REPORT ON A COLLECTION OF PLANTS MADE IN THE STATES OF SONORA AND COLIMA, MEXICO, BY DR. EDWARD PALMER, IN THE YEARS 1890 AND 1891.

By J. N. Rose.

The collection here reported upon was made by Dr. Edward Palmer, chiefly in the States of Sonora and Colima during the latter part of 1890 and the early months of 1891. The localities visited were Agiabampo, Manzanillo, Colima, and Armeria.

Dr. Palmer arrived at Agiabampo September 12, en route for Alamos. Heavy showers had previously fallen and vegetation was well advanced, but few plants were as yet in flower. From this place he went directly to Alamos and obtained a valuable collection, upon which a report has already been made.* While at Alamos one of those dry, hot winds, so characteristic of this region, occurred and seriously injured or killed many of the plants; heavy showers fell again on October 1, reviving some plants which were in unexposed places. Dr. Palmer returned to Agiabampo October 3, and was much disappointed at finding the vegetation in so poor a condition. Collecting was difficult and unsatisfactory, but his work under these circumstances was most admirably done, as shown by the many new and interesting plants enumerated in this report. About 55 species were obtained. The specimens are numbered from 752 to 815, the result of two weeks' collecting at this place.

The town of Agiabampo is a small seaport on the Gulf of California, in the extreme southern part of Sonora. It is 145 miles southeast of Guaymas and about 60 miles from Alamos, the latter of which is almost wholly dependent upon Agiabampo for supplies. After finishing the work at Agiabampo, Dr. Palmer visited Carmen Island and returned to Guaymas, where the trip to the State of Colima was planned.

Manzanillo was reached by steamer December 1. This village is a small one, containing only about 500 inhabitants, has an excellent harbor, and is situated at the foot of a low range of mountains. It is the seaport of Colima and is connected with that city by railway. Dr. Palmer spent the month of December, 1890, about Manzanillo, collecting chiefly in the mountains and in the low, marshy places about the bay.

* See this volume, pp. 91 to 116.

He stopped here two weeks in the following year (March 2 to 16, 1891), securing many plants not obtainable earlier in the season.

From Manzanillo he went to Colima, the capital of the state of the same name. Almost a month was spent here (January 9 to February 6, 1891), and a second visit was made later, February 27 and 28. One day (February 15) was spent in Armeria, a small place half way between Manzanillo and the city of Colima.

The following table will show the places visited, with the dates of collection and the numbers of the plants:

Places visited.	Date of collection.	Collector's numbers (inclusive).
Agiabampo	Oct. 3 to 15, 1890	752–815
Manzanillo	Dec. 1 to 31, 1890	816–1096
Colima	Jan. 9 to Feb. 6, 1891	1097–1273
Armeria	Feb. 15, 1891	1274–1293
Colima	Feb. 27 and 28, 1891	1294–1328
Manzanillo	Mar. 2 to 18	1329–1401
Colima (bought at market)	Jan. 9 to Feb. 6, 1891	1402–1410*
Manzanill	Dec. 31, 1891	1810–1812

The following interesting account of Colima and Manzanillo is taken from the consular report for January, 1885, by Emil Mahlo, U. S. consul at Manzanillo:

The state of Colima lies between 18° 30′ and 19° 28′ north latitude, and 105° to 107° west longitude; is bounded north by the state of Jalisco, east by the same state and Michoacan, and south and southwest by the Pacific Ocean. It covers, probably, an area of 4,000 square miles and is said to have between 70,000 and 75,000 inhabitants. All these figures are approximations, as no survey of the state has ever been made, nor have they had an official census since 1871. The city of Colima may have 30,000 inhabitants.

The topographical and geological features of the state are interesting. The ground rises gradually from the coast, frequently intersected by detached, unconnected ranges of the Cordilleras (Sierra Madre), forming between them terrace-like, fertile plains which make Colima one of the richest agricultural states of Mexico.

The city of Colima, in an altitude of 1,450 feet, and 58 miles distant from its port of Manzanillo, is situated almost in the center of one of the plains, which is probably 75 miles in circumference, traversed by several rivers and creeks.

Southeast and west of it are wooded mountains from 2,000 to 4,000 feet high, while to the north the ground again at first rises gradually, when suddenly, proud and majestic, the double volcano of Colima, about 20 miles distant, pushes itself high up above the surrounding country into the limits of eternal snow.

From here radiate the almost impassable deep "barrancas" which traverse the state in its northern and northeastern portion, making the communication with the interior of the Republic exceedingly difficult.

The base of the geological formation is granite; it is in many places overlaid by feldspathic porphyry, conjointly with limestone, gypsum, and shale. In and near the barrancas porphyry, trachite, and calcareous conglomerate predominate. The structure of the volcano of Colima is trachite.

Although entirely within the hot zone, this consular district can truly be said to present all kinds of climates. From the snow of the volcano and the cold climate of

*The numbers between 1410 and 1810 represent Dr. Palmer's collection in the state of Sinaloa, made in 1891. The identification of these plants is nearly completed and will form the basis of a future paper.

the high surrounding country through the temperate, beautiful climate of the terraced slopes and plateaus, down through the semitropical to the tropical heat of the shores of the Pacific, are represented the three principal climatic zones.

To this difference in the climate is due the great variety of the agricultural products grown in this district. There are only two marked seasons—the rainy and the dry season. The rains commence invariably at the end of May or the beginning of June and terminate about the end of October.

I give herewith in a tabular form a résumé of the annual rainfall as observed by an intelligent private citizen of Colima during the years 1869 to 1880, inclusive. This is, as far as I know, the first reliable compilation of meteorological observations ever made on this coast of Mexico. The place of observation is the city of Colima.

Years.	Mean annual rainfall.		Years.	Mean annual rainfall.	
	Inches.	Number of days of rain.		Inches.	Number of days of rain.
1869	60.2	91	1875	39.1	82
1870	47.6	97	1876	35.1	89
1871	35.1	53	1877	32.2	72
1872	64.8	71	1878	60.1	79
1873	64.7	76	1879	45.0	88
1874	48.0	75	1880	41.0	75

Yearly mean for twelve years, 46 inches; yearly average number of rainy days, 79.

It is to be regretted that no hygrometric observations have been made. The atmosphere contains considerable humidity the whole year round.

The maximum temperature in the shade, as observed, was, in July, 96° F.; the minimum in February, 70° F.; greatest variation during the year, 26°; annual mean, 83°.

The observed monthly mean temperature during one year (1880) gave the following result:

Month.	Mean.	Month.	Mean.
	Degrees F.		*Degrees F.*
January	75	July	86
February	71	August	83
March	78	September	79
April	81	October	78
May	83	November	78
June	83	December	77

On the higher plateau in the interior the thermometer ranges from 54° to 90°.

While the climate of the port of Manzanillo is not very healthy, the city of Colima, at an elevation of 1,450 feet, and other places farther inland and of a higher altitude, are considered healthy places.

The state of Colima, small though it is, is one of the most fertile of Mexico, and is noted for the variety of agricultural products. It produces maize, rice, coffee, sugar, cotton, cocoa, indigo, tobacco, the castor-oil bean, etc.; and upon the higher plateaus of Jalisco and Michoacan wheat, maize, and potatoes are cultivated.

Of all the tropical and semitropical fruits which this part of Mexico produces I will mention only the following: Cocoa, limes, oranges, mangoes, bananas, pineapples, tamarinds, the chico (a very delicious fruit), the "aguacate," and the mamey. Limes are exported from Manzanillo to San Francisco to a considerably extent; also some pineapples, oranges, and mangoes.

In the small state of Colima alone over two hundred different kinds of useful and valuable woods are encountered; fine cabinet and dyewoods and woods for construction. The most valuable of these, as, for instance, mahogany, cedar, "primavera," granadillo, "tampinziran" palo-maria, palo-fierro, are articles of export to Europe and to the United States. They grow in abundance all along the coast and to a considerable distance inland. Among the dyewoods are the "campeachy," and palo Brazil. On the higher plateau fine oak and pine forests are met with. Fibrous plants and trees also grow in abundance. Besides the majestic "palma de coco" we have the useful palm-nut oil tree (palma de coquito de aceite) and other species of palms.

The rubber tree grows wild in the forests of the lowland along the Pacific coast. Some crude rubber is made, chiefly by the natives, and is exported to Europe and to the United States.

I am under obligation to many botanists who have aided me in comparing my specimens with those owned or controlled by them.

Dr. George Vasey, late chief of the division of botany, gave me every facility to carry on this work, and is wholly responsible for the determination of the grasses. The following list comprises the grasses determined by him:

Ægopogon gracilis.
Anthephora elegans.
Aristida manzanilloana.
Aristida tenuis.
Arundinella brasiliensis.
Bouteloua bromoides.
Bouteloua polystachys.
Cathestecum erectum.
Cenchrus echinatus.
Chloris radiata.
Eleusine indica.
Eragrostis ciliaris.
Eragrostis plumosa.
Eragrostis diversiflora.
Eragrostis pallida.
Eragrostis purshii.
Gouinia polygama.
Hilaria cenchroides.
Jouvea straminea.
Muhlenbergia exilis.
Oplismenus humboldtianus nudicaulis.
Oplismenus setarius.
Panicum molle.
Panicum capillaceum.
Panicum divaricatum.
Panicum myurum.
Panicum pringlei.
Panicum sanguinale ciliare.
Panicum trichanthum.
Paspalum conjugatum.
Paspalum paniculatum.
Pennisetum setosum.
Phragmites communis.
Sporobolus argutus.

Prof. Daniel C. Eaton has named the ferns and fern allies of which the following species were obtained:

Adiantum concinnum.
Aspidium patens.
Aspidium trifoliatum.
Gymnogramme calomelanos.
Lygodium mexicanum.
Notholæna brachypus.
Pellæa rigida.
Phegopteris tetragona.
Polypodium elongatum.
Polypodium incanum.
Polypodium lanceolatum.
Selaginella lepidophylla.

The following Cyperaceæ were determined by Dr. N. L. Britton:

Cyperus canus.
Cyperus compressus.
Cyperus fugax.
Cyperus ligularis.
Cyperus ottonis.
Cyperus regiomontanus.
Eleocharis geniculata.

The late Dr. Sereno Watson, to whose kindness I have repeatedly referred in the past, assisted me in various ways in the preparation of this report. One of his last letters contained a note on *Pisonia aculeata*,

which appears in its proper place in the text. To him were submitted the following species:

Eupatorium dissectum.
Fleischmannia rhodostylis.
Forchhammeria watsoni.
Forchhammeria pallida.
Heteropterys palmeri.

Dr. B. L. Robinson, the present curator of the Harvard Herbarium, has again and again loaned specimens for comparison and study. He has also aided me in the study of *Ayenia manzanilloana* and *Crataeva palmeri*. Specimens of nearly all the new species have been submitted to him.

Dr. Casimir DeCandolle, of Geneva, has determined all the plants of the genus *Piper*, including one new species and two varieties, as well as two new species of the genus *Trichilia*. The following are the species examined by him:

Piper palmeri.
Piper palmeri manzanilloanum.
Piper realejoanum.
Piper tuberculatum.
Piper umbellatum.
Piper unguiculatum longifolium.
Trichilia palmeri.
Trichilia colimana.

I also submitted to him for examination a new species and variety of my own, *Guarea palmeri* and *Trichilia havanensis spatulata*.

Mr. J. G. Baker, curator of the Herbarium at Kew, in addition to suggesting the relationship of the *Agave*, identified for me *Tillandsia polystachya* and *T. recurvata*.

Mr. W. Botting Hemsley, also of the Kew Gardens, has been especially helpful in definitely ascertaining that many of my new species were clearly distinct from closely related ones, specimens of which are to be found in several cases only at Kew. The following species were submitted to him for determination or comparison:

Bumelia arborescens.
Colubrina arborea.
Heteropterys gayana.
Ipomœa nelsoni.
Karwinskia parvifolia.
Zizyphus mexicana.

The following *Sapindaceæ* have been determined by Prof. L. Radlkofer, of Munich. Of the seven species determined four are new:

Paullinia fuscescens.
Paullinia sessiliflora.
Paullinia tomentosa.
Serjania fuscopunctata.
Serjania rutæfolia.
Serjania trifoliolata.
Serjania triquetra.

Several other species were determined by Prof. Radlkofer, and proper credit is given in the text.

Mr. E. G. Baker, of the British Museum, has named most of the *Malvaceæ*, as well as aided me in the identification of the others. The following are those determined by him:

Abutilon bastardioides.
Abutilon incanum.
Abutilon triquetrum.
Anoda hastata.
Hibiscus sabdariffa.
Malvaviscus arboreus.
Kosteletzkya asterocarpa.
Sida acuta carpinifolia
Sida glutinosa.
Sida ulmifolia.
Sida urens.

The following species have been determined by Prof. A. Cogniaux:

Corallocarpus emetocatharticus.
Curcurbita radicans.
Cyclanthera gracillima.
Luffa operculata intermedia.
Sicyos sertuliferus.
Tibouchina schiedeana.

I have also received advice and assistance from the following well-known specialists: Dr. F. Pax, of Berlin; Mr. R. A. Rolfe, of Kew; Dr. K. Schumann, of Berlin; Dr. O. Hoffman, of Berlin; Dr. Hans Schinz, of Zurich; and Dr. A. Engler, of Berlin.

Mr. William M. Canby, Capt. John Donnell Smith, and Mrs. Katharine Brandegee have repeatedly loaned me specimens and aided me in many ways.

The following plants have been cultivated by Mrs. H. L. T. Wolcott at Halifax, Mass., during the summer and fall of 1892 from seeds obtained by Dr. Palmer:

Agave angustissima.
Asclepias curassavica.
Henrya scorpioides.
Hibiscus sabdariffa.
Ipomœa bracteata.
Ipomœa grayi.
Ipomœa nelsoni.
Ipomœa peduncularis.
Ipomœa quinquefolia.
Ipomœa umbellata.
Jussieua octonervia.
Manihot angustiloba.
Nicotiana trigonophylla.
Portulaca stelliformis.
Theretia cuneifolia.

It is proper to state here that this work of Mrs. Wolcott has been of great assistance to me in supplementing the herbarium specimens with fresh flowers, fruits, etc. She has entered into this work with enthusiasm and has looked after the plants almost continually, subjecting herself to no little outlay of time and money.

The following list comprises the new species described from this collection, of which 9 are from Agiabampo, 29 from Manzanillo, 26 from Colima, 4 from Armeria, and 2 from Sonora:

Abutilon bastardioides.
Acalypha coryloides.
Acalypha papillosa.
Agiabampoa congesta.
Argithamnia manzanilloana.
Aristida manzanilloana.
Ayenia manzanilloana.
Brickellia colimæ.
Bumelia arborescens.
Canavalia acuminata.
Capparis palmeri.
Cassia manzanilloana.
Ceiba grandiflora.
Celosia monosperma.
Cienfuegosia palmeri.
Crataeva palmeri.
Drymaria procumbens.
Encelia purpurea.
Epidendrum palmeri.
Eragrostis diversiflora.
Eragrostis pallida.
Euphorbia colimæ.
Euphorbia sonoræ.
Flaveria robusta.
Forchhammeria watsoni.
Gaya minutiflora.
Guarea palmeri.
Heteropterys palmeri.
Hiræa mexicana.
Ipomœa nelsoni.
Ipomœa wolcottiana.
Jacobinia auriculata.
Jatropha purpurea.
Justicia mexicana.
Justicia paniculata.

Karwinskia parvifolia.
Krameria palmeri.
Leucæna macrocarpa.
Lonchocarpus palmeri.
Luffa operculata intermedia.
Malpighia ovata.
Malpighia umbellata.
Mimosa manzanilloana.
Mimosa leptocarpa.
Panicum pringlei.
Paullinia sessiliflora.
Piper palmeri.
Piper palmeri manzanilloanum.
Piper unguiculatum longifolium.
Piptadenia leptocarpa.
Porophyllum palmeri.
Sassafridium macrophyllum.
Schrankia diffusa.
Serjania fuscopunctata.
Serjania rutæfolia.
Serjania trifoliolata.
Spigelia palmeri.
Tabebuia donnell-smithii.
Tephrosia multifolia.
Tetramerium aureum.
Tetramerium diffusum.
Tetramerium tenuissimum.
Trichilia colimana.
Trichilia havanensis spatulata.
Trichilia palmeri.
Tridax dubia.
Viguiera tenuis alba.
Xylosma horrida.
Xylosma palmeri.
Zizyphus mexicana.

In addition to the foregoing new species, the following list comprises those plants not reported from Mexico by Mr. Hemsley in Biologia Centrali-Americana, most of them, however, having been described since that excellent work was published. The number of these species is 59.

Acacia cochliacantha H. & B.
Acalypha subviscida Watson.
Acnida cannabina L.
Ægopogon gracilis Vasey.
Eschynomene amorphoides Rose.
Eschynomene petræa Robinson.
Antigonon flavescens Watson.
Bigelovia diffusa Gray.
Bouchea dissecta Watson.
Bursera laxiflora Watson.
Bursera palmeri Watson.
Cacalia pringlei Watson.
Carlowrightia arizonica Gray.
Cereus strictus Brandegee.
Colubrina arborea Brandegee.
Comocladia dentata Jacq.
Corallocarpus emetocatharticus Cogn.
Corchorus acutangulus L.
Coursetia glandulosa Gray.
Coursetia mollis Rob. & Greenow.
Cyperus ottonis Boeckl.
Cyperus regiomontanus Britton.
Diphysa racemosa Rose.
Dracocephalum moldavica L.
Euphorbia californica Benth.
Ficus fasciculata Watson.
Gomphrena decipiens Watson.
Gynandropsis pentaphylla DC.
Hamelia versicolor Gray.
Hibiscus sabdariffa L.
Hilaria cenchroides texana Vasey.
Jussiena octonervia Lam.
Malvastrum scabrum Gray.
Matayba scrobiculata Radlk.
Monnieria trifolia L.
Oxalis berlandieri Torr.
Panicum capillaceum Lam.
Panicum sanguinale ciliare Vasey.
Paullinia tomentosa Jacq.
Pectis palmeri Watson.
Sapindus saponaria Radlk.
Selaginella lepidophylla Spring.
Sicyos sertuliferus Cogn.
Sida pyramidata Cav.
Solanum grayi Rose.
Solanum tequilense Gray.
Sporobolus argutus Kunth.
Stemodia palmeri Gray.
Tibouchina schiedeana Cogn.
Tournefortia floribunda H. B. K.
Veatchia discolor Brandg.
Verbesina sphærocephala Gray.
Zexmenia tequilana Gray.
Zinnia palmeri Gray.

The following species are included by Mr. Hemsley in Biologia Centrali-Americana, but not under the names here used:

Abutilon texense T. & G.=*Abutilon incanum* Don.
Prosopis heterophylla Benth.=*Acacia willardiana* Rose.
Acalypha chamædrifolia Mull.=*Acalypha microphylla* Klotzsch.
Nephrodium patens Desv.=*Aspidium patens* Swartz.
Nymphæa ampla DC.=*Castalia ampla* Salisb.
Cyperus polystachys Rottb.=*Cyperus fugax* Liebm.
Mollugo glinus A. Rich.=*Glinus lotoides* Loefl.
Tetramerium scorpioides Hemsl.=*Henrya scorpioides* Nees.
Kosteletzkya sagittata Presl. in part,=*Kosteletzkya asterocarpa* Turcz.
Panicum microspermum Fourn.=*Panicum trichanthum* Nees.
Paullinia velutina DC.=*Paullinia fuscescens* Kunth.
Nephrodium conterminum Desv.=*Phegopteris tetragona* Fee.
Sida carpinifolia L. f.=*Sida acuta carpinifolia* K. Schum.
Verbena caroliniana L., in part,=*Verbena polystachya* H. B. K.
Bastardia hirsutiflora Presl=*Wissadula* sp.

CATALOGUE OF SPECIES.

RANUNCULACEÆ.

Clematis sp. An abundant bloomer, flowers white and sweet scented. Manzanillo, December 1 to 31, 1890. No. 992.

Clematis sp. A strong, high climber, covering fences and trees. The fruit is similar to that of the above species, but the leaves are thicker. Along water courses. Colima, January 9 to February 6, 1891. No. 1113.

DILLENIACEÆ.

Tetracera volubilis L. Sp. Pl. i. 533 (1753). A high climbing shrub, its large stems often prostrate for a long distance, either straight or coiled; flowers in large axillary or terminal panicles. Common in wet bottoms across the bay from Manzanillo, March 2 to 18, 1891. No. 1044.

The fruit of our plant is somewhat different from that of this species and it ranges farther northward, but it seems to answer to this better than any other. It is called "Beyuco deaqua." The stems when cut give forth a large quantity of clear, sweetish water, with which travelers often quench their thirst.

MENISPERMACEÆ.

Cocculus diversifolius DC. Syst. i. 523 (1818). Low climber. Colima, January 9 to February 6, 1891. No. 1111.

Cissampelos pareira L. Sp. Pl. ii. 1031 (1753). Colima, January 9 to February 6, 1891. No. 1140.

NYMPHÆACEÆ.

Castalia ampla Salisb. Parad. Lond. i. 73, t. 14 (1805); *Nymphæa ampla* DC. Syst. ii. 54 (1821). Strongly fixed in the mud by long fleshy white roots: leaves above dark olive, beneath dark cherry, and with very conspicuous veins, 12 inches or more in diameter; petals white; stamens yellow; fruit olive-green, depressed, 2½ inches in diameter. At the mouth of a creek where it enters the lagoon. Manzanillo, March 2 to 18, 1891. No. 1392.

This plant is figured in Curtis's Botanical Magazine, t. 4469.

CRUCIFERÆ.

Nasturtium tanacetifolium (Walt.) Hook. & Arn. Journ. Bot. i. 190 (1834); *Sisymbrium tanacetifolium* Walt. Fl. Car. 174 (1788). Flowers said to be white; only three small plants collected. Rich bottoms near Manzanillo, March 2 to 18, 1891. No. 1344.

CAPPARIDACEÆ.

Gynandropsis pentaphylla (L.) DC. Prod. i. 238 (1824); *Cleome pentaphylla* L. Sp. Pl. ed. 2. ii. 938 (1763). About 2 feet high; sparingly found about the lagoon, probably introduced. Manzanillo, December 1 to 31, 1890. No. 973.

Capparis cynophallophora L. Sp. Pl. ed. 2. i. 721 (1762). A loose-growing shrub, 10 to 12 feet high. Collected near the base of the mountains at Manzanillo, January 9 to February 6, 1891. No. 1068.

Capparis palmeri Rose, sp. nov. A compact shrub, 8 feet high: leaves oblong, acute or obtuse, cordate at base, on very short, puberulent petioles, dull green on both sides; veins not prominent: petals white, 6 to 8 lines long: stamens about 60, 15 lines long, about equal to the stipe.—On the mountain sides. Manzanillo, March 2 to 18, 1891. No. 1358.

Near *C. cynophallophora*, from which it differs in its more compact habit, smaller flowers, and leaves not strongly reticulated nor shining, cordate at base. Both species grow about Manzanillo. This species grows on the mountain sides, while *C. cynophallophora* is found in the plain, between the mountain and lagoon. The favorite habitat of the latter species is along the coast. It was collected the latter part of January in fruit, while *C. palmeri* was collected in March in flower.

Capparis sp. With the above species was sent a branch with immature fruit which differs in its larger leaves, 3 to 5 inches long, acuminate and cuneate at base, on petioles sometimes 15 lines long. No. 1358 a.

This plant very much resembles Jaquin's figure of *C. frondosa;* see Jacq. Stirp. Amer. t. 104 (1763). It may not, however, belong to this genus.

Cratæva palmeri Rose, sp. nov. A diffuse shrub, 8 feet high: leaves 3-foliolate, on petioles 2 to 4 inches long; leaflets oval to ovate, 2 to 4 inches long, slightly acuminate, rounded or cuneate at base and more or less oblique, a little roughened above and with crisp hairs beneath: inflorescense corymbose; flowers on pedicels 1½ to 2 inches long: torus 1½ lines long: sepals 4, oblong, 2 lines long, acute: petals 4, cuneate at base, 3 lines long, not including the long slender claw (6 to 10 lines long): stamens 16; filaments 2 to 2½ inches long: stipe of ovary 2½ to 3 inches long, that of fruit 3½ to 4 inches long: fruit pear-shaped, 1½ to 2 inches long, obtuse, often slightly appendiculate.—Armeria, February 15, 1891. No. 1285.

This plant seems very distinct from any of the other species. Dr. B. L. Robinson, who has examined it, says: "It seems to have considerable in common with *C. tapia* and *C. benthami*, but differs from both in its scurfiness, in its smaller less conspicuous lenticels, its short sublateral inflorescence and longer anthers."

Cratæva sp. A tree 40 feet high and 40 inches in diameter; fruit the size of a lime. Manzanillo, December 1 to 31, 1891. No. 1013.

Called "Zapatillo amarillo." This tree is taller than either *C. gynandra* or *C. tapia*, the only two species attributed to Mexico. The leaves are more like the former, but the fruit is larger than in that species.

Morisonia (?) sp. A small tree, 12 feet high, 3 inches in diameter: leaves oblong, acute, perfoliate near the base, thick, shining and glabrous above, stellate-pubescent beneath: fruit spherical, 1½ inches in diameter. Manzanillo, December 1 to 31, 1890. No. 1011.

The shape and size of the fruit resembles that of the species of *Cratæva* (No. 1013) collected here also. These specimens do not belong to any described species, so far as I can learn, and the genus has not been reported previously from Mexico. It seems to belong in *Morisonia*, but in the absence of flowers it is better to refer it doubtfully, as above.

Forchhammeria pallida Liebm. Kjoeb. Vidensk. Meddel. 1853. 94 (1854). A small tree, 15 to 20 feet high, 5 to 8 inches in diameter, with a large top and a great profusion of leaves: leaves 2½ to 4 inches long, including the petioles (2 to 8 lines long), 8 to 12 lines broad: calyx of male flowers minute or wanting: in flower while in full leaf. On a sandy beach near Manzanillo, March 2 to 18, 1891. No. 1333, in flower; No. 1348, with immature fruit; No. 1366, with leaves only.

The tree is somewhat taller with the leaves larger than in the type, but in other respects it agrees with it. Only the male flowers were collected. This is a very rare plant in herbaria and has not been collected for many years. It was first seen and described by F. Liebmann, and is now collected the second time.

In habit and flowers the following new species is closely allied:

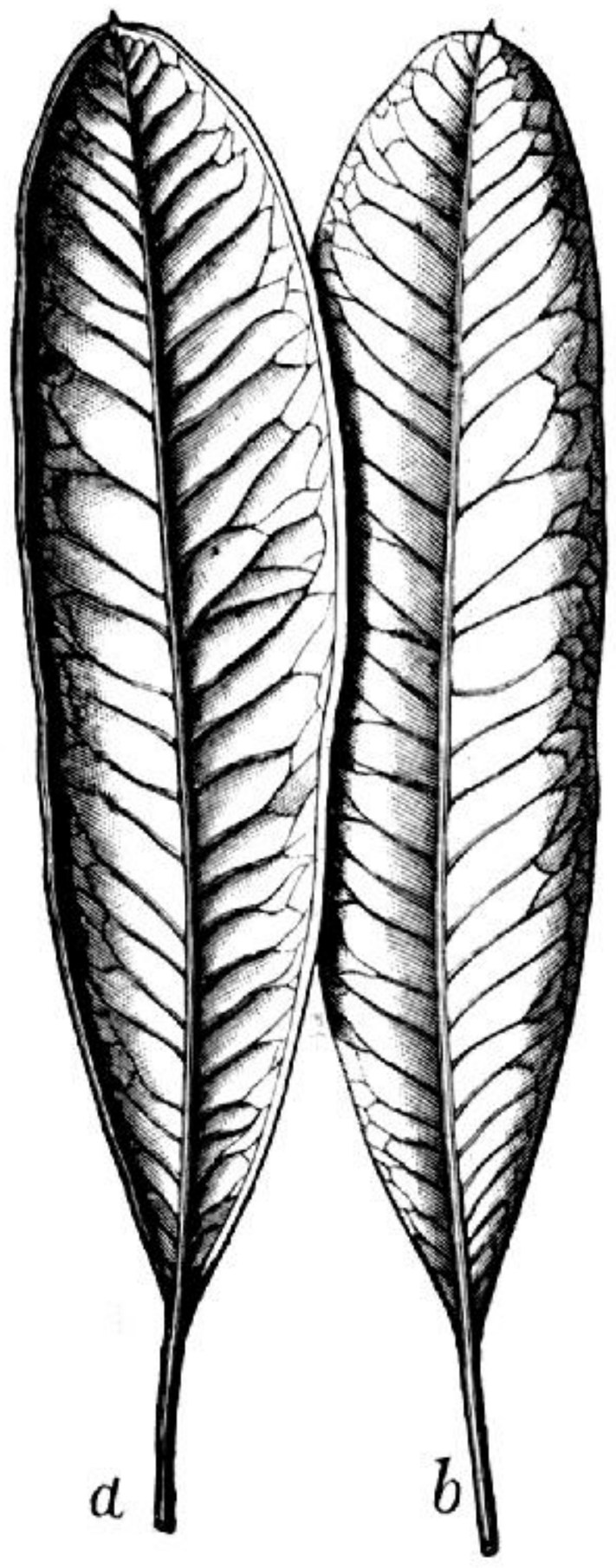

FIG. 1.—*a*, Leaf of ***Forchhammeria pallida*** showing the lower surface; *b*, the same as seen from above.

Forchhammeria watsoni Rose, sp. nov. A tree with large spreading top, 15 feet high, 1 to 5 feet in diameter; young branches finely pubescent: leaves coriaceous, narrowly to broadly linear, 3 to 5 inches long, 2 to 6 lines broad, more or less puberulent, cordate at base, strongly reticulated beneath, with prominent midrib and revolute margins: flowers in slender racemes 2 to 3 inches long: stamens 18 to 22: fruit pear-shaped, orange-colored, but when fully ripe a "purplish red," 5 to 6 lines long.—Common about Guaymas, Mexico, and at low elevations in the cape region of Lower California. Collected by Dr. Palmer in

1887 (No. 179); February 15, 1890 (No. 167); April 1 and 2, 1890, in flower; and July 30, 1891, in fruit. Mr. Brandegee reports it from Lower California, and has recently written me that he obtained it also at Guaymas in 1892.

For illustrations see Frontispiece and Pls. XXIV and XXV.

Considerable doubt has existed among our American botanists as to what this plant is, owing to the insufficient material which has been collected. This is the plant referred to under No. 167, on page 90 of this volume. A long note by Dr. Sereno Watson with reference to the same may be found in Proc. Amer. Acad. xxiv. 82 (1889), and another by Mr. Brandegee in Proc. Cal. Acad. ser. 2. ii. 215 (1889). The ripe fruit is much eaten by birds.

I have named this remarkable tree in honor of the late Dr. Sereno Watson, who made a careful study of the plant when it first appeared in the collection of Dr. Palmer in 1887.

In this species, which is clearly distinct from *F. pallida*, the flowers appear just after the leaves of the previous growing season have fallen and before the new leaves are put forth. In *F. pallida* the flowers and leaves appear together: in both cases the racemes of flowers arise in the axils of the old leaves. *F. pallida* seems to be clearly dioecious as described, while *F. watsoni* often has more or less developed ovaries in the staminate racemes.

Forchhammeria has been variously placed, sometimes in *Capparidaceæ*, sometimes in *Euphorbiaceæ*, and once in *Malvaceæ*. It certainly does not belong to the latter order nor does it seem to me that it can be placed in *Euphorbiaceæ*. Prof. Radlkofer has made a very careful study of the genus, and believes that it should be retained in *Capparidaceæ*, where it was first placed by Liebmann.

BIXACEÆ.

Cochlospermum hibiscoides Kunth, Syn. Pl. Æq. iii. 214 (1824). A tree 25 to 30 feet high. Common about Mazanillo, December 1 to 31, 1890. No. 1096. This is a beautiful flowering tree, remaining in bloom for more than two months.

Bixa orellana (?) L. Sp. Pl. i. 512 (1753). A small tree, 20 feet high, leaves mostly rounded at base, rarely truncate: fruit broader than long. Along the bay opposite the city of Manzanillo, December 1 to 31, 1890. No. 920.

Xylosma horrida Rose, sp. nov. A tree 30 feet high, 8 inches in diameter; thorns on the trunk large, often 3 to 6 inches long, branching: leaves 2½ to 3½ inches long, acute or slightly acuminate, broadly cuneate at base, bluntly serrate, glabrous and shining: flowers hermaphrodite in short axillary racemes; sepals small: glandular disk prominent: stamens about 20, much longer than the sepals: ovary glabrous, prolonged into a slender style; stigmas 2: seeds 2 to 6, oval in outline.—Manzanillo, March 2 to 18, 1891. No. 1340.

This species agrees with *X. intermedia*, collected in Panama, in having its flowers racemose and hermaphrodite, but this latter plant is described as a shrub 10 feet high, with large leaves, without thorns, with sepals nearly as long as the stamens and with 3 stigmas. Its nearest alliance is probably with *X. calophyllum*. I am indebted to Capt. John Donnell Smith for comparing my specimen with No. 1600 of Spruce, already referred to *X. calóphyllum*, of which he writes: "Like your 1340, the spines are long and branched and the hermaphrodite flowers are racemose and glands of disk numerous, but the leaves are quite different."

Xylosma palmeri Rose, sp. nov. Dioecio-polygamous, glabrous, armed at the nodes with slender straight spines 5 to 15 lines long: leaves about 2 inches long, elliptical, cuneate at base, alternate, shining, dentate: flowers fasciculately grouped, 6 to 10 together: pedicels 4 to 5 lines long: male flowers with 4 sepals, 20 to 26 stamens set within the disk, and no style: female or hermaphrodite flowers, with a prominent disk, few or no stamens, short style; broad, peltate

stigma, and ovary with 2 parietal placenta; fruit black or red, with 2 to 4 seeds.—Near the base of the mountains about Manzanillo, December 1 to 31, 1890. Nos. 930, 930*a*, 969, 969*a*.

For illustration see Pl. XXVI.

This species was collected four different times. All the specimens are so similar in habit and leaves that I am unable to separate them. Nos. 969 and 969*a* have all the flowers staminate; in No. 930 they are pistillate or nearly so, while in 930*a* they are hermaphrodite and fertile. No. 930 is said to be a large shrub, while No. 969 is said to be a small shrub. Dr. Palmer states that the fruit of No. 930 is red, while that of 930*a* is fleshy and black. In No. 930*a* the styles become cleft to the base in the fruit.

POLYGALACEÆ.

Krameria palmeri Rose, sp. nov. Compact shrub, 2 to 3 feet high, much branched; young branches appressed-pubescent: leaves numerous, alternate, slightly pubescent, linear, 3 to 9 lines long: pedicels short, bibracteate near the middle: sepals oblong, obtuse, 3 lines long: petals 5; the 2 lower fleshy, broadly obovate, 1 line long; the 3 upper united below, the middle one ovate, the lateral ones more dilated, 2 lines long including the claw: stamens 4, slightly shorter than the upper petals: ovary glabrous: fruit globose, flattened, 4 lines in diameter, glabrous, yellowish or purplish, covered with stout naked prickles.—Scattered here and there on the gravelly plains. Agiabampo, October 3 to 15, 1890. No. 753.

For illustration see Pl. XXVII.

CARYOPHYLLACEÆ.

Drymaria cordata (L.) Willd. in Roem. & Schult. Syst. v. 406 (1819); *Holosteum cordatum* L. Sp. Pl. i. 88 (1753). In swampy places in river bottoms. Colima, January 9 to February 6, 1891. No. 1166.

Drymaria procumbens Rose, sp. nov. Annual, slender, procumbent, rooting at the nodes, puberulent throughout, except the leaves: leaves succulent, oval, 3 to 9 lines long, obtuse, on very short petioles, glabrous: flowers in diffuse pedunculate cymes: sepals 2 lines long, herbaceous with scarious margins, acute, 5-nerved at base: petals white, deeply 2-parted, two-thirds the length of the sepals: capsule few-seeded.—Near water ditches about Colima. January 9 to February 6, 1891. No. 1165.

Drymaria villosa Cham. & Schlecht. Linnæa, v. 232 (1830). Very common on clay banks in the mountains. Manzanillo, December 1 to 31, 1890. No. 945.

PORTULACACEÆ.

Portulaca pilosa L. Sp. Pl. i. 445 (1753). A very common plant everywhere about Manzanillo. March 2 to 18, 1891. No. 1375.

Portulaca sp. Erect, often 1 foot or more high, more or less branching above, purplish: leaves terete, 15 lines long, tapering towards the apex, a little hairy in the axils: flowers pink, 1 inch or more in diameter: stamens 30 to 50, much shorter than the style; filaments and style red. Agiabampo, October 3 to 15, 1890. No. 804.

This is the same as *P. pilosa?* Proc. Amer. Acad. XXI. 417. (Palmer's No. 79 of 1885.)

These plants bear numerous slender tubers similarly to *P. stelliformis*, which differs from this species in the color of the flowers, longer leaves, and a somewhat different habit. Perhaps it should be referred to *P. stelliformis* as a variety. Specimens have been cultivated by Mrs. H. L. T. Wolcott at Halifax, Mass., to whom I am indebted for some fine blooming plants.

MALVACEÆ.

Malvastrum scabrum (Cav.) Gray in Bot. Wilkes Exped. i. 147 (1854); *Malva scabra* Cav. Diss. v. 281, t. 138, f. 1 (1788). Only fruiting specimens collected. Grows in rich bottoms. Agiabampo, October 3 to 15, 1890. No. 790.

Malvastrum spicatum (L.) Gray, Pl. Fendl. 22 (1849); *Malva spicata* L. Amœn. Acad. v. 401 (1760). Very common about the lagoon at Manzanillo. December 1 to 31, 1890. No. 1040.

Malvastrum tricuspidatum (Ait.) Gray, Pl. Wright. i. 16 (1852); *Malva tricuspidata* Ait. Hort. Kew. ed. 2. iv. 210 (1812). Manzanillo, December 1 to 31, 1890. No. 1041.

Anoda hastata Cav. Diss. i. 38, t. 11, f. 2 (1785), *fide* Baker. A common plant in low places about Manzanillo. December 1 to 31, 1890. No. 909.

Anoda pentaschista Gray, Pl. Wright. ii. 22 (1853). Agiabampo, October 3 to 5, 1890. No. 780.

Gaya minutiflora Rose, sp. nov. Stems erect with many ascending branches: leaves 6 to 12 lines long (on petioles mostly 6 to 15 lines long), ovate, acute, cordate or truncate at base, dentate: flowers axillary, solitary, on peduncles (6 to 45 lines long) mostly longer than the petiole of the subtending leaf: calyx 4 lines broad with 5 ovate-acute to acuminate lobes: petals "cream-colored," 3 lines long, broadly wedge-shaped: styles 10: capsule broadly ovate, acute: carpels 9 to 10, 4 lines long, 1-seeded: seed puberulent.—Not common. Found along a creek near Colima, January 9 to February 6, 1891. No. 1167.

This is also No. 1939 of Capt. John Donnell Smith's distribution, under *G. hermannioides*, Pl. Guat. pt. 2. 6. This species resembles in habit *G. hermannioides*, but has smaller flowers, longer petioles, fewer carpels, different-shaped capsules, etc.

"I think it is perfectly distinct from *G. hermannioides* H. B. K.; in fact, it comes nearer to *subtriloba* H. B. K. We have a specimen of this latter species which was named by Mr. Triana, and which comes from New Granada, and although not very like the figure I think it must be correct. Your *minutiflora* differs from this specimen of *subtriloba* in its smaller leaves, which are acute and not acuminate, rather smaller flowers, and fewer carpels. Of course, compared with the figure in H. B. K. it seems totally different, but in our specimen the flowers are not always axillary on the main stem, but sometimes on lateral branches." E. G. Baker *in lit.*

Sida acuta carpinifolia (L.) K. Schum. Fl. Bras. xii, pt. 3, 326. (1891); *S. carpinifolia* L. f. Supp. Syst. Veg. 307 (1781). Stems about 4 feet high. Very common. Manzanillo, December 1 to 31, 1890. Nos. 908, 1130. The branches are cut and tied in bunches and used for brooms by the Mexicans.

"This approaches *S. acuta* Burm. by its narrower leaves, but is not exactly the typical form of this species." E. G. Baker. This was reported to me by Mr. Baker under the name *S. carpinifolia*, but in his recent "Synopsis of Malveæ" he has followed K. Schumann as given above.

Sida diffusa H. B. K. Nov. Gen. et Spec. v. 257 (1821). Colima, January 9 to February 6, 1891. No. 1130.

Sida dumosa Swartz, Prod. Veg. Ind. Occ. 101 (1788). Armeria, February 15, 1891. No. 1249.

Sida rhombifolia L. Sp. Pl. ii. 684 (1753). Common about the lagoon at Manzanillo, December 1 to 31, 1890. No. 1004.

Sida urens L. Amœn. Acad. v. 402 (1760), *fide* E. G. Baker. Manzanillo, December 1 to 31, 1890. No. 1004a.

Sida ulmifolia Cav. Diss. i. 15, t. 2, f. 4 (1785), *fide* Baker. Manzanillo, December 1 to 31, 1890. No. 936.

Sida glutinosa Cav. Diss. i. 16, t. 2, f. 8 (1785), forma, *fide* Baker. Colima, January 9 to February 6, 1891. No. 1109.

Sida sp. Manzanillo, December 1 to 31, 1890. No. 1003.

"I am rather puzzled with this plant. It is, of course, a *Sida* and comes near *Sida aggregata* Presl, Reliq. Haenk. We have not the type of this, so I have only the description to go by. It also comes rather near a plant I described as *S. barclayi*, but has totally different leaves. It may be new." E. G. Baker.

Wissadula rostrata Planch. in Hook. Fl. Nig. 229 (1849). Carpels 3 or 4. Found along fences in river bottoms. Colima, January 9 to February 6, 1891. No. 1137.

Wissadula hirsutiflora (Presl); *Bastardia hirsutiflora* Presl, Reliq. Haenk. ii, 112 (1836). Colima, February 27 and 28, 1891. No. 1307.

When I first studied this plant, more than two years ago, I considered it a new species of *Wissadula*, and so sent it to Mr. E. G. Baker, who was then preparing his Synopsis of Malveæ. He reported it as the *Bastardia hirsutiflora* of Presl. While my plant does not answer to Presl's description in all respects, Mr. Baker is doubtless right in considering them the same. One thing, however, seems certain, and that is that Presl's plant belongs with *Wissadula* rather than with *Bastardia*, although Mr. Baker (see Journ. Bot. xxxi. 68) still retains it in the latter genus.

It differs from *Bastardia* in having three styles and carpels instead of five, three ovules instead of one in each cell, and the carpels constricted with an internal projection. It is like *Wissadula*, in having the peculiar carpel structure of that genus, but the carpels are rounded at the apex and only three in number. The flowers are violet instead of yellow. While these differences may not be sufficient to establish a generic separation from *Wissadula*, yet in the light of other material which I have studied they seem to suggest a good subgenus.

Either there are several valid species belonging to this group, or *W. hirsutiflora* is an extremely variable species. One of these forms is *Abutilon* (*Wissadula*) *cinctum* Braudegee, Zoe, iii. 348 (1893), collected at Las Durasnillas, Sonora, and with it should probably be referred Palmer's No. 38 (1890) from Alamos. These specimens have small rounded leaves, merely acute, with short petioles, and the pubescence is short and dense throughout except some pilose hairs on the calyx. Another form, and it certainly seems specifically distinct from that above, is Mr. Pringle's No. 4610 (1893) from the state of Jalisco, which he has recently distributed as a new species of *Wissadula*. The stems are covered with pilose hairs, and the leaves, which are much larger, gradually taper from near the base into a long acumination. In the same distribution (No. 4578) is another form, near the last, but with slightly different pubescence. Palmer's Colima plant has thinner, broader leaves, with a broad, open sinus, and an abrupt acumination. Still another form is Palmer's No. 1720 from Ymala, which has not yet been distributed.

Abutilon bastardioides Baker fil. ms.; caule vel ramo ligneo terete, foliis cordato-ovatis acutis vel acuminatis serratis 7–9-palmati-nervatis membranaceis utrinque tenuiter stellato-pubescentibus petiolis quam laminis longioribus vel subæquilongis, floribus paniculatis, panicalis foliosis laxis, pedunculis gracilibus teretibus circa medium articulatis, alabastris calycibusque externe brunneopiloso-pubescentibus, sepalis lanceolatis vel ovatis acutis vel acuminatis, carpellis 4–5 in capsulam loculicidem connatis, carpellis triovulatis intus nudis apice muticis.—Hab. Mexico Colima. February 27 and 28, 1891. No. 1314.

Stem or branches woody, canescent, terete except at the apex: leaves cordate, ovate, acute or acuminate, serrate, generally slightly broader than long; 1½ to 2 inches long, 1½ to 2¾ inches broad; on both sides finely stellately pubescent, palmately 7-nerved, petioles as long as or longer than the lamina: panicle lax, leafy: peduncles terete, articulated generally about at the middle, above the articulation covered with brown somewhat glandular pubescence, often bent at the articulation: calyx tube campanulate, sepals lanceolate or ovate, acute or acuminate, externally together with the tube covered with brown glandular and pilose pubescence: petals obovate, longer than the sepals (½ inch long): staminal column, especially below, covered with stellate white hairs, about 3 lines long:

stigma capitately stigmatose: capsule composed of 4 or 5 carpels, loculicidally dehiscent, externally incano-pubescent, about ¼ inch high, shorter than the calyx: carpels 3-ovuled, muticous: seeds black, sparsely pubescent. This plant approaches the genus *Bastardia* in the structure of its fruit, there being 4 or 5 carpels which are entirely muticous and united so as to form a loculicidally dehiscing capsule.

Abutilon incanum (Link) Sweet, Hort. Brit. 53 (1827); *Sida incana* Link, Enum. Plant. ii. 204 (1822), *fide* Baker. Armeria, February 15, 1891. No. 1281. Agiabampo, October 3 to 15, 1890. No. 768.

Dr. Palmer writes as follows of this plant: "The natives call this plant 'Tronadora,' which signifies popping of the leaf. It grows about 8 feet high, acquiring the greatest perfection upon rich bottom lands. It yields a strong, durable fiber, which the Zotlahnacar Indians, who live 40 miles southeast of Manzanillo, utilize in making hammocks, ropes, and carrying-nets, which are so durable that they last from seven to ten years when in constant use."

According to Dr. Palmer, the fiber is prepared as follows: "When the plant is mature, the lateral branches are cut away and the stems are buried in the mud at the edge of Lake Alcuzagua (Lake of the Devil). Three to four days afterward the plants are removed and washed, and are then ready for the stripping of the inner bark or fiber. This is done in the following manner: The workman, standing upright, with the stem which rests firmly upon the ground in his left hand, presses the right thumb firmly upon the stick, and taking the fiber between the fingers, he pulls steadily, bending gradually to the work until he falls upon his knees. When the fiber is removed the stem rebounds and flies over the shoulder of the operator, stripped of half its bark. This seems a very slow process, but jute was formerly cleaned as slowly, and it was only after many and repeated trials that machinery was perfected to perform this tedious work. Probably this, like jute, if allowed to die before cutting, would become brittle, and fit only for paper manufacture; therefore, in more northern latitudes it may be best to cut the plants before frost. Experiments will be necessary to ascertain the proper time for cutting, the length of time it should be immersed, if water will accomplish the same result as mud, rendering the bark soft and pliable."

Abutilon triquetrum Presl, Reliq. Haenk. ii. 115 (1836), *fide* Baker. Along rich bottoms. Agiabampo, October 3 to 15, 1889. No. 810.

Abutilon sp. Colima, February 27 and 28, 1891. No. 1314.

Malachra radiata L. Syst. Veg. 518 (1767); *Sida capitata* L. Sp. Pl. ii. 685 (1753). Manzanillo, December 1 to 31, 1890. No. 958.

Malachra capitata L. Syst. Veg. 518 (1767); *Sida radiata* L. Sp. Pl. ed. 2. ii. 965 (1763). Manzanillo, December 1 to 31, 1890. No. 962.

Malvaviscus arboreus Cav. Diss. iii. 131, t. 48, f. 1 (1787), *fide* Baker. A very showy shrub, 10 to 12 feet high: leaves 3 to 6 inches long (petioles 2 to 4 inches long), ovate, sometimes subtrilobate, crenate, slightly cordate or truncate at base. The fruit, which is edible, is at first red, but becomes yellow when mature. The shrub is called "Monacillo," while the fruit is known as "Manzanita." Manzanillo, December 1 to 31, 1890. No. 963.

"This plant certainly does not agree with Cavanille's description of *arboreus* where the leaves are described as '3–5-lobis,' but I think it comes near this species." E. G. Baker *in lit.*

Kosteletzkya asterocarpa Turcz. Bull. Soc. Mos. xxxi. pt. 1. 191 (1858), *fide* Baker. Branches slender, hispid with spreading hairs or stellate-pubescent: leaves narrowly lanceolate to linear, serrate, acute, 1½ to 4 inches long, stellate-pubescent, truncate at base or with one or two auricles or lobes; petioles 3 to 6 lines long: peduncle 10 to 20 lines long: flowers small, yellow: involucre of 8 to 9 filiform bractlets shorter than the calyx: sepals 2 lines long, obtuse: capsule 5-celled, hispid on the angles. Collected from a garden at Manzanillo, March 2 to 18, 1891. No. 1362.

Kosteletzkya sagittata Presl, Reliq. Hænk. ii. 131, t. 70 (1836). Probably this species or one closely related to it. About 3 feet high: leaves sometimes truncate at base: flowers small, "white, shaded with pink," drying a yellowish green: stamineal tube short: seeds with short crisped hairs. Only one plant seen, near a lagoon. Manzanillo, December 1 to 31, 1890. No. 951.

Hibiscus coulteri Harvey in Gray, Pl. Wright. i. 23 (1852). "Flowers canary color with purple base." Collected along a creek botton at Agiabampo, October 3 to 15, 1890. No. 779.

Hibiscus sabdariffa (?) L. Sp. Pl. ii. 695 (1753). About 4 feet high, nearly glabrous: leaves simple or deeply 3-cleft, dentate, 3 to 5 inches long: flowers axillary, solitary on short (3 to 4 lines long) peduncles: involucre gamophyllous, 10-cleft: calyx 12 to 18 lines long, deeply 5- to 6-cleft into ovate, acuminate divisions, dark purple: corolla spreading to 1½ inches, yellow with a black or purplish eye: style 5-cleft; stigma capitate: capsule globular, 6 to 9 lines long, 5-celled: cells 4- to 7-seeded. Cultivated at Manzanillo, but said to be native. December 1 to 31, 1890. No. 1065.

Dr. Palmer says: "The stems, involucre, and capsules are copper-red. The Mexicans gather the fleshy capsules and use them after drying to make a cool, refreshing drink. This is an important article of commerce and is sold all over Mexico."

I have grown this plant in my grounds, but was not successful in getting it to flower. The young plants are a bright purple and the leaves are all simple.

Hibiscus tiliæceus L. Sp. Pl. ii. 694 (1753). Very common along the banks of a ravine at Manzanillo, December 1 to 31, 1890. No. 1054.

Hibiscus (Bombycella) sp. Shrubby 4 feet high: leaves mostly 3-lobed, serrate; central lobe acute or acuminate peduncles 2 to 3 inches long, longer than the leaves: involucral bracts 11, cleft to the base, linear, 3-nerved, longer than the capsule: calyx cleft below the middle, shorter than the capsule: capsule globose, 5-celled, 4 lines long, pubescent with appressed hairs at the top: seed with long cottony, dirty-white hairs. Not found in flower. Under brush along a creek. Agiabampo, October 3 to 15, 1890. No. 776

Near *H. phœniceus* var. of Palmer's 1885 collection, but differing in having lobed leaves, longer peduncles, shorter and more globose capsule, etc.

Cienfuegosia palmeri Rose, sp. nov. An upright shrub, 6 to 8 feet high: leaves heart-shaped, acuminate, 2 to 4 inches long, on petioles 1 inch or less long: flowers axillary on short peduncles: bractlets 3, minute, 3 lines long with a small pit at the base without: calyx cup-shaped, 4 lines long, with 5 small acute or acuminate teeth, black-dotted: corolla large, white with dark purple center, or becoming purplish throughout in age: petals 2 inches long: staminal column elongated, bearing anthers throughout its entire length except near the base: style clavate, slightly 2-lobed: capsule oblong, 1 inch long, apiculate, black-dotted, glabrous, 3-celled; seeds several in each cell, lanate, ovoid.—In shady woods about Colima, February 27, 1891. No. 1316.

This plant has much the habit of *Hibiscus*, but its relationships are evidently with the above genus.

Ceiba (Euone) grandiflora Rose, sp. nov. A small tree, 15 to 20 feet high, 8 to 12 inches in diameter: branches covered with short straight prickles, mostly infrastipular: petioles 2 to 4 inches long; leaflets glabrous, 3 to 5, oblong, cuneate at base (sometimes tapering into a petiolule), obtuse or acute, entire or slightly serrulate, 2 to 3½ inches long: calyx narrowly campanulate, 8 to 10 lines long, with 3 small equal obtuse teeth, glabrous without, silky within: petals white, silky, especially without, strap-shaped, 4 to 5 inches long: stamens 5; filaments long (3½ inches), each with 2 anthers, united at base into a tube 9 lines in length with 5 small teeth at its apex: style glabrous: capsule oblong, 4½ inches

long.—In rich valleys and in the mountains about Manzanillo December 1 to 31, 1890. No. 1050.

Called "Pochote" or tree cotton. Dr. Palmer says: "The flowers are borne at the extremity of the branches; they are fleshy with a waxy appearance, at first white, then changing to brown (snuff color) before falling."

This species seems nearest *C. rosea* Schum., but is not so tall and has larger, differently colored flowers. We have followed Dr. K. Schumann in taking up the name *Ceiba* in place of *Eriodendron*.

STERCULIACEÆ.

Physodia corymbosa Presl, Reliq. Haenk. ii. 150, t. 72 (1836). About 10 feet high with a few weak stems leaning for support on adjacent shrubs. Colima, February 27 and 28, 1891. No. 1372.

Palmer's plant from Jalisco (No. 86), 1886, has acuminate sepals and may be designated variety **acuminata** var. nov. Dr. K. Schumann refers this genus to *Melochia* in Engler & Prantl, Pflanzenf. iii. teil, 6 abt. 80, but it seems very distinct from our Mexican and North American species of that genus.

Melochia pyramidata L. Syst. ed. 10. ii. 1140 (1759). This plant has several slender stems from the base: flowers pink. Common in level places at the base of the mountains. Manzanillo, December 1 to 31, 1890. No. 912.

Melochia plicata Presl, Reliq. Haenk. ii. 145 (1836). Few stems from the base, erect, 5 feet high or less: flowers rose-colored. Common on the sides of the mountains. Manzanillo, December 1 to 31, 1890. No. 956.

This seems to be the old species collected by Haenke at Acapulco, which, so far as I can learn, has not since been found.

Its resemblance to *M. tomentosa* is striking, but it is easily distinguished by the fruit.

Waltheria detonsa Gray, Pl. Wright. ii. 24 (1853). Partly prostrate. A common plant between the mountains and the lagoon. Manzanillo, December 1 to 31, 1890. No. 1039.

Waltheria americana L. Sp. Pl. ed. 2. ii. 941 (1763). A common plant about the lagoon at the base of the mountains. The Mexicans use a decoction of the leaves for washing wounds. Manzanillo, December 1 to 31, 1890. No. 961.

Guazuma ulmifolia Lam. Encyc. iii. 52 (1789). A medium-sized tree, 25 feet high and 1 foot in diameter. Manzanillo, December 1 to 31, 1890. No. 960.

It is called "Guacima," and is used in many ways by the Mexicans as a medicine. The fruit is often eaten.

Ayenia manzanilloana Rose, sp. nov. Fruticose: leaves lanceolate, acute, serrate, 10 to 20 lines long, slightly pubescent: flowers 1 to 5 in the axils of the upper leaves: peduncles (pedicels) 4 to 8 lines long: sepals ovate, acute: petals with 2 small teeth close to the point of union with staminal cup, and with a long appendage on the back tipped with brown: anthers 3-celled: ovary on a stipe, 1 line long, glabrous except the numerous brown glands.—Very common in the mountains. Manzanillo, December 1 to 31, 1890. No. 940.

Ayenia pusilla L. Syst. ed. 10. ii. 1247 (1759). Common in shade near the lagoon. Manzanillo, December 1 to 31, 1890. No. 976.

Buettneria carthagenensis Jacq. Stirp. Amer. Pict. 41 (1780). Manzanillo, December 1 to 31, 1890. No. 1026.

TILIACEÆ.

Triumfetta semitriloba L. Mant. i. 73 (1767). Variable in height up to 5 feet. In various parts of the mountains. Manzanillo, December 1 to 31, 1890. No. 902.

It is called "Abrojo." The roots are used for diseases of the liver, kidneys, and spleen.

Heliocarpus tomentosus Turcz. Bull. Soc. Nat. Mosc. xxxi. pt. 1. 225 (1858). A small tree, 15 to 30 feet high, 3 to 5 inches in diameter, with a very large top and a great abundance of fruit. Very common all over the mountains. Manzanillo, December 1 to 31, 1890. No. 986.

The plant was collected in fruit only, and is tentatively referred here. It is not nearly so pubescent as our herbarium specimens nor as the original description requires, and fuller material may show it to be a new species.

Corchorus acutangulus Lam. Encyc. ii. 104 (1786). Only a single specimen found near the base of the mountains. Manzanillo, December 1 to 31, 1890. No. 944.

I have thus referred my plant, although I have seen no specimens of the species otherwise nor have I any knowledge of its having been reported from Mexico before. Wight's figure (Icon. t. 739) shows numerous stamens, while the single flower on my plant had but 10 stamens.

Corchorus siliquosus L. Sp. Pl. i. 529 (1753). Only a few plants found near a water-ditch. Colima, January 9 to February 6, 1891. No. 1231.

Corchorus pilolobus Link, Enum. Hort. Berol. ii. 72 (1822). Only a single plant found near the base of the mountains. Manzanillo, December 1 to 31, 1890. No. 922. Also found in a creek bottom at Agiabampo, October 3 to 15, 1890. No. 763.

MALPIGHIACEÆ.

Malpighia ovata Rose, sp. nov. Shrub, 3 to 15 feet high, glabrous throughout, or a little hairy in the inflorescence: leaves opposite, broadly ovate, acuminate, slightly tapering at base to truncate or even a little cordate, pale beneath, somewhat reticulated, 2 to 2½ inches long, 1¼ to 2 inches broad, on very short but distinct petioles: flowers in small axillary umbels or corymbs; peduncles short; pedicels 3 to 5 lines long, jointed and 2-bracteate near the middle, the upper half thickened in age: calyx 10-glandular: petals 5, cuneate at base into a slender claw: stamens 10, slightly united at base, glabrous: anthers obtuse: styles 3, obtuse: drupe 3-pyrenous, 4 lines in diameter: pyrene carinate, with 5 horizontal crests.—Manzanillo, December 1 to 31, 1890. No. 900.

For illustration see Pl. XXVIII.

Malpighia umbellata[1] Rose, sp. nov. A large shrub 8 feet high, intricately much branched: leaves glabrous or when young pubescent with appressed hairs, obovate to oblong, obtuse to retuse, mostly tapering toward the base, 10 to 18 lines long, 4 to 8 lines wide: fruit in small umbel-like clusters, either sessile or on very short peduncles: pedicels 9 to 12 lines long, jointed considerably below the middle: flowers not seen: calyx 5-to 8-glandular: drupe red, ovate to oval, 2 to 3 lines in diameter.—Agiabampo, October 3 to 15, 1890. No. 799.

For illustration see Pl. XXIX.

The fruit is edible and is called Mulberry or "Mora de Campo."

Bunchosia sp. A small tree, 10 to 14 feet high, 3 to 4 inches in diameter, with large symmetrical top: leaves glabrous (sometimes with a few hairs beneath), 3 to 5

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[1]Very near the above species is **Malpighia watsoni** (*Bunchosia parviflora* Watson, Proc. Amer. Acad. xxiv. 42), but the latter differs in the following points. It is a small shrub 3 to 4 feet high, leaves acute with rounded base, the calyx with more glands, the fruit much larger and the pyrene more sharply ribbed, etc. This species seems clearly to belong to *Malpighia* rather than to *Bunchosia*, from which it differs in its distinct styles, cristate pyrene, and pink flowers.

This species may properly bear Dr. Sereno Watson's name as *M. parviflora* has already been used by Jussieu.

I would also refer as **Malpighia guadalajarensis** Palmer's No. 490, from Jalisco collected in 1886, the type of *Bunchosia guadalajarensis* Watson, Proc. Amer. Acad. xxii. 401.

inches long, 2 to 3 inches broad: calyx 8-glandular: drupe "yellow," or reddish, fleshy, compressed, acute, glabrous, 7 to 8 lines broad, 2-pyrenous. Manzanillo, December 1 to 31, 1890. No. 1064.

Dr. Palmer says, "It resembles a magnolia tree; its large leaves and large handsome clusters of yellow fruit should recommend it for cultivation in our Southern States."

It is nearest *B. palmeri*, but has broader and glabrous leaves, and 8- (instead of 10-) glandular calyx, with differently shaped fruit and more compact inflorescence. It seems to be a good species.

Bunchosia sp. Small tree, 10 to 12 feet high, with glabrous branches: leaves oblong, acute, tapering and a little oblique at base, without glands, glabrous above, with a few scattered, appressed hairs beneath (more pubescent when young), 1½ to 2½ inches long, including the petiole (3 to 6 lines long), 1 to 1¾ inches broad: racemes 1 to 3 in each axil, 3 to 4 inches long, including the peduncle (6 to 18 lines long), canescent: pedicels 3 to 6 lines long, jointed near the base and bearing 1 or 2 glands near the joint: calyx 8-glandular; sepals oblong, obtuse, pubescent: petals yellow, 4 lines long, including the claw: stamens 10, nearly equal, connate for one-third of their length: anthers obtuse; styles connate: stigma peltate: drupe "orange," dry, compressed-globose, pubescent, 2-pyrenous, 6 lines broad. Manzanillo, December 1 to 31, 1890. No. 1056.

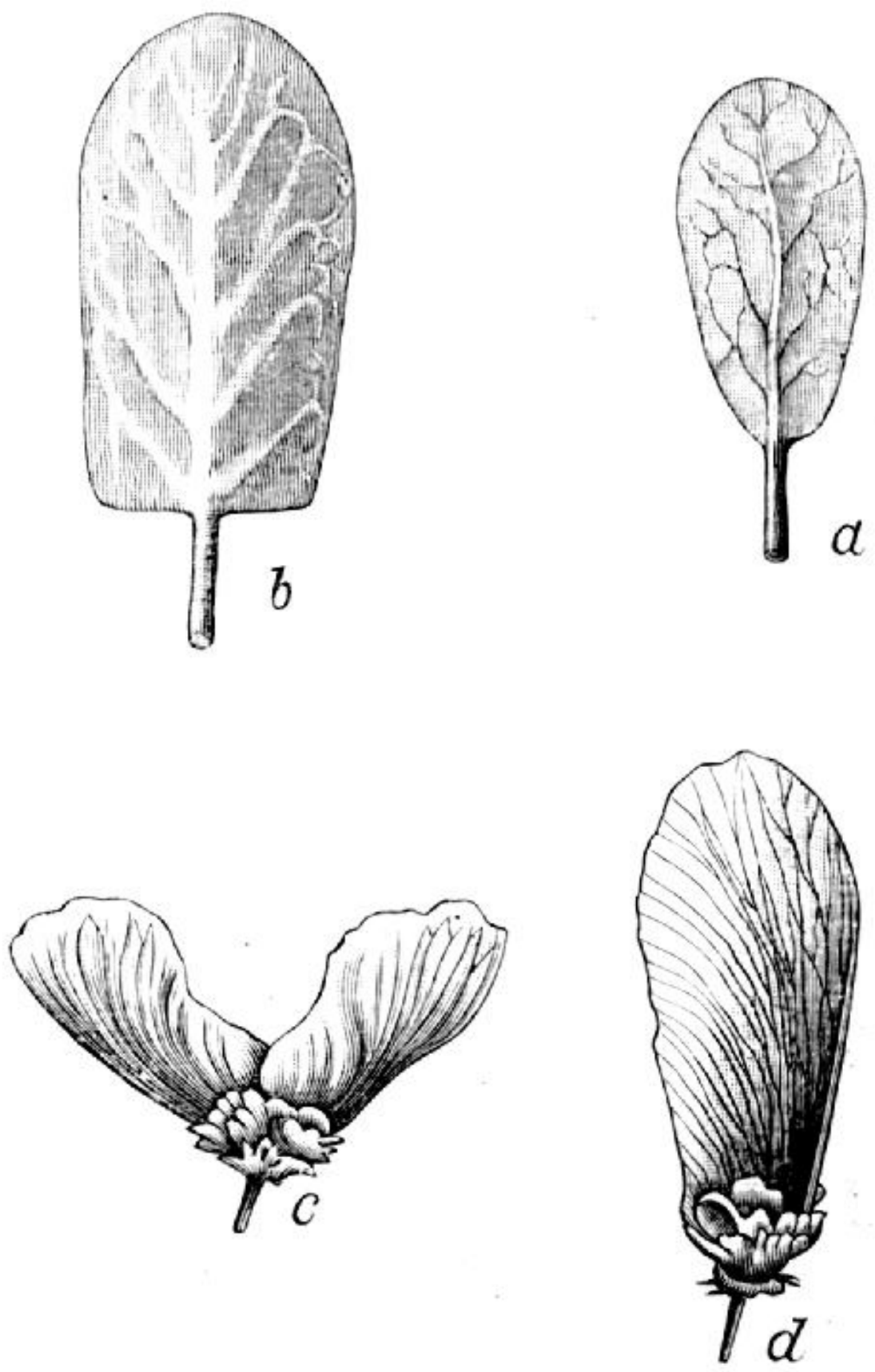

FIG. 2.—*a*, Petal of *Heteropterys palmeri*; *b*, petal of *H. portillana*; *a* and *b* enlarged: *c*, samara of Palmer's No. 656 (*H. palmeri*): *d*, samara of Palmer's No. 1025 (*H. gayana*); *c* and *d* natural size.

This species is near *B. palmeri* Watson, but has different leaves, number of glands, calyx lobes, ovary, and fruit. This tree grows on the mountain side. It has a very irregular top.

Echinopterys lappula Juss. Arch. Mus. Par. iii. 342 (1843). Colima, February 27 and 28, 1891. No. 1308.

Heteropterys* **gayana** Juss. Arch. Mus. Par. iii. 439 (1843), *fide* Hemsley. A tall climbing shrub with large fruit clusters: samarae sometimes 2 but mostly single, "bright cherry color above,

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**Heteropterys palmeri* Rose, sp. nov. This species differs from *H. portillana* in the following particulars: leaves lanceolate to ovate, 2 to 3 inches long, 9 to 12 lines broad, obtuse or acute; petioles and base of blade without glands or with an occasional one; petioles 3 to 6 lines long: flowers in panicles of small corymbs: pedicels slender: flowers and glands smaller: sepals shorter: petals 4, oblong to obovate, 2 lines long, reflexed with cuneate base and short claw; the fifth petal larger with thick claw and erect: samarae mostly 2; dorsal wing 9 lines long.—Alamos, 1890. Nos. 655, 656.

This is the *H. portillana*, p. 95 of this volume.

old-gold below," with several small lateral crests; dorsal wing 12 to 15 lines long. Only a single plant seen near the base of the mountains. Manzanillo, December 1 to 31, 1890. No. 1025.

These specimens are only in fruit.

The flower characters of *H. portillana*, a closely related species, are here added: sepals 5, 1½ lines long, obtuse; glands 8: petals 5, 2½ lines long including the short claw; blade oblong with truncate or sagittate base, with a thick midrib.

Bourgeau's No. 3112, referred to *H. gayana* in Biol. Cent.-Amer., seems to be *H. beechyana*.

Hiræa mexicana Rose, sp. nov. Shrub with slender hanging branches, sometimes trailing over bushes: young branches lanate-pubescent, becoming glabrate with age: leaves opposite, oblong to oval, obtuse or acutish with rounded or somewhat tapering base, somewhat pubescent beneath (lanate or soft-silky when young), glabrous above (a little pubescent when young), 2½ to 3½ inches long, 1 to 1¾ inches broad; petioles pubescent, 3 to 8 lines long, with 2 glands near the middle: flowers in 3-to 6-flowered umbels or corymbs: peduncles slender: pedicels 6 to 9 lines long, pubescent: calyx with 8 large glands: petals yellow, 4 or 5 lines in diameter, denticulate, with a claw 1 line long: stamens 10, short, nearly equal; the filaments unequally connate above the middle; anthers obtuse: styles 3: samaræ pubescent, with 3 wings, these equal or nearly so (central one sometimes more prominent), 1½ inches broad, 2 to 3¾ inches long.—Armeria, February 15, 1891. No. 1275.

For illustration see Pl. XXX.

In foliage and flowers this species is nearest *H. greggii*, but it has much larger fruit, and is apparently distinct.

ZYGOPHYLLACEÆ.

Tribulus grandiflorus (Torr.) Benth. & Hook. Gen. Plant. i. 264 (1862); *Kallstræmia grandiflora* Torr. in Gray, Pl. Wright. i. 28 (1852). Plant procumbent. Found in rich bottoms. Agiabampo, October 3 to 15, 1891. No. 783. Also on grassy plains, though not common. Colima, January 9 to February 15, 1891. No. 1110.

Tribulus maximus L. Sp. Pl. i. 386 (1753). Agiabampo, October 3 to 15, 1890. No. 786.

GERANIACEÆ.

Oxalis berlandieri Torr. Mex. Bound. Surv. 41 (1859). Only a few plants found along a mountain trail. Manzanillo, December 1 to 31, 1890. No. 1008.

The finding of this rare Texan plant in central Mexico is interesting and it should be looked for further north. This species had not been collected since the Mexican Boundary Survey was published, until Pringle and Nealley got it in 1890.

RUTACEÆ.

Monnieria trifolia L. Sp. Pl. ed. 2. ii. 986 (1763). In wet places along the bay, opposite the village. Manzanillo, December 1 to 31, 1891. No. 927.

This genus is not credited to Mexico by Mr. Hemsley in Biol. Centr.-Amer., nor do I find it reported anywhere from Mexico. The range of this species is given as Brazil and Guiana. It is not represented in the National Herbarium, but through the kindness of Dr. Robinson I have examined the three sheets from the Gray Herbarium.

My specimens have broader leaflets and the terminal one has a narrow cuneate base, the peduncles longer, and the two larger sepals broader, and the pellucid dots are not so conspicuous. Future study may show that this form constitutes a good variety.

SIMARUBACEÆ.

Quassia amara L. f. Suppl. Syst. Veg. 235 (1781). Only a single plant seen near the edge of woods. Manzanillo, March 2 to 18, 1891. No. 1338.

Rigiostachys bracteata Plan. Lond. Journ. Bot. vi. 30 (1847). A small tree, 10 feet high, with trunk 3 inches in diameter, bearing a large branching top; leaflets very variable in size and shape: flowers "white" or yellow: petals oblong, 4 lines long, cuneate at base: ovaries 1 or 2, 2-seeded: seeds collateral: fruit, a small drupe (?), 8 to 9 lines long: brown, glabrous, with a thin brittle integument: seed oblong, 6 lines long: cotyledons fleshy, incumbent; albumen none. Manzanillo, March 2 to 18, 1891. No. 1334.

Bentham and Hooker state that the ovules are frequently solitary. In the few cases I have examined the ovules were uniformly two. This species has not before been collected in fruit. Galleotti's specimens were only in flower and were obtained from the coast of Oaxaca about the year 1839. So far as I can learn this species has not since been collected. The position of the genus is very uncertain, as the history of it will show.

This genus was described by Planchon in Hooker's Lond. Journ. Bot. vi. 29 (1847). He places it next to *Suriana* (*Simarubacea*) and considers it a connecting link between the orders *Connaracea* and *Ochnacea*. He states that it has the leaves of a *Sapindus* (*Sapindacea*), the aspect of a *Gomphia*, and the structure of *Suriana*.

Walper in his Annales Bot. Syst. i. 202 (1848) refers the genus to *Connaraceæ*. and Bentham Hooker in Gen. Plant. i. 309 (1862) place it in *Simarubaceæ*, but speak of its doubtful affinities and suggest its probable reference to *Rosaceæ*. Baillon in Adinsonia x. 42 (1871) is also inclined to refer it to this latter order. Hemsley in Biol. Centr.-Amer. i. 173, retains it in *Simarubaceæ*.

Baillon also refers to the genus in Hist. des Pl. iv. 408 (translation iv. 415) and Dict. Bot. iii. 738.

Alvaradoa amorphoides Liebm. Kjoeb Vidensk. Meddel. 1853. 101 (1854). Colima, January 9 to February 6, 1891. No. 1245.

Prof. Radlkofer considers that this genus belongs to *Simarubacea* rather than to *Sapindaceæ*, to which it has generally been referred.

BURSERACEÆ.

Bursera laxiflora Watson, Proc. Amer. Acad. xxiv. 44 (1889). A small tree on the rolling hills and plains. Agiabampo, October 3 to 15, 1890. No. 797.

Bursera ovalifolia Engler, in DC. Monog. Phan. iv. 40 (1883). A tree 30 feet high with long naked trunk 1 foot in diameter, and large umbrella-like top: leaflets 1 to 5: fruit in short racemes. Manzanillo, March 2 to 18, 1891. No. 1388.

This is one of the most conspicuous trees of the mountain slopes facing the lagoon at Manzanillo.

Bursera palmeri Watson, Proc. Amer. Acad. xxii. 402 (1887). A small tree, 10 feet high, with 2 stems from the base: leaflets larger and less reticulated than in the type. Along the sandy beach. Manzanillo, December 1 to 31, 1890. No. 987.

MELIACEÆ.

Guarea palmeri Rose, Bot. Gaz. xix. 39 (1894); foliis modice petiolatis 2–6-jugis, foliolis oppositis subsessilibus e basi cuneata oblongis vel obovato-lanceolatis apice obtusis supra glabris subtus ad axillas nervorum secundariorum pilosis, paniculis simplicibus racemiformibus, calyce obtuse 4-partito, ovario glabro 4-loculari loculis uniovulatis, capsula subglobosa glabra lævi, semine in arillo læte rubro immerso.—In Manzanillo (*Palmer* 1391).

Arbor mediocris 5 m. alta glabra, Marte fructifera, corona lata symmetrica. Rami pallide fuscescentes lenticillis concoloribus. Folia 12–26 cm. longa. Foliola

ad 12 cm. longa ad 4 cm. lata in sicco firmula pallida subopaca epunctata supra nitentia, nervis secundariis utrinque circiter 8. Rhachis cum petiolo circiter 2 cm. longo teres glabra. Paniculae cum foliis coætaneis. Capsula pallide fuscescens 2 cm. longa 22 mm. lata 4-locularis. Cotyledones transverse superpositi crassi, radicula inclusa, plumula minima.

Species G. *brachystachyæ* C. DC. et *G. filiformi* C. DC. affinis.

Trichilia colimana C. DC. Bot. Gaz. xix. 40 (1894); foliis modice petiolatis 5-6-jugis, foliolis subæqualibus petiolulatis oppositis subalternisve lanceolatis basi leviter inæquali acutis apice acute acuminatis supra subtusque densius pilosulis, paniculis fructiferis simplicibus quam folia pluries brevioribus, capsulis pedicellatis 3- vel abortu 2-valvatis, valvis late ovatis transverse rugulosis hirsutis, loculis monospermis, seminibus subglobosis arillo aurantiaco circumdatis.—In Colima (*Palmer* 1117).

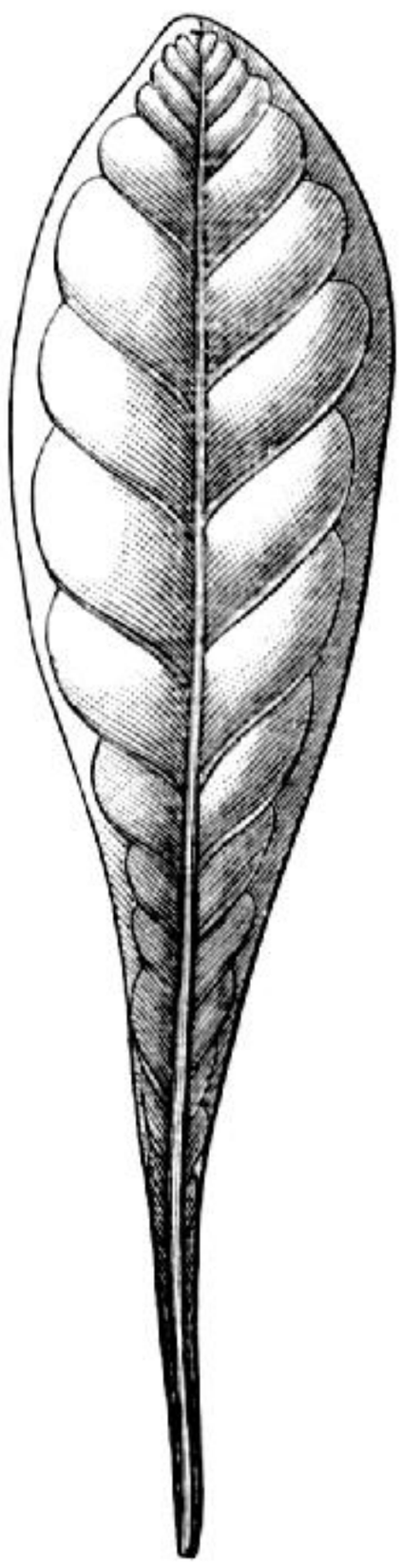

FIG. 3.—A leaf of *Trichilia havanensis spatulata*, drawn natural size.

Ramuli adulti glabri, in sicco rufescentes lenticellis pallidioribus inconspicuis. Folia ad 30 cm. longa impari-pinnata. Foliola superiora ceteris parum majora ad 7.5 mm. longa ad 22 mm. lata in sicco firmule membranacea inconspicue subtiliter pellucido-punctulata, nervis secundariis subadscendentibus utrinque 10–12. Rhachis cum petiolo 7 cm. longa teres pilosula. Paniculae fructiferae circiter 8 cm. longae. Capsularum valvae circiter 1 cm. longae. Embryo intra sacculum persistentem extus perispermio pulverulente albo circumdatum inclusus, cotyledonibus carnosis ellipticis, radicula exserta brevi obtusa, plumula minima.

Trichilia havanensis spatulata Rose, var. nov. Small tree, 15 to 20 feet high with a very large top: leaves small with long cuneate base, becoming spatulate.—Colima, January 9 to February 6, 1891. No. 1136.

Called "Garrapatilla."

M. C. de Candolle, to whom I afterwards submitted the plant, writes me as follows:

"I quite agree with you as to the specimen (Palmer's No. 1136) which you have sent to me. It differs from *Trichilia havanensis* by its narrower leaflets only, and must accordingly be taken as a variety of that species—*T. havanensis spatulata* as you propose."

Trichilia palmeri. C. DC. Bot. Gaz. xix. 3 (1894); foliis parvis modice petiolatis 3-foliolatis, foliolis petiolulatis lanceolatis basi æqual' acutis apice breviter obtuse cuspidatis supra glabri subtus velutino-puberulis, paniculis glabris breviter ramulosi fructiferi quam folia multum brevioribus plerumque monocarpinis capsulis apice ramulorum sessilibus globosis parvis, valvis ovato-acutis glabris extus nigrescentibus lenticellis pallidis numerosis conspersis, seminibus ellipticis.—In Mexico (*Palmer* 1, 292).*

Februario fructifera. Ramuli glabri pallide fuscescentes lenticellis albis conspersi. Folia ad 9 cm. longa. Foliola in sicco firmo-membranacea inconspicue subtiliter pellucido-punctulata subpellucida, terminalia 7.5 cm. longa 3 cm. lata lateralia parum minora, nervis secundariis subadscendentibus subopppositis utrinque 8–10. Petioluli ad 6 mm. longi subtiliter puberuli. Petioli ad 2 cm. longi. Paniculae hornotinae axillares glabrae. Capsula paulo latior quam longa, circiter 7 mm. lata. Semina circiter 4 mm. longa elliptica in sicco flavicantia. Embryo perispermio albo tenui inclusus, cotyledonibus carnosis basi cordulatis, radicula exserta subrotunda, plumula minima.

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* Dr. Palmer collected *T. spondioides* Swartz on the Alamos Mt. March 25 to April 8, 1890 (No. 309), but it was not given in my report on that collection.—J. N. R.

Species sicut subsequens ac tertia e Guatemala alio loco describenda semine perispermium includente radiculaque e cotyledonibus exserta a cæteris *Trichiliis* quorum fructus notus est discrepans.

RHAMNACEÆ.

Zizyphus mexicana Rose, sp. nov. A tree 25 feet high, 9 inches in diameter, with large, dense top; spines straight and scattered; leaves oblong, 2 to 3 inches long, strongly 3-nerved, coriaceous, glabrous, obtuse or retuse, cuneate or rounded at base, crenately toothed; petioles 3 to 8 lines long: peduncle 6 lines long; flowers 8 to 10 in a small umbel; peduncle and pedicels (as well as young leaves and branches) a little pubescent: calyx nearly glabrous, 5-parted: petals 5, small: stamens 5: fruit drupaceous, 6 to 8 lines in diameter.—On hills about Armeria, February 27 and 28. No. 1278.

This species seems nearest *Z. guatemalensis*, but it is a small tree, with leaves commonly cuneate at base, and longer petioles and peduncles. Mr. Hemsley writes me that the species is quite distinct. The fruits are gathered by the Mexicans and sold in the markets by the dozen. They are used in the place of soap and are highly prized for washing woolen goods. They are called "Amole."

Karwinskia humboldtiana Zucc. Nov. Stirp. fasc. 1, 353 (1832). A compact shrub 10 to 12 feet high. Manzanillo, December 1 to 31, 1890. No. 959.

Called "Margareta." The twigs and leaves are much used in cases of fever, etc.

Karwinskia parvifolia Rose, sp. nov. Large bush, 5 to 10 feet high, glabrous throughout: leaves opposite or subopposite, small, oblong, or linear-oblong, about 1 inch long on short petioles, obtuse, rounded, or somewhat tapering at base, the margin somewhat black-dotted; stipule minute: pedicels short; peduncles short or none: stigma 2-lobed: fruit mostly single, axillary, black, 2-celled.—Agiabampo, October 3 to 15, 1890. No. 773.

For illustration see Pl. XXXI.

This plant is not in flower, but it has all the indications of being a *Karwinskia*. It differs from *K. humboldtiana* in its much smaller leaves, the fruit more tapering at base, its larger disk, etc.

Mr. Hemsley writes me that it is not Coulter's (No. 3) from Sonora, nor is it represented in the Herbarium at Kew.

Colubrina arborea (?) Brandegee, Zoë, iv. 401 (1894). Along the edge of thick woods. Armeria, February 15, 1891. No. 1293.

Dr. Palmer says this tree has the habit of the weeping willows. Its long hanging branches are loaded with fruit. I have referred this plant as above with some doubt. I at first described it as a new species, but since then Mr. Brandegee has described a species from Lower California under the above name, to which my plant probably belongs.

AMPELIDACEÆ.

Cissus sicyoides L. Syst. ed. 10. ii. 897 (1759). Trailing over bushes along the lagoon. Manzanillo, December 1 to 31, 1890. No. 1075.

Cissus sp. Leaflets 3. Agiabampo, October 3 to 15, 1890. No. 784.

SAPINDACEÆ.

Serjania fuscopunctata Radlkofer, sp. nov. Scandens, fruticosa, subincano-pubescens; rami canaliculato-6-sulcati, ad angulos pilis patulis cano-pubescentes, cortice subfusco; corpus lignosum simplex, sulcatum; folia biternata (interdum foliolorum terminalium conformatione transitum in supradecomposita indicantia): foliola ovata, acuta, mucronulata, basi rotundata vel sub-

cordata in petiolulos abrupte contracta, integerrima vel (lateralia præsertim) utrinque grosse 1–2-dentata, penninervia, utrinque pubescentia glandulisque microscopicis adspersa, membranacea, e viridi fuscescentia, punctis pellucidis fuscis a latere superiore impressis notata, epidermide mucigera (paginæ superioris quoque stomatibus instructa); petioli nudi, petioluli submarginati; thyrsi rhachi abbreviata subcorymbiformes, dense cincinniferi; cincinni stipitati; flores majusculi, flavescentes; sepala omnia canescenti-tomentella; fructus semimaturi fusco-purpurei, maturi pallescentes, ovati vel subelliptici, basi et apice excisi, glabrati, loculis latis tumidis reticulato-nervosis, dorso carinatis ecristatis, endocarpio glabro; semen prope loculi basin insertum.

Rami thyrsigeri diametro 2–4 mm. Folia (majora) 15 cm. longa, totidem lata; foliola terminalia (petiolulo ad 2.5 cm. longo excluso) 7 cm. longa, 4.5 cm. lata, lateralia decrescentim minora, petiolus communis 2 cm., partialium intermedius 4 cm., laterales 2.5 cm. longi; stipulæ minutæ, ovato-triangulares. Thyrsi 4–14 cm. longi, rhachi 2.5 cm. vix excedente; cincinni abbreviati; pedicelli 4 mm. longi, medio articulati. Flores:—Sepala interiora 4 mm. longa. Petala sepalis longiora, intus glandulis vix ullis obsita; squamæ superiores petala dimidia superantes, crista divaricato-bifida appendiceque deflexa lineari dense villoso-barbata, inferiores crista subcornuta erecta instructæ. Tori glandulæ superiores ellipticæ, laterales subconformes minores. Staminum filamenta villosiuscula, antheræ glabræ. Germen ad angulos puberulum, ceterum glanduli, microscopicis obsitum; stylus puberulus; stigmata stylum subæquantia. Fructus 2.7 cm. longus, 2 cm. latus, infra loculos vix constrictus, loculis 8 mm. longis, totidem latis, subinflatis, pericarpio tenui, endocarpio papyraceo ab epicarpio plus minus solubili. Semen obovoideum, badium.

In Mexico: Palmer n. 1360! (Manzanillo, m. Mart. 1891, flor. et fruct.)

Obs. Affinis *S. subtriplinervi* Radlk. (Sect. xi.; cf. Radlk. Serjaniæ Monogr. p. 273), a qua inter alia differt partibus omnibus robustioribus, præsertim floribus duplo majoribus, nec non foliolis sæpius dente uno alterove instructis.

Serjania rutæfolia Radlkofer, sp. nov. Scandens, suffruticosa, cano-pubescens; rami teretes, leviter 8-striati, pube brevi cana crispula induti, cortice viridi; corpus lignosum simplex, teretiusculum; folia impari-pinnata, tri-quadrijuga, primis infimis nunc ipsis trijugis, jugo infimo utrinque ternato, vel biternatis, vel 5-foliolato-pinnatis, proximis 5-foliolato-pinnatis vel trifoliolatis, summis simplicibus (folio 1 inde foliola 19 ad 41 exhibente); foliola parvula, superiora subrhombea vel oblonga vel obovata, inferiora ovata vel suborbicularia, fere omnia obtusa, immo retusa, mucronulo ornata, in petiolulos attenuata vel subsessilia, integerrima vel parce inciso-dentata, pilis brevibus crispulis glandulisque microscopicis utrinque obsita, membranacea, triste viridia, punctis pellucidis parvis lineolisque notata, epidermide valde mucigera (paginæ superioris quoque stomatibus instructa); petiolus communis teretiusculus, striatus, petioli partiales superiores rhacheumque segmenta superiora marginata; thyrsi solitarii, folia subduplo superantes, rhachi quam pedunculus communis subduplo longiore cincinnisque stipitatis subverticillatim approximatis pube cana crispula densa indutis; flores mediocres, albi, suaveolentes; sepala omnia pube cana crispa densa intus quoque induta; tori glandulæ superiores ovatæ, inferiores conformes, vix minores; stamina fere tota breviter hirsuta; germen (auctum) ex obovato cuneatum, pube brevi cana ad loculos densissima indutum nec non intus dense albido-pubescens, stylo glaberrimo; fructus—(non suppetebat).

Rami thyrsigeri diametro 2 mm. Folia inferiora 12 cm. longa, totidem lata; foliola terminalia 2–2.5 cm. longa, 0.9–1 cm. lata, lateralia inferiora 1 cm. longa et lata; petiolus communis 2.5–3.5 cm. longus, partiales paullo breviores, rhacheum segmenta apicem versus decrescentia, summa circ. 1.2 cm. longa; stipulæ minutæ, subulatæ. Thyrsi inferiores 35 cm., summi 7 cm. longi; cincinni stipite 5–6 mm. longo adjecto 1 cm. vix superantes, 5–6-flori; pedicelli 4–5 mm. longi, basi-articu-

lati; alabastra ellipsoidea, 3.5 mm. longa, albido-tomentella. Flores (masculi):—Sepala interiora 3.5 mm. longa. Petala 4.5 mm. longa, intus fere usque ad basin dense glanduligera; squamæ superiores crista obovata vix emarginata appendiceque deflexa brevi obtusa villosa, inferiores crista oblonga instructæ. Torus glaber. Stamina petala æquantia. Germinis rudimentum puberulum.

In Mexico: Palmer n. 795! (Agiabampo, 1890).

Obs. Maxime affinis *S. sphenocarpæ* Radlkofer (Sect. xi; cf. Radlk. Serjaniæ Monogr. p. 269), attamen robustior, ut videtur, et fructu obtuso (nisi maturitate formam variat) nec non epidermide valde mucigera (an satis?) distincta.

Serjania trifoliolata Radlkofer, sp. nov. Scandens, fruticosa, glabra; rami inæqualiter 6-costati, costis obtusis subfuscis, inter costas planiusculi vel leviter sulcati, sulcis viridibus; corpus lignosum simplex; folia ternata; foliola suborbicularia, mucronulata, in petiolulos abruptius attenuata, remote serrato-dentata, membranacea, glaberrima nec nisi glandulis microscopicis et subtus in axillis nervorum inferiorum pilorum fasciculo obsita, penninervia vel terminalia subtriplinervia, viridia, utrinque opaca, obsoletius pellucide punctata et lineolata, epidermide mucigera; petiolus communis nudus; thyrsi in ramulis accessoriis supraaxillaribus paniculatim congesti, breviter pedunculati, ecirrhosi, adjecto interdum axillari longe pedunculato bicirrhoso; cincinni subsessiles, abbreviati; flores minimi, albi; sepala omnia glabriuscula, nec nisi margine apiceque minutissime puberuli, intus pube brevi induta; fructus sectionis xii. (semimaturus) oblongus, ad loculos trigonus, obtusus, glaber, loculorum pariete tenui (submembranacea), endocarpio glaberrimo; semen prope loculi basin insertum—(maturum non suppetebat).

Rami thyrsigeri diametro 2–3 mm. Folia circ. 12 cm. longa, 9 cm. lata; foliolum terminale petiolulo 1–1.5-centimetrali excluso circ. 5 cm. longum, 4.5 cm. latum, lateralia minora, brevius petiolulata; petiolus communis 5–6 cm. longus; stipulæ minutæ, ovato-triangulares. Thyrsi ecirrhosi circ. 4 cm. longi, bicirrhosi plus triplo longiores, rhachi pulverulento puberula, dense cincinnifera; pedicelli 1.5 mm., fructiferi 2 mm. longi, prope basin articulati; alabastra obovoidea, 1.5 mm. longa. Flores (masculi):—Sepala interiora 2 mm. vix superantia. Petala 2.5 mm. longa, intus glandulis paucis adspersa; squamæ (cristis exclusis) petala dimidia æquantes, superiores crista profunde bifida, laciniis subulatis erectis, appendiceque deflexa brevi obtusa barbata, inferiores crista subcornuta erecta instructæ. Tori glandulæ superiores breviter ellipticæ, laterales obsoletæ. Staminum filamenta parce pilosula, antheræ glabræ. Germinis rudimentum glabrum. Fructus semimaturus 14 mm. longus, 6 mm. latus—(maturus non suppetebat).

In Mexico: Palmer n. 1367! (Manzanillo, ad flumen Cottone, m. Mart. 1891, flor. et fruct.).

Obs. Affinis *S. meridionali* (Sect. xii; cf. Radlk. Serjaniæ Monogr. p. 286), a qua præsertim foliis ternatis differt.

Serjania triquetra Radlk. Monogr. 305 (1875). Manzanillo, December 1 to 31, 1890. No. 972.

Paullinia fuscescens. H. B. K. Nov. Gen. et Spec. v. 120 (1821). Climbing shrub: flowers white: carpels "carmine color." Climbs over small trees and bushes. In the openings between the lagoon and the mountains. Manzanillo, March 2 to 18, 1891. No. 1400.

Paullinia sessiliflora Radlkofer, sp. nov. Scandens, fruticosa, pubescens vel subglabra; rami teretiusculi, leviter 4–5-sulcati, glabri; corpus lignosum simplex; folia 5-foliolato-pinnata; foliola ovali-oblonga, terminale basi cuneatum, lateralia apice basique acutiuscula vel subobtusa, remote subrepando-dentata vel subintegerrima, margine revoluta, breviter petiolulata, chartacea, glabriuscula vel subtus pubi brevi densiore mollia nec non in axillis nervorum barbata, glandulis microscopicis obsita, subtus reti utriculorum laticiferorum pellucido

interrupto instructa, epidermide non mucigera; petiolus rhachisque late alata; thyrsi solitarii, pedunculati, elongati, interrupte cincinnigeri, tomentelli; cincinni sessiles vel breviter stipitati; bracteæ bracteolæque lanceolato-subulatæ, parvulæ; flores sat magni, sessiles, ex albido flavescentes, sepalis tomentellis; fructus ex ellipsoideo pyriformis, glabratus, stipite quam capsula ipsa pluries breviore; semen ellipsoideum, compressiusculum, arillo dorso ventreque fisso ultra duas tertias indutum.

Rami juniores (thyrsigeri) diametro 2–5 mm., adultiores lenticellis notati. Folia circ. 15 cm. longa, fere totidem lata, inferiora majora; foliola circ. 7 cm. longa, 2.5 cm. lata; petiolus communis 2–6 cm. longus, rhachis brevior vel æquilonga, alis basi vix angustatis utrinque 3–5 mm. latis; stipulæ lineari-lanceolatæ, 7–15 mm. longæ, 2 mm. latæ. Thyrsi 15–30 cm. longi, pedunculo 2–12 cm. longo, glabro; bracteæ circ. 2 mm. longæ, 0.8 mm. latæ. Sepala duo exteriora reliquis tertia parte breviora, interiora late ovata. Petala oblonga, circ. 5 mm. longa, 2 mm. lata; squamæ duas petalorum tertias æquantes, margine villosæ, superiores crista obcordata squamæ dimidiam partem vix æquante appendiceque brevi barbata, inferiores crista aliformi fere recte adscendente instructæ. Tori glandulæ superiores orbiculares, conspicuæ. Staminum filamenta filiformia, compressiuscula, pilosa; antheræ glabræ. Germen e trigono globosum, tomentosum, stylo germen æquante. Fructus circ. 3 cm. longus, 1.6 cm. latus, stipite pilosiusculo 5 mm. longo, ruber. Semen 12 mm. longum, 8 mm. latum.

In Mexico: Palmer n. 1066! (Colima, m. Januario et Februario, 1891, flor., foliis subglabris); idem n. 1187! Manzanillo, m. Decembri, 1890, fruct.)

A Warwa (1868–'71) in hortis insulæ Hawaicæ Honolulu lecta exstat in Hb. Vindobonensi, ut et *Paullinia tomentosa* Jacq.

Obs. Affinis *Paullinia clavigeræ* Schlecht. Linnæa X. 239 (1836) (Sect. i, *Neurotæchus;* cf. Radlk. in Durand Ind. p. 72) a qua differt floribus majoribus sessilibus, capsula brevius stipitata, petiolis latius alatis.

Paullinia tomentosa Jacq. Enum. Pl. Carib. 37 (1760), fide Prof. Radlkofer. A shrub climbing over trees, with slender branches 10 to 20 feet long. Flowers white. Colima, January 9 to February 6, 1891. No. 1248.

Sapindus saponaria L. Sp. Pl. ed. 2. i. 526 (1762), *fide* Prof. Radlkofer. A small tree, 12 feet high, 3 to 5 inches in diameter, with a large compact top. In a creek bottom. Manzanillo, March 2 to 18, 1891. No. 1370.

Prof. Radlkofer writes me that it approaches the forms described as species under the names *S. inequalis* and *S. diviricatus.*

Matayba scrobiculata (H. B. K.) Radlk. Sitzungsber. K. Bayer. Akad. Bd. ix. 627 (1879); *Cupania scrobiculata* H. B. K. Nov. Gen. et Spec. v. 127 (1821), *fide* Prof. Radlkofer. A tree 25 feet high with a compact top: leaves alternate, pinnate; leaflets 2 to 3 pairs, oblanceolate, cuneate at base, retuse, 3 to 5 inches long, glabrous above and beneath, strongly veined: panicle terminal and large: sepals 5, obtuse: petals 5: stamens 8, long exserted: ovary pubescent, 3-celled: style none. In woods about Manzanillo, March 2 to 18, 1891. No. 1339.

Dr. Palmer states that the flowers are of a greenish-yellow and sweet-scented.

ANACARDIACEÆ.

Veatchia discolor (Benth.) Brandegee, Proc. Cal. Acad. ser. 2. ii. 140 (1889); *Schinus (?) discolor* Benth. Bot. Voy. Sulph. 11, t. 9 (1844); *Rhus veatchiana* Kell. Proc. Cal. Acad. ii. 24 (1863); *Veatchia cedrosensis* Gray. Bull. Cal. Acad. i. 4 (1886); *Bursera pubescens* Watson. Proc. Amer. Acad. xxiv. 44 (1887). Dr. Palmer obtained flowering specimens of this at Angeles Bay in July, 1891. This is the same plant he collected here in 1887 (No. 585) which was only in foliage. It is called "Torate blanco." The bark is shipped to Europe and has valuable dye and tanning properties.

Spondias purpurea L. Sp. Pl. ed. 2. i. 613 (1762). Small tree, 8 to 15 feet high, sometimes 10 inches in diameter: flowers red. Manzanillo, December 1 to 31, 1891. No. 998.

Leaflets sometimes more numerous than described. Called "Ciruelo." The fruit is bitter, not edible; is said to be red when ripe.

Comocladia dentata Jacq. Enum. Pl. Carib. 12 (1760). Several stems, spreading from the base, 8 feet long: leaflets 6 to 7 pairs, oblong or the lower ones oval, obtuse, slightly and remotely toothed: sepals obtuse, pubescent: petals thinnish. Manzanillo, March 2 to 18, 1891. No. 1393.

My specimens differ from the above species in having the sepals pubescent and petals thinner.

This species belongs to the West Indian Islands, and has not before been reported from Mexico; it is curious that it should now be obtained from western Mexico.

CORIARIACEÆ.

Rourea glabra H. B. K. Nov. Gen. et Spec. vii. 41 (1825). High climbing shrub. Only in fruit. Manzanillo, March 2 to 18, 1891. No. 1349.

LEGUMINOSÆ.

Crotalaria longirostrata Hook. & Arn. Bot. Beech. Voy. 285 (1836–'40). About 5 feet high, younger parts puberulent. Common in bottoms and on hills. Colima. January 9 to February 6, 1891. No. 1139.

Although I have not seen this species, yet this plant is probably rightly referred. Most of the upper leaflets are small (one-half inch long) as described, yet they are often 1½ inches long. Dr. Palmer writes of it as follows: "One of the most attractive of plants. It is upright and with a compact symmetrical top. It is a free bloomer and the flowers are a beautiful yellow with brown patches, and it is worthy of cultivation."

In 1891 I sent seed to Kew where it was planted and proves to be a most promising plant. Sir Joseph Hooker has recently figured and redescribed it in Curtis's Botanical Magazine (vol. xlix. pl. 7306).

The following note is taken from the above article:

"A very handsome greenhouse plant described as suffruticose, but, though copiously branched, harbaceous as grown in the Royal Gardens, where it forms a conspicuous winter feature in the Begonia house, flowering freely from December to March and attaining a yard in height. It was discovered by the late Dr. Sinclair, surgeon in H. M. *Blossom*, during the surveying voyage of Capt. Beechey, at Acapulco on the west coast of Mexico, and also in the province of Jalisco by other officers of the ship, and on the Volcano de Fuego in Guatemala, altitude 5,300 feet, by Mr. Salvin, F. R. S., and at Mazatenango, by Bernoulli."

The Garden, in its issue of March 25, 1893, contains the following note respecting this plant:

"*Crotalaria longirostrata* may be seen in bloom in the stove at Kew. It is a thoroughly useful plant for flowering in the winter months, and the specimen there has kept up a gay display for over two months, notwithstanding the fogs, which are peculiarly trying to stove subjects. This species is still in full bloom, bearing at the ends of the long slender shoots clusters of large, bright yellow pea-shaped flowers, which make a great show of color in the winter season. It is easily propagated by cuttings, and all who wish for something distinct and attractive in their stoves during the so-called dark months of the year, should make good note of it."

Crotalaria sp. Manzanillo, December 1 to 31, 1890. No. 979; and Colima, January 9, to February 6, 1891. No. 1205.

Crotalaria sp. Manzanillo, December 1 to 31, 1890. No. 995.

Crotalaria sp. On level places about the lagoon. Manzanillo, December 1 to 31, 1890. No. 979.

Apoplanesia paniculata Presl, Sym. Bot. i. 64, t. 41 (1831). Diffuse shrub, 12 feet high, 3 inches in diameter, with a large top: flowers white. On the low land between the lagoon and the mountains. Manzanillo, December 1 to 31, 1890, No. 967. December 30, 1891. No. 1810.

A few specimens with leaves only were collected with *Coursetia glandulosa*. Manzanillo, March 2 to 18, 1890. No. 1373a.

This shrub is called by the Mexicans "Cacanaquasle," and is used by them for covering their huts. The bark is said to yield a good dye.

This species is not in the National Herbarium, and has apparently been collected only once or twice.

Dalea diffusa Moric. Pl. Nov. Amer. 8, t. 6 (1833). Very common along ridges and river banks. Colima, January 9 to February 6, 1891. No. 1189.

This plant is largely sold in the market for brooms.

Dalea sp. Colima, February 27 and 28, 1891. No. 1312.

Dalea sp. Manzanillo, December 1 to 31, 1890. No. 933.

Indigofera sp. Manzanillo, December 1 to 31, 1890. No. 957.

Indigofera anil L. Mant. ii. 292 (1771). Manzanillo, December 1 to 31, 1890. No. 1057.

Tephrosia multifolia Rose, sp. nov. Somewhat bushy, several feet high, pubescent: leaves impari-pinnate; leaflets 10 to 15 pairs, narrowly oblong, 1 to 2 inches long, rounded at base, obtuse or retuse, appendiculate, green and appressed-pubescent above, paler and more pubescent beneath; stipules linear, caducous: racemes axillary or terminal, 4 to 8 inches long: pedicels 2 to 3 lines long: sepal triangular, acuminate, 2 lines long: corolla purplish; standard orbicular, 6 to 7 lines long; wings oblong: stamens 10, monadelphous above: style hairy: legume silky-pubescent, linear, 2 to 2½ inches long, about 10-seeded: seeds oblong, 2 lines broad, turgid.—Collected in a creek bottom. Manzanillo, March 2 to 18, 1891. No. 1364.

Seemingly near *T. schiedeana*.

Gliricidia maculata H.B.K. Nov. Gen. et Spec. vi. 393 (1823). A small tree, 15 to 25 feet high, 1 foot in diameter: flowers white in bud, but pink when expanded. Armeria, February 15, 1891. No. 1279.

Dr. Palmer says he saw this species at Colima also. It is a very profuse bloomer and the flowers last for two months. The leaves appear after the flowers are gone.

Diphysa sennoides Benth. Kjoeb. Vidensk. Meddel. 1853. 12 (1854). Large shrub, 5 to 20 feet high, 4 inches in diameter, with spreading top; branches slender, often hanging: not seen in flower. Manzanillo, December 1 to 31, 1890. No. 890.

The pods are shorter than in Palmer's (1887) plant from Guaymas.

Diphysa racemosa Rose, Contr. Nat. Herb. i. 97 (1891). A shrub, 10 to 12 feet high: leaflets 1 inch long or less, obtuse: flowers yellow: banner with a brown spot. Colima, February 27 and 28, 1891. No. 1319. Certainly near this species but with large leaflets.

Coursetia glandulosa Gray, Proc. Amer. Acad. v. 156 (1862). Large diffuse shrub, 10 feet high. Manzanillo, March 2 to 18, 1891. No. 1373.

Coursetia mollis Robinson & Greenman, Proc. Amer. Acad. xxix. 384 (1894). Shrub (?), very pubescent, often glandular throughout: leaves oddly pinnate; leaflets 10 to 15 pairs, oblong, obtuse, 6 to 9 lines long, silky-pubescent on both sides; stipules stout spines 2 to 3 lines long: racemes axillary, single or in pairs, erect, many-flowered, 3 to 6 inches long: calyx campanulate; sepals 5, triangular, acuminate, the lower a little longer than the 2 upper, 3 lines long: flowers "light yellow" but drying purplish: vexillary stamen free, the other 9 connate into a tube, oblique: style inflexed, hairy: legume 2½ to 3 inches long, pubes-

cent, linear, 2-valved, many-seeded. Very common along hillsides. Colima, January 9 to February 6, 1891. No. 1141.

Cracca edwardsii Gray, Pl. Wright. ii. 35 (1853). Stems 2 to 3 feet high. Along creek bottoms. Agiabampo, October 3 to 15, 1890. No. 787.

Stems about 2 feet high. Grows in shady places on the mountain side, only 2 plants seen. Manzanillo, December 1 to 31, 1890. No. 955.

Sesbania macrocarpa picta (Cav.) Watson, Proc. Amer. Acad. xxiv. 46 (1889); *Eschynomene picta* Cav. Ic. iv. 7, t. 314 (1797). Stems 5 to 6 feet high. Common in rich bottom near Agiabampo, October 3 to 15, 1890. No. 775.

Æschynomene americana L. Sp. Pl. ii. 713 (1753). Colima, January 9 to February 6, 1891. No. 1102. This seems to be the most common Mexican form.

Also a somewhat similar species, but perhaps distinct, growing in the wet bottoms about the bay at Manzanillo, December 1 to 31, 1891. No. 901. The flowers are white, legume glabrous and there are slight differences in the parts of the corolla.

Æschynomene amorphoides (Watson) Rose in Robinson, Proc. Amer. Acad. xxix. 315 (1894); *Brya* (?) *amorphoides* Watson, Proc. Amer. Acad. xxii. 406 (1887). An upright shrub with many lateral branches: leaflets 25 to 40 pairs, often 4 to 5 lines long; stipules ovate-acuminate, early deciduous: the bractlets subtending the flowers small, $\frac{1}{3}$ line long, oval, 5-nerved: calyx 1 line long;* teeth 5, small, the lower a little narrower and longer: staminal tube cleft above and below into 2 equal phalanges: legume 1- to 3-jointed; joints broadly falcate, glabrous, or nearly so. Growing in stony places in various parts of the mountains. Manzanillo, December 1 to 31, 1890. No. 903.

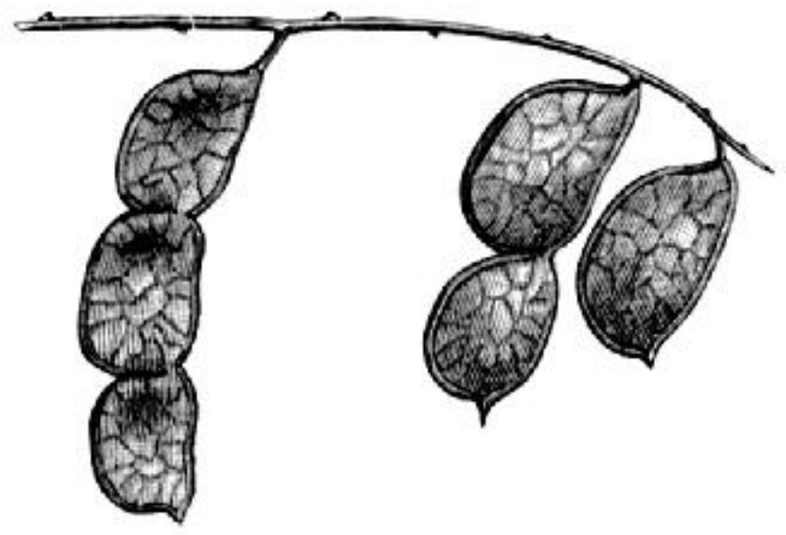

FIG. 4.—Three legumes from *Æschynomene amorphoides;* natural size.

This species was doubtfully referred to *Brya* by Dr. Watson in the Proc. Amer. Acad. xxii. 406. The material from which his description was drawn was only in flower, although specimens in the National Herbarium of the same distribution (Palmer's 1886) have nearly mature legumes. In the above description I have added some additional characters not found in the original. This species seems to belong very clearly to *Eschynomene* rather than to *Brya*. Dr. B. L. Robinson has independently reached the same conclusion. *Eschynomene* differs from the latter in having the staminal tube cleft below as well as above, the bractlets appressed to the calyx, leaflets more numerous and appendiculate, stipules not spinescent, and joints often more than 2. In all the above points my specimens agree with *Eschynomene*. *Brya* also has large yellow flowers. Two of the three species of *Brya* have single leaflets and in *B. eberus* the leaflets are evergreen.

Æschynomene fascicularis Cham. & Schlecht. Linnæa, v. 584 (1830). Stems 2 to 3 feet high: flowers yellow. Agiabampo, October 3 to 15, 1890. No. 808.

Æschynomene hispida Willd. Sp. Pl. iii. pt. 2. 1163 (1801). A single specimen collected with *Sesbania macrocarpa picta*. Agiabampo, October 3 to 15, 1890. No. 775a.

Æschynomene petræa Robinson, Proc. Amer. Acad. xxvii. 166 (1892). Along river bank near Colima, January 9 to February 6, 1891. No. 1153.

I first described this plant as a new species, but owing to the long delay in the publication of my paper it has since been named as above. I have not yet seen the type, but Dr. B. L. Robinson assures me that it is his species.

Also collected by Marcus E. Jones, at Tuzpan, Jalisco, June 15, 1892 (No. 597), and at Chiquilistlan, May 30, 1892 (No. 718).

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* In the original description said to be 6 lines long, which is evidently a mistake.

Desmodium scorpiurus (Swartz) Desv. Journ. Bot. Ser. 2. i. 122 (1813); *Hedysarum scorpinus* Swartz, Prod. Veg. Ind. Occ. 107 (1788). A very variable species as to the leaves. The form found at Colima has the typical oblong leaflets, but the specimens from Armeria have linear leaflets. Colima, January 9 to February 6, 1891, No. 1101; also February 27, 1891, No. 1101a. The specimens collected at Armeria were obtained on the dry table-lands. February 15, 1891. No. 1276.

Desmodium triflorum (L) DC. Prod. ii. 334 (1825); *Hedysarum triflorum* L. Sp. Pl. ii. 749 (1753). A prostrate herb. In shade along a creek bottom. Colima, January 9 to February 6, 1891. No. 1128.

Desmodium sp. A small plant growing in the shade. Colima, January 9 to February 6, 1891. No. 1103.

We have nothing in the National Herbarium to match this plant.

Desmodium sp. Two specimens just past flowering. In wet ground. Manzanillo, December 1 to 31, 1890. No. 928.

Erythrina coralloides DC. Prod. ii. 413 (1825). A small tree, 10 feet high. Agiabampo, October 3 to 15, 1890. No. 771.

Commonly called "Pioneo." The seeds are pulverized and used in making a kind of poultice.

Calopogonium cæruleum (Benth.) Hemsl. Biol. Cent.-Amer. i. 301 (1880); *Stenolobium cæruleum* Benth. Ann. Wien. Mus. ii. 125 (1837). A high climber. Common along watercourses. Colima, January 9 to February 6, 1891. No. 1108.

Canavalia obtusifolia (Lam.) DC. Prod. ii. 404 (1825); *Dolichos obtusifolia* Lam. Encyc. ii. 295 (1786). Growing very abundantly in the sand along the seacoast. Manzanillo, December 1 to 31, 1890. No. 1024.

Only the pods were obtained.

Canavalia acuminata Rose, sp. nov. A climbing shrub, glabrous or early glabrate: leaflets 3, oblique-oval or -ovate, rounded at base, acuminate but tip truncate or appendiculate, glabrous on both sides, 2 to 4 inches long: racemes axillary, nodose, 3 to 7 inches long: flowers large: calyx tube 5 to 6 lines long, with very short lobes; upper lobe 2-parted, very large, rounded; lower lobe 3-parted, minute: corolla large; banner orbicular, obtuse, with short claw, 12 to 14 lines long, yellow; wings linear, 10 lines long including the claw (2 to 3 lines long); keel oblique-oblong, 14 lines long, "cream color," slightly twisted at the tip: ovary and young legumes silvery-pubescent: mature legumes straight, oblong, 6 to 8 inches long, strongly 2-ribbed on side of each valve: seeds brownish-black, oval, 6 lines in diameter.—In various parts of the mountains about Manzanillo, December 1 to 31, 1890. No. 1036.

This plant climbs over the highest bushes. The buds are said to be steel-colored.

Phaseolus (Drepanospron) sp. Colima, January 9 to February 6, 1891. No. 1116.

Phaseolus (?) sp. Only a single specimen collected and this in fruit. Manzanillo, March 2 to 18, 1891. No. 1365.

Phaseolus (?) sp. Manzanillo, December 1 to 31, 1890. No. 904.

Rhynchosia phaseoloides (Swartz) DC. Prod. ii. 385 (1825); *Glycine phaseoloides* Swartz, Prod. Veg. Ind. Occ. 105 (1788). Colima, January 9 to February 6, 1891. No. 1216.

Rhynchosia minima (L.) DC. Prod. ii. 385 (1825); *Dolichos minimus* L. Sp. Pl. ii. 726 (1753). Common in rich bottom lands. Agiabampo, October 3 to 15, 1890. No. 789.

Lonchocarpus (Neuroscapha) palmeri Rose, sp. nov. A tree 20 to 30 feet high, 6 to 12 inches in diameter: leaves large, alternate, with 7 to 13 leaflets; leaflets opposite, oval or oblong, rounded at base, rarely cuneate, obtuse or sometimes acuminate, shining and a little pubescent above, soft-pubescent and strongly veined beneath, 2 to 5 inches long: lower pedicels 2-flowered; bracts oval, obtuse, deciduous: calyx $1\frac{1}{2}$ lines long, cup-shaped, truncate or with small teeth:

corolla 6 lines long; the standard greenish-yellow, densely silvery-pubescent, as broad as long, retuse, and with callous appendages; wings and keel "light mauve" or purplish, somewhat pubescent, slightly adhering (as in this genus), each on a claw 2½ lines long: ovary and legume pubescent: legume 2 to 3 inches long, several seeded, somewhat thickened on the ventral side by a ridge on each side near the margin: seeds brown, kidney-shaped, 4 lines broad.—Manzanillo, December 1 to 31, 1890. No. 1021.

This tree has a large spreading top; its numerous clusters of flowers are very attractive.

This species seems nearest *L. sericeus*, but differs in its larger obtuse and strongly veined leaves, longer raceme and larger flowers.

Lonchocarpus (?) sp. A small tree, 15 feet high, 8 inches in diameter, with large spreading top: leaflets 9 to 13, oblong or oval, 1 to 2 inches long, obtuse, glabrous and shining above, rusty-pubescent beneath, with veins impressed above, strongly elevated beneath: racemes 3 to 6 inches long: legumes densely brownish-tomentose, elliptical or rarely oblong, slightly tapering at the base, 2½ to 3 inches (rarely 4 inches) long, indehiscent, 1- (rarely 2-) seeded. At the base of the mountains. Manzanillo, December 1 to 31, 1890. No. 984.

The seeds are sometimes eaten by birds, but with poisonous effects.

This species certainly comes near *L. rugosus* and answers Bentham's description very well except in the pods. In the absence of flowers, therefore, I have referred it without specific name.

Lonchocarpus sp. A diffuse shrub, 6 to 8 feet high: leaves small, alternate, with 5 to 7 leaflets; leaflets opposite, oval, obtuse or retuse, thin, 6 to 15 lines long, glabrous above, villose-pubescent beneath: racemes 2 to 3 inches long: calyx cup-shaped, truncate, brownish-pubescent, 1 line long: corolla purplish; banner broader than long, 4 lines long, 5 lines broad, retuse: style glabrous: ovary pubescent: legume not seen. In rocky places near the base of the mountains. Manzanillo, March 2 to 18, 1891. No. 1379.

Swartzia grandiflora Willd. Sp. Pl. ii. 1220 (1799). A small tree, 15 feet high and about 3 inches in diameter. A single tree seen along the trail near the base of the mountains. Manzanillo, December 1 to 31, 1890. No. 1005.

Cæsalpinia bonducella (L.) Fleming, in As. Res. xi. 159 (1810); *Guilandina bonducella* L. Sp. Pl. ed. 2. i. 545 (1762). Three to four feet high. Only along the sandy beach just above high tide. Manzanillo, December 1 to 31, 1890. No. 1015.

Cæsalpinia cacalaco Humb. & Bonp. Pl. Æq. ii. 173 [Fr. ed. 165], t. 137 (1809). A shrub 6 feet high. Only a single plant found in the low lands near the lagoon. Manzanillo, December 1 to 31, 1890. No. 997.

The lower sepal has a lacerate margin, and in this differs from Humboldt and Bonpland's figure.

Cæsalpinia eriostachys Benth. Bot. Voy. Sulph. 88 (1844). A small tree, 15 to 20 feet high, 8 inches in diameter, with large symmetrical top: leaves 4 to 6 inches long with small glabrous leaflets: racemes often 9 inches long: legumes glabrous, 3 to 9 inches long, 9 to 10 lines broad, falcate or straight, sharply pointed, tardily dehiscent. Colima, February 27, 1891. No. 1309. Manzanillo, March 2 to 18, 1891. Letter E.

This plant is called "Palo alejo." The bark is used by fishermen, who crush it and throw it into the water to stun fish.

Apparently very common on mountain sides both at Colima and Manzanillo. Its published range is now extended much farther northward. According to Mr. Hemsley it has been collected three or four times before, but not north of the Central American States.

Mr. Bentham did not have mature legumes for his description, and hence I have carefully characterized them above, as well as filled in some dimensions

not given before, and added some variations not found in the original description. This species is very different from our other Mexican specimens in its oblique leaflets and glandular stamens.

Cæsalpinia (**Coulteria**) **platyloba** Watson, Proc. Amer. Acad. xxi. 425 (1886). A shrub, 8 feet high, glabrous: leaves twice pinnate; pinnæ 2 to 4 pairs; leaflets 6 to 9 pairs, oblong, acute, 1 to 2 inches long, glabrous: racemes axillary, 3 to 4 inches long: lower sepal pectinate-fimbriate: petals yellow: stamens hairy at base, about the length of the petals: pods indehiscent, glabrous, 3 to 6 inches long, 10 to 15 lines broad. Along the sandy beach a few feet above tide water. Manzanillo, December 1 to 31, 1890. No. 1010 (in fruit): March 2 to 18, 1891. Letter K (in flower).

This seems to be the plant that Dr. Watson referred as above while questioning its generic position. My plant differs in several minor details, and especially in the length of the pods. Flowering specimens are now for the first time collected and show clearly that the plant belongs to this genus and to the section *Coulteria*. The specimens ought to be compared with the South American species *C. tinctoria*, to which it is certainly closely related. Here, perhaps, may be referred Coulter's No. 873 from Zimipan, cited by Mr. Hemsley in Biol. Cent.-Amer. vol. i.

Cæsalpinia (**Pomaria**) sp. Shrub, 15 feet high, loosely branching: leaves 2-pinnate; pinnæ 2 to 4 pairs; leaflets, 2 to 3 pairs, oblong or oval, obtuse, unequal at base, glabrous, strongly veined, 6 to 18 lines long: racemes terminal and axillary, 5 to 10 inches long; pedicels 4 to 5 lines long: sepals 5, puberulent, strongly imbricated, obtuse, 4 about equal, the fifth exterior and longer: petals 5, yellow, covered more or less with short stipitate glands, 4 to 5 lines long: stamens 10, woolly at base, a little longer than the corolla: legume falcate, narrowed downward, 2 inches long, densely covered with stipitate glands, 3- to 4-seeded: seed 4 lines broad. Manzanillo, March 2 to 18, 1891. No. 1397.

This species resembles *C. palmeri* in its legumes, but in foliage approaches *C. mexicana*.

Dr. Palmer also collected a form closely related to this from Colima, but with larger, straight pods, less tapering at base, leaflets smaller and often 4 pairs, etc. Letter F.

Cæsalpinia* sp. A large bush on hills and in bottoms. Agiabampo, October 3 to 18, 1890. No. 796.

Probably *C. platyloba*, but not collected in flower; the few pods are immature.

Cæsalpinia (**Libidibia**) sp. Small tree, 15 to 20 feet high: leaves 2-pinnate; pinnæ 4 to 6 pairs; leaflets 3 to 5 pairs, glabrous, oval to obovate, obtuse or retuse, 9 to 18 lines long: raceme terminal, 6 to 12 inches long, puberulent (as also the young branches and rachis of the leaves), many-flowered: sepals 5, obtuse and with entire margins; the lower sepals larger, exterior and strongly concaved: petals 5, "outer ones yellow, inner ones red," 4 about equal, oblong, 5 lines long; upper one smaller, orbicular: stamens about the length of the petals, very woolly: ovary silky-pubescent: legumes slender, 4 to 7 inches long, torulose, indehiscent, many-seeded. Armeria, February 15, 1891. No. 1289.

A handsome tree, 6 inches in diameter at base, with large symmetrical top. Called "Palo fierro."

This species is very near *C. cacalaco*, and I see no good reason for keeping it separate I have not seen any specimens, however, of that species, and there-

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* *Cæsalpinia mexicana* Gray. This is a small bush common about Monterey. Specimens were collected and sent in by Charles K. Dodge, April, 1891; also collected by Eaton and Edwards from the same locality many years before.

Cæsalpinia pulcherrima Swartz. Collected at Vera Cruz, April 12, 1888, by James Shepard.

fore leave my specimens undetermined. My specimens have no thorns on the branches, but this is likewise true of Humboldt and Bonpland's figure.

Cassia atomaria L. Mant. i. 68 (1767). A small tree, 15 feet high, 4 inches in diameter: leaflets 3 to 6 pairs, often 5 inches long: raceme slender, hanging, 12 to 15 inches long: legumes often 16 inches long. On the mountains around Manzanillo, December 1 to 31, 1890. No. 983.

This plant is referred as above, although I have not otherwise seen *C. atomaria*. The leaflets are somewhat larger than described, but I have little hesitation in referring it here.

Cassia biflora L. Sp. Pl. i. 378 (1753). Manzanillo, March 2 to 18, 1891. No. 1350.

Cassia manzanilloana Rose, sp. nov. A large diffuse shrub, 5 feet high, puberulent: leaflets 4 pairs, 1 inch or less long, obovate, obtuse, paler beneath, bearing a gland between the lower pair: flowers in axillary racemes: sepals unequal: 3 stamens long, curved, rostrate; 4 shorter, straight; 3 sterile, small, deltoid, petaloid: legumes 3 to 6 inches long, terete, 7 to 8 lines in diameter; endocarp becoming fleshy, separating from the exocarp: seeds appearing in 2 rows, horizontal.—Low land along streams. Colima, January 9 to February 6, 1891. No. 1161.

A single shrub 4 feet high, in flower, was found at Manzanillo, on the banks of the river. December 1 to 31, 1891. No. 1061.

This species belongs in Bentham's section *Chamæfistula*. It resembles considerably *C. bicapsularis*, but differs in being puberulent, the longer stamens rostrate, etc.

Cassia oxyphylla Kunth, Mimos. 129, t. 39 (1819). In a swamp. Manzanillo, December 1 to 31, 1891. No. 1052. Armeria, February 15, 1891. Letter L.

Cassia rotundifolia Pers. Syn. i. 456 (1805). Grassy mesa near the city of Colima, January 9 to February 6, 1891. No. 1107.

Cassia sericea Swartz, Fl. Ind. Occ. 724 (1800). Stems 2 to 4 feet high. Common on the low land at base of mountains, and about the lagoon. Manzanillo, December 1 to 31, 1890. No. 906.

This plant is called "Bicho."

Bauhinia porrecta Swartz, Prod. Veg. Ind. Occ. 66 (1788). A diffuse shrub, 12 feet high, flowers white. Only two plants seen growing in shady woods. Armeria, February 15, 1891. No. 1284.

This species agrees with C. Wright's specimen collected in 1853–56 in Nicaragua. In both of these specimens, however, the leaves are truncate or rounded at base and more acute than in the figure (No. 1708) of Curtis's Botanical Magazine.

Bauhinia (**Casparia**) sp. Shrub, 15 feet high: Leaves glabrous above, pubescent beneath, truncate or a little cordate at base, deeply emarginate, 7-nerved: petals white, on long pubescent claws: stamens 10, 1 fertile, 9 connate and sterile: ovary pubescent: legume puberulent. Colima, February 27 and 28, 1891. No. 1322.

Entada polystachya DC*. Mem. Leg. 434, tt. 61, 62 (1825). A high climbing shrub: leaves twice pinnate: leaflets 6 pairs, oblong, rounded at apex, somewhat oblique at base, glabrous: pods a foot long, 2½ inches broad, glabrous. Manzanillo, December 1 to 31, 1890. No. 988.

If this reference, made without having seen the species, is correct, it extends the range of this plant considerably northward. Mr. Hemsley gives only three stations for North America and all those in Central America.

Piptadenia leptocarpa Rose, sp. nov. Large diffuse shrub, about 16 feet high, glabrous or nearly so, with numerous reflexed prickles: leaves large; rachis some-

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*Through the kindness of Capt. John Donnell Smith, I have been able to see and study this species as represented by Eggers's West Indian plant. The two plants are undoubtedly the same.

what prickly; pinnæ 10 to 12 pairs; leaflets about 30 pairs, linear 3 to 5 line long, glabrous or nearly so; the midrib on one side: spikes mostly paired in the axils of the leaves, 3 to 4 inches long, densely flowered: flowers yellow, subtended by a small, oval, deciduous bract: calyx nearly truncate, ½ line long: petals 5, a line long: stamens as in the genus, 10; anthers glandular: ovary glabrous: legume 3 to 5 inches long, 9 lines broad, glabrous, thin, the two valves readily separating when mature: seeds containing albumen.—In various parts of the mountains back from Manzanillo. December 1 to 31, 1890. No. 996.

This species belongs to Bentham's *Eupiptadenia*, and is nearest *P. communis* of South America, but more thorny, with more numerous pinnæ, shorter pods, etc. It differs from the other species of this genus in having albumen in the seed.

Prosopis juliflora (Swartz) DC. Prod. ii. 447 (1825); *Mimosa juliflora* Swartz, Prod. Veg. Ind. Occ. 85 (1788). A low-spreading shrub, growing at the base of the mountains and about the lagoon. Manzanillo, December 1 to 31, 1890. No. 985.

This plant is called here "Algarroba."

Mimosa asperata L. Sp. Pl. ed. 2. ii. 1507 (1763). Shrub 4 to 5 feet high: leaves very sensitive. Growing in the water near where a creek empties into the lagoon. Manzanillo, March 2 to 18, 1891. No. 1377.

Mimosa distachya (?) Cav. Ic. iii. 48, t. 295 (1794). A small tree, 15 feet high, with large top: leaves with 2 pinnæ; leaflets 3 pairs: pods 1½ inches long, strongly setose. In grassy plains. Armeria, February 15, 1891. No. 1291.

This species could only be collected in poor condition, and only a few leaves and no flowers were obtained. It is referred here, owing to its close resemblance, to *M. laxiflora*, from which, however, it differs very much in its pods.

The fruit was not known by Mr. Bentham when he wrote his monograph in Trans. Linn. Soc., and I do not know whether it has ever before been collected.

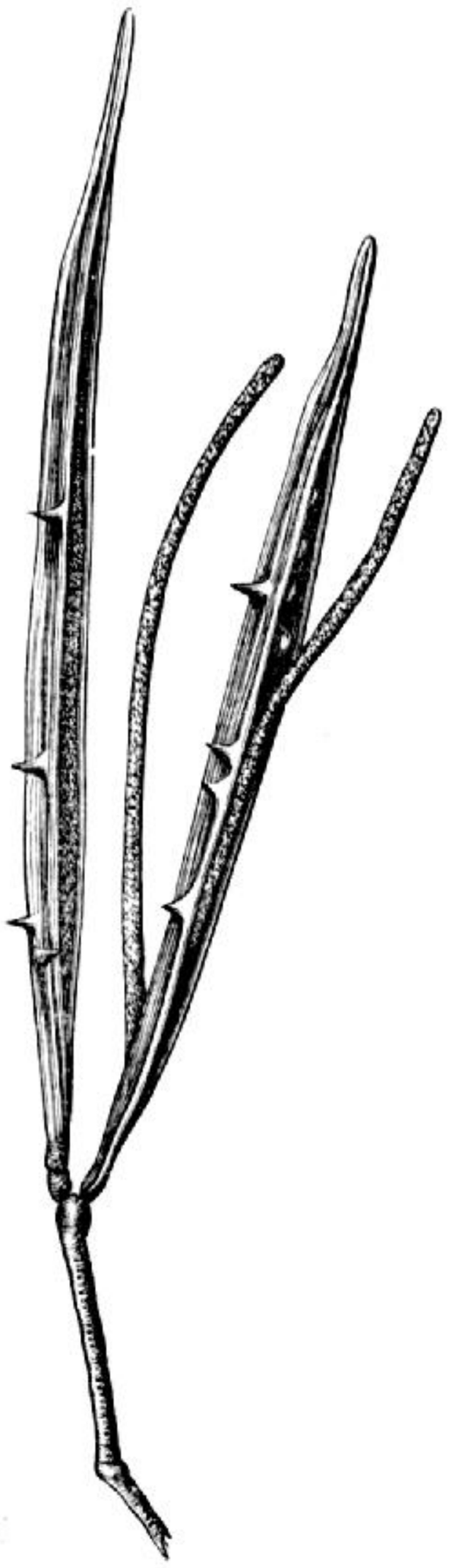

FIG. 5.—Two pods of *Schrankia diffusa*, one of them dehiscing, showing valves, replum, etc.; natural size.

Mimosa (Sensitiva) manzanilloana Rose, sp. nov. Thorny shrub, 5 feet high, with slender hanging branches, glabrous: leaves twice pinnate; leaflets two pairs (one of the lower leaflets very small or often wanting), 9 to 15 lines long, oblong, acute, glabrous except for the appressed setæ of the margins and under surface: inflorescence in raceme-like clusters of heads, or the lower peduncles subtended by leaves: flowers pink: stamens 4 or 5: legumes 1 inch or more long, puberulent, the margins and sides with few appressed setæ.—Low places near base of the mountains. Manzanillo, December 1 to 31, 1890. No. 905.

The leaves are said to be somewhat sensitive. It is nearest *M. relloziana*, but with smaller heads, different pod, etc.

Mimosa leptocarpa Rose, sp. nov. A large shrub, with many long, slender, hanging branches: young branches and rachis of leaves with many small reflexed prickles: pinnæ 4 to 6 pairs; leaflets 6 to 12 pairs, oblong, 3 to 6 lines long, obtuse, appendiculate, puberulent: flowers capitate, racemose; pedunceles 6 lines long: flowers wanting: stamens 5: legumes flat, thin, glabrous, shining, oblong, 3 to 5 inches long, 8 to 10 lines broad; valves not articulated; replum delicate, often bearing

reflexed prickles; stipe 3 to 6 lines long.—Manzanillo, March 2 to 18, 1891. No. 1341.

Schrankia diffusa Rose, sp. nov. A weak plant, with long hanging branches 4 to 6 feet long, with short pubescence and reflexed prickles: leaves sensitive, with 2 to 3 pairs of pinnæ; rachis prickly and pubescent; stipules setaceous; leaflets 10 to 20 pairs, glabrate, linear-oblong, 4 to 5 lines long: peduncles becoming 10 lines long: flowers capitate, pink becoming white: sepals valvate: stamens 10: legume terete, 2 to 4 inches long, more or less beaked, naked or a little prickly.—Very common along the beach, hanging over rocks and low bushes. Manzanillo, December 1 to 31, 1891. No. 1046.

Nearest *S. subinermis*, but with more pinnæ and leaflets, longer legumes, etc.

Leucæna macrophylla Benth. Bot. Voy. Sulph. 90 (1844). A small tree, 12 feet high: peduncle 3 to 6 lines long: pods 8 to 10 inches long, 12 to 15 lines broad on stipes 1 inch long. Along a river bank. Colima, February 27 and 28, 1891, No. 1325.

The specimen is only in fruit.

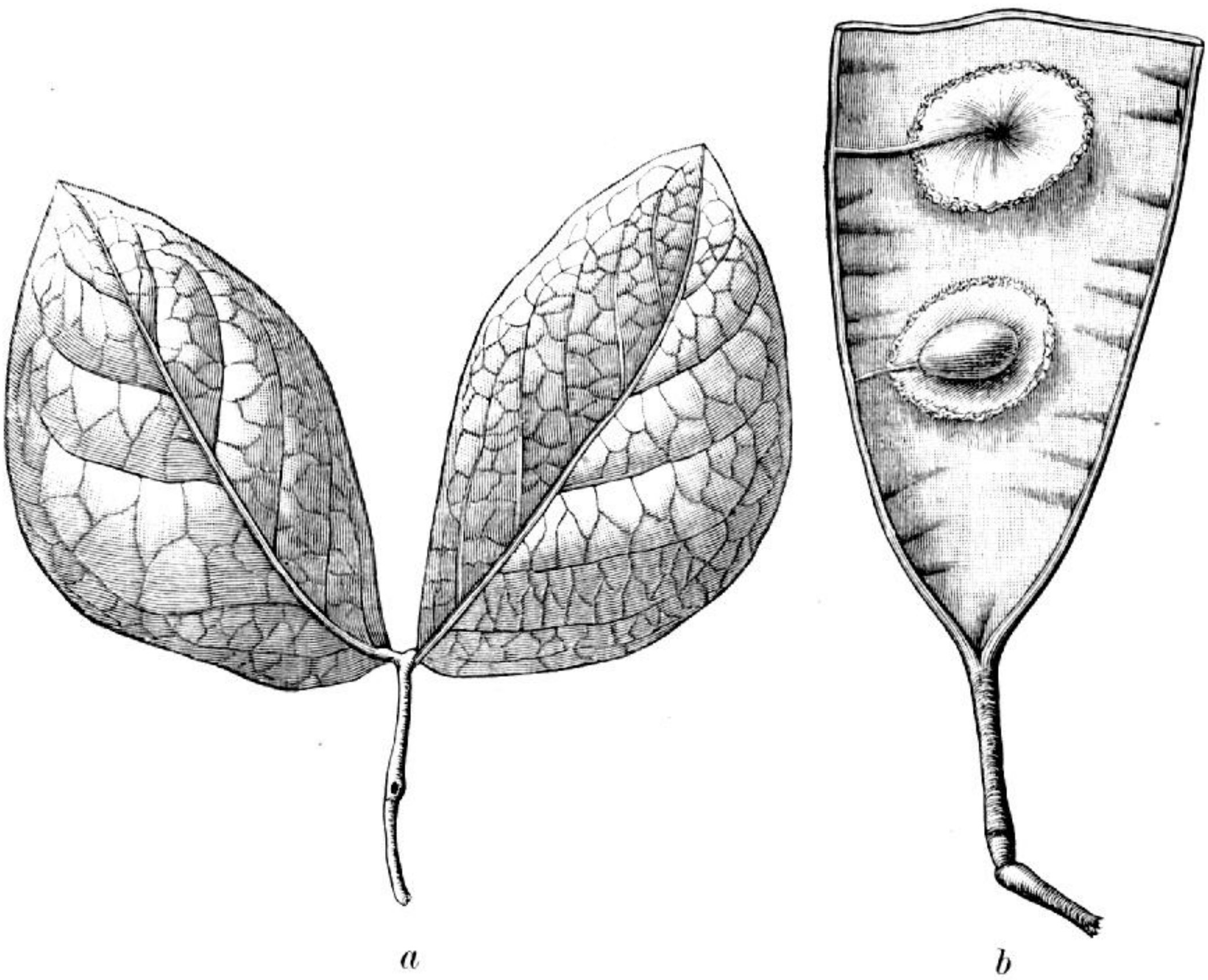

FIG. 6.—*Leucæna macrocarpa*: *a*, the terminal pair of leaflets; *b*, a section of the legume.

This is a rare species and has been poorly understood in this country. This confusion has been due to two factors: First, the absence of the species from all our collections, and, second, because Mr. Bentham referred to it (Trans. Linn. Soc. xxx.) an undescribed species, which proves to be a species of *Albizzia*. I should state here that it is through the kindness of Mr. Hemsley, of Kew, that I have been able to clearly fix upon this as the true *L. macrophylla*.

The pods described above were detached, and while a little longer than the type seem to be the same. They may, however, as suggested by Mr. Hemsley, belong to a different species.

Leucæna macrocarpa Rose, sp. nov. A shrub or small tree, 25 feet high or less, glabrous: leaves twice pinnate; pinnæ 2 to 4 pairs: leaflets large, 2 to 3 pairs, 1½

to 3 inches long, oblong or oval, somewhat oblique, acute, rounded at base, strongly reticulated, a little puberulent beneath: flowers in small, compact heads in terminal naked racemes: legume large, 8 to 10 inches long, 1 to 1½ inches broad; stipes 9 to 12 lines long. This is *L. macrophylla*, Watson Proc. Amer. Acad. xxii. 409, collected by Palmer at Rio Blanco, State of Jalisco, August 1886 (No. 320). The flowering specimens of No. 320 are made the type of this species. Here undoubtedly belongs Pringle's No. 3848, from the same State, collected in 1891 and distributed under *L. macrophylla*, but the name is corrected in Mr. Pringle's list for 1892. Palmer's No. 981 from Manzanillo (December 1 to 31, 1891) is also referred here, but with less confidence. The specimens are only in fruit and the foliage and legumes are so similar to Mr. Brandegee's *Albizzia occidentalis* that without flowers it is next to impossible to separate the two. Palmer's Jalisco plant, which is undoubtedly a true *Leucæna*, has pods exactly like those from Manzanillo.

Mr. Hemsley has compared these specimens with the type at Kew and decided that it is not the *L. macrophylla* of Bentham. The leaves are in fact much larger than in that species.

Acacia cochliacantha Humb. & Bonp. in Willd. Sp. Pl. iv. 1081 (1805). Sometimes a tree 30 feet high. Manzanillo, March 2 to 18, 1891. Nos. 1353, 1331.

Xantus found it here in 1859 and '60.

Acacia coulteri Benth. in Gray, Pl. Wright. i. 66 (1852). A handsome tree, 20 feet high, 3 to 5 inches in diameter: leaves large, often with 25 pairs of pinnæ: spikes 4 to 5 inches long, in pairs, often forming terminal racemes 10 inches long: flowers sweet-scented: legume with thin valves covered with a close tomentum. Along river bottoms and mountain sides. Colima, January 9 to February 6, 1891. No. 1209.

I have seen flowering specimens only of *A. coulteri*, with which the above compares fairly well. Bentham's description, however, calls for fewer pinnæ, shorter stipes, and glabrous pods.

Acacia spadicigera Cham. & Schlecht. Linnæa, v. 594 (1830). A large tree, a foot in diameter: flowers sweet-scented. Manzanillo, March 2 to 18, 1891. No. 1395.

This is one of the Acacias in which the tree-inhabiting ants live. They nest in the large stipular spines, each pair being inhabited by a colony.

Acacia willardiana Rose, Contr. Nat. Herb. i. 88 (1890); *Prosopis heterophylla* Benth. in Lond. Journ. Bot. v. 82 (1846).

Dr. Palmer has re-collected an abundance of these plants in flower and fruit. Seed has been distributed, and it is hoped that the species will prove valuable in cultivation. Guaymas, April 1 to 2 (in flower) and July, 1891 (in fruit). No. 164a and 164b.

Mr. Brandegee has recently sent me specimens collected at Guaymas, May 12, and at Hermosillo, May 22, 1892.

Acacia sp. Large tree, 30 feet high, 1 foot in diameter. Near the base of the mountains. Manzanillo, March 2 to 18, 1891. No. 1401.

This species is only in fruit. It is near *A. cochliacantha*.

Calliandra coulteri Watson, Proc. Amer. Acad. xvii. 352 (1882). Six to eight feet high. Manzanillo, December 1 to 31, 1890. No. 896.

Calliandra grandiflora (L'Her.) Benth. in Hook. Journ. Bot. ii. 139 (1840); *Mimosa grandiflora L'Her.* Sert. Angl. 30 (1788). Shrub, 8 to 10 feet high. Along river banks. Colima, January 9 to February 6, 1891. No. 1200.

Pithecolobium dulce (Roxb.) Benth. in Hook. Lond. Journ. Bot. iii. 199 (1844); *Mimosa dulcis* Roxb. Corom. Pl. i. 67 t. 99 (1795). Manzanillo, December 1 to 31, 1890, No. 966; also, Agiabampo, October 3 to 15, 1890. No. 800.

Pithecolobium tortum Mart. Herb. Fl. Bras. 114 (1837). A diffuse shrub, 8 to 10 feet high: rachis 2 to 3 inches long, bearing a small gland half way between the base and first pair of pinnæ, and generally between the uppermost pair:

pinnæ 3 pairs; leaflets 5 to 7 pairs, oval, obtuse, glabrous, 3 to 4 lines long: pods linear, 6 to 9 inches long. At the base of the mountain. Manzanillo, December 1 to 31, 1890. No. 916.

Pithecolobium (?) sp. Small tree, 15 to 20 feet high. Not in flower. Armeria, February 15, 1891. No. 1283.

The fruit is used in tanning, especially the hides of small animals. It is known as "Cascalote."

COMBRETACEÆ.

Combretum farinosum H. B. K. Nov. Gen. et Spec. vi. 110 (1823). One of the highest climbers of the region. Collected both in flower and fruit. Manzanillo, December 1 to 31, 1891. No. 1067.

Combretum mexicanum* Humb. & Bonp. Pl. Æq. ii. 159 [Fr. ed. 151], t. 132 (1809). Large shrub with long weak branches: leaves broadly oblong to oblanceolate, rounded at base, "dark olive colored," petals yellowish: flowers "sweet-scented." At the base of the mountains near Manzanillo, March 2 to 18, 1891. No. 1374.

I have not been able to compare this with authentically named specimens, but it answers fairly well for the above species. The leaves are very similar to *C. jacquini* Griesb (?), but this species is said to be climbing.

MELASTOMACEÆ.

Tibouchina schiedeana Cogn. in DC. Monogr. Phan. vii. 261 (1891), *fide* Cogniaux. About 2 feet high. On the bank of a river. Colima, January 9 to February 6, 1891. No. 1238.

Conostegia xalapensis Don, Mem. Wern. Soc. iv. 317 (1823). A small tree about 15 feet high. On lowlands about Colima, January 9 to February 6, 1891. No. 1125.

LYTHRACEÆ.

Cuphea llavea Lex. in La Llave & Lex. Nov. Veg. Desc. fasc. i. 20 (1824). Not common. Colima, January 9 to February 6, 1891. No. 1224.

Cuphea sp., Colima, February 27, 1891. No. 1296.

Cuphea sp., Colima, January 5 to February 6, 1891. No. 1221.

Lawsonia inermis L. Sp. Pl. i. 349 (1753). Cultivated in gardens. Colima, January 9 to February 6, 1890. No. 1212.

ONAGRACEÆ.

Jussieua octonervia Lam. Encyc. iii. 332 (1789). A small plant, 1½ to 2 feet high. In wet places. Colima, January 9 to February 6, 1891. No. 1217.

Also grown in 1892 by Mrs. Wolcott from seed obtained by Dr. Palmer.

This species is not reported in Biol. Cent.-Amer., but it was obtained by Palmer at Guaymas, 1887 (Watson in Proc. Amer. Acad. xxix. 49), and by W. G. Wright, at Mazatlan, in 1889. We also have specimens collected in Florida and Texas.

SAMYDACEÆ.

Casearia corymbosa H. B. K. Nov. Gen. et Spec. v. 366 (1821). Colima, February 27 and 28, 1891. No. 1317.

Dr. Palmer says, "the plant is loaded with white flowers and with new leaves and shoots, which are very full of moisture, making them very difficult to dry."

**Combretum reticulatum*, which is an Abyssinian species, is credited to Mexico by Walper (Repert. ii. 65), and this is followed by Mr. Hemsley (Biol. Cent.-Amer. i. 404), while *C. tetragonum* Presl, was evidently intended.

This species may not be properly referred, but it is certainly near Dr. Palmer's Jalisco plant named *C. corymbosa* by Dr. Watson. The stamens in my flower are 8.

Casearia sp. Diffuse shrub, 6 to 8 feet high: young branches yellowish pubescent: leaves deciduous, alternate, oblanceolate, downy-pubescent, sharply serrate: flowers axillary, large: calyx 5-lobed, pubescent without: stamens 10, ovary 1-celled, with 3 parietal placentæ: style entire. Manzanillo, December 30, 1891. No. 1812.

I have not been able to place this in any described species, and, owing to the present confusion in the genus, I have deemed it best not to give it a specific name.

Mr. Marcus E. Jones has collected what seems to be the same species at Colima (No. 72), July 2, 1892.

TURNERACEÆ.

Turnera diffusa aphrodisiaca (Ward) Urban, Jahrb. Bot. Gard. Berl. ii. 127 (1883); *T. aphrodisiaca* Ward, Va. Med. Month. iii. 48 (1876). Manzanillo, December 1 to 31, 1890. No. 1071.

CUCURBITACEÆ.

Momordica charantia L. Sp. Pl. ii. 1009 (1753). Climber running over bushes. At the foot of the mountains near Manzanillo, December 1 to 31, 1890. No. 1016.

The fruit is eaten by children and birds.

Palmer's No. 59 from La Paz (poor specimens only were obtained) was referred to the above species, p. 70 of this volume, but is probably *M. balsamina*.

Cucurbita radicans. Naud. Ann. Sci. Nat. ser. 5. vi. 8 (1866), *fide* Cogniaux. Manzanillo, December 1 to 31, 1891. No. 1037.

Luffa operculata intermedia Cogn. var. nov. Petiolus ½–1 decim. longus. Folia profunde lobata, lobes lobulatis. Cirrhi sæpius trifidi. Flores feminei breviter pedunculati.—A climber running over fences and bushes. Very common in creek bottoms. Agiabampo, October 3 to 15, 1890. No. 770.

Also found growing about the lagoons at Manzanillo, December 1 to 31, 1890. No. 1018.

Corallocarpus emetocatharticus (Grosourdy) Cogn. Bull. Soc. Bot. Belg. xxx. pt. 1. 279 (1891); *Doyerea emetocathartica* Grosourdy, El Medico Bot. criollo, ii. 388 (1864), *fide* Cogniaux. A vine climbing over small bushes: leaves ovate, somewhat 3-lobed, glabrous or nearly so above, with short dense pubescence beneath: fruit axillary, small, 3-seeded (?). Manzanillo, March 2 to 18, 1891. No 1398.

We have not had this genus represented before in the National Herbarium. The specimen is in very poor condition, without good leaves or flowers.

Cayaponia attenuata (Hook. & Arn.) Cogn. in DC. Monogr. Phan. iii. 769 (1881); *Bryonia attenuata* Hook & Arn. Bot. Beech. Voy. 424 (1841?). Climbing over shrubs along the base of hills. Colima, January 9 to February 6, 1891. No. 1146.

These specimens are only in fruit, and we have not the above species in our collection with which to compare them.

I succeeded in growing some specimens of this little vine in 1892, but they had not flowered when killed by frost in November.

Cyclanthera gracillima Cogn. Mem. Cour. Acad. Belg. xxviii. 71 (1878), *fide* Cogniaux. Colima, January 9 to February 6, 1891. No. 1138.

Sicyos sertuliferus Cogn. Bull. Soc. Bot. Belg. xxx. pt. 1. 277 (1891), *fide* Cogniaux. Vigorous, climber; branches slender, somewhat pubescent: leaves oval, 1½ to 3 inches long, cordate at base, acute or acuminate, somewhat 3-lobed, remotely callose-toothed white-papillose and scabrous above, scabrous beneath; petioles

pubescent, 5 to 10 lines long; tendrils 4- to 5-parted. River bottoms. Colima, January 9 to February 6, 1891. No. 1176.

It runs over fences, bushes, and rocks, forming a very dense mass. Sometimes the sterile flowers are abnormally developed, the pedicels becoming 1 inch long and the petals transformed into small leaves.

CACTACEÆ.

Mamillaria sp. Manzanillo, December 1 to 31, 1890. No. 1053.

Echinocactus wislizenii Engelm. Wisliz. Mem. 96 (1848). Agiabampo, October 3 to 15, 1890. No. 803.

Cereus striatus Brandegee, Zoe, ii. 19 (1891). Roots large and tuberous, resembling those of the dahlia. Agiabampo, October 3 to 15, 1890. No. 794. Also from Carmen Island, November 1 to 7, 1890. No. 852.

Dr. Palmer collected this plant in 1887, but it is not reported in Dr. Watson's list. Roots were sent to the Department in 1887 and were grown for some time in the greenhouse, but finally died.

Dr. Palmer says that the large roots are cut into thin slices and dried, and are in this form found in the markets, having various medical uses.

Cereus sp. Manzanillo, March 2 to 15, 1891. No. 1396.

Opuntia sp. Manzanillo, March 2 to 18, 1891. No. 1380.

FICOIDEÆ.

Mollugo verticillata L. Sp. Pl. i. 89 (1753). Common in sandy places near the lagoon. Manzanillo, December 1 to 31, 1890. No. 970.

Glinus lotoides Lœfl. It. Hisp. 145 (1758). Rich bottoms. Manzanillo, March 2 to 18, 1891. No. 1345.

RUBIACEÆ.

Exostemma caribæum (Jacq.) Rœm. & Schult. Syst. v. 18 (1819); *Cinchona caribæa* Jacq. Enum. Pl. Carib. 16 (1760). A shrub 8 to 10 feet high. Manzanillo, December 1 to 31, 1890. No. 918.

Rondeletia dubia (?) Hemsl. Diag. Pl. Nov. pt. 2. 28 (1879). Shrub 8 feet high: flowers 4- to 5-parted: calyx-lobes persistent: corolla brownish, glabrous within, unequal, sometimes 3½ lines long. Only a single shrub seen on a river bank. Colima, February 27 and 28, 1891. No. 1311.

I refer this plant here without having seen any specimens of the species, which seems best, although it differs slightly in some of its characters.

Hamelia patens Jacq. Enum. Pl. Carib. 16 (1760); Select. Stirp. Amer. 72 (1763). This species is without number, but is probably from Manzanillo. Letter C.

Hamelia versicolor Gray, Proc. Amer. Acad. xxii. 416 (1887). Fruit black, either 3-or 4-celled. Armeria, February 15, 1891. No. 1277.

Hamelia zorullensis H. B. K. Nov. Gen. et Spec. iii. 414 (1818), *fide* Dr. K. Schumann. Colima, January 9 to February 6, 1891. No. 1164.

Chiococca racemosa. L. Syst. ed. 10. ii. 917 (1759). Manzanillo, December 1 to 31, 1891. No. 1062. Agiabampo, October 3 to 15, 1890. No. 777.

Geophila reniformis (H. B. K.) Don, Prod. Fl. Nep. 136 (1825); *Cephaëlis reniformis* H. B. K. Nov. Gen. et Spec. iii. 377 (1818). Very common in low grounds about Manzanillo, December 1 to 31, 1890. No. 1060.

Diodia prostrata Swartz, Prod. Veg. Ind. Occ. 30 (1788). Not common. Colima, January 9 to February 6, 1891. No. 1106.

We have not the typical form of this species with which to compare this, but our plant seems nearer this species than to *D. teres*, although Mr. Pringle's No. 739 (1883), from Chihuahua seems very near our plant.

Crusea rubra Cham. & Schlecht. Linnæa, v. 165 (1830). Colima, January 9 to February 6, 1891. No. 1194.

This is the same as Palmer's No. 416 from Jalisco, referred as above by Dr. Gray.

In the same collection (No. 462) is a specimen which Dr. Gray referred to *C. calocephala* DC. This was also collected by Pringle in 1890 (No. 3256) from near the same locality. Both the latter specimens seem to differ from specimens distributed by Capt. John Donnell Smith under the name *C. calocephala*. Mr. Smith's specimens have larger and more strongly veined leaves, and larger calyx (3 lines long) and corolla (4 to 5 lines long), the latter blue: Palmer's and Pringle's Jalisco specimens have the calyx 1½ to 2 lines long, the corolla with very slender tube, 2 to 3 lines long, and purple or rose-colored.

I am inclined to think that Mr. Smith's specimens are the true *C. calocephala*, while the latter belongs to an undescribed species.

Spermacoce sp. Low herb, much branched, and more or less spreading, rough on the angles: leaves linear or narrowly lanceolate: flowers white in dense glomerules, 1 terminal and 2 or 3 lateral: calyx teeth 2: corolla 4-parted: stamens 4: fruit pubescent above. On sandy spots about the lagoon. Manzanillo, December 1 to 31, 1890. No. 974.

This species is near *S. podocephala*, but differs in being an annual, in the character of the leaves, etc.

Spermacoce sp. Along the base of the mountains and about the lagoon. Manzanillo, December 1 to 31, 1890. No. 937.

This species is near *S. asperifolia*.

Richardia scabra L. Sp. Pl. i. 330 (1753). Manzanillo, December 1 to 31, 1890. No. 999.

Galium sp. Sold in the market at Colima. No. 1407.

COMPOSITÆ.

Vernonia triflosculosa H. B. K. Nov. Gen. et Spec. iv. 40 (1820), *fide* O. Hoffmann. Colima, February 27 and 28, 1891. No. 1298.

Elephantopus spicatus Juss. in Aub. Pl. Gui. ii. 808 (1775). Colima, January 9 to February 6, 1891. No. 1184.

Stevia eupatoria (Spreng.) Willd. iii. pt. 3. 1775 (1803); *Mustelia eupatoria* Spreng. Trans. Linn. Soc. vi. 152, t. 13 (1802). Only one plant seen. Colima, January 9 to February 6, 1891. No. 1240.

Stevia trifida Lag. Gen. et Spec. Nov. 27 (1816). Colima, January 9 to February 6, 1891. No. 1158.

Stevia sp. Grows on grassy slopes near the river. Colima, January 9 to February 6, 1891. No. 1219.

Fleischmannia rhodostylis Schultz, Bip. Flora, xxxiii. 417 (1850). Several plants grow together. Flowers rose-colored. Not very common. Found in the shade of rocks, near water. Colima, February 27 and 28, 1891. No. 1295.

This rare plant has only been collected once before and then by Ersted in 1846–'48, who found it in Nicaragua.

Eupatorium conyzoides Vahl, Sym. Bot. iii. 96 (1794). About 5 feet high, with many spreading or hanging branches: flowers lavender. Common at the base of the mountains. Colima, January 9 to February 6, 1891. No. 1214.

Eupatorium dissectum (Hook. & Arn.) Benth. Bot. Voy. Sulph. 113 (1844); *Phania* (?) *dissecta* Hook. & Arn. Bot. Beech. Voy. 433 (1841). Stems and leaves very succulent: peduncles long; flowers white. Manzanillo, March 2 to 18, 1891. No. 1371.

This plant has not only the corolla of *Hofmeisteria*, as stated by Bentham and Hooker in Gen. Plant., but the whole habit, the foliage, the single heads on long

naked peduncles, etc. Technically it is not a *Hofmeisteria*, because it lacks the outer row of pappus, but its relationships are certainly there.

Eupatorium graciliflorum DC. Prod. v. 145 (1836). A loose-growing plant with many stems, 5 feet high: leaves sometimes 1½ inches broad: pedicels variable, nearly wanting to 8 lines long: flowers 15, white. In the mountains back of Manzanillo, December 1 to 31, 1890. No. 898.

The finding of this plant by Dr. Palmer brings to light an old but little-known species. It is probably not in any American herbarium, nor have they it at Kew. It has only twice before been collected, first by Thaddaeus Haenke, in the latter part of the last century—about 1790 or 1792. It was probably obtained on his trip with Luis Née from Acapulco to the City of Mexico. It was next collected by Karwinski, about Acapulco, probably between 1826 and 1831.

Eupatorium quadrangulare DC. Prod. v. 150 (1836). Upright plant, woody at base, 8 to 10 feet high: leaves 15 inches long: flowers white with yellow cast. Colima, January 9 to February 6, 1889. Nos. 1048, 1162.

Eupatorium palmeri Gray, Proc. Amer. Acad. xxi. 383 (1886). Plant 3 to 5 feet high, with weak branches. In various parts of the mountains, growing in shade. Manzanillo, December 1 to 31, 1890. No. 934.

Eupatorium sagittatum Gray, Pl. Wright. i. 88 (1852). Hanging upon fences and bushes for support. Very common. Agiabampo, October 3 to 15. No. 754.

Eupatorium sp. Colima, February 27 and 28, 1891. No. 1310.

Eupatorium sp. Colima, February 27 and 28, 1891. No. 1300.

Eupatorium sp. Manzanillo, December 1 to 31, 1890. No. 889.

Mikania gonoclada DC. Prod. v. 199 (1836). A climbing plant, trailing over bushes and fences along river bottoms. Colima, January 9 to February 6, 1891. No. 1207. Here seems to belong *M. cordifolia* of Smith's Pl. Guatm. pt. 2. 35, collected by John Donnell Smith in Guatemala, 1890.

Brickellia diffusa (Vahl) Gray, Pl. Wright. i. 86 (1852); *Eupatorium diffusum* Vahl, Sym. Bot. iii. 94 (1794.) Grows in shade along fences in river bottoms. Colima, January 9 to February 6, 1891. No. 1188.

Brickellia lanata (DC.) Gray, Pl. Wright. i. 84 (1852); *Bulbostylis lanatus* DC. Prod. viii. 268 (1839). Among bushes on river banks at Colima, January 9 to February 6, 1891. No. 1149.

Brickellia coulteri Gray, Pl. Wright. i. 86 (1852). In shady ravines about Manzanillo, December 1 to 31, 1891. No. 947.

Brickellia colimæ Rose, sp. nov. Stems suffruticose, 4 to 5 feet high, short glandular-pubescent: leaves opposite, 1 to 1½ inches long, ovate, acute or obtuse, cuneate or subtruncate at base, crenately-toothed, scabrous above, pubescent beneath: heads mostly on short lateral branches in corymbs of 1 to 5, 11-flowered: involucral bracts in about 3 series, very unequal, more or less pubescent and glandular; outer bracts short, ovate, acute, nerved; inner much larger, hardly nerved, obtuse, purplish: corolla brownish: akenes villous. Grows under shrubs along a river bank at Colima, January 9 to February 6, 1891. No. 1160.

Heterotheca inuloides Cass. Dict. Sci. Nat. li. 460 (1827). It is said to have come from the mountains near Colima. No. 1181. Dr. Palmer says: "It is called 'Arnica' here, and is used for the same purposes as the arnica of commerce. It is put up in small packages and sold in the markets of the city." It is the same plant as Palmer's No. 268 (1885) from Jalisco, which Dr. Gray refers to *H. leptoglossa* DC. in Proc. Amer. Acad. xxii. 421, regarding it as only a form of *H. lamarckii*. It seems to me to be a form of *H. inuloides*. Palmer's specimens differ from *H. lamarckii* in having larger heads and more numerous rays, ray-akenes more slender (often abortive) and puberulent, etc.

Bigelovia diffusa (Benth.) Gray, Proc. Amer. Acad. viii. 640 (1873); *Ericameria diffusa* Benth. Bot. Voy. Sulph. 23 (1844). Compact plant, 1 to 3 feet high. Common on the sandy beach at Agiabampo, October 3 to 15, 1889. No. 815.

It is called "Yerba del pasno," and is used as a cathartic.

Egletes viscosa (L.) Less. Syn. Comp. 252 (1832); *Cotula viscosa* L. Sp. Pl. ii. 892 (1753). A low, compact plant, 6 to 8 inches high. Manzanillo, March 2 to 18, 1891. No. 1389.

The range of this species as given by Mr. Hemsley in Biol. Cont.-Amer. is along the Atlantic coast of South Mexico and South America. I cannot learn that it has before been found on the west coast of Mexico. My specimens agree with C. Wright's, from Nicaragua, collected in 1853–56. Here, it seems, should be referred C. Wright's No. 2865, distributed as *E. domingensis*, and Palmer's 1092 of 1878–9, distributed as *Grangea maderaspatana*.

Pringle's No. 4101, distributed as *E. riscida*, seems to be near *E. obovata*.

Erigeron divergens T. & G. Fl. N. Am. ii. 175 (1841), *fide* O. Hoffmann. On banks of streams. Colima, January 9 to February 6, 1891. No. 1236.

Pluchea odorata ? (L.) Cass. Dict. Sc. Nat. xlii. 3 (1826); *Conyza odorata* L. Syst. ed. 10. ii. 1213 (1759). Probably from near Colima. No. 1097a. Leaves thinner and less pubescent than in typical *P. odorata*.

Pluchea subdecurrens Cass. Dict. Sc. Nat. xlii. 4 (1826). Five to six feet high, with few stems: leaves 3 to 6 inches long, the broadest 1½ inches wide. Found along a watercourse among underbrush. Not common. Colima, January 9 to February 6, 1891. No. 1097.

This plant seems to answer to the above species. Very near to it is Palmer's 546 (1880).

Lagascea decipiens (?) Hemsl. Diag. Pl. Nov. pt. 2. 33 (1879). Shrubby, 4 to 6 feet high, glabrous, much branched and open: leaves opposite, ovate, acuminate, 1 to 3 inches long, 3-nerved, slightly dentate, scabrous above and below: heads very numerous, aggregated: involucre 1-flowered, somewhat hirsute, becoming glabrate, 5-toothed: akenes glabrous except a slight puberulence above, 2 lines long; pappus a minute denticulate crown: flowers yellow. In shady woods. Colima, February 27, 1891. No. 1320.

Nearest *L. decipiens*, but the leaves are less dentate, the glomerules and flowers smaller, etc.

Lagascea mollis Cav. Ann. Sci. Nat. vi. 333, t. 44 (1800). Rare about Colima, January 9 to February 6, 1891. No. 1185.

Lagascea suaveolens H. B. K. Nov. Gen. et Spec. iv. 29 (1820). "Flowers dull-white." On grassy hillsides. Colima, January 9 to February 6, 1891. No. 1148.

Guardiola tulocarpus Gray, Pl. Wright. i. 111 (1852); *Tulocarpus mexicana* H. & A. Bot. Beech. Voy. 299 (1840). Bushy, 1½ to 2 feet high: ray 1; disk-flowers 8 or 9. Along river banks. Colima, January 9 to February 6, 1891. No. 1198.

I am somewhat in doubt whether this plant should be referred to G. *mexicana* or as above.

Melampodium perfoliatum (Cav.) H. B. K. Nov. Gen. et Spec. iv. 274 (1820); *Alcina perfoliata* Cav. Ic. i. 11, t. 15 (1791). Along a water ditch. Colima, January 9 to February 6, 1891. No. 1163.

Melampodium sericeum longipes Gray, Proc. Amer. Acad. xxii. 423 (1887). Common on a creek bottom near Colima, January 9 to February 6, 1891. No 1172.

Melampodium divaricatum (Rich.) DC. Prod. v. 520 (1836); *Dysodium divaricatum* Rich. in Pers. Syn. ii. 489 (1807). Common along water ditches. Colima, January 9 to February 6, 1891. No. 1232.

Parthenium hysterophorus L. Sp. Pl. ii. 988 (1753). Manzanillo, December 1 to 31, 1890. No. 921.

Zinnia palmeri Gray, Proc. Amer. Acad. xxii. 423 (1887). From 2 inches to 1 foot high, much branched and spreading. Smaller throughout, and apparently of somewhat different habit from the type. Manzanillo, December 1 to 31, 1890. No. 893. Also at Colima, January 9 to February 6, 1891. Letter J.

Jægeria hirta Less. Syn. Comp. 223 (1832). An inch to one foot or more high, spreading or erect. Very common along river bottoms at Colima, January 9 to February 6, 1891. No. 1190.

This is Pringle's No. 1282 (1887) distributed as *J. calva* Schultz Bip. To this genus, and perhaps to the same species (although it is taller and has simpler inflorescence) belongs Botteri's No. 1180, referred by Mr. Hemsley to *Spilanthes uliginosa* Biol. Cent.-Amer. ii. 194; also J. D. Smith's No. 930 distributed as *S. sessilifolia*.

Gymnolomia patens Gray, Proc. Amer. Acad. v. 182 (1861). Often 8 feet high with spreading branches, frequently depending for support upon other plants. It is a very abundant bloomer. Colima, January 9 to February 6, 1891. No. 1223.

Agiabampoa Rose in Hoffmann, Wiss. Beil. z. Jahresb. Fried. Werd. Gym. Berl. p. — (reprint, 20) and Eng. & Prantl, Pflanzenf. iv. abt. 5. 390 (1894). A new genus of *Helianthoideæ*. Heads heterogamous, radiate, few-flowered; ray-flowers sterile, in 1 row; disk-flowers hermaphrodite, fertile. Involucre oblong; bracts in 4 series, broad and obtuse; receptacle very small, almost flat; corolla of ray-flowers without style, spreading, 2-lobed or merely notched: corolla of disk-flowers regular, 5-toothed; proper tube short; throat tubular: stamens entire at base; style-branches short, somewhat flattened, with an ovate, acute tip: akenes a little flattened, cuneate-oblong: pappus none.—Shrubby, much branched: leaves opposite, slender and entire: heads in small compact cymes terminating the branches.

For illustration see Pl. XXXII.

This genus seems to belong to Bentham and Hooker's third section of *Verbesineæ* and near *Varilla*, although it differs from it quite widely.

Mr. Canby in a letter to me points out the close resemblance in habit of this species to *Gymnosperma*, but of course its opposite leaves and bracts on the receptacle keep it distinct from this genus.

Dr. O. Hoffmann, of Berlin, has placed the genus next to *Gymnolomia*, from which it differs in its cylindrical involucre and very unequal bracts.

Agiabampoa congesta Rose, ll. cc. A loose-growing shrub, 4 to 5 feet high, quite woody below with several stems from the base, glabrous or with some hispid pubescence: leaves (uppermost ones often alternate) linear to linear-lanceolate, 3-nerved, a little hispid on both sides, 2 to 6 inches long: heads (sessile or on short pedicels) 3 lines long: involucral bracts 3- to 5-nerved, coriaceous with green tips, oblong and obtuse and with long, oily glands on the back: rays 5, yellow, oval to oval-oblong, 1½ to 2 lines long: disk-corolla 2 lines or less long with a very short proper tube: akenes black, glabrous, 1¼ lines long.—Common in rocky creek bottoms. Agiabampo, October 3 to 15, 1891. No. 752.

The bracts are more or less viscid as seems also to be the case with *Varilla*.

Sclerocarpus uniserialis (Hook) B. & H. Gen. Plant. ii. 364 (1873); *Gymnopsis uniserialis* Hook. Ic. Pl. t. 145 (1837). One to one and one half feet high. Only a few plants seen on the mountain side at Manzanillo, December 1 to 31, 1891. No. 975. A spreading or somewhat procumbent form was obtained at Colima, but is without number. Distributed as Letter I.

Montanoa grandiflora DC. Prod. v. 565 (1836). A shrub 10 feet high. Colima, January 9 to February 6, 1891. No. 1159.

Zexmenia greggii Gray, Pl. Wright. i. 113 (1852). Stem 5 to 6 feet high. Along river banks. Colima, January 9 to February 6, 1891. No. 1241.

Zexmenia tequilana Gray in Watson, Proc. Amer. Acad. xxii. 425 (1887). A shrub 10 feet high. On the bank of a creek on the opposite side of bay from Manzanillo, December 1 to 30, 1890. No. 1022.

Tithonia tagetiflora Desf. Ann. Mus. Par. i. 49, t. 4 (1802). About 3 feet high. Only two plants seen in a creek bottom. January 9 to February 6, 1891, No. 1250.

Tithonia tubæformis (Ortega) Cass. Dict. Sc. Nat. xxxv. 278 (1825); *Helianthus tubæformis* Ortega, Hort. Matr. Dec. 181 (1791-1800). About 5 feet high. Grows on the banks of the lagoon. Manzanillo, December 1 to 31, 1890. No. 1076.

In old fields along streams. Colima, January 9 to February 6, 1890. No. 1220.

Viguiera tenuis alba Rose, var. nov. Like the type, but heads and leaves somewhat smaller, bracts of the involucre and receptacle more or less purplish, and rays white.—Grassy hillsides among other plants. Colima, January 9 and February 6, 1891. No. 1151. Nearly past blooming at time of collection.

Viguiera helianthoides H. B. K. Nov. Gen. et Spec. iv. 226, t. 379 (1820). Only a single perfect plant was found, owing to the fact that domestic animals eat it with avidity. Agiabampo, October 3 to 15, 1890. No. 811.

Other specimens were collected at Colima, January 9 to February 6, 1891. No. 1131.

These two forms have been referred to this polymorphous species, although they differ considerably from each other.

Encelia (Simsia) purpurea Rose, sp. nov. Stems 2 to 3 feet high, with spreading branches; younger parts villose-pubescent: leaves ovate, 6 to 18 lines long, acute, truncate or a little cuneate at base, entire or somewhat serrate, appressed-pubescent on both sides, short-petioled: inflorescence somewhat corymbose; peduncles 6 to 18 lines long: heads slender, cylindrical, 3 to 5 lines long; bracts of two lengths, ovate-lanceolate, acute, somewhat hispid, 3- to 5-nerved, more or less purplish: involucral bracts emarginate or short-appendiculate, purplish: rays 5 to 8, 2 to 3 lines long, a little exserted beyond the disk, sterile, slightly 2-toothed, yellow: disk-corolla 2½ lines long, with a very short proper tube (one-fourth line long), a slender cylindrical throat and 5 small teeth: akenes strongly flattened, 2½ lines long, appressed, pubescent: pappus of 2 nearly equal awns a little longer than the akenes.—Only two plants found, these in a creek bottom. Colima, January 9 to February 6, 1891. No. 1105. A peculiar species, resembling *E. exaristata* in the color and shape of the involucral bracts, but of different habit.

Verbesina sphærocephala Gray in Watson, Proc. Amer. Acad. xxii. 428 (1887). Leaves toothed. Bought in the market at Colima, January 9 to February 6, 1891. No. 1404.

Spilanthes alba Willd. Sp. Pl. iii. pt. 3. 1714 (1803). Involucral bracts about 8: rays none: corolla 4-toothed: outer akenes 3-angled; inner ones flat: receptacle high-conical. Grassy plains and river bottoms. Colima, January 9 to February 6, 1891. No. 1192.

This is the *S. alba* of Hemsley's Biol. Cent.-Amer., but differs from the description in the number and shape of the involucral bracts. Fendler's No. 166 from the Isthmus of Panama seems to be the same species. *S. pseudo-acmella* var. of Capt. Wilkes' Exped. (probably from the East Indies) seems very near our plant.

Cosmos sulfureus Cav. Ic. i. 56, t. 79 (1791). About 4 feet high, with a rough pubescence: leaves bi- to tri-pinnatifid, often 12 inches or more long, with rachis and midrib hispid; ultimate pinna, entire or 2- to 3-toothed: peduncles 7 to 10 inches long: bracts of outer involucre 2 lines long, ovate-linear, 3-nerved; inner involucre, twice longer, scarious: rays 6 to 8, oblong; 6 to 9 lines long, 3-toothed, "amber" or deep orange: akenes 8 to 9 lines long, including the long beak, upwardly scabrous and with 2 spreading awns. Not common, and at the time of collection almost past blooming. Colima, January 9 to February 6, 1891. No. 1222.

This species is the same as the one collected by Palmer in Jalisco (1886) and referred as above by Dr. Gray.

I have not seen other specimens of this species, nor have I seen Cavanilles'

plate of the same. The style tips are peculiar for the genus, being long and filiform.

I have grown this species in my grounds from seed. It is a rank, weedy looking plant, with rather coarse foliage. Some of the larger specimens reach the height of 7 feet. None of the plants bloomed out of doors, but they had budded when killed by frost the 1st of November. A small specimen was saved and transplanted to the greenhouse and flowered about the middle of December. The flowers are very attractive and are fully 2 inches in diameter. The chief objection to the plant is its very late blooming, being several weeks later than the commonly cultivated species. The flowering continues for several months.

Bidens pilosa L. Sp. Pl. ii. 832 (1753). In shade along river bottoms. Colima, January 9 to February 6, 1891. No. 1169.

Bidens bipinnata L. form. Awns divergent. Manzanillo, December 1 to 31, 1890. No. 923. Near Palmer's No. 131 (1885) from S. W. Chihuahua.

Galinsoga parviflora Cav. Ic. iii. 41, t. 281 (1794). Only a few plants seen in a river bottom. Colima, January 9 to February 6, 1891. No. 1244.

Calea urticæfolia DC. Prod. v. 674 (1836); *Calcacte urticifolia* R. Br. Trans. Linn. Soc. xii. 109 (1818). Four to eight feet high. A very common plant about Colima, January 9 to February 6, 1891. No. 1215.

Tridax dubia Rose, sp. nov. A slender and more or less procumbent herb, somewhat hirsute: leaves opposite, ovate to lanceolate, serrate: inflorescence a few-flowered corymb; pedicels variable in length, sometimes 2 to 3 inches long: involucral bracts 5, distinct, herbaceous, ovate, acute: rays yellow, 5, fertile, 3-toothed; disk flowers perfect, fertile: pappus of 10 oblong, obtuse, ciliate-pectinate palæ: akenes slightly flattened dorsally, a little pilose.—Along the river bottom; not common. Colima, January 9 to February 6, 1891. No. 1173.

For illustration see Pl. XXXIII.

This species is doubtfully referred to *Tridax*, from which it differs in its less simple inflorescence, involucral bracts in a single series, and fertile rays, and in the character of the pappus.

Mr. Wm. M. Canby, who has been very much interested in the plants, writes me as follows: "The plant clearly belongs where you place it, viz, in subtribe *Galinsogeæ*, of tribe *Helianthoideæ*. Bentham and Hooker give but 7 genera in this subtribe and this plant is nearly related to but two of these, *Galinsoga* and *Tridax*, and does not fully agree with either. On the whole, however, it seems to me to be sufficiently near *Tridax* to be taken into it. In the detailed generic description of Bentham and Hooker is the phrase concerning the pappus of 'aristato-acuminatæ.' If this were left out you would not have much difficulty in bringing your plant into it. Now, in *Tridax trilobata* (which has been put under *Galinsoga* by good botanists) you have a pappus which is really nearer that of your plant than of other species of *Tridax*. Bentham and Hooker suppress, I think, with reason, all the genera which have been found to accommodate species not just *Tridax* or *Galinsoga* and unite them with the former. Your plant is much like the original species of *Tridax* (*T. procumbens*) in the receptacle, chaff, and scales of the involucre. It approaches *T. trilobata* in the pappus. It seems to me that the simple fact of its having a definite number of pappi which are only ciliate-pectinate instead of plumose-ciliate and which are not aristate should not take it out of a genus in which there is as much variation in species as in *Tridax*."

Tridax procumbens L. Sp. Pl. ii. 900 (1753). Colima, January 9 to February 6, 1891. No. 1183.

Flaveria robusta Rose, sp. nov. About 4 feet high, pubescent or glabrate below: leaves lanceolate or linear above, 3 to 5 inches long, acute to acuminate, tapering into a slender petiole, 3-nerved, entire or slightly serrate: inflorescence open, corymbose; heads small, with 3 involucral bracts: flowers 3; ray 1, obicular,

about 1 line long; disk flowers 2: akenes $\frac{2}{3}$ of a line long.—Colima, February 27 and 28, 1891. No. 1299. Also collected by Marcus E. Jones, June 28, 1892, near Armeria. No. 276.

This species is near *F. linearis* and *F. longifolia*, but with different leaves, fewer flowers, etc.

Porophyllum palmeri Rose, sp. nov. Perennial, much branched and open, several feet high, reddish and glabrous throughout: leaves opposite, oblong to broadly linear, 9 to 20 lines long, mostly obtuse, with linear glands along the margin: flowers abundant, in numerous small corymbs: involucral bracts 5, 6 lines long, linear, acute, greenish or with purplish margin, with black glands: corolla tube very slender with 5 equal slender lobes: akenes linear, 3½ lines long: pappus abundant, shorter than the corolla.—Collected in a ravine bottom, in the shade of bushes. Colima, January 9 to February 6, 1891. No. 1142.

For illustration see Pl. XXXIV.

This plant seems nearest *P. jorullense*, but differs in its inflorescence, gland-bearing leaves which are not reticulated, its pappus which is shorter than the corolla, etc.

Dysodia tagetiflora Lag. Gen. et Spec. Nov. 29 (1816). Very common on grassy plains about Colima, January 9 to February 6, 1891. No. 1157.

Tagetes subulata Llav. & Lex. Nov. Veg. Desc. fasc. 1. 31 (1824). Collected on the river bank; also bought in the market under the name "Santa Maria." It has a very strong, disagreeable odor, and is manufactured into an insect powder. Colima, January 9 to February 6, 1891. Nos. 1154 and 1180.

Tagetes tenuifolia Cav. Ic. ii. 54, t. 169 (1793). Common in river bottoms at Colima, February 27 and 28, 1891. No. 1318.

Pectis arenaria Benth. Bot. Voy. Sulph. 110 (1844). Leaves 1 to 2 inches long: akenes 4 lines long. The plant grows in the sand just above high tide at Manzanillo. December 1 to 31, 1890. No. 971.

Pectis coulteri Harvey & Gray, Pl. Fendl. 62 (1849). Very common on sandy plains. Agiabampo, October 3 to 15, 1890. No. 759.

Pectis diffusa Hook. & Arn. Bot. Beech. Voy. 296 (1840). Common by river banks at Colima, January 9 to February 6, 1891. No. 1155.

This seems to be Hooker and Arnott's species. The pappus, which is described as of 10 to 29 setæ, is quite variable. These plants have many akenes with 10 to 14 setæ, but often there are only 3 to 5.

It is the same as Palmer's No. 4 (1886) and Pringle's No. 1814 from Jalisco, both doubtfully referred to the above species.

Pectis palmeri Watson, Proc. Amer. Acad. xxiv. 58 (1889). Very common on rich bottoms near creek. Agiabampo, October 3 to 15, 1890. No. 765.

Pectis prostrata Cav. Ic. iv. 12, t. 324 (1797). Not common. Found near the beach. Manzanillo, December 1 to 31, 1890. No. 910.

Erechthites runcinata (Less.) DC. Prod. vi. 295 (1837); *Senecio runcinata* Less. Linnæa, vi. 410 (1831). A tall, coarse herb with large leaves 1 to 1½ feet long: flowers red. In moist, shady valleys. Colima, January 9 to February 6, 1891. No. 1145.

Dr. Palmer says this plant seems to have some good medical properties and is much used by the medicine venders under the name of "Maguapas."

Cacalia pringlei Watson, Proc. Amer. Acad. xxv. 156 (1890). Stems 6 feet high: flowers white. Collected on the grassy slope of a hill. Colima, January 9 to February 6, 1891. No. 1234.

Trixis obvallata Hook. & Arn. Bot. Beech. Voy. 300, t. 65 (1840). On grassy hills about Colima, January 9 to February 6, 1891. No. 1235. Also from the markets. No. 1406.

Trixis alata Don, Trans. Linn. Soc. xvi. 192 (1833). A bushy plant, 5 to 10 feet high. Near the base of the mountains. Manzanillo, December 1 to 31, 1890. No. 897.

This plant, which is now collected for the second time, was obtained by Sesse

and Mocino over a hundred years ago (about 1788), but the station is not mentioned; and it is more than sixty years since Don first published (1833) his description.

Mr. Hemsley writes me that the type is probably in the Delessent Herbarium at Geneva, and that the species was not represented in the Kew Herbarium.

LOBELIACEÆ.

Heterotoma tenella, Turcz. Bull. Soc. Nat. Mosc. xxv. pt. 2. 175 (1852). In moist, shady places among rocks along river bottoms. Colima, January 9 to February 6, 1891. No. 1177. Also good specimens from Mrs. H. L. T. Wolcott, to whom seed had been sent.

PLUMBAGINACEÆ.

Plumbago pulchella Boiss. in DC. Prod. xii. 692 (1848). Common along fences. Colima, January 9 to February 6, 1891. No. 1182.

MYRSINACEÆ.

Jacquinia sp. A small tree, 12 feet high with very large top: leaves spatulate to oblanceolate, sharply pungent, glabrous, 3 inches long: flowers in racemes, orange-colored: fruit 1 inch in diameter. Manzanillo, December 1 to 31, 1891. No. 1014.

Lucuma sp. A small shrub, 10 feet high; young branches pubescent: leaves oblanceolate, tapering into a slender petiole (1 inch or more long), glabrous, obtuse or acutish, shining above; 5 to 8 inches long, 1½ to 2½ inches broad: flowers in clusters of 2 to 4, supra-axillary: peduncles 6 to 7 lines long, pubescent: sepals 5, orbicular, obtuse, imbricated, pubescent without, subequal, 3 lines long: corolla dull white, somewhat tubular, 6 lines long, 5-cleft to the middle or into obtuse lobes, puberulent: stamens and staminodia equally inserted near the top of the tube; stamens included on short filaments about equal to the anthers; staminodia linear, longer than the stamens; ovary pubescent, 5-celled: fruit unknown. Manzanillo, March 2 to 18, 1891. No. 1346.

Very similar to a specimen in the National Herbarium from a plant cultivated in Florida under the name *L. fruticosa*.

SAPOTACEÆ.

Bumelia arborescens Rose, sp. nov. A tree with a wide-spreading top; trunk 1 foot in diameter; branches often bearing short, straight thorns: leaves when young clothed with a close, short, reddish pubescence, in age glabrous and shining, oblong, obtuse, 2 to 3 inches long: flowers very numerous in the axils of the leaves: pedicels 1½ to 2½ lines long: calyx and pedicels ferruginous-pubescent: fruit glabrous. Colima, January 9 to February 6, 1891. No. 1123.

Mr. Hemsley writes that they have not this species in the herbarium at Kew. Perhaps nearest *B. persimilis*.

APOCYNACEÆ.

Rauwolfia heterophylla Roem. & Schult. Syst. iv. 805 (1819). A shrub 5 to 6 feet high. Manzanillo, December 1 to 31, 1890. No. 1030. Armèria, February 27 and 28, 1891. Letter H.

Thevetia cuneifolia (H. B. K.) A. DC. Prod. viii. 344 (1844); *Cerberia cuneifolia* H. B. K. Nov. Gen. et Spec. iii. 224 (1818). A shrub 20 feet high, 6 to 12 inches in diameter, leaves often 5 to 6 inches long: flowers yellow. Manzanillo, December 1 to 31, 1890. No. 1069.

This shrub gives out an abundance of milky juice when cut. The plant has apparently only been collected twice, first by Humboldt in flower and next by

Dr. Palmer, in 1886, in fruit. At Manzanillo the plant was both in flower and fruit. It differs but slightly from the description in H. B. K., Nova Genera et Species Plantarum vol. iii. The leaves are, however, a little longer.

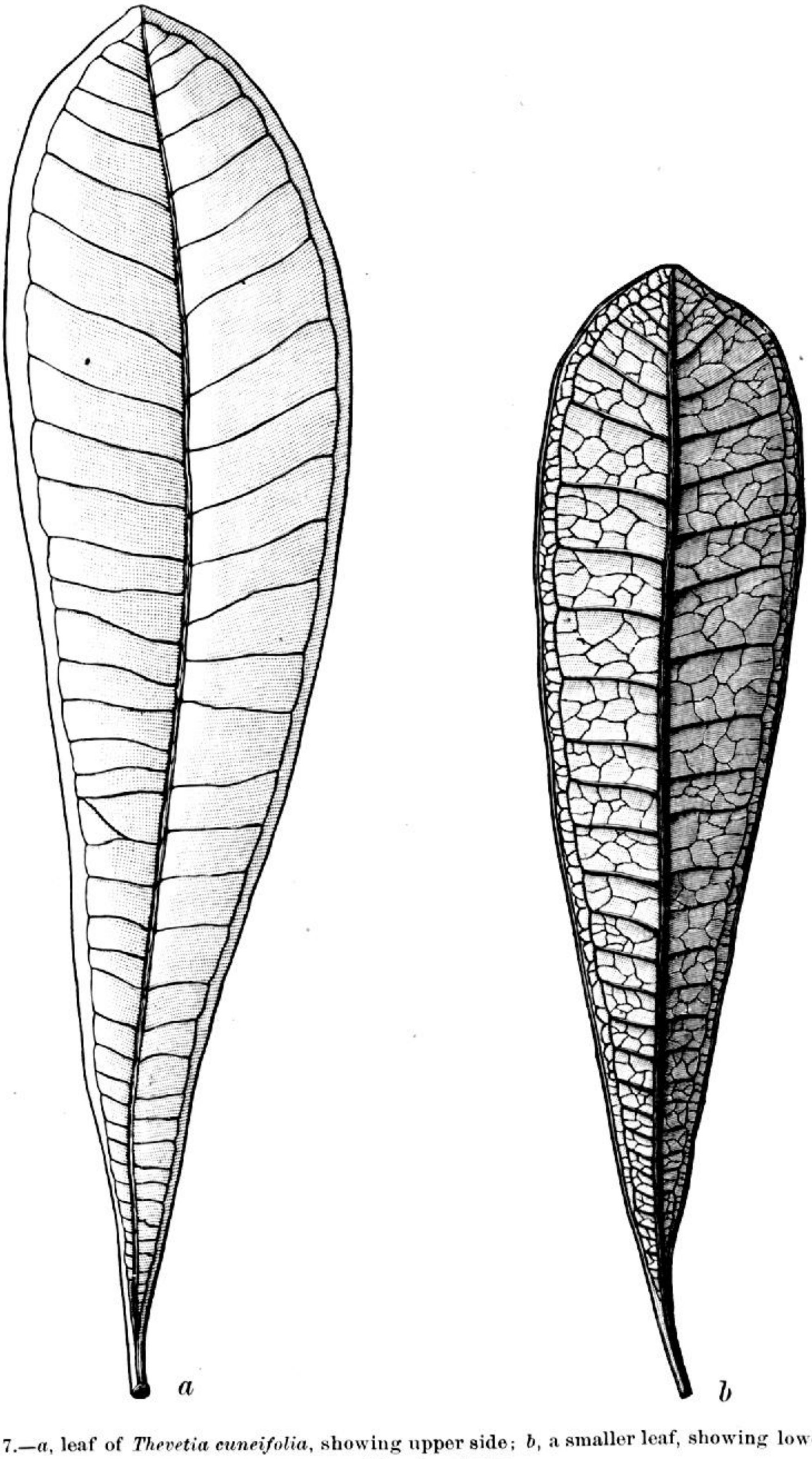

FIG. 7.—*a*, leaf of *Thevetia cuneifolia*, showing upper side; *b*, a smaller leaf, showing lower side; *a* and *b* natural size.

Plumeria sp. A shrub 15 to 20 feet high, 4 inches in diameter. Manzanillo, March 2 to 18, 1891. No. 1394.

This may be *P. mexicana*, but the specimens have neither flowers nor leaves.

ASCLEPIADACEÆ.

Philibertia cumanensis (H. B. K.) Hemsl. Biol. Cent.-Amer. ii. 318 (1881); *Sarcostemma cumanensis* H. B. K. Nov. Gen. et Spec. iii. 195 (1818). Climbing over plants about the lagoon. Manzanillo, December 1 to 31, 1890. No. 1002.

The white flowers are said to be sweet-scented.

Macroscepis sp. A high climber: leaves broadly oblong, 5 to 6 inches long, obtuse or shortly acuminate, rounded at base, sessile, densely tomentose beneath, nearly glabrous above: follicles 3 inches long, reflexed in fruit, tapering to the apex, densely velvety-pubescent: seeds glabrous, except the long brownish coma. In the mountains about Manzanillo, December 1 to 31, 1890. No. 1028.

This plant is said to climb to the top of the tallest trees. If a *Macroscepis* it is a new species, but as it is only in fruit it is referred to as above. Bourgeau's No. 1510, which seems to be the same as Palmer's plant, is also referred to this genus without name by Hemsley in Biol. Cent.-Amer. ii. 321.

Asclepias curassavica L. Sp. Pl. i. 215 (1753). Leaves very narrow. In low ground. Manzanillo, December 1 to 31, 1890. No. 1047. Armeria, February 15, 1891. No. 1282.

Dr. Palmer says this species is sometimes cultivated in Mexico.

Mrs. H. L. T. Wolcott has grown some very attractive plants from seed sent May 1, 1892, which bloomed November 1. The contrast between the bright orange stamens and the dark corolla is very pleasing.

An interesting note regarding the culture of this species occurs in the Gardener's Chronicle (April 15, 1893). It is there spoken of as a very attractive plant and worthy of a place in our gardens.

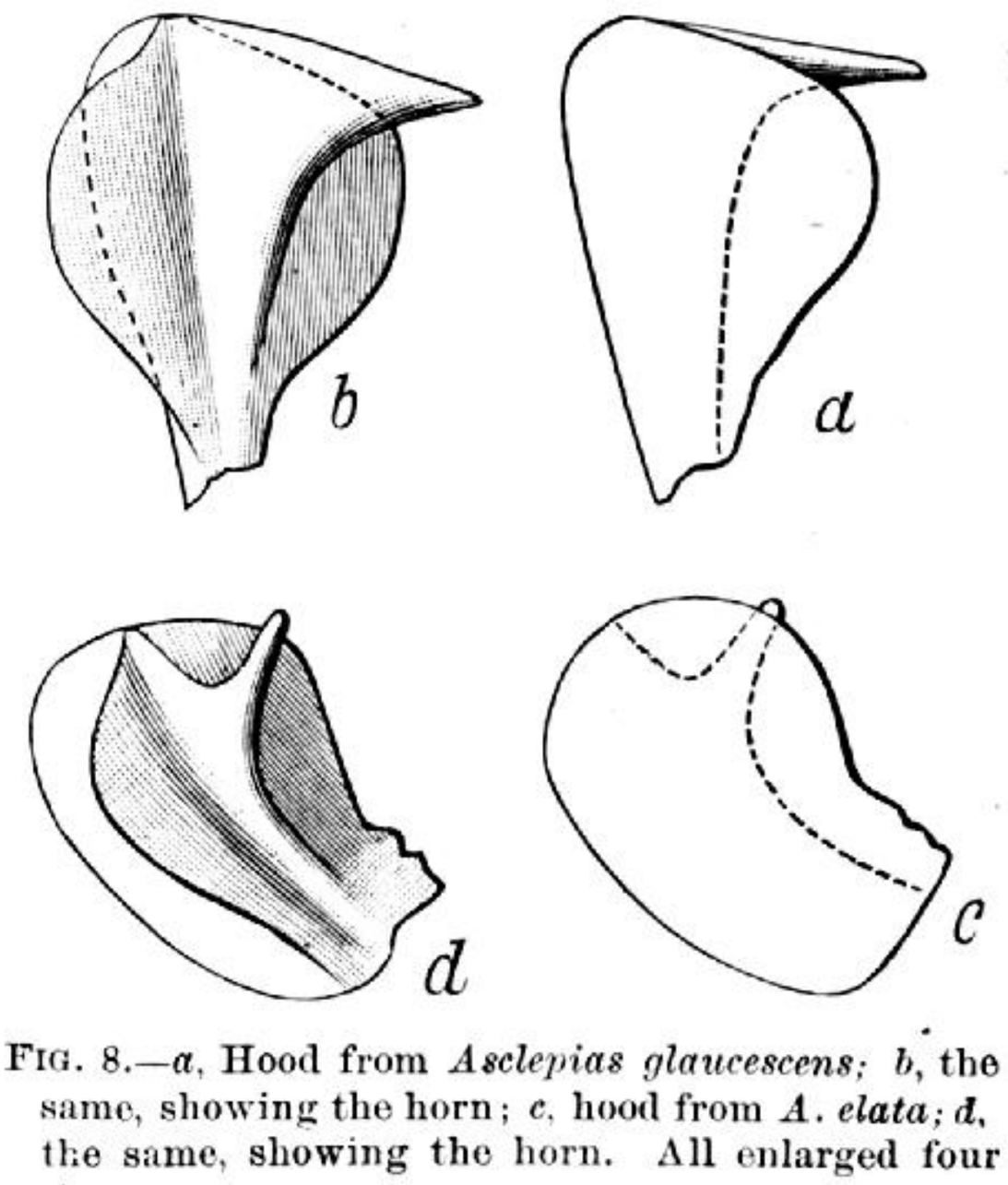

FIG. 8.—*a*, Hood from *Asclepias glaucescens*; *b*, the same, showing the horn; *c*, hood from *A. elata*; *d*, the same, showing the horn. All enlarged four times.

Asclepias glaucescens H. B. K. Nov. Gen. et Spec. iii. 190, t. 227 (1818). Leaves 5 to 6 inches long, acute. Colima, January 9 to February 6, 1891. No. 1150.

A comparison of these specimens with those referred to *A. glaucescens* from the United States shows that the latter belong to a different though closely allied species.

A. glaucescens was described and figured by H. B. K. in Nov. Gen. et Spec. iii., p. 190, t. 227, from plants collected between Acapulco and La Verta de la Moxonera. The following note is from the Bot. Gaz. xvii. 193.

Dr. Gray in Syn. Fl., ii. 92. refers the *A. sullivantii* Torrey, Bot. Mex. Bound. p. 162, to this species. The United States species, however, is clearly distinct from *A. glaucescens*, and should be referred to *A. elata* Benth. Dr. Gray, indeed, in the Syn. Flora, Suppl. p. 407, considers the two to be the same species; but in the light of this new material I am convinced we have two good species, although closely related.

A. elata Benth. has oblong or oval leaves, rounded at the apex, very similar to those of *A. obtusifolia*.

A. glaucescens has much longer and narrower leaves, oblong to linear-oblong and acute: the flowers are much larger in *A. elata*, and the hoods are spreading, exposing the gynostegium; in *A. glaucescens* the hoods are longer instead of shorter than the gynostegium, and erect and connivent. There is also a good

character in the horns. Dr. Gray clearly describes the form as it is in *A. elata* (under *A. glaucescens* Syn. Fl.), where, in speaking of the hood, he says "the whole length within occupied by a broad and thin crest, which is 2-lobed at the summit, the outer lobe broad and rounded, the inner a short triangular-subulate nearly included horn;" in *A. glaucescens* the horn is a broad, triangular, incurved, entire beak.

LOGANIACEÆ.

Spigelia* **palmeri** Rose, sp. nov. Annual, simple, 4 to 8 inches long, glabrous: leaves opposite (connected by an ovate membranaceous stipule), oblong to oval, acute or obtuse, tapering at base into a short petiole, glabrous, pale beneath, 1 to 3 inches long, 8 to 20 lines broad, spikes 8-to 12-flowered, terminal or axillary: sepals linear, 1½ lines long, shorter than the capsule: corolla white; tube 4 lines long; lobes 4 to 5 lines long: stamens 5: capsule glabrous.—In wet places across the lagoon from Manzanillo, December 1 to 31, 1890. No. 929.

POLEMONIACEÆ.

Lœselia ciliata L. Sp. Pl. ed. 2. ii. 875 (1763). Common along river bottoms. Colima, January 9 to February 6, 1891. No. 1175.

Lœselia coccinea (Cav.) Don, Gen. Syst. iv. 247 (1838); *Hoitzia coccinea* Cav. Ic. iv. 44, t. 365 (1797). In mountain ravines. Colima, February 27 and 28, 1891. No. 1301.

This plant is called "Espinella," and is used in many places in Mexico as a medicine.

Lœselia glandulosa (Cav.) Don, Gen. Syst. iv. 248 (1838); *Hoitzia glandulosa* Cav. Ic. iv. 45, t. 367 (1797). Collected along streams. Colima, January 9 to February 6, 1891. No. 1152.

HYDROPHYLLACEÆ.

Nama jamaicense L. Sp. Pl. ed. 2. i. 327 (1762). Colima, January 9 to February 6, 1891. No. 1233.

Hydrolea spinosa L. Sp. Pl. ed. 2. i. 328 (1762). A small specimen found at the side of a dry ditch near Colima, February 27 and 28, 1891. No. 1305.

BORAGINACEÆ.

Cordia sp. A tree 25 feet high, about 10 inches in diameter, younger stems whitish: leaves broadly lanceolate to broadly ovate, acute to somewhat acuminate, with truncate or somewhat cuneate base, green and smooth above, whitish and with a short, close pubescence below: flowers very abundant in large open panicles: pedicels short, mostly 1 line long, sometimes 4 lines long: flower-buds globular, opening by a deciduous operculum: calyx short-campanulate, 2 to 3 lines long, whitish pubescent, somewhat 10-ribbed, with small teeth: corolla with short tube scarcely longer than the calyx, limb spreading (10 to 12 lines broad) deeply cut into 5 oblong, obtuse lobes, white (?), marcescent: stamens 5, exserted: style twice 2-parted: drupe ovate-acuminate, 4-celled. A very common tree about Manzanillo and worthy of cultivation. December 1 to 31, 1890. No. 895.

The marcescent corolla seems to ally this species with De Candolle's section *Gerascanthus*. Of all the specimens of *Cordia* which we have seen, it most resembles *C.* (*Varronia*) *alba*.

Cordia alba (Jacq.) Roem. & Schult. Syst. iv. 466 (1819); *Varronia alba* Jacq. Select. Stirp. Amer. p. 41 (1763). Manzanillo, March 2 to 18, 1891. No. 1369.

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*To this genus should be referred *Calophanes palmeri* Gray, Proc. Amer. Acad. xxii. 443, which is probably *S. scabrella* Benth. or near it.

Tournefortia capitata Mart. & Gal. Bull. Acad. Brux. xi., pt. 2, 332 (1844). Colima, January 9 to February 6, 1891. No. 1243.

Tournefortia floribunda H. B. K. Nov. Gen. et Spec. iii. 89 (1818). A high woody climber: flowers greenish yellow. Very common along streams, and at the base of mountains. Colima, January 9 to February 6, 1891. No. 1210. Manzanillo, March 2 to 18, 1891. No. 1359.

This plant almost completely covers the bushes and shrubs over which it runs. Dr. Palmer speaks of a large shrub 15 feet high, with considerable spread of branches, which was entirely hidden by it. I do not find that this plant is reported from Mexico, but it seems to be common there, and as it corresponds fairly well with the description and with a single specimen from Brazil, I have no hesitancy in referring it as above.

Tournefortia hirsutissima (?) L. Sp. Pl. ed. 2. i. 201 (1762). Tall shrubby climber covering the tops of the highest trees with its numerous branches: the small drupes at first dull white and fleshy: in age hard and dry. Manzanillo, December 1 to 31, 1890. No. 1043.

This plant seems to be the same as the one obtained by C. Wright in Nicaragua, and also referred as above. In both of these specimens the leaves are nearly glabrous in age. In De Candolle's Prodromus this species is described as "fruticosa erecta." Also about Colima, January 9 to February 6, 1891. No. 1242. But in these specimens the leaves are very scabrous and more pubescent.

Heliotropium curassavicum L. Sp. Pl. i. 130 (1753). Manzanillo, March 2 to 18, 1891. No. 1343.

Heliotropium phyllostachyum Torr. Bot. Mex. Bound. 137 (1859). Manzanillo, December 1 to 31, 1890. No. 891.

Heliotropium indicum L. Sp. Pl. i. 130 (1753). Manzanillo, December 1 to 31, 1890. No. 953. March 2 to 18, 1891. No. 1378.

Heliotropium inundatum Swartz, Prod. Veg. Ind. Occ. 40 (1788). Colima, January 9 to February 6, 1891. No. 1122. Manzanillo, March 2 to 18, 1891. No. 1361.

Heliotropium parviflorum L. Mant. ii. 201 (1771). Manzanillo, December 1 to 31, 1890. No. 915.

CONVOLVULACEÆ.

Ipomœa (Orthipomœa) wolcottiana Rose, Garden and Forest, vii. 367 (1894). A tree, 30 feet high, sometimes 1 foot in diameter: branches slender, somewhat drooping: leaves ovate to ovate-lanceolate, 3 to 5 inches long, 1½ to 3½ inches broad, rounded or truncate at base, acuminate, glabrous, on petioles 2 to 4 inches long: flowers in numerous short racemes or corymbs mostly naked: pedicels jointed near the base, little if at all thickened upward, 4 to 6 lines long: calyx 5 to 6 lines long, glabrous: sepals nearly equal, oblong or oval, rounded at apex: corolla white, broadly campanulate, 2½ inches broad, with a short thick tube 1 inch long: capsule oblong, 9 lines long, glabrous, 2-valved, 4-seeded, separating into 4 carpels: seeds oblong, 4 lines long with the margins covered with a long reflex coma longer than the seed. Manzanillo, March 2 to 18, 1891. No. 1342.

Dr. Palmer speaks of this as a tree with a large top, hanging branches, and a great profusion of flowers. The flowers generally appear before the leaves, but when both appear together the flowers are found in the axils of the leaves forming short, leafy racemes. It is called "Acote" and the bark is used in the preparation of a tea which is taken for diseases of the kidneys.

Ipomœa bracteata Cav. Ic. v. 51, t. 447 (1799). Agiabampo, October 3 to 15, 1890. Letter D.

Ipomœa nelsoni Rose, sp. nov. Climbing, abundantly hirsute: leaves cordate, with open sinus, obtuse to somewhat acuminate, 1½ to 3 inches long (peduncles mostly shorter, sometimes longer) glabrous or nearly so: peduncles slender, longer than

the leaves, glabrous, 2- to 12-flowered; calyx 1 line long, the lobes oblong-ovate, obtuse; corolla funnel-form, glabrous, 9 to 12 lines long, orange color: stamens included: style included, stigma 2-lobed: capsule glabrous, 2 lines in diameter, 2-celled, 4-ovuled, 2- to 4-seeded.—A great climber over fences and bushes. Very common in the bottom of a creek near where it empties into the lagoon. Manzanillo, March 2 to 18, 1891. No. 1363. Also collected by E. W. Nelson in a deserted field near the town of Tuxtepec, Oaxaca, April 9, 1894. No 318.

For illustration see Pl. xxxv.

This is a very handsome climber and well worthy of cultivation.

I have grown specimens in the greenhouse of the Agricultural Department, as has also Dr. B. L. Robinson at Cambridge. It is a very delicate little vine and its yellow flowers are very attractive.

Near to *I. microsepala* Benth. (Bot. Voy. Sulph. 136), which species I have not seen. Mr. Helmsley writes me, however, that "*I. microsepala* has quite a narrow corolla", and that he also takes Palmer's plant to be new.

Ipomœa pes-capræ Roth, Nov. Pl. Sp. 109 (1821); *Convolvulus pes-capræ* L. Sp. Pl. i. 159 (1753). Manzanillo, December 1 to 31, 1890. No. 1055.

Ipomœa peduncularis Bertol. Fl. Guatem. 8, t. 2 (1840). Colima, January 9 to February 6, 1891. No. 1104.

Ipomœa quinquefolia L. Sp. Pl. i. 162 (1753). Flowers white. Along the banks of a lagoon. Manzanillo, December 1 to 31, 1890. No. 1017. Only a single plant seen.

Ipomœa sidæfolia Choisy, Mem. Soc. Phys. Genev. vi. 459 (1833). A high-climbing plant and an abundant bloomer: flowers white with the tube blotched with purple. Along the side of the river emptying into the lagoon at Manzanillo, December 1 to 31, 1890. No. 1049.

Ipomœa umbellata (L.) G. F. W. Mey. Prim. Fl. Esseq. 99 (1818) not L; *Convolvulus umbellatus* L. Sp. Pl. 155 (1753). Colima, January 9 to February 6, 1891. No. 1099. The flowers, which are yellow, open late in the morning and do not close until late in the day.

Ipomœa sp. Low climber, glabrous: leaves pinnate or pedately 7-parted; segments glabrous, linear to linear-lanceolate, more or less toothed: petioles short: peduncles 1½ to 2 inches long, 1- to 2-flowered; petioles 6 to 12 lines long, much thickened in fruit: sepals imbricate, equal, 5 to 6 lines long, oval to oblong, rounded at apex with a scarious margin: corolla in bud covered with long silky hairs tinged with yellow, wheel-shaped with a slender tube shorter than the calyx: anthers partly exserted and twisted. No. 781.

This species belongs to Choisy's sub-section *Multilobæ* of *Strophipomæa* as laid down in DC. Prod. vol. ix. As considered by others, it would be referred to the section *Operculina;* for although the capsule is not strictly circumscissile, yet it is clearly differentiated into an upper and lower part. A. Peter in Engler and Prantl, Pflanzenf. keeps *Operculina* distinct from *Ipomæa* on account of the capsule, but I do not find that this character holds in the Mexican species. *I. rhodocalyx* Gray has a very different leaf and corolla from my species, but the capsule has very thin valves throughout, irregularly breaking apart.

Ipomœa sp. Trailing or low-climbing plant: leaves palmately parted: corolla purplish. Common on mountain side. Manzanillo, December 1 to 31, 1890. No. 1031.

Ipomœa sp. Low climber: leaves cordate and with a deep sinus: flowers in umbellate clusters: corolla pinkish. At base of mountains. Manzanillo, December 1 to 31, 1890. No. 978.

Ipomœa sp. A low climber. Not common. Agiabampo, October 3 to 15, 1890. No. 774.

Evolvulus linifolius L. Sp. Pl. ed. 2. i. 392 (1762). Only a few specimens seen. Manzanillo, December 1 to 31, 1890. No. 952.

Cuscuta sp. Manzanillo, December 1 to 31, 1890. No. 948.

Cuscuta sp. Manzanillo, December 1 to 31, 1890. No. 949.

SOLANACEÆ.

Solanum amazonium Ker, Bot. Reg. i. t. 71 (1815). A very thorny shrub, 2½ feet high. Manzanillo, December 1 to 31, 1890. No. 1035.

Solanum callicarpæfolium Kunth & Bouche in DC. Prod. xiii. pt. 1. 107 (1852). Five to six feet high: flowers dull white: fruit yellow. Along the margin of the lagoon and in the neighboring swamps. Manzanillo, December 1 to 31, 1890. No. 1051.

Solanum grayi Rose, Contr. Nat. Herb. i. 108 (1891). Stems 3 feet high. Common on grassy bottoms. Colima, January 9 to February 6, 1891. No. 1202.

This species was recently collected by W. G. Wright (determined by Dr. B. L. Robinson) near Mazatlan.

Solanum tequilense Gray in Watson, Proc. Amer. Acad. xxii. 441 (1887). Two to three feet high: flowers white: fruit yellow. Colima, February 27 and 28, 1891. No. 1327.

Probably this species, although the spines are fewer and stouter. Only a few flowers and 2 leaves were obtained.

Solanum triste Jacq. Enum. Pl. Carib. 15 (1760). Shrub 4 feet high. In swamps across the bay from Manzanillo, December 1 to 31, 1890. No. 1001.

Solanum sp. Shrub about 6 feet high: branches and leaves more or less prickly: leaves entire or repandly toothed: flowers white. Colima, January 9 to February 6, 1891. No. 1179.

Capsicum baccatum L. Mant. i. 47 (1767). Agiabampo, October 3 to 15, 1890. No. 772.

This small pepper, which is very common all over the State of Sonora, is much used by the Mexicans. Some years capsules are gathered in great quantities and shipped to San Francisco, where they are made into pepper sauce.

Cestrum macrophyllum Vent, Choix. 18 (1803). Shrub, 5 feet high. Colima, January 9 to February 6, 1891. No. 1246.

Nicotiana plumbaginifolia Viv. El. Pl. Hort. Bot. Dinegro, 26 (1802). Colima, January 9 to February 6, 1891. No. 1121.

SCROPHULARIACEÆ.

Russelia sarmentosa Jacq. Select. Stirp. Amer. 178, t. 113 (1763). On the mountain sides. Manzanillo, December 1 to 31, 1890. No. 954.

Stemodia palmeri Gray, Proc. Amer. Acad. xxi. 403 (1886). Among rocks along a river. Colima, January 9 to February 6, 1891. No. 1252.

Stemodia parviflora Ait. Hort. Kew. ed. 2. iv. 52 (1812). Habitat similar to that of above species. No. 1178.

Stemodia durantifolia Swartz, Obs. 240 (1791). Along a ditch. Colima, January 9 to February 6, 1891. No. 1112.

Herpestis chamædryoides H. B. K. Nov. Gen. et Spec. ii. 369 (1817). Common. Colima, January 9 to February 6, 1891. No. 1237.

Herpestis monnieria (L.) H. B. K. Nov. Gen. et spec. ii. 366 (1817); *Gratiola monnieria* L. Amoen. Acad. iv. 306 (1759). Common about the lagoon at Manzanillo, March 2 to 18, 1891. No. 1376.

Scoparia dulcis L. Sp. Pl. ed. 2.i. 168 (1762). Manzanillo, December 1 to 31, 1890. No. 894.

Capraria saxifragæfolia Cham. & Schlecht. Linnæa, v. 105 (1830). Near the base of the mountains. Manzanillo, December 1 to 31, 1890. No. 917.

Buchnera mexicana (?) Hemsley, Biol. Cent.-Amer. ii. 457 (1882). Colima, January 9 to February 6, 1891. No. 1168.

Specimens found in poor condition, and hence the specific determination is somewhat uncertain.

BIGNONIACEÆ.

Bignonia unguis-cati (?) L. Sp. Pl. ii. 623 (1753). Climbing over small trees and bushes. Manzanillo, December 1 to 31, 1890. No. 1072.

This is doubtfully referred here, as the specimens are without flowers or fruit, but it agrees with C. Wright's specimens from Nicaragua collected on the Ringgold and Rogers Exploring Expedition, 1853-1856.

Tabebuia donnell-smithii Rose, Bot. Gaz. xvii. 418, t. 26 (1892). A tree 50 to 75 feet high, often 4 feet in diameter: leaves palmately compound on long peduncles 5 to 10 inches long; leaflets 7, very variable in size (the largest on petiolules 1 to 3½ inches long), oblong to ovate, acuminate, rounded or truncate at base, serrate, glabrate in age, 2 to 10 inches long, often 3 inches broad: flowers arranged in a large terminal panicle of small cymes, 8 inches long, with short glandular-pubescence throughout: cymes few-flowered, with deciduous scarious bracts; pedicels 6 lines long: calyx closed in bud, deeply cleft and two-lipped in flower, 6 lines long: corolla yellow, tubular, 5-lobed; tube 1 to 1½ inches long; limb 1½ inches broad: stamens 4, included, didynamous; filaments incurved, glabrous except at base; anther cells glabrous, oblong; sterile filament 1½ lines long: ovary sessile: pods 12 inches or more long, 10-ribbed, glandular-pubescent and loculicidally dehiscent: seeds in 2 rows. Common on the mountains about Colima and cultivated about the town. Collected by Capt. John Donnell Smith, at Cuyuta in the department of Escuintla, at an altitude of 200 feet, April, 1890, No. 2070; and, also, by Dr. Edward Palmer, at Colima, January 9 to February 6, 1891. No. 1098.

This is said to be one of the most beautiful trees of Mexico, and is called "Primavera." The flowers are of a beautiful golden yellow, produced in great abundance, and generally appearing before the leaves. The trees are often large, sometimes 4 feet in diameter, and the wood very valuable. The trunks are cut into logs about 12 feet in length and shipped from Manzanillo, in the State of Colima, to the United States, principally to Cincinnati and San Francisco, where they are much used for cabinetwork and veneering. The tree is very common in the lower part of the department of Escuintla; it is tall and slender, usually leafless, and with the profuse delicate yellow flowers standing out against the sky like golden clouds.

The following note is from a letter of J. D. Smith, January 7, 1892: "The trees were too branchless for my servant to climb, too stout for him to fell with his machete, and too high for me to discern what manner of leaves were those which occasionally showed themselves among the flowers. My flowers were all picked up on the ground. I think there must be many trees in those countries of which botanists have not been able easily to collect specimens, and which, therefore, remain unknown."

I have not been able to place in any known species this interesting tree. It seems curious that a tree so widely distributed, of such attractive flowers, and of some commercial importance should have remained unknown to botanists. The species, while not agreeing in all respects with *Tabebuia*, answers better to this than to any other known genus. In its inflorescence and ribbed pods it is more like *Godmannia* and *Cybistax*, but does not agree in other particulars.

Since the above description of this tree was published by me in the Botanical Gazette I have written to several New York dealers in imported woods and learn that they are well acquainted with it. I give two of these letters. Mr. John R. Graham wrote, under date of December 29, 1892:

"Replying to your postal, 'Primavera' or 'white mahogany' are the two names for the same wood, which grows in Mexico. It is used largely in the manufacture of fine furniture and interior decoration. We handle it in the logs and lumber, also veneers. Worth from 12 cents per foot in the log to 15 to 25 cents in lumber."

William E. Uptegrove & Bro. write, under date of December 29, 1892:

"We do handle 'Primavera' or 'white mahogany.' The two names are used for the same wood. The former is correct. It is a native of Mexico. That growing on the west coast is the best. It is used only moderately and costs somewhat higher than 'red' mahogany. We do not consider it a desirable cabinet wood."

A condensed account of the original description is given in Hardwood (vol. iii. 21), by Geo. B. Sudworth.

Prof. C. S. Sargent, in Garden and Forest (vol. VI, p. 12), says:

"In the December issue of The Botanical Gazette there is a figure reproduced from one of Mr. Faxon's drawings of a species of *Tabebuia*, a native of Mexico and Central America, which Prof. Rose, of the Department of Agriculture, describes as a new species, and which he dedicates to Mr. John Donnell Smith, of Baltimore, its discoverer. For the last twelve or fifteen years a handsome, light-colored wood has been imported into the market of San Francisco from the west coast of Mexico, and is said to have been produced by a tree called 'Prima vera.' This wood, of late years, has been quite extensively brought into the Eastern markets under the name of 'white mahogany,' and is now considered here one of the most valuable and useful of all cabinet woods. Its origin has long remained unknown, and although there may be still some doubt as to the identity of white mahogany with the 'Primavera' of Manzanillo, Prof. Rose's note gives the indication of the direction in which further investigations of the origin and source of supply of this wood should be made."

Tecoma stans (L.) Juss. Gen. Plant. 139 (1789); *Bignonia stans* L. Sp. Pl. ed. 2. ii. 871 (1763). Collected in the public square at Guaymas, July 30, 1891.

This plant is commonly cultivated in Mexico for its handsome flowers.

Parmentiera sp. A small tree, 12 feet high with horizontal branches: leaves in fascicles of 2 to 5 subtended by a single spine; leaflets 3, obovate, obtuse, entire or toothed towards the apex; petioles slightly winged, about the length of the leaflets: pods 10 inches long, yellow. In shady woods about Manzanillo, March 2 to 18, 1891. No. 1347.

This species differs certainly from *P. cereifera* and *P. edulis*, which by some are considered the only two species; from the former it differs in its pods, acuminate leaflets and calyx: from the latter, in its pods, etc. Miers considered there were six species; of these it seems nearest to *P. foliolosa*, but differs in being spiny; *P. aculeata* has similar spines, but its leaflets are often simple; in *P. lanceolata* all the leaflets are simple; *P. alata* has very properly been referred to the genus *Crescentia*.

Mr. John Donnell Smith has since written me that he has in his collection two numbers which he considers the same as mine, which he has referred to *P. edulis*.

ACANTHACEÆ.

Calophanes sp. Armeria, February 15, 1891. No. 1274.

Calophanes sp. Compact plant, 2 to 3 feet high: leaves oblong, acuminate, tapering at base into a short petiole, glabrous beneath, slightly scabrous above, 3 to 6 inches long; upper leaves smaller and narrower: flowers axillary or forming leafy spikes: calyx puberulent; tube 2 lines long; lobes unequal, filiform 3 to 4 lines long: corolla violet, puberulent without, 1½ to 1¾ inches long; tube slender; lobes obtuse, equal, spreading: stamens 4, nearly equal, slightly

exserted; anthers 2-celled, obtuse at base: capsule slightly compressed, 5 lines long including the short stipe, cinereous-puberulent: seeds 4 (2 to each cell), much flattened. Armeria, February 15, 1891. No. 1286.

This species has the stamens of *Ruellia*.

A peculiar form growing with the above has short woolly pubescence and bright crimson flowers. No. 1287.

Ruellia albicaulis Bertero, in Spreng. Syst. Veg. ii. 822 (1825). Flowers lilac. A very common plant growing in thick shady woods. Colima, February 27 and 28, 1891. No. 1321.

In this species the ovules are only 2 in each cell and only one in each cell matures. In this respect the species has the character of *Calophanes*. This peculiarity I find holds in J. D. Smith's Guatemala plant as well as in that of C. Wright from Nicaragua.

Ruellia tuberosa L. Sp. Pl. ii. 635 (1753). Along creek bottoms. Agiabampo, October 3 to 15, 1890. No. 757.

Ruellia sp. Flowers lilac color. Among underbrush along a river bank. Colima, February 27, 1891. No. 1313.

Blechum brownei Juss. Ann. Mus. Par. ix. 270 (1807). This is a very common plant about the mouth of the river which enters the lagoon near Manzanillo. It grows in the shade. March 2 to 18. No. 1357.

Justicia mexicana Rose, sp. nov. An upright shrub, sometimes 6 feet high, glabrous or nearly so: leaves short-petioled, ovate, acuminate, glabrous or with some appressed pubescence: flowers few on short axillary branches: bracts 3, linear, 6 lines long: bractlets filiform: calyx deeply 5-cleft, its lobes 3 lines long: corolla scarlet, 1½ inches long, puberulent, deeply bilabiate; upper lip erect, entire or with a slight notch; lower lip spreading, 3-cleft: stamens 2; anthers 2-celled, unequally exserted, the lower one slightly mucronate: capsule 2 lines long, on a stipe of equal length, glabrous, 2-celled, 4-seeded: seeds reddish, glabrous.—In rich bottoms, growing in shade. Agiabampo, October 3 to 15, 1890. No. 788.

This species is near *J. palmeri*, but with more acuminate leaves, narrower bracts, etc.

Justicia paniculata Rose, sp. nov. One or two feet high, much branched, glandular-pubescent and somewhat villose, older parts with whitish bark and glabrate: leaves lanceolate, acute, or slightly acuminate, or lower ones oblong to oval and obtuse, cuneate at base into a short petiole, pubescent beneath, becoming glabrate above: panicles sometimes axillary, 2 to 4 inches long: flowers sessile: bracts and bractlets small, filiform, 1½ lines long: calyx deeply 4-parted into filiform lobes 4 lines long, glandular-pubescent: corolla somewhat swollen, "white, tinted with mauve," 5 to 6 lines long, two-lipped; lower lip 3-lobed, spreading; upper lip erect, rostrate, and bidentate: stamens 2; anther cells 2, oblique, hairy on the back, separated by a broad connective, broader above; lower cells appendiculate or coalescing with the connective: style a little hairy below and also the ovary: capsule 6 to 8 lines long, puberulent, 4-seeded: seeds 1½ lines in diameter with a short, thick pubescence.—Along a river bottom in the shade. Only three plants seen. Colima, January 9 to February 6, 1891. No. 1143.

Dianthera (?) sp. Leaves oblong, 3 to 4 inches long, on short petioles, acute: flowers in long, slender, unilateral spikes: corolla 2-lipped; upper lip entire, lower lip 3-lobed: stamens, 2; filaments broadened; anther cells 2, unequally inserted: capsules 5½ lines long including the slender stipe, acuminate, cells each 2-seeded: seeds very flat, cordate, papillose.—On the mountain sides about Manzanillo, December 1 to 31, 1890. No. 892.

These specimens are in fruit, but from some buds the flower characters were made out. This resembles *Carlowrightia*, but the stamens seem to place it in the above genus.

Carlowrightia arizonica Gray, Proc. Amer. Acad. xiii. 364 (1878). A diffuse shrub, sometimes 3 feet high: largest leaves 1 inch long, jointed near the base.—Growing among other shrubs. Agiabampo, October 3 to 15, 1890. No. 769.

Only a few specimens were collected and these are in fruit with no flowers.

Jacobinia auriculata Rose, sp.nov. Two to three feet high: branches sharply 4-angled: leaves glabrous, 3 to 6 inches long, broadly lanceolate, acuminate, tapering into a winged petiole with an auriculate base: flowers in a dense panicle of racemes, bracts and bractlets small: peduncles in fruit 6 lines long: calyx 2 lines long, deeply cleft into 5 equal acuminate sepals: corolla crimson, 1 inch long, 2-lipped; upper lip 2-lobed: stamens 2, inserted at the top of the slender corolla tube: anther cells 2, equal and parallel: capsule 12 to 15 lines long (including the very slender stipe), glabrous: cells 2-seeded: seeds 2½ lines in diameter.—Colima, February 27 and 28, 1891. No. 1323.

Jacobinia sp. Four to five feet high, somewhat open: leaves ovate-lanceolate, acuminate, cuneate at base, 2 to 3 inches long, glabrous or a little villose on the veins, short petioled: flowers in small, axillary or terminal clusters: bracts filiform, 5 to 6 lines long, slightly hairy; bractlets 2, similar but shorter: calyx puberulent, 2 lines long, cleft below the middle into 5 ovate-acuminate lobes: corolla scarlet, puberulent without, 15 lines long, 2-lipped; upper lip (interior in bud) erect, entire; lower lip 3-cleft to near the middle: stamens 2, each 2-celled; anther cells parallel, almost equally inserted, oblong, 1 line long, muticous at base: capsule (including the stipe) 7 lines long, 2-celled, 2 seeds to each cell; seeds 1 line in diameter, roughened. In shade of bushes in the mountains. Manzanillo, December 1 to 31, 1890. No. 946.

With only scanty material and scattered descriptions of the various species of this genus, I think it is best not to name what seems to be a new species.

Dicliptera resupinata (Vahl) Juss. Ann. Mus. Par. ix. 268 (1807); *Justicia resupinata* Vahl, Enum. Plant. i. 114 (1804). Colima, January 9 to February 6, 1891. No. 1171.

Tetramerium aureum Rose, sp. nov. Two to three feet high, with numerous branches, hispid- and short glandular-pubescent: leaves ovate to lanceolate, rounded at base, 1 to 2½ inches long, 9 to 12 lines broad, strongly nerved at base: bracts 4 to 5 lines long, oblong to spatulate-oblong, obtuse; bracteoles 2, linear-oblong, obtuse, 3 to 4 lines long, 1-nerved: calyx deeply 5-parted with slender lobes 2 lines long: corolla yellow, 1 inch long; tube slender, 3 to 4 lines long; lobes 4: stamens 2; anthers 2-celled, parallel: ovary glabrous, 3 lines long, 2-celled; cells 2-seeded.—Common in shady woods. Colima, January 9 to February 6, 1891. No. 1302.

The bracteoles are like those of *Dicliptera*, but the corolla is that of *Tetramerium*.

Tetramerium (?) diffusum Rose, sp. nov. Annual, diffuse, much branched, rooting at the nodes: leaves ovate to lanceolate, acute or obtuse: flowers in loose terminal spikes: bracts and bractlets 3 to 4 lines long, narrowly oblong: calyx very small, deeply cleft into unequal lobes: corolla 2-lipped; lower lip deeply 3-parted: stamens 2, 2-celled; cells parallel: capsule small, 2 lines long on a very short thick stipe: cells 2-seeded, papillose-roughened.—Near the ocean among the rocks. Manzanillo, December 1 to 31, 1890. No. 994.

The bractlets are those of *Dicliptera*, but the corolla does not agree.

Tetramerium hispidum Nees in DC. Prod. xi. 468 (1847). Very common along river bottoms. Colima, January 9 to February 6, 1891. No. 1132.

Tetramerium tenuissimum Rose, sp. nov. A foot or so high with many slender branches: leaves narrowly-oblong to ovate, obtuse or acute, 1 to 2 inches long: spikes short, terminal: bracts ovate, apiculate, 3 to 4 lines long, 3-nerved at base: bractlets 2; filiform, 2 to 3 lines long, longer than the calyx: calyx 5-parted into filiform lobes: corolla white, 4 lines long, 2-lipped, lower lip exterior, deeply 3-cleft; upper lip entire; stamens 2, anterior, inserted at the top of the short corolla

tube: filaments hairy below; anther-cells 2, oval, equal, parallel: capsule puberulent, 2 lines long, 4-seeded; placenta separating from the valves: seeds ½ line in diameter, papillose.—A very common plant growing in the shade. Colima, February 27 and 28, 1891. No. 1297.

I have not seen the little known *T. ovalifolium*, but I judge that my plant is clearly distinct. Besides this, the former was collected farther south.

Henrya scorpioides (L.) Nees in DC. Prod. xi. 491 (1847); *Justicia scorpioides* L. Sp. Pl. ed. 2. i. 21 (1762). Low, of spreading habit, 8 to 12 inches high, involucre 3½ lines long: corolla white: capsule 2 to 2½ lines long: seeds ½ line in diameter. Manzanillo, March 2 to 18, 1890. No. 1330a.

Dr. Palmer sends another plant from near the same place, which differs considerably from it in habit. Branches very long and slender, rooting at the joints: leaves more oval, on very long petioles, beneath glabrate; involucre very pilose, less glandular, the appendiculation stronger. In shade at the edge of a lagoon. March 2 to 18, 1891. No. 1330.

Bentham in Botany Sulphur speaks of this genus as being a shrub. Our specimens, while the plants are probably perennial, having a small, indurated root, can not bear the dignity of shrubs.

The restoration of the *Henrya* of Nees supplants the *Henrya* of Hemsley (Journ. Linn. Soc. xxvi. 111), and which that author has recently (Bull. Torr. Club, xix. 97) renamed *Neohenrya*.

FIG. 9.—The corolla of *Barleria micans* split open, showing the stamens.

Barleria micans Nees in Benth. Bot. Voy. Sulph. 146 (1844). One to two feet high: leaves 8 to 10 inches long, narrowly oblong to oblong-lanceolate. A very showy plant. Growing in shade. Colima, January 9 to February 6, 1891. No. 1144.

Dr. Palmer's notes state that the flowers are sulphur-yellow, but this must be a mistake; in the herbarium specimens they area dark violet.

In this species only the 2 anterior stamens are developed, but there are 3 small scaly hairy staminodia at the base of the corolla.

VERBENACEÆ

Lantana camara L. Sp. Pl. ed. 2. ii. 874 (1763). Found only in poor condition. Manzanillo, December 1 to 31, 1890. No. 1059.

The drupes are called "Moro," and are sometimes eaten.

Lantana involucrata L. Amœn. Acad. iv. 319 (1759). Common along river banks. Colima, February 27 and 28, 1891. No. 1303.

Lippia sp. Colima, January 9 to February 6, 1891. No. 1199.

Bouchea dissecta Watson, Proc. Amer. Acad. xxiv. 68 (1889). Agiabampo, October ; to 15, 1890. Letter B.

Priva echinata Juss. Ann. Mus. Par. vii. 69 (1806). A few specimens obtained from the mountains. Manzanillo, December 1 to 31, 1890. No. 1007, and also No. 1093, which is infested by peculiar gall-insects.

Verbena polystachya H. B. K. Nov. Gen. et Spec. ii. 274 (1817). Very common on grassy plains. Colima, January 9 to February 6, 1891. No. 1156.

Citharexylum sp. Colima, February 27 and 28, 1891. No. 1326.

LABIATÆ.

Hyptis capitata Jacq. Coll. i. 102 (1786). Along river bottoms. Colima, January 9 to February 6, 1891. No. 1174.

Hyptis stellulata Benth. Lab. Gen. et Spec. 129 (1833). Three to five feet high, Along the river bottom. Colima, January 9 to February 6, 1891. No. 1203,

Hyptis pectinata (L.) Poit. Ann. Mus. Par. vii. 474, t. 30 (1806); *Nepeta pectinata* L. Sp. Pl. ed. 2. ii. 799 (1763). Found at the base of the mountains. Manzanillo, December 1 to 31, 1890. No. 993.

Hyptis polystachya H. B. K. Nov. Gen. et Spec. ii. 321 (1817). Colima, January 9 to February 6, 1891. No. 1134.

Hyptis suaveolens (L.) Poit. Ann. Mus. Par. vii. 472, t. 29, f. 2 (1806); *Ballota suaveolens* L. Syst. ed. 10. ii. 1100 (1759). Manzanillo, December 1 to 31, 1890. No. 913.

The seed is called "Chana" at Colima and Manzanillo, but elsewhere it is known as "Chia granda." The "Chia" proper is the fruit of a *Salvia*. This species is collected in considerable quantities and sold in the markets under the above names. With sweetened water it makes a cool, refreshing drink, much used by the sick. The roots are also gathered and used medicinally.

Dracocephalum moldavica L. Sp. Pl. ii. 595 (1753). Flowers white. Colima, January 9 to February 6, 1891. No. 1225.

This is a medical plant much used by the Mexicans and sold in the market at Colima. It is probably cultivated in the gardens, but it was not seen by Dr. Palmer in any of his excursions.

The specimen from southern Mexico, doubtfully referred by Mr. Hemsley to *D. parviflorum*, could hardly be confused with this species.

NYCTAGINACEÆ.

Boerhavia erecta L. Sp. Pl. i. 3 (1753). Common plant growing in sand along the beach and margins of the lagoons. Manzanillo, December 1 to 31, 1890. No. 907.

Boerhavia erecta L. form (?). Stems purplish: "flowers white;" stamens 3. On sandy plains. Agiabampo, October 3 to 15, 1890. No. 758.

Boldoa lanceolata Lag. Gen. et Spec. Nov. 10 (1816). Colima, January 9 to February 6, 1891. No. 1204.

Pisonia aculeata* L. Sp. Pl. ed. 2. ii. 1511 (1763). Colima, January 9 to February 6, 1891. Nos. 1114 and 1115.

Mr. Watson says of it in a letter dated October 23, 1891. "That must be *Pisonia aculeata*. We have seen the same thing essentially from the West Indies and Brazil, and the variety *hirsutissima* is described as having the cymes corymbose-capitate."

Cryptocarpus globosus H. B. K. Nov. Gen. et Spec. ii. 187, t. 123 (1817). Bushy plant, 4 feet high: largest leaves 12 inches long, including the long petioles: flowers dull white, perianth pubescent, with granular and hooked hairs: stamens 3: style lateral. Manzanillo, December 1 to 31, 1890. No. 950.

I have not seen specimens of *C. globosus*. My specimens differ from the description of that species in having only 3 stamens and much larger leaves.

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* *Pisonia aculeata* L. Guaymas, April 1 and 2, 1891. No. 175a. Specimens of this plant are again collected by Dr. Palmer. The following note was sent me by the late Dr. Watson:

"*Cryptocarpus (?) capitatus* Watson [Proc. Amer. Acad. xxiv. 71 (1889)]. Fresh specimens of this doubtfully named species, collected by Dr. Palmer at Guaymas, show it to be a form of the widely-distributed and very variable *Pisonia aculeata*. It does not differ essentially from the var. *hirsutissima* Schmidt. Fl. Bras. xiv. 354, distinguished by its blunt obovate leaves and dense, short-hirsute pubescence. The want of spines (they are few on these specimens also), the unusual form of the leaves, and the presence of only staminate flowers served to effectually disguise Dr. Palmer's original specimens."—S. W.

AMARANTACEÆ.

Celosia (?) monosperma Rose, sp. nov. Shrub, 8 to 16 feet high, glabrous: leaves lanceolate, 3 to 6 inches long, acute or shortly acuminate, cuneate at base; panicles terminal large, often 1 foot long, slightly pubescent: bracts and bractlets ovate, acute, ½ line long: segments of the perianth oblong, 1 line long, acute: stamens 5, united at base into a shallow membranaceous cup; anthers 2-celled; intermediate appendages none: styles none: stigmas 2, reflexed, acute: utricle stipitate, ovoid, compressed, circumscissile, shorter than the perianth: ovule 1, suspended from an elongated funiculus: seed pendulous, lenticular, shining; aril none.—Very common on the mountains near Manzanillo, December 1 to 31, 1891. No. 887.

The following note has been sent me by Dr. Hans Schinz in regard to this species:

"I have to thank you very much for having sent me the very interesting *Amarantaceæ*. No doubt your *Celosia monosperma* is a very interesting and puzzling plant, but I also take it for a *Celosia*. Unfortunately, most of the flowers are destroyed by a little beetle, so that I could not make out for sure if the anthers are 2-celled or 1-celled, but as you say in your description that they are 2-celled it *can not* be anything else than a *Celosia*. The *Celosia monosperma* does not stand alone, for the different species that were formerly united under the name *Lagrezia* generally have but one or two seeds."

Celosia moquini Guillem. in DC. Prod. xiii. pt. 2. 239 (1849). An upright plant, 4 to 8 feet high: utricle circumscissile: ovules 2. Along fences in river bottoms. Colima, January 9 to February 6, 1891. No. 1208.

This plant is referred as above, although I have not seen other specimens of the species.

Very little is known of this species. It was probably collected by Bonpland, and is No. 354 of Ghiesbreght. The localities from which these collectors obtained the plant is not known. Perhaps Ghiesbreght obtained his specimens from near this locality. He seems to have visited Colima, although I find very few species of this region credited to him. A type specimen is said to be in Herb. Mus. Paris.

Moquin was uncertain whether the utricle was circumscissile or not. My specimens, while not quite mature, clearly show that the utricle is circumscissile.

Chamissoa altissima (Jacq.) H. B. K. Nov. Gen. et Spec. ii. 197, t. 125 (1817); *Achyranthes altissima* Jacq. Enum. Pl. Carib. 17 (1760). Common along the base of the mountains and near the lagoon. Manzanillo, December 1 to 31, 1890. No. 1023.

Amarantus sp. Sepals 5: stamens 5: stigmas 3. Manzanillo, December 1 to 31, 1890. No. 1000.

This seems to be a common species, but it does not agree with any represented in the National Herbarium.

Acnida cannabina L. Sp. Pl. ii. 1027 (1753). Stems 2 feet high. Grows along the edge of the lagoon. Manzanillo, March 2 to 18, 1891. No. 1399.

Only the staminate form of this species was obtained and it can not be definitely referred here. So far as I can learn, neither this species nor any other *Acnida* has been reported from Mexico.

Achyranthes aspera L. Sp. Pl. i. 204 (1753). Common along the base of the mountain and about the lagoon. Manzanillo, December 1 to 31, 1890. No. 1032.

Telanthera gracilis (?) Moq. in DC. Prod. xiii. pt. 2. 375 (1849). Shrubby, 5 to 8 feet high: leaves lanceolate, long-acuminate, tapering at base into a short petiole, glabrous or nearly so, 3 to 7 inches long, 1 to 2 inches wide: inflorescence irregularly trichotomously branched or in umbellate clusters of 3 to 5 rays: heads small, white, either on short pedicels or in glomerate clusters: calyx 5-parted, 2½ lines long, nerveless, long-pilose on the back; stigmas capitate. Common in the mountains. Manzanillo, December 1 to 31, 1890. No. 886.

I have referred my plant as above without having seen any specimens of that species. It differs from the description in some slight details and it has not been collected so far north before.

The foliage is rather coarse, but Dr. Palmer writes that the white flowers are very attractive and he thinks it would be a good plant for ornamental cultivation.

Gomphrena decipiens Watson, Proc. Amer. Acad. xxi. 437 (1886). In bottom lands.

Gomphrena decumbens Jacq. Hort. Schoenbr. t. 482 (1804). Manzanillo, December 1 to 31, 1890. No. 911. Agiabampo, October 3 to 15, 1890. No. 793.

Frœlichia sp. Leaves oblong to oval, 1 to 2 inches long, obtuse or acutish: fruiting calyx flattened, 2-winged. Colima, January 9 to February 6, 1891. No. 1133.

This species belongs to the section containing *F. tomentosa* and *F. alata*, and is very near the latter, but the leaves are somewhat different.

Iresine interrupta Benth. Bot. Voy. Sulph. 156 (1844). Large leaves ovate, 6 to 8 inches long, including the petiole; flowers pistillate. Manzanillo, December 1 to 31, 1890. No. 1074.

Other specimens, with similar leaves, but with smaller heads, were collected, which are provisionally referred here. No. 932. The staminate plant was found very common about Colima, along streams. January 9 to February 6, 1891 No. 1211.

To this species, apparently, should have been referred Palmer's No. 389, from Alamos.

Iresine celosioides L. Sp. Pl. ed. 2. ii. 1456 (1763). Common along river bottoms. Colima, January 9 to February 6, 1891. No. 1206.

PHYTOLACCACEÆ.

Rivina humilis L. Sp. Pl. i. 121 (1753). The typical form. Agiabampo, October 3 to 15, 1890. No. 782. Also the pubescent form. About Manzanillo, December 1 to 31, 1890. No. 1034.

I find no character except the pubescence to distinguish these specimens, and it appears very doubtful whether there should be two species recognized, as some botanists hold.

Petiveria alliacea L. Sp. Pl. ed. 2. i. 486 (1762). Manzanillo, December 1 to 31, 1890. No. 942.

Stegnosperma halimifolia Benth. Bot. Voy. Sulph. 17, t. 12 (1844). Armeria, February 15, 1891. No. 1280.

POLYGONACEÆ.

Coccoloba sp. A small tree, 30 feet high, with large top: leaves coriaceous, oblong to broadly obovate, 4 to 6 inches long, 2½ to 3½ inches broad, rounded at apex, oblique and more or less tapering at base, glabrous on both sides, with veins rather prominent beneath; petioles 6 to 9 lines long; sheaths 3 to 4 lines long, truncate, glabrous, very tardily deciduous: spikes single, 6 to 10 inches long: perianth 5-parted: stamens 8: fruit sessile, solitary in the axils of the bracts, somewhat fleshy when mature, ovate, 4 to 5 lines long. Manzanillo, March 2 to 18, 1891. Letter G.

Collected in flower by Marcus E. Jones at Manzanillo, June 25, 1891. No. 5. This seems to be an unnamed species.

Coccoloba sp. Diffuse shrub, 5 to 8 feet high, glabrous or the younger parts puberulent: leaves thinnish, oblong, 3 to 4 inches long, rounded at apex, oblique at base, reticulated and puberulent: petiole 2 to 3 lines long: sheath 2-lobed, puberulent: racemes slender, single or somewhat branching, 4 to 8 inches long: pedicels 1 to 2 lines long: fruits small, "red". Rare. On the mountain sides. Manzanillo, December 1 to 31, 1890. No. 965.

These two species are very similar, but the former may be distinguished from the latter by its larger, thicker, glabrous leaves and sessile fruit.

Antigonon flavescens Watson, Proc. Amer. Acad. xxii. 446 (1887). A very common climber found running over bushes and trees in various parts of the mountains. Manzanillo, December 1 to 31, 1890. No. 980.

ARISTOLOCHIACEÆ.

Aristolochia pardina Duch. Ann. Sci. Nat. ser. 4. ii. 47 (1854). A high-climbing shrub; the woody base ½ inch in diameter, the bark corky; the herbaceous branches glabrous or a little glaucous (except the margins, petioles, and axils of young leaves, these pubescent): leaves orbicular to broadly ovate with broad cleft, open or closed sinus, 5-nerved, somewhat reticulated, obtuse or retuse: flowers solitary, axillary, on slender peduncles 1½ to 3½ inches long: calyx "old gold, spotted with brown," oval, 4 to 5 lines in diameter; tube 9 lines long, obtuse or acutish; stamens 6; capsule many-seeded, oblong, 15 to 20 lines long: seeds 3 lines long. Colima, January 9 to February 6, 1891. No. 1247.

Very common in shade on hillside and river bottoms, climbing over bushes, trees, and fences.

The leaves are not as large as described by Duchartre.

I have not seen specimens of this species, but it has been collected about Colima by Ghiesbreght and Dugès. The species is only known from this locality. Mr. Hemsley thinks that this is the *Guaco mexicana* Liebm.

PIPERACEÆ.

Piper palmeri C. DC. sp. nov.; foliis modice petiolatis ovato-lanceolatis basi inæquali latere longiore rotundatis breviore subacutis apice acute acuminatis utrinque et subtus densius velutino-pubescentibus haud scabris, nervo centrali nervos adscendentes alternos utrinque 5 mittente, petiolo dense pubescente, basi vaginante, pedunculo petiolum æquante dense retrorsum pubescente, amento limbi dimidium superante in sicco flavescente, rhachi inter baccas fimbriolata, bracteæ pelta triangulari margine in sicco flavida hirsuta pedicello angusto hirsuto, bacca obpyramidato-trigona vertice carnosa puberulaque. In Colima ubi Natico dictum, Januario florens (Palmer n. 1227). Frutex 6 ped. altus ramulis retrorsum pubescentibus amentiferis 2 mm. crassis in sicco virescentibus, ramis glabris ligno duro. Limbi in sicco membranacei pallidi virescentes subopaci haud crebre pellucido-punctulati, ad 15 cm. longi ad. 5½ cm. lati. Petioli ad 1 cm. longi. Amenta apice obtusa, baccifera in sicco ad 4 mm. crassa. Stamina 4 antheris subglobosis parvis caducis. Bacca circiter 1 mm. longa. Stigmata 3 sessilia brevia.

Species *Piper pseudo-fuliginei* C. DC. (in Linnæa) proxima, limbis haud subobovatis nervorum numero minore amentisque haud apice mucronulatis ab eo sat discrepans.

Var. **manzanilloanum** C. DC. var. nov.; ramulis pubescentibus limbis tenuioribus amentis in sicco haud aut minus flavescentibus baccisque paulo minoribus a specie vix distinctum. Manzanillo, December 1 to 31, 1890. No. 1045.

Piper unguiculatum longifolium C. DC. var. nov.; limbis ad 10½ cm. longis baccis densius et longius hirtellis.

In Colima, ubi commune. Palmer n. 1120.

Piper umbellatum L. Sp. Pl. ed. 2. i. 43 (1762). Colima, January 9 to February 6, 1891. No. 1226.

Piper tuberculatum Jacq. Ic. Par. ii. 2, t. 211 (1786–'93). Colima, January 9 to February 6, 1891. No. 1213.

Piper realejoanum C.DC. Linnæa, xxxvii. 345 (1871–'73). Manzanillo, March 2 to 18, 1891. Nos. 1374 and 1332.

LAURACEÆ.

Sassafridium macrophyllum Rose, sp. nov. A diffuse shrub with numerous stems, 15 feet high: leaves alternate, obloug, 6 to 10 inches long, 1 to 3 inches broad, cuneate at base, acuminate, "emerald-green," shining, strongly veined beneath; petioles 3 to 6 lines long: panicles axillary and terminal, 4 to 8 inches long, including the peduncle; pedicels 3 to 5 lines long: flowers white, sweet-scented, 5 to 6 lines in diameter: calyx 6-parted, the outer considerably larger: perfect stamens 9, 4-celled, 4-valved, sessile; the three inner with a pair of glands at base; staminodia 3, capitate.—Very abundant in the wet bottom of a small creek on the opposite side of the bay from Manzanillo, December 1 to 31, 1890. No. 1033.

The only described species is *S. veraguense* from Nicaragua, although there are said to be 2 undescribed species from South America. My species differs from the above in having nearly all the parts much larger, especially the leaves; the latter are also acuminate, with stronger lateral veins, but the veinlets are not so strongly or regularly reticulated.

Meissner, in the original description of the genus (DC. Prod. xv. 171), as well as Benth. and Hook. (Gen. Plant. iii. 160), states that the berry is unknown. Charles Wright, however, collected mature fruit in Nicaragua as long ago as 1853–'56. The berry is oblong, glabrous, 6 to 8 lines long. By some mistake these specimens of Wright's were distributed under the name "*Daphnidium veraguense* Meissn."

Here I am inclined to refer J. N. Rovirosa's Nos. 35 and 15, although they have somewhat smaller leaves, and the No. 35 is said to be a tree 8 to 10 meters high. Rovirosa's specimens are from Tabasco and were collected November 6 and 20, 1887, respectively.

LORANTHACEÆ.

Loranthus sp. A common plant parasitic on *Bumelia*. Colima. January 9 to February 6, 1891. No. 1124.

Phoradendron sp. Manzanillo, December 1 to 31, 1890. No. 982.

EUPHORBIACEÆ.

Pedilanthus sp. Leaves oblong, small, 6 lines long, glabrous: peduncle glabrous: involucre glabrous, crimson, 6 lines long: upper lip small, 2-lobed; spur or appendage slender, 6 lines long: glands 2: glands and pedicels of male flowers glabrous: capsule 1 inch broad, crimson. Abundant in certain places in the rich bottoms. Agiabampo, October 3 to 15, 1890. No. 802.

This species seems near the specimens obtained by Dr. Palmer at Los Angeles Bay in 1887 and referred to *P. macrocarpa* by Mr. Watson. It seems very distinct, however, from that species.

Pedilanthus sp. Shrub, 2 to 3 feet high, glabrous: leaves thick and "leathery" glabrous, oblong to obovate, 3 to 5 inches long, peduncle pubescent: involucre very oblique, puberulent along the margins; 6 lines long: upper lip small, 2-lobed: perianth of 3 squamellæ: spur or appendage very short and obtuse: glands 3 or 4: stamens numerous; pedicels and filament glabrous. Colima, February 27 and 28, 1891. No. 1328.

Euphorbia californica Benth. Bot. Voy. Sulph. 49, t. 23B (1844). A tree-like shrub with trunk 6 feet high and with a very large top. Agiabampo, October 3 to 15, 1890. No. 756.

As first suggested by Mr. Watson, this species seems to include *E. hindsiana*, and with it also I am inclined to place the more recent species *E. comonduana* Millsp.

As the species is now construed its range extends in Mexico along the coast from Guaymas to Agiabampo and on both sides of the peninsula of Lower California as far north as Comondu. The bibliography of this species is as follows:

Boissier in DC. Prod. xv. pt. 2. 68; Watson, Proc. Amer. Acad. xxiv. 76; Zoë, i. 348; Brandg. Proc. Cal. Acad. ser. 2. iii. 170.

E. hindsiana Benth. Bot. Sulph. 51, t. 24; Boissier in DC. Prod. xv. pt. 2. 68; Millsp. Proc. Cal. Acad. ser. 2. ii. 229; Zoë, i. 348.

E. comonduana. Millsp. Proc. Cal. Acad. ser. 2. ii. 229; Contr. Nat. Herb. i. 77; Brandg. Proc. Cal. Acad. ser. 2. iii. 170.

Euphorbia capitellata laxiflora Watson, Proc. Amer. Acad. xxiv. 74 (1889). In shade along a creek bottom. Agiabampo, October 3 to 15, 1890. No. 762.

Euphorbia (Cyttarospermum) colimæ Rose, sp. nov. Slender, weak annuals, 1 to 2 feet high, villose or glabrate: leaves alternate below, opposite above, ovate to lanceolate, slightly narrowed at base, acute, bract-like above; bracts small, with white or whitish margins: involucre about 1 line long: glands 5 with an entire petaloid, white appendage; lobes broad, obtuse, with a pectinate margin: styles 2-parted: capsule, glabrous: seeds with smaller pits, pectinate-margined.—In gardens and fields, growing in shade. Colima, January 9 to February 6, 1891. No. 1170.

Euphorbia pilulifera L. Sp. Pl. i. 454 (1753). Common between the mountains and beach. Manzanillo, December 1 to 31, 1891. No. 938.

Euphorbia (Cyttarospermum) sonoræ Rose, sp. nov. Annual, slender, erect, glabrous, 1 to 3 feet high: leaves oblong, 1½ inches long or less, rounded at base, obtuse or acutish, tipped with a long seta, thin in texture, slightly pubescent and ciliate on the margin when young; petiole longer than the blade, 1 to 2 inches long; stipules setaceous, deciduous; involucre solitary, very small, ⅓ line long; glands (1 smaller) 5, with an appendage of 5 to 7 long white setæ: styles 3, entire; carpels slightly villose: seeds ovoid, with pitted surface; pits with glandular tubercles about the margins and punctate in the center.—In the dense shade of bushes along rich bottoms. Agiabampo, October 3 to 15, 1890. No. 760.

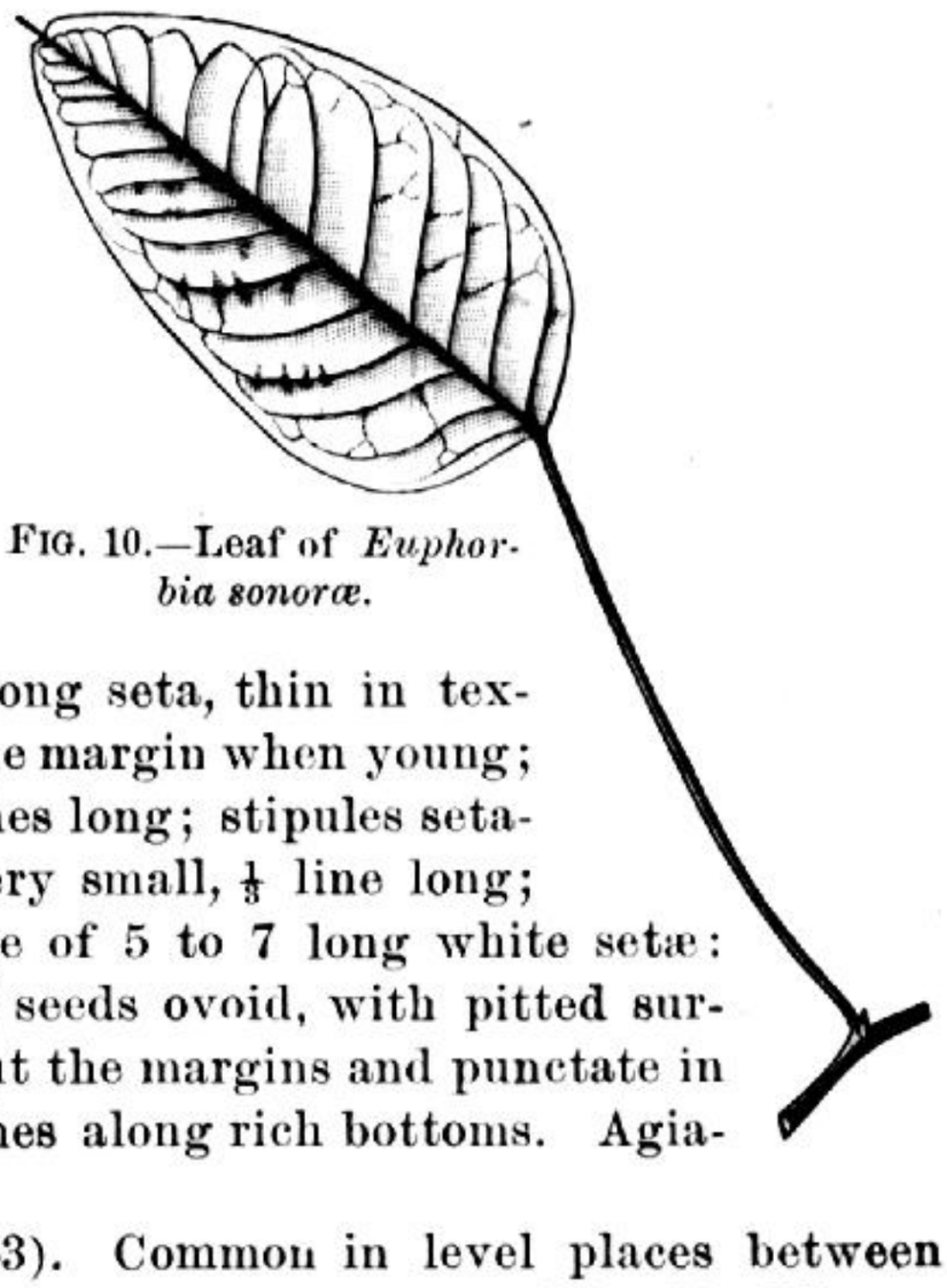

FIG. 10.—Leaf of *Euphorbia sonoræ*.

Euphorbia thymifolia L. Sp. Pl. i. 454 (1753). Common in level places between the mountains and the beach. Manzanillo, December 1 to 31, 1890. No. 939.

This species, although of wide distribution, is scarce in our herbarium.

Euphorbia sp. In shade along a creek bottom. Agiabampo, October 3 to 15, 1890. No. 761.

Euphorbia sp. Plains and river banks. Colima, January 9 to February 6, 1891. No. 1191.

Euphorbia sp. Along river bottoms. Manzanillo, December 1 to 31, 1890. No 924.

Euphorbia sp. Manzanillo, December 1 to 31, 1890. No. 943.

Euphorbia sp. Manzanillo, December 1 to 31, 1890. No. 899.

Euphorbia sp. Manzanillo, March 2 to 18, 1891. No. 1351.

Euphorbia sp. Manzanillo, December 1 to 31, 1890. No. 1038.

Phyllanthus polygonoides Nutt. in Spreng. Syst. Veg. iii. 23 (1825). In rich bottoms. Agiabampo, October 3 to 15, 1890. No. 767.

Phyllanthus niruri L. Sp. Pl. ed. 2. ii. 1392 (1763). Very common about the lagoon in moist places. Manzanillo, December 1 to 31, 1890. No. 925.

Jatropha cordata Muell. Arg. in DC. Prod. xv. pt. 2. 1078 (1866). Agiabampo, October 3 to 15, 1890. Letter A. Only collected in flower at this place. It was obtained in fruit at Alamos (No. 667), but not reported upon in that list.

Jatropha (Adenoropium) purpurea Rose, sp. nov. A bush with several stems, monœcious, glabrous throughout: leaves small, 1 to 2 inches long, 3-lobed, more or less toothed and often bearing short glandular setæ, truncate at base: petiole about the length of the blade: stipules (and bracts) lacerate, cut into glandular setæ: inflorescence a small corymb: male flowers with calyx deeply 5-parted; lobes oblong, obtuse, 2 lines long; 2 sepals nearly entire, the other 3 glandular-setose; petals 5, oblong, 4 lines long, obtuse, brown or "cherry color," free or slightly cohering near the base, glabrous; glands 5; stamens 11, connate to the anthers, glabrous: female flowers with calyx and petals similar to male flowers; ovary glabrous; styles 3, thickened and 2-lobed; capsule about 6 lines in diameter, glabrous.—Agiabampo, October 3 to 15, 1890. No. 785.

Croton ciliato-glanduliferus Ortega, Hort. Matr. 51 (1797–1800). Very common in rich bottoms. Agiabampo, October 3 to 15, 1890. No. 798.

Croton sp. Manzanillo, December 1 to 31, 1890. No. 888.

Croton sp. Manzanillo, December 1 to 31, 1890. Nos. 977 and 968.

Croton sp. Manzanillo, December 1 to 31, 1890. No. 1058.

Argithamnia manzanilloana Rose, sp. nov. Monœcious; branches slender, angled: leaves lanceolate, entire or slightly toothed, 2 inches long or less, pubescent on both sides, strongly nerved beneath, 2 inches or less long: flowers in small glomerules in the axils of the leaves; pistillate flowers, mostly 1; sepals 5, linear, acute, a little longer than the fruiting capsule; petals persistent, shorter than the sepals: seed reticulate-nerved: staminate flowers with calyx and corolla similar to pistillate flowers; stamens 10, in 2 series, the inner 5 longer.—Under shade of bushes along the lagoon. Manzanillo, December 1 to 31, 1890. No. 1073.

This species resembles *A. palmeri*, but has stronger-veined leaves, smaller calyx and carpels, and very different seeds.

Manihot angustiloba (Torr.) Muell. Arg. in DC. Prod. xv. pt. 2. 1073 (1866); *Janipha manihot angustiloba* Torr. Mex. Bound. Surv. 199 (1859). Manzanillo, December 1 to 31, 1890. No. 1027a.

Acalypha coryloides Rose, sp. nov. Shrub, 4 to 6 feet high, with grayish bark; young branches puberulent: leaves alternate, oblong, acute, 5-nerved at base, serrate, 3 to 4 inches long; petioles short, 3 to 4 lines long: staminate flowers in axillary catkins (3 to 6 lines long), 2 to 3 in the axil of each bract; subtending bract ovate, rounded at apex, hairy on the margin, scaly; lateral bracts 2, setaceous; pedicels short, but distinct; sepals 4; stamens 8; anthers 2-celled; cells distinct and reflexed; pistillate flowers solitary or in pairs in the axils of young leaves: pedicel (peduncle) slender, 6 to 12 lines long, 1- to 2-bracteate near the center; sepals 5; ovary 3-lobed, 3-celled, 3-seeded, muricate; styles lacerate.—Manzanillo, December 1 to 31, 1890. No. 1368. December 30, 1891. No. 1811.

This is a very peculiar *Acalypha*. It differs from all other species which I have seen in its staminal spikes being aments or catkins. They appear as scaly buds and seem to have been formed at the close of the last growing season. The flowers seem to develop just before the leaves appear. The position of this species in the genus is doubtful; it is perhaps near *A. longipes*, which has similar pedicels and ovaries in the female flowers, but the latter has the flowers arranged in panicles.

The plant has much the habit of the hazelnut, and hence the specific name.

The following note is taken from F. Pax's letter of December 28, 1892:

"Indeed, it is a very peculiar plant, not allied with any other species of *Acalypha*. There is no doubt that the plant shows the greatest affinity with the genus *Acalypha:* the flowers are identical with those of *Acalypha*, but the inflorescence is very unlike. I do not know any other species of *Acalypha*

which has any affinity with your new plant, and I think it is best to place it in a new subgenus."

Acalypha microphylla Klotzsch in Seem. Bot. Voy. Herald, 278 (1856). Common along the base of the mountain, and about the lagoon. Manzanillo, December 1 to 31, 1890. No. 935. Also collected from a garden at Colima, January 9 to February 6, 1891. No. 1251.

This same species was collected at Mazatlan in 1888 and was referred as above by Dr. B. L. Robinson.

Acalypha papillosa Rose, sp. nov. Diffuse shrub, 5 to 6 feet high, monœcious: leaves ovate, long acuminate, rounded or slightly cordate at base, sharply dentate, 3- to 5-nerved, pubescent when young, becoming glabrate in age; blade 2 to 4 inches long, 1 to 2 inches broad; petiole 6 to 10 lines long; stipules setaceous, early deciduous: fertile spikes terminal, few-flowered; bract cup-shaped, 7-toothed, 1-flowered: calyx lobes 4: styles long, purple, each with 8 to 10 branches: capsules hispid, papillose roughened: sterile spikes axillary, dense; calyx-lobes 4.—Along creeks. Agiabampo, October 3 to 15, 1890. No. 778.

Probably nearest the recent species *A. flavescens* Watson.

Acalypha subviscida Watson, Proc. Amer. Acad. xxi. 440 (1886). Manzanillo, December 1 to 31, 1890. No. 941.

URTICACEÆ.

Ficus fasciculata Watson, Proc. Amer. Acad. xxiv. 78 (1889). A tree, 30 feet high, bearing a widely spreading top; trunk 2 feet in diameter: leaves often 5 inches long on petioles 1 inch long. Colima, January 9 to February 6, 1891. No. 1119.

This seems to be the same as Mr. Watson's species although the leaves are considerably larger. Mr. Watson afterwards thought that his species was possibly referable to *F. sapida*.

This wild fig is called "Camichin." The fruit, which is small, is sweet and juicy, and is much used by the people of this region.

Ficus sp. Tree, 20 feet high with trunk 1 foot in diameter, and bearing a widely spreading top; branchlets pubescent, especially on the stipular lines: leaves oblong, 3 to 5 inches long, 2 to 2½ inches broad (on petioles 9 to 20 lines long) obtuse, rounded at base, pinnately veined: fruit sessile, in pairs, small, 3 lines in diameter: involucre 3- to 4-lobed; lobes obtuse, puberulent. At the base of the mountains growing among the rocks. Manzanillo, March 2 to 18, 1891. No. 1387. Pringle's No. 3887 (1891), from Barranca, near Guadalajara, is the same plant. It was distributed as *F. tecolutensis*, from which it differs in its smaller, sessile fruit, 3- to 4-lobed involucre, pubescent stems, etc. It is, perhaps, a new species.

Ficus sp. Small shrub, 6 feet high: leaves 4 to 6 inches long, acuminate, cuneate at base, somewhat pubescent beneath. Colima, February 27 and 28, 1891. No. 1324.

Ficus sp. Leaves oblong, 10 inches long on petioles 2 inches long. Colima, January 9 to February 6, 1891. No. 1186.

SALICACEÆ.

Salix taxifolia H. B. K. Nov. Gen. et Spec. ii. 22 (1817); Anders in DC. Prod. xvi. pt. 2. 215; *S. microphylla* Cham. & Schlect. Linnæa, vi. 354; Hook & Arn. Bot. Beech. Voy. 311, t. 70, *fide* M. S. Bebb. Shrub, 4 feet high. Along a river bank. Colima, January 9 to February 6, 1891. No. 1193.

ORCHIDACEÆ.

Epidendrum (Barkeria) palmeri Rolfe, Kew Bull. 1893, 6 (1893); pseudobulbis fusiformibus di-triphyllis, foliis linearibus v. lineari-lanceolatis acutis, pedun-

culis terminalibus, racemis simplex v. interdum ramosis multifloris, bracteis lanceolatis acuminatis, pedicellis gracilibus, sepalis lineari-lanceolatis acuminatis, petalis lanceolatis acutis, labello suborbiculari-elliptico obtuso irregulariter crenulato, carinis 3 approximatis parallelibus crenulato-papillosis, nervis lateralibus basi elevatis crenulato-papillosis, columna brevi clinandrio late alato.

Hab. Colima; January–February, 1891, n. 1201!

Pseudobulbi 1-3 poll. longi. Folia 1½–2½ poll. longa. Pedunculi ⅓–1 ped. longi. Bracteæ 1½–3 lin. longæ. Pedicelli 5–8 lin. longi. Sepala 7 lin. longa, 1½ lin. lata. Petala 7 lin. longa, 2 lin. lata. Labellum 7 lin. longum, 5½ lin. latum. Columna 1 lin. longa.

A very distinct *Epidendrum*, belonging to the section *Barkeria*, readily distinguished from every other by its narrow leaves, small bracts, and smaller flowers, which are densely arranged on the raceme, and appear to be light-rosy purple in color. A dried specimen collected by Dr. Edward Palmer, at Colima, in Mexico, was sent for determination by Mr. J. N. Rose, assistant botanist, Department of Agriculture, Washington, U. S. A., in November, 1892.

The above description and note are taken from Kew Bulletin of Miscellaneous Information, for January, 1893, p. 6.

BROMELIACEÆ.

Hechtia sp. Along the ocean just above high tide and extending back to the base of the mountains. Manzanillo, March 2 to 18, 1891. No. 1352.

Probably near *H. rosea*. Another plant which may belong to this genus was obtained from the market at Colima, but it is in too poor condition to determine accurately. No. 1410.

Tillandsia recurvata L. Sp. Pl. ed. 2. i. 410 (1762), *fide* J. G. Baker. Agiabampo, October 3 to 15, 1890. No. 806.

Tillandsia polystachya L. Sp. Pl. ed. 2. i. 410 (1762), *fide* J. G. Baker. Agiabampo, October 3 to 15, 1890. No. 805.

AMARYLLIDACEÆ.

Hymenocallis sp. Scape strongly compressed, 12 to 15 inches high: leaves (appearing with the flowers), about 6, 10 to 20 inches long by 10 to 14 lines broad, glaucous: scape 3- to 6-flowered; spathe 2-leaved; bracts ovate, membranaceous, 2 inches long: perianth tube 4 to 5 inches long, green; lobes 2½ to 3½ inches long, linear, white: staminal cup funnel form, 10 lines long, 10 lines broad at the throat; free tips of filament green, 15 lines long; style slender, green, a little longer than the stamens; cells with 2 ovules. Probably collected near Agiabampo, October 8 to 15, 1890. No number.

Only bulbs were collected by Dr. Palmer. I had these planted and two specimens flowered during the summer of 1891; none flowered during 1892, and only a single specimen flowered during 1893. It is a very delicate little plant and well worthy of cultivation.

This species is near *H. harrisiana*, but the leaves are glaucous, and not nearly so wide, of different shape, and with different tip.

Agave (Littæa) angustissima Engelm. Trans. St. Louis Acad. iii. 306 (1875). Acaulescent: leaves 15 to 20 in a dense rosette, straight, linear, 12 to 20 inches long, 4 to 5 lines broad above the inflated base, flat on both sides; the edge splitting off in fine threads; the end spine slightly pungent: peduncle 12 feet long including the dense spikes: flowers in pairs: corolla yellow; tube slender, cylindrical, 8 to 9 lines long; lobes linear, 6 lines long: stamens purple; filaments more than twice as long as lobes; anthers becoming curved and forming almost a complete circle: fruiting peduncle very short or none in the axil of a long, setaceous bract (1 to 2 inches long): pedicels 1 to 2 lines long: capsule glabrous,

9 to 10 lines long. Growing among rocks with little soil, along the margin of the bay at Manzanillo, December 1 to 31, 1890. No. 1070.

I have given a full description above, as the original reference is very incomplete.

The following note appeared in *Garden and Forest* of January 4, 1893:

"It will be of considerable interest to the readers of Garden and Forest to know that Dr. Edward Palmer has collected what seems to be the little-known *Agave angustissima* (see figure 11). The plant is entirely unknown to the growers of *Agaves*, and is only represented in herbaria by the type specimens in the Engelmann Herbarium at the Shaw School of Botany, St. Louis.

"The following note from Dr. Engelmann, published in the Transactions of the Academy of Sciences, St. Louis (vol. iii, p. 306), contained all the information that we previously had respecting this plant:

"'Dr. Gregg collected near Ocotillo, direction of Tepic, in western Mexico, leaves of a plant which he says bears a scape 5 to 6 feet high, and which, like many narrow-leaved *Agaves* and *Yuccas*, was called "Pamilla" by the natives; unfortunately no flowers came along, but as it seems to be an undescribed *Agave*, it may be designated as *A. angustissima;* leaves 2 to 3 feet long, 2 and 1½ lines wide, convex on the back, filamentose on the margin, narrowed into a short (2½ lines), stout, triangular, brown spine. It seems allied to *A. filamentosa* Salm., which, however, has much shorter and wider leaves. The form of the terminal spine precludes its being taken for a *Yucca*.'

"Dr. Palmer's plant reaches 12 feet in height. The leaves are numerous in a dense rosette, the flowers, in pairs, as in *A. schottii*, yellow, with linear lobes. I submitted this species to Mr. J. G. Baker, of Kew, as probably a new species, who wrote me as follows: 'We have nothing like this either in the herbarium or the garden; its nearest affinity is evidently the imperfectly described *A. angustissima*, of which we have no specimens.'

"With this suggestion I applied to Dr. William Trelease for the loan of Engelmann's plant. Through his kindness I have been able to examine the type of this species. I have little hesitancy in referring my specimens here. The type specimens, however, consist of only a few leaves cut off above the enlarged base. With such material any comparison is very unsatisfactory, but until specimens can be obtained from the original station, and it is proved to be different, this plant should stand for *A. angustissima*.

"Dr. Palmer's plant was collected at Manzanillo, December 1 to 31, 1890 (No. 1070). The plant is common, growing among rocks, with little soil, along the margin of the bay. I have some small plants growing in the greenhouses of the Department of Agriculture.

"Seeds when planted in pans, germinated in seven to ten days. Seeds have been sent to Kew and to the Shaw gardens, but no report has yet been received."

Mr. W. Watson, of Kew, also writing in *Garden and Forest* (vol. vi. p. 76) has this to say regarding this discovery:

"The picture and full account of this *Agave*, published in Garden and Forest (vol. vi. p. 5), were highly interesting to growers of succulent plants in this country, and still more interesting is the fact that, through the kindness of Prof. Sargent, who sent seeds of it to Kew, it is likely soon to become known in collections here, the seeds having germinated quickly and freely. The offer of seeds through your pages (vol. vi. p. 6) to any person wishing to grow this plant should be taken advantage of by all cultivators of such species of agave as *A. filifera* and *A. schottii*, to which ornamental and compact growers *A. angustissima* is closely related. The attention of collectors and botanists generally should be drawn to the forethought and good nature which attended the rediscovery of this plant. It is difficult to interest botanical collectors in the introduction of desirable plants into cultivation."

DIOSCOREACEÆ.

Dioscorea macrostachya Benth. Pl. Hartw. 73 (1841). Flowers staminate. Only a single plant seen, in shady woods. Manzanillo, March 2 to 18, 1891. No. 1329.

COMMELINACEÆ.

Athyrocarpus leiocarpus (Benth.) Benth. & Hook. in Hemsl. Biol. Cent.-Amer. iii. 386 (1885); *Commelina leiocarpa* Benth. Bot. Voy. Sulph. 176 (1844). A weak vine climbing over low bushes. Colima, January 9 to February 6, 1891. No. 1147.

Commelina virginica L. Sp. Pl. ed. 2. i. 61 (1762). Manzanillo, December 1 to 31, 1890. No. 919.

PALMACEÆ.

Cocos (?) sp. A tree, sometimes 100 feet high, 12 to 18 inches in diameter: leaves large and pinnate: sepals and petals 3 each, about equal, broadly ovate, 1 inch long: disk prominent: fruit oblong, 2 inches long; the husk thin: the wall of the nut is thick and hard; embryo nearly filling the cavity. Across the bay from Manzanillo, December 1 to 31, 1890. No. 1063.

I have not been able to place these specimens satisfactorily, not having them in flower, but they seem to have many of the characters of *Cocos*. The albumen has the taste of the common cocoanut, but it is more oily. The central cavity is almost wanting. The nut is 1-celled and has three eyes near the base.

The nuts are used in making a kind of soap.

It is variously called "coqueto," "Palma de Coquito de aceita," "Coco de aceita." I find this form referred to *Elæis melanococca* in Antonio Garcia Cubas' "Mexico, its Trade, Industries, and Resources." It is certainly not that species, if it really belongs to that genus.

A second species of palm was collected at Manzanillo which I have not been able to determine generically. Six to eight feet high, spiny: leaves palmate; fruit ½ inch in diameter in small, dense clusters: flowers unknown. In low places. Rare. Manzanillo, December 1 to 31, 1890. No. 964.

ARACEÆ.

Pistia stratiotes L. Sp. Pl. ii. 963 (1753). At the mouth of a creek. Manzanillo, March 2 to 18, 1891. No. 1356.

NAIADACEÆ.

Ruppia maritima L. Sp. Pl. i. 127 (1753). From the lagoon at Manzanillo, December 1 to 31, 1890. Nos. 926 and 1042.

CYPERACEÆ.

Cyperus canus F. & C. Presl, Reliq. Haenk. i. 179 (1830). Three feet or more high; flower white. Grew in large bunches under the shade of bushes upon the river bank. Colima, February 27 and 28, 1891. No. 1304.

"Same as F. Mueller, No. 596." N. L. B.

Cyperus compressus L. Sp. Pl. i. 46 (1753). Found in opening between mountains and on the beach near lagoon. In the shade of other plants. Manzanillo, December 1, to 31, 1890. No. 1081.

Cyperus fugax Liebm. Vidensk. Selsk. Skr. ser. 5. ii. 196 (1851). Plentiful under shade of trees and in sandy places at the upper part of the lagoon. Manzanillo, December 1 to 31, 1890. No. 1079.

Cyperus ligularis L. Amœn. Acad. v. 391 (1760). Very robust and of a light-green color. Manzanillo, March 2 to 18, 1891. No. 1383.

Cyperus ottonis Boeckl. Linnæa, xxxvi. 350 (1869–70). Ex. descr. The plants grow at the edge of the lagoon upon low spots where the water reaches them readily. In front of and over them are Mangrove trees and behind, the contiguous mountains give them shade. Manzanillo, March 2 to 18, 1891. No. 1382. Also found in bunches among rocks just above the spray of the ocean. Manzanillo, December 1 to 31, 1890. No. 1095.

Cyperus regiomontanus Britton. Shady spots in the mountains. Manzanillo, December 1 to 31, 1890. No. 1080.

This is *Mariscus hænkei* Presl. Rel. Haenk. i. 181(1830). "There is a *Cyperus hænkeanus* Kunth, an altogether different plant; so I propose to name it *Cyperus regiomontanus* The plant is referred to *C. flavus* by Boeckeler, and Watson followed him; but both Clarke and I can see a good species in it. Clarke and I differ in this, however, that he maintains *Mariscus* as a genus, while I do not so regard it." N. L. Britton.

Cyperus sp. Manzanillo, March 2 to 18, 1891. No. 1381.

"It is a *Cyperus* of the *Diclidium* section, but I can not quite match it. It is pretty young." N. L. B.

Eleocharis geniculata (L.) R. Br. Prod. 224 (1810); *Scirpus geniculatus* L. Sp. Pl. i. 48 (1753). Only two specimens seen. In a swamp. Colima, January 9 to February 6, 1891. No. 1260.

GRAMINEÆ.*

Anthephora elegans Schreb. Beschr. Gräs. ii. 105, t. 44 (1810). Near the beach. Manzanillo, December 1 to 31, 1890. No. 1094. Also along a river bank. Colima, January 9 to February 6, 1891. No. 1255.

Hilaria cenchroides texana Vasey, Contr. Nat. Herb. i. 53 (1890). Very common on grassy plains. Colima, January 9 to February 6, 1891. No. 1267.

This is undoubtedly the *Hexarrhena cenchroides* Presl.

Ægopogon gracilis Vasey, Bull. Torr. Bot. Club, xiii. 230 (1886). In large patches near river banks. Colima, January 9 to February 6, 1891. No. 1270.

Arundinella brasiliensis Raddi. Agrost. Bras. 37 (1823). On a river bank. Colima, January 9 to February 6, 1891. No. 1264.

Paspalum conjugatum Berg. Act. Helv. vii. 129 (1772). In low, damp ground. Rare. Colima, January 9 to February 6, 1891. No. 1272.

Paspalum paniculatum L. Sp. Pl. ed. 2. i. 81 (1862) Along a ditch. Rare. Colima, January 9 to February 6, 1891. No. 1265.

Panicum molle Swartz, Prod. Veg. Ind. Occ. 22 (1788); *Panicum barbinode* Trin. Ic. Pl. iii. 318 (1828–'36). Said to be introduced. Manzanillo, December 1 to 31, 1890. No. 1078. Much used as a forage plant.

Panicum capillaceum Lam. Encyc. i. 173 (1791). In the mountains and wet bottoms. Manzanillo, December 1 to 31, 1890. No. 1083.

Panicum divaricatum L. Amoen. Acad. v. 392 (1760). In the mountains. Manzanillo, December 1 to 31, 1890. No. 1089.

Panicum myurum Meyer, Prim. Fl. Esseq. 50 (1818). In wet bottoms. Colima, January 9 to February 6, 1891. No. 1259.

A good forage plant.

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* The determination and critical notes upon the grasses were furnished me in 1891 by the late Dr. George Vasey. It has been found necessary since that time to make some slight changes in the nomenclature.

Panicum (Ptychophyllum) pringlei Vasey, sp. nov. Culms tufted, apparently perennial, 8 to 10 inches high, branching near the base: leaves mostly radical (the upper part of culm naked), about 2 inches long, 2 to 3 lines wide, acute: panicle racemose, 2 to 3 inches long, consisting of 3 to 4 alternate, nearly sessile, 1-sided spikes: spikes mostly $\frac{3}{4}$ to 1 inch long, and containing 12 to 15 spikelets on alternate sides of the flattened rachis, each spikelet with a simple persistent bristle at its base; the bristles rather larger than the spikelets: spikelets conical-oblong, about 2 lines long, acute; first glume $\frac{1}{5}$ as long as spikelet, obtuse, obscurely 3-toothed; second glume 9-nerved, a little shorter than the acute 5-nerved male floral glume which incloses the nearly equal, acute palet, and the 3 stamens; fertile spikelet oblong 3-nerved, with a short, pointed apex. Mexico, Pringle Coll. of 1888, No. 2047, and Coll. of 1889, No. 2423; also from Colima, January '9 to February 6, 1891, No. 1256.

Panicum sanguinale ciliare (Retz.) Vasey, Bull. No. 8. Div. Bot..23 (1889); *Panicum ciliare* Retz. Obs. Bot. fasc. 6, 16 (1786). In the low ground between the mountains and lagoon. Manzanillo, December 1 to 31, 1890. No. 1083.

This variety differs in its usually smaller size, more prostrate habit, shorter leaves, fewer spikes, and in the strongly ciliate-fringed third glume.

Panicum trichanthum Nees, in Mart. Fl. Bras. ii. 210 (1829). In shady places in gardens. Colima, January 9 to February 6, 1891. No. 1257.

Oplismenus humboldtianus nudicaulis Vasey. This is near *Oplismenus humboldtianus muticus* Fournier, but differs from that by having larger flowers, with longer awns, and the hermaphrodite flower not muticous. Colima, January 9 to February 6, 1891. No. 1258.

Oplismenus setarius (Lam.) Roem. & Schultz, Syst. Veg. ii. 481 (1817); *Panicum setarium* Lam. Encyc. i. 170 (1791). In the wet bottom near the bay. Manzanillo, December 1 to 31, 1890. No. 1090.

Cenchrus echinatus L. Sp. Pl. ii. 1050 (1753). Found sparingly on the mountain sides. Manzanillo, December 1 to 31, 1890. No. 1086.

Pennisetum setosum Rich. in Pers. Syn. i. 72 (1805). Grassy bottoms of a creek. Colima, January 9 to February 6, 1891. No. 1269.

Aristida (Ortachne) manzanilloana Vasey, Contr. Nat. Herb. i. 282 (1893). Apparently annual; culms tufted, 2 to $2\frac{1}{2}$ feet high, smooth, slender, erect, simple, or geniculate and branching below; leaves 2 to 3 inches long, plane below, conduplicate above, not rigid, very narrow, almost setaceous; sheaths shorter than the blade; panicle racemose, simple, 4 to 5 inches long; branches single, or 2 or 3 together, the lower about 1 inch long, sessile, with 3 to 5 somewhat crowded spikelets; empty glumes about 3 lines long, awn-pointed, nearly equal; floral glume with the undivided awn about 1 inch long when mature, scabrous on the keel, not twisted, flattish, commonly curved above.

Collected in the mountains about Manzanillo, December 1 to 31, 1890. No. 1084. This species differs from *A. tenuis flexuosa* in its culms being slender and flexuous, leaves softer, and spikelets with a few scattered hairs.

Aristida tenuis (?) (H.B.K.) Kunth, Rev. Gram. i. 62 (1829–1835); *Streptachne tenuis* H. B. K. Nov. Gen. et. Spec. i. 124 (1815). Manzanillo, January 9 to February 6, 1890. No. 1091.

Muhlenbergia exilis Fourn. Mex. Pl. Gram. 84 (1886). Along the banks of a creek. Colima, January 9 to February 6, 1891. No. 1271.

Sporobolus argutus (Nees) Kunth, Enum. Pl. i. 215 (1833); *Vilfa arguta* Nees in Mart. Fl. Bras. ii. 395 (1829). Very common along the coast. Agiabampo, October 3 to 15, 1890. No. 814.

Chloris radiata (?) Swartz, Prod. Veg. Ind. Occ. 26 (1788). Common along water ditches. Colima, January 9 to February 6, 1891. No. 1253.

Bouteloua bromoides Lag. Gen. et Spec. Nov. 5 (1816). Common on grassy plains. Colima, January 9 to February 6, 1891. No. 1254.

Bouteloua polystachya (Benth.) Torr. Pac. R. R. Rep. v. pt. 2. 366, t. 10 (1857); *Chondrosum polystachyum* Benth. Bot. Voy. Sulph. 56 (1844). In rich valleys. Agiabampo, October 3 to 15, 1890. No. 791.

Eleusine indica Gærtn. Fruct. i. 8 (1788). On wet bottoms. Colima, January 9 to February, 1891. No. 1263.

Cathestecum erectum Vasey & Hack. Bull. Torr. Bot. Club, xi. 37, t. 45 (1884). Colima, January 9 to February 6, 1891. No. 1261.

A reduced form with short leaves and short flowering culms.

Phragmites communis Trin. Fund. Agrost. 251 (1820). Eight to ten feet high. Common about the margin of the lagoon. Manzanillo, December 1 to 31, 1890. No. 1092.

Eragrostis pallida Vasey, Contr. Nat. Herb. i. 285 (1893). Apparently annual; culms erect, more or less branched at the base, 1½ feet high, smooth; leaves 2 or 3 on the culm, 3 to 5 inches long, erect, acuminate; ligule inconspicuous, truncate; sheaths shorter than the internodes; panicle 6 to 9 inches long, ½ to ¾ inch wide, pale, strict, sometimes interrupted below, crowded above; branches unequal, semiverticillate, numerous, the longer 1½ inches long, strict, all closely flowered to the base; spikelets 1 line long, 5-flowered; empty glumes less than ½ line long, 1-nerved, subacute; floral glumes ½ line long, subacute, 3-nerved.

Collected in a ditch. Colima, January 9 to February 6, 1891. No. 1268.

At first I thought this might be *E. alba* Presl, but it does not answer the description; neither does the Californian species, so called by Dr. Thurber, which is quite different from the present species.

Eragrostis ciliaris (L.) Link, Hort. Berol. i. 192 (1827); *Poa ciliaris* L. Sp. Pl. ed. 2. i. 102 (1862). In gardens. Colima, January 9 to February 6, 1891. No. 1266.

Eragrostis plumosa, (Retz.) Link, Hort. Berol. i. 192 (1827). Common on the low ground between the mountains and the lagoon. Manzanillo, December 1 to 31, 1890. No. 1085.

Eragrostis diversiflora Vasey, Contr. Nat. Herb. i. 285 (1893). Culms densely tufted, 2 to 8 feet high, firm, leafy at the base, lower leaves 6 to 8 inches long, gradually narrowed to long, setaceous points; sheaths smooth; ligule ciliate with long hairs; upper leaves distant, filiform; panicle spike-like, interrupted below, 7 to 10 inches long, ¾ inch wide, the nearly sessile branches densely crowded, interrupted and distant below, also on the same plant some panicles open and thinly flowered; spikelets linear, 3 to 4 inches long, 7- to 13-flowered or on less perfect culms reduced to 5, 3, or 2; outer glumes ovate, subacute, similar in texture to the floral glumes, which are ovate-lanceolate, rather thick, subobtuse, smooth, the lateral nerves not prominent.

Manzanillo, March 2 to 18, 1891. No. 1335. Here should be referred W. G. Wright's No. 1318, from Mazatlan, 1889.

Eragrostis purshii Schrad. Linnæa, xii. 451 (1838). In gardens. Colima, January 9 to February 6, 1891. No. 1262.

Eragrostis purshii miserrima Fourn. Mex. Pl. Gram. 116 (1886). Culms tufted, low, 3 to 6 inches high, branching from the base, often geniculate: leaves 1 inch long or less, very narrow; ligule short, ciliate; lower sheaths loose, striate; panicle 1 to 1½ inches long, branches alternate, spreading, short (less than an inch long), each with 2 to 5 spikelets; spikelets 1½ to 2 lines long, 5- to 9-flowered; floral glumes 3-nerved; the lateral nerves prominent. River bottoms. Colima, January 9 to February 6, 1891. No. 1273.

Eragrostis purshii Schrad. Linnæa, xii. 451 (1838). Manzanillo, December 1 to 31, 1890. No. 1088.

Gouinia Fournier (emended, description). Spikelets 2- to 4-flowered, narrow, approximate or somewhat distant, along the 2 sides of the triangular rachis, sessile or short-pedicelled, erect on the spreading branches of the rather large pan-

icles. Two lower glumes empty, somewhat unequal, shorter than the spikelet, narrowly lanceolate, purplish, keeled, awnless. Floral glumes somewhat larger, narrowly lanceolate, compressed, entire or 2-toothed at apex, awned, 3-nerved; the lateral nerves near the margin, and with the keel silky-ciliate below the middle. Rachilla pilose.—Perennial grasses with large panicles. Awns from the apex of the floral glume, straight, scabrous. M. Fournier adds: "staminibus 3, filamentis brevissimis, antheris longis, caryopsi libera, toto in dorso sulcata, apice bilobulata, macula hilari elliptico-ovali, stigmatibus sessilibus plumosis." [Mex. Pl. Gram. 103 (1886).]

Differs from *Triodia* in the keeled, not rounded, floral glumes, in the fewer and less imbricate florets, and in the absence of the lateral teeth.

Tricuspis section *Neuroblepharum* Griseb. in Pl. Lorentz. p. 211.

To be compared with *Trichoneura* Andersson, which is referred by Bentham and Hooker to *Triodia*.

Gouinia polygama Fourn. Mex. Pl. Gram. 103 (1886). Culms rather slender, 2 to 3 feet high, rather leafy: leaves acuminated, 6 to 10 inches long, 4 to 6 lines wide, smooth above, somewhat scabrous below: panicles 8 to 12 inches long, the 10 to 15 branches single or rarely the lower in twos, 5 to 6 inches long, divergent, flowering uniformly nearly to the base with 10 to 15 spikelets: spikelets 2- to 3-flowered, appressed; empty glumes narrow, obtusish, the lower 2 and the upper nearly 3 lines long; floral glumes 3 to 4 lines long, gradually attenuated into a straight awn as long as itself or longer; palet nearly as long as its glume, acute, sparingly ciliate; grain oblong-linear, nearly two lines long, nearly cylindrical, with narrow furrow from base to apex.—Manzanillo, December 1 to 31, 1890. No. 1087.

I have an unpublished drawing of this plant from Paris by which it is easily recognized. M. Fournier enumerates the following localities and numbers: Vera Cruz, Gouin No. 76; Acapulco, Thiebaut No. 1042; San Augustin, Liebmann Nos. 504, 505; without locality, Karwinski No. 1000. Probably the reference to Florida, Karw. is an error. The following two species belong to the same genus:—

G. latifolia Vasey; *Tricuspis (Neuroblepharum) latifolia* Griseb. Pl. Lorentz. 211. Obtained from Cordoba, Argentine Republic, also No. 928 Morong's S. American collection.

G. mexicana Vasey; *Leptochloa* (?) *mexicana* Scribn. Proc. Phila. Acad. 1891. 302 (1891). This species is larger and more robust than either of the others, the culm almost reed-like, the leaves 8 to 10 lines wide, the panicle 1 foot long, the branches 7 or 8 inches long, with the lower one-fourth or one-third part naked, the spikelets 3- to 4-flowered, 4 to 6 lines long, with the awns one-third or one-half as long as the floral glumes.

No. 3252, collection C. G. Pringle, San Luis Potosi, Mexico.

Perhaps this is the *G. polygama major*, Fourn. Mex. Pl. Gram. 103 (1886). Vera Cruz, Gouin No. 77.

Jouvea straminea Fourn. Bull. Soc. Roy. Bot. Belg. xv. 475 (1876); *Rachidospermum mexicanum* Vasey, Bot. Gaz. xv. 110 (1890). Manzanillo, March 2 to 18, 1891. No. 1384.

FILICES.[1]

Adiantum concinnum H. B. K. in Willd. Sp. Pl. v. 451 (1810). Found associated with No. 1126. Colima, January 9 to February 6, 1891. No. 1127.

Aspidium patens Swartz in Schrader's Journal ii. 34 (1801). Two or three plants of this were gathered with No. 1129. Colima, January 9 to February 6, 1891. No. 1129a.

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[1] The ferns and fern allies were determined by Prof. Daniel C. Eaton, of Yale College, who has also contributed critical notes on some of the species.

Aspidium trifoliatum Swartz, Syn. Fil. 43 (1806). This fern and the *Adiantum* (No. 1127) were found growing abundantly on a garden wall the top of which was channeled to convey a stream of water. Colima, January 9 to February 6, 1891. No. 1126.

Gymnogramme calomelanos Kaulf. Enum. Fil. 76 (1824). The common white-powdered form. Shady side of river banks under bushes and among rocks. Colima, January 9 to February 6, 1891. No. 1218.

Lygodium mexicanum Presl, Reliq. Haenk. i. 72 (1830). Climbing fern found in dark shady spots among trees and bushes on the mountains. Grows from 5 to 12 feet high Manzanillo, December 1 to 31, 1890. No. 931.

Notholæna brachypus (Kunze) J. Smith, Ferns British & Foreign, 172 (1886); *Cheilanthes squarrosa brachypus* Kunze, Linnæa, xviii. 340 (1844). Shade of stone walls. Colima, January 9 to February 6, 1891. No. 1230.

Pellæa rigida (Swartz) Hook. Sp. Fil. ii. 144 (1858); *Pteris rigida* Swartz, Syn. Fil. 104 (1806). From a shady bank among bushes. Colima, January 9 to February 6, 1891. No. 1294.

Polypodium elongatum Metteuius, Polyp. 88 (1857). The plants are not in good condition, and the identification is somewhat doubtful in consequence. The fronds are 2 to 3 inches long, obovate-spatulate in outline, and dull yellowish-green in color. The fruit is very scanty, and forms small oblong sori near the tips of only a few of the fronds. Shady side of stone walls. Colima, January 9 to February 6, 1891. No. 1228.

Polypodium incanum Swartz, Syn. Fil. 35 (1806). Some of the specimens show a heavy coating of lacerate-ciliate and pointed scales on the lower surface of the frond; these are most observable on young fronds; in maturer fronds the scales are nearly entire and have mostly lost their acuminations. Found adhering to the shady side of stone walls. Colima, January 9 to February 6, 1891. No. 1229.

Polypodium lanceolatum L. Sp. Pl. ed. 2. ii. 1542 (1763). Mature plants much contracted by drought. The local name is "Lengua de Sierra para las calenturas." It is used as a remedy in cases of fever and ague. Found at the market at Colima. January 9 to February 6. No. 1409.

Phegopteris tetragona Mettenius. Fil. Hort. Lips. 84 (1856). On stone walls in shade. Colima, January 9 to February 6, 1891. No. 1129.

Selaginella lepidophylla Spring. Monogr. Lycopod. iii. 72 (1848). The natives call this "Flor de Piedra para la sangre," and employ it to check hemorrhages. Manzanillo, March 2 to 18, 1891. No. 1401.

MUSCI.

Funaria hygrometrica Sibth.* With *Philonotis* probably *fontana* Brid. Colima, January 9 to February 6, 1891. No. 1118. No. 1196.

Philonotis fontana Brid.* Probably, with a species of *Gymnostomum*. Both are sterile and not with certainty determinable. Colima, January 9 to February 6, 1891. No. 1197.

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* Determined by J. H. Holzinger.

THREE NEW SPECIES OF SAPINDACEÆ FROM WESTERN MEXICO AND LOWER CALIFORNIA.[1]

By L. RADLKOFER.

Serjania (?) **albida** Radlk. sp. nov.; *Paullinia* (*?*) sp. Vasey et Rose, Contr. Nat. Herb. i. 82 (1890). Scandens, suffruticosa, parvula; rami (caules) tenues, sexangulares, angulis glabris, faciebus leviter canaliculatis, albide pulverulento-puberulis; corpus lignosum simplex; folia ternata; foliola parva, ovata, obtusa, subtrilobodentata, terminale in petiolulum longum anguste marginatum abrupte contractum, lateralia petiolulis brevioribus insidentia, omnia membranacea, pallide viridia, opaca, glabra, nec nisi glandulis microscopicis adspersa, punctis pellucidis obscurius notata, epidermide mucigera (paginæ superioris quoque stomatibus instructa); petiolus (communis) brevis, nudus; thyrsi solitarii, folia subæquantes, rachi perbrevi; flores (non nisi insectorum ictu deformati suppetebant) parvi; sepala puberula.

Rami thyrsigeri diametro 1.5–2 mm., internodiis elongatis 5–7 cm., longis. *Folia* 3–5 cm. longa, 2–4 cm. lata; foliola terminalia petiolulo 1.5 cm. longo excluso 1.5–2 cm. longa, 1–1.5 cm. lata, lateralia minora; petiolus 6–15 mm. longus; stipulæ minimæ, subulatæ. *Thyrsi* 3–6 cm. longi.

In California inferiore ad Santa Agueda: Palmer No. 263!

Observ. Affinis videtur Serjaniæ (*?*) *californicæ* Radlk. (v. Serj. Suppl. 1886. 139; *Cardiospermum?* sp. Gray), sed ut hæc quoque quoad genus dubia est. An *Paullinieæ sonorensi* Wats., an *Cardiospermo spinoso* Radlk. congener?

Serjania brachylopha Radlk. sp. nov.; *Serjania* sp.? Watson, Proc. Amer. Acad. xxii. 403 (1887); coll. Palmer No. 381!

Scandens, fruticosa, ramis petiolisque sparsim crispato-pilosis vel subsetulosis, ceterum glabra; rami subtrigoni, 6-sulcati, cortice pallide subfusco; corpus lignosum compositum e centrali majore et periphericis 3 parvis angulos efficientibus; folia biternata; foliola lateralia ovato-oblonga, acuta vel inferiora obtusata, breviter petiolulata, terminalia late rhombea, acuta et mucronulata, in petiolulum contracta, omnia subduplicato-serrata, membranacea, reti venarum tenerrimo instructa, præter nervos glabra nec nisi glandulis microscopicis adspersa, impunctata, epidermide mucigera; petiolus communis partialesque nudi; thyrsi solitarii, dense cincinniferi; cincinni stipitati, deflorati pedicellorum supra medium articulatorum articulis inferioribus stipitem æquantibus sat numerosis scopiformes; flores parvuli; sepala exteriori puberula, interioribus tomentellis fere dimidio breviora; fructus—

Rami thyrsigeri diametro 2.5 mm. *Folia* circ. 11 cm. longa, totidem lata; foliola terminali petiolulo 1-centimetrali excluso 5 cm. longa, 3.5 cm. lata, lateralia super-

[1]The three following new species of Prof. Radlkofer were intended to form a part of my next report upon Dr. Palmer's Mexican plants. At Prof. Radlkofer's request, I have published them here so as to enable him to refer to them in his work on the order soon to appear.—J. N. ROSE.

iora 4 cm. longa, 2 cm. lata, inferiora plus dimidio minora; petiolus communis 2–3 cm. longus, partialium intermedius circ. 3 cm. lateralis 1 cm. longi; stipulæ parvæ ovato-triangulares. *Thyrsi* folia superantes, rhachi quam pedunculus communis longiore; cincinni circ. 8-flori, contracti, stipite 2.5–3 mm. longo suffulti, pedicelli circ. 4 mm. longi, supra medium articulati. *Flores masculi: Sepala* exteriora vix 2 mm., interiora 3 mm. longa. *Petala* e late obovato abruptius attenuata, 3 mm. longa, 2 mm. lata, intus glanduligera; squamæ superiores crista brevi truncata, crenulata appendiceque deflexa brevi barbata, inferiores crista dentiformi instructæ. *Tori* glandulæ superiores ovatæ glabræ, laterales minores subconformes. *Stamina* glabra, nec nisi breviora extus pilis singulis adspersa. *Germinis* rudimentum apice puberulum.

In Mexico septentrionali: Palmer No. 381! (Jalisco, Tequila, m. Aug. to Sept., 1886, flor.).

Observ. Habita accedit, ut jam Watson l. c. indicavit, ad *S. racemosam* Schum.; vera affinitas autem ei potius est, ut videtur, cum *S. mucronulata* Radlk. in eadem Sectione xi (*Physococcus*).

Cardiospermum spinosum Radlk. sp. nov. Suffruticosa, affinis *Cardiospermo tortuoso* Benth.; insignis cirris binis ad apicem pedunculi communis in spinas conversis, pedunculo inde apice furcillato ex angulo quasi furculæ rhachin brevem cum floribus paucis, si qui sunt, protrudente, vel interdum omnino sterili ipsoque in spinam simplicem converso; rami thyrsigeri geniculato-flexuosi, tenues, e 5–6 angulari subteretes angulis vix prominulis subfuscis glabratis, faciebus pulverulento-canopuberulis; folia e ternato folioli terminalis dissociatione transeuntia in 5-foliolato-pinnata; foliola superiora obovata, inferiora suborbicularia, parvula (vix 1-centimetralia), subsessilia, obtusa, subsinuato-crenata vel lobata nec nisi glandulis microscopicis et in nervis pilis singulis adspersa, crassiuscule membranacea, pellucide lineolata utriculis laticiferis sat crebris et plerumque venis approximatis, epidermide valde mucigera exceptis solummodo cellulis stomata in pagina superiore quoque numerosa (puncta albida efficientia) cingentibus; petiolus nudus; stipulæ minutæ, subulatæ, thyrsi abbreviati, pauciflori; flores pro genere mediocres; sepala 5 (?).

Rami thyrsigeri diametro 1 mm. vix superantes. *Folia* ramorum thyrsigerorum 2.5 cm. longa, summa minora; foliola 0.5–1 cm. longa. *Thyrsi* vix 1.5 cm. longi. *Flores masculi: Sepala* duo exteriora breviora, interiora 4 mm. longa. *Petala* obovata, in unguem latum attenuata, 4 mm. longa, 3 mm. lata, intus (densius quam extus) glanduligera; squamæ (cristis exclusis) quam petala dimidio breviores, margine villosulæ, superiores crista obcordata appendiceque deflexa mediocri dense barbata, inferiores crista obliqua instructæ. *Tori* glandulæ superiores ovatæ, glabræ, inferiores minores, subannulares. *Stamina* adpresse puberula, apice glabra. *Germinis* rudimentum glabrum.

In California inferiore: Palmer No. 2! (La Paz, m. Jan. to Feb., 1890, flor.).

Observ. Affinis *Cardiospermo tortuoso* Benth., quod sepalis 5 quoque (ut e speciminibus a Brandegee in Magdalena Bay lectis patet) gaudet nec non foliolis eodem modo ac in *C. spinoso*, supra quoque stomatibus numerosis instructis.

PLATE XXIV.

Forchhammeria watsoni Rose.

Fig. *a*, fruiting branch; *b*, flowering branch; *c*, sterile flower; *d*, seed. Figures *a* and *b* are of natural size; fig. *c* is enlarged 7 diameters; *d*, 2 diameters. Description on page 302.

K. Mayo del.

F. Meteyer, lith. Boston.

FORCHHAMMERIA WATSONI ROSE.

PLATE XXV.

Forchhammeria watsoni Rose.

Fig. *a* and *b*, sterile branches showing leaves of different forms. Description on page 302.

K. Mayo, del.

B. Mansel, lith. Boston.

FORCHHAMMERIA WATSONI ROSE.

PLATE XXVI.

Xylosma palmeri Rose.

The main figure illustrates a branch bearing fruit and female flowers; fig. *a*, staminate flowering branch; *b*, staminate flower; *c*, the same with sepals removed, exposing the disk; *d*, sepal; *e*, pistillate flower; *f*, the same with sepals removed; *g*, a flower with the ovary removed, viewed from above, showing sepals and disk. The dissections are enlarged 4 diameters. Description on page 303.

F. Muller, del.

B. Mersel, lith. Boston.

XYLOSMA PALMERI ROSE.

PLATE XXVII.

Krameria palmeri Rose.

Portion of plant, natural size; fig. *a*, the 5 sepals, disjointed; *b*, the 3 upper petals and the 4 stamens; *c*, ovary with two lower petals. Figs. *a*, *b*, and *c* are enlarged about 3 diameters. Description on page 304.

PLATE XXVII.

K. Mayo, del.

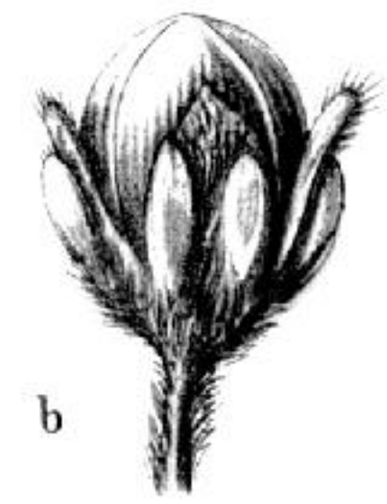
B. Mensel, lith. Boston.

KRAMERIA PALMERI ROSE.

PLATE XXVIII.

Malpighia ovata Rose.

A branch showing flowers and leaves; fig. *a*, lower leaf showing venation, natural size; *b*, bud showing position and shape of glands, enlarged 3 diameters; *c*, fruit as seen from the side, showing the distinct styles; *d*, the fruit as seen from above. Figs. *c* and *d* are of natural size. Description on page 310.



b

c

d

a

F. Müller del.

P. Mercer, lith. Boston.

MALPIGHIA OVATA ROSE.

PLATE XXIX.

Malpighia umbellata Rose.

A fruiting branch; fig. *a*, fruit; *b*, the same as seen from beneath, showing calyx and glands; *c*, a nutlet with fleshy covering removed. Figs. *a*, *b*, and *c* are enlarged 5 diameters. Description on page 310.

F. Muller, del.

B. Meisel, lith. Boston.

MALPIGHIA UMBELLATA ROSE.

PLATE XXX.

Hirœa mexicana Rose.

Flowering branch, natural size; fig. *a*, an open flower, natural size; *b*, sepal with its two glands, enlarged 3 diameters; *c*, petal, enlarged 2 diameters; *d*, stamen tube spread out, enlarged about 2½ diameters; *e*, ovary, enlarged about 3 diameters; *f*, fruit, natural size. Description on page 312.

e

d

c

b

a

f

F. Muller del.

F. Meisel Lith. Boston.

HIBAFA MEXICANA Rose.

PLATE XXXI.

Karwinskia parrifolia Rose.

Fruiting branch; fig. *a*, fruit, enlarged 2½ diameters; *b*, embryo, enlarged 2 diameters. Description on page 315.

F. Muller, del.

B. Metsel, lith. Boston.

KARWINSKIA PARVIFOLIA ROSE

PLATE XXXII.

Agiabampoa congesta Rose.

A flowering branch; figs. *a* and *b*, ray flowers; *c*, disk flower with bract; *d*, style branches; *e*, involucral bract. Figs. *a* and *b* are enlarged 2 diameters; *c*, 3 diameters; *d*, 10 diameters; *e*, 2½ diameters. Description on page 335.

F. Muller, del.

B. Metsel, lith. Boston.

AGIABAMPOA CONGESTA ROSE.

PLATE XXXIII.

Tridax dubia Rose.

A flowering branch; fig. *a*, ray flower, enlarged about 4 diameters; *b*, disk flower, enlarged about 4 diameters; *c*, paleæ of the pappus, enlarged about 10 diameters. Description on page 337.

F. Muller, del.

B. Meisel, lith. Boston.

TRIDAX DUBIA ROSE.

PLATE XXXIV.

Porophyllum palmeri Rose.

A flowering branch, natural size; fig. *a*, flower, enlarged about 3 diameters; *b*, an akene with pappus, enlarged about 5 diameters. Description on page 338.

F. Muller, del.

POROPHYLLUM PALMERI ROSE.

B. Metsel, lith. Boston.

PLATE XXXV.

Ipomœa nelsoni Rose.

A branch, showing flowers and fruit, natural size. Description on page 343.

F. Muller del. B. Mensel, lith. Boston.

IPOMOEA NELSONI ROSE.

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