

THE AMERICAN SPECIES OF CANAVALIA AND WENDEROTHIA.

By C. V. PIPER.

INTRODUCTION.

In connection with economic investigations of certain species of *Canavalia*, the writer became impressed with the paucity of our botanical knowledge of the genus and the great confusion existing. As a result of these conditions, it seemed desirable to attempt to monograph the genus. In this effort he received the cordial aid of Col. Sir David Prain, until recently Director of the Royal Botanic Gardens at Kew, who requested Mr. S. T. Dunn to assist in the work. The Old World species, all of which belong to the section *Eucanavalia*, have been treated fully in a recently published paper (Kew Bull. Misc. Inf. 1922: 129-145. 1922). The task of elucidating the New World species was left to the writer. In connection with this work he desires to express his cordial thanks for the loan of herbarium material to the following gentlemen: Col. Sir David Prain, Royal Botanic Gardens, Kew; Dr. Hermann Ross, Staatsherbarium, Munich; Dr. B. L. Robinson, Gray Herbarium; Dr. J. M. Greenman, Missouri Botanical Garden; Dr. N. L. Britton, New York Botanical Garden; Dr. W. A. Setchell, University of California; Dr. C. F. Millspaugh, Field Museum of Natural History.

HISTORY OF THE GENERIC NAMES PROPOSED.

Some writers use *Canavali* as the generic name, but *Canavalia* is preferred by most. The latter has been included in the list of *nomina conservanda* of the International Code of Nomenclature. The data regarding the important proposals of the genus and its synonyms are given chronologically.

Canavali Adans. Fam. Pl. 2: 325, 531. 1763.

Adanson gives a brief description of the genus *Canavali* based on Hort. Mal. plates 43, 44, and 45, but an index, page 531, has "Katu tsjandi, Malab." and also "Dolichos, 3. Lin. sp. 725." Plate 43 of the Hortus Malabaricus is labeled Katu tjandi and also Canavali. It clearly represents *Canavalia turgida* Graham, but *Dolichos* 3 of Linnaeus is *D. ensiformis*, that is, *Canavalia ensiformis*.

Clementea Cav. Anal. Cienc. Nat. 7: 63. 1804.

Only species, *C. nitida* Cav., which probably is *Canavalia bahamensis* Britton (*C. ekmani* Urban).

Canavalia DC. Prodr. 2: 403. 1824.

Under the generic name DeCandolle cites as synonyms *Canavali* Adans. and *Malocchia* Savi (Diss. 15. 1824 and 1. 1825). The first species described is *C. obtusifolia* (Lam.) DC., which is erroneously considered the same as Rheede's "Catu-Tsjandi" (Hort. Malabar. 8: 25, pl. 43), and correctly as Plukenet's Almag. Bot. pl. 51, f. 2.

Inasmuch as *Clementea* Cav. and *Malocchia* Savi have priority over *Canavalia* DC., one of these might be chosen as the legitimate name to use, but such a change would be unfortunate. The difficulty would be avoided by accepting the genus as beginning with Adanson and changing the spelling *Canavali* to *Canavalia*, as has been done with other similar barbarous names. Many recent authors have used the name *Canavali*, but its Latinized form is more desirable. In any event it would seem impossible to accept *Canavalia* if accrediting it wholly to DeCandolle, owing to the priority of *Clementea* and *Malocchia*.

Wenderothia Schlecht. Linnaea 12: 330. 1838.

One species, *W. discolor* Schlecht. The group of species allied to this is considered of generic value in the present monograph, being clearly separated by characters of calyx, corolla, and pod.

Cryptophasolus Kuntze, Rev. Gen. Pl. 1: 176. 1891.

One species, *C. anamensis* Kuntze, which probably is *Canavalia gladiata* (Jacq.) DC.

DISTRIBUTION.

The species of *Canavalia* occur in both hemispheres, mostly in the tropics, but a few reach the subtropics. One species, *C. maritima*, a variable seashore plant, occurs in both hemispheres; of the remainder 13 are Old World species and 24 New World species.

ECONOMIC USES.

The genus as a whole is of comparatively little economic importance. Some of the species are rather attractive, but not one is cultivated for ornament. *Canavalia gladiata*, the sword bean, is generally cultivated in the tropics and subtropics, and both the young pods and seeds are used to a small extent for food. The seeds are red, ochraceous, or white and the large beans rather ornamental. *Canavalia ensiformis*, the jack bean, also known as Overlook, Giant Pod, and Wataki bean, is more or less employed as a green manure crop. Boname (Agr. Prat. Pays Chauds 10: 370-378. 1910) speaks of it enthusiastically as a food plant, but in some cases at least it gives rise to intestinal discomforts. The attractive

white seeds contain more urease than any other known, and are employed as a commercial source of this substance. The jack bean has been more or less employed as feed for domestic animals, but both the herbage and the seeds are eaten with reluctance by most animals. *Canavalia maritima* is cosmopolitan in the tropics on sea-shores, where it serves as a sand binder. There is difference of opinion as to the edibility of the seeds. Ridley (Trans. Linn. Soc. Bot. 3: 293. 1888-9) says the seeds are eatable but rather mealy, but later (Journ. Straits Branch Roy. As. Soc. 71. 1900) writes "beans said to be poisonous." Trimen (Fl. Ceylon 2: 67. 1894) says "seeds are much eaten, boiled, at Batticaloa and elsewhere." As several closely related species of southern Asia have been confused with *C. maritima*, there is doubt as to the identity of the species referred to in the above notes. Banks and Solander (Bot. Cook's Voy. 1: 24) say it was eaten by members of the expedition but was very bad. This plant may have been *C. baueriana*, a very similar species. Of this last Maiden (Proc. Linn. Soc. N. S. W. 28: 702. 1903) narrates how sailors on Norfolk Island were made very ill by eating this bean; further (Agr. Gazette N. S. W. 10: 281. 1899) that "the seeds are eaten by the blacks after cooking, as they are poisonous in the raw state." It is not unlikely that the deleterious principles may be removed by boiling in several changes of water.

The seeds of *Canavalia virosa*, an Indian species, are generally reputed to be poisonous. Birdwood (Veg. Prod. Bombay ed. 2. 118. 1865) writes, "The pods are dried like French beans, boiled, and eaten, when intoxication follows."

Canavalia campylocarpa, the Babricou bean, is utilized as a green manure crop in Barbados.

POLLINATION.

No very special studies have been made in the pollination of *Canavalia*. In experiments at Biloxi, Mississippi, it was found that bagged flowers set pods and seeds in *C. ensiformis*. Apparently insect visits are not necessary. Under greenhouse conditions numerous species set pods readily, and presumably the flowers are not visited by insects, at least large ones like honeybees or bumblebees. The flowers are greatly inclined to drop if handled. This makes artificial crossings almost impossible. So far as known, none such have yet been made nor are any natural hybrids definitely known.

At the Hawaiian Sugar Planters' Experiment Station, Honolulu, Dr. H. L. Lyon has obtained numerous seed variants of *C. ensiformis*. These are speckled, banded, or marbled in various patterns and colors. It is still uncertain whether these variations are the result

of natural crossing or are caused by other factors—a matter that is being investigated by Dr. Lyon.

The mechanism of the flowers of *C. bonariensis* Lindl. is described and figured by Lindman (Bih. Svensk. Vet. Akad. Handl. 27: Afd. III. No. 14: 53. *fig. 17.* 1902). In southern Rio Grande do Sul, Brazil, the flowers are visited in December by very large bumblebees. The bee alights on the standard, usually about horizontal in its reflexed position, and inserts its beak into the slit of the erect keel, which it spreads apart. The tip of the keel is thereby depressed and the anthers and stigma extended.

SPECIFIC CHARACTERS.

In the section *Eucanavalia* distinct species resemble each other so closely that often they can not be separated except by the mature pods and seeds. Unfortunately pods and seeds are often absent from herbarium specimens, so that the identification of such specimens is unsatisfactory. The seed characters in particular appear to be constant and reliable. Much of the confusion in botanical literature is doubtless due to the lack of mature pods and seeds on the specimens.

SYSTEMATIC TREATMENT.

CANAVALIA Adans.

DESCRIPTION OF THE GENUS.

Herbs or shrubs, mostly twining; leaves pinnately trifoliolate; petioles sulcate above; petiolules somewhat fleshy; stipules caducous, thin, not striate; peduncles axillary; flowers numerous, in raceme-like thyrses, two or more short pedicels often arising from each prominent pedicellar gland; bracts minute, caducous; bracteoles mostly orbicular, caducous; calyx tubular-companulate, bilabiate, the upper lip large, bilobed, the lower small and simple or three-lobed; standard large, reflexed, with a pair of basal auricles and bearing two callosities toward the base; wings free, narrow, auricled; keel falcate, truncate, the petals partly united; stamens monadelphous, the vexillar one partly or rarely entirely free; anthers all alike; style glabrous, rarely a little hairy near the tip; stigma capitate; pods stipitate, oblong or linear, beaked, straight or curved, compressed or turgid, the inner layer often loose and papery, the valves strengthened by one, two, three, or four longitudinal ribs, all very close to the sutures; seeds several to many, globose or ellipsoid and compressed, the hilum linear.

Species about 40, all tropical or subtropical in both hemispheres.

KEY TO THE SECTIONS.

Pod valves each with one longitudinal ridge very near the ventral suture; leaves coriaceous; stems woody; seeds spherical or nearly so.

1. *Clementea* (*Clementea* Cav.).

Pod valves each with more than one longitudinal ridge; leaves membranaceous; seeds ellipsoid, mostly compressed.

Ridges two on each valve, one contiguous to each suture; stems woody.

2. *Diplegma*.

Ridges three, two near the ventral suture, one very close to the dorsal suture often united to the sutural edge; stems mostly herbaceous.

3. *Eucanavalia* (*Malocchia* Savi).

Ridges four, two near each suture; stems herbaceous.....4. *Didiplopleura*.

1. *Clementea*. Shrubby vines with coriaceous leaflets; calyx with upper lip bilobed and lower lip simple; keel blunt, not produced; pod valves each with but a single longitudinal rib, this close to the ventral suture; seeds subglobose.

Lower lip of calyx entire.

Leaflets prominently reticulate; corolla 1.5 cm. long; pods dark brown, the valves thick; seeds red, the (1 mm. wide) hilum two-fifths of the circumference. (Cuba).....1. *C. cubensis*.

Leaflets not prominently reticulate; corolla 2.5 cm. long; pods pale, the valves not thick; seeds brown, the (2 mm. wide) hilum one-half the circumference. (Argentina, etc.).....2. *C. bonariensis*.

Lower lip calyx obscurely 3-lobed.

Leaflets 7 to 10 cm. long; pods 12 to 15 cm. long, 4 cm. broad; seeds over 2 cm. long.....3. *C. rusiosperma*.

Leaflets 3 to 7 cm. long; pods 10 cm. long, 2.5 cm. wide; seeds 1.5 cm. long. 4. *C. nitida*.

2. *Diplegma*. Stems woody; leaflets membranaceous or slightly coriaceous; upper lip of calyx emarginate; keel not produced, blunt; pod valves each with two longitudinal ribs, one close to each suture.

Corolla 2.5 cm. long; pods 25 cm. long, the ribs winglike.....5. *C. macropleura*.

Corolla 1.5 cm. long; pods 12 cm. long, the ribs not winglike...6. *C. parviflora*.

3. *Eucanavalia*. Vines, mostly herbaceous; calyx with bilobed upper lip about as long as the tube, the lower lip trilobed; keel not produced, obtuse; pod valves each with three longitudinal ribs, one close to each suture, the third close to the ventral rib; inner layer of pod thin and papery, adherent in some species, separating in others; seeds compressed.

Leaflets 3-nervedI. VARIICOLORES.

Leaflets not 3-nerved.

Herbage canescent-puberulent.....II. PUBERULAE.

Herbage green, usually minutely strigillose.....III. GENUINAE.

I. VARIICOLORES. A single species.....7. *C. variicolor*.

II. PUBERULAE. A single species.....8. *C. puberula*.

III. GENUINAE. Eighteen species.

Plants of the seashore, usually prostrate or procumbent but climbing when in thickets. Leaflets suborbicular, thickish; hilum about one-fifth the circumference of the seed.

Leaflets obtuse or retuse, glabrous or nearly so.....9. *C. maritima*.

Leaflets acute, strigillose on both faces.....10. *C. apiculata*.

Plants not of the seashore, ascending or climbing.

Fruit 20 times as long as broad. Seeds white.....11. *C. ensiformis*.

Fruit 4 to 8 times as long as broad.

Pods short, strongly curved.....12. *C. campylocarpa*.

Pods nearly straight, elongate.

Seeds pink-buff; pods straw-colored.....13. *C. plagiosperma*.

Seeds ochraceous to brown, mostly unicolored; pods dark.

Pods only 4 times as long as broad; leaflets obtuse...14. *C. arenicola*.

Pods more than 4 times as long as broad; leaflets not obtuse (except in *C. amazonica*).

Hilum short, not over one-fifth the circumference of the seed.

Apex of leaflets not strongly acuminate.

Leaflets firm, almost chartaceous. Intermediate ridge 2 to 3 mm. from the ventral ridge.....15. *C. mexicana*.

Leaflets membranaceous.

Intermediate ridge 3 to 4 mm. from the ventral ridge; pods 12 to 14 cm. long.....16. *C. panamensis*.

Intermediate ridge 5 mm. from the ventral ridge; pods 17 cm. long.....17. *C. paraguayensis*.

Apex of leaflets strongly acuminate.

Leaflets conspicuously venulose.....18. *C. fendleri*.

Leaflets not conspicuously venulose.....19. *C. leptophylla*.

Hilum long, at least one-third the circumference, and nearly as long as the seed.

Pods 20 to 30 cm. long; seeds red, white, or cinnamon-colored.

20. *C. gladiata*.

Pods less than 20 cm. long; seeds brownish.

Intermediate rib of pod 2 to 3 mm. from the ventral rib.

Leaflets acutely acuminate and apiculate, conspicuously reticulate.....21. *C. caribaea*.

Leaflets obtusely acuminate and apiculate, not conspicuously reticulate.....22. *C. boliviana*.

Intermediate rib of pod 5 mm. from ventral rib.

Leaflets obtuse or obtusish, elliptic in outline.

23. *C. amazonica*.

Leaflets not obtuse or obtusish.

Seeds black and brown striped; leaflets lance-oblong, acute, reticulate; calyx teeth ciliate.....24. *C. dictyota*.

Seeds isabella-color; leaflets ovate, acuminate; calyx teeth not ciliate.....25. *C. brasiliensis*.

4. *Didiplopleura*. Stems herbaceous; leaflets membranous; calyx with upper lip broad, emarginate, and lower lip small, 3-lobed; pod valves each with 4 longitudinal ridges, a pair of them close to each suture.

A single species.....26. *C. anomala*.

1. *Canavalia cubensis* Griseb. Mem. Amer. Acad. n. ser. 8: 178. 1861.

Stems climbing, woody, glabrous; petioles slender, mostly shorter than the leaflets; stipules and stipels not seen; petiolules puberulent, 3 mm. long; leaflets coriaceous, oblong to broadly oval, shortly and obtusely acuminate, rounded at base, glabrous, prominently reticulate, 5 to 8 cm. long; peduncles about as long as the 10 to 15-flowered thyse, the rachis sparsely puberulent; pedicellar glands prominent; pedicels 3 to 4 mm. long; bracteoles minute, orbicular; calyx campanulate, glabrous, 10 mm. long, the broad upper lip bilobed, about equaling the tube, the lower lip entire, oblong, 2 mm. long; corolla purple, 1.5 cm. long; standard broadly obovate, reflexed, not emarginate, obscurely biauriculate and with two linear callosities; wings nearly as long as the keel; keel falcate, obtuse; stigma capitate; young pods sparsely strigillose; mature pods oblong, beaked at tip, stipitate, compressed, dark brown, the valves thick and much wrinkled, each with a single rib near the ventral suture, 2 to 9-seeded, 10 to 15 cm. long; seeds dark red, shiny, 17×17×10 mm., the linear blackish hilum two-fifths of the circumference.

CUBA: Monte Verde, a coffee plantation in the mountains back of Santa Catalina de Guantánamo, *Wright* 139, "climbing over trees" (Gray, Kew).

2. *Canavalia bonariensis* Lindl. Bot. Reg. 6: pl. 1199. 1828.

Canavalia paranensis Hook. & Arn. Bot. Misc. Hook. 3: 200. 1833.

Canavalia monodon E. Mey. Comm. Pl. Afr. Austr. 149. 1835.

Canavalia cryptodon Meisn. Lond. Journ. Bot. 2: 96. 1843.

Stems woody, climbing, terete, sparsely retrorse-puberulent when young, glabrate in age; petioles slender, glabrous, about as long as the leaflets; stipules narrowly ovate, attenuate-acuminate, 2 mm. long, each with a thickened gland at base; stipels very minute, aculeolate; petiolules 3 mm. long, densely strigillose; leaflets coriaceous, narrowly oval to broadly lanceolate, short-acuminate, the tip obtuse and apiculate, rounded to obtusely angled at base, finely reticulate, sparsely strigillose on both sides when young, becoming glabrous, 4 to 7 cm. long; peduncles about as long as the 10 to 15-flowered thyrse; pedicellar glands prominent; bracteoles orbicular, minute; calyx coriaceous, campanulate, pale-margined, sparsely strigillose, 10 to 12 mm. long, the broad upper lip bilobed, shorter than the tube, the entire lower lip 2 mm. long, triangular, acute; corolla purple, 2.5 cm. long; standard reflexed, obovate, deeply emarginate, attenuate at base to a claw 6 mm. long, not auriculate, with a median groove on each side of which is a linear callosity; wings equaling the keel, falcate, obtuse, auriculate at base, the slender claw 7 mm. long; keel falcate, obtuse, the petals united from above the middle to the tip, 2.5 mm. long, the auricles long, curved, acute, the slender claw 7 mm. long; stamens monadelphous, the vexillar one partly free; style glabrous; stigma capitate; ovary pubescent, 7-ovuled; pods pale, oblong, straight, long-stipitate, beaked, the only one examined 7 cm. long, 2.5 cm. wide, 2-seeded, a single longitudinal rib 2 to 3 mm. from the ventral suture, the inner layer adherent; seed dark brown, 15×17×10 mm., the linear hilum about half the circumference of the seed.

Southern Brazil, Uruguay, and east-central Argentina; introduced in South Africa.

URUGUAY: Santa Lucia, *Gilbert* 1084 (Kew).

BRAZIL: Rio de Janeiro, *Glaziou* 6179 (Kew). Without locality, *Sello* 1426 (Kew).

AFRICA: Port Natal, *Grant*; *Krauss* 296, type of *C. cryptodon* (Kew, N. Y., Mo.). Omtendo River, *Drège* (Kew, Mo.), type of *C. monodon*. Natal, *Gerrard* 644 (Kew).

Canavalia bonariensis was described originally from greenhouse plants raised from seeds from Buenos Aires. The type of *C. paranensis* was collected on the Río Paraná, Argentina (?), by Tweedie. It is reported by Bentham from the Piranga River, Minas Geraes, Brazil. Hicken (*Chloris Platensis Argentina* 136. 1910.) records the plant from Maciel and Isla Santiago, Argentina, and from Entre Ríos, Uruguay. Lindman (*Bih. Svensk. Vet. Akad. Handl.* 27: Afd. III. No. 14: 53. 1902) found it at Rio Grande do Sul, Brazil.

Canavalia monodon was based on plants from the Omtendo (? Umtentu) River, Natal, *Drège*, and *C. cryptodon* is based on *Krauss* 296 from Port Natal. With scarcely a doubt, *C. bonariensis* is an introduced plant in South Africa.

Arechavaleta (*Anal. Mus. Nac. Montevideo* 3: 384. 1901) describes the pods as 10 to 15 cm. long and containing 5 or more seeds.

3. *Canavalia rusiosperma* Urban, Symb. Antill. 1: 473. 1900.

Stems woody, climbing, terete, sparsely appressed-puberulent with reflexed hairs, at length glabrous, becoming as much as 10 cm. thick (*Cook & Collins*); stipules triangular, 1.5 mm. long, caducous; petiole usually much shorter than

the leaflets; petiolules puberulent, 4 to 5 mm. long; leaflets coriaceous, ovate-oblong, very shortly acuminate at apex, the tip blunt and not apiculate, rounded to subcordate at base, glabrous or nearly so, prominently reticulate-venose beneath, 7 to 10 cm. long, 4 to 5 cm. broad; peduncles short, the inflorescence about 20-flowered; pedicellar glands prominent; bracteoles suborbicular; calyx 10 to 14 mm. long, campanulate, glabrous or nearly so, 2-lipped, the upper lip as long or a little longer than the tube and divided to the base, its lobes rounded, the lower lip entire, lanceolate, concave, thickish, 1.5 to 2 mm. long; corolla purplish, 2 cm. long; standard with a broad claw 7 mm. long, the blade orbicular, deeply bilobed, the callosities lunate, thick, the auricles short, broad, and inflexed; wings 17 mm. long, linear-oblong, obtuse, curved, the claw 6 mm. long, the auricles curved and reflexed; keel as long as the wings, incurved, obtuse, the petals united for the upper fifth to the tip, the claws 6 mm. long, the auricles curved, reflexed; stamens monadelphous; style glabrous; stigma capitate, lop-sided; pods stipitate, the stipe 1.5 to 2 cm. long, the body linear-oblong, compressed, dark brown, much wrinkled, becoming brittle in age, 12 to 15 cm. long, 4 cm. broad, with a single longitudinal ridge 3 to 4 mm. from the ventral suture; seeds subglobose, shiny, dark red or rarely yellow, 18 to 24 mm. long, 15 to 20 mm. broad, 10 to 15 mm. thick; hilum linear, 23 mm. long about two-fifth of the circumference.

Porto Rico: Maricao, *Sintensis* 452 (U. S.). Monte Montoso, *Britton & Pennell* 4151 (U. S.). Cuatro Calles, *Shafer* 2823 (U. S.). Lares to Callejones (*vide* Urban). Near Quebradillas (*vide* Urban).

DOMINICAN REPUBLIC: Near Puerto Plata in forests of Loma Isabel de la Torre, *Eggers* 2659, type (*vide* Urban). Constanza, *Türckheim* 3032 (*vide* Urban). San Pedro de Macorís, *Rose, Fitch & Russell* 4184 (U. S.). Barahona, near Bahoruco, *Fuertes* 1186, 1401 (*vide* Urban).

ST. THOMAS: Signal Hill, *Eggers* (*vide* Urban).

4. *Canavalia nitida* (Cav.) Piper.

Clementea nitida Cav. Anal. Clenc. Nat. 7: 63. 1804. Type grown in the Botanical Garden at Madrid from seed sent from Cuba.

Canavalia bahamensis Britton, Bull. N. Y. Bot. Gard. 4: 119. 1906. Described from specimens from Abaco and Eleuthera.

Canavalia ekmani Urban, Repert. Nov. Sp. Fedde 13: 317. 1918. Type from Cojimar, Habana, Cuba, *Ekman* 364. Other specimens cited are *Shafer* 587 and *Wilson* (? *Shafer*) 11517.

Stems twining, terete, reflexed-strigillose; petioles glabrous or nearly so; petiolules puberulent; leaflets coriaceous, elliptic to ovate-elliptic or oblong-lanceolate, often abruptly narrowed toward the tip, obtuse or sometimes emarginate at apex, rounded or truncate at base, glabrous, 4 to 7 cm. long; peduncles stout, shorter than the 10 to 50-flowered thyrses; pedicellar glands prominent; bracteoles orbicular, 1 mm. long, ciliolate; calyx campanulate, 6 to 8 mm. long, glabrous, the broad upper lip emarginate, as long as the tube, the lower lip 2.5 mm. long, 3-lobed; corolla purple; standard with a claw 5 mm. long, the blade 11 mm. long, orbicular, reflexed, auriculate at base; wings 14 mm. long, unguiculate, auricled, pink; keel falcate, as long as the wings, auricled, pink; ovary sericeous, 12-ovuled; style glabrous; pods dark brown, somewhat wrinkled, linear-oblong, compressed, 10 to 15 cm. long, stipitate, beaked, each valve with a single rib very near the ventral suture; seeds red, 15×12×12 mm., the linear hilum one-fourth the circumference.

BAHAMAS: Marsh Harbor, Abaco, *Brace* 1620 (N. Y., U. S.), type of *C. bahamensis*. Tarpum Bay, Eleuthera, *Coker* 411 (N. Y.). Mangrove Bay, Andros, *Brace* 4982 (U. S.). Standard Creek, Andros, *Small & Carter* 8918 (U. S., Kew).

CUBA: Camagney, *Shafer* 587. Sierra Guane, Pinar del Río, *Shafer* 10527 (U. S.). Sierra de Anafe, *Shafer* 11517 (U. S.). Sumidero, *Shafer* 13518 (U. S.). Without locality, *Rugel* (N. Y.).

No characters have been detected by which *C. bahamensis* and *C. ekmani* can be kept distinct. With scarcely room for doubt, *Clementea nitida* Cav. is the same thing, as indicated by Cavanilles's detailed description and figure. In herbarium specimens, however, the leaves can scarcely be called shiny.

5. *Canavalia macropleura* Piper, sp. nov.

Probably a climbing vine; stems woody, terete, sparingly reflexed-strigillose; petioles sparsely strigillose, 12 to 20 cm. long, about equaling the leaflets; stipules caducous, not seen; petiolules 7 mm. long, densely hirsutulous with stiff hairs; stipels subulate, persistent, 4 mm. long; leaflets membranous, thinish, ovate or elliptic-ovate, rounded at base, acuminate and apiculate at apex, finely reticulate, becoming glabrous above, sparsely strigillose beneath, 15 cm. long; peduncles stout, strigillose with reflexed hairs; thyrses about 12-flowered, the pedicels very short; bractlets orbicular; calyx campanulate, sparsely strigillose, 18 mm. long, the broad upper lip emarginate, the lower lip with 3 ovate teeth about 2 mm. long, the middle one longest; corolla 4 cm. long; standard orbicular, erect in anthesis, longer than the wings; keel curved, somewhat produced; pods on pedicels 1 to 2 cm. long, the young pods strigillose; mature pods linear, brownish, much compressed, sharply apiculate with a recurved beak, 28 cm. long, 4 cm. broad, the inner layer closely adherent, each valve with a broad longitudinal rib near each suture, the ventral one 10 mm. broad, the dorsal one 5 mm. wide; seeds dark brown, semicircular in outline, much compressed, $27 \times 18 \times 4$ mm., the linear hilum about the whole length of the convex border, over half the circumference of the seed.

Type in the Kew Herbarium, collected in Venezuela, a few miles north of the Colombian border, by August Fendler (no. 251). This specimen is in fruit. Flowering specimens were collected near Tovar, Venezuela, by Fendler (no. 248).

Very well marked by the two broad ribs on each valve. The only good flower on the specimen was not dissected.

6. *Canavalia parviflora* Benth. in Mart. Fl. Bras. 15¹: 177. 1859-62.

Stems woody, terete, glabrous; leaflets thin, slightly coriaceous, oval to ovate, abruptly short-acuminate, with blunt and apiculate tip, rounded or truncate at base, sparsely strigillose on both faces, 6 to 10 cm. long, 4 to 6 cm. broad; petioles shorter than the leaflets, glabrous or nearly so; petiolules 5 to 7 mm. long, glabrous or puberulent; stipules and stipels not seen; peduncles much shorter than the 15 to 30-flowered thyrses, the pedicellar glands prominent, hemispheric; bracteoles orbicular; calyx 10 mm. long, glabrous or sparsely strigillose, the upper lip broad, emarginate, the lower lip 1.5 mm. long, with 3 small ovate thin-margined teeth, the median slightly narrower and longer; standard 1.5 cm. long, thickish, almost orbicular, deeply emarginate, strongly nerved, reflexed in anthesis, bicallose near the base, the callosities puberulent, auricled at base, the auricles inflexed, the slender claw half as long as the blade; wings 13 mm. long, oblanceolate, concave, gradually attenuate at base into the claw, bearing an elongate recurved auricle just below the middle; keel 12 mm. long, the blade rhomboid and each petal bearing an inflexed auricle at base, the slender claw as long as the blade; style exceeding the stamens, sparsely bearded on the lower side; stigma capitate; mature pods thick, woody, brown, glabrous, straight, 10 cm. long, 3 cm. broad, with a short sharp incurved beak and bearing two sharp ribs, one very close to each suture; seeds $18 \times 10 \times 2$ mm., oblong, much compressed, brown, shiny; hilum linear, nearly as long as the seed and more than one-third its circumference.

BRAZIL: Rio de Janeiro, *Riedel* 446, in fruit (U. S.). Without locality, *Pohl*, type (Kew). Rio de Janeiro Province, *Glaziou* 6508 (Kew). Minas Geraes Province, *Claussen* 134, 45 (Kew).

Bentham cites also specimens from Piauhy Province, *Martius*; Goyaz Province, *Weddell*; and Rio de Janeiro, *Luschnath*.

7. *Canavalia varicolor* Piper, nom. nov.

Canavalia ensiformis versicolor Kuntze, Rev. Gen. Pl. 3¹: 55. 1898. Not *C. versicolor* Rodrig. 1894.

Stems herbaceous(?), terete, slender, sparsely strigillose; petioles strigillose, longer than the leaflets; petiolules puberulent; leaflets membranaceous, broadly ovate, acuminate and apiculate, rounded or truncate at base, glabrous above, puberulent on the veins beneath, finely reticulate, 3-nerved from the base, 5 cm. long, nearly as broad; peduncles about as long as the inflorescence; thyrses about 10-flowered; pedicellar glands very prominent, bud-shaped; flowers not seen; pod (nearly mature) sessile, finely strigillose, nearly straight, linear, compressed, short-beaked, brownish, 13 cm. long, 1.6 to 1.8 cm. broad, each valve with 3 small ribs, one rib near each suture, the third 4 mm. from the ventral rib; seeds immature, the hilum as long as the seed.

BRAZIL: Villa Maria, Mattogrosso, *Kuntze* (U. S.).

Kuntze's description is very brief and relates merely to the color of the flowers, "petals yellow or ochraceous, the vexillum at length bluish." The plant differs from all other known *Canavalias* in the peculiar leaflets, palmately 3-ribbed from the base.

8. *Canavalia puberula* Piper, sp. nov.

Whole plant whitish-puberulent; stems slender, terete, herbaceous; petioles much shorter than the leaflets; petiolules 4 mm. long; stipules and stipels not seen; leaflets membranaceous, oval or slightly ovate, short-acuminate, with very blunt apiculate tip, obtuse to rounded at base, densely white-puberulent on both faces, 5 to 10 cm. long; peduncles about equaling the 10 to 20-flowered thyrses; pedicellar glands prominent; bracteoles minute, orbicular; calyx campanulate, 10 mm. long, the broad emarginate upper lip shorter than the tube, the lower lip 3 mm. long, with three triangular acute teeth, the median longer and thicker than the lateral ones; corolla 20 to 25 mm. long, the petals of equal length; standard broadly obovate, deeply notched, reflexed, attenuate at base to a short broad claw, bilauriculate at base, the auricles inflexed, bearing two lunate callosities near the base where the petal is reflexed; wing oblong-spatulate, obtuse, a short blunt tooth near the middle, an oblong auricle near the base, the claw short; keel falcate, the petals united from above the middle nearly to the blunt tip, each with an acute basal auricle and a short claw; stamens monadelphous; style glabrous; stigma capitate; young pods densely sericeous, with 3 ribs on each valve, one near each suture, the third near the middle.

Type in the herbarium of the New York Botanical Garden, collected in Santa Marta, Colombia, by H. H. Smith (no. 2047). Specimens of the same collection are in the U. S. National Herbarium and at Kew.

VENEZUELA: Guegue, Jan. 25, 1855, *Fendler* 271 (Kew).

Probably a species of the section *Eucanavalia*.

9. *Canavalia maritima* (Aubl.) Thou. Journ. de Bot. Desv. 1: 80. 1813.

Dolichos maritimus Aubl. Pl. Guian. 765. 1775. Based on a plant from French Guiana.

Dolichos roseus Swartz, Prodr. Veg. Ind. Occ. 105. 1788. Apparently based on *Dolichos maritimus repens* P. Br. Civ. Nat. Hist. Jam. 293.

Dolichos rotundifolius Vahl, Symb. Bot. 81. 1790-94. Based on specimens sent from the Caribbean Islands.

Canavalia maritima Thou. Journ. de Bot. Desv. 1: 80. 1813. Thouars gets his specific name *maritima* from Plukenet, whereas Aublet takes it from Plumier.

Canavalia cathartica Thou. Journ. de Bot. Desv. 1: 80. 1813.

Dolichos miniatus H. B. K. Nov. Gen. & Sp. 6: 441. 1823. Specimens from Batabano and Cayo Flamingo, Cuba.

Canavalia miniata DC. Prodr. 2: 404. 1825. Based on the preceding.

Canavalia rosea DC. Prodr. 2: 404. 1825.

Dolichos littoralis Vell. Fl. Flum. 7: 301. pl. 160. 1825. "Ad littora maris Pharmacopolitana," Brazil.¹

Stems herbaceous, terete, sparsely strigillose, 3 to 10 meters long, prostrate when growing on open beaches but climbing where support is available; petioles about as long as the leaflets; stipules triangular-ovate, small, thickened at base; leaflets rather thickish, oval or ovate to orbicular, obtuse to retuse and usually apiculate at apex, sparsely strigillose on both sides when young, 5 to 8 cm. long; peduncles stout, the naked part about as long as the leaves; thyrses 6 to 30-flowered; calyx campanulate, sparsely strigillose, 2-lipped, the upper lip broad, emarginate, nearly as long as the tube, the lower lip 3-toothed, the lobes triangular, obtuse; corolla rose-colored; standard obovate, emarginate, 10 to 15 mm. long, auricled at base and bearing two lunate callosities; wings as long as the keel, oblong, obtuse, falcate, unguiculate, auricled at base of blade; keel blunt, curved, unguiculate, auricled at base; stamens monadelphous; style glabrous; stigma capitate; pod linear-oblong, nearly straight, beaked at apex, scarcely compressed, sparsely strigillose, 7 to 15 cm. long, 2 to 2.5 cm. broad, each valve with a longitudinal rib close to each suture and a third one 3 to 5 mm. from the ventral suture; inner layer loose and separating; seeds 4 to 9, ovoid to subglobose, brown and tawny marbled, 12 to 16 mm. long, 7 to 10 mm. broad, 4 to 9 mm. thick, the short hilum broadest at micropylar end, one-fifth of the circumference of the seed.

FLORIDA: Palm Beach, *Curtiss* 5522 (U. S., Kew); October, 1877, *Garber* (U. S.). Eastern Florida, *Curtiss* 682 (U. S., Kew). Cedar Keys, April, 1876, *Garber* (U. S.). Sugar Loaf Key, *Pollard, Collins & Morris* 71 (U. S.). Captiva Island, *Tracy* 7721 (U. S.). Fort Myers, *Hitchcock* 90 (U. S.). Punta Rassa, *Miss J. P. Standley* 255; *Hitchcock* 54 (U. S.). Coon Key, *Simpson* 255, 279 (U. S.). St. Vincent Island, *McAtee* 1844 (U. S.)

LOUISIANA: Breton Island, *Tracy & Lloyd* 184 (U. S.).

BERMUDA. South Shore, *Collins* 443 (U. S.); June 3, 1905, *Harshberger* (U. S.). Paget, *Brown & Britton* 133 (U. S., Kew).

BAHAMAS: Nassau, *Curtiss* 114 (U. S., Kew). Without locality, *Robinson* 28 (Kew). Deep Creek, Andros, *Brace* 5112 (U. S.). Pompey Bay, Acklin Island, *Brace* 4416 (U. S.).

CUBA: Cayo Sabinal, Camagüey, *Shafer* 1121 (U. S.). Manzanillo, *Shafer* 12351 (U. S.). Cayo Coco, Camagüey, *Shafer* 2686 (U. S.). Balabano, *Baker & Wilson* 2386 (U. S.). Playa de Marinao, *Palmer & Riley* 852 (U. S.).

¹ The more involved synonymy based on Old World plants and closely related species is discussed by Piper and Dunn (Kew Bull. Misc. Inf. 1922: 138. 1922). *Dolichos obtusifolius* Lam. (Encycl. 2: 295. 1786), described from Santo Domingo and the basis of *Canavalia obtusifolia* DC. (Prodr. 2: 402) is obscure. It is described as having red seeds, so that Urban (Symb. Antill. 8: 308. 1910) suspects it may be *Canavalia rusiosperma* Urban.

Cabañas, *Palmer & Riley* 752 (U. S.). Mariel, *Palmer & Riley* 726 (U. S.). Vivijagua, Isle of Pines, *Britton & Wilson* 14693 (U. S.).

PORTO RICO: San Juan, *Underwood & Griggs* 925 (U. S.). Isabel Segunda, *Shafer* 2401 (U. S.). Arecibo, *Cook & Collins* 1054 (U. S.). Catano, *Cook & Collins* 987 (U. S.). Santurce, *Heller* 52 (U. S., Kew).

ST. VINCENT: *Guilding* (Kew).

ST. THOMAS: Soldier's Bay, *Eggers* 318 (Kew).

ST. CROIX: Frederiksted, *Rose, Fitch & Russell* 3504 (U. S.); *Ricksecker* 25 (U. S.).

DOMINICA: *Imray* 34 (Kew).

MONTSERRAT: Plymouth, *Shafer* 365 (U. S.).

DOMINICAN REPUBLIC: San Pedro de Macorís, *Rose, Fitch & Russell* 4262 (U. S.). Santo Domingo, *Rose, Fitch & Russell* 3698 (U. S.). Haina, *Faris* 146 (U. S.).

GUADELOUPE: *Duss* 2652 (U. S.).

JAMAICA: Port Antonio, *Fredholm* 3057 (U. S.). Without locality, *Distin* (Kew).

BAHAMAS: Deep Creek, Andros, *Brace* 5112 (U. S.). Pompey Bay, Acklin's Island, *Brace* 4416 (U. S.).

DOMINICA: Rosalie, *Lloyd* 727 (Kew).

YUCATÁN: Chichancanab, *Gaumer* 1502, 1542, 2243 (Field). San Anselmo, *Gaumer* 1201 (Field).³

COSTA RICA: Boca Panamá, *Tonduz* 9146 (U. S.); *W. W. & H. E. Rowlee* 477 (U. S.).

PANAMA: Chagres, *Fendler* 80 (Kew, U. S.). Colón, *Hayes* 370 (Kew).

COLOMBIA: Santa Marta, *H. H. Smith* 292 (U. S., Kew). Cartagena, *Heriberto* 183 (U. S.). Western Colombia, *Cuming* 1204 (Kew).

BRITISH GUIANA: Without locality, *Lechmann*, January, 1918 (Kew); *Jenman* 2012 (Kew).

FRENCH GUIANA: Without locality, *Sagot* 147 (Kew).

BRAZIL: Without locality, *Sello*; *Martius* 1133 (Kew). Zapativa, *Pohl* (Kew). Fernando Noronha, *Ridley* (Kew).

GALÁPAGOS ISLANDS: Bindloe Island, *Snodgrass & Heller* 770 (U. S.).

10. *Canavalia apiculata* Piper, sp. nov.

Stems herbaceous, stout, terete, strigillose with reflexed hairs; petioles stout, strigillose, half as long as the leaflets; petiolules very strigillose, 5 mm. long; stipules triangular-ovate, thick at base; stipels subulate, stiff, somewhat persistent; leaflets membranaceous, thick, broadly obovate, rounded or abruptly acuminate-apiculate at tip, broadly deltoid at base, prominently reticulate, sparsely strigillose, shorter than the thyrses; peduncles stout, erect, about as long as the leaves, 6 to 8-flowered; pedicellar glands large; calyx campanulate, strigillose, longitudinally sulcate when dry, 10 cm. long, the broad emarginate upper lip shorter than the tube, the lower lip 3-toothed, the teeth ovate-triangular, the median longest; corolla 13 to 18 mm. long; standard obovate, emarginate, auricled, bicallose; wings as long as the keel; young pods densely silvery-strigillose; mature pods oblong-linear, stipitate, compressed, nearly straight, strongly beaked, 10 to 12 cm. long, 2 cm. broad, the valves thick, each with three longitudinal ridges, one near each suture, the third very prominent and 4 to 5 mm. from the ventral suture; seeds ellipsoid, compressed, dark brown, 12×9×5 mm.; hilum broadest at the micropylar end, one-fourth the circumference of the seed.

³ These Yucatán specimens are not typical and may be distinct. The first-named locality is in the interior of Yucatán.

Type in the U. S. National Herbarium, nos. 209168 and 209169, collected at Manzanillo, Colima, Mexico, December 1-31, 1890, by Edward Palmer (no. 1024).

MEXICO: Altata, Sinaloa, *Rose* 1343 (U. S.). Clarion Island, *Anthony* 405, (Kew, Mo., U. S., Calif.; in fruit); *C. H. Townsend*, March, 1889 (U. S.).

Very closely allied to *C. maritima*, but the leaflets, and especially the seeds, differ.

11. *Canavalia ensiformis* (L.) DC. Prodr. 2: 404. 1825.

Dolichos ensiformis L. Sp. Pl. 725. 1753. The original basis of Linnaeus' species is the "Horse Bean" of Jamaica, described by Sloane (Cat. Pl. Jam. 1: 68. 1696).

Dolichos acinaciformis Jacq. Coll. Bot. 1: 114. 1786. Based on a twining plant grown in the greenhouse from West Indian seed and supposed to be different from *D. ensiformis*, described by Linnaeus as "erect."

Dolichos pugioniformis Gmel. Syst. Nat. ed. 13. 2: 1103. 1796, in part. Based on older descriptions, mainly of *C. ensiformis* but partly of *C. gladiata*.

Annual, usually bushy and erect, 1 to 2 m. high, the tips of the branches inclined to twine and in the shade becoming pronouncedly twining; stems stout, terete, sparsely strigillose with reflexed hairs; petioles usually longer than the leaflets; stipules lanceolate, thickened at base, minute, quickly deciduous; petiolules densely puberulent; stipels minute, subulate; leaflets membranaceous, oval to ovate, obtuse to acute, apiculate, 6 to 12 cm. long, strigillose at first on both faces but at length glabrous or nearly so; peduncles stout, 10 to 20-flowered; pedicellar glands prominent; bracteoles orbicular; calyx campanulate, 16 mm. long, the upper lip broad, emarginate, shorter than the tube, the lower lip 3-lobed, 4 mm. long, the lobes triangular, acute, the median thicker, narrower, somewhat concave; corolla 15 mm. long, rose-colored, gradually fading to white toward the base; standard oblong-orbicular, notched at apex, reflexed in anthesis, bearing two conical thickenings near the base of the blade, and at the base two inflexed semicircular auricles, the claw broad, 5 mm. long; wings oblong, obtuse, curved, unguiculate, the basal auricle thickish and inflexed; keel as long as the wings, falcate, the petals united except at base, unguiculate, an inflexed auricle on each side at the base of the blade; stamens monadelphous, the vexillar one free near the base, all free for the terminal one-sixth; style glabrous; stigma capitate, scarcely thickened; pods linear, slightly curved, stipitate, beaked at tip, scarcely compressed, 25 to 30 cm. long, 2 to 2.5 cm. wide, 12 to 20-seeded, each valve with three longitudinal ridges, one near each suture, the third 4 mm. from the ventral suture; inner layer thin, white, papery, separating; seeds ellipsoid, compressed, shiny white, 22×14×8 mm., the hilum grayish, 8 mm. long, about one-seventh the circumference, surrounded by an orange-brown narrow border.

Cultivated in the southern United States under the names Jack bean, Wonder bean, Giant Stock bean, Wataka bean, Pearson bean, etc. The plant is known to occur through the West Indies and in Panama, Guiana, Brazil, and Peru, but probably in all cases as a cultivated plant. While now widespread in the Tropics of both hemispheres, it is practically certain that the plant is native to America.

12. *Canavalia campylocarpa* Piper, Proc. Biol. Soc. Washington 30: 175. 1917.

Herbaceous annual, or under tropical conditions perhaps longer enduring; stems twining, green, branching, minutely and sparsely appressed-puberulent with white hairs, growing to a height of 2 to 4 meters; petioles about as long as the leaflets, sparsely puberulent; petiolules dark green, densely white-puberulent, somewhat swollen; leaflets membranaceous, ovate to oblong-

ovate, short-acuminate, sparsely puberulent, especially on the margins and the veins beneath, in age nearly glabrous, 10 to 18 cm. long; stipules triangular, acuminate, ciliate, 3 mm. long, quickly fugacious, but the base of each developing into a persistent green protuberance; stipels linear, the minute swollen base of each persistent; peduncles exceeding the subtending leaves; thyrses 5 to 10-flowered; pedicels very short, a group of swollen nectaries at the base of each; calyx green, sparsely puberulent, 10 to 12 mm. long, 2-lipped, the broad upper lip half as long as the tube and emarginate, the lower lip 3-lobed, the lobes small, subequal, triangular, acute; corolla pink; standard erect, broadly oval, deeply notched at apex, white in the center, the sides recurved, 2 cm. long, the broad claw 5 mm. long, the auricles oblong, obtuse, inflexed, 1 mm. long, the callosities conic; wings shorter than the keel, 22 mm. long, linear-oblong, concave, obtuse, the claw 5 mm. long, the auricles ovate, curved; keel 24 mm. long, incurved, obtuse, the claw 4 mm. long, the auricles ovate, incurved; stamens monadelphous; stigma capitate; pods much compressed, curved into a semicircle, 6 to 10 cm. long, 2 to 3 cm. broad, wax-yellow when immature, brown when ripe, finally white-puberulent, each valve with 3 longitudinal ridges, one close to each suture, the third 5 mm. from the ventral ridge; seeds oval in outline, compressed, 12 to 18 mm. long, wax-brown, the linear black hilum four-fifths as long, about one-fourth the circumference.

The peculiar pods well distinguish it from any other species as yet described. The seed of this plant was sent to the U. S. Department of Agriculture by John R. Bovell, Esq., Department of Agriculture, Bridgetown, Barbados, under the name "Babricou bean." In Antigua it has been used as a green manure crop. Presumably it is native to the West Indian region.

13. *Canavalia plagiosperma* Piper, Bull. Misc. Inf. Kew 1922: 141. 1922.

Annual; whole herbage sparsely strigillose; stems terete, climbing, one to several meters long; petioles as long as the leaflets; leaflets membranaceous, obscurely reticulate, broadly ovate, rounded or obtuse at base, acutish, 10 to 13 cm. long; petiolules puberulent; thyrses about 10-flowered; calyx green, spotted with blackish, strigillose, the upper lip emarginate, the lower lip with three broad deltoid acute subequal teeth; corolla purple, the wings as long as the blunt keel; pods linear, much compressed, nearly straight, strigillose, 20 to 25 cm. long, 4 cm. broad, tipped with a recurved beak, the intermediate ridge 5 mm. from the sutural one; seeds about 10, ellipsoid, much compressed, somewhat shiny, abruptly narrowed at the micropylar end, 27×17×10 mm., ochraceous salmon (Ridgway); hilum lanceolate, 10 mm. long, wholly on the oblique micropylar end of the seed, black, encircled by a narrow brown band.

Obtained from Dr. P. Boname, Director of Agriculture, Mauritius, the seed originally from Cuba, and grown at Biloxi, Mississippi; Miami, Florida; and in the greenhouse at Washington, D. C., No. 02053 (type; also from Nicaragua, No. 02735.

Easily distinguished from any other species by its peculiar seeds.

14. *Canavalia arenicola* Piper, sp. nov.

Stems herbaceous, terete, sparsely strigillose; petioles sparsely strigillose, shorter than the leaflets; stipules and stipels not seen; petiolules 5 mm. long, pubescent; leaflets membranaceous, thickish, oblong to elliptic, obtuse or retuse, rounded at base, glabrous, 5 to 7 cm. long, half as wide; peduncle terete, strigillose, longer than the few-flowered thyrses; bracteoles orbicular; calyx campanulate, strongly nerved, sparsely strigillose, 10 mm. long, the broad emarginate upper lip shorter than the tube, the lower lip 3 mm. long, with triangular teeth; corolla "rouge violet," 2 cm. long; petals subequal in length;

keel blunt; pods densely strigillose when young, glabrous when mature, linear, compressed, dark brown, smooth, 12 cm. long, 3 cm. broad, 3-ribbed, one rib close to each suture, the third more prominent and 5 mm. from the ventral rib; inner layer separating when mature; seeds oval in outline, somewhat narrowed at the micropylar end, much compressed, $18 \times 12 \times 5$ mm.; hilum oblong-linear, nearer to the micropylar end, 10 mm. long, or about one-fifth the circumference.

Type in the Kew Herbarium, collected at Coyaquilla, Michoacán or Guerrero, Mexico, in sandy places, June, 1898, by E. Langlassé (no. 734).

Readily distinguished from any form of *C. maritima* by the pods and seeds.

15. *Canavalia mexicana* Piper, sp. nov.

Stems herbaceous, climbing, terete, sparsely strigillose with reflexed hairs; stipules minute, ovate, obtuse, purplish, quickly deciduous; petioles shorter than the leaflets, strigillose; stipels minute, linear; leaflets chartaceous, oval, acute or acutish or rarely acuminate, strigillose on both faces when young, glabrous in age, 5 to 7 cm. long; peduncles about 10 cm. long, equaling the 15 to 20-flowered thyrses; bracteoles broadly ovate to orbicular; calyx campanulate, sparsely strigillose, sulcate with many longitudinal grooves when dry, 10 mm. long; upper lip deeply emarginate, shorter than the tube; lower lip 3-lobed, the lobes triangular, acute, the middle one longer and narrower, 2 mm. long; corolla 2 to 2.5 cm. long; standard ovate, emarginate, reflexed, the auricles rounded and inflexed, the claw rather broad, the callosities thick; wings as long as the keel, oblanceolate, obtuse, auricled, unguiculate; keel falcate, truncate, the auricles narrow, the claw slender; style glabrous; stigma capitate; pod linear, 10 to 15 cm. long, strigillose when young, thick and firm, each valve with three ribs, one very near each suture, the third 3 mm. distant from the ventral rib; seeds ellipsoid, compressed, tawny, streaked with brown, 15 mm. long, 10 mm. wide, 5 mm. thick; hilum oblong, black, broadest at the micropylar end, encircled by a dark brown band, less than half as long as the seed, about one-sixth its circumference.

Type in the U. S. National Herbarium, nos. 567787 and 305542, collected at Imala, Sinaloa, Mexico, September 25 to October 8, 1891, by Edward Palmer (no. 1753).

MEXICO: María Madre Island, *Nelson* 4190 (U. S.). Guadalupe, Sinaloa, *Rose, Standley & Russell* 14787 (U. S.). Villa Unión, Sinaloa, *Lamb* 385 (U. S.); *Rose, Standley & Russell* 13979 (U. S.). Culiacán, Sinaloa, November 10, 1904, *Brandege* (U. S.). Acoponeta, Tepic, *Rose* 3363 (U. S.) Acapulco, *Palmer* 145 (Kew). Valley of Córdoba, *Bourgeau* 1758 (Kew, Gray). (The Bourgeau specimen is doubtfully referred to *C. mexicana*, as it has long-acuminate leaflets.)

SALVADOR: Gulf of Fonseca, *Sinclair* (Kew).

NICARAGUA: Without locality, *Wright* (Mo.).

GUATEMALA: Gualán, *Deam* 310 (Field). Between Cahabón and Secanquim, Alta Verapaz, *Goll* 125 (U. S.). Mazatenango, *Kellerman* 5688 in part (U. S.).

YUCATÁN: Mérida, *Schott* 729 (Field).

16. *Canavalia panamensis* Piper, sp. nov.

Stems herbaceous, terete, sparsely strigillose in indistinct lines, the hairs reflexed; petioles shorter than the leaflets, sparsely strigillose; petiolules puberulent, 5 mm. long; stipules subulate, appendaged at base, quickly fugacious, 2.5 mm. long; stipels aculeolate, minute; leaflets membranaceous, elliptic to ovate, rounded to deltoid at base, acuminate and obscurely apiculate at apex, finely reticulate-veined, sparsely strigillose, especially beneath, 6 to 10 cm. long; peduncles stout, 15 to 25 cm. long in fruit, 5 to 20-flowered; flowers

not seen; pods linear, stipitate, much compressed, nearly straight, short-beaked, finely strigillose, 12 to 14 cm. long, 2 cm. broad, the valves each with 3 longitudinal ridges, one very close to each suture, the third 3 to 4 mm. from the ventral suture; seeds 12, their position faintly visible from the outside, ellipsoid, compressed, tawny except for the dark brown border around the hilum, $12 \times 8 \times 5$ mm.; hilum nearly black, lanceolate, broadest at the micropylar end, 7 mm. long, about one-fifth the circumference.

Type in the U. S. National Herbarium, nos. 1,111,593-4, collected at Punta Paitilla, near Panama City, Panama, February 24, 1923, by C. V. Piper (no. 5168).

CANAL ZONE: Near Fort Amador, *Piper*. Corozal to Ancón, "flowers purplish," *Pittier* 2175.

This species is common near the seashore about Panama Bay, climbing the trees to a height of 15 to 20 feet.

17. *Canavalia paraguayensis* Piper, sp. nov.

Stems herbaceous, twining, terete, sparsely strigillose; petioles about as long as the leaflets; stipules and stipels early deciduous, not seen; petiolules densely puberulent; leaflets firm-membranaceous, oblong to oblong-ovate, rounded to cuneate at base, abruptly short-acuminate, rather prominently veined, glabrous above, strigillose beneath, 5 to 8 cm. long by half as broad; peduncles strigillose, as long as the young thyrses; racemes 20 to 25-flowered; bracteoles orbicular; calyx campanulate, sparsely strigillose, 15 mm. long, the broad upper lip emarginate, the small lower lip 3-toothed, the lateral ones obtusish, the middle one acute, narrower and longer; corolla 2.5 to 3 cm. long, "violet-white"; standard orbicular, emarginate, reflexed in anthesis, bearing two linear callosities just below the middle, the broad claw 5 mm. long, the auricles ovate-triangular; wings oblong, obtuse, as long as the keel, each with a broad rounded lobe near the middle, the auricles oblong, the claw 5 mm. long; keel petals united for more than half their length but free at tips, the auricles narrowly oblong; stamens monadelphous; style glabrous; pods 17 cm. long, 1 cm. broad, straw-colored, one longitudinal ridge close to each suture the third 5 mm. distant from the ventral ridge; seeds about 12, oval, $13 \times 10 \times 6$ mm., shiny, Dresden brown (Ridgway); hilum broadly oblong, half as long as the seed, encircled by a narrow brown band.

Type in the Gray Herbarium, collected between Río Apa and Río Aquidaban, Centurión, Paraguay, December 10, 1908-09, by K. Fiebrig (no. 4395).

PARAGUAY: Asunción, *Morong* 694, 624 (Gray, N. Y.; *Morong's* 694 is in the Gray Herbarium numbered 649). Cordillera de Altos, *Hassler* 2951 (Kew).

Notes on *Morong's* 694 were published in the Annals of the New York Academy of Science (7: 84. 1892) under the name *C. ensiformis* (L.) DC., but there was associated with it *Morong's* 639, which is *Phaseolus caracalla* L., so that the notes are confused.

18. *Canavalia fendleri* Piper, sp. nov.

Stems herbaceous (?), terete, sparsely strigillose with reflexed hairs; petioles stout, sparsely strigillose, equaling or shorter than the leaflets; stipules not seen; stipels aculeolate, sometimes persisting; petiolules 5 to 7 mm. long, densely puberulent; leaflets thin-membranaceous, broadly oval, acuminate with acutish and apiculate tip, rounded or truncate at base, pale green, glabrous or nearly so above, sparsely strigillose beneath, 10 to 13 cm. long, 6 to 10 cm. broad; peduncles stout, about as long as the thyrses; pedicellar glands prominent; thyrses 20 to 25-flowered; bracteoles broadly ovate, acutish; calyx campanulate, sparsely strigillose, 10 to 12 mm. long, the broad upper lip emarginate, the lower lip 2.5 mm. long, with triangular acute teeth, the median

slightly longer and thicker; corolla "light purple" or "white"; petals equal in length; standard broadly oblong, notched at apex, 3 cm. long, narrowed at base into a short broad claw, bearing two small inflexed auricles at base and just above the claw two lunate callosities; wings linear-oblong, short-unguiculate, the oblong basal auricle inflexed; keel falcate, the petals united from just above the middle nearly to the tip, each oblong auricle slightly inflexed, the claws slender; stamens monadelphous; anthers oblong; style glabrous; stigma capitate; pods densely strigillose when young, glabrous or nearly so when mature, linear, stipitate, beaked at tip, 15 to 20 cm. long, 3 cm. broad, the inner layer separating, 8 to 12-seeded, 3-ribbed on each valve, one rib close to each suture, the third 5 mm. from the ventral rib; seeds ellipsoid, $15 \times 10 \times 7$ mm., ochraceous; hilum oblong, broadest at the micropylar end, 10 mm. long or about one-fifth the circumference of the seed.

Type in the Kew Herbarium, collected at Biscaina, Venezuela, September 7, 1855, by August Fendler (no. 248). A specimen of the same collection is in the herbarium of the Missouri Botanical Garden.

VENEZUELA: Caracas, *L. H. & Ethel Zoe Bailey* 300 (U. S.) Ciudad Bolivar, *L. H. & Ethel Zoe Bailey* 1908 (U. S.).

COLOMBIA: Santa Marta, *H. H. Smith* 289, 290 (Kew, N. Y., Mo., U. S.).

19. *Canavalia leptophylla* Piper, sp. nov.

Annual, herbaceous, twining, growing to a height of 2.5 meters or more, the whole herbage sparsely strigillose; stems terete; petioles as long as the leaflets; stipules narrowly lanceolate, very early fugacious; leaflets thin-membranaceous, ovate-oblong to slightly obovate, sharply acuminate, rounded or truncate at base, densely but minutely ciliate, 6 to 12 cm. long; petiolules densely puberulent; stipels minute, lanceolate; thyrses few-flowered; calyx green, sparsely strigillose, the large upper lip emarginate, the lower lip with three small acute teeth, the middle one narrower and twice as long as the lateral ones; corolla pale violet, 2 cm. long, the wings as long as the blunt keel; pods linear, straight, with a recurved sharp beak, dark-colored, sparsely strigillose, 12 to 20 cm. long, 2 to 2.5 cm. broad, conspicuously angled by the intermediate ridge, this 5 to 6 mm. from the suture, the sides of the valves nearly flat; seeds 5 to 10, olive-ochre to dark olive-buff (Ridgway), ellipsoid, somewhat compressed, 12 to 16 mm. long, 8 to 10 mm. wide, 8 mm. thick; hilum lanceolate or broadest at micropylar end, bordered by a narrow band of dark brown, three-fourths as long as the seed, nearly one-third its circumference; first true leaves of seedlings unifoliate, broadly ovate, subcordate, conspicuously and sharply acuminate.

Type in the U. S. National Herbarium, no. 1,021,963, collected at Huigra, Ecuador, altitude about 1,200 meters, August 22, 1918, by J. N. Rose (no. 22295), and cultivated in the greenhouse at Washington, D. C.

Rusby & Pennell 307 (N. Y.), July 24, 1917, from Quebrada de Angeles above Natogaima, Colombia, is apparently the same.

20. *Canavalia gladiata* (Jacq.) DC. Prodr. 2: 404. 1825.

Dolichos gladiatus Jacq. Coll. Bot. 2: 276. 1788. Jacquin described the species from plants grown in the greenhouse at Vienna.

Canavalia maxima Thou. Journ. de Bot. Desv. 1: 78. 1813. Thouars' name is based on the Bara-mareca of Rheede, a plant of Malabar, India.

Annual or in the tropics perhaps perennial, climbing to a height of several meters; stems green, reflexed-strigillose when young, at length glabrous or nearly so; stipules lanceolate, thickened at base, quickly fugacious; petioles shorter than the leaflets; petiolules puberulent; stipels subulate, minute;

leaflets membranaceous, broadly ovate, acuminate at apex, the very tip acute or obtuse but apiculate, truncate at base, glabrous or nearly so, 10 to 12 cm. long; peduncles stout, exceeding the leaves, 10 to 40-flowered; pedicellar glands prominent; calyx campanulate, 15 to 20 mm. long, strigillose, the broad upper lip emarginate, shorter than the tube, the lower lip 3-lobed, 3 to 4 mm. long, the lobes triangular-ovate; corolla pale pink or pink-tinged, 15 to 18 mm. long; standard ovate-orbicular, emarginate, reflexed in anthesis, unguiculate, bearing two conical callosities near the base of the blade and a pair of inflexed auricles at the base; wings as long as the keel, oblong, obtuse, curved, unguiculate, auriculate at base; keel falcate, the petals united toward the tip, each unguiculate and auricled at base; style glabrous; stigma capitate; pod densely strigillose when young, becoming glabrous; pod linear, compressed, slightly curved, stipitate, beaked, straw-colored, 20 to 35 cm. long, 3.5 to 5 cm. broad, 8 to 16-seeded, each valve with a longitudinal ridge close to each suture and a third more prominent one 4 to 7 mm. from the ventral suture; inner layer thin, papery, white, separating; seeds ellipsoid, compressed, 22 to 35 mm. long, 16 to 20 mm. broad, 5 to 6 mm. thick, the hilum 15 to 20 mm. long, about one-fourth of the circumference.

The sword bean is known only as a cultivated plant and may be a derivative of the wild *C. virosa* (Roxb.) Wight & Arn., a native of India and the nearest known wild species. There are several very distinct cultivated varieties of the sword bean. The most common is the typical form with dark red seeds. In India and Burma occurs also a variety with ochraceous colored seeds, *C. gladiata spodiosperma* Voight. In China the common variety has rather pale, dull red seeds which shrink when dry. This same variety occurs in Japan, and in addition one with white seeds. In this last form the pods are less compressed and usually wrinkled on the surface; the seeds are likewise relatively thicker and the hilum narrow and often slightly sunken. It is the "nattaname" of the Japanese, and probably the basis of *Dolichos incurvus* Thunb. (Fl. Jap. 280. 1784; *Canavalia incurva* DC.), although Thunberg's description is faulty.

All the varieties have been cultivated more or less in America, but the commonest is the typical form with dark red seeds.

21. *Canavalia caribaea* Urban, Symb. Antill. 7: 232. 1912.

Stems herbaceous (?), terete, densely strigillose when young with reflexed white hairs; petioles slender, strigillose, shorter than the leaflets; petiolules 4 mm. long, densely puberulent; stipules not seen; stipels aculeolate; leaflets membranaceous, ovate, short-acuminate, with apiculate tip, sparsely strigillose on each surface, closely reticulate, dark green, 5 to 8 cm. long, 3 to 5 cm. broad; peduncles strigillose with reflexed hairs, about equaling the thyrses; calyx campanulate, sparsely strigillose, 10 mm. long, the broad emarginate upper lip shorter than the tube, the lower lip 3 mm. long, with triangular acute teeth; corolla 2.5 cm. long, the petals of equal length; standard with 2 linear median callosities below the middle; keel falcate, obtuse; pods densely strigillose when young, glabrous or nearly so when mature, linear, beaked at tip, dark brown, smooth, 15 cm. long, 3 cm. wide, stipitate, the inner layer separating, 3-ribbed, one rib close to each suture, the third 3 to 4 mm. from the ventral rib; seeds ellipsoid, compressed, brown, 17 × 10 × 5 mm., a narrow darker border about the hilum; hilum 13 mm. long, about two-fifths the circumference of the seed.

ANTIGUA: *Rose, Fitch & Russell* 3312 (U. S.).

ST. VINCENT: *H. H. & G. W. Smith* 1638 (Kew).

Urban cites the following specimens: Bocolet River at Calder Hall, Tobago, *Eggers* 5705 (type). Tobago, *Broadway* 3446, 3857. St. Vincent, *Smith* 1179.

From Urban's long descriptions of the floral parts, not possible with our scanty material, the following details are compiled: Standard obovate, deeply notched, 2.5 cm. long, auriculate, bicarinate, the claw 5 mm. long.

22. *Canavalia boliviana* Piper, sp. nov.

Herbaceous; stems stout, terete, sparsely strigillose; petioles stout, sparsely strigillose, half as long as the leaflets; stipules triangular, 2 mm. long; stipels aculeolate; petiolules puberulent, 6 mm. long; leaflets membranaceous, broadly oval to ovate, 7 to 12 cm. long, 5 to 10 cm. broad, truncate to broadly deltoid at base, very abruptly acuminate to a short broad tip, this obtuse and apiculate, very sparsely strigillose on both surfaces, the 5 or 6 pairs of lateral nerves prominent; peduncles stout, exceeding the leaves, 10 to 30-flowered; pedicellar glands prominent; calyx campanulate, 14 mm. long, nearly glabrous, the upper lip emarginate, shorter than the tube, the lower lip 3-toothed, the lateral lobes obtuse, the median slightly longer, ovate, acutish; bracteoles orbicular; corolla purple, 4 cm. long; standard emarginate, the limb broadly ovate; wings spatulate-oblongate, shorter than the standard; keel much curved, broad; pods stipitate, linear, straight, much compressed, beaked with a recurved tip, dark brown, sparsely strigillose, 10 to 20 cm. long, 3 cm. broad, the intermediate rib most prominent and 2 to 3 mm. from the ventral rib; inner layer not separating; seeds ellipsoid, compressed, 15×8×5 mm., olive-yellow, speckled and spotted with brown dots, the black hilum as long as the seed, broadest at the micropylar end, surrounded by a narrow border of brown.

Type in the U. S. National Herbarium, no. 1,122,148, collected at Espía, Bolivia, altitude 1,050 meters, July 25, 1921, in ripe fruit, by O. E. White (no. 616). The flowers are described from specimens grown at McNeill, Mississippi, from seeds of no. 616.

BOLIVIA: Espírito Santo, *Bang* 1274, young pods only (U. S.). Cocapata, *Bang* 2195, flowers just fallen, "climbing on high trees in the forest, the flowers blue" (U. S., Mo.).

23. *Canavalia amazonica* Piper, sp. nov.

Stems herbaceous, climbing, terete, strigillose when young, glabrate; petioles glabrous, shorter than the leaflets; stipules and stipels not seen; petiolules 5 mm. long, puberulent; leaflets membranaceous, oblong-oval, obtusish to acutish, cuneate at base, glabrous above, sparsely strigillose beneath, 8 to 10 cm. long, 6 cm. broad, widest in the middle; peduncles stout, 10 to 15 cm. long, as long or longer than the thyrses; pedicellar glands prominent; thyrses 15 to 25-flowered; bracteoles minute, orbicular; calyx campanulate, sparsely strigillose, 10 mm. long, the emarginate upper lip not as long as the tube, the lower lip 3-toothed, 2 mm. long, the teeth triangular-ovate; corolla "red," 12 mm. long; standard obovate, emarginate, bilauriculate (?), bearing two linear callosities below the middle; wings equaling the keel; keel falcate, obtuse, as long as the standard; pods densely strigillose when young, becoming glabrous, nearly straight, linear, compressed, brownish, hooked at tip, 15 cm. long, 2.5 cm. broad, 3-ribbed, one rib close to each suture the second 6 to 7 mm. distant from the ventral rib; seeds (scarcely mature) ellipsoid, compressed, brown, 16×10×4 mm.; hilum linear, 13 mm. long about two-fifths the circumference of the seed.

Type in the Kew Herbarium, collected at Barra, Province of Rio Negro, Brazil, by Richard Spruce (no. 1468). *Spruce* 1868, collected in May, 1851, also belongs to this species.

24. *Canavalia dictyota* Piper, sp. nov.

Vine, herbaceous or perhaps shrubby at base; stems terete, strigillose with reflexed hairs when young, at length glabrous; stipules (not seen) quickly deciduous; petiole much shorter than the leaflets; petiolules densely puberulent; leaflets firm, almost chartaceous, lance-ovate, acute at apex, cuneate at base, sparsely strigillose on both surfaces especially beneath, prominently nerved, beautifully reticulate-veined, 6 to 8 cm. long, 3 cm. wide; peduncles stout, 10 cm. long; thyrses about 8-flowered; calyx campanulate, sparsely strigillose, 13 mm. long; upper lip broad, emarginate; lower lip with 3 small deltoid-ovate ciliate teeth, the lateral ones larger, 2.5 mm. long; corolla 2.5 cm. long; standard oval, emarginate at apex and with two thick callosities near the auriculate clawed base; wings obtuse at apex, each with a short lobe below the middle; keel blunt, as long as the wings; style glabrous; stigma capitate; ovary strigillose; pods linear, compressed, very firm and woody, tipped with a straight beak, strigillose when young, straw-colored to brown, 16 cm. long, 3 cm. wide, one ridge very close to each suture, the second 5 mm. distant from the ventral suture; seeds ellipsoid, compressed, 20 mm. long, 12 mm. wide, 7 mm. thick, reddish brown, marbled with longitudinal black bands, dull; hilum linear, 17 mm. long, encircled by a narrow dark brown band.

Type in the U. S. National Herbarium, no. 1,111,602, collected at mouth of Demerara River, British Guiana, April, 1887, by G. S. Jenman (no. 4211). A specimen of the same collection is in the herbarium of the New York Botanical Garden.

BRITISH GUIANA: Demerara, *Parker* (Kew). Vreed-en-Hoop, Demerara River opposite Georgetown, *Hitchcock* 16698 (U. S., N. Y.), "flower pinkish lavender."

FRENCH GUIANA: Cayenne, *Broadway* 452, 141 (N. Y.), "flowers rose-color, fragrant."

VENEZUELA: Los Chorros, near Caracas, *Bailey* 486, "cultivated" (U. S.).

BRAZIL: Seeds obtained from Pará, Brazil, S. P. I. no. 48600, are identical with Jenman's 4211, but none would germinate.

25. *Canavalia brasiliensis* Mart.; Benth. Ann. Wien. Mus. Naturg. 2: 135. 1838.

Herbaceous vine; stems slender, terete, strigillose; petioles sparsely strigillose, as long as the leaflets; petioles densely puberulent, 5 mm. long; stipules minute, triangular, acuminate, puberulent, quickly deciduous; stipels awl-shaped, minute, persisting; leaflets ovate to oval, membranaceous, very short-acuminate and minutely apiculate, rounded to obtuse at base, sparsely strigillose on both surfaces but more so beneath, 10 to 16 cm. long; peduncles stout, longer than the leaflets; thyrses 10 to 15-flowered; bracteoles ovate-orbicular; calyx campanulate, 13 to 15 mm. long, sparsely strigillose, the large upper lip emarginate, the lower lip with three small triangular acute teeth, the median longer, narrower, and thicker; corolla purplish, 2.5 cm. long; standard obovate, notched at apex, 2.5 cm. long, bearing 2 lunate callosities at base of blade, the broad claw 5 cm. long, the auricles ovate, inflexed; wings oblong, obtuse, unguiculate, as long as the keel, the oblong basal auricles inflexed; keel falcate, blunt, the petals united above the middle, each with a short claw and an ovate inflexed basal auricle; style glabrous; pods fuscous (*Ridgway*), linear, compressed, nearly straight, sparsely strigillose, 10 to 15 cm. long, 2 to 5 cm. broad, one ridge very near the ventral suture, the second 3 to 5 mm. distant; inner layer papery and separating; seeds ellipsoid, compressed, 10 to 13 mm. long, 7 to 8 mm. broad, 4 to 5 mm. thick, dull, Isabella color (*Ridgway*); hilum black, linear, surrounded by a dark brown narrow band, two-thirds as long as the seed, about one-fourth its circumference.

BRAZIL: "Sebastiano politanae in sylvis," *Martius* in 1817, apparently the type and that cited by Bentham as "In sylvis Catingas provinciae Bahia," specimen in flower (Munich). Piahy Province, *Martius*, in young fruit (Munich). Bahia, *Salzmann*, in flower (Kew, Mo.). Utinga, Bahia, *Blanchet* 2748, in flower (Kew). Baixa Verde, Rio Grande do Norte, "growing over a cactus tree 25 feet high and aiding in its destruction; on very dry sandy soil," *E. C. Green*, S. P. I. no. 41816; cultivated in the greenhouse at Washington.

26. *Canavalia anomala* Piper, sp. nov.

Stems herbaceous, terete, sparsely strigillose; petioles sparsely strigillose, nearly as long as the middle leaflet; petiolules densely rusty-strigillose, 6 mm. long; leaflets membranaceous, broadly oval or slightly obovate, very short-acuminate but the tip blunt, narrowed and somewhat truncate at base, sparsely strigillose, 9 cm. long; peduncles shorter than the thyrses; calyx campanulate, sparsely strigillose, the upper lip broad, emarginate(?), the lower lip with three small triangular teeth; corolla not seen; young pod densely sericeous; pods linear, straight, dark brown, sparsely strigillose, 12 to 14 cm. long, each valve with four ribs, one near each suture, one 4 mm. distant from each of the sutural ribs, the median two more prominent; inner layer loose, papery; seeds ellipsoid, $13 \times 10 \times 7$ mm., clay-colored, a narrow brown border about the hilum; hilum rather broad, two-thirds the length of the seed and about one-fourth its circumference.

Type in the herbarium of the New York Botanical Garden, collected at edge of forest, three miles east of Masina, Santa Marta, Colombia, by H. H. Smith (no. 681). The specimen is in fruit.

There are two sheets of specimens, part of each being the foliage of a striate-stipuled plant, probably either *Bradburya* or *Clitoria*.

The species is unique in its pod characters.

SPECIES DOUBTFUL OR NOT SEEN.

Canavalia microsperma Urban, Symb. Antill. 5: 373. 1908.

"*Canavalia microsperma* Urb. (n. sp.) ramis hornotinis pilos parcos breves refractos gerentibus, mox glabrescentibus; foliolis ovali-ellipticis, apice plicato obtusissimis, 7.5–8.5 cm. longis, 3.5–4 cm. latis, chartaceo-coriaceis, glabris, nervis supra tenuiter prominentibus, parvum v. obsolete, subtus manifeste reticulato-anastomosantibus; legumine oblongo-lineari, 14–15 cm. longo, 3.5 cm. lato, compresso glabro, juxta suturam ventralem acutatam breviter bialato; seminibus 8–10, in sicco nigrescentibus, ca. 11 mm. longis, 9 mm. latis, hilo $\frac{2}{5}$ circuitus aequante."

"Volubilis. Rami teretes, plus minus striati. Stipulae triangulares, 1–1.5 mm. longae, valde deciduae. Folia 3–4 cm. longe petiolata; foliola lateralia 3.5–4 mm., terminale ca. 15 mm. longe petiolulata, hoc basi rotundatum, caetera subtruncata, apice ipso submarginata, nervo medio supra prominente, lateralibus 7–8 sub angulo ca. 60° abeuntibus. Inflorescentiae cum pedunculo ca. 7 cm. longo ca. 18 cm. longae; flores e vestigiis pluriatim e gibberibus prodeuntes; pedicelli fructiferi ca. 1 cm. longi. Legumen 7–10 mm. longe stipitatum, inter semina singula non constrictum, apice oblique truncatum, unilateraliter apiculatum, nervis transversis, obsolete, alis lateralibus 2–3 mm. a margine ipso distantibus, 1–1.3 mm. altis, in sicco bruneum. Semina oblique ovato-rotundata, convexa, 6 mm. crassa, hilo lineari."

"Hab. in Cuba: Ramón de la Sagra."

CANAVALLIA RUTILANS DC. Prodr. 2: 404. 1825.

"*C. rutilans*, foliolis ovali-oblongis obtusis, leguminibus rectis latitudine quadruplo longioribus. In Mexico. *Mucuna rutilans* fl. mexic. ined. Flores seminaque rubro-punicei. Forsan à *C. obtusifolia* vix diversa."

CLITOBIA BRASILIANA Vell. Fl. Flum. 7: 293. pl. 129. 1825.

"*Clitoria brasiliana*. *C. foliis ternatis, foliolis ovatis; perianthii denticulo producto, uncinato.* (Tab. 129a, T. 7.)

OBSERVATIONES.

"Perianthium quadri-dentatum, tribus minimus, singulari ampliore, productiore, rostrum uncinatum efficiente. Ab altero alae latere denticulus unus; legumen latum, ab altero latere carinatum, ad apicem declinatum, rostratum. Semina reniformia, plurima, compressa. Habitat silvis maritimis."

Bentham (Mart. Fl. Bras. Addenda 15: 326) guesses Vellozo's plant to be *Canavalia gladiata* (L.) DC. We can not agree, but think that the plate is a fairly good representation of *Canavalia brasiliensis* Mart. It has nothing at all to do with *Clitoria brasiliensis* L., which is *Centrosema brasilianum*.

CANAVALIA VERSICOLOR Rodrig. Pl. Nov. Cult. Jard. Bot. Rio Janeiro 4: 5. pl. 2. 1894.

"*Canavalia versicolor* Barb. Rod., caule alte volubili, foliolis ellipticis, obtusi-acuminatis, lateralibus inaequilateris; calycis labio superiore magno, bilobo, tubo triplo brevior, inferiore minutissimo, trilobo; ala intus supra auriculam pulvinata; carina incurva, erostris.

"*Tabula nostra II.*

"*Caules* alte volubiles, glabri, ramosi. *Folia* trifoliata. *Petioli* antice sulcati, 0.^m07-0.^m09 lg. *Foliola* elliptica, obtusi-acuminata, lateralia inaequilatera, basi subcordiformia, crassiuscule membranacea, glabra, 0.^m10-0.^m001×0.^m07-0.^m08 lg. *Pedunculi* 0.^m20-0.^m25 lg., penduli, multiflori; nodi tuberculiformes parum distantes, 2-6-flori. *Bracteae* obsoletae. *Flores* erecti, breviter pedicellati, rosei vel coccinei. *Calix* glaber, tubo latiusculo, compresso, 0.^m008 lg., labium superius dilatatum, tubo triplo minore, rotundatum, inferiores lobi 0.^m001-0.^m002 lg., laterales acuti, intermedius longior. *Vexilli* unguis complicatus, incurvus, lamina late oblonga, profunde emarginata, reflexa, basi complicata auriculus inflexis appendiculata, medio albo-bicallosa. *Alae* unguiculatae, falcato-oblongae, margine interiore sinuatae, superiore incurvae, basi longe auriculatae et hic interioriter pulvinatae. *Carina* alas paulo superans eisque latior, incurva, longe unguiculata. *Ovarium* segmoideum, breviter stipitatum glabrum.

"Hab. in silvis prope Rio de Janeiro, S. Paulo et in Horto botanico Fluminensi No. 2066 culta. Feijao Fava bravo vulgo. Florebat Februario."

In a long discussion Rodrigues compares his plant with *C. maritima* (*C. littoralis* Vell.) and emphasizes that it is a climber and blooms in February, while the seashore plant flowers in August. *C. maritima*, however, is always a climber if it can secure support, as in common cultivation, and as is often seen on the coast of Florida. The shape of the leaflets of *C. versicolor* as figured differs from all forms of the variable *C. maritima* known to the writer, which leads us to regard Rodrigues' species as valid.

CANAVALIA ENSIFORMIS ALBIDA DC. Prodr. 2: 404. 1825.

This is based on Mocino and Sessé's unpublished plate of a Mexican plant and described simply as having the flowers and seeds white. *C. ensiformis* is, in our experience, always a red-flowered plant, but a white-flowered variant would not be strange.

WENDEROTHIA Schlecht.

DESCRIPTION OF THE GENUS.

Herbs or shrubs, mostly twining; leaves pinnately trifoliolate; petioles sulcate above; petiolules rather fleshy; stipules caducous, thin, not striate; peduncles axillary; flowers numerous, in raceme-like thyrses, two or more short pedicels often arising from each prominent pedicellar gland; bracts minute, caducous; bracteoles mostly orbicular, caducous; calyx tubular-campanulate, bilabiate, the upper lip large, entire, the lower small and three-lobed; standard large, reflexed, without basal auricles, bearing two callosities toward the base; wings free, narrow, auricled; keel falcate, produced or rostrate, sometimes spirally coiled at tip, the petals partly united; stamens monadelphous,

the vexillar one more or less free; anthers all alike; style glabrous; stigma capitate; pods stipitate, oblong or linear, beaked, straight or curved, compressed, the inner layer not loose, each valve strengthened by three or four longitudinal ribs, one very close to each suture, the other one or two toward the middle; seeds several to many, ellipsoid and compressed or lentiform, the hilum linear.

Species 12, tropical or subtropical in the Western Hemisphere. The truncate upper calyx lip, the absence of auricles on the standard, the rostrate keel, and the different pod characters seem ample justification for keeping *Wenderothia* distinct from *Canavalia*.

The 12 species of *Wenderothia* occur scattered through Mexico and southward to southern Brazil and Bolivia, only one species being found in the West Indies, *W. altipendula* of Jamaica. Apparently all are strictly tropical plants and nearly all are woody-stemmed perennials. None have any particular economic value, though several might well be employed as ornamental.

The mechanism of the flowers of *W. matogrossensis* and *W. grandiflora* has been described and figured by Malme (Ark. för Bot. 4¹: 7-11. 1905), and of *W. matogrossensis* by Lindman (Bih. Svensk. Vet. Akad. Handl. 27: Afd. III. No. 14: 55. 1902). Lindman says the flowers of the latter species are visited by large bumblebees. The insect alights on the standard, inserts its beak into the cleft on the upper side of the keel, and presses downward to reach the nectar. As a result, the tip of the keel is depressed and the stamens and stigma are extruded.

KEY TO THE SECTIONS AND SPECIES.

Pod valves each with four longitudinal ridges, one near each suture, the other two equidistant.....1. *Tetrapleura*.

Pod valves each with three longitudinal ridges, one near each suture, the third near the middle.....2. *Cochlitropis*.

1. *Tetrapleura*. Leaflets membranous; keel produced, rostrate, spirally twisted at apex; pod valves each with four longitudinal ribs, one close to each suture, the other two equidistant from each other and from the sutures.

Stems woody; leaflets glabrous; upper lip of calyx emarginate, not apiculate, very short; corolla yellowish; hilum one-twelfth the circumference of the seed.....1. *W. acuminata*.

Stems herbaceous; leaflets puberulent; upper lip of calyx not emarginate, apiculate, as long as the tube; corolla purple; hilum about one-third the circumference of the seed.....2. *W. bicarinata*.

2. *Cochlitropis*. Mostly shrubby vines with membranous or chartaceous leaflets; calyx with upper lip of calyx entire, usually apiculate, and lower lip 3-lobed; keel produced, rostrate to spiral at tip; pod valves each with three longitudinal ridges, one near each suture, the third nearer to the ventral than to the dorsal suture; seeds compressed.

Ribs of pod winglike. Leaflets obtuse and emarginate.....3. *W. obidensis*.

Ribs of pod not winglike.

Apex of leaflets obtuse to acutish.

Calyx silvery-sericeous; bractlets orbicular.....3. *W. palmeri*.

Calyx not silvery-sericeous; bractlets ovate.....5. *W. matogrossensis*.

Apex of leaflets acuminate but with the very tip blunt and apiculate.

Leaflets chartaceous, glabrous.

Corolla 2 cm. long; keel not spiral at tip.....6. *W. altipendula*.

Corolla 4 cm. long; keel spiral at tip.....7. *W. grandiflora*.

Leaflets membranaceous, rarely glabrous.

Lower calyx lobes rather large, ovate, subequal; raceme very dense.

8. *W. hirsuta*.

Lower calyx lobes small, triangular, the median narrower and longer; raceme not very dense.

Calyx ferruginous-pubescent.*

Leaflets lance-oblong, attenuately acuminate; intermediate rib of pod 3 to 4 mm. from the ventral one.....9. *W. picta*.

Leaflets oblong, abruptly acuminate; intermediate rib of pod 5 mm. from the ventral one.....10. *W. lasiocalyx*.

Calyx not ferruginous-pubescent.

Leaflets small, elliptic, softly puberulent on both sides; branches slender, densely ferruginous-pubescent.....11. *W. lenta*.

Leaflets large, oblong to ovate, usually canescent-strigillose to tomentulose beneath, sometimes glabrous or nearly so; branches usually cinereous-pubescent, sometimes ferruginous-pubescent.

12. *W. villosa*.

1. *Wenderothia acuminata* (Rose) Piper.

Canavalia acuminata Rose, Contr. U. S. Nat. Herb. 1: 322. 1895.

Whole plant glabrous except the petiolules and inflorescence; stems terete, woody; stipules not seen; petioles slender, about equaling the leaflets; leaflets membranaceous, ovate to obovate, rounded at base, conspicuously acuminate, the tip obtuse and apiculate, 5 to 10 cm. long; peduncles much shorter than the 10 to 30-flowered thyrses, the pedicellar glands very prominent; calyx campanulate, minutely strigillose, 14 mm. long, the broad emarginate upper lip very short, not longer than the 3-lobed lower lip, with nearly orbicular lobes about 2 mm. long; standard 3 cm. long, the blade broadly oval, slightly notched at the reflexed tip, bearing two linear callosities in the middle near the base, the claw broad, about 7 mm. long; wings much shorter than the keel, linear, auricled at base, slender-clawed; keel 3 cm. long, falcate, the narrowed beak partly coiled, each petal auriculate at base, the claw slender; style glabrous; stigma clavate; stamens monadelphous, the vexillar one partly free; pods linear, 12 to 15 cm. long, 2 cm. broad, straight, strigillose with white hairs, each valve with 4 prominent ribs, one very close to each suture, the other two equidistant from each other and from the sutures; seeds lenticular, shiny, 10×12×4 mm., olive-gray, sprinkled with black, the hilum 3 to 7 mm. long, one-twelfth to one-sixth the circumference of the seed.

MEXICO: Manzanillo, Colima, *Palmer* 1036, type (U. S., Kew). San Gerónimo, Michoacán or Guerrero, *Langlassé* 714 (Kew).

2. *Wenderothia bicarinata* (Standl.) Piper.

Canavalia bicarinata Standl. Contr. U. S. Nat. Herb. 18: 106. 1916.

Climbing herb; stems very slender, terete, densely puberulent, the hairs somewhat reflexed; stipules minute, subulate, hairy, quickly deciduous; petioles about as long as the leaflets; petiolules 3 mm. long, very puberulent; leaflets membranaceous, oval to ovate, rounded at base, mostly doubly acuminate, the acumination again narrowed to a mucronate point, densely hispidulous above, puberulent beneath, 3 to 5 cm. long; peduncles terete, puberulent, 6 to 10 cm. long, about 6-flowered, the gland at base of each pedicel conspicuous; bracteoles broadly ovate; calyx nearly 2 cm. long, sparsely strigillose, the large

* In *W. villosa* the calyx is rather rarely ferruginous-pubescent. The usually ovate leaflets and the wider space, 6 to 10 mm., between the ventral and intermediate ribs will serve to separate the species from *W. lasiocalyx*.

upper lip truncate and apiculate, the small lower lip with 3 triangular acute lobes, the middle one longest; corolla 3 cm. long, apparently purple, streaked; standard 3 cm. long, oblong-ovate, obtuse or slightly retuse, clawed at base and with two shallow depressed glands near base, each thickened a little at the upper margin; wings linear, obtuse, twisted, 2 cm. long, much shorter than the keel; keel strongly falcate, long-rostrate, twisted in a single spiral near the bilobed apex; style glabrous; stigma terminal, capitate; pods linear, compressed, densely strigillose, 10 to 14 cm. long, 15 to 18 mm. wide, each valve with 4 longitudinal ridges, one close to each suture, one 4 to 6 mm. from the ventral rib and the fourth 4 mm. from the dorsal rib; seeds (scarcely mature) oval, compressed, constricted at the micropylar end, very dark brown, dull, 7 to 8 mm. long, 5 to 6 mm. wide, 2 mm. thick; hilum linear, more than half as long as the seed, about one-fourth its circumference.

PANAMA: Alhajuela, *Pittier* 2354, type (U. S.). Punta Paitilla, near Panama, *Piper* 5169 (U. S.). Penonomé, *Williams* 132 (U. S.).

COSTA RICA: Nicoya, *Pittier* (U. S.).

GUATEMALA: Chupadero, Depart. Santa Rosa, *Heyde & Lux* 3730, distributed as *Phaseolus dysophyllus* Benth. (U. S.).

A peculiar species in its very slender stems and small leaflets.

3. *Wenderothia obidensis* (Ducke) Piper.

Canavalia obidensis Ducke, Arch. Jard. Bot. Rio de Janeiro 3: 173. 1922.

The original description by Ducke is as follows:

"Herba volubilis minime tomentella, foliis ut in *C. gladiata* at minoribus et angustioribus (usque ad 7 cm. longis ad $2\frac{1}{2}$ c. latis). Flores quam in specie citata minores, dilute roseo-violacei, calice angustiore, labii superioris lobis minoribus. Vexillum laminâ circa 13 mm. longâ 10 mm. latâ basi bicallosâ at non appendiculatâ unguiculo circa 6 mm. longo; alae angustissimae; carina in rostrum breve incurvum terminata. Ovarium pilosum, basi attenuatum. Legumen junius parce pilosulum, maturum glabrum, 11 ad 12 cm. longum 2 ad $2\frac{1}{2}$ cm. latum, alis in utroque latere suturarum circa 3 cm. a suturâ distantibus alâque longitudinali (in valvis medianâ) munitum. Semina 1 cm. vix longiora valde compressa $\frac{2}{3}$ vel $\frac{3}{4}$ cm. lata, nigra, nitidula, dura.

"Species calicis formâ ad sect. II accedit ubi *C. gladiatae* characteribus multis approximatur, at vexilli formâ ad sect. I spectat ubi petalorum structurâ *C. pictae* Benth. affinis videtur.

"Obidos, in terris argillosis ab Amazonum fluvio periodice inundatis inter vegetationem secundariam, A Ducke 12-8-1916 n. 16336.

"Cette espèce a le calice du bien connu *C. gladiata*, mais le labre supérieur moins profondément bilobé; l'absence des appendicules de l'étendard, et l'aile médiane des valves de la gousse ne permettent pas de la confondre avec ce dernier."

The specimen in the National Herbarium has no flowers but does have nearly ripe pods. From this the following data are added:

Apparently a woody climber; stems slender, terete, pale, glabrous; petioles slender, glabrous, shorter than the leaflets; petiolules sparsely puberulent; leaflets rather thin, somewhat coriaceous, elliptic to lanceolate, truncate at base, obtuse and notched at apex, paler beneath, glabrous except a sparse puberulence on the principal veins above, 4 to 8 cm. long, 2 to 3 cm. broad; glands at the base of the pedicels not prominent; pods woody, linear, sharp-pointed at tip, 10 cm. long, 2 cm. broad, dark-colored, sparsely strigillose, each valve with 3 winglike longitudinal ridges, one 4 mm. high close to the ventral suture, one 3 mm. high near the dorsal suture, and the third 2 mm. high about one-third the width of the pod from the ventral suture; seeds (immature) dark, shiny, much compressed, 12 mm. long, the dark linear hilum 10 mm. long, more than one-third the circumference of the seed.

4. *Wenderothia palmeri* Piper, sp. nov.

Stems slender, terete, densely soft-canescenscent or near the tips fulvous-pubescent; petioles densely pubescent, about as long as the leaflets; stipules and stipels not seen; leaflets membranaceous, oval to ovate, obtuse to acute, weakly apiculate, green and strigillose above, densely soft-canescenscent beneath, 3 to 6 cm. long; peduncles stout; thyrses about 6-flowered; pedicels 2 to 4 mm. long, the gland at base of each prominent, semiglobose; calyx bracts suborbicular, canescenscent; calyx 1.5 to 2 cm. long, densely canescenscent or slightly rusty-pubescent, the orbicular emarginate upper lip equaling or exceeding the tube, the small lower lip with three broadly ovate, acutish, subequal teeth 5 mm. long; corolla purple, 3 cm. long; standard 3 cm. long, elliptic, slightly emarginate, reflexed, attenuate at base into a short broad claw, bearing at the base of the blade a linear callosity on each side of the median groove; wings shorter than the keel, linear, twisted, the basal auricles rounded, the slender claw 6 mm. long; keel 3 cm. long, falcate, petals united above the middle to the tip into a narrow twisted beak, each auricled at base and with a slender claw 6 mm. long; style glabrous; stigma capitate; pod (immature) linear, 10 cm. long 2 cm. broad, densely soft-canescenscent, one rather prominent longitudinal ridge close to the ventral suture, a less prominent one very close to the dorsal suture, and a median one nearer to the ventral than to the dorsal suture; immature seeds with the hilum nearly as long as the seed.

Type in the U. S. National Herbarium, no. 266512, collected at Acapulco, Mexico, 1894-95, by Edward Palmer (no. 575). This same collection in the Kew, Gray, and New York herbaria bears the number 375.

MEXICO: Sierra Madre, Michoacán or Guerrero, *Langlassé*, February, 1899 (U. S., Kew, N. Y., Gray). Tonalá, Chiapas, *Nelson* 2881 (U. S.).

Closely allied to *W. villosa* and *W. hirsuta*, but differing from both in the fact that the leaflets are not acuminate, and by the intermedlate characters of the lower calyx lip.

5. *Wenderothia mattogrossensis* (Rodr.) Piper.

Mucuna mattogrossensis Rodr. Pl. Mattogr. 15. 1898.

Canavalia mattogrossensis Malme, Ark. för Bot. 4¹: 9. 1905.

Stems herbaceous, slender, terete, white-puberulent; petioles densely pubescent, shorter than the leaflets; stipules "minute, setaceous" (Rodrigues); stipels minute; leaflets membranaceous, oval or slightly ovate, rounded or slightly subcordate at base, obtuse, rarely acutish, never acuminate at apex, apiculate, sparsely white-puberulent above, more densely so beneath, 4 cm. long; peduncles puberulent, 2 to 3 cm. long, shorter than the 10 to 12-flowered thyrses; bracteoles ovate, acutish, 2 mm. long; calyx 18 mm. long, densely canescenscent, the truncate apiculate upper lip shorter than the tube, the lower lip 3 mm. long, the lateral teeth ovate, acute, the median ovate, triangular, acuminate, longer and narrower; corolla "lilac" (Malme,) or "blue violet" (Lindman); standard 3 cm. long, oblong, emarginate, the sides reflexed, attenuate at base to a broad claw 7 mm. long, bearing toward the base two prominent conic callosities; wings as long as the keel, linear-spatulate, loosely coiled, short-unguiculate and bearing at base of blade a small obtuse inflexed auricle; keel 3 cm. long, narrow, falcate, rostrate, inflexed at tip, unguiculate at base, each petal with a small oblong auricle at base, the two petals united toward their tips; stamens monadelphous; anthers oblong-linear; ovary linear, pubescent; style glabrous; stigma capitate; pods not seen but according to Rodrigues's description and figure nearly straight, beaked at tip, stipitate, 11 to 12 cm. long, densely hirsute-villous with chestnut-colored hairs, the valves 3-ribbed, one rib near each suture, the third near the middle.

This species was originally described by Rodrigues who found it at several places in Matto Grosso, namely barrancas of the Rio San Lourenço, banks of the Rio Coxipo, an affluent of the Cuyaba, and in the Engenho San Joao. Malme (Ark. för Bot. 4^r: 9, 1905) reports it as abundant along the Cuyaba River at Santa Anna da Chapada, Matto Grosso, flowering profusely in April. Lindman (Bih. Svensk. Vet. Akad. Handl. 27: Afd. III, No. 14: 54, 1902) describes the mechanism of the flower and its pollination by bumblebees as observed at Santa Cruz da Barra, Matto Grosso, but he erroneously refers the plant to *C. picta* Mart.

BRAZIL: Cuaba (Cuyaba) River, Matto Grosso, *La Plata Exped., Capt. Page* (U. S.).

PARAGUAY: Between Río Apa and Río Aquidabán, *Fiebrig* 5118 (Gray, Mo.). Apo River, *Hassler* 8287 (Kew). Cordillera de Altos, *Hassler* 42, 2542 (Kew). Tobati, *Fiebrig* 790 (Kew). San Bernardino, *Hassler* 12559 (U. S.).

6. *Wenderothia altipendula* Piper, nom. nov.

Canavalia altissima Macfad. Fl. Jam. 1: 292, 1837, excluding synonymy.

Stems terete, woody, glabrous; petioles terete, slender, glabrous, mostly shorter than the leaflets; petiolules puberulent, 5 mm. long; stipules and stipels not seen; leaflets coriaceous, oblong to elliptic, rounded at base, acuminate to a blunt apiculate tip, glabrous, 6 to 15 cm. long; peduncles strigillose or glabrate, 6 to 10 cm. long, mostly longer than the 10 to 15-flowered thyrses, the pedicellar glands large, hemispheric; bracteoles orbicular; calyx 10 to 12 mm. long, minutely strigillose or glabrous, the broad upper lip apiculate and shorter than the tube, the lower lip 2 mm. long, the lateral teeth ovate, the median narrower and longer; corolla purple; standard 2.5 cm. long, ovate, emarginate, reflexed, attenuate at base to a short claw, bearing two linear callosities toward the base, one on each side of the median groove; wing 18 mm. long, oblanceolate, twisted, the basal auricle semicircular, the claw 5 mm. long; keel 20 mm. long, sharply falcate, obtuse-beaked, the petals united at tip, each with a blunt auricle at base, the claws 5 mm. long; stigma with an inflexed appendage; stamens monadelphous; anthers dark; ovary densely strigillose; pods linear-oblong, brown, strigillose, 15 cm. long, 2.5 cm. broad, nearly straight, 3-ribbed, one rib near each suture, the intermediate one 6 to 9 mm. from the ventral suture; seeds shiny, ellipsoid, compressed, brown, speckled with black, a pinkish border around the hilum, 15×10 mm.; hilum toward the micropylar end, about one-eighth the circumference of the seed.

JAMAICA: Without locality, *Macfadyen; Distin* (Kew). Oxford, *Marble* 503 (U. S., N. Y.). St. Margaret's Bay, *Fredholm* 3270 (U. S., N. Y.). Santa Cruz Mountains, *Britton* 1305 (N. Y.). Bluefields, *Britton* 2004 (N. Y.). Mandeville, *Britton* 1012 (N. Y.).

Macfadyen records the plant from Port Royal and St. John's Hill. Fawcett and Rendle add Guava Ridge and near Troy. The species seems confined to Jamaica. Macfadyen thought his plant to be the same as *Dolichos altissimus* Jacq. (*Mucuna altissima* DC.), and thus derived his specific name. This misconception on his part should invalidate the specific name he used.

7. *Wenderothia grandiflora* (Benth.) Piper.

Canavalia grandiflora Benth. Ann. Wien. Mus. Naturg. 2: 135, 1838.

Whole plant glabrous to the inflorescence; stems terete, slender, woody; stipules and stipels not seen; petioles shorter than the leaflets; petiolules glabrous, 3 to 4 mm. long; leaflets thin, coriaceous, shiny above, elliptic to oval, rounded or subcordate at base, acuminate (the tip blunt and apiculate), 6 to 10 cm. long; peduncles 5 to 8 cm. long, about equaling the 10 to 20-flowered thyrses, the rachis glabrous or strigillose; bracteoles orbicular; calyx 15 to

17 mm. long, campanulate, minutely strigillose; bracteoles orbicular; calyx 15 to 17 mm. long, campanulate, minutely strigillose, the broad upper lip as long as the tube and recurved-apiculate, the lower lip 3 to 4 mm. long, with ovate teeth, the median slightly longer and thicker; standard 4 cm. long, ovate, emarginate, reflexed, attenuate at base to a short claw, bearing two linear callosities near the base, one on each side of the median groove; wings linear, twisted, 2 to 5 cm. long, short-clawed, the basal auricle semicircular; keel longer than the wings, falcate, the petals united toward the tip, the narrowed beak curved into a complete spiral, the basal auricle small, blunt; style glabrous, the stigma terminal, with an inflexed appendage; pods not seen.

BRAZIL: Pilar, Parahyba, *Pohl*, type (Kew). Near Goyaz, *Burchell* 7079 (Kew). Santarem, Pará, *Ducke* 17088 (U. S.). Alcobaza, *Ducke* 16194 (U. S.).

Reported also by Bentham from Salinas, *Weddell*. Malme (*Ark. för Bot.* 4¹: 7. 1905) reports the plant from Santa Anna da Chapada, Matto Grosso, stating that the flowers appear in May and June and are odorous like sweet peas, and that the standard is whitish with violet spots or bands which coalesce near the margin.

A young pod on the Santarem specimens is finely puberulent and 3-ribbed, evidently very similar to that of *W. villosa*.

8. *Wenderothia hirsuta* Mart. & Gal. Bull. Acad. Sci. Brux. 10³: 192. 1843.

Canavalia hirsuta Standl. Contr. U. S. Nat. Herb. 23: 495. 1922.

Stems terete, woody, densely pubescent, the hairs usually fulvous; petioles rusty-pubescent, mostly shorter than the leaflets; stipules and stipels not seen; petiolules very pubescent, 3 to 4 mm. long; leaflets membranaceous, ovate, rounded or subcordate at base, long-acuminate (the tip acute), sparsely puberulent above, densely so beneath, reticulate-veined, 8 to 12 cm. long; peduncles 10 to 15 cm. long, densely pubescent, much longer than the very dense, 15 to 25-flowered thyrses; pedicellar glands large, subglobose; bracteoles orbicular; calyx densely appressed-pubescent with fulvous hairs, 15 to 18 mm. long, the upper lip entire, apiculate, the lower lip 7 mm. long, with 3 subequal, broadly ovate, obtuse lobes; corolla rose-purple; standard oblong, emarginate, reflexed, 3 cm. long, bearing on each side of the median groove toward the base a narrow linear callosity, the slender claw 8 mm. long; wings shorter than the keel, linear, twisted, each with a rounded auricle at base and a slender claw 7 mm. long; keel 3 cm. long, falcate, rostrate and usually spiral at tip, the petals united above, the basal auricles rounded; style glabrous; stigma capitate; pod not seen.

The original specimens (not seen) were from Rincón, Talea, Oaxaca, Mexico, *Galeotti* 3424. The following specimens agree perfectly with the description:

MEXICO: Orizaba, *Botteri* 1152 (U. S., Kew, Gray); *Bourgeau* 2668, 2916 (Kew, Gray).

GUATEMALA: Cobán, *Türkheim* 237 (U. S., Kew, Gray).

9. *Wenderothia picta* (Mart.) Piper.

Canavalia picta Mart.; Benth. Ann. Wien. Mus. Naturg. 2: 135. 1838.

Stems slender, woody, terete, hirsutulous; stipules and stipels not seen; petioles hirsutulous, about as long as the leaflets; petiolules densely hirsutulous, 3 mm. long; leaflets thin, coriaceous, oblong to narrowly ovate, rounded to subcordate at base, long-acuminate, with blunt apiculate tip, sparsely reddish-puberulent when young, especially on the veins, becoming glabrous, 8 to 12 cm. long; peduncles terete, hirsutulous, mostly longer than the thyrses, 6 to 15 cm. long; pedicellar glands roundish, prominent; thyrses 10 to 20-flowered; bracteoles orbicular, caducous; calyx campanulate, minutely strigillose, 18 mm. long, the upper lip abruptly apiculate, as long as the tube, the lower lip 3 mm.

long, the lateral teeth broader, thinner, and shorter than the median tooth; standard "lilac," striate-nerved, broadly oval, not retuse, attenuate into the short claw, reflexed from near the base, 2.5 cm. long, bearing a conic callosity on each side of the median groove where the petal is reflexed; wings "rose", oblong, each bearing a semicircular auricle at base, 18 mm. long including the short claw (4 mm. long); keel "rose-lilac", broadly falcate, the two petals united above, the beak narrowed but blunt, sometimes twisted at tip, auricled at base, short-clawed, 3 cm. long, equaling the standard; stamens and style not examined; pods short-pediceled, linear, compressed, short-beaked, covered with short reddish hairs, one rib close to each suture, the third 3 mm. from the ventral rib, 10 to 12 cm. long; seeds "oblong, compressed, the linear hilum shorter than the seed."

BRAZIL: Organ Mountains, Province of Rio de Janeiro, *Gardner* 355 (Kew). Near Caldas, Minas Geraes, *Regnell* 82, 83 (Kew). Sumidouro, *Langsdorff* 178 (Kew). Without locality, *Sello* (Kew).

Bentham cites also the following: Near Cabo d'Agosta in Serro Frio, Minas Geraes, *Martius* (type); Minas Geraes, *St. Hilaire*.

I have seen no pods with well-developed seeds, but these are described by Bentham. There were available no flowers good enough to permit examination of the pistil and stamens, and these organs are not described by Bentham. According to St. Hilaire (ex Bentham) the flowers have the odor of sweet peas.

10. *Wenderothia lasiocalyx* (Kuntze) Piper.

Canavalia lasiocalyx Kuntze, *Rev. Gen. Pl.* 3²: 55. 1898.

Twining shrub; stems slender, terete, pubescent with spreading fulvous hairs; petioles fulvous-pubescent, shorter than the leaflets; stipules not seen; stipels subulate, minute; leaflets firm-membranaceous, elliptic, rounded at base, acutely short-acuminate at apex, green and sparsely puberulent above, paler and sparsely pubescent beneath, especially on the nerves, 5 to 8 cm. long, the ribs prominent beneath; petiolules 5 mm. long, densely puberulent; peduncles densely fulvous-puberulent, mostly shorter than the inflorescence; thyrses dense when young, 15 to 20-flowered; pedicels very short, their basal glands large; bracteoles ovate, acute, densely pubescent; calyx 1 cm. long, streaked with dark purple lines, densely fulvous-pubescent with appressed hairs, the broad upper lip truncate and shorter than the tube, the lower lip small, with three lance-ovate acuminate lobes; corolla purple, 3 cm. long; standard oblong-ovate, emarginate, the claw broad, 6 mm. long, the callosities conic, prominent; wings linear-spatulate, obtuse, without median auricles; keel narrow, curved, rostrate, 3 cm. long, slightly incurved at tip; pods linear, 12 mm. broad, 8 to 10 cm. long, compressed, densely villous with spreading fulvous hairs, one rather prominent longitudinal ridge close to the ventral suture, a second less prominent one very close to the dorsal suture, and a third median one 4 to 5 mm. distant from the ventral suture and nearly twice as far from the dorsal; seeds ellipsoid, much compressed 7×5×5 mm., pale brown, spotted with dark brown, shiny, the linear hilum nearly as long as the seed, about one-third its circumference, covered with a thick white caruncle.

Type collected by Kuntze at Santa Cruz de Sierra, Bolivia, altitude 1,000 meters.

BOLIVIA: Yapacani, June, 1892, in fruit, *Kuntze* (U. S., N. Y.). Yungas, *Bang* 586, in flower (Gray, N. Y., U. S.); *Rusby* 1325 (U. S.). Mapiri, *Rusby* 2856 (N. Y.). Machichoíriza River, *Williams* 1584 (N. Y., U. S.), with mature fruit.

PERU: Santa Ana, alt. 900 m., *Cook & Gilbert* 1611 (U. S.).

Kuntze distributed the Yapacani plant as *C. picta* Mart., and it is possible that his Santa Cruz plant, the basis of *C. lasiocalyx*, is different.

11. *Wenderothia lenta* (Benth.) Piper.

Canavalia lenta Benth. Ann. Wien. Mus. Naturg. 2: 135. 1838.

Stems slender, terete, densely puberulent, apparently herbaceous; stipules and stipels not seen; petioles densely puberulent, shorter than the leaflets; petiolules 2 mm. long, densely puberulent; leaflets elliptic to slightly ovate, rounded at base, acuminate, the tip acute and apiculate, densely soft-puberulent on both sides, 4 to 7 cm. long; peduncles as long as the racemes; pedicellar glands roundish, conspicuous; thyrses about 10-flowered; calyx campanulate, 15 mm. long, the upper lip stoutly apiculate at tip, as long as the tube; lower lip 3 mm. long, the teeth triangular, subequal, the median thicker; standard broadly oval, not retuse, reflexed, attenuate at base to a very short claw, bearing two papillate callosities near the base; wings 20 mm. long, oblong, twisted near the base, the auricles semicircular, the short claw 2 mm. long; keel 25 mm. long, broadly falcate, the narrowed tip incurved or twisted, the basal auricles small, the short claw 2 mm. long; style glabrous; stigma capitate.

BRAZIL: Cabellado, *Pohl*, type (Kew).

Reported also from Paraguay, *Balansa* 3096 (Bull. Herb. Boiss. II. 4: 902. 1904).

12. *Wenderothia villosa* (Benth.) Piper.

Canavalia villosa Benth. Ann. Wien. Mus. Naturg. 2: 135. 1837. The type of this, in the Munich herbarium, is a flowering specimen collected somewhere in Mexico by Karwinsky. The branchlets and petioles are densely ferruginous-hirsutulous, the leaflets sparsely puberulent above and densely canescent-tomentulose beneath, elliptic to elliptic-ovate, with the short acumination blunt and apiculate at tip; calyx densely ferruginous-tomentulose, scarcely "villose"; lower calyx lip not entire but with 3 lobes, these all triangular and acutish, the median 2 mm. long, longer and thicker than the lateral ones; keel slightly twisted at tip. In the pubescence of the calyx this specimen is quite unusual. The best match for it examined is from Ocuila (? Ocuilán), State of Mexico, *F. Salazar*, November 16, 1911, which specimen has even longer, denser, and darker pubescence on the calyx.

Canavalia rostrata Benth. Ann. Wien. Mus. Naturg. 2: 135. 1837. The type of this, in the herbarium at Munich, is a fragmentary specimen in bloom, collected somewhere in Mexico by Karwinsky. It is evidently a shade specimen. Stems slender, sparsely strigillose; leaflets thin, elliptic to ovate, with a rather long acumination, but the very tip blunt and apiculate, glabrous above except on the nerves, sparsely strigillose beneath; calyx nearly glabrous, the lower lip 3-lobed, 3 mm. long; corolla (straightened out) 3 cm. long.

Wenderothia discolor Schlecht. Linnaea 12: 331. 1838. The original specimens from Jalapa, Veracruz, *Schiede*, for which the genus *Wenderothia* was proposed, have not been examined. The long description accords closely with *Rose & Hay* 6129 from the same place. In the latter the calyx is nearly glabrous and, as described for *W. discolor*, the under leaf surface is densely tomentulose.

Neurocarpum multiflorum Hook. & Arn. Bot. Beechey Voy. 286. 1841.

Canavalia multiflora Hook. & Arn. Bot. Beechey Voy. 416. 1841. The type, in the herbarium at Kew, is said to have been collected by Sinclair somewhere on the west coast between San Blas, Mexico, and Realejo, Nicaragua. The specimen is in young fruit. Leaflets sparsely strigillose beneath; calyx sparsely strigillose; stems hirsutulous, the hairs somewhat reflexed.

Wenderothia glabra Mart. & Gal. Bull. Acad. Sci. Brux. 10³: 191. 1843. The original specimens, not seen, are from Hacienda de Mirador, Veracruz. The only points in the description that seem diagnostic are the white flowers and the minutely fulvous-pilose stems. Specimens from the type locality, *Nelson* 90, *Linden* 723, and *Sartorius* 2800, have the fulvous-pilose stems, but the corollas in the Sartorius and Linden specimens are certainly purple.

Wenderothia pilosa Mart. & Gal. Bull. Acad. Sci. Brux. 10³: 191. 1841. The type collection is Galeotti's 3273 from Zacuapan, Veracruz, and duplicates are in the herbarium at Kew. The only unusual feature of the specimens is the spreading fulvous pubescence of the stems, perhaps best described as thinly short-pilose. The pubescence of the under leaf surface and of the calyx is similar but less erect.

Stems perennial, woody, terete, climbing, more or less densely pubescent, hirsutulous to strigillose, rarely quite glabrous; petioles about as long as the leaflets, varying in pubescence like the stem; petiolules 4 to 6 mm. long, usually densely puberulent; stipules lanceolate, attenuate, 3 mm. long; leaflets 4 to 10 cm. long, thin to rather thickish, membranaceous, oval to ovate or somewhat obovate, sometimes merely acute, usually with a more or less elongate acuminate apex, the tip blunt and apiculate, rounded to subcordate at base, sometimes glabrous or nearly so on both sides, usually sparsely strigillose above, strigillose to densely tomentulose beneath, the pubescence usually whitish but varying to ferruginous; peduncle stout, usually longer than the young inflorescence, this 10 to 25-flowered; pedicellar glands very prominent; thyrses 10 to 30-flowered; bracteoles ovate-orbicular, 2 to 3 mm. long; calyx campanulate, 12 to 15 mm. long, glabrous to strigillose or tomentulose, canescent to ferruginous, the truncate apiculate upper lip nearly as long as the tube, the lower lip 3-lobed, 2 to 3 mm. long, the lateral lobes ovate-triangular, thinner and shorter than the median lobe; corolla reddish purple (white in *W. glabra*, according to Galeotti); standard 3 to 3.5 cm. long, elliptic to oblong-ovate, emarginate, reflexed below the middle in anthesis, not auricled at base, bearing two elongate callosities below the middle, the claw 1 cm. long; wings linear-oblong, obtuse, at length twisted, shorter than the keel, a rounded inflexed auricle at base of blade of each; keel 3 cm. long, long-rostrate, falcate, the two petals united from above the middle to the tip, each with a small basal auricle, the tip often coiled into a single spiral; style glabrous; stamens monadelphous; pods nearly straight, beaked, compressed, 10 to 20 cm. long, 1 to 1.5 cm. wide, densely tomentulose with white to ferruginous hairs, the valves 3-ribbed, one rib near each suture, the median one about twice as far from the dorsal suture as from the ventral; inner layer of pod closely adherent; seeds oval in outline, compressed, chestnut-colored, sprinkled with unequal brown dots, 10×7×4 mm., the dark hilum surrounded by a nearly black border, and extending one-eighth to one-fourth the circumference of the seed.

Study of the extensive series of specimens listed seems to indicate that all the names cited pertain to but a single species ranging throughout Mexico and south into Panama. The forms vary mainly in the amount of pubescence on the calyx and leaves. This pubescence is usually short-appressed on the calyx and leaves and commonly white, but not rarely tomentulose or short-pilose and frequently ferruginous. In all the specimens cited the leaflets are similar in form and alike in being acuminate, the tip blunt and apiculate. They vary however in texture as well as amount of pubescence, these doubtless being fluctuating variations due to environmental influences. Bentham in publishing *C. villosa* described the lower lip as entire, but a reexamination of the type shows it to be 3-lobed. The lateral teeth are often small or obscure,

which perhaps led Bentham to describe the calyx lip of *C. rostrata* as "subentire," but in the type of this it is clearly 3-lobed.

Bentham also contrasted *C. villosa* and *C. rostrata*, stating that the keel was slightly twisted in the former but not so in the latter. I have been unable to escape the conclusion, from many examinations, that this difference is due to the age of the flowers, and is not specific. In a young flower the keel is usually not twisted.

So far as pubescence is concerned, every gradation can be found from glabrous or nearly glabrous to densely short-pubescent or to tomentulose, both on the calyx and on the lower leaf surfaces. Indeed, a series of specimens may be selected all with the leaflets densely pubescent beneath, but in this series the calyx will vary from glabrous to densely strigillose or to tomentulose. On the other hand, a series of specimens with the calyx glabrous or nearly so will show all variations as regards the pubescence on the leaflets. In short, there is no correlation as regards the pubescence of calyx and leaflets, nor has any been detected with other variable organs.

COAHUILA: Caracol Mountains, *Palmer* 250 (U. S., Kew).

NUEVO LEÓN: Monterrey, *Edwards* (Kew). Nuevo León, *Pringle* 2274 (Gray). Sierra Madre near Monterrey, *Pringle* 2506 (U. S., Kew).

TAMAULIPAS: Gómez Farías, *Palmer* 268 (U. S.). Tampico, *Palmer* 167 (U. S.).

SINALOA: San Ignacio, *Montes & Salazar* 29, 704, 744 (U. S.).

DURANGO: Durango, *Rose* 2320 (U. S.).

ZACATECAS: Colotlán to Bolaños, *Rose* 2839 (U. S.). Monte Escobedo, *Rose* 2632 (U. S.). Bolaños to Guadalajara, *Rose* 3042 (U. S.).

SAN LUIS POTOSÍ: Pelote, *Purpus* 4851 (U. S.). Bagre, *Purpus* 5203 (U. S.).

JALISCO: Guadalajara, *Pringle* 2118 (Gray); *Rose & Painter* 7367 (U. S.); *Berlandier* (Kew); *Rose & Hay* 6401 (U. S.). Etzatlán, *Rose & Painter* 7523 (U. S.). Río Blanco, *Palmer* 162 (U. S.). Chapala, *Rose & Hay* 7659 (U. S.).

GUANAJUATO: Guanajuato, *Dugès*, August, 1895 (Gray).

HIDALGO: Zimapán, *Beechey* (Kew); *Coulter* (Kew).

VERACRUZ: Valley of Córdoba, *Bourgeau* 1857 (Gray), 1895 (U. S.), 1855, 1537 (Kew). Orizaba, *Bourgeau* 2802 (Kew), 2916 (Gray); *Botteri* 970, 374 (Gray), 118, 1152 (U. S.), 728, 1153 (Kew). Veracruz to Orizaba, *Müller* 1311 (Kew). Jalapa, *Rose & Hay* 6129 (U. S.). Hacienda Mirador, *Nelson* 90 (U. S.). Río Blanco, near Orizaba, *Bourgeau* 2675 (Kew). Veracruz, *Galeotti* 3273 (Kew), type of *Wenderothia pilosa*. Mirador, *Linden* 723 (Kew). Huatusco, *Liebmann* 5254 (U. S.). Wartenburg, *Ervendberg* in 1858 (U. S.).

MICHOACÁN: Morelia, *Arsène* 2760 (Gray); *Galeotti* 3367 (Kew). Mt. Santa Helena, *Langlassé* 65 (U. S.). Sierra Madre, *Langlassé*, February, 1899 (U. S.).

GUERRERO: Acapulco, *Palmer* 575 (U. S.).

MEXICO: Tlalpam, *Rose & Hough* 4531 (U. S.). Ocuilán, *Salazar*, November 16, 1911 (U. S.).

PUEBLA: Tehuacán, *Rose & Hay* 5904, 9944 (U. S.).

MORELOS: Cuautla, *Holway* 11 (U. S.). Cuernavaca, *Rose & Hay* 6856 (U. S.); *Bourgeau* 1377 (Kew); *Rose & Painter* 6903 (U. S.).

OAXACA: San Felipe del Agua, *Conzatti* 590 (U. S.). Oaxaca, *Nelson* 1224 (U. S.); *Conzatti* 1677 (U. S.); *Conzatti & González* 43 (U. S.); *Purpus* 2679 (U. S.). Monte Albán, near Oaxaca, *Rose & Hough* 4575 (U. S.).

CHIAPAS: Tonalá, *Nelson* 238 (U. S.). San Cristóbal to Teopisca, *Nelson* 3471 (U. S.). Tumbala, *Nelson* 3349 (U. S.). El Carmen, *Doyle* 243 (U. S.). Solosuchiapa, *Doyle* 246 (U. S.).

TABASCO: Teapa, *Linden* (Kew).

MEXICO (state uncertain): Without locality, *Bourgeau* 7377 (Gray); *Beechey* (Kew), type of *Neurocarpum multiflorum*. Villa Thuret, Cap d'Antibes, *Poirault* (Kew). Without locality, *Karwinsky* (Munich), type of *Canavalia villosa*; *Karwinsky* (Munich), type of *Canavalia rostrata*.

GUATEMALA: Huehuetenango, *Nelson* 3575 (U. S.). Neutón, *Nelson* 3537 (U. S.). Without locality, *Heyde* 289 (U. S.). Cubilquitz, *Türckheim* 7849 (U. S., Kew). Morán, *Kellerman* 4839 (U. S.). Chiapas, *Heyde & Lux* 3741 (U. S., Kew). Guatemala, *J. D. Smith* 2296 (Gray); July, 1860, *Hayes* (Gray). Las Vacas Barranca, July, 1860, *Hayes* (Gray). Chiantia, July, 1860, *Hayes* (Gray). Volcán de Fuego, *Salvin* (Kew). Santa María, Quezaltenango, *Kellerman* 5582 (U. S.)

SALVADOR: Volcán de San Salvador, January 9, 1898, *Niederlein* (U. S.)

COSTA RICA: Cartago, *Oersted* 12, 13 (Kew). San Francisco de Guadalupe, *Tonduz* 1564, 1570 (U. S.). San José, *Tonduz* 7222 (U. S.). Desamparados, *Tonduz* 1691 (pods fulvous) (U. S.). Without locality, *Oersted* (U. S.).

NICARAGUA: Chontales, *Tate* (Kew); leaflets lance-elliptic or slightly ovate, thin, glabrous; calyx nearly glabrous.

PANAMA: Sabana de Cerro Vaca, *Pittier* 5298 (U. S.).

ADDITIONAL SPECIES

CANAVALLIA ALBIFLORA Ducke, Arch. Jard. Bot. Rio Janeiro 3: 173. 1922.

Evidently a species of *Wenderothia*, but no specimens have been seen. Ducke's original description is as follows:

"Speciei meridionali *C. picta* omnino similis, differt partibus omnibus paulo minoribus, calice viridi unicolore, petalis albis solum vexillo maculâ parvâ violaceâ notato, et imprimis legumine novello breviter et parum dense griseo-vel subargenteo-piloso demum plus minusve glabrato.

"Habitat in terris argillosis fertilibus inter vegetationem secundariam: civitate Pará prope Santerém (loco Manicá) n. 17.088 prope Montealegre loco Airy n. 16.518 et ad vicinum flumen Maicuru inferius n. 9.530, prope lacum Salgado fluminis Trombetas n. 11.069, prope Alcobaca fluvii Tocantins n. 16.194; civitate Maranhão prope Codó, Her. Gen. Mus. Pará numero 660. Specimina omnia ab A. Ducke lecta, excepto n. 9.530 ab E. Sneath lecto."

CANAVALLIA CUSPIDIGERA Hoehne, Comm. Linhas Tel. Estrat. Matto Grosso ao Amazonas. Ann. 5. Bot. Part 8: 94. pl. 156. 1919.

"Planta volubilis alte scandens, ramulis novellis, petiolis, pedunculisque minutissime sparseque puberulis vel parce pubescentibus, caulibus adultis glabris; foliis trifoliolatis, petiolo communi fere 3,5-5 cm. longo; foliolis oblongo-ellipticis, fere 5-6 cm. longis et usque 2,5-3 cm. latis, basi rotundatis, 2 mm. longo petiolulatis, apice abrupte 5 mm. longo cuspidato-rostratis et minutissime mucronatis, supra subtusque nervis primariis minutissime sparseque pubescentibus, lateralibus saepius paulo asymetricis; inflorescentiis racemosis, simplicibus, supra medium florigeris et descendentes; floribus violaceis cum vexillo et calyce extus purpureo-striatis vel maculatis saepius geminis in utroque nodulo; calyce tetralobato, extus sparse pubescente et purpureo maculato vel striato, fere 2 cm. longo, lobo vexillari magno, usque 13 mm. longo et 20 mm. lato, apice recurvo, late emarginato et minute mucronato, ceteris parvis, triangularibus, acutis; vexillo infero, late obovato, inferne abrupte angustato et unguiculato, supra unguem calloso incrassato et deinde arcte reflexo, apice late emarginato. marginibus recurvatis, fere 3,2 cm. longo et 2,5 cm. lato, basi necque auriculis necque appendicibus munito; alis unguiculatis, supra unguem abrupte lateque auriculatis dein subcontractis, incurvis, paullulum falcatis, apice rotundatis, fere 3-3,5 cm. longis; carina unguiculata, supra unguem minute obtusoque auriculata, deinde paulo contracta, falciforme curvata et in tertia summa parte concretescentia, alis aequilonga vel paulo longiora; staminibus 10, monodelphis, tubo curvo; ovario pubescente; stylo glabro, incurvo et apicem versus levissime incrassato.

"N.: 2569. Tabula nostra n. 156.

"Leg. ad margines silvarum ad ripas fluminis prope Coxim; floret Maio.

"Planta voluvel, com folhas trifolioladas, foliolos elliptico-alongados, na base arredondados e no apice providos de um prolongamento linear em fórma de rostro, que é mucronulado, glabros ou levemente pubescentes nas nervuras principaes; inflorescencias racimosas, como as da *Canavalia picta*, Mart., sempre pedentes; flores geralmente 2 em cada nó do racimo, abrindo-se gradativamente, da base para o apice deste, por dentro roxo-violaceas e por fóra, sobre o vexillo e calyce, estriadas ou maculadas de roxo-avermelhado.

"A fórma do vexillo e demais partes da corolla nao se afastam muito das da *Canavalia picta*, Mart., a fórma dos foliolos e o revestimento em geral da planta afastam-na porém de todas as descriptas até esta data.

"Como em geral todas as *Canavalias*, é esta uma planta que se recommenda especialmente para cobrir caramanchoes e sébes."

This plant is clearly a *Wenderothia*, allied to *W. picta* but probably distinct.