. Said to have been obtained in March also, but specimens are lost.
- Vernonia** (?) **Palmeri**, n. sp. A bush with many stems, 4 to 5 feet high, closely sericeous-pubescent: leaves lanceolate, 3 to 6 inches long, entire: inflorescence forming large pyramidal clusters: involucre cylindrical, or 3 or 5 series of bracts: corolla white with slender proper tube and narrow lobes: akenes turbinate, pubescent.—Alamos. March 26 to April 8. No. 387. Very abundant half way up the mountain side.
- Stevia trifida** Lag. Only a few plants seen. Found near a water-course half way up the Alamos mountain. March 26 to April 8. No. 287.
- Stevia subpubescens** Lag. One to two feet high, bushy: flowers white. High part of the mountain under shade of oaks and pines. Alamos. March 26 to April 8. No. 386.
- Eupatorium**, sp. About 2 feet high: leaves 1 to $1\frac{1}{2}$ inches long, ovate, slightly toothed, under surface densely covered with minute glands: involucre cylindrical, with 3 or 4 rows of closely imbricated bracts. Only found half way up the mountain. Alamos. March 26 to April 8. No. 359.

- Eupatorium pauperulum** Gray. Stem 18 inches to 2 feet high : inflorescence corymbose : flowers creamy white ; proper tube of corolla long and slender. Grows in shade upon the upper part of the Alamos Mountain. March 26 to April 8. No. 281. According to Syn. Flora it is credited to Pringle alone from Arizona, but Parish collected it at Lowell, and Lemmon (Nos. 183 or 201) in 1881 found it at Santa Catalina Mountains, and distributed it as *E. pycnocephalum* Less.
- Eupatorium Palmeri** Gray. Proc. Amer. Acad. xxi. 383. Collected by Palmer in 1885 and recently (1890) by Pringle.
- Barroetia subuligera** Gray. Leaves serrate, not crenate. Alamos. Sept. 16 to 30. No. 677.
- Brickellia Pringlei** Gray. The plant grows from 1 to 1½ feet high ; rare. Found in the higher part of the Alamos mountain. March 26 to April 8. No. 286.
- Brickellia diffusa** Gray. Found in the shade on the bank of a creek. Alamos. Sept. 16 to 30. No. 812.
- Aster tanacetifolius** H. B. K. Common on grassy creek bottoms. Alamos. Sept. 16 to 30. No. 654.
- Erigeron Alamosanum**, n. sp. Slender annual a foot or so high, simple, or more or less branched, slightly hirsute and granular : radical and lower leaves ovate to broadly spatulate, remotely toothed ; upper leaves narrowly spatulate to linear : peduncles filiform : involucre 1 to 2 lines long, its bract slender, acute, with scarious margins and a brown gland along the back : rays about 50, slender, violet. —Grows half way up the mountain side in shade of rocks. Alamos. March 26 to April 8. No. 348. This is nearest *E. divergens*, but it has different pubescence, smaller heads, and fewer rays.
- Baccharis glutinosa** Pers. Six to eight feet high. Common along water-courses near Alamos. Sept. 16 to 30. No. 719.
- Lagascea decipiens** Hems. A common loose-growing plant 5 feet high : flowers orange-colored. Near Alamos. March 26 to April 8. No. 401.
- Gnaphalium Sprengelii** Hook and Arn. Collected near the top of Alamos Mountain, March 26 to April 8. No. 349. What appears to be the same species found Sept. 16 to 30. No. 678.
- Milleria quinqueflora** L. This plant is about 3 feet high. It grows along water courses in dense shade. Alamos. Sept. 16 to 30. No. 722.
- Guardiola platyphylla** Gray. A bushy shrub about 3 feet high. Common on the gravelly beds just above the river near Alamos. March 26 to April 8. No. 280.
- Melampodium cupulatum** Gray. Common along ravines, on hillsides, and in cañons. Alamos. September 16 to 30. No. 726. Also common at Agiabampo. It seems to have been collected by Palmer in 1869.
- Franseria cordifolia** Gray. A plant known only from the collections of Pringle & Parish. Dr. Palmer reports it as very common about Alamos on wooded hillside. It grows about 2 feet high and is quite bush-like. The young stems show an intense whiteness which disappears, somewhat, in drying. Alamos. March 26 to April 8. No. 391.
- Tragoceros Mocinianus** Gray. Proc. Amer. Acad. xxi. 388. Flowers creamy white. Very common on sandy bottoms and in cañons, but has only been collected before by Palmer in SW. Chihuahua in 1885. Pringle's No. 2450 from Jalisco distributed as this species answers better to *T. microglossus* DC. Alamos. September 16 to 30. No. 646.
- Zinnia linearis** Benth., var. *latifolia*, n. var. Low and somewhat spreading : leaves broader, lanceolate, 1 to 1½ inches long, 2 to 4 lines broad, 3-nerved : rays few, always 7 : akenes with 2 unequal awns.—Alamos. March 26 to April 8. No. 352. Only a single specimen found near the base of the mountain. Although this plant does not seem to answer very well for *Z. linearis*, yet it is very similar in the color of the flowers and in its akenes, but on account of the scanty material it seems best to make it a form of this species.

- Sclerocarpus spatulatus**, n. sp. Several feet high with widely spreading branches: leaves alternate, 3 to 5 inches long including the petioles, coarsely serrate, a little scabrous above, appressed-pubescent below: involucre bracts 3 to 6 lines long, hirsute: rays yellow: central disk-flowers sterile.—Very common in woods and along streams about Alamos. September 16 to 30. No. 649.
- Montanoa**, sp. Three feet high with several stems: leaves opposite, ovate-lanceolate 3 to 5 inches long by 2 inches broad, acuminate, 3-nerved, sub-entire, hispid above, villous-pubescent beneath: involucre bracts very small (2 lines long) mucronate: chaffy bracts large (6 lines long), glabrous, with mucronate tip reflexed: rays not seen: disk-corolla 2 lines long; proper tube slender (1 line long), swollen at base, abruptly enlarged into the long slightly puberulent throat: style with bulbous base, hardened in age, attached or deciduous from the akenes: akenes glabrous, top-shaped, $1\frac{1}{2}$ lines long, without pappus.—Alamos. March 26 to April 8. No. 361. A single plant found half way up the mountain side. It is called "Bolallaqui;" it exudes from the stem a gum which is much valued by the common people for its healing properties. Although the number of rays is not known, it clearly belongs to De Candolle's § *Acanthocaphae*. By comparing the flowers with those of *M. grandiflora* (Palmer's No. 492 of 1886), I find that the corolla is shorter and less pubescent and the latter lacks the bulbous style. *M. subtruncata* Gray has still shorter corolla ($1\frac{1}{2}$ lines long) with a very short proper tube and a more abrupt throat, but possesses the bulbous base of our plant. The akenes of *M. subtruncata* have a thick margin forming a low crown which is not possessed by the other two. *M. patens* has a corolla and akene with crown similar to *M. subtruncata*, but with or without a small bulbous style-base. There seem to be very good specific characters in the structure of the disk-flowers.
- Montanoa (Enocoma)**, sp. Large, loose shrub, 8 to 10 feet high: leaves 2 to 6 inches long (including the $\frac{1}{2}$ inch petiole), lanceolate, with acuminate tip and cuneate base, scabrous above, hirsute below, coarsely serrate or sub-entire: flowers in corymbose clusters: pedicels slender, hairy: involucre in one series of about 5 bracts: rays 2 to 4, very small, white: disk-flowers 3 to 5: chaff very hairy on the back, narrowed into a mucronate tip. Alamos. March 26 to April 8. No. 394. This is a loose-growing shrub with many stems, and the habit of the elder.
- Zexmenia podoccephala** Gray. About 3 feet high. Only a single plant seen near the base of the mountain. Alamos. March 26 to April 8. No. 363.
- Zexmenia fruticosa**, n. sp. Upright shrub, 8 feet high: leaves lanceolate to ovate-lanceolate, 2 to 4 inches long sharply serrate, scabrous: heads terminating the branches, or in corymbs of 3 to 5: involucre bracts in 2 or 3 series, imbricate, hispid: rays small, yellow: akenes slender, 2 lines long, with awns as long or longer.—Common along streams and on mountain side about Alamos. September 16 to 30. No. 645.
- Viguiera montana**, n. sp. Two to three feet high, slender, scabrous: leaves opposite (except some upper bract-like ones), linear-lanceolate, 4 to 5 inches long by 3 to 7 lines broad, acuminate, sessile, 3-nerved, scabrous above, prominently reticulated below: head turbinate, 6 lines long, with bracts closely imbricated in 5 or 6 series: bracts oblong, obtuse, or abruptly mucronate, conspicuously ciliate, with soft white hairs: rays small, oblong, 5 or 6: disk-flowers 2 lines long: akenes 2 to $2\frac{1}{2}$ lines long, villous-pubescent: pappus conspicuous, with two unequal awns and with several intermediate paleæ, laciniate, a line long.—Near the summit of the mountain, under shade of oaks; at the time of gathering, almost past blooming. Alamos. March 25 to April 8. No. 340. A peculiar *Viguiera*, differing from all other species we have examined, in its many series of imbricating involucre bracts; in this respect it is most like *V. Purisimæ*. The stems are slender and purplish and the base has a tuft of wool as in the native species of *Perezia*. Alamos. March 30 to April 8. No. 340. It resembles *V. blepharolepis*, but the heads are smaller, bracts more numerous and glabrous on the back.

Tithonia Palmeri, n. sp. Four to six feet high, more or less hispid-pubescent: lower leaves very large, over 1 foot long, 10 inches broad with a somewhat cordate base; upper leaves oblong with truncate or cuneate base coarsely serrate; petioles more or less winged, scabrous and hispid-pubescent: heads on long peduncles (little thickened above), small, 6 to 9 lines long: involucre bracts about 2 series, short; the outer ones narrow and acute; the inner ones broad and obtuse: akenes 3 lines long, with 1 or 2 awns and 3 intermediate paleæ: rays oblong, 6 lines long, "yellow to orange."—Along water-courses and in cañons. Alamos. September 16 to 30. No. 721. It resembles *T. tagetifolia*, but with different pubescence, involucre, rays, and pappus.

Tithonia (?) fruticosa Canby and Rose, n. sp. Shrubby, 5 to 10 feet high; younger part silky-pubescent: leaves alternate, lanceolate, acuminate, 6 to 8 inches long (including the petioles) cuneate at base, slightly crenately-toothed, somewhat reticulated and soft pubescent below; appressed and somewhat scabrous above: heads on short axillary or terminal peduncles, 1 inch high: involucre campanulate of 3 or 4 rows of broad, oblong, and obtuse bracts: ray-flowers pistillate and sterile, 12 to 15, the slender ligules $1\frac{1}{2}$ inches long: akenes 3 lines long, pubescent: pappus composed of united scales forming a short crown.—Only two plants seen. Among bushes near a water-course. Alamos. March 26 to April 8. No. 303. Dr. Palmer says that at a distance this plant appears to be a beautiful shrub, with numerous, large, bright-colored flowers. The stem is 4 inches in diameter at the base and the wood resembles the Elder. This species is very different from the rest of the genus in its tall shrubby habit.

EXPLANATION OF PLATE V.—A branch showing leaves and head; natural size; a, section of woody stem.

Encelia Mexicana Mart. Flowers yellow, somewhat pinkish on drying. Grows along the creek bottom near Alamos. September 16 to 30. No. 741.

Bidens (Psilocarpæa) Alamosana, n. sp. Perennial; 4 feet or less high, glabrous throughout: leaves mostly 3-parted, sometimes 5-parted, upper ones often simple; segments lanceolate, 2 to 3 inches long, acute, cuneate at base, sharply serrate with erect teeth: heads broad, 6 to 9 lines long: rays broadly oblong, 6 to 8 lines long, sterile (as in most of the species): disk-flowers 5 to 6 lines long: anthers yellow: style-branches broad, abruptly tipped with a linear appendage: ray-akenes abortive, 2-awned; disk-akenes very slender, 5 to 9 lines long, 4-angled, glabrous, becoming curved outward and with 4 to 5 retrorsely barbed awns.—Very rare; in the shade along a water-course near Alamos. March 26 to April 8. No. 278. September 16 to 30. Letter E. Dr. Palmer says it is a loose grower with many branches and abundant flowers, which have the strong odor of the marigold.

EXPLANATION OF PLATE VI.—Plant natural size; b, akene much enlarged.

Calea scabrifolia Benth. and Hook. A plant with two or more stems from the base, about 2 feet high: largest leaves 5 inches long and 2 inches broad: "flowers white:" ray-akenes without pappus: disk-akenes 1 line long. Along ravines in the higher portions of the Alamos Mountain. March 26 to April 8. No. 283. With this should be combined *Perymenium album* Watson.

Perityle effusa, n. sp. Slender annuals, much branched, more or less glandular or glandular-pubescent with some villose hairs: leaves mostly opposite, a few alternate, more or less deeply cleft: heads small: rays small, numerous, white: disk-flowers yellow with slender proper tube gradually passing into the throat: style-branches slender, acuminate-tipped: akenes small, $\frac{3}{8}$ line long, oblong, straight or slightly curved, with callose and villose margin; pappus a delicate paleaceous crown, with two short unequal awns.—In the shade half way up the mountain near Alamos. March 26 to April 8. No. 350. Also very common along the river bank. No. 377. It has also been collected by Palmer in southwest Chihuahua (No. 238, 1885); and by Pringle in southern Arizona, 1882.

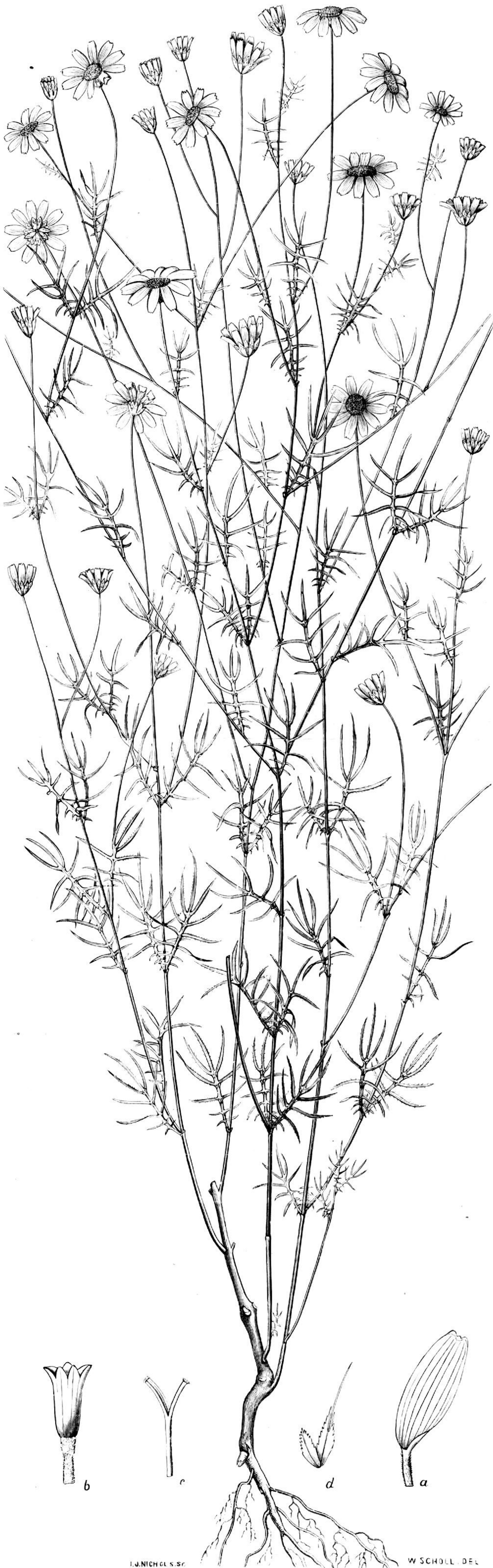


TITHONIA FRUTICOSA, n. sp.

W. SCHOLL DEL



BIDENS ALAMOSANUM



J. NICHOLS SC.

W. SCHOLL DEL.

HYMENATHERUM ANOMALUM, n. sp.



PEREZIA MONTANA, n. sp.

Perityle microglossa Benth, var. *effusa* Gray. *Bidens pilosa* Gray, non L. Proc. Amer. Acad. xxi. 432.

This plant differs from *P. microglossa* in several important particulars beside those pointed out in the Syn. Flora. The habit and leaves are different, the rays white instead of yellow, and the inflorescence differs some. Its relationship seems to be with *P. microcephala*, from which it differs in its pubescence, somewhat larger heads, different disk-corolla, etc. Palmer's 238 is a coarser plant, more villose and with fewer heads, but it apparently belongs here. Like the latter is Palmer's 373, from the mountain cañons about Alamos, where it is very common.

Porophyllum macrocephalum DC. Grows under bushes in cañons. It has the very strong odor of Rhue. Alamos. Sept. 16 to 30. No. 716.

Tagetes Lemmoni Gray. Collected but once before and this by Lemmon in southern Arizona. Palmer found but a single plant near water-course in the middle of the mountains of Alamos. It grows about 3 feet high, with a large top. March 26 to April 8. No. 339.

Pectis punctata Jacq. Stems prostrate or ascending. Common on stony ridges. Alamos. Sept. 16 to 30. No. 730.

Pectis prostrata Cav. Common near the water in grassy bottoms near Alamos. Sept. 16 to 30. No. 659.

Hymenatherum anomalum Canby & Rose, n. sp. Slender annual, 6 to 20 inches high, with many slender branches, glabrous or nearly so: leaves opposite or alternate, with 7 to 9 filiform segments bearing large oblong oil glands: involucre campanulate; bracts in 2 series, equal, free, about 2 lines long, acute, broadly lanceolate, bearing 1 to 5 oblong oil glands: rays conspicuous, about 10, spreading, oblong, 5 lines long, 3-toothed: disk-flower tubular, $1\frac{1}{2}$ lines long, with throat longer than the proper tube and 5-toothed: style-branches elongated, obtuse: akenes linear-turbinate, slightly pilose: pappus paleaceous, in 2 series: outer series 10; paleæ spatulate, laciniate-toothed; inner series 10, 3-aristata, the inner longer, hispid.—Abundant near the base of Alamos Mountain. March 26 to April 8. No. 346.

This genus combines the characters of several closely related genera but is nearest *Hymenatherum*, yet it seems to break down its most distinctive character, viz, the connate involucre. It seems to belong clearly to the subtribe Tagetineæ as laid down by B. & H. and only differs in having a double involucre. It differs from *Hymenatherum* in having 2 series of bracts and these free, and as defined by B. & H. in having a conical receptacle and in its 3-toothed ray and merely toothed disk-flowers and pappus in 2 series. But as stated by Dr. Gray in a later revision most of these characters break down in certain species. Of the species of this genus, it resembles most *H. Neo-Mexicanum*, resembling it in habit and having a similar receptacle. It has the free involucreal bracts of *Adenophyllum* but with different style-tips, and the pappus is very different from *A. coccineum*, the only species left in this genus by Dr. Gray. It has the free bracts and the bristles at the base of the leaves of *Pectis*, but with a different style and receptacle.

EXPLANATION OF PLATE VII.—Plant natural size; *a*, ray; *b*, corolla; *c*, style; *d*, pappus; all enlarged.

Perezia montana, n. sp. Three to five feet high, slender, purplish, glabrous: leaves coriaceous, reticulated, narrowly oblong, 3 to 6 inches long, 9 to 12 lines broad, with a broad clasping base, spinose-dentate: panicle loose, spreading, glabrous: involucreal scales 3 to 5 series, narrowly oblong, acute, sometimes a little obtuse, the lower and smaller ones mucronate, glabrous except the puberulent margin: akenes glabrous, 3 lines long, flattened, delicately ribbed, narrowed at apex.—Very rarely seen: grows under oaks on the higher parts of the Alamos Mountain. March 26 to April 8. No. 285. Belonging to the *P. rigida* group as arranged by Dr. Gray.

EXPLANATION OF PLATE VIII.—Section from the top and bottom of plant, natural size and the base of stem showing tufts of wood, much enlarged; *c*, akene.

Trixis obvallata H. & A. It grows about 2 feet high: the flowers are yellow, with a strong pine odor. It is commonly called "Yerba del aire," and is used extensively by the common people in preparing a medicine for colds. Alamos. March 26 to April 8. No. 290. The plant differs from the figure in Beechey's Report in having entire leaves, but it seems the same as Pringle's No. 2431, referred here by Mr. Watson. It is certainly very near *T. longifolia*; Parry and Palmer's No. 1121, referred here by Mr. Hemsley, is the same as our plant.

Lobelia laxiflora H. B. K. Only a few plants found in a deep ravine in a portion of the Mountain of Alamos. March 26 to April 8. No. 288.

Heterotoma tenella¹ Mart. & Gal. This little plant is very variable; our specimens being either simple, 1 to 2 inches high, 1 to few flowered; or taller, 10 to 12 inches high, and often branching. It grows in moist spots half way up the mountain side. Alamos. March 26 to April 8. No. 289. Here belong also Bourgeau's No. 1722, distributed as *Lobelia Cliffortiana*, and also so referred by Hemsley in Biol. Cent.-Amer. ii. 266. The Smithsonian Institute distribute under the same name a plant from Orizaba, collected by Botteri (No. 1191), which is also this species: this plant is tall, with long filiform branches. All of these specimens differ from the original description in being puberulent below.

Metastelma latifolia, n. sp. High climbing shrub, nearly glabrous: leaves oblong to lanceolate, roundish at base, obtuse with abrupt appendiculation, an inch long, shortly pedunculate, margin and midrib pubescent (especially above): umbel short-peduncled, 3 to 7-flowered: pedicels $1\frac{1}{2}$ lines long: flowers very small, less than 1 line long: calyx lobes short, acute: corolla white, the oblong, obtuse lobes densely puberulent on their inner margins: column very short if any: lobes of the crown about equal the stigma.—Climbing over the tops of bushes, it forms a compact mass of sweet-scented flowers. Alamos. September 16 to 30. No. 665. According to the recent Revision of Dr. Gray (Proc. Amer. Acad. xxi.) it comes in the sub-section containing *M. Pringlei*; but the foliage is different.

Buddleia verticillata H. B. K. A large bushy plant, early glabrate, 5 to 8 feet high, with woody stems and rough bark: lower leaves ovate, 10 inches long and serrate; upper leaves lanceolate with cuneate base, entire: heads on peduncles 4 to 8 lines long: flowers yellowish with "honey-like odor." Common on good soil everywhere about Alamos. March 26 to April 8. No. 279.

Erythræa Madrensis Hemsl. Biol. Cent.-Amer. ii. 346. Collected on the top of Alamos Mountain. March 26 to April 8. No. 405. Seemann's plant is the only one referred here, but it seems to me that Parry and Palmer's No. 567 (collected in 1878) should also be referred here.

The variety (No. 2597) in Mr. Pringle's collection is lower and more spreading, and with more twisted anthers.

Gilia Sonoræ Rose. Contr. Nat. Herb. i. 90. This plant is reported as very abundant on the sandy river bottoms. Alamos. March 26 to April 8. No. 396.

Lœselia glandulosa Don. Common. Alamos, March 26 to April 8. No. 399.

Cordia (Sebestenoides) Sonoræ, n. sp. A small tree 10 to 20 feet high, 6 inches in diameter; younger parts puberulent: leaves elliptical, 2 to 4 inches long, obtuse, entire, a little scabrous above: racemes short and dense: calyx cylindrical, 5 to 6 lines long: corolla white, 15 lines in diameter: stamens 5 to 7, exerted.—A common tree in low places and on hillsides. About Alamos. September 16 to 30. No. 376.

Called Palo-de-Asta, and is one of the most beautiful of flowering trees; the whole tree is covered with large clusters of white flowers (becoming lavender by age), a short distance away entirely hiding from view the large shining leaves. The tree has a symmetrical top and is well worthy of cultivation.

EXPLANATION OF PLATE IX.—A flowering branch and showing flowers and leaves; natural size.

¹ Another species of this genus has been wrongly distributed, viz, Palmer's No. 43 (1886), from Jalisco, referred to *Lobelia subnuda* Gray, Proc. Amer. Acad. xxii. 433, which is *H. arabioides* B. & H.

Heliotropium phyllostachyum Torr. Only a few plants found growing on a creek bottom. Alamos. September 16 to 30. No. 637.

Krynitzkia micromeres Gray. This plant is very common on sandy bottoms. Alamos. September 16 to 30. No. 397.

Ipomœa murucoides Rœm. & Schultz, var. **glabrata** Gray. This plant is without leaves (except very young ones), and its appearance is peculiar; as it is now apparently for the first time collected in fruit, we append a description. A tree 20 to 30 feet high, 1 foot or more in diameter, with smooth bark and numerous branches: leaves (immature) about 1 inch long, ovate-lanceolate, strongly reticulate and pubescent below: racemes terminal, many flowered: calyx as well as pedicels and young branches puberulent: sepals oval, obtuse, 5 lines long: corolla about 2 inches long, white, yellowish below: filaments pubescent at base: capsule 10 lines long, 2-celled, 4-valve, 4-seeded: seeds 5 lines in length, oblong, with a long coma upon the sides. The tree is called "Palo santo," and is very abundant about Alamos. No. 316.

The wood is of no commercial value. The Mexicans use the ashes for soap-making. Dr. Palmer says: "But one flower of a raceme opens at a time, and the large tree, devoid of foliage, and with only 3 or 4 large flowers, presents a peculiar appearance". The flowers of our plant are similar to Gray's type (Palmer's No. 703, of 1886), and Pringle's No. 2443 (of 1889), from near the same locality, but the sepals are shorter and obtuse and not glabrate. The sepals resemble Hemsley's figure of the species, which is probably Gray's form. According to dates on the title pages, it appears that H. B. K.'s specific name *macrantha* is older by one year than Rœm. and Schultz, and if the oldest specific name is used, Don's combination should be taken up. *Convolvulus macranthus* H. B. K. Gen. et Spec., iii. 95; *Ipomœa murucoides* Rœm. & Schultz, iv. 248; *Ipomœa macrantha* Don. Gen. Syst. iv. 267.

Ipomœa bracteata Cav. This is a climbing plant and without leaves, but with long racemes of flowers with large purple bracts. It is called "Zicana." It has large tubers, like sweet potatoes, which are eaten raw by the Mexicans. Alamos. March 30 to April 8. No. 313.

Ipomœa Grayi, n. sp. High climbing, glabrous or nearly so: leaves orbicular to broadly ovate, $1\frac{1}{2}$ to 3 inches long, truncate or somewhat cordate at base, on peduncles 2 to 5 inches long: peduncles variable, $1\frac{1}{2}$ to 3 lines long, 1 to several-flowered: pedicels $1\frac{1}{2}$ to $2\frac{1}{2}$ inches long, somewhat thickened in fruit: sepals 3 to 4 lines long, broad and obtuse: corolla purple, 3 inches broad: stamens short, included; capsule glabrous, ovate, 7 to 8 lines long, 4-valved, 2-celled, 4-seeded: seeds $3\frac{1}{2}$ lines long, densely puberulent.—Alamos. September 16 to 30. No. 710. Also collected by Dr. Palmer in SW. Chihuahua (1885). No. 102. This is a profuse bloomer and a vigorous plant, climbing over fences, walls, and the highest trees.

*I. rubro-cœrulea*¹ Gray, non Hooker. Proc. Amer. Acad. xxi. 434.

I. violacea Gray in herb. non L. To this latter species should be referred, according to herbarium note of Dr. Gray, *I. rubro-cœrulea* of Hemsley. Biol. Cent.-Amer. ii. 393. *I. Grayi* differs from *I. rubro-cœrulea* in its calyx teeth not being "subulate-linear," the color of the corolla, and somewhat in the shape of the leaves. Its alliances seem to be with *I. pedicellaris* Benth. of Central America, and without seeing the type it is hard to separate the two.

¹After the above was prepared and sent to the printer, a letter was received from Sir Joseph Hooker from which the following note, respecting this plant, is taken: "Mr. Hemsley has told me that your *Ipomœa* is quite distinct from *I. rubro-cœrulea* in the calyx, and also from *I. pedicellaris* which has an open sinus to the leaf."

Ipomœa alata,¹ n. sp. Slender, climbing, glabrous throughout: leaves thin, triangular in outline, 2 to 3 inches long, with broad open sinus, acuminate: peduncles 2 to 4 inches long, somewhat winged, 1 to 3-flowered: pedicels 9 lines long, clavate thickened in fruit and deciduous with it: calyx "brick-red," 9 lines long, closely enveloping the ripe capsule: corolla "scarlet," salver-form: tube 2 inches long; limb 1 inch broad: stamens included or the anthers (2 to 4 lines long) barely protruding: style included: stigma 2-lobed: capsule globular, 6 lines in diameter, 2-celled, 4-seeded: seeds oblong, 3 to 4 lines in length, glabrous, black.—Collected along creek bottoms and in cañons. It climbs over fences and bushes at Alamos. September 16 to 30. No. 706. A peculiar species and seemingly nearest *I. rhodocalyx*. *I. alatipes* has a similar winged peduncle, but the flowers are 3 inches in diameter.

EXPLANATION OF PLATE X.—Natural size of plant shown; a, seed.

Ipomœa Quamoclit L. Very common at Alamos. September 16 to 30. No. 707.

Ipomœa Palmeri Watson. Proc. Amer. Acad. xxiv. 63. "Flowers creamy-white, open at night." Common about Alamos, climbing over trees, bushes, fences, etc. March 26 to April 8. No. 305. This species is only known from Palmer's (No. 75) 1887 collection at Guaymas.

Ipomœa, sp. Only a few plants found, climbing over bushes. The corolla is purple. Alamos. March 26 to April 8. No. 304.

Physalis, sp. A little viscid: flowers small, yellow with brownish eye. It grows in a shady cañon. Alamos. September 16 to 30. No. 709.

Solanum diversifolium Schl. About 6 feet high with loose branches: flowers white. Collected in a shady ravine near the summit of the mountain. Alamos. March 26 to April 8. No. 364.

Solanum Fendleri Van Huck. and Müll. About 3 feet high. Only a single plant found and this in poor condition. At the base of Alamos Mountain, March 25 to April 8. No. 364. This approaches nearest Fendler's No. 254, from Panama, of any specimen seen in Gray or National Herbarium, but the pubescence is redder, stems somewhat thorny, and racemes shorter.

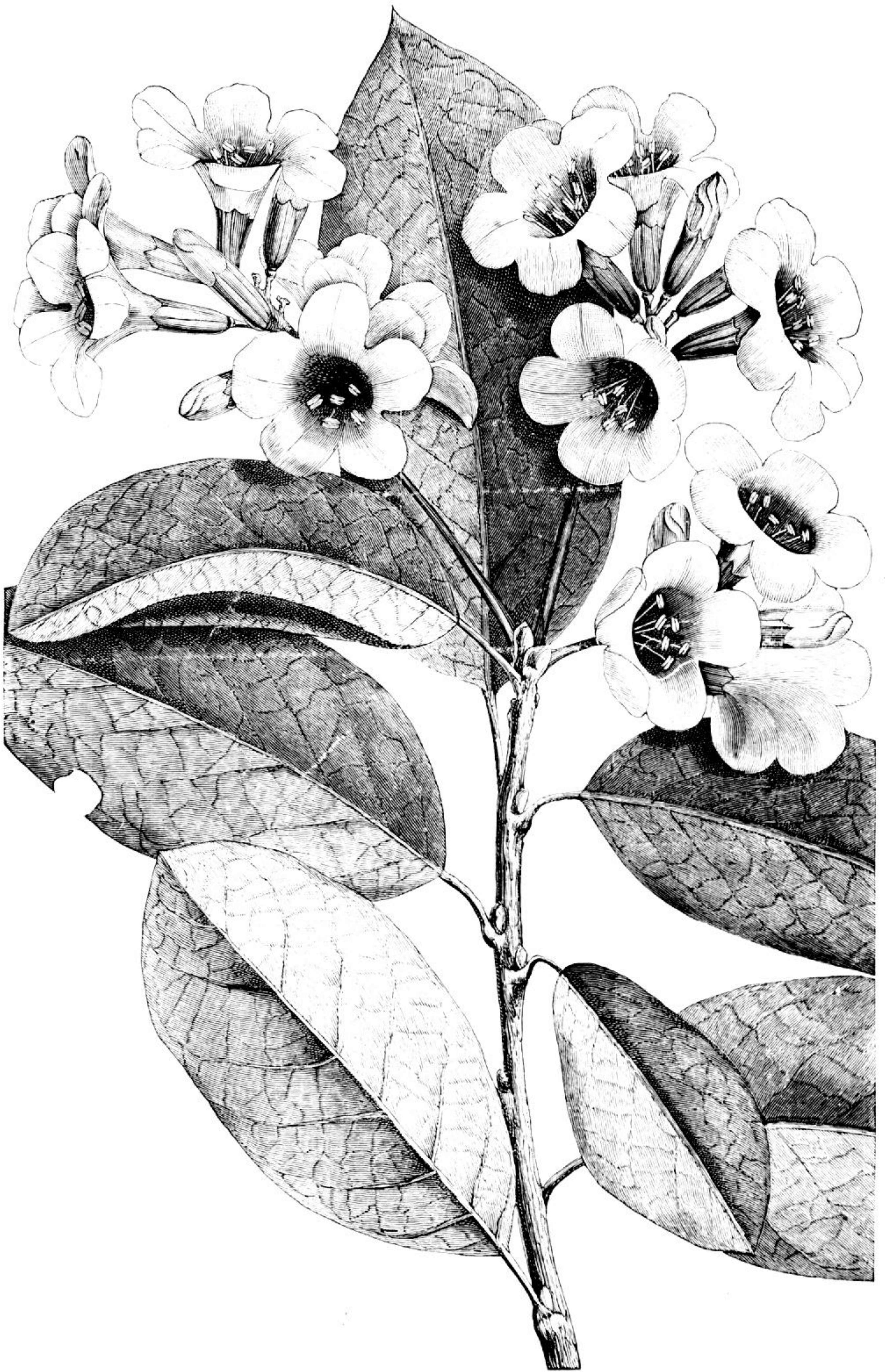
Both these plants are merely tentatively referred as above as better material may place them quite differently.

Solanum (Androcera) Grayi, n. sp. A slender annual, 1 to 2 feet high, stems more or less thorny: leaves pinnately parted with ovate to oblong segments irregularly toothed or cleft: racemes few-flowered: pedicels of the flower very short: of the fruit 6 lines long, somewhat thickened: corolla small, 4 to 6 lines in diameter, white: stamens irregular, 4 short, 1 long and curved: fruit very prickly.—Only a few plants found in shade near Alamos. September 16 to 30. No. 633. Here should be referred *S. sisymbriifolium* Gray, Proc. Amer. Acad. xxi. 434. Although a larger plant than Palmer's present plant, the flowers are much smaller than in *S. sisymbriifolium*.

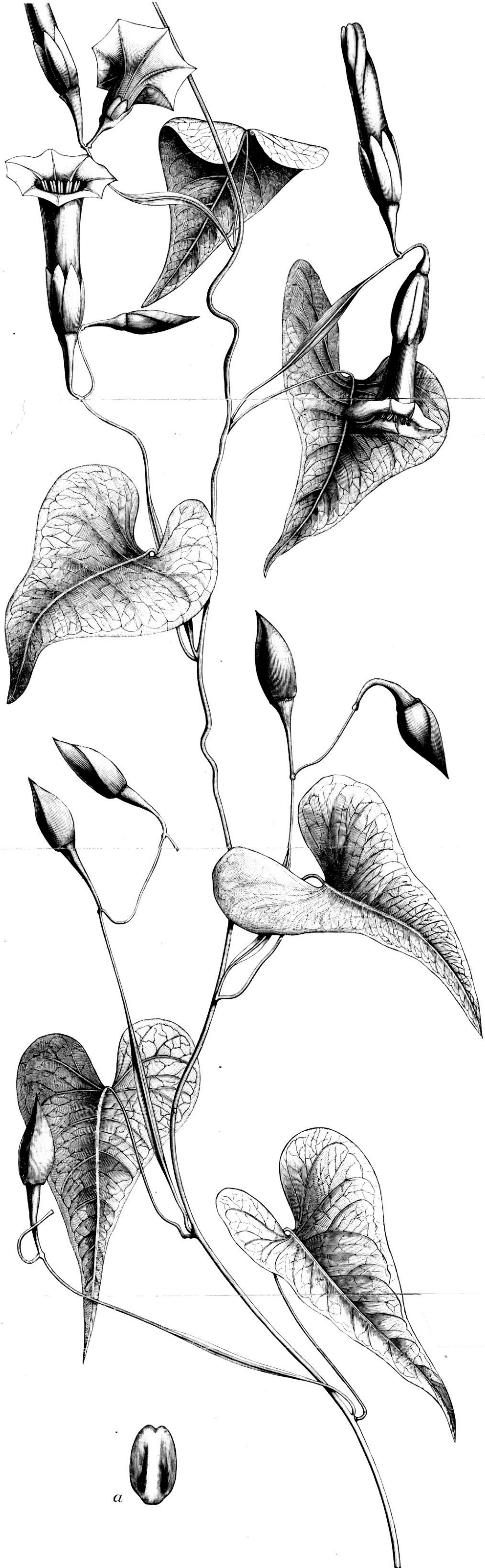
Solanum Amazonium Ker. A loose growing shrub 2 to 3 feet high with showy purple flowers. Here should be referred No. 237 (1885) of Palmer from SW. Chihuahua. It is *S. elwagnifolium* Gray, not Cav. Proc. Amer. Acad. xxi. 434. It differs conspicuously from *S. elwagnifolium* in its slender, curved and dissimilar stamens, and in its erect, fruiting pedicels: In the sterile flowers the calyx is naked and three of the anthers much longer (6 lines long); in the fertile and lower flowers the calyx is armed with prickles and the anthers nearly equal, or often longer. Near Alamos. March 26 to April 8. No. 314.

Solanum verbascifolium L. This is a shrub 4 to 5 feet high; its fruit is "orange-colored." Common along river banks among bushes. Alamos. March 26 to April 8. No. 392.

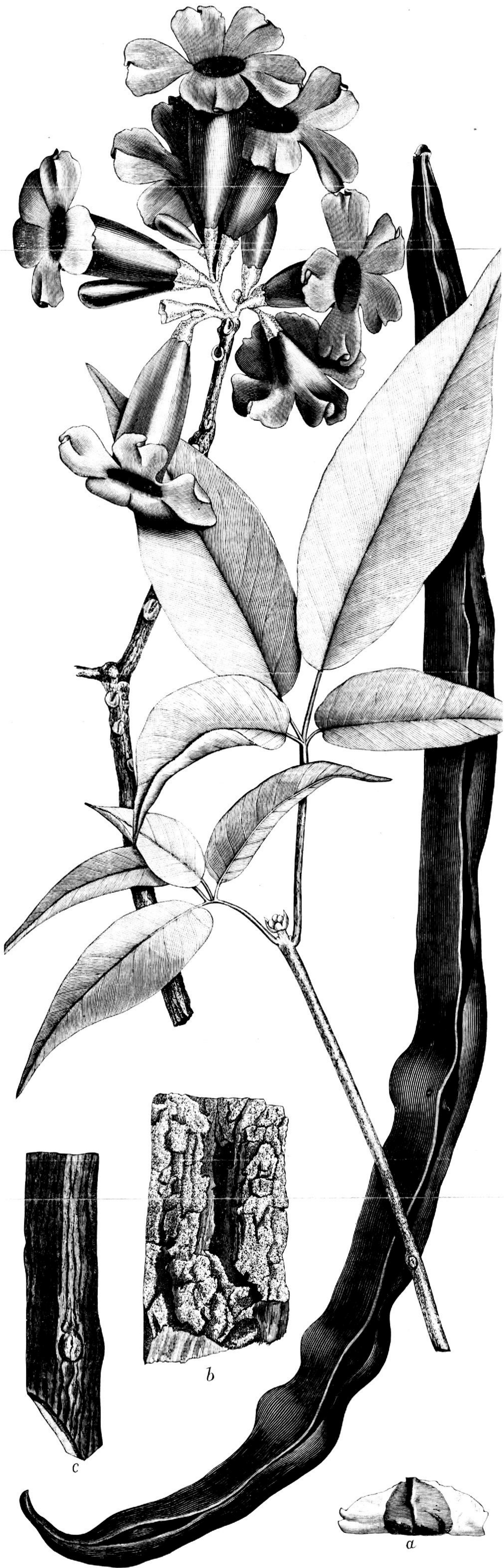
¹ From the above letter of Sir Joseph Hooker is also taken the following note: "Your *I. alata* may also, Mr. Hemsley thinks, be new and belongs to the same group a, *I. alatipes*."



Cordia palmeri, n. sp.



IPOMOEA ALATA, n. sp.



R. C. SHINC.

TABEBUIA PALMERI, n. sp.

- Nicotiana glauca** Graham. At Alamos it is called "Maraquiana;" at Guaymas, "Don Juan." The leaves are laid upon the head of patients to relieve headache. About Alamos. March 26 to April 8. No. 331.
- Nicotiana trigonophylla** Dunal. Common at Alamos on hillsides and in old fields. March 26 to April 8. No. 308.
- Linaria Canadensis** Dumont. Abundant on the sandy river bottoms. Alamos. March 26 to April 8. No. 395.
- Mimulus floribundus** Dougl. This plant was found abundantly along a water-course, half way up the mountain. It has a strong odor like musk. Although common along the border we have no specimens from Mexico. Alamos. March 26 to April 8. No. 338.
- Mimulus cardinalis** Dougl. The calyx teeth are more slender and acuminate. Only two small plants seen. Found half way up the mountain. Alamos. March 26 to April 8. No. 328.
- Mimulus luteus** L. Common along a water-course near Alamos. March 26 to April 8. No. 276.
- Stemodia Palmeri** Gray. Proc. Amer. Acad. XXI. 403. The corolla is dark purple and the lobes of the lower lip are broad and retuse; the anther cells are unequal in size. Collected on a rocky ridge in the shade near Alamos. March 26 to April 8, No. 327, and September 16 to 30, No. 727.
- Stemodia durantifolia** Swartz. This plant was found along a water-course half-way up the mountain. Alamos. March 26 to April 8. No. 337.
- Conobea intermedia** Gray. Collected on a rocky ridge. Alamos. September 16 to 30. No. 728.
- Aphyllon Californicum** Gray. This plant was found growing under bushes in a low valley. The flowers are purple. Alamos. March 26 to April 8. No. 318.
- Tabebuia Palmeri**, n. sp. A large tree 18 to 25 feet high: leaves opposite; leaflets 4, 2 to 5 inches long, oblong, obtuse at base, somewhat acuminate glabrous or nearly so: flowers in close clusters at the ends of the naked branches: calyx small, 2 to 3 lines long, covered with a mealy pubescence: corolla $1\frac{1}{2}$ to 2 inches long with ample tube, mealy-puberulent, white and purplish with yellow spots: capsules terete, 15 inches long, 8 to 10 lines in diameter, straight or nearly so, smooth and ribless: seeds very numerous in several series, oblong, 12 to 18 lines long by 6 lines broad, winged at the ends.—In ravines near the base of the mountain. Alamos. March 26 to April 8. No. 320. Called "Amapa." A beautiful flowering tree with its large Paulownia-like flowers, which Dr. Palmer describes as light-mauve at base, with white and yellow patches; they quickly fade. Only a few flowers were found at the ends of the naked branches. Two leaves, each with 4 leaflets, were found on the tree and Dr. Palmer says the new ones had not begun to appear; there was an abundance of long black pods. The trunk of the tree is covered with a thick, rough bark, resembling the oak; the wood is hard and durable and is generally used for rafters in the construction of houses in this region. That this is a *Tabebuia*, as considered by Benth. and Hook., there can be very little doubt, although the inflorescence is a little more compact than the known species of this genus. It is a little surprising that such a handsome tree of some economic value has until now remained unknown.
- EXPLANATION OF PLATE XI.—Upper part shows flowers, lower part stem and leaves; natural size; a, seed; b, piece of bark; c, section of stem; d, pod.
- Calophanes bilobatus** Seem. Stem procumbent with branches ascending, glandular, pubescent throughout: leaves 1 to 2 inches long, including the petiole, acute, somewhat tapering at base: flowers in glomerate clusters with small, foliaceous bractlets shorter than the calyx: calyx 6 lines long, cleft to the base (or becoming so) into subulate lobes: corolla lilac, 8 lines long, its tube 5 lines long: style pubescent; stigma linear, hardly oblique: capsule 4 lines long, glabrous. Edge of a ravine at Alamos. March 26 to April 8. No. 402. The plant has a very offensive odor. Bourgeau's specimen also has the pubescent style. Collected recently by Pringle.

- Justicia caudata** Gray. Proc. Amer. Acad. XXI. 405. Flowers "mauve-colored:" capsule (including the short thick stipe) 6 to 7 lines long: seeds orbicular. Only a single plant found, in a shady ravine. Alamos. September 16 to 30. No. 666. This seems to be the same plant which Palmer collected in 1885.
- Dicliptera resupinata** Juss. But a single large plant seen. Alamos. September 16 to 30. No. 632.
- Lantana vetulina** Mart. & Gal. About 3 feet high: flowers white. Common on wooded hills and slopes. Alamos. March 26 to April 8. No. 379.
- Lantana involucrata** L. Alamos. September 16 to 30. No. 635.
- Lantana macropoda** Torr. Very common at Alamos. September 16 to 30. Nos. 636 and 740.
- Bouchea dissecta** Watson. Proc. Amer. Acad. XXIV. 68. The flowers in these specimens are blue. Collected at Agiabampo, October 3 to 15. Letter G. Dr. Palmer says he obtained this plant at Alamos also.
- Priva echinata** Juss. Flowers "light purple." Only a single specimen seen, growing in shade in a creek bottom. Alamos. September 16 to 30. No. 745.
- Castilleja tenuifolia** Benth. The bracts and calyx are scarlet. Only a few plants seen near the summit of the mountain. Alamos. March 26 to April 8. No. 366.
- Verbena Aubletia** L. This plant is very common in old fields and valleys about Alamos. March 26 to April 8. No. 307.
- Verbena ciliata** Benth. This plant is used as a pot-herb by the Mexicans, who call it Verbena. March 26 to April 8. No. 326.
- Hyptis suaveolens** Poit. Flowers said to be white. Only one or two nutlets mature. Called by the Mexicans "confituria;" they use it as a tea to abate fevers. Alamos. Sept. 16 to 30. No. 734.
- Hyptis Seemanni** Gray. Proc. Amer. Acad. xxi. 407. Alamos. March 25 to April 8. No. 398.
- Salvia (Calosphace) Alamosana**, n. sp. Two or three feet high, with many lateral branches, more or less pubescent when young: leaves 2 to 3 inches long, on very short petioles, narrowly lanceolate, cordate at base, with very broad rounded crenatures, silky when young, slightly hispid or glabrate in age: calyx 2 lines long; upper lip entire; lower, 2 toothed: corolla blue, about 5 lines long; its upper lip short, erect, pubescent: lower portion of the connective deflexed, connate, and broad.—Grassy slopes half way up the mountain side. Alamos. March 30 to April 8. No. 345. This plant does not seem to agree with any of our Mexican Salvias.
- Salvia privoides** Benth. This plant is common in the shade along water-courses and cañons. Alamos. Sept. 16 to 30. Nos. 680, 681.
- Salvia hyptoides** Mart. & Gal. Flowers pale blue. Found in shade of bushes in a mountain cañon. Alamos. Sept. 16 to 30. No. 682.
- Salvia elegans** Vahl. This plant grows about 2½ feet high. It is a common plant throughout Mexico; only two plants were seen; these were found in the upper part of the mountain in a shaded ravine. Alamos. March 26 to April 8. No. 292.
- Stachys coccinea** Jacq. This plant has showy "salmon-colored" flowers. The filaments are nearly equal and villose as in *Physostegia*, although Dr. Gray says in Syn. Flora (p. 347) "filaments naked." Only a few plants were seen. Found in a shady ravine near the summit of the mountain. Alamos. March 26 to April 8. No. 365.
- Teucrium Cubense** L. Common in gardens and fields. Alamos. March 26 to April 8. No. 277.
- Boerhaavia Alamosana**, n. sp. Stems 12 to 15 inches high, branching throughout, glabrous or below somewhat scabrous-pubescent; leafy below; leaves linear to narrowly lanceolate, 1 to 2 inches long (including the petiole), whitish below: racemes slender, spike-like; bracts and bractlets purplish ovate-lanceolate, caducous: perianth white, drying yellowish, 2 lines broad: stamens (4) and

style exerted; fruit 1 line long, clavate, obtuse with obtuse ribs.—Hillside about Alamos. Sept. 16 to 30. No. 714. In fruit and habit resembling *B. Palmeri*, but with larger flowers, more and longer stamens, etc. It resembles Palmer's specimen of *B. Wrightii* from Guaymas, in habit and pubescence, but has smaller fruit and differs in number of stamens and larger flowers, etc.

Boerhaavia Sonoræ, n. sp. Stems somewhat spreading, much branched above; flowers in head-like cluster, "crimson": involucre $\frac{1}{2}$ line long: stamen 1, rarely 2 (?): style exerted, capitate; fruit clavate with tapering tip.—Along water-courses near Alamos. Sept. 16 to 30. No. 715. Seemingly the same species as No. 172 of Palmer's 1887 collection from Guaymas.

Boldoa lanceolata Lag. A small shrub 2 to 3 feet high, with several stems. Flowers "cream color."¹ Very common at Alamos and also Agiabampo on hillside, in cañons and valleys. Collected in fruit at Alamos. March 26 to April 8, and in fruit and flower September 16 to 30; at Agiabampo, October 3 to 15. Nos. 310, 720.

According to Mr. Hemsley there is some uncertainty whether this plant should be called *Salpianthus arenarius* H. & B. or as above, and we give here as far as we know its bibliography:

B. lanceolata. Lag. Nov. Gen. et Sp. 10. Roem & Schult. Syst. i. 522. Bot. Sulph. p. 155. DC. xiii. 2, 438. Biol. Cent.-Amer. iii. 8.

S. arenarius H. & B. Pl. Æquin. 1. 154 t. 44. H. B. K. Nov. Gen. et Sp. ii. 218. Poir. Illus. Suppl., 536 t. 906.

Telanthera stellata Watson. Proc. Amer. Acad. xxi, 436. The typical form found at Alamos, Sept. 16 to 30. No. 760, with this and more common was found Var. **glabrata**, n. var., a form with narrower leaves and white instead of straw-colored glomerules, but in other respects apparently the same. No. 760a.

Dr. Palmer says he saw it at Agiabampo also.

Aristolochia brevipes Benth. Very common in bottom lands. Much used as a medicine. Near Alamos. March 26 to April 8. No. 329.

Iresine celosioides L. A climbing plant with large spreading panicles of flowers. Collected along ravines and river banks near Alamos. March 26 to April 8. No. 389.

Euphorbia (Poinsetia) tuberosa, n. sp. Seemingly a new species. Slender, delicate plant about 1 foot high: leaves (lower) alternate, scattering, linear, 3 to 4 inches long, a line broad: upper leaves verticillate, a little broadened at base and acuminate, bright crimson: flowers terminal, 1 to few; involucre 4-lobed; lobes small, entire or 3-toothed: glands 4, large, cup-shaped: bracts purple, fimbriate: styles bifid.—In ravines in the upper portions of the mountains. March 25 to April 8. No. 356.

Commonly called "Contrayerba." A small tuberous-rooted plant. It is a medical plant of much repute and is used in kidney and liver troubles.

Euphorbia florida Engl. Collected on gravelly bottoms near Alamos. Sept. 16 to 30. No. 640.

Euphorbia plicata Watson. Proc. Amer. Acad. xxi. 438. Stems 2 to 3 feet high. The leaves fall as soon as they begin to dry. Rocky hills about Alamos. Sept. 16 to 30. No. 631.

Euphorbia florida Engl. On grassy bottoms around Alamos. No. 356.

Jatropha angustidens Muell. Seeds 4 lines long, gray, spotted with brown. Alamos. Sept. 16 to 30. No. 639.

Croton (Eucroton) Alamosanum, n. sp. A small shrub 4 to 6 feet high, younger parts villose-pubescent: leaves oblong-lanceolate, 3 to 5 inches long, 1 to 2 inches broad, almost sessile, densely stellate-pubescent, a little glandular at base; stipules orbicular, slightly dentate-glandular: racemes dense, at first spike-like, becoming more or less elongated, sometimes 4 inches long; female flower more common at the base, but sometimes throughout the racemes; calyx deeply 5-parted; petal none;

¹ Roem & Schult., says flores rubi.

styles 3, thrice dichotomous; seeds 3, 2 lines long: male flowers more numerous; calyx 5-parted, petals 5, white, glabrous without, villose within; stamens 12 to 13 with glabrous filaments.—On sandy ridges and along creek bottoms under shrubs near Alamos. March 26 to April 8. No. 324. Found in flower and fruit Sept. 16 to 30. No. 742. Belongs to the subsections *Cyclostigma*, perhaps near *C. heterocalyx*.

Acalypha polystachya Jacq. The larger leaves 4 to 5 inches long on petioles 5 to 6 inches long; the long filiform lobes of the involucre, ciliate with glandular-tipped hairs. Grows along water-courses near Alamos. Sept. 16 to 20. No. 724. This is *A. filifera* Watson, which seems to be only a form of the above species.

Acalypha subviscida Watson. Proc. Amer. Acad. xxi. 440. Leaves with shorter petioles than in the type; fertile spikes, sometimes staminate for half the length above; style-branches, long, purplish; staminate spikes, occasionally 2 or 3 from a common peduncle, generally with an abortive pistillate flower at tip. Collected in a cañon near Alamos, Sept. 16 to 30. No. 641.

Sebastiania Palmeri, n. sp. A loose-growing shrub 5 to 8 feet high, or sometimes a small tree 10 feet high, 5 inches in diameter, glabrous, diœcious: leaves lanceolate, to narrowly lanceolate, $2\frac{1}{2}$ to 4 inches long, including petiole 6 lines long, slightly dentate: female flowers solitary, sessile; calyx 3-parted, its lobes oval, serrate; petals none; styles 3, connate at base, entire; ovary 3-celled; valves contorted after dehiscence; seeds 1 in each cell, globose, 2 lines in diameter without a strophiole.—Seen in various places about Alamos. March 26 to April 8. No. 403; also in September. Letter A. The natives speak of it as “Palo de la flecha que de los semas brinca doras”—“the arrow-wood which produces the jumping beans.” The generic position of the plant in which *Carpocapsa* is found has long puzzled the botanist and entomologist. This is partly due to the fact that the fruit which is stung (and this is the kind that is generally collected) appears very different from those developed naturally. While this is evidently a new species, still some uncertainty exists as to its position. Its relationship is doubtless with *Sebastiania*, but it has close affinities with both *Gymnanthus* and *Bonania*; in habit it seems closer to the latter than to either the other two, however its minute or obsolete calyx seems to be sufficient to keep it out of that genus. It has the rudimentary calyx and connate stamens of *Gymnanthus*, but has dehiscent and contorted carpels which are thin walled; carpophore wanting; leaves serrate: all of which is at variance with this genus, but corresponds with *Bonania*. Dr. Palmer says the boys gather these beans, for which they find a ready market at Alamos. None of the beans which had been stung were obtained, as they had all been carefully gathered before Dr. Palmer's visit and none of the so-called “jumpers” could be obtained at Alamos at this time. The plant produces an abundance of milk, which is said to be used by the Indians for poisoning their arrows. The milk readily crystallizes into a clear, rather brittle substance, and is a violent cathartic. The wood is very hard.

Ficus, sp. A large tree with many wide-spreading branches, 2 feet in diameter, with thick, corky bark: leaves alternate, oblong-lanceolate, acute at both ends, 4 to 6 inches long, on a petiole 9 to 16 lines long: fruit nearly globose, 10 lines in diameter on a very short pedicel (2 lines long). Near Alamos. March 26 to April 8. No. 367. The fruit is very abundant and edible and is called “Chalala.” Dr. Palmer collected the same species at Hacienda San Miguel in southwest Chihuahua in 1885.

Tillandsia recurvata L. This plant was found growing on oaks. Alamos. March 26 to April 8. No. 372.

Heteranthera limosa Vahl. Alamos. September 16 to 30. No. 731.

Commelina Virginica L. Alamos. September 16 to 30. No. 663.

Tradescantia Palmeri, n. sp. Stems erect, 6 to 9 inches high, glabrous, or with a pubescent line: leaves lanceolate, 1 to 2½ inches long, glabrous except the ciliate margin (and sheath), sessile, acute: umbels pedunculate (1 to 2 inches long), 4 to 9-flowered: pedicels 3 to 5 lines long: sepals oval, 1½ lines long: petals white, 1½ lines long: stamens 6; filaments naked, the 3 longer with dilated filaments; the 3 shorter almost sessile: style short: cells 3, each with 2 ovules: seeds 3, triangular, 3-lobed, the margins revolute.—Found in moist shady places among rocks near Alamos. September 16 to 30. No. 737.

It differs from most species of *Tradescantia* in its one-seeded cells; the ovules however are two, the lower being abortive. The filaments differ considerably in length, but the anthers are but slightly different. It is perhaps nearest the *T. amplexicaulis* and yet I am not certain this is the proper section. It resembles *T. Disgrega* very much in habit.

Mr. Watson has suggested a relationship with *T. geniculata* from which species it differs in having the lower surface of the leaves glabrous (at least not villous): unequal stamens, with glabrous filaments: seeds of different shape, glabrous and alveolate.

Leptorhœo tenuifolia, n. sp. Slender annual, erect or a little spreading and rooting at the joints, glabrous or pubescent in lines: leaves linear, 1 to 1½ inches long, 1 to 2 lines broad, glabrous except a little pubescence at base: peduncles from the axils of the leaves, mostly in clusters of 3 or 4, 9 to 12 lines long: flowers in umbellets of 2 to 4, sometimes solitary, glabrous: sepals 1 line long: petals, 1 line long, blue: stamens 6, of two lengths: capsule 3-celled, 3-seeded.—It grows in shade along water-courses at Alamos. Sept. 16 to 30. No. 744.

This makes the second species for this genus and confirms the wisdom of separating it from *Tradescantia*, to which it is closely related and with which the type species had for nearly forty years been associated. It differs from *Tradescantia* chiefly in having but 1 ovule in each cell, and in the shape of the seeds and the central position of the hilum. It seems to be closely related to *L. filiformis* of Southern Mexico, but appears quite distinct, differing especially in its more erect habit, narrower and longer leaves, glabrous pedicels and calyx, and in the inflorescence.

Quercus, sp. Only sterile branches found: leaves glabrous, narrowly lanceolate, 2 to 3 inches long, with spiny-toothed margin. Alamos. March 26 to April 8. No. 368.

Quercus grisea Liebm. Alamos. March 26 to April 8. Nos. 369–370. “Nos. 369 and 370 probably belong to the same species, No. 369 being a vigorous shoot.” C. S. Sargent.

Quercus Kelloggii (?) Newberry. “Probably a narrow leaved form of this species; certainly there is no other described species to which it can be referred.” C. S. Sargent. Alamos. March 26 to April 8. No. 371.

The above oaks were found on the summit of the Alamos mountains and have neither flower nor fruit. They are mostly stunted forms 15 to 20 feet high and 1 to 1½ feet in diameter.

Eleocharis¹ **capitata** R. Br. The stems are about 3 inches high, and peculiar in being recurved. Alamos. March 26 to April 8. No. 411.

Eleocharis¹ **palustris** R. and S. var. **glaucescens** Gray. The achenia in these specimens are triangular, but in all other respects the characters are those of this form; and triangular achenia sometimes occur in *E. palustris*.

Fimbristylis diphylla² Vahl. Found in a moist place near a creek. Alamos. September 16 to 30. No. 699.

Cyperus incompletus² Link. Grows sparsely in wet places near Alamos. September 16 to 30. No. 701.

¹ Determined by F. C. Coville.

² Determined by N. L. Britton.

- Cyperus Schomburghkianus**¹ Nees. Found in a shady damp spot under bushes. Alamos. September 16 to 30. No. 703.
- Cyperus**¹ Too young. No. 747.
- Paspalum**² **setaceum** Michx, var. **pubiflorum** Vasey, n. var. Spikelets somewhat glandular-pubescent. Grew in a swampy place, many plants together. Alamos. September 16 to 30. No. 704.
- Eriochloa aristata** Vasey. Bull. Torr. Bot. Club. xiii. 229. Found in a cultivated field, used for fodder, mixed with other grasses. Alamos. September 16 to 30. No. 692.
- Panicum capillare** L. var. ? Alamos. September 16 to 30. No. 690.
- Panicum fasciculatum** Swartz. Alamos. September 16 to 30. No. 694.
- Panicum Hallii** Vasey. Bull. Torr. Bot. Club. xi. 61. Found in a ravine near Alamos. September 16 to 30. No. 695. Also at Agiabampo in low wet places. September. No. 750.
- Panicum sanguinale** L. Cultivated field near Alamos. September 16 to 30. No. 685.
- Setaria pauciseta** Vasey. Bull. Torr. Bot. Club. xiii. 230. The seed of these grasses had shelled out. The tops were very full. The seeds and stems had become a golden color. The natives pull these grasses from cultivated fields and sell them at stables at Alamos, near which they grow. September 16 to 30. Nos. 684 and 686.
- Cathestechum erectum** Vasey & Hackel. Grows in thick lawn-like patches often completely hiding the ground; on hillsides and level places near Alamos. September 16 to 30. No. 705.
- Manisuris granularis** Swartz. Found at one locality only; on a hillside near Alamos. September 16 to 30. No. 700.
- Sorghum halepense** Linn. Cultivated field near Alamos. September 16 to 30. No. 687.
- Aristida scabra** Kunth. Near the summit of the mountain. Alamos. March 26 to April 8. No. 410; also, in small bunches, many together, among underbrush on hillsides. September 16 to 30. No. 702.
- Muhlenbergia Alamosæ** Vasey. Bot. Gaz. xvi. 146. Perennial, culms closely tufted, 2 to 2½ feet high, slender, wiry, many (6 to 9) jointed, leafy, mostly unbranched: lower leaves approximate, erect, the upper distant, often overtopping the panicle, bud-like protrusions at the lower nodes: panicle capillary, spreading, 3 to 4 inches long, pyramidal, branches erect-spreading, 1 to 2 inches long, flowering nearly to the base: pedicels short to 2 or 3 times as long as the spikelets: spikelets purple, 1½ lines long, empty glumes half as long, ovate, acuminate or awn-pointed, 1-nerved: flowering glume lance-linear, 3-nerved, 1½ lines long, 2-toothed and with an awn 3 to 4 times as long: palet equaling its glume, bifid at apex; both palet and glume hairy at the base. Found in a shady arroyo in the mountain. Alamos. March 26 to April 8. No. 407. This is the type.
- Muhlenbergia distichophylla** Kunth. Collected near the summit of the mountain. Alamos. March 26 to April 8. No. 409.
- Muhlenbergia dumosa** Scrib. Common along water-courses in the mountain. Alamos. March 26 to April 8. No. 406.
- Muhlenbergia ramosissima** Vasey. Bull. Torr. Bot. Club. xiii. 231. In fields near Alamos. September 16 to 30. No. 691.
- Muhlenbergia virescens** Trin. Near the summit of the mountain. Alamos. March 26 to April 8. No. 408.
- Sporobolus confusus** Vasey. Grows in thick patches along water-courses. Alamos. September 16 to 30. No. 696. This is *Sporobolus ramulosus* of American authors, not of Kth. It is *Vilfa confusa* Fourn.

¹ Determined by Dr. N. L. Britton.

² Grammnæ determined by Dr. Geo. Vasey.

- Epicampes cœrulea** (?) Often 5 feet high. It grows in wet lands near the mouth of Yacque River; it is brought in bundles to Guaymas, where it is used to thatch out-buildings and the dwellings of the poor. March 26 to April 8. No 414.
- Bouteloua aristidoides** Thurb. Very common on bottoms and level places among hills. Alamos. September 16 to 30. No. 697.
- Bouteloua Alamosana** Vasey, n. sp. Apparently annual, culms tufted, mostly decumbent or prostrate, 3 to 6 inches high: leaves narrow, 1 to 1½ inches long: panicle racemose, 1 to 1½ inches long, with 3 to 5 spikes, each composed of 3 to 4 crowded spikelets, about ½ inch in length: spikelets 2-flowered: empty glumes linear, 2 to 3 lines long, the upper scabrous on the keel: glume of fertile flower oblong-lanceolate, 3½ lines long, 3-toothed and 3-awned, its palet as long, bifid at apex: glumes of sterile flowers with the body about two lines long, 2 lateral lobes reaching nearly to the base, 4 lines long, the central one 5 lines long.—Many plants growing together on rocky ridges. Alamos. September 10 to 30. No. 698.
- Bouteloua polystachya** Torr. In gravelly soil with underbrush. Alamos. September 16 to 30. Nos. 751, 791.
- Bouteloua polystachya** Torr. Var.? Nos. 751, 791.
- Leptochloa mucronata** Kunth. In garden with other grasses near Alamos. September 16 to 30. No. 699. No. 749 grew in low wet places near tide lands at Agiabampo.
- Diplachne viscida** Scrib. Found at the base of the hill in a moist place. Alamos. September 16 to 30. No. 748. No. 748½, same plant, collected in a swamp at Agiabampo.
- Eragrostis ciliaris** Link.? No. 688; and
- Eragrostis major** Host. Found in cultivated field; used in stables at Alamos. September 16 to 30. No. 689.
- Pinus oocarpa** Schiede. A small tree, 25 feet high, 1 foot in diameter, with pendent leaves, 8 to 9 inches long: cones about 2½ inches long; apophysis 4 to 5-sided with a somewhat elevated umbo which is especially strong toward the base: seeds 6 to 7 lines long. Collected near the summit of Alamos Mountain. March 26 to April 8. No. 374.
- The seeds of this species are described as being an inch long, and the trees are said to be 40 feet high. As is generally known, Dr. Engelmann found in his study of the leaves of pines that the resin ducts might occupy one of three positions in the parenchyma, viz, internal, parenchymatous, or peripheral. In this species the ducts are peculiar and can not be assigned to any of the group. On each side of the leaf are two ducts which with the surrounding strengthening cells completely separate the parenchyma tissue into distinct regions; the ducts extend from the fibro-vascular bundle to the epidermis or its underlying strengthening cells. These ducts have the paradoxical position of being both peripheral and internal. Dr. Engelmann in his arrangement places this species in the section with internal ducts, but says he occasionally found parenchymatous ones. We have not seen his specimens, but Palmer's plant of 1886 referred here by Mr. Watson has similar ducts. Dr. Palmer says there were many young plants which would be especially fine for cultivation.
- Notholæna candida** Hook.¹ Found under shade of rocks half-way up the mountain. Alamos. March 26 to April 8. No. 341.
- Notholæna Lemmoni** D. C. Eaton.¹ From mountain cañons. Alamos. September 16 to 30. No. 669.
- Selaginella cuspidata** Link.¹ Under shade. Alamos. September 16 to 30. No. 672.
- Notholæna sinuata**¹ Kaulf. Grew in shade near Alamos. September 16 to 30. No. 671.

¹ These plants were determined by Henry E. Seaton.

Adiantum emarginatum¹ Hook.

Adiantum thalictroides¹ Willd. Found near water-course at Alamos. March 26 to April 8. No. 344.

Cheilanthes microphylla¹ Swartz. Under shade of rock. Alamos. September 16 to 30. No. 672.

Indeterminable sp. "Papachi boraacho" is an upright growing shrub 8 to 10 feet high with short branches and very thorny: leaves very small 3 to 4 lines long obovate: fruit very numerous, globose, about 10 lines in diameter, indehiscent: seeds numerous, black, flattened. Not found in flower, and the fruit was nearly destroyed by birds. Alamos. March 26 to April 8. No. 330.

¹These plants were determined by Mr. Henry E. Seaton.

LIST OF PLANTS COLLECTED BY DR. E. PALMER IN ARIZONA IN 1890.

By J. N. ROSE.

Dr. Palmer, after having made large and valuable collections in Lower California and Mexico in the early months of the year, visited Arizona during the latter part of April, remaining there through May and June and a part of July. He made collections at Camp Huachuca, Willow Springs, and Fort Apache. A small collection made in 1889 at Camp Huachuca which Dr. Palmer purchased is included in this report; these plants are designated by letters only.

Camp Huachuca is about 15 miles from the Mexican border at the base of the Huachuca Mountains, in the extreme southeastern part of Arizona. Its elevation is 5,100 feet above sea level. The mountains are rough and rocky. The soil is of decomposed granite. Dr. Palmer was here from April 26 to May 21, and collected about one hundred species. The season was unfavorable for his work as no rain had fallen for seven months and the mountains and valleys were dry and barren, and the only plants found in proper condition for collecting were in the gardens and in two moist cañons. The plants of this collection are numbered from 416 to 478; unfortunately the numbers 450 to 459 were repeated, hence the latter are designated by the letter *a* in addition.

The only other important collection¹ made at this place is that of Mr. J. G. Lemmon and wife in 1882, a very large and valuable one, of which over fifty species were new.

Willow Springs is in the White Mountains near the pass leading to Fort Apache, at an altitude² of 7,600 feet. It is 75 miles south of Holbrook on the Atlantic and Pacific Railroad and is reached only by stage. The mountains here are covered with oaks and pines, and the two large meadows from which this collection was largely made, kept damp by the springs, were covered with vegetation. Dr. Palmer remained here from June 10 to 25; the nights at this season are very cool, often thin ice is

¹ Mr. Lemmon writes me that Dr. Palmer visited this place once before; as it was during the dry season nothing of importance was obtained.

² Dr. Rothrock gives the altitude of the pass 7,400 feet and of Willow Springs 7,195. Wheeler's Report, vi. 22.

formed. At this time he collected the plants numbered 479 to 574; on his return from Fort Apache he remained two days, July 5 and 6, collecting numbers 613 to 626.

Dr. Rothrock, in Wheeler's Report, vol. vi., has forty eight species from this place; most of these were recollected.

Fort Apache, upon the east fork of Salt River, in the Indian reservation of the valley of the White Mountains, has an altitude of 5,200 feet.¹ It is only reached after one hundred miles of rough mountain staging. The mountain here also is covered with oaks and pines, but the valley is dry, having little or no vegetation. Salt River supplies water for the fort and for irrigating the gardens and the farms of the Indians. The temperature is 10° warmer than at Willow Springs. Dr. Palmer was at Fort Apache from June 21 to 30, collecting plants numbered 575 to 613.

Dr. J. J. Rothrock made a small collection here in 1874. (Wheeler's Report, vi.)

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- Clematis Palmeri**, n. sp. A peculiar form which we have not been able to place. It seems nearest *C. filifera* Benth. of Mexico. The leaves very thin and delicately nerved, pinnate-ternate; the leaflets obtusely 3-lobed, paler beneath: peduncles one-flowered, 6 to 7 inches long: akenes with long plumose tails.—Among bushes along river bottom. Fort Apache, June 21 to 30. No. 600.
- Thalictrum Fendleri** Engelm. Under bushes in a ravine near Willow Springs. June 10 to 20. No. 516.
- Ranunculus affinis** R. Br., var. **cardiophyllus** Gray. Proc. Phil. Acad. 1863, p. 56. Common in swampy meadows. Collected here by Rothrock also. This form was first published by Dr. Gray, under the above varietal name, followed by Rothrock, Watson, and others, but in his last revision he takes up a new name, var. *validus*. Willow Springs, June 10 to 20. No. 498.
- Ranunculus macranthus** Scheele. Very common in wet bottoms. Rothrock also collected it here. Willow Springs. June 10 to 20. No. 495.
- Ranunculus hydrocharoides** Gray. Common, in a marsh. This species was also collected here by Rothrock. Willow Springs. June 10 to 20. No. 485.
- Aquilegia chrysantha** Gray. Very common in the cañons along water courses. Fort Huachuca. April and May. No. 434.
- Erysimum Wheeleri** Rothrock. Only in flower, but apparently this species. Willow Springs. June 10 to 20. No. 483.
- Capsella Bursa-pastoris** Moench. Collected in a garden at Fort Huachuca. April and May. No. 444.
- Ionidium polygalæfolium** Vent. Collected in an old garden at the mouth of a cañon. Fort Huachuca. April and May. No. 445.
- Cerastium nutans** Raf. In swamps at Willow Springs. June 10 to 20. No. 515.
- Claytonia Chamissonis** Esch. Willow Springs. June 10 to 20. No. 570.
- Sphæralcea Fendleri** Gray. A peculiar form with very small flowers and carpels. Grows on open mesas at Fort Apache. June 21 to 30. No. 594.
- Linum perenne** L. Willow Springs. June 10 to 20. No. 529.
- Linum aristatum** Engelm. *fide* Trelease. Collected at the edge of rich bottoms and slopes under oaks and pines. Willow Springs. June 10 to 20. No. 497.
- Ptelea trifoliata** L. A loose growing shrub about 8 feet high. Fort Huachuca. April and May. No. 428.
- Rhamnus Californica** Esch., *fide* Trelease. Fort Huachuca. April 26 to May 21. No. 431. Willow Springs. June 10 to 20. No. 520.

¹ Only 5,000 feet. Wheeler's Report, vi. 23.

- Ceanothus integerrimus** Hook. and Arn. Fort Huachuca. April and May. No. 427. "The leaves are somewhat thicker, more like *C. spinosus*," Mrs. K. Brandegee. Found at the head of a deep cañon among undershrubs. April and May. No. 427.
- Ceanothus Fendleri** Gray, *vide* Mrs. K. Brandegee. Very common. Willow Springs. June 10 to 20. No. 501.
- Ceanothus buxifolius** Willd, *vide* Mrs. K. Brandegee. Fort Huachuca. April and May. No. 451.
- Vitis Arizonica** Engelm. A very common grape and bears abundant fruit: when growing in shade of trees and bushes it climbs over them, but when growing in exposed places alone it becomes bush-like with merely the slightest inclination to climb, and has the appearance of a California cultivated grape which has been closely pruned to the height of 3 to 4 feet. Fort Apache. June 21 to 30. No. 609. Also very common in all the cañons at Huachuca. April 20 to May 21. No. 446.
- Rhus glabra** L. Only a few plants seen at Fort Apache. June 21 to 30. No. 585.
- Rhus Toxicodendron** L. Very common. Fort Huachuca. April to May. No. 453a.
- Rhus aromatica** Ait., var. *trilobata* Gray. Called "Squaw berry," and is gathered in great quantities by the Indians. The slender twigs are used by them in making baskets. Fort Apache. June 21 to 30. No. 590.
- Thermopsis montana** Nutt. Willow Springs. June 10 to 20. No. 528.
- Lupinus Palmeri** Watson. Very common under pines and on high level places. Willow Springs. June 10 to 20. No. 533.
- Trifolium involucreatum** Willd. Common in marshes along creeks. Also collected here by Rothrock (No. 229). Willow Springs. June 10 to 20. No. 507.
- Hosackia Wrightii** Gray. Willow Springs. June 10 to 20. No. 525.
- Hosackia puberula** Benth. Collected at the edge of a garden at Fort Huachuca. April and May. No. 422.
- Psoralea tenuiflora** Pursh. Willow Springs. June 10 to 20. No. 512. Also collected near Fort Huachuca in 1889.
- Amorpha fruticosa** L. A shrub 4 to 6 feet high, with many stems. "Bloom navy-blue with amber-colored anthers." Common along creeks. Also collected here by Rothrock (No. 244). Willow Springs. June 10 to 20. No. 484.
- Dalea formosa** Torr. A small bush, 1 to 1½ feet high. Fort Apache. June 21 to 30. No. 584.
- Dalea aurea** Nutt. Grows on stony mesas among bushes. Fort Apache. June 21 to 30. No. 611.
- Petalostemon candidus** Michx. Grows in large masses along river bottoms. Collected by Rothrock (No. 248) at Willow Springs. Fort Apache. June 21 to 30. No. 595.
- Astragalus Bigelovii** Gray. Collected near Fort Huachuca, 1889. Letter M.
- Astragalus Arizonicus** Gray. Collected on the parade ground at Fort Huachuca. April and May. No. 424.
- Vicia leucophæa** Greene. Bot. Gaz. vi. 217. About 2 feet high, hanging over small plants. Leaflets 2 to 6, mostly 4. Flowers "lemon-colored with violet spot." Style densely hairy in the middle. Very near to this species is *V. medicincta* Watson, and should be referred as var. *medicincta* of the above species. It differs only in its more narrow leaflets and stipules.
- In the type (Palmer's specimen) the stipules are described as linear, the flowers solitary on pedicels (peduncles), 3 to 6 lines long. In the only other collection of this form (Pringle's, 1887) I find some of the stipules almost subhastate, and some of the peduncles an inch or more long, with 2 flowers. I should state here that I have not yet seen any specimens of this form with 6 leaflets.
- A slight change is necessary in Mr. Greene's description of the style, which he

- says is "very villous at the apex," while Lemmon's plant, seemingly a part of the type, has the style hairy as above. The species has only been reported from southwestern New Mexico and southeastern Arizona, while this variety is from New Mexico. Palmer's specimens were collected at Willow Springs July 5 and 6. No. 625.
- Vicia pulchella** H. B. K. Flowers white. Also collected here by Rothrock under various numbers. Willow Springs. July 5 and 6. No. 621.
- Vicia Americana** Muhl. Collected here also by Rothrock (No. 224 in part). Willow Springs. June 10 to 20. No. 530.
- Lathyrus paluster** L., var. **angustifolius** Gray. Grows sparsely on rich bottoms under pines. "Bloom white, upper part pink." Also collected by Rothrock (No. 224). Willow Springs. June 10 to 20. No. 534.
- Robinia Neo-Mexicana** Gray. A thorny bush or tree 8 to 12 feet high: a loose grower; "bloom rose color," drying purplish. Collected here by Lemmon in 1882. Very common in cañons about Fort Huachuca. April and May. No. 440.
- Desmanthus Jamesii** T. & G. Bloom lemon color with yellow anthers. Common on gravelly bottoms. Fort Apache. June 21 to 30. No. 606.
- Desmanthus depressus** H. & B. Flowers "at first canary color, by age becoming salmon color." No fruit obtained. Very common in rich bottoms. Fort Apache. June 21 to 30. No. 613.
- Mimosa biuncifera** Benth. A loose thorny bush 1 to 1½ feet high: "flowers white," but in Rothrock's report said to be purplish. Also collected by Lemmon at this station. Very common on the plain at the foot of the mountain at Fort Huachuca. April and May. No. 449.
- Prunus salicifolia** H. B. K., var. **acutifolia** Watson. Proc. Amer. Acad. xxii. 411. Ten to fifteen feet in height, 5 inches in diameter, with edible fruit. Fort Huachuca, April and May. No. 450a.
- Fragaria vesca** L. Grows among bushes on sloping rich bottoms at Willow Springs. June 10 to 20. No. 487.
- Geum triflorum** Pursh. Willow Springs. June 10 to 20. No. 506.
- Potentilla Hippiana** Lehm. Very common in rich moist bottoms. Willow Springs. June 10 to 20. No. 482.
- Rosa Fendleri** Crepin. This species was also collected at this station by Rothrock. What seems to be the same species from Fort Huachuca was collected from a garden, but the plant originally grew in a neighboring cañon. No. 435. Willow Springs. June 10 to 20. No. 505.
- Amelanchier alnifolia** Nutt. About 4 feet high. It was found in ravines, high up the mountains. Willow Springs. June 10 to 20. No. 504.
- Heuchera rubescens** Torr. Collected near Fort Huachuca 1889. Letter K.
- Oenothera albicaulis** Nutt. Collected at the outer edge of a garden near Fort Huachuca. April and May. No. 471.
- Oenothera serrulata** Nutt. Willow Springs. June 10 to 20. No. 481.
- Oenothera Hartwegi** Benth. Common on rich bottoms. Fort Apache. June 21 to 30. No. 582.
- Oenothera triloba** Nutt. "Flowers yellow." Grows in marshy meadows. This same form was collected at this station by Rothrock. Willow Springs. June 10 to 20. No. 568.
- Gaura suffulta** Engelm. Found in level places exposed and in the shade. Flowers white but soon change. Willow Springs. June 10 to 20. No. 508.
- Gaura coccinea** Nutt. Flowers at first white, then rose and sometimes crimson. Fort Huachuca. April and May. No. 417.
- Gaura** sp. Seemingly near *G. Nealleyi* Coulter. The lower part of stem and leaves glabrous (except a few stiff hairs), above puberulent. Not in fruit and but a single plant seen. Flowers white, changes to red. On hillside. Fort Huachuca. April. No. 420.

- Cereus cæspitosus** Engelm. The flowers are a bright red. Common on stony ridges and mountain sides. Fort Huachuca. April and May. No. 475.
- Cereus** sp. Not very common. A very free bloomer with bright showy scarlet flowers. Fort Huachuca. April and May. No. 429.
- Cereus pectinatus** Engelm. (?) A single fruiting specimen obtained. Fort Huachuca. April and May. No. 447.
- Opuntia Engelmanni** Salm. Flowers yellow. Fort Huachuca. April and May. No. 477.
- Opuntia hystricina** Engelm. and Bigel. "It grows about a foot high with several joints." Flowers yellow, lower third red. On stony ridges. Fort Huachuca. April and May. No. 474.
- Opuntia arborescens** Engelm. This cactus is 2 to 3 feet high with flowers of a beautiful crimson. On stony plains and hillsides at Fort Huachuca. April and May. No. 476.
- Pseudocymopterus montanus** var. *tenuifolia* Coult. & Rose. Rev. p. 75. (*Thaspium* (?) *montanum* var. *tenuifolium* Gray.) Common at Willow Springs. June 10 to 20. No. 500. Also collected here by Rothrock.
- Cornus stolonifera** Michx. *vide* Coulter & Evans. A shrub 4 feet high. Willow Springs. June 10 to 20. No. 518.
- Lonicera ciliosa** Poir. About 2 feet high with drooping habit. Found in ravines high up the mountain side. Willow Springs. June 10 to 20. No. 537.
- Sambucus glauca** Nutt. Also collected by Rothrock. Willow Springs. June 10 to 20. No. 292.
- Symphoricarpos oreophilus** Gray. Willow Springs. June 10 to 20. No. 521.
- Galium trifidum** L. Grows along creeks. Willow Springs. June 10 to 20. No. 514.
- Houstonia Wrightii** Gray. Grows in low places and on hillsides. "Flower white with pink tip and corolla." Willow Springs. June 10 to 20. No. 528.
- Bouvardia triphylla** Salisb. The corolla very slender. Collected near Fort Huachuca in 1889. Letter G.
- Valeriana sylvatica** Banks. Willow Springs. June 10 to 20. No. 526.
- Valeriana edulis** Nutt. A common plant. Willow Springs. July 5 and 6. No. 618.
- Stevia Plummeræ** Gray. Collected in a cañon near Fort Huachuca, Arizona. 1889. Letter A.
- To the stations given in Syn. Flora we here add the following, viz: Mogollon Mountains, New Mexico, Rusby (1881), No. 152½; Mexico, Pringle (1887), No. 1260.
- Stevia serrata** Cav. Collected in a cañon near Fort Huachuca, 1889. Letter B.
- Eupatorium occidentale** Hook., var. **Arizonicum** Gray. A single specimen from near Fort Huachuca, Arizona. 1889. Letter D.
- Carphochæte Bigelovii** Gray. A single specimen from a cañon near Fort Huachuca, Arizona. 1889. Letter C. Pringle is the only collector who got the plant from Arizona, according to Syn. Flora. We have specimens from Rusby, 1881, collected at the San Francisco Mountains.
- Aplopappus spinulosus** DC. Collected in a cañon near Fort Huachuca, Arizona. 1889. Letter F.
- Solidago Missouriensis** Nutt. Var. Not very common, along river bottoms. Fort Apache. June 21. No. 602.
- Aster ericæfolius** Rothrock. Common on mesas and hillsides at Fort Huachuca. April 26 to May 21.
- Erigeron divergens** T. & G. The stems lie close to the ground. Upper end of a cañon under bushes. Near Fort Huachuca, Arizona. April 26 to May 21. Nos. 450, 494.
- Erigeron flagellaris** Gray. Willow Springs. June 10 to 20. No. 503.
- Baccharis Wrightii** Gray. Grown on second bottoms of Salt River. June 21 to 30. No. 580.

- Baccharis pteronioides** DC. Small shrub 3 feet high on stony mesas. Fort Huachuca, Arizona. April 26 to May 21. The female plant is No. 468. The male plant is a compact shrub 2 to 3 feet high on rocky sides of cañons. No. 443.
- Zinnia grandiflora** Nutt. Fort Apache. June 21 to 30. No. 583.
- Rudbeckia laciniata** L. Willow Springs. July 5 and 6. No. 620.
- Lepachys columnaris** T. & G. Fort Apache. June 21 to 30. No. 601.
- Wyethia Arizonica** Gray. The large roots yield a peculiar odor. Grows in rich bottoms under pines; rather common. Willow Springs. June 10 to 20. No. 543.
- Viguiera cordifolia** Gray. Grows in shade along river bottoms at Fort Apache. June 21 to 30. No. 593.
- Thelesperma gracile** Gray. Very common. Fort Apache. June 21 to 30. No. 396.
- Hymenopappus filifolius** Hook. Grows on rich bottoms. Fort Apache. June 21 to 30. No. 599.
- Hymenopappus Mexicanus** Gray. Found on sandy river bottoms. Willow Springs. June 10 to 20. No. 517.
- Hymenopappus radiata**, n. sp. Perennial from a long slender root, 1½ feet high, branching at base floccose-tomentose becoming somewhat glabrate above: leaves mostly radical, 1 to 2 pinnate into narrow linear segments: heads corymbose on peduncles 1 to 2 inches long: involucre bracts broad, little or not at all petaloid: rays about 5, white, 6 to 7 lines long: disk-flowers numerous; proper tube short, about ½ line long; throat swollen, campanulate, about 1 line long; lobes short, acute, about one-third the length of throat; anthers but not the filaments exerted: akenes 1½ to 2 lines long, obpyramidal, 4-angled with a delicate intermediate nerve, glabrous or a little puberulent: pappus of numerous very short paleæ.—Common in low rich bottoms under pines and oaks. Willow Springs. July 5 and 6. No. 615.
- This species differs from all other species of *Hymenopappus* in the presence of ray-flowers, but in other respects corresponds with this genus. Its habit is perhaps more like *H. filifolius*, but the akenes and pappus are more like *H. flavescens*. Although it seems undoubtedly a *Hymenopappus*, yet in all its external appearances, including the rays, it resembles *Leucampyx*; the disk-flowers, akenes, and pappus are also similar. It has been a puzzle to me to separate this species clearly from *L. Newberryi*, and it is questionable whether they ought not to go together and be placed under *Hymenopappus*. The following are the slight differences I note between the two: In *H. radiata* the pappus is not so deciduous, the proper corolla tube is shorter, and the style-branches a little thicker and not so papillose. The absence of the bracts on the receptacle seems to be the only reliable character separating the two genera.
- Actinella Bigelovii** Gray. This species has been collected in Arizona by quite a number of collectors, but is only credited to New Mexico in Syn. Flora. Grows on stony ridge and slope under pines. Willow Springs. June 10 to 20. No. 486.
- Gaillardia pinnatifida** Torr. The entire-leaved form; a free bloomer. Collected in a garden, in good soil by a water ditch. Fort Huachuca, Arizona. April 26 to May 21. No. 430.
- Pectis longipes** Gray. Common on mesas and hillsides near Fort Huachuca, Arizona. April 26 to May 21. No. 425.
- Achillea Millefolium** L. Willow Springs. June 10 to 20. No. 524.
- Senecio Actinella** Greene. According to Syn. Flora only collected by Rusby at Flag Staff, but it was obtained at the original station by J. G. Lemmon and wife in 1884, and now collected and reported by Dr. Palmer as very common at Willow Springs. June 10 to 20. No. 488.
- Senecio aureus** L. form. Fort Huachuca, April 26. No. 438.
- Senecio Neo-Mexicana** fide S. Watson. Willow Springs. June 10 to 20. No. 480.
- Senecio lugens** Richards. A very common plant under pines at Willow Springs. June 10 to 20. No. 479.

- Senecio Douglasii** DC. Very common. Fort Huachuca, Arizona. April 26 to May 21.
- Cacalia decomposita** Gray. In a cañon near Fort Huachuca. 1889. Letter E. The plant is in Pringle's 1886 collection, from Chihuahua, Mexico.
- Cnicus ochrocentrus** Gray. The roots are boiled and eaten by the Apache Indians. A common plant on bottoms and hillsides. Fort Apache. June 21 to 30. No. 605.
- Rafinesquia Neo-Mexicana** Gray. The flowers are pinkish-white when first open. Collected from the parade ground at Fort Huachuca, Arizona. April 26 to May 21. No. 456.
- Krigia amplexicaulis** Nutt. Common in wet bottoms along creeks. Willow Springs. June 10 to 20. No. 539.
- Hieracium Fendleri** Schultz Bip. var. **discolor** Gray. Common on bottoms and mountain slopes. Willow Springs. June 10 to 20. No. 532.
- Malacothrix Fendleri** Gray. Collected on the parade ground at Huachuca, April 26. No. 421.
- Troximon aurantiacum** Hook, var. **purpureum** Gray. The flowers are yellow becoming purplish in drying. The specimens correspond exactly with Fendler's original specimens. Collected in rich bottoms at Willow Springs. June 10 to 20. No. 541.
- Pyrrhopappus multicaulis** DC. Grows in low sandy places near river banks. Willow Springs. June 10 to 20. No. 519.
- Lactuca graminifolia** Michx. Willow Springs. June 10 to 20. No. 510.
- Anisacanthus Thurberi** Gray. An upright growing bush about 5 feet high. Beside the collection mentioned in Syn. Flora, we have the species from Pringle, Parish, and Smart. Fort Huachuca, Arizona. April and May. No. 453.
- Arctostaphylos pungens** H. B. K. Fort Huachuca. April and May. No. 458ⁿ (?).
- Arbutus Xalepensis** H. B. K. var. **Arizona** Gray. A large shrub or small tree 10 to 15 feet high, largest stem 6 inches in diameter. Fort Huachuca. April and May. No. 433.
- Samolus Valerandi** L. var. **Americanus** Gray. Grows in boggy soil near Fort Huachuca. May. No. 470.
- Dodecatheon**, sp. Leaves oblanceolate, 2 to 3 inches long: scape about a foot high, 4 to 5-flowered: flowers 4-parted: "corolla light crimson with purple tinge, the base of petals with white spot and a yellow ring below all:" stamens, 3 lines long, distinct, sessile: capsule obtusish, about the length of calyx. Grows in swamps. Willow Springs. June 10 to 20. No. 342.
- According to Dr. Gray's Revision in Botanical Gazette this form would go into his second section which contains only *D. frigidum*, as the stamens are distinct and almost sessile, but it can hardly be his variety *dentatum* as the leaves are of a different shape, entire, and flowers purple. It resembles in habit the Rocky Mountain variety *alpina* which has been variously referred. But it is not the variety *alpina* recently described by Mr. Greene, Pitt. ii. 12, as *D. pauciflora* as this has a stamineal tube nearly as long as the anthers. In the recent arrangement of Mrs. Brandegee, Zoe i. 20, this would answer best in her variety *Jeffreyi*, but as it is here defined, I do not think it includes all the forms placed under it by Dr. Gray. It most resembles a specimen of Cusick's collected in 1884 and distributed as *D. Media*.
- Forestiera Neo-Mexicana** Gray. A stiff growing shrub 4 to 5 feet high in cañons at Fort Apache. June 21 to 30. Nos. 578 and 612.
- Fraxinus pistaciæfolia** Torr. A small tree 6 to 10 feet high. In cañons at Fort Apache. June 20 to 30. No. 592.
- Frasera speciosa** Dougl. This plant grows 4 to 5 feet high. Willow Springs. June 10 to 20. No. 573.

- Gilia aurea** Nutt. Willow Springs. June 10 to 20. No. 496.
- Krynitzkia Jamesii** Gray. Fort Apache. June 21 to 30. No. 591.
- Lithospermum multiflorum** Torr. Common under trees. Willow Springs. June 20 to 30. No. 536.
- Lithospermum Cobrense** Greene. Collected near a ditch in a garden, at Fort Huachuca. April and May. No. 432.
- Onosmodium Thurberi** Gray. Willow Springs. July 5 and 6. No. 617.
- Mertensia paniculata** Don. Willow Springs. July 5 and 6. No. 619.
- Apocynum cannabinum** L. Willow Springs. June 10 to 20. No. 511.
- Asclepias tuberosa** L. In cañons about Fort Huachuca. May. No. 473. Also very common at Willow Springs. June 10 to 20. No. 538.
- Asclepias speciosa** Torr. This species grows along ravines and rich bottoms. Willow Springs. June 10 to 20. No. 544.
- Asclepiodora decumbens** Gray. On mesas and hill slopes about Fort Huachuca. April and May. No. 437.
- Asclepias involucrata** Engelm. On gravelly mesas. Fort Huachuca. April 26 to May 21. No. 454.
- Acerates auriculata** Engelm. This plant grows on river banks in shade of bushes. "Flowers old-gold." Fort Apache. June 21 to 30. No. 604.
- Solanum umbelliferum** Eschs. Along stony ridges. Fort Apache. June 21 to 30. No. 607.
- Nicotiana attenuata** Torr. "Flowers light-violet with white tinge at summit." Dr. Palmer says, "this is the tobacco once commonly smoked by the Apache Indians but is now only used by the very old men, the younger generation preferring that which is sold in the stores." Fort Apache. June 21 to 30. No. 610.
- Evolvulus lætus** Gray. Gravelly mesas and hillsides. Fort Huachuca. April and May. No. 442.
- Veronica Americana** Schwein. Willow Springs. June 10 to 20. No. 540.
- Castilleia parviflora** Bong. Willow Springs. June 10 to 20. No. 513.
- Veronica peregrina** L. Flowers white. Very common. Willow Springs. June 10 to 20. No. 489.
- Pedicularis Parryi** Gray. This plant differs somewhat from the Colorado forms; the floral bracts are callous-denticulate, the beak shorter and thicker. The flowers are lemon-colored. Very common in grassy swamps at Willow Springs. July 5 and 6. No. 622.
- Mimulus luteus** L. Willow Springs. June 10 to 20. No. 527.
- Mimulus**, sp. Perhaps a form of *M. cardinalis*, but with slender calyx tube with ovate-acuminate lobes; corolla salmon-red, 2 inches long, very slender. Common in cañons. Fort Huachuca. April and May. No. 441.
- Chilopsis saligna** Don. Dwarf trees resembling willows in habit; grow in stony ravines, coming from the mountains. Fort Huachuca. April and May. No. 448.
- Erythræa Douglasii** Gray. Near Fort Huachuca. 1889. Letter I.
- Calophanes decumbens** Gray. Collected on the parade ground at Fort Huachuca. April 26 to May 21. No. 472.
- Jatropha macrorhiza** Benth. Plant. Hart. p. 8. A small plant growing on stony mesas and ridges. It has a large root 8 to 9 inches long and 4 to 5 inches in diameter. Fort Huachuca. April and May. No. 469.
- Pentstemon barbatus** Nutt. var. **Torreyi** Gray. "Corolla scarlet, inside of tube orange." A very showy and abundant plant under trees and bushes. Fort Apache. June 21 to 30. No. 588.
- Pentstemon spectabilis** Thurber. "Corolla showy, magenta color. Fort Apache. June 21 to 30.
- Pentstemon linarioides** Gray. Only a few plants seen. Fort Apache. June 21 to 30. No. 585.

- Pentstemon virgatus**¹ Gray. "Corolla white with yellowish cast and a patch of purple on the upper part." Not common; in sandy places. Willow Springs. June 10 to 20. No. 493.
- Pentstemon Wrightii** Hook. ? "Corolla beneath light-snuff color, the remainder violet." Grew on level places under pines and oaks. Willow Springs. July 5 and 6. No. 614.
- Verbena ciliata** Benth. Collected near Fort Huachuca, 1889.
- Dracocephalum parviflorum** Nutt. Grows in rich moist bottoms. Willow Springs. June 10 to 20. No. 569.
- Monarda fistulosa** L., var. *media* Gray. Fort Apache. June 21 to 30. No. 579.
- Monarda fistulosa** L. Grows in profusion on grassy slopes and open level places. Willow Springs. July 5 and 6. No. 626.
- Amarantus retroflexus** L. Called "red-root." The White Mountain Apaches use the plant very much as food; the green herbage is cooked and the seeds gathered, parched and ground into flour, from which they make bread, mush, etc. Fort Apache. June 21 to 30. No. 587.
- Chenopodium album** L. Common. Used by the White Mountain Indians as a pot-herb. Fort Apache. June 21 to 30. No. 587.
- Polygonum Bistorta** L., var. *oblongifolium* Meisn. *vide*, S. Coulter. Willow Springs. June 10 to 20. No. 522.
- Eriogonum alatum** Torr. With more corymbose inflorescence than the type. Common on hillsides and river bottoms. Fort Apache. June 21 to 30. No. 597.
- Comandra pallida** A. DC. Willow Springs. June 10 to 20. No. 502.
- Euphorbia montana** Engelm. A very common plant along cañons. Fort Huachuca. April and May. No. 455.
- Acalypha Lindheimeri** Muell. Collected in an old garden. Fort Huachuca. April and May. No. 419.
- Argythamnia mercurialina** Muell. This plant is very common on dry and exposed places. Fort Apache. June 21 to 30. No. 581.
- Tragia urticæfolia** Michx. Willow Springs. June 10 to 20. No. 491.
- Guilleminea densa** Moq. Common in cañons. Fort Huachuca. April and May. No. 457.
- Gomphrena cæspitosa** Torr. Fort Huachuca. April and May. No. 423.
- Juglans rupestris** Engelm. Seen only in cañons. The young trees are quite ornamental. They grow here to a height of 30 feet, and are 1½ to 2½ feet in diameter. No. 416.
- Alnus incana** Willd., var. A large brushy topped tree 20 to 30 feet high and 12 to 18 inches in diameter. The Indians use the bark in tanning. Fort Apache. June 20 to 30. No. 602.
- Quercus Emoryi** Torr. The acorns of this oak are gathered in great quantities by the Mexicans and Indians. A small tree 30 feet high and 1½ feet in diameter. Fort Huachuca. April 26 to May 21. No. 459a.
- Salix nigra** Marsh., var. *venulosa* Anders, *vide* M. S. Bebb. "This varietal name is retained for forms which the species assumes in its distribution from Texas westward. Notwithstanding the inaccuracies of Anderson's description, these originated quite naturally from certain peculiarities in Wright's No. 1877, which peculiarities are now recognized as having resulted from an abnormal growth." M. S. Bebb.
- Iris Missouriensis** Nutt. Very common at Willow Springs. June 10 to 20. No. 499.
- Sisyrinchium anceps** L. Willow Springs. June 10 to 20. No. 490.
- Sisyrinchium angustifolium** Mill. Same habitat as the last. No. 490 a.
- Allium Nuttallii** Watson. Flowers white. The bulbs are eaten by the Indians and "settlers." Willow Springs. June 10 to 20. No. 574.

¹The specimens have on them an *Æcidium*, which Mr. J. W. Anderson tells me is a new species *Æ. Palmeri*.

- Lilium Parryi** Watson. A free bloomer with sweet-scented canary-colored flowers. Grows in the cañons about Fort Huachuca. Pringle also got it near this station in 1884, and beside the type we have specimens from California collected by Parish. April and May. No. 478.
- Smilacina**¹ **amplexicaulis** Nutt. Willow Springs. June 10 to 20. No. 572.
- Lemna trisulca** L. Common in creeks at Willow Springs. June 10 to 20. No. 531.
- Juncus**² **xiphioides** Meyer, var. **montanus** Engelm. The specimens have only unopened flowers, but they undoubtedly belong here. No. 571.
- Juncus tenuis** Willd. Flowers not yet opened. This is the typical form with flowers not secund and with the lowest involueral leaf much exceeding the panicle. No. 550.
- Juncus Balticus** Dethard, var. **montanus** Engelm. Flowers just beginning to open. No. 555.
- Juncus longistylis** Torr. Flowers just beginning to open. No. 556.
- Juncus longistylis** Torr. Fruit not yet mature. No. 624.
- Juncus tenuis** Willd. No. 461f.
- Juncus xiphioides** Meyer, var. **montanus** Engelm. No. 467a.
- Eleocharis palustris** R. & S., var. **glaucescens** Gray. The specimens are without fruit, but appear to be a 3-styled form of this plant. No. 554.
- Eleocharis palustris** R. & S. The achenes are not yet mature, and the spikes in their young state are less sharply acute than is usual. No. 155.
- Eleocharis montana** R. & S. Plant only in flower and the determination made only on its general resemblance to the species. No. 459.
- Scirpus pungens** Vahl. No. 460.
- Carex**³ **hystricina** Muhl., var. **angustior** Bailey, n. var. Whole plant whitish-green, tall and slender but erect; spikes one-half narrower than in the species, erect or ascending; perigynium less inflated, ascending.—Willow Springs, Arizona. No. 464. Pringle's 222 from Santa Rita Mountains is the same.
- Carex teretiuscula** Gooden. No. 553.
- Carex marcida** Boott. No. 552t. No. 552b is a single immature specimen. Mixed with this is *Carex filiformis* L., var. *latifolia* Boeckl.
- Carex filiformis** L. var. *latifolia* Boeckl. No. 549.
- Carex echinata** Murr. No. 548.
- Carex Nebraskensis** Dew., var. *prævia* Bailey. No. 547.
- Carex nudata** W. Boott. No. 546.
- Carex aurea** Nutt., var. *celsa* Bailey. Perigynia distinctly beaked. No. 545.
- Carex occidentalis** Bailey. No. 467.
- Carex teretiuscula**, Gooden., var. *ampla* Bailey. No. 462.
- Carex hystricina**, form. No. 464.
- Eatonia obtusata** Gray. Var. *robusta* Vasey. No. 466.
- Eatonia Pennsylvanica** Gray, var. *longiflora* Vasey. No. 467.
- Eatonia**⁴ **Pennsylvanica** Gray, var. *major* Gray. 517.
- Eatonia Pennsylvanica** var. Fort Apache June 10 to 20. No. 577.
- Aristida purpurea** Nutt. Fort Apache June 21 to 30. No. 575.
- Stipa leucotricha** Trin. Fort Apache June 21 to 30. No. 576.
- Calamagrostis neglecta** Kunth. A common grass in wet soil. Willow Springs. July 5, 6. No. 616.
- Koeleria cristata** Pers. No. 562.
- Koeleria cristata** Pers, var. Willow Springs. No. 564.

¹ It is proper to state here that Mr. E. L. Greene, in a recent paper (Bull. Torr. Club, xv. 285 to 287), has replaced this genus by the older name *Uniflorum*, which makes this species *U. amplexicaule* Greene.

² The Juncaceæ and Cyperaceæ (except *Carex*) were determined by Mr. F. V. Coville.

³ The CARICES were determined by Prof. L. H. Bailey.

⁴ The Graminæ were determined by Dr. Geo. Vasey.

- Deschampsia cæspitosa** Beauv. Willow Springs. Nos. 566 and 559.
Hierochloe borealis R. and S. Willow Springs. No. 558.
Glyceria nervata Trin. Willow Springs. No. 557.
Mühlenbergia virescens Trin. Willow Springs. No. 565.
Agropyrum glaucum R. and S. Willow Springs. No. 563.
Poa pratensis L. Willow Springs. No. 560.
Poa annua L. Huachuca. No. 458.
Festuca myurus L. No. 465.
Festuca Arizonica. Grows on mountain-slopes and rich level places. Willow Springs, July 5 and 6. No. 623.
Panicum scoparium Lam. Willow Springs. No. 561.
Cheilanthes¹ Eatoni Baker. Fort Huachuca. April 20 to May 21. No. 437a.
Cheilanthes tomentosa Link. Fort Huachuca. April 26 to May 21. No. 451.
Cheilanthes Lindheimeri Hook. Fort Huachuca. April 26 to May 21. No. 452.
Asplenium Filix-fœmina Bernh. Fort Huachuca. 1889. Letter W.
Notholæna ferruginea Hook. Fort Huachuca. 1889. Letter X.
Cystopteris fragilis Bernh. Fort Huachuca. 1889. Letter Y.
Woodwardia radicans Smith.
Equisetum lævigatum A. Br. Fort Huachuca. April and May. No. 463.

MUSCI.

- Marchantia polymorpha** L. Willow Springs. No. 535.
Funaria hygrometrica Sibth. "The spores are somewhat larger than usual in this species."—C. R. Barnes. No. —

FUNGI.

- Agaricus** L., sp. Mr. F. W. Anderson identifies the poor specimens as *A. campestris* probably. The following is Dr. Palmer's note: "This species of mushroom is plentiful during the rainy season. When cooked it is very firm and of better flavor than the ordinary mushroom. The Indians eat it with much relish." Fort Apache. June 21 to 30. No. 508.
Æcidium Palmeri Anderson. Journ. Mycol. vi. 122. This is the type of a new species found on *Pentstemon virgatus*, at Willow Spring.

¹Ferns determined by Mr. H. Seaton.