

THE MIDDLE AMERICAN SPECIES OF LONCHOCARPUS

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INTRODUCTION.

SCOPE AND MEANS OF THE INVESTIGATION.

The genus *Lonchocarpus* is one of the best-represented groups of the Fabaceae, subfamily Dalbergieae, in the forests and on the half-denuded hills and plains of the lower altitude belt of Central America and southern Mexico. The species, however, are not generally conspicuous as an ecologic element, and their significance from the economic standpoint is very limited, facts which probably account for the slight attention paid to the genus in recent years. Notwithstanding the evident wealth of forms, only six Middle American species have been described since the last revision by Bentham in 1860.

In the present paper I have described all the Central American and Mexican species of *Lonchocarpus*, old and new, found in the Gray, New York Botanical Garden, John Donnell Smith, Field Museum of Natural History, and United States National herbaria, all of which have very obligingly been put at my disposal. In consequence of the large increase in the number of species, it has been found necessary to discard the systematic arrangement established by Bentham and make an attempt at a new classification.

In an additional chapter a West Indian and a South American species, intimately related to and often confused with the Middle American *Punctati*, have been described and discussed, as well as several other species recently collected in Colombia and Venezuela.

HISTORY AND LIMITATION OF THE GENUS.

ORIGIN AND TYPE.

The genus *Lonchocarpus* was established by Kunth and published in 1823 in the *Nova Genera et Species of Humboldt, Bonpland, and Kunth.*¹ The name, formed from *λόγχη*, lance, and *καρπός*, fruit, refers to the peculiar shape of the legume, often resembling a lance head.

¹ 6: 383.

In a footnote following the original description, it is stated that the following species, heretofore considered as belonging to other genera, really pertain to the new genus:

<i>Robinia sericea</i> Poir.	<i>Dalbergia domingensis</i> Turp.
<i>Robinia violacea</i> Beauv.	<i>Amerimnum scandens</i> Willd.
<i>Dalbergia pentaphylla</i> Poir.	<i>Amerimnum latifolium</i> Willd.

As will be shown hereafter the generic identity of another *Robinia violacea*, described and named by Jacquin, must be considered doubtful.¹

Two new species were described by Kunth, *Lonchocarpus punctatus*, from the shaded forests near Cumana, Venezuela, and *L. macrophyllus*, growing at Angostura de Carare, on the banks of the Magdalena River, Colombia. The first I regard as the type species of the genus, although this place may be claimed for *L. sericeus* H. B. K. (*Robinia sericea* Poir.), heading the list of transferred species. It seems reasonable to believe that the species first considered by Kunth were those of which he was actually handling specimens, and that the relationship of the others became evident only after he was thoroughly familiarized with these.

Of the earlier species transferred to this genus by its author, *Robinia sericea* Poir., *Dalbergia domingensis* Turp., and *Amerimnum latifolium* Willd. have without much questioning taken the place assigned to them, undergoing the appropriate change of name, and are known to-day respectively as *Lonchocarpus sericeus*, *L. domingensis*, and *L. latifolius* H. B. K. *Dalbergia pentaphylla* Poir. has been found to be a synonym of *L. latifolius*, and *Amerimnum scandens* Willd. is the Venezuelan *Pterocarpus scandens* Poir. The name *violaceus* proves invalid under *Lonchocarpus* for reasons to be stated under *L. benthamianus*.¹

FUNDAMENTAL CHARACTERS.

Lonchocarpus belongs, with several large genera (*Dalbergia*, *Machaerium*, *Pterocarpus*) and a greater number of monotypic or small ones, in the division of the Papilionatae known as the subfamily *Dalbergieae*, the members of which are trees or, less often, shrubs, sometimes of climbing habit. One of the fundamental characters of the subfamily, by which *Lonchocarpus* can always be distinguished from *Robinia* and *Gliricidia*, provided fruit-bearing specimens are at hand, is the indehiscent legume. When there are no fruits the decision is often difficult, even to the experienced botanist. In *Lonchocarpus* the leaflets are always exstipellate, but this is supposed to be the case also with several species of *Robinia*, as well as the whole genus *Gliricidia*.

¹ Page 87 below.

There is some measure of uncertainty as to the value of the characters of the base of the staminal tube and the freedom or coalescence of the vexillar stamen in separating *Lonchocarpus* from the mentioned genera of the Galegeae. As indicated above, Kunth considered the stamens of the former as diadelphous, a view which is hardly justified by the facts. The elder de Candolle¹ has already shown that the stamens are often monadelphous, a statement which can now be generalized. The extreme basal ring of the tube is continuous up to the time when the fecundated ovary begins to swell. On the upper side of the tube, just above the basal ring, there are two openings, oval in most species, V-shaped in a few, and separated by the vexillar stamen, which thus appears to be free for a very short distance. Farther toward the anthers the tube is completely closed, all the filaments becoming free at about the same distance from the anthers. The basal openings, or "fenestrellæ," have a distinctly thickened, callous margin, and the corresponding part of the tube is more or less dilated laterally.

In the flowers of *Robinia* and *Gliricidia* also, the staminal tube is often found to be fenestratae, but the margins of the openings seem to be always thin and the adherence of the vexillar stamen above the latter less marked in *Robinia*, the tube being almost always split, and wanting in *Gliricidia*, where that stamen is entirely freed at an early stage. In *Lonchocarpus eriophyllus* Benth., the generic position of which will remain in doubt until the fruit is found, the thickening of the margins of the fenestrellæ is hardly marked, and the tube is either split or closed. But in other cases, as in *Lonchocarpus meistophyllus* Donn. Smith, which I have transferred to *Gliricidia*, the tube is thin everywhere and the vexillar stamen either completely or partly free.

In *Lonchocarpus*, as shown by de Candolle in the memoir cited, the style is usually glabrous. This is also the case in *Gliricidia*, but in *Robinia* we find it covered with stiff hairs. Considered alone, this is consequently a character of little or no value.

The number of ovules varies in *Lonchocarpus* from 1 to 9. In only 3 of the Middle American species is the ovary 8 or 9-ovulate; 36 species have from 3 to 8 ovules, and 2 others 1 or 2. These numbers are not exceeded in the other species of the genus, and this is another reason why *L. eriophyllus*, with its 11 or 12 ovules, should be held generically doubtful. There is also variation in the adherence of the wings to the keel, and of the carinal petals to each other, which is also far from being an absolute generic character, since it is found to a greater or less degree in several arborescent or shrubby genera of both the Dalbergieae and Galegeae.

¹ DC. Mém. Legum. 278. 1825.

Besides being dehiscent, the legume is always stipitate; but this detail is not often apparent in the ovary and is not restricted to the genus.

To summarize, the differential characters of the genus are never absolute when taken singly. But the following, taken all or several together, describe it with sufficient accuracy. Every one of these characters, considered separately, will be found to be shared with other more or less nearly related genera, but it is their concurrence upon which the genus *Lonchocarpus* is based.

These characters are: (1) Legume indehiscent; (2) leaflets exstipellate; (3) legume stipitate; (4) stamens monadelphous, the base of the staminal tube 2-fenestrata, the openings with callous margin; (5) ovules 1 to 9; (6) style glabrous or at most sparsely pubescent; (7) leaves alternate; leaflets opposite.

THE AMERICAN SPECIES OF DERRIS.

The characters above attributed to *Lonchocarpus* are shared by the so-called American species of *Derris*. These species differ only in a very secondary detail of the legume, viz., the greater or less development of the vexillar margin, or of both margins. I have no hesitation in bringing into the former genus the Costa Rican species of *Derris* described recently by Capt. John Donnell Smith. They fit nicely into the classification and, considering the broad range of variation in the shape of the legume within the genus, I can not but believe that respect for the authority of Bentham, which I myself share to a certain extent, is the only argument for keeping them apart. The fruits of *Derris nicoyensis*, *D. costaricensis*, and *D. peninsularis* do not differ more than does that of *Lonchocarpus neuroscapha* or *L. sericeus* from that of the typical *L. punctatus*.

As to *Derris grandifolia* I hold it to constitute in itself a well characterized genus, hardly closely related to either *Lonchocarpus* or *Derris*. This will be described in a future publication under a new generic name.

The reasons for transferring the Costa Rican species of *Derris* hold in the same manner in the case of the three South American species *D. guyanensis*, *D. negrensis*, and *D. longifolia*. Though the fact that they are described as climbing shrubs would hardly exclude them from *Lonchocarpus*, we find that in *D. guyanensis* the legume has a well-defined, narrow wing and the seeds have a characteristic shape, while the other details of the plate in the *Flora Brasiliensis*¹ remind one of some species of *Lonchocarpus*, section *Paniculati*. The two other species differ mainly in the short and broad legume.

¹ 15¹: pl. 107.

According to Bentham, the vexillar stamen is almost always detached in *Derris longifolia*, never in *D. guyanensis*.¹

GENERA ESTABLISHED WITHIN LONCHOCARPUS.

In 1837 Vogel² founded his genus *Sphinctolobium* on a plant collected by Luschnath near Rio de Janeiro. The main characters consisted in a 5-toothed calyx with the teeth sometimes obsolete and a flat-compressed legume, sometimes 1-seeded, or 2 or 3-seeded and then contracted between the seeds (whence the generic name). These characters obviously belong to *Lonchocarpus*, to which Vogel's three Brazilian species (*S. virgilioides*, *S. nitidum*, and *S. floribundum*) were transferred by Bentham. The special features given by Vogel as fundamental are not even confined to a single group, but are found in species widely apart. To this botanist, however, we owe the first mention of the fact that in *Lonchocarpus* the staminal tube is entire, that is to say, continuously closed above the fenestrellæ.

The genus *Neuroscapha*, established by Tulasne³ in 1843, had certainly a better foundation. The type is *Neuroscapha guilleminiana* (*Lonchocarpus neuroscapha*) and the genus included all the species of *Lonchocarpus* in which the legume is thickened or broadened on the parts of the vexillar margin fronting the seeds. This is a well-defined feature, but as all the other characters also belong to *Lonchocarpus*, Bentham considered *Neuroscapha* as a simple section of this genus.

In 1844 Fenzl⁴ proposed, without describing it, his African genus *Philenoptera*, the principal character of which seems to have been the elliptic-lanceolate legume with a paper-like texture. The type of *Philenoptera* was *P. kotschyana* Fenzl, described by Hochstetter⁵ as *P. schimperi* and by Bentham as *Lonchocarpus philenoptera*. The same plant is the type also of a fourth genus, *Capassa*, proposed by Klotzsch⁶ but never described.

In the classification of the Middle American species given hereafter, the name *Philenopteri* has been adopted to designate the first

¹ This name is not in accordance with the rules. The species was published in 1775 in the *Plantes de la Guiane*, under the name of *Degelia scandens* Aubl. This has priority over *Dalbergia scandens* Roxb., used for the first time in the *Plants of Coromandel*, volume 3, issued not earlier than 1800. The Guiana plant should consequently be called *Derris scandens* (Aubl.), while the East Indian species would become *Derris timorensis* (DC.), having been described in de Candolle's *Prodromus* (2: 417. 1815) as *Dalbergia timorensis* DC.

² *Linnaea* 11: 417.

³ *Ann. Sci. Nat. II. Bot.* 20: 137. 1843.

⁴ *Flora* 27: 312. 1844.

⁵ In A. Rich. *Tent. Fl. Abyss.* 1: 232. 1847.

⁶ *Pl. Peters. Exsicc.*, under *Capassa violacea* Klotzsch.

section, the species of which have the membranous legume attributed to the genus *Philenoptera*.

GROUPING OF THE SPECIES.

BENTHAM'S CLASSIFICATION AND TAUBERT'S REARRANGEMENT.

Bentham is to this day our greatest authority on the taxonomy of the Leguminosae and we owe to him the first attempt at a general revision of *Lonchocarpus* and its division into natural groups. In his synopsis of the *Dalbergieae*¹ he brought together 46 species under 7 heads with characters which can be stated as follows:²

Floral peduncles geminate or bifurcate or sometimes several together, but not fasciculate.

Legume thickened at the seeds along the vexillar margin;
standard mostly silky without..... 1. NEUROSCAPHI.

Legume not thickened on the vexillar margin.

Leaflets not punctate.

Leaves softly tomentose or villous throughout..... 3. ERIOPHYLLI.

Leaves glabrous or more or less hairy, but not tomen-
tose or villous on both sides.

Standard appendiculate and more or less callous
at the base..... 2. DENSIFLORI.

Standard attenuate and not callous at the base.. 4. LAXIFLORI.

Leaflets pellucid-punctate..... 5. PUNCTATI.

Floral peduncles neither distinctly geminate nor bifurcate.

Inflorescence a ramified terminal panicle..... 6. PANICULATI.

Inflorescence simple, the flowers fasciculate..... 7. FASCICULATI.

In the *Pflanzenfamilien*³ Taubert has the following arrangement, which has the advantage of giving the sections according to their numerical order but is founded partly on a misstatement. The Neuroscaphi, Densiflori, and Laxiflori, namely, have the leaflets far from always glabrous on the upper surface. Besides this, the more or less marked pubescence or silkiness of the standard is hardly a safe character, and the distinction between the Fasciculati and Paniculati can be made clearer.

¹ Synopsis of *Dalbergieae*, a tribe of Leguminosae. Journ. Proc. Linn. Soc. Bot. 4: Suppl. 1-128. 1860.

² In all the following descriptions I distinguish in the inflorescence the rachis, the peduncles, and the pedicels, which is not exactly in accord with the usual nomenclature, but simplifies the expression. The rachis is the peduncle proper, while what I call peduncle would be a pedicel of the first order, and my pedicels are those of the second order.

³ 3: 343. 1891.

- Flowers geminate along the rachis, rarely several together and then
the leaves pellucid-punctate.
- Leaflets glabrous above.
- Leaflets not pellucid-punctate.
- Standard callous or auriculate at the base.
- Standard mostly silky without; upper suture of
of the legume thickened and broader at the
seeds..... 1. NEUROSCAPHI.
- Standard glabrous or sparsely silky without;
upper suture of the legume not thickened.. 2. DENSIFLORI.
- Standard not callous nor auriculate at the base, per-
fectly glabrous without or very sparsely silky.. 3. LAXIFLORI.
- Leaflets pellucid-punctate; standard glabrous or sparsely
silky without..... 4. PUNCTATI.
- Leaflets tomentose or villous on both sides..... 5. ERIOPHYLLI.
- Flowers mostly fasciculate along the rachis; leaflets not pellucid-
punctate.
- Flowers irregularly paniculate..... 6. PANICULATI.
- Flowers in simple or scarcely ramified racemes..... 7. FASCICULATI.

His second section, Densiflori, Bentham again subdivided, according to the size and dimensions of the leaves, into Macrophylli, Acuminati, and Obtusifolii, while other subdivisions, founded on characters of the carina or of the standard, were established in section 7, Fasciculati.

In the present paper I shall not discuss the last two sections, Paniculati and Fasciculati. They are not represented among the Middle American species of *Lonchocarpus*, and besides this they are so well characterized that they can be considered *a priori* as natural divisions within the genus.

In the other five sections the known species were grouped by Bentham in the following manner:

1. NEUROSCAPHI:	OBTUSIFOLII—
guatemalensis.	rugosus.
sericeus.	obovatus.
neuroscapha.	
parviflorus.	
2. DENSIFLORI:	3. ERIOPHYLLI:
MACROPHYLLI—	phaseolifolius.
unifoliolatus.	velutinus.
macrocarpus.	fendleri.
spiniflorus.	eriophyllum.
ACUMINATI—	
hondurensis.	
atropurpureus.	
lanceolatus.	
rubiginosus.	
nitidus.	
	4. LAXIFLORI:
	(Formed of 6 exclusively Brazilian species.)
	5. PUNCTATI:
	violaceus.
	confertiflorus.
	araripensis.
	subglaucescens.

Subsequent advance in the knowledge of the genus calls for the transfer from the section Densiflori to the section Neuroscaphi of *L.*

atropurpureus and *L. lanceolatus*, and it is probable that *L. hondurensis* also belongs to the latter group. With these exceptions, Bentham's species seem tolerably well grouped, but the same distinctions will hardly serve for the establishment of well-defined groups among the 40 species recognized in this paper for Central America and Mexico.

NEW CLASSIFICATION OF THE MIDDLE AMERICAN SPECIES.

To provide for these species the following attempt has been made at a more comprehensive grouping, in sections and higher units.

KEY TO THE SUBGROUPS.

Legume narrowly lanceolate or broadly quadrate-lanceolate, the margin almost uniform in width, sharp-edged or rounded.
(Subgenus 1. EULONCHOCARPUS.)

Costa and veins deeply impressed on the upper face of the leaflets, very prominent beneath; leaves more or less tomentose or villous; flowers (the standard principally) more or less silky-pubescent; legume lanceolate or elongate, 1 to 6-seeded, glabrous or ferruginous-tomentose. (Series 1. IMPRESSINERVI.)

Legume membranous, not over 2 cm. broad, more or less elongate; wings narrow, more or less distinctly plicate transversely on the vexillar side..... 1. PHLENOPTERI.

Legume coriaceous, ovate-lanceolate, the seeds embedded in a thick, porous tissue; wings ovate, not plicate; ovules 2 or 3..... 2. SPONGOPTERI.

Costa and veins seldom deeply impressed on the upper face of the leaflets, the veins more or less prominent beneath; leaves glabrous or more or less pubescent; flowers glabrous or pubescent; legume lanceolate or quadrate-lanceolate, 1 or 2-seeded, glabrous. (Series 2. PLANINEERVI.)

Leaflets punctate; calyx and petals often yellow-dotted; standard bilobulate at the base..... 3. PUNCTATI.

Leaflets not punctate and petals not dotted; standard elobulate, usually truncate at the base..... 4. EPUNCTATI.

Legume lanceolate or elongate-linear, the vexillar margin thickened at the seeds, carinate or concave. (Subgenus 2. NEUROSCAPHA.)

Petals sparsely pubescent, or the standard silky-pubescent, the flowers then very small (not over 5.5 mm. long).

Leaves rather small; legume (as far as known) glabrous, narrow and elongate, or broader and then 1-seeded (the leaflets then small). (Series 3. PUBIFLORI.)

Petals more or less silky-pubescent.

Leaves of medium size or large; legume thick, ferruginous-pubescent or glabrescent, sometimes glabrous.
(Series 4. SERICIFLORI.)

Vexillar margin of the legume flat or concave..... 5. CONCAVI.

Vexillar margin of the legume carinate..... 6. CARINATI.

While still far from absolutely satisfactory, this arrangement seems to bring the species more closely together according to their nearest

affinities. But it has also marked deficiencies. In the first place, the modification of the vexillar margin of the legume, which is fundamental to the distinction of the two subgenera, seems to be only a secondary character, not bound to any other important modification in the structure of the flowers or of the leaves, so that it is hardly possible to place a species in the right subgenus in the absence of the fruit. In a general way, however, it can be said that all species with small leaflets belong to *Neuroscapha*, and all species with pellucid-punctate leaflets are included in *Eulonchocarpus*.

The above system could easily be extended so as to include the other American species, by elevating the sections *Paniculati* and *Fasciculati* to subgeneric rank.¹ The species of the section *Laxiflori* would be included under *Eulonchocarpus*.

DISTRIBUTION OF THE SPECIES.

DISPERSION OUTSIDE OF MIDDLE AMERICA.

The genus *Lonchocarpus* is distributed over tropical America as well as tropical and austral Africa. A few species are found also in Madagascar and Australia. *Lonchocarpus sericeus* (Poir.) H. B. K. is the only species common to America and the West Coast of Africa. It seems to be also the only representative of the subgenus *Neuroscapha* reaching beyond the limits of America. *Eulonchocarpus* is entirely neotropical; all the African and Australian species but the one mentioned above belong either to the section *Paniculati* or the section *Fasciculati*, or to recently established groups.

¹ The section *Fasciculati* Benth. forms a natural group, characterized by having the flowers fasciculate on thick peduncles branching from the common rachis, by the peculiar shape of the wings, often reflexed and shrivelled at the later stages of the flowers, and by the leaflets, the costa and veins of which are neatly reticulate and very prominent beneath. These characters appear sufficient to justify the elevation of the section to the rank of a subgenus, for which the name *Phacelanthus* is here proposed.

In all species the pistil is also slender, with a moderately arcuate style, which is either glabrous (*L. nitidulus*, *L. glabrescens*) or more or less hairy. Among the species I have seen, the ovary is 2-ovulate in *L. negrensis* and *L. floribundus* and 8 to 10-ovulate in *L. spruceanus* and *L. glabrescens*. *Lonchocarpus costatus* is said to have 6 to 8 ovules, while *L. variiflorus* and *L. nitidulus* are species with 2-ovulate ovaries. *Lonchocarpus boliviensis*, the fruit of which is not known, while closely related to several of the above-named species, constitutes a remarkable exception in the genus on account of its having 16 to 18 ovules. It is described for the first time in the present paper (p. 93). The Mexican tree or shrub described by Bentham as *L. eriophyllum* has only 11 or 12 ovules, but it differs from *Lonchocarpus* by several other important characters (p. 85). We have seen that in the Middle American species the maximum number of ovules is 9. In South America, besides the 2 species mentioned above, *L. denudatus* Benth., of the section *Laxiflori*, is also known to have 10 ovules, all the other species showing a smaller number.

Up to the present no representatives of the two sections just named have been reported from Central America or the West Indies. The westernmost species of the section *Paniculati* was collected in Santa Marta (Colombia) by Herbert H. Smith; it is described in this paper under the name of *L. sanctae-marthae*. The *Fasciculati*, well represented in Brazil, reach westward to Venezuela, but the section *Laxiflori* is entirely Brazilian.

Thus the great majority of the Brazilian species belong to sections not represented in Middle America, while the *Lonchocarpus* flora of the latter area is made up exclusively of representatives of *Neuroscapha* and *Eulonchocarpus*, which have only a small representation in South America.

Of the 40 species included in the analytical key, only 4 extend beyond the limits of Middle America. They are *Lonchocarpus velutinus*, originally described from Panama, but apparently common in Santa Marta (Colombia) and undoubtedly in the foothills of the intervening region; *L. latifolius*, reported from Colombia and Surinam, and especially common all over the West Indies; *L. atropurpureus*, an exclusively continental species like *L. velutinus*, specimens of which have been collected all over the northern parts of South America from Ecuador to Venezuela, in the lower mountain belt; and finally *L. sericeus*, already cited as extending to western Africa, and distributed in America from Mexico to Brazil and in the West Indies.

DISTRIBUTION IN MIDDLE AMERICA.

Most of the Middle American species have only a limited (areal) range, only four species, as shown above, extending beyond the limits of that region of the Western Continent. Here, the northernmost limit of the whole genus is about $21^{\circ} 30'$ north latitude and it is reached, so far as is known, only by one species, *L. megalanthus*.

In Mexico a few species reach the central xerophytic plateau or its borders. Thus *oaxacensis* and *unifoliolatus* probably reach the former in the States of Oaxaca and Puebla, while *rugosus*, *jaliscensis*, *caudatus*, and *emarginatus* are found in the mountains which fringe the plateau on its southwest side and can be considered also as belonging to the tropical province of Middle America. The xerophytic districts in central Guatemala and the interior valleys of Costa Rica, considered by Engler and his followers as parts of the Andine floral system, have not so far furnished any contribution to *Lonchocarpus*, but in Yucatán we find at least three species, *rugosus*, *longistylus*, and *yucatanensis*, the first with a wider dispersion, the two latter apparently locally endemic.

The neotropical floral province, including both coasts of Middle America from about the twenty-first degree of northern latitude southward, and including almost the whole territory of Panama, claims four-fifths, or 32, of the reported species of the genus. Of these, 22 belong exclu-

sively to the semiarid Pacific coast, which can consequently be considered the main endemic center. Of the species reported from the Pacific slopes and coast, 13 belong to the subgenus *Eulonchocarpus* and 9 to *Neuroscapha*. Of the former, all the species of the section *Spongopteri* seem to have originated along this coast, 3 of them (*peninsularis*, *nicoyensis*, and *costaricensis*) being apparently localized in the peninsula of Nicoya and its immediate surroundings, and 2 (*eriocarinalis* and *jaliscensis*) in the tierra caliente of western Mexico.

Even making due allowance for our imperfect knowledge of the distribution of the several species, it can be definitely stated that most of them have very limited areas of dispersion, even within Middle America. Excluding *velutinus*, *latifolius*, *atropurpureus*, and *sericeus*, which we have found already to extend beyond our limits, we find that only one of the 36 remaining species is found on both sides of the isthmus of Tehuantepec, which, in the geographic and floristic sense, separates Mexico from Central America. This is *guatemalensis*, which extends along the Pacific coast from southern Mexico to Costa Rica, and reaches also the Atlantic watershed in the semiarid districts of western Guatemala. Our knowledge of the distribution of the other species is mostly limited to the type locality, which points either to an extreme splitting of species, which I refuse to admit, or to a remarkable localization of type. The latter hypothesis is corroborated by the localism of other well known species of the West Indies, as for instance, *benthamianus*, restricted to the Leeward Islands.

Distribution of the Middle American species of Lonchocarpus.

Species arranged by groups.	Xero-phytic province.		Neotropical province.				West Indies.	Northern South America.	Western South America.	West Africa.				
			Mexico.		Central America.									
	Mexico.	Yucatán.	Atlantic.	Pacific.	Atlantic.	Pacific.								
EULONCHOCARPUS.														
1. Philenopteri.														
1. <i>rugosus</i>	X	.....	X	X	X	X	.....	.....	.....	.....
2. <i>velutinus</i>.....	.....	.....	.....	X	X	X	.....	X	.....	.....		
3. <i>affinis</i>.....	.....	X	.....	.....	.....	.....	.....	.....	.....	.....
2. Spongopteri.														
4. <i>peninsularis</i>.....	.....	.....	.....	.....	.....	X	.....	.....	.....	.....
5. <i>nicoyensis</i>.....	.....	.....	.....	.....	.....	X	.....	.....	.....	.....
6. <i>costaricensis</i>.....	.....	.....	.....	.....	.....	X	.....	.....	.....	.....
7. <i>eriocarinalis</i>.....	.....	.....	.....	X	.....	.....	.....	.....	.....	.....
8. <i>jaliscensis</i>	X	.....	X	.....	.....	.....	.....	.....	.....	.....
3. Punctati.														
9. <i>longipedicellatus</i>.....	.....	.....	.....	.....	.....	X	.....	.....	.....	.....
10. <i>michelianus</i>.....	.....	.....	.....	.....	.....	X	.....	.....	.....	.....
11. <i>longistylus</i>	X	.....	.....	.....	.....	.....	.....	.....	.....	.....
12. <i>chiricanus</i>.....	.....	.....	.....	.....	.....	X	.....	.....	.....	.....
13. <i>p roteranthus</i>.....	.....	.....	.....	.....	.....	X	.....	.....	.....	.....

Distribution of the Middle American species of Lonchocarpus—Continued.

Species arranged by groups.	Xero-phytic province.		Neotropical province.						Northern South America.	Western South America.	West Africa.	
			Mexico.		Central America.		West Indies.					
	Mexico.	Yucatan.	Atlantic.	Pacific.	Atlantic.	Pacific.	West Indies.					
EULONCHOCARPUS —Continued.												
4. Epunctati.												
14. luteomaculatus						X						
15. purpureus							X					
16. oaxacensis	X											
17. lineatus					X							
18. unifoliolatus	X											
19. cochleatus				X								
20. caudatus	X											
21. latifolius					X	X	X	X				
22. darienensis						X						
23. megalanthus				X								
24. mexicanus		X										
NEUROSCAPHA.												
PUBIFLORI.												
25. minimiflorus							X					
26. atropurpureus				X	X				X	X		
27. lanceolatus			X									
28. yucatanensis	X											
29. orotinus							X					
SERICIFLORI.												
5. Concavi.												
30. hondurensis					X							
31. comitensis						X	X					
32. lucidus					X	X						
33. constrictus					X							
6. Carinati.												
34. guatemalensis					X	X	X					
35. emarginatus			X									
36. salvadorensis							X					
37. palmeri			X									
38. sericeus			X						X		X	
39. robustus			X									
40. santarosanus							X					
Résumé.												
EULONCHOCARPUS:												
1. Phelenopteri		1	1	1	2	2			1			
2. Spongopteri	1			2		3						
3. Punctati		1				4						
4. Epunctati	3		1	2	3	3	1	1				
NEUROSCAPHA.												
Pubiflori		1		2	1	2		1	1			
Sericiflori:												
5. Concavi					1	2	2					
6. Carinati					5	1	3	1			1	
Total	4	3	2	13	9	19	2	3	1		1	

HABIT AND ECOLOGY OF THE MIDDLE AMERICAN SPECIES.

It is unfortunately almost the rule among collectors to limit themselves to sampling, omitting the indispensable complementary notes, or, if such notes have been made, they do not appear on the sheets, so that the botanist who later studies the specimens is at a loss as to the definition of the habit of the plant. This is generally the case with reference to the material of *Lonchocarpus*. We know, however, that the Middle American species are trees or rarely erect shrubs, some of the first reaching almost portly dimensions. *Lonchocarpus latifolius* and *L. salvadorensis* are described as large trees; *L. proteranthus* and *L. lucidus* are known to reach a height of 20 meters and over, the trunk having a diameter of 35 to 40 cm. at the base. The tree of *L. costaricensis* from which I took my specimens was low, with a rounded crown, but the diameter of the trunk was certainly not under 50 cm. A considerable number of species are indicated as reaching a height of from 8 to 10 meters, and the number of those of which it is definitely stated that they are mere shrubs is rather reduced, the mention being mostly "shrub or small tree."

It is very probable that the great majority of the species, inhabiting as they do xerophytic or semiarid areas, are deciduous. We know this positively with reference to *costaricensis*, *chiricanus*, *megalanthus*, *guatemalensis*, and *salvadorensis*, and there are inferences of the same fact for several other species. On the other hand, *L. lucidus*, as seen by myself in the Canal Zone and in the forests along the San Blas Coast, seems to be an evergreen, and such is probably the case with all species growing in districts with permanent rainfall.

Of the larger species, some grow in the open or parklike formation, as for instance *salvadorensis* and sometimes *costaricensis*, while others are found either in the lightly wooded forests of the Pacific seaboard (*proteranthus*, *orotinus*, *peninsularis*) or in the high silva of the Atlantic slope (*luteomaculatus*, *lucidus*, *hondurensis*). None of them are gregarious, and in the last-mentioned region they grow mostly on rich alluvial bottoms. In the Gatún Valley (Panama) in 1914 the tops of many trees of *L. lucidus* were surging in the middle of the newly formed lake, most of them being still in full vegetation, but apparently powerless to develop their flower buds.

The smaller species are fond of the rocky, half-denuded slopes of the lower hills, or of stony flats and sea beaches. This is principally the case with the shrubby species growing along the Pacific coast.

As to vertical distribution, most species seem to be restricted to the lower belt, this extending from sea level to 1,000 or 1,200 meters and corresponding more or less to the so-called "tierra caliente."

USES AND COMMON NAMES.

Most of the arboreous Middle American species of *Lonchocarpus* have a hard, fine-grained wood, and this could be put to many uses, but the trees grow very much scattered, and therefore the supply is small. Many of the species have hardly attracted the attention of the natives. Vernacular names have been reported for the following:

Lonchocarpus costaricensis. Siete-cueros. Nicoya, Costa Rica.

eriocarinalis. Palo de oro. Guerrero, Mexico.

hondurensis. Gusano. Tabasco, Mexico.

longistylus. Bal-ché, xbal-ché. Maya; Yucatán, Mexico.

nicoyensis. Chaperno. Nicoya, Costa Rica.

peninsularis. Chaperno. Nicoya, Costa Rica.

rugosus. Masicaarón. Honduras.

salvadorensis. Sangre de chicho; i-kua-pelo. Nahuizalco, El Salvador, the latter name in the corrupted Nahua dialect.

sericeus. Cocorocho. Santa Rosa, Guatemala.

velutinus. Gallote. Chiriquí, Panama.

DESCRIPTIONS.

GENUS, WITH KEY TO SPECIES.

LONCHOCARPUS H. B. K.

Calyx mostly cupulate, truncate or toothed. Standard usually suborbicular, sometimes ovate, attenuate, auriculate, or callous-plicate at the base, rounded and emarginate at the apex; wings oblique-oblong to falcate, adhering to the keel above the claw; carinal petals obtuse, more or less falcate, cohering by the carinal margin. Stamens monadelphous, the staminal tube fenestrata at the base, entirely closed in the middle, the fenestrelle parted by the free base of the vexillar stamen. Ovary sessile or stipitate, 2 to 9-ovulate; style slender, arcuate or geniculate, the stigma usually capitellate and small. Legume broadly ovate to narrowly elongate, membranous or coriaceous, the vexillar suture thin, thickened, or slightly winged; seeds 1 to 4 or seldom more, flat-compressed, reniform and more or less orbicular.

Trees or shrubs, with imparipinnate, alternate leaves; leaflets opposite, stipellate. Stipules rudimentary or caducous. Flowers white, pink, or purple, solitary, geminate, or on a bifurcate peduncle, or else fasciculate. Inflorescence racemose, simple or ramified. Bracts and bractlets small, orbicular, ovate, or linear, early deciduous.

Genus extending over tropical America, tropical and austral Africa, Madagascar, and Australia, the Middle American species about 40.

KEY TO THE MIDDLE AMERICAN SPECIES.¹Subgenus 1. **EULONCHOCARPUS**.Series 1. **IMPRESSINERVI**.Section 1. **PHILENOPTERI**.

Ovules 7 or 8; legume 1 to 6-seeded, ferruginous-pubescent; leaflets pilosulous or glabrescent; inflorescence distinctly paniculate. Petals deep pink.

1. *L. rugosus*.

Ovules 2 to 4; legume 1 or 2-seeded, glabrous; leaflets pubescent; inflorescences axillary.

Leaves 7-foliolate; calyx and petals deep purple, the former grayish-pubescent without..... 2. *L. velutinus*.

Leaves 13 or 15-foliolate; calyx ferruginous-tomentose without..... 3. *L. affinis*.

¹ Two species from outside of Middle America are included without number for the purpose of comparison.

Section 2. SPONGOPTERI.

Legume recurved on the carinal margin; leaflets usually 5, not reticulate, minutely cano-pubescent on the lower face..... 4. *L. peninsularis*.
Legume flat; leaflets more or less tomentose or (in *L. nicoyensis*) minutely grayish-pubescent.

Vexillar margin of the legume manifestly broadened; leaflets usually 5, broadly ovate and obtusely acuminate, minutely pubescent beneath.
5. *L. nicoyensis*.

Vexillar margin of the legume thin and narrow; leaflets ovate, rounded or emarginate at the apex, more or less tomentose.

Leaves 5 or 7-foliolate, the leaflets broadly ovate, up to 12 cm. long; bractlets long, linear; calyx ferruginous-tomentose.

6. *L. costaricensis*.

Leaves 7 to 13-foliolate, the leaflets ovate or oblong; bracts and bractlets ovate, very small; calyx pubescent.

Legume broadly ovate-lanceolate, 1 to 3-seeded, 7 to 11.5 cm. long; leaflets (7 to 11) ovate, 3 to 6.5 cm. long, 2 to 4 cm. broad, the veins deeply immersed..... 7. *L. eriocarpinalis*.

Legume ovate, 1-seeded, about 4 cm. long; leaflets (7 to 13) oblong, 2 to 4.5 cm. long, 1.5 to 2.5 cm. broad, the veins not deeply immersed..... 8. *L. jaliscensis*.

Series 2. PLANINERVI.

Section 1. PUNCTATI.

Leaves, inflorescences, and young branchlets more or less pubescent.

Peduncles of the flowers about 13 mm. long, the pedicels half as long; bractlets distant from the calyx; claw of the standard 1.5 mm. long.

9. *L. longipedicellatus*.

Peduncles of the flowers 4 to 5 mm. long, the pedicels 6 to 7 mm.; bractlets close to the calyx; claw of the standard 3 to 3.5 mm. long.. 10. *L. michelianus*.

Leaves, inflorescences, and branchlets glabrous.

Leaflets 11 to 15. Petals punctate; ovules 7 or 8..... 11. *L. longistylus*.
Leaflets 5 to 11.

Legume quadrate-lanceolate, 1-seeded, about 10 cm. long and 4 cm. broad; leaflets ovate or obovate, up to 11 cm. long..... 12. *L. chiricanus*.

Legume smaller, lanceolate; leaflets smaller.

Petals densely spotted; ovules 7 to 9. (Venezuelan.)... *L. punctatus*.

Petals not spotted; ovules 3 to 5.

Legume long-stipitate, 1-seeded; leaflets membranous; basal lobules of the standard long and rounded; ovules 3 or 4. (West Indian.)..... *L. benthamianus*.

Legume short-stipitate, 1 or 2-seeded, the seeds far apart; leaflets coriaceous; basal lobules of the standard much reduced; ovules 5..... 13. *L. proteranthus*.

Section 2. EPUNCTATI.

Leaves more or less pubescent.

Ovules 2 or 4; leaflets strongly reticulate beneath. Petals purple, densely ferruginous-pubescent without.

Ovules 2; standard 11 to 11.5 mm. long, with a large yellow spot at the base, the other petals uncolored..... 14. *L. luteomaculatus*.

Ovules 4; standard 8.5 mm. long, uncolored, the other petals minutely yellow-spotted..... 15. *L. purpureus*.

- Ovules 7 or 8; leaflets scarcely reticulate beneath. Standard not yellow-spotted.
- Leaflets 7, ovate, obtuse; petals purplish, shading to white at the base; standard 13 mm. long..... 16. *L. oaxacensis*.
 - Leaflets 1 to 5, oblong, acutely acuminate; petals pink, lineolate; standard 11 mm. long..... 17. *L. lineatus*.
- Leaves glabrous.
- Leaves 1-foliolate. Standard ovate-oblong..... 18. *L. unifoliolatus*.
 - Leaves plurifoliolate.
 - Legume cochleate, 1 to 3-seeded, the stipe and margins dark-colored. Leaflets 5 to 9..... 19. *L. cochleatus*.
 - Legume flat.
 - Leaflets 5 or fewer, long and acutely attenuate-acuminate; legume 1 or 2-seeded..... 20. *L. caudatus*.
 - Leaflets 5 or more, obtuse or shortly and obtusely acuminate; ovary 4 to 6-ovulate.
 - Flowers small or medium-sized, the standard not over 13 mm. long.
 - Large tree; flowers small, greenish purple, the standard not over 7.5 mm. long; legume thin, membranous, 1 or 2-seeded; terminal leaflet up to 23 cm. long.
 - 21. *L. latifolius*.
 - Shrub; flowers medium-sized or large, lavender, minutely yellow-spotted, the standard up to 13 mm. long; leaflets not over 12 mm. long..... 22. *L. darienensis*.
 - Flowers largest in the genus, white and purple, the standard 15 to 18.5 mm. long.
 - Calyx minutely darkish-pubescent; leaflets subacute at the base, the petiolules 10 mm. long, the blades oblong, up to 9 cm. long..... 23. *L. megalanthus*.
 - Calyx densely silvery-pubescent; leaflets broadly rounded at the base, the petiolules 7 mm. long or less, the blades ovate, up to 11 cm. long..... 24. *L. mexicanus*.

Subgenus 2. NEUROSCAPHA.

Series 2. PUBIFLORI.

- Standard silky-pubescent, up to 5.5 mm. long, the wings and keel glabrous; carinal petals auriculate. Leaves 7 to 13-foliolate..... 25. *L. minimiflorus*.
- Standard and petals slightly pubescent; carinal petals not auriculate.
- Leaves entirely glabrous, 5 to 9-foliolate. Legume slender-stipitate, up to 10 cm. long and 1 cm. broad, flat, glabrous..... 26. *L. atropurpureus*.
 - Leaves more or less pubescent.
 - Leaves 9 to 15-foliolate. Base of calyx, wings, and carinal petals sparsely yellow-dotted; legume cochleate, thin, glabrous, up to 3.5 cm. long and 0.9 cm. broad..... 27. *L. lanceolatus*.
 - Leaves 5 or 7-foliolate.
 - Calyx densely gray-pubescent; petiolules broadly canaliculate; leaflets broadly obtuse-acuminate, usually 5, opaque.
 - 28. *L. yucatanensis*.
 - Calyx ferruginous-pubescent; petiolules narrowly canaliculate; leaflets mostly 7, acute at the apex, punctate..... 29. *L. orotinus*.

Series 4. SERICIFLORI.

Section 1. CONCAVI.

Leaves entirely glabrous, 5-foliolate. Free part of the filaments minutely hairy.

30. *L. hondurensis*.

Leaves more or less pilose, pubescent, or tomentose.

Calyx fulvous-hairy; leaves 7 to 11-foliolate, the leaflets ovate, not over 4 cm. long..... 31. *L. comitensis*.

Calyx minutely pubescent; leaflets much larger.

Rachis of the leaves thick, deeply and broadly canaliculate; leaflets ovate-elliptic or obovate, obtusely acuminate; standard ovate, longer than broad; vexillar margin of the legume scarcely contracted between the seeds..... 32. *L. lucidus*.

Rachis of the leaves slender, narrowly canaliculate; leaflets obovate, obtuse or emarginate at the apex; standard orbicular, broader than long; vexillar margin of the legume strongly contracted between the seeds..... 33. *L. constrictus*.

Section 2. CARINATI.

Leaves sparsely punctate; petals densely and minutely yellow-spotted.

34. *L. guatemalensis*.

Leaves epunctate; petals not spotted.

Calyx and back of standard densely silvery-pubescent; leaflets oblong, retuse; floral racemes numerous, approximate, densely flowered.

35. *L. emarginatus*.

Calyx and standard silky but not silvery-pubescent; leaflets acuminate; floral racemes few, rather distant.

Flowers large, the standard 16 to 18 mm. long; bractlets relatively large, ovate or suborbicular, 2 to 3 mm. long and broad.

Leaves 7-foliolate, the rachis subterete; leaflets subacute-acuminate; calyx truncate; basal lobules of the standard obsolete and inflexed..... 36. *L. salvadorensis*.

Leaves 7 to 13-foliolate, the rachis canaliculate; leaflets obtusely acuminate; calyx sinuate-dentate; basal lobules of the standard acute, remote from the claw..... 37. *L. palmeri*.

Flowers smaller, the standard less than 15 mm. long; bractlets oblong, very small.

Carinal petals oblong, 13 mm. long and 3.5 mm. broad; leaflets obtuse.

Peduncles and pedicels about 3 mm. long..... 38. *L. sericeus*.

Carinal petals subrhomboidal, the blade short and broad; leaflets acuminate.

Peduncles and pedicels about 1 mm. long; carinal petals 7.5 mm. long, 3.5 mm. broad; leaflets obtusely acuminate.

39. *L. robustus*.

Peduncles 4 to 6 mm., the pedicels 2 to 3 mm. long; carinal petals 5.5 mm. long, 2.5 mm. broad; leaflets acutely acuminate.

40. *L. santarosanus*.

MIDDLE AMERICAN SPECIES.

1. *Lonchocarpus rugosus* Benth. Journ. Proc. Linn. Soc. Bot. 4: Suppl. 92.
1860.

PLATE 1, A. FIGURE 1.

A tree, the branchlets stout, nodose, gray, lenticellate, the younger parts tomentellous.

Leaves 9 to 17-foliolate, the rachis fulvescent-tomentose, terete, 10 to 20 cm. long. Leaflets coriaceous, the petiolules terete, tomentose, 2 to 3 mm. long, the blades ovate to oblong, rounded at the base, rounded-obtuse at the apex, 2.5 to 6.5 cm. long, 0.9 to 2.5 cm. broad, pilosulous or glabrescent, the costa and veins deeply immersed above, beneath pubescent-tomentose, reticulate, the costa and veins ferruginous-pubescent and prominent. Stipules acutely triangular, about 4 mm. long, hairy, caducous.

Racemes numerous, paniculate at the ends of the branchlets, 6 to 8 cm. long, the rachis tomentose; bracts at the insertion of the racemes triangular-acute, pubescent,



FIG. 1.—*Lonchocarpus rugosus*. a, Standard; b, wings; - c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From Rose, Painter & Rose 9380.

about 2 mm. long, caducous. Peduncles and pedicels densely ferruginous or fulvous-pubescent, the former very short or wanting, the latter 2 to 4 mm. long; bractlets at the base and near the apex of the pedicel very small, orbicular, fulvous-pubescent, caducous. Calyx campanulate, subacute at the base, distinctly 5-toothed, densely fulvous-pubescent, the carinal tooth longer, the 2 vexillar teeth connate into a rounded lobe. Petals deep pink; standard suborbicular (broader than long), subbilobulate and plicate at the base, more or less emarginate at the apex, densely fulvous-pubescent without, the claw about 1 mm. long, the blade 6 mm. long, 8 mm. broad; wings oblique, oblong, narrow, auriculate, glabrous but for a few hairs at the base of the blade on the carinal margin, the claw about 2.5 mm. long, the blade plicate on the vexillar side, about 6.5 mm. long and 2.2 mm. broad; carinal petals falcate, auriculate, obtuse, densely fulvous-pubescent along the carinal margin and at the apex, the claw about 2 mm. long, the blade 5.5 mm. long and about 2.8 mm. broad. Vexillar stamen free at the base. Ovary linear, sessile, densely cano-pubescent, about 5 mm. long, 7 or 8-ovulate; style arcuate, glabrous; stigma capitellate.

Legume elongate, narrow, attenuate, and short-stipitate at the base, obtuse or rounded and mucronulate at the apex, more or less furfuraceous, 1 to 6-seeded, 4 to 14 cm. long, 1.7 to 2 cm. broad; mature seeds not seen.

Type collected in Campeche, Mexico, by Houstoun.

SPECIMENS EXAMINED:

MEXICO: Near Iguala, Guerrero, flowers, August 11, 1905, Rose 9380; young fruits, Pringle 10338. Izamal, Yucatán, flowers, 1895, Gaumer 996.

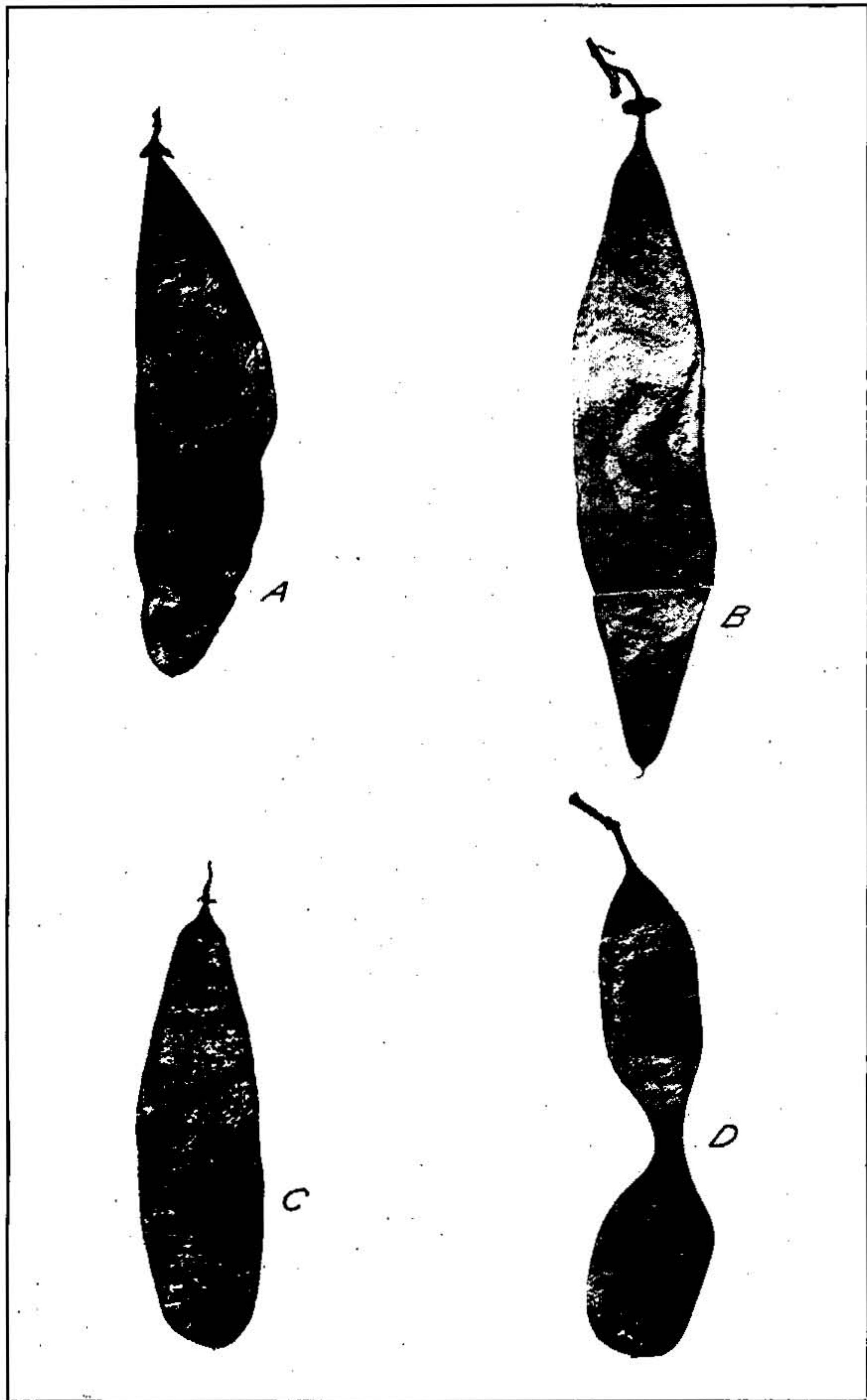
BRITISH HONDURAS: Near Toledo, in forest, young fruits, January 15, 1907, Peck 600.

GUATEMALA: Near Santa Rosa, Department of Santa Rosa, alt. 1,000 meters, flowers and young fruits, July, 1892, Heyde & Lux (J. D. Smith, no. 3281).

HONDURAS: Between El Chaparral and Meambar, road from Comayagua to Puerto Cortés, February 24, 1898, Niederlein (vernacular name "masicaarón").

These specimens differ from the original description in the larger number of leaflets and their very variable size. The inflorescence is a typical aphyllous panicle, like that of *L. subglaucescens* Mart., notwithstanding which neither of these two species belongs to the section *Paniculati*.

EXPLANATION OF PLATE 1.—Fruits of 4 species of *Lonchocarpus*. Fig. A, *L. rugosus*, from Peck 600; fig. B, *L. velutinus*, from H. H. Smith 934; fig. C, *L. affinis*, from Bourgeau 2834; fig. D, *L. sanctae-marthae* (p. 92 below), from type collection, H. H. Smith 107. Natural size.



FRUITS OF (A) LONCHOCARPUS RUGOSUS BENTH., (B) L. VELUTINUS BENTH., (C) L.
AFFINIS PITTIER, AND (D) L. SANCTAE-MARTHAE PITTIER.

2. *Lonchocarpus velutinus* Benth. in Seem. Bot. Voy. Herald 111. 1853.

PLATE I, B. FIGURE 2.

A tree 5 to 16 meters high, the branchlets grayish or brownish, lenticellate, the young shoots finely pubescent.

Leaves 7-foliolate, the rachis narrowly canaliculate, densely pubescent, 8 to 18 cm. long. Leaflets subcoriaceous, the petiolules dark-colored, fuliginous-pubescent, about 6 mm. long, the blades ovate, obovate, or oblong, subacute to acute-attenuate at the base, usually shortly acute-acuminate, but sometimes acute, obtuse, or retuse at the apex, 5 to 14 cm. long, 2 to 5.5 cm. broad, densely felted-pubescent, the costa and veins impressed above, reticulate, grayish-pubescent, the venation prominent beneath. Stipules linear, hairy, very small, caducous.

Racemes simple, axillary, often subpanicle at the ends of the branchlets, the rachis brown or grayish velvety pubescent, 12 to 20 cm. long. Peduncles and pedicels minutely hairy, the former usually biflorous, 2 to 4 mm. long, the latter 2 to 3 mm. long; bracts and bractlets linear, very small, hairy, caducous, the latter distant from the base of the calyx. Flowers entirely deep purple. Calyx salverform, broad, about 2.5 mm. long, finely pubescent without, 5-toothed, the two vexillar teeth broadly rounded and coalescent, the lateral and carinal ones acute, the latter longer. Standard suborbicular, concave, slightly attenuate and callous-plicate at the base, emarginate at the apex, minutely silky-pubescent without, the claw about 2 mm. long and obliquely inserted, the blade 7 mm. long, 8.5 to 9 mm. broad, the margins revolute; wings narrowly oblong, plicate on the upper margin, slightly pubescent at the apex without, the claw about 2.5 mm. long, the blade 5.5 mm. long and 2 mm. broad; carinal petals falcate, obtuse, pubescent without along the dorsal line, the claw as in the wings, the blades about 5 mm. long, 2.5 to 3 mm. broad. Vexillar stamen free at the base, the staminal tube and filaments glabrous, the anthers ovoid, sparsely and minutely hairy. Ovary linear, sessile, about 7.5 mm. long, 1 or 2-ovulate, densely pubescent; style sharply incurved; stigma capitellate, exceeding the stamens.

Legume elongate-lanceolate, attenuate and short-stipitate at the base, rounded and apiculate at the apex, 1 or 2-seeded, 8.5 to 11 cm. long, about 1.7 cm. broad, thin and submembranous, pale yellow, pubescent or glabrescent, the vexillar margin slightly thickened, the carinal margin thin-edged. Seeds crescent-shaped, flat, pale brown, about 12 mm. long and 4 mm. broad.

Type from Panama, collected at Culebra, Canal Zone, by Hinds.

SPECIMENS EXAMINED:

PANAMA: San Carlos, Province of Panama, Seemann 1183 (cited in original description). Vicinity of Penonomé, Province of Coclé, in flower, March, 1908, Williams 349. Caldera, Chiriquí, in flower, March 22, 1911, Pittier 3353.

COLOMBIA: Near Masinga, and on Aguadulce road near Santa Marta, in flower and fruit, January 6 and April 25, 1899, H. H. Smith 930, 934. Forest along a stream on the road from Bonda to Don Amo, Cordillera de Santa Marta, alt. about 170 meters, in flower, February 8, 1899, H. H. Smith 933. Forest beyond Don Amo, on the mountain trail to Cordillera de Santa Marta, alt. about 700 meters, in flower, March 12, 1899, H. H. Smith 2028, 2029.

The leaflets are variable in shape and size, but on 15 sheets examined the leaves were invariably 7-foliolate. The color of the flowers varies from deep purple or crimson to yellowish and dull purple. The tree seems to be of frequent occurrence in the lower belt of the Cordillera de Santa Marta and was also noted as common on the road from Caldera to David, in the Province of Chiriquí.

The specimens from Santa Marta were distributed as *Lonchocarpus latifolius* (Willd.) H. B. K.

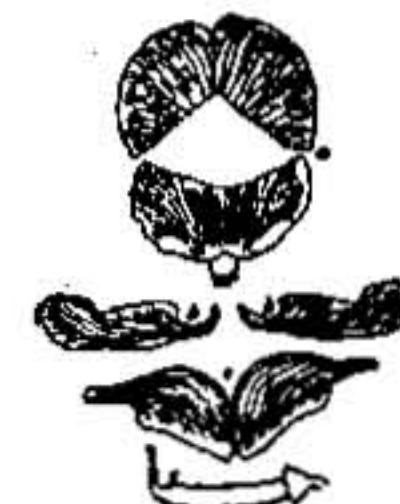


FIG. 2.—*Lonchocarpus velutinus*.
a, Standard; b, wings; c, carinal petals; d, pistil.
Natural size.
From R. S. Williams 349.

3. *Lonchocarpus affinis* Pittier, sp. nov.**PLATE 1, C. FIGURE 3.**

A tree, the branchlets thick, nodose, the younger parts ferruginous-pubescent.

Leaves 13 or 15-foliolate, rarely 11-foliolate, the rachis subterete, 19 to 27 cm. long, at first ferruginous-hairy, later glabrescent. Leaflets coriaceous, the petiolules 5 to 6 mm. long, subcanalicate, ferruginous-hairy, the blades oblong, rounded and subattenuate at the base, obtuse, acute, or shortly sub acuminate at the apex, 3 to 12.5 cm. long, 1.8 to 4 cm. broad, glabrous and impressed-reticulate above, elevated-reticulate and softly pubescent beneath, the costa and veins ferruginous-pubescent and impressed above, ferruginous-hairy and very prominent beneath. Stipules ovate, ferruginous-hairy, caducous.

Racemes axillary, mostly paniculate at the ends of the branchlets, the rachis terete, 10 to 13 cm. long, ferruginous-hairy. Peduncles and pedicels ferruginous-hairy, the former usually biflorous, 1 to 2 mm. long, the latter 2 to 3 mm. long; bracts oblong, very small, hairy, caducous, the latter a little distant from the calyx. Calyx cupulate, about 2.5 mm. long, ferruginous-hairy, 5-toothed, the two vexillar teeth rounded and connate, the carinal tooth longer and prominent. Petals purplish, turning to white toward the base; standard suborbicular (broader than long), concave, bilobulate and callous-plicate at the base, emarginate at the apex, densely fulvous-pubescent on both sides of the median line without, the claw obliquely inserted, 1.5 to 2 mm. long, the blade about 6 mm. long and 7 mm. broad; wings obliquely oblong, auriculate, plicate on the upper margin, sparsely hairy along the longitudinal veins, the claw about 2.5 mm. long, the blade 5 mm. long, 2 to 2.5 mm. broad; carinal petals falcate, broadly rounded at the apex, sparsely and minutely ferruginous-pubescent without along the main veins next to the carinal margin, the claw as in the wings, the blade 5 mm. long and 3 mm. broad.

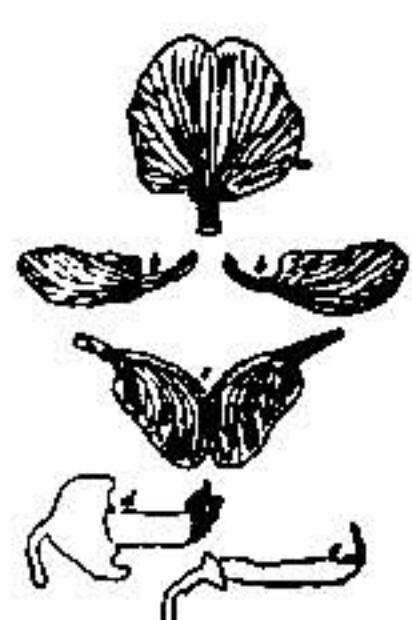


FIG. 3.—*Lonchocarpus affinis*. a, Standard; b, wings; c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From Rose & Hough 4278.

Vexillar stamen free at the base; staminal tube and filaments glabrous. Ovary linear, sessile, densely fulvous-hairy, about 5 mm. long, 2-ovulate; style glabrous, abruptly geniculate, straight and exceeding the stamens; stigma capitate.

Legume lanceolate-elongate, attenuate and short-stipitate at the base, rounded and apiculate at the apex, 1 or 2-seeded, 5.5 to 9 cm. long, 1.6 to 1.8 cm. broad, thin and submembranous, fulvescent, softly hairy or glabrescent, the vexillar margin narrowly 3-winged, the carinal margin slightly thickened. Seeds reniform, flat, purplish, about 10 mm. long, 5 mm. broad.

Type in the U. S. National Herbarium, no. 48926, collected at Orizaba, State of Veracruz, Mexico, by Botteri (no. 348).

OTHER SPECIMENS EXAMINED:

MEXICO: Vicinity of Orizaba, in fruit, August 4, 1866, Bourgeau 2834. Near Jalapa, Veracruz, May 17 to 22, 1899, Rose & Hough 4278.

This species agrees closely with *Lonchocarpus velutinus* Benth. in most details, but is specifically differentiated by the number and shape of the leaflets, the pubescence of the flowers, the characters of the fruits, and the shape, size, and color of the seeds.

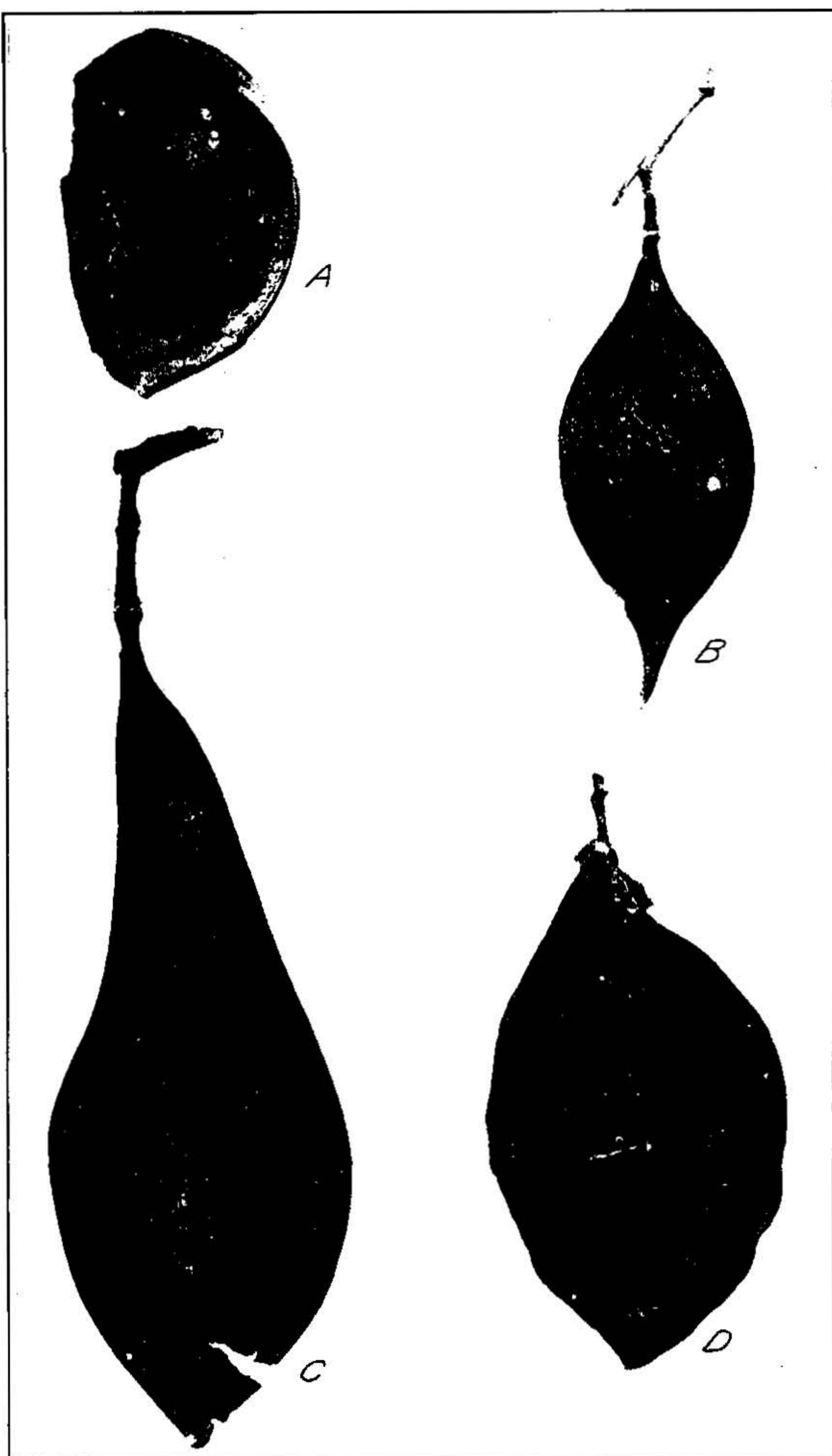
EXPLANATION OF PLATE 1.—See p. 54.

4. *Lonchocarpus peninsularis* (Donn. Smith) Pittier. PLATE 2, A. FIGURE 4.

Derris peninsularis Donn. Smith, Bot. Gaz. 44: 111. 1907.

A tree, the branchlets brownish, glabrous, minutely lenticellate.

Leaves 5-foliolate, the rachis glabrous, canaliculate, 8 to 12 cm. long. Leaflets submembranous, the petiolules canaliculate, glabrous, 7 to 8 mm. long, the blades obovate, ovate-lanceolate, or elliptic, acute at the base, more or less abruptly obtuse-



FRUITS OF (A) *LONCHOCARPUS PENINSULARIS* (DONN. SMITH) PITTIER, (B) *L. NICOYENSIS* (DONN. SMITH) PITTIER, (C) *L. COSTARICENSIS* (DONN. SMITH) PITTIER, AND (D) *L. ERIOCARINALIS* MICHELI.

acuminate at the apex, 4.5 to 8.5 cm. long, 1.5 to 4 cm. broad, glabrous or sparsely puberulous above, minutely and densely cano-pubescent beneath, the costa and veins immersed above, slightly prominent beneath.

Racemes axillary, subpanicle at the ends of the branchlets, the rachis slender, glabrous or sparsely puberulous, 6 to 8 cm. long. Peduncles and pedicels sparsely grayish-pubescent, the former usually biflorous, 1 to 2.5 mm. long, the latter 1 to 1.5 mm. long; bracts and bractlets very small, scalelike, orbicular, ciliate on the margin, the bractlets inserted on the middle of the pedicels. Calyx cupulate, about 3.5 mm. long, truncate, glabrescent or puberulous, obscurely ciliate. Petals pink, dark-spotted; standard suborbicular, concave, callous-biplicate at the base, emarginate at the apex, minutely grayish-pubescent without above the insertion of the claw, sparsely so along the main veins, the claw obliquely inserted, about 2 mm. long, the blade about 8 mm. long and 9 mm. broad (broadest at the base), the margins inflexed; wings oblong, oblique, auriculate, glabrous, the claw about 2.7 mm. long, the blade about 7 mm. long and 3 mm. broad; carinal petals falcate, obtuse, auriculate or subauriculate, minutely grayish-pubescent at the apex, the claw as in the wings, the blades 6.5 mm. long, 3.2 mm. broad. Staminal tube glabrous, the vexillar stamen free at the base. Ovary sessile, linear, minutely grayish-pubescent, about 4 mm. long, 4-ovulate; style pilosulous; stigma inconspicuous.

Legume coriaceous, ovate-oblique or broadly crescent-shaped, light brown, 1-seeded, about 6.5 cm. long, 3 to 3.5 cm. broad, glabrous, rarely 2-seeded and then about 10 cm. long, the vexillar margin slightly winged, 2 mm. broad, the carinal margin strongly incurved or inflexed. Seeds reniform, lustrous, dark brown, about 11 mm. long, 21 mm. broad.

Type in the John Donnell Smith Herbarium, collected in the forested hills around Nicoya, Costa Rica, in flower, May, 1900, by A. Tonduz (Inst. Fis. Geogr. Costa Rica, nos. 13961, 13966).

Other specimens (Inst. Fis. Geogr. Costa Rica, no. 13812) were collected in flower in the same locality, also by Mr. Tonduz. The fruits accompanying the last specimen, in the U. S. National Herbarium, are all detached. In his description, Capt. Smith does not mention the remarkably recurved carinal margin.

The vernacular name of the species is "chaperno." This tree produces one of the hardest timbers in the country.

My reasons for not including this species and the two following in the genus *Derris* are given elsewhere.¹

5. *Lonchocarpus nicoyensis* (Donn. Smith) Pittier. PLATE 2, B. FIGURE 5.

Derris nicoyensis Donn. Smith, Bot. Gaz. 44: 111. 1907.

A shrub or small tree, the branchlets grayish, glabrous, minutely lenticellate.

Leaves, 5-foliolate, the rachis glabrous, canaliculate, 7.5 to 10 cm. long. Leaflets coriaceous, the petiolules canaliculate, 6 to 8 mm. long, the blades broadly ovate, acute at the base, at first acutely acuminate, obtusely so in fruiting specimens, 5 to 9 cm. long, 2.5 to 5 cm. broad, glabrous above, the costa and veins impressed, beneath minutely grayish-pubescent, the costa and veins glabrous and prominent.

¹ P. 40 above.

EXPLANATION OF PLATE 2.—Fruits of 4 species of *Lonchocarpus*. Fig. A, *L. peninsularis*, from type collection (Inst. Fis. Geogr. Costa Rica, no. 13966); fig. B, *L. nicoyensis*, type collection (Inst. Fis. Geogr. Costa Rica, no. 13547); fig. C, *L. costaricensis*, from Pittier 3654; fig. D, *L. eriocarpa*, from Palmer 984 Natural size.



FIG. 4.—*Lonchocarpus peninsularis*. a, Standard; b, wings; c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From Inst. Fis. Geogr. Costa Rica 13966.

Racemes axillary, densely flowered, the rachis more or less pilosulous or pubescent, 6 to 9 cm. long. Peduncles and pedicels grayish-pubescent, the former usually biflorous, about 1 mm. long, the latter 1.5 to 2.5 mm. long; bracts and bractlets very small, ovate, scarious, ciliate, the bractlets opposite, inserted at the base of the calyx stipe. Calyx cupulate, turbinate or stipitate at the base, shallowly sinuate-dentate, 4 to 4.5 mm. long, minutely puberulous, longitudinally dark-striped. Petals crimson or red, thick, obscurely spotted; standard suborbicular, callous-plicate and subauriculate at the base, emarginate at the apex with the margin more or less inflexed, densely silvery-pubescent above the claw and along the veins without, the claw about 2 mm. long, the blade 9 mm. long, 10 mm. broad; wings long, narrow, arcuate, auriculate, rounded-obtuse at the apex, glabrous, the claw 2.6 mm. long, the blade 7 mm. long, 2 mm. broad; carinal petals strongly falcate, subauriculate, rounded at the apex, slightly pubescent without along the veins, the claw 3.2 mm. long, the blade about

6.5 mm. long, 2.5 mm. broad. Staminal tube glabrous. Ovary linear, long-stipitate, densely and minutely cano-pubescent, about 5.5 mm. long, 4-ovulate; style arcuate, sparsely pubescent; stigma capitellate.

Legume ovate-lanceolate, attenuate and substipitate at the base, long-acuminate at the apex, light brown, glabrous, 6.5 cm. long, 2.8 cm. broad, 1-seeded, the vexillar margin about 2 mm. broad, the carinal margin somewhat rounded. Seed dark brown, reniform, 11 mm. long, 18 mm. broad.

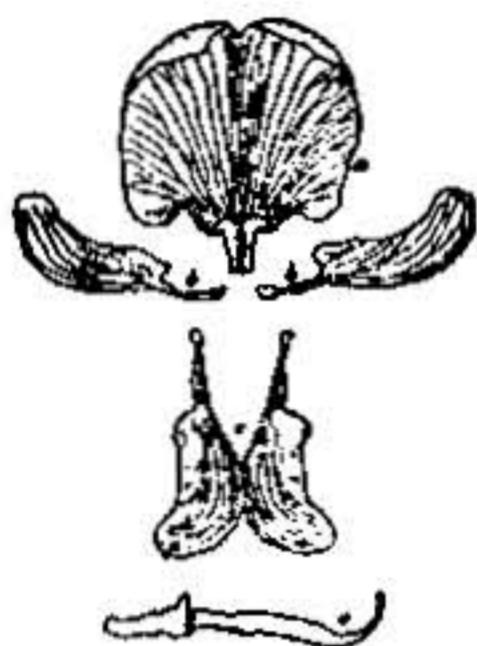


FIG. 5.—*Lonchocarpus nicoyensis*.
a, Standard; b, wings; c, carinal petals; e, pistil. Natural size. From *Inst. Fis. Geogr. Costa Rica* 13812.

Type in the John Donnell Smith Herbarium, collected on the wooded hills around Nicoya, Costa Rica, December, 1899, in fruit, by A. Tonduz (*Inst. Fis. Geogr. Costa Rica*, no. 13547).

ADDITIONAL SPECIMENS EXAMINED:

COSTA RICA: Around Nicoya, in thickets, in flower, January, 1900, Tonduz (*Inst. Fis. Geogr. Costa Rica*, no. 13812); in flower, May, 1900, Tonduz (*Inst. Fis. Geogr. Costa Rica*, no. 13961).

Lonchocarpus peninsularis and *L. nicoyensis* are known among the natives under the common name of "chaperno," a fact that seems to have brought about an almost hopeless confusion of the collections distributed by Mr. Tonduz. Thus the flowers of the latter were attributed to the former and vice versa. It seems, however, that both species are quite distinct and hardly need be confused. *Lonchocarpus nicoyensis* is probably always a shrub, and its leaves are fully developed before the appearance of the flowers. These are noted by Mr. Tonduz as being red, while those of *L. peninsularis* are pinkish; furthermore the petals of the former species are unusually thick, and the wings assume a falcate, elongate shape exceptional in the genus. Lastly, the fruits are quite distinct.

6. *Lonchocarpus costaricensis* (Donn. Smith) Pittier. PLATE 2, C. FIGURE 6. *Derris costaricensis* Donn. Smith, Bot. Gaz. 44: 110. 1907.

A deciduous tree, the branchlets thick, the grayish bark at first densely tomentose, later glabrous; young shoots densely reddish brown tomentose.

Leaves 5 or 7-foliolate, the rachis 9 to 12 cm. long, terete, at first densely reddish-tomentose, later grayish brown pubescent. Leaflets coriaceous, the petiolules thick, canaliculate, about 7 mm. long, reddish brown tomentose, the blades broadly ovate to obovate, shortly cuneate at the base, rounded-emarginate at the apex, 6 to 12 cm. long, 4 to 11 cm. broad, at first velvety, later sparsely pubescent, impressed-reticulate above, reticulate and grayish-tomentose beneath; costa and primary nerves reddish brown hairy on both faces, slightly prominent above, strongly so beneath. Stipules short, broad, rounded at the apex, reddish brown hairy.

Racemes (not perfectly developed) axillary and subpaniculate at the ends of the branchlets, short, few-flowered, the rachis reddish brown tomentose. Peduncles and pedicels fuliginous-tomentose, the former 1 or 2-florous, 3 to 4 mm. long, the latter 3 to 6 mm. long; bracts and bractlets linear, hairy, up to 8 mm. long, the latter close to the base of the calyx. Calyx tubular-campanulate, fuliginous-tomentose, 5-toothed, the carinal tooth long and linear. Petals pink or purplish; standard suborbicular (broader than long), callous-plicate at the base, emarginate at the apex, concave, softly hairy without, the claw 4 mm. long, the blade 12 mm. long, 14 mm. broad; wings obovate-oblique, scarcely auriculate, rounded-obtuse at the apex, glabrous, the claw about 6.5 mm. long, the blade 8.5 mm. long, 4.5 mm. broad; carinal petals falcate, subauriculate, obtuse, densely hairy without, the claw nearly 6 mm. long, the blade 9 mm. long, 4 mm. broad. Staminal tube glabrous, strongly dilated at the base. Ovary linear, cano-pubescent, about 7 mm. long, 1 or 2-ovulate; style glabrescent; stigma inconspicuous.

Legume ovate-elliptic or obovate-lanceolate, 1 or 2-seeded, 12.5 to 16 cm. long, 4 cm. broad, cuneate-attenuate at the base, obtuse or rounded and apiculate at the apex, the cinnamon-colored surface pubescent, the marginal nerve narrow and subacute; pedicel thick, 13 mm. long, dark brown pubescent. Seeds dark brown, reniform, 2 cm. long, 1 cm. broad.

Type from Costa Rica (see below).

SPECIMENS EXAMINED:

COSTA RICA: Nicoya, forested hills of the Pacific seaboard, in flower and fruit, May, 1900, Tonduz (Inst. Fis. Geogr. Costa Rica, no. 13993 in John Donnell Smith Herb., type); floral buds and fruits, January, 1900, Tonduz (Inst. Fis. Geogr. Costa Rica, nos. 13528, 13532). Salinas Bay, dry forests, fruits, July, 1890, Tonduz. La Balsa del Rio Grande, Province of Alajuela, fruits, June 2, 1911, Pittier 3654.

This is distinguished from the single other Middle American species of the group, *Lonchocarpus eriocarinalis*, by its large leaflets and fruits, the thick velvety indument covering the young leaves, the long, unguiculate petals, the very broad and peculiarly shaped wings, etc. It is known among the natives of Nicoya as "siete-cueros," i. e., "seven hides," a name applied to several hard timbers and referring to the toughness of the wood, which causes the hand to blister to the deepest layer of the skin. The tree does not shed its bark as supposed by Captain Smith.

EXPLANATION OF PLATE 2.—See p. 57.

7. *Lonchocarpus eriocarinalis* Micheli, Mém. Soc. Phys. Hist. Nat. Genève 34: 267. 1903.

PLATE 2, D. FIGURE 7.

A tree 6 to 8 meters high, the branchlets lenticellate, more or less grayish brown tomentose.

Leaves 7 to 11-foliate, the rachis terete, subcanaliculate, brownish-tomentose, 7 to 12 cm. long. Leaflets coriaceous, the petiolules densely hairy, 4 to 5 mm. long, the blades ovate, rounded at the base, obtuse and emarginate at the apex, 3 to 6.5 cm. long, 2 to 3.8 cm. broad, sublustrous and sparsely pilosulous above, the costa and veins hairy and deeply immersed, sparsely pubescent beneath, reticulate, the costa and veins very prominent. Stipules small, hairy, early deciduous.

Racemes simple, axillary and paniculate at the ends of the branchlets, the rachis hairy or subtomentose, terete, 4 to 11 cm. long. Peduncles and pedicels tomentose,

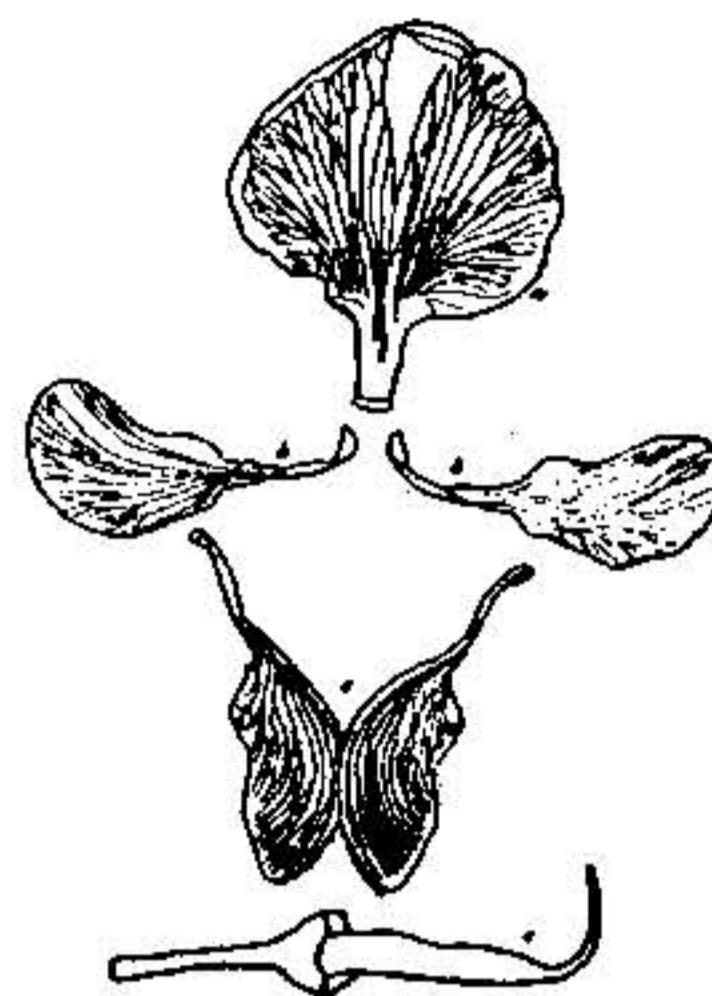


FIG. 6.—*Lonchocarpus costaricensis*. a, Standard; b, wings; c, carinal petals; d, pistil. Natural size. From Inst. Fis. Geogr. Costa Rica 13528.

the former usually biflorous, 3 to 5 mm. long, the latter 2 to 3 mm. long; bracts and bractlets very small, ovate-oblong, hairy, the latter inserted slightly above the middle of the pedicel. Calyx cupulate, densely fulvous-pubescent without, 4 to 4.5 mm.

long, distinctly 5-toothed, the 2 carinal teeth largest, the vexillar one smallest. Petals deep red; standard broadly orbicular, bilobulate at the base, emarginate at the apex, almost flat, densely silky-villous without, the margins inflexed, the claw oblique, about 1 mm. long, the blade 8.5 mm. long, 9.5 mm. broad; wings ovate, auriculate, adhering to the keel, glabrous, the claw about 3 mm. long, the blade 8.5 mm. long, 3 to 3.5 mm. broad; carinal petals ovate, obtuse, subauriculate, densely silky-villous without, the claw as in the wings, the blade 5 to 5.5 mm. long, 3.5 mm. broad. Vexillar stamen free at the base, the staminal tube short and broad. Ovary linear, stipitate, densely tomentose, about 4.5 mm. long, 2 or 3-ovulate; style sharply recurved, relatively long, tomentose at the base; stigma capitellate.

Legume broadly ovate-lanceolate, compressed, attenuate at the base, obtuse at the apex, densely rufous-tomentose, 1

or rarely 2 or 3-seeded, 7 to 8.5 cm., or when 2 or 3-seeded up to 10 or 11.5 cm. long, 3.5 to 4 cm. broad. Seeds reniform, dark brown with white hilum, 15 mm. broad, nearly 10 mm. long, and 2 mm. thick.

SPECIMENS EXAMINED:

MEXICO: El Valle Grande, Guerrero, alt. about 400 meters, September 5, 1898, in flower, *Langlassé* 320 (type collection, a specimen in U. S. Nat. Herb.).

Near Acapulco, Guerrero, in flower and fruit, October, 1894, to March, 1895,

Palmer 226. Near Manzanillo, Colima, in fruit, December, 1890, *Palmer* 984.

The common name of the species is "palo de oro," an allusion to the golden hue of the flower masses.

Closely related to *Lonchocarpus rugosus* Benth., but departing from it in the arrangement of the inflorescence, the size and color of the flowers, the shape and dimensions of the fruits, the number of the leaflets, etc.

EXPLANATION OF PLATE 2.—See p. 57.

8. *Lonchocarpus jaliscensis* Pittier, sp. nov.

A shrub or a small tree, the bark of the trunk and larger limbs gray and verruculose, that of the branchlets brownish and lenticellate; young shoots more or less puberulous.

Leaves 7 to 13-foliolate, the rachis canaliculate, fulvous-hairy, 6.5 to 13.5 cm. long. Leaflets subcoriaceous, the petiolules densely hairy, 3 to 4 mm. long, the blades orbicular-ovate, obovate, or oblong, rounded at the base, obtuse and sometimes emarginate at the apex, 1.5 to 5 cm. long, 1.5 to 2.5 cm. broad, puberulous or glabrescent above, the costa and veins immersed, softly hairy beneath, the costa and veins prominent, the margins revolute.

Flowers not known.

Legume ovate-lanceolate, shortly attenuate-stipitate at the base, obtuse at the apex, 1-seeded, about 4 cm. long, 2 to 2.5 cm. broad, dark brown hairy without, the margin thin-edged, broader on the vexillar side. Seed reniform, thick, reddish brown, about 8 mm. long and 14 mm. broad.

Type in the U. S. National Herbarium, no. 301874, collected at Bolaños, State of Jalisco, Mexico, in fruit, September, 1897, by J. N. Rose (no. 2923).

Although the only specimen is rather incomplete, it is sufficient to show distinct specific characters, the place of the species being close to *Lonchocarpus eriocarpalis* Micheli, from which it differs principally in the smaller leaves and legumes.

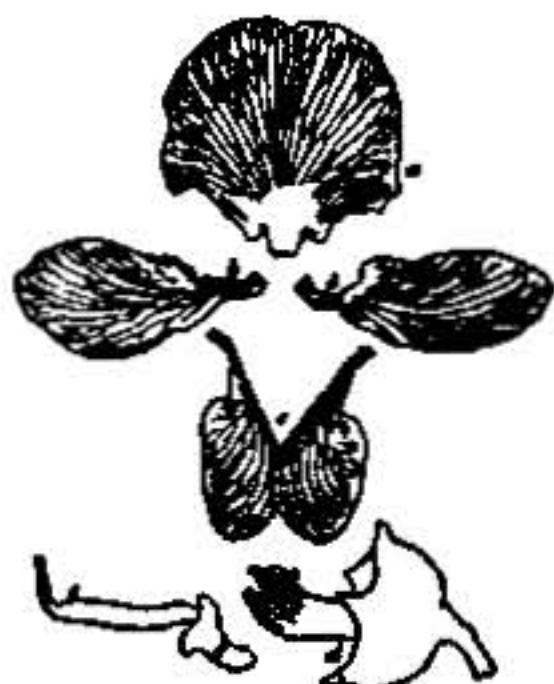


FIG. 7.—*Lonchocarpus eriocarpalis*. a, Standard; b, wings; c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From *Langlassé* 320.

9. *Lonchocarpus longipedicellatus* Pittier, sp. nov.

A tree, the branchlets terete, grayish, more or less villous and pubescent.

Leaves 7 or 9-foliolate, the rachis semiterete, canaliculate, glabrescent or sparsely hairy, 7 to 12 cm. long. Leaflets membranous or subcoriaceous, pellucid-punctate, the petiolules canaliculate, minutely puberulous or glabrescent, about 4 mm. long, the blades mostly oblong, sometimes ovate, rounded at the base, obtuse or emarginate or sometimes with a short obtuse acumination at the apex, 3.5 to 10.5 cm. long, 2 to 5 cm. broad, light green and glabrous above, paler beneath, the costa and veins prominent and more or less pilosulous. Stipules oblong, about 2 mm. long, densely whitish-tomentose at the apex, caducous.

Racemes axillary, usually 1 or 2 at the ends of the branchlets, the rachis more or less puberulous, 12 to 18 cm. long. Peduncles and pedicels puberulous at first, glabrous later, the former slender, solitary or geminate, biflorous, about 1.3 cm. long, the latter about 0.7 cm. long; bracts and bractlets ovate, very small, scarious, ciliolate, the latter opposite and inserted about the middle of the pedicels. Calyx broadly cupulate, truncate, glabrous or pilosulous without, more or less gland-dotted, about 5 mm. long. Petals pale purple (?), densely pellucid-punctate; standard orbicular, suboblique, bilobulate at the base, emarginate at the apex, slightly pubescent without above the insertion of the claw, this about 2.5 mm. long, the blade 13 mm. long and broad; wings oblong, auriculate at the base on the vexillar margin, rounded-obtuse at the apex, the claw slender, 5 to 5.5 mm. long, the blade 10.5 mm. long, 5 mm. broad; carinal petals falcate, subauriculate at the base, obtuse, pubescent along the carinal line, the claw as in the wings, the blade pubescent along the carina, 9 mm. long, 4 mm. broad. Vexillar stamen free at the base. Ovary sessile, linear, minutely pubescent or puberulous, about 9 mm. long, 3 or 4-ovulate, the style arcuate, subulate, glabrous, the stigma capitellate, very small.

Legume not known.

Type in the U. S. National Herbarium, no. 470825, collected at Jiquipilas, State of Chiapas, Mexico, in flower, May 31, 1904, by E. A. Goldman (no. 1030).

This species is a near relative of *L. punctatus* H. B. K., but differs in the glabrescent or slightly hairy leaves, the appearance of the glandular dots, the shape and dimensions of the leaflets, the relative length of the peduncles and pedicels, the absence of the dark vexillar spot, and the shape of the wings and carina, as well as in other minor details.

10. *Lonchocarpus michelianus* Pittier, sp. nov.

Branchlets grayish, minutely lenticellate, the younger parts more or less pubescent.

Leaves mostly 9-foliolate, sometimes 7-foliolate, the rachis broadly sulcate, pubescent, 7 to 12 cm. long. Leaflets membranous, minutely pellucid-punctate, the petiolules subcanaliculate, pubescent, 5 to 6 mm. long, the blades ovate or ovate-elliptic, more or less oblique, subacute at the base, shortly acute-acuminate at the apex, 3.5 to 7 cm. long, 2 to 3.3 cm. broad, sparsely pubescent except on the hairy costa above, densely grayish-pubescent beneath, the costa and veins prominent. Stipules small, ovate, grayish-hairy, early deciduous.

Racemes sparse, axillary, few-flowered, the rachis pilosulous, 7 to 10 cm. long, flower-bearing only on its upper third, the peduncles and pedicels pubescent, the former solitary, biflorous, 4 to 5 mm. long, the latter 6 to 7 mm. long; bracts and bractlets very

FIGURE 8.

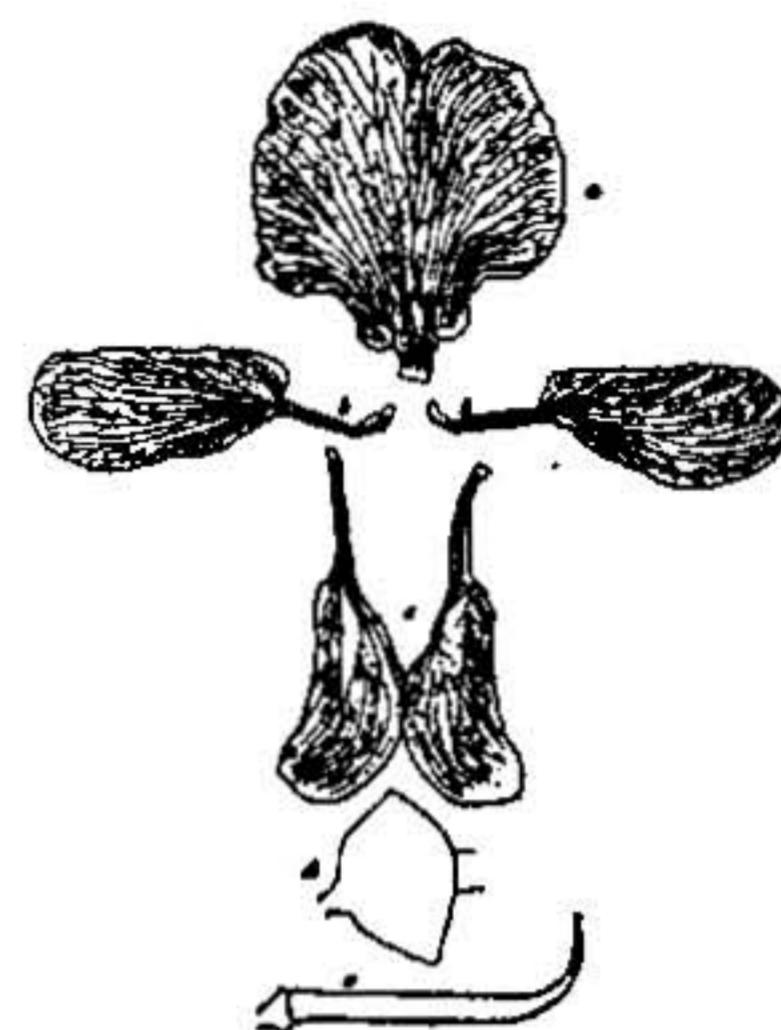


FIG. 8.—*Lonchocarpus longipedicellatus*. a, Standard; b, wings; c, carinal petals; d, calyx; e, pistil. Natural size. From Goldman 1030.

small, oblong, hairy, caducous, the latter opposite, close to the calyx. Calyx broadly cupulate, truncate, about 4.5 mm. long, sparsely grayish-pubescent without. Petals purplish or pinkish, irregularly dotted or spotted (under the lens); standard suborbicular, concave, emarginate at the apex, the basal lobules hardly prominent, the claw strongly arcuate, 3 to 3.5 mm. long, the blade densely silvery-pubescent at the base, sparsely so toward the margin without, sparsely pubescent and darker colored at the base within, 12.5 to 13 mm. long and broad; wings oblique, oblong, rounded-auriculate at the base on the vexillar margin, obtuse at the apex, very sparsely pilosulous without, the claw about 5 mm. long, the blade 10.5 mm. long, 4.5 mm. broad; carinal petals falcate, rounded-auriculate on the vexillar margin, convex, obtuse at the apex, sparsely pilosulous without, the claw 5 mm. long, the blade about 11 mm. long, 4.5 mm. broad. Vexillar stamen free at the base. Ovary sessile, linear, velvety-pubescent, 9.5 mm. long, 3 or 4-ovulate; style arcuate, glabrescent, the stigma very small.

Legume not known.

Type in the U. S. National Herbarium, no. 246518, collected at El Naranjo, Department of Santa Rosa, Guatemala, at an altitude of about 1,200 meters, in flower, May, 1893, by Heyde and Lux (J. D. Smith, no. 4468).

FIG. 9.—*Lonchocarpus michelianus*.
a, Standard; b, wings; c, carinal petals; d, calyx; e, pistil. Natural size. From J. D. Smith 4468.

Determined as *L. violaceus* (Beauv.) H. B. K. by the late Micheli, this species departs from *L. benthamianus* in its general pubescence, the shape of the leaflets, the arrangement of the inflorescence, and the less prominent lobules of the standard, and also in its distinct habitat, the latter growing on cliffs near the seashore, while *L. michelianus* is a mountain tree.

11. *Lonchocarpus longistylus* Pittier, sp. nov.

A tree, the branchlets brownish, glabrous, lenticellate.

Leaves 11 to 15-foliolate, glabrous, the rachis terete, 8 to 20 cm. long. Leaflets membranous, pellucid-punctate, the petiolules canaliculate, 4 to 5 mm. long, the blades mostly oblong, sometimes ovate, oblique (the lateral ones), subacute at the base, acute-acuminate at the apex, 3.5 to 8.5 cm. long, 1.5 to 3.5 cm. broad, minutely reticulate, dark green above, grayish or fulvous (almost glaucescent) with a prominent costa beneath. Stipules not seen.

Racemes axillary, subpanicle at the ends of the branchlets, the rachis subangulate, glabrous, 14 to 17.5 cm. long. Peduncles and pedicels glabrous, 5 mm. long, the former biflorous; bracts and bractlets very small, oblong, acute, ciliate, caducous, the latter opposite, distant from the calyx. Calyx broadly cupulate, rounded at the base, truncate or subdenticulate, 4 to 4.5 mm. long, glandular-dotted, glabrous, minutely ciliate. Petals purplish; standard orbicular (shorter than broad), 10.5 to 11 mm. long, 12.5 to 13 mm. broad, more or less oblique, emarginate at the apex, minutely silky-pubescent on both sides above the insertion of the claw and along the veins, the basal lobes lateral, the claw 1.5 to 2 mm. long; wings oblique, obovate, obtuse, rounded-auriculate at the base on the

FIGURE 10.

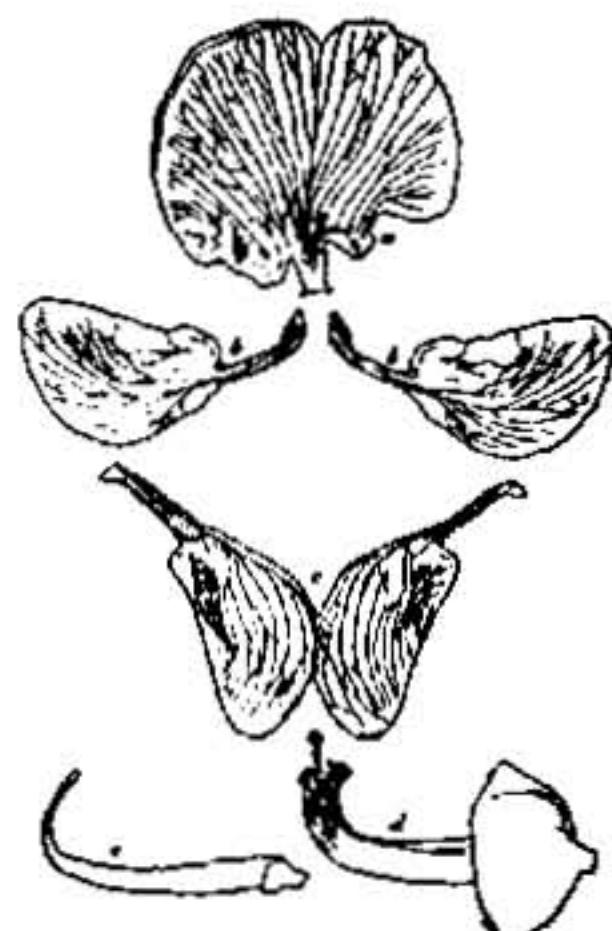
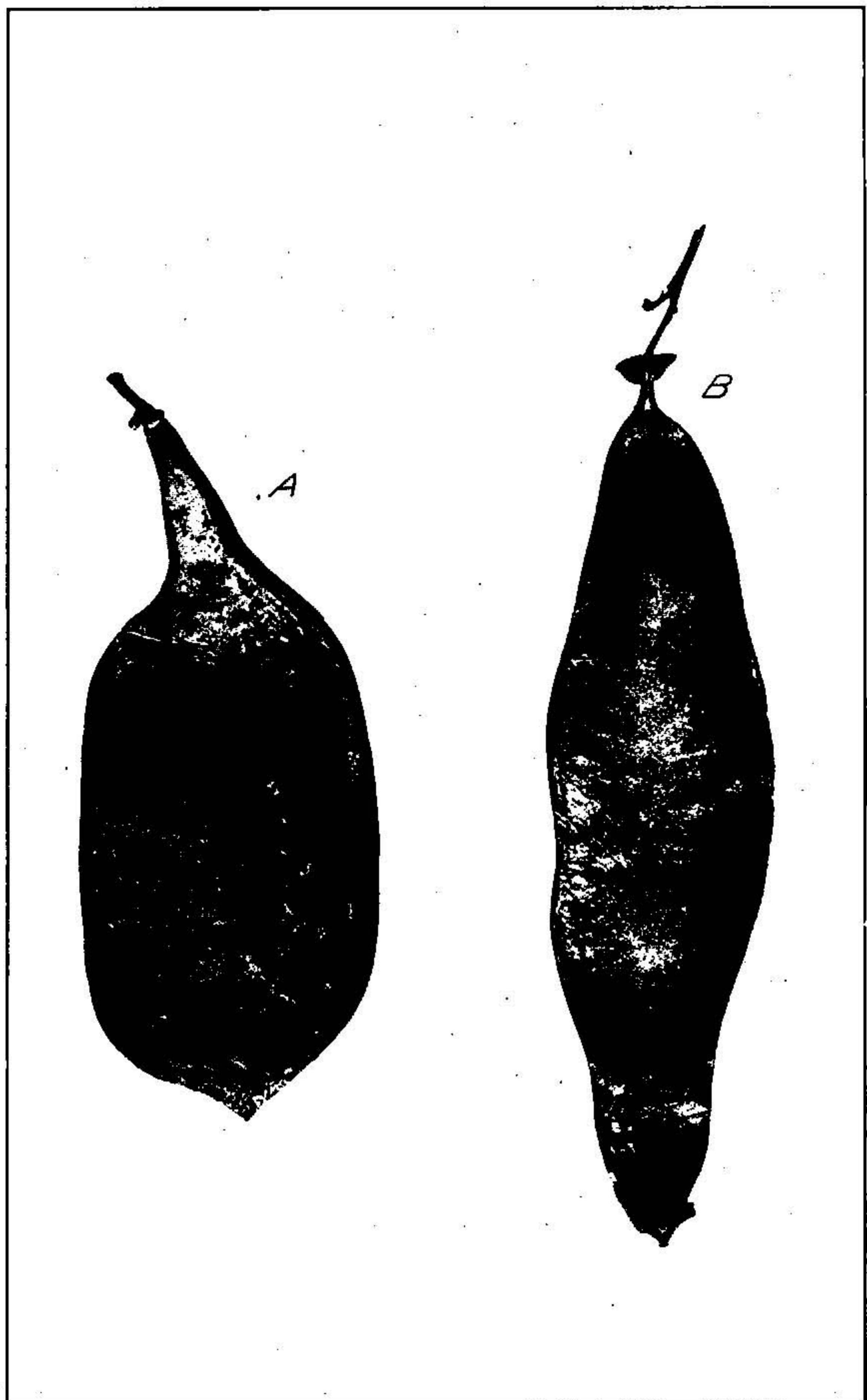


FIG. 10.—*Lonchocarpus longistylus*. a, Standard; b, wings; c, carinal petals; d, calyx, stamens, and style; e, pistil. Natural size. From Gaumer 904.



FRUITS OF (A) *LONGOCARPUS CHIRICANUS* PITTIER AND (B) *L. PROTERANTHUS* PITTIER.

carinal side, almost glabrous, the claw 4.5 to 5 mm. long, the blade 10 mm. long, 5 to 5.5 mm. broad; carinal petals falcate, rounded-auriculate at the base, obtuse at the apex, the claw 4.5 mm. long, the blade folded near the base, sparsely silky-pubescent without and within, 10 mm. long, 4.5 to 5 mm. broad. Vexillary stamen free at the base. Ovary sessile, linear, 3.5 mm. long, 8-ovulate, silky-pubescent; style arcuate, pilosulous, exceeding the stamens, the stigma capitellate.

Legume coriaceous, ovate-lanceolate, compressed, attenuate-stipitate at the base, rounded-mucronate at the apex, glabrous, 1 or 2-seeded, 8 to 8.5 cm. long, 3 cm. broad, both margins thin-edged.

Type in the herbarium of the Field Museum of Natural History, collected at Xbalché, Yucatán, Mexico, by Dr. G. F. Gaumer (no. 904).

OTHER SPECIMENS EXAMINED:

YUCATÁN: Mucuyché, in flower, December 20, 1865, Schott 691. Cozumel Island, Gaumer.

Maya name "bal-ché," or "xbal-ché."

Closely related perhaps to *L. punctatus* H. B. K., but differing in the number, shape, and dimensions of the leaflets, the ciliate, glandular calyx, and the size and shape of the petals and legume.

12. *Lonchocarpus chiricanus* Pittier, sp. nov.

PLATE 3, A.

A small deciduous tree, the branchlets grayish, glabrous, lenticellate.

Leaves 7 or 9-foliolate, the rachis subterete, canaliculate, glabrous, thicker at the insertion, 10 to 12 cm. long. Leaflets coriaceous, densely pellucid-puncticulate, the petiolules canaliculate, thick, 6 to 7 mm. long, the blades ovate or obovate, rounded at the base, sub acuminate and obtuse at the apex, 6.5 to 11 cm. long, 4.5 to 6 cm. broad, dark green and sublustrous above, paler (almost glaucous) and minutely pilosulous beneath, the costa and veins glabrous and prominent. Stipules not known.

Flowers not known.

Legume flattened, club-shaped, ovate, long-stipitate at the base, abruptly acuminate at the apex, glabrous, subligneous with a suberous mesocarp, 1-seeded, about 10 cm. long and 4 cm. broad, both margins thin-edged and sharp. Seed reniform, rich brown with a whitish hilum, about 2.3 cm. long, 1.5 cm. broad, and 6 mm. thick.

Type in the U. S. National Herbarium, no. 677284, collected on Parida Island, Province of Chiriquí, Panama, in fruit, February 25, 1911, by H. Pittier (no. 2817).

The transparent-dotted leaflets indicate that the place of this species is in the section Punctati; the characters of the legume and seed show that it is distinct from *L. benthamianus* and *L. proteranthus*; the presence of the minute pubescence on the lower face of the leaves, presumably the remnants of a denser initial indument, almost excludes the possibility of the specimens belonging to *L. punctatus* or *L. longipedicellatus*, etc. Notwithstanding the absence of the flowers, it seems permissible to consider this tree a distinct species.

13. *Lonchocarpus proteranthus* Pittier, sp. nov.

PLATE 3, B. FIGURE 11.

A tree 15 to 20 meters high, the trunk 35 to 40 cm. in diameter at the base, the branchlets sparsely lenticellate, the young growth glabrous or puberulous.

Leaves mostly 9-foliolate, glabrous, the rachis 10 to 14 cm. long, subterete, thickened at the base. Leaflets petiolulate, coriaceous, pellucid-punctate, the petiolules 7 mm. long, narrowly canaliculate, dark greenish brown, the blades ovate-oblong, broadly rounded at the base, shortly and obtusely acuminate at the apex, 3.5 to 9 cm. long, 2.3 to 3.8 cm. broad, the venation finely reticulate and prominent on both faces. Stipules not seen.

EXPLANATION OF PLATE 3.—Fruits of 2 species of *Lonchocarpus*. Fig. A, *L. chiricanus*, from the type specimen, Pittier 2817; fig. B, *L. proteranthus*, from the type specimen, R. S. Williams 418. Natural size.

Racemes subaxillary, paniculate at the ends of the branchlets, the rachis 3 to 8 cm. long, minutely pilosulous. Peduncles and pedicels pubescent, the former solitary, biflorous, 3 to 4 mm. long, the latter slender, about 5 mm. long; bracts and bractlets ovate-orbicular, pubescent, very caducous, the latter opposite and close to the base of the calyx. Calyx broadly cupuliform, subturbinate at the base, truncate, about 5.5 mm. long, grayish-pubescent without and on the margin within. Petals minutely pubescent and whitish without, glabrous and pink within, the standard with a yellow spot above the claw; standard suborbicular (broader than

long), subpetiolate, the claw thick, 2.5 to 3 cm. long, the blade 12 mm. long and 15 mm. broad, emarginate with a pair of beaklike appendages at the base, emarginate at the apex; wings oblique, auriculate, adhering to the carina by the base of the blades, the claw 4.7 mm. long, the blade rounded at the apex, 11 to 11.5 mm. long, 5.5 mm. broad; carinal petals falcate, adhering through the middle part of the lower margin of the blade, the claws slender, 5 to 5.5 mm. long, the blades subauriculate and convex at the base, obtuse at the apex, 9.5 mm. long, 4 to 4.5 mm. broad. Stamens monadelphous, the vexillar one free at the base for about 4 mm.; staminal tube broadened at the base, about 12 mm. long (including the free part of the stamens). Ovary linear, sessile, 10.5 mm. long, 5-ovulate, minutely silky-pubescent, the style glabrous, subapiculate, arcuate but not retrocurved, the stigma inconspicuous.

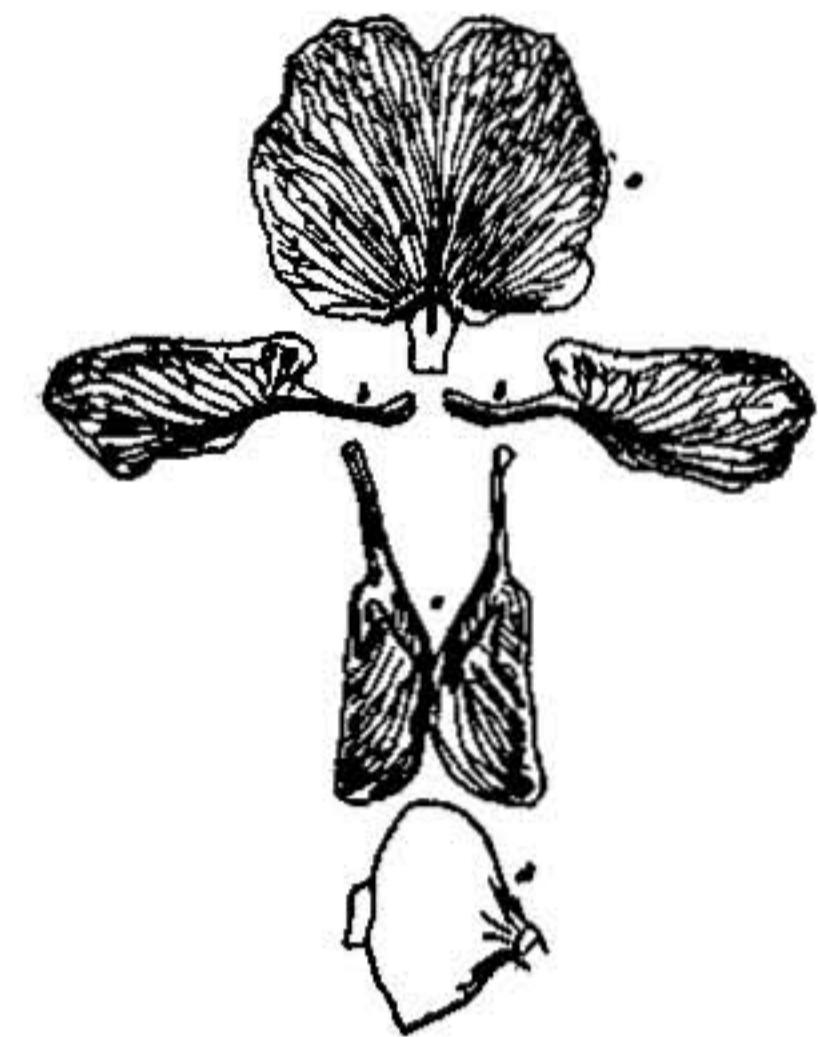


FIG. 11.—*Lonchocarpus proteranthus*.
a, Standard; b, wings; c, carinal petals; d, calyx. Natural size.
From R. S. Williams 418.

Legume lanceolate, thin, stipitate at the base, mucronate at the apex, glabrous, 1 or 2-seeded, 11 to 12 cm. long, up to 3 cm. broad, light brown, the ventral margin sulcate. Seeds reniform, flat, 2.7 cm. long, 1.6 cm. broad.

Type in the herbarium of the New York Botanical Garden, collected in the neighborhood of Penonomé, Province of Coclé, Panama, March, 1908, by R. S. Williams (no. 418).

This species evidently belongs to the *L. punctatus* group, but differs from the type in that the flowers precede the new leaves,¹ in the coriaceous, long-petiolulate leaflets, in the short floral racemes, in the distinct shape and dimensions of the petals, and probably also in the characters of the fruit.

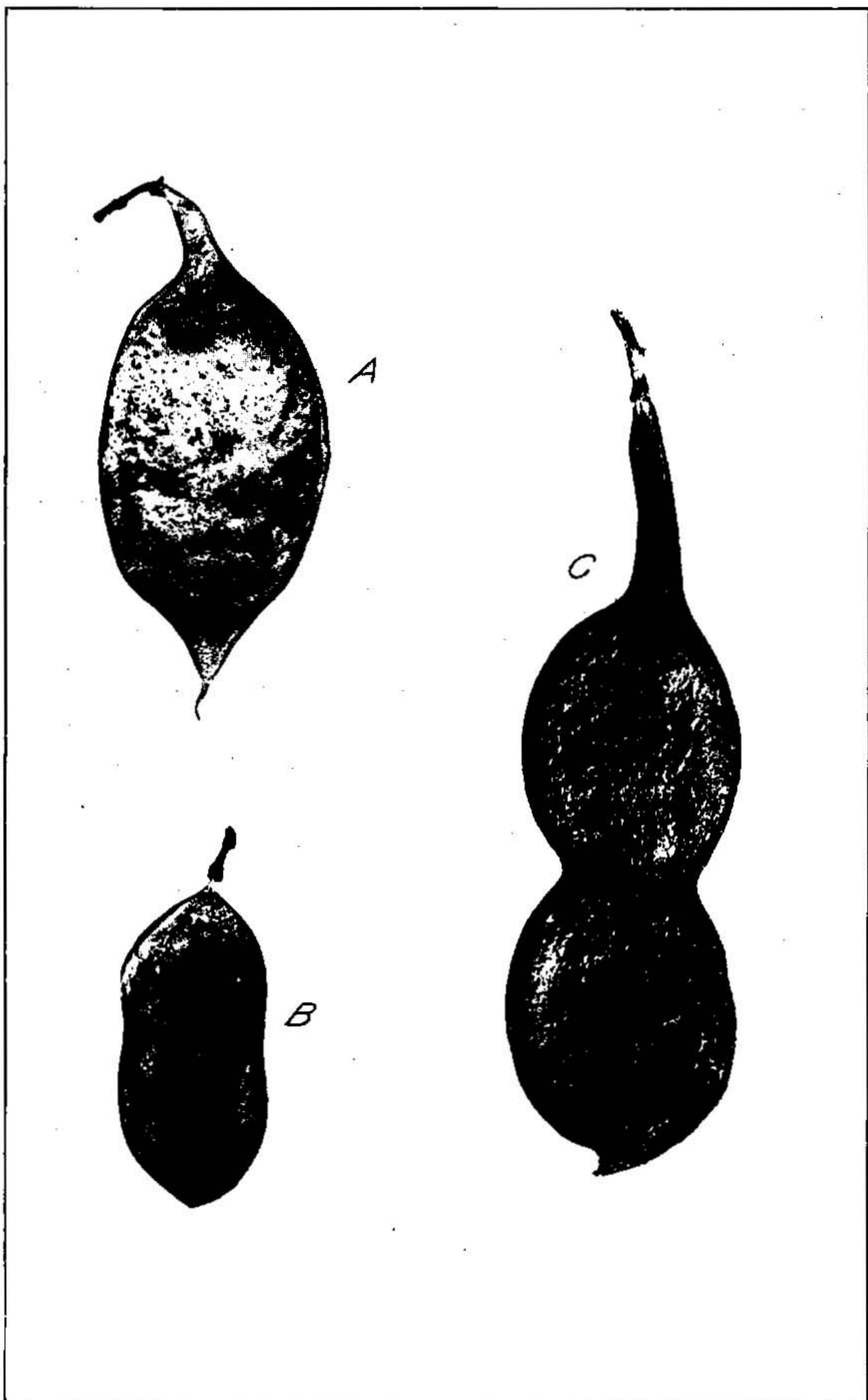
14. *Lonchocarpus luteomaculatus* Pittier, sp. nov. PLATE 4, B. FIGURE 12.

A small tree; branchlets and young shoots pubescent, the former covered with a dark gray, lenticellose bark.

Leaves 5 to 9-foliolate, the rachis minutely and sparsely pubescent, 8 to 12 cm. long. Leaflets coriaceous, the petiolules 6 to 7 mm. long, pubescent, the blades elliptic-ovate or obovate, usually cuneate at the base, subacute at the apex, 6 to 10 cm. long, 3 to 5.5 cm. broad, dark green and sparsely hairy above, subglaucous and sparsely hairy beneath; costa and primary veins yellowish, hairy, subimpressed above, prominent beneath; margins slightly revolute.

Racemes axillary or subfasciculate at the ends of the branchlets, the rachis pubescent, 9 to 10 cm. long. Peduncles and pedicels pubescent, the former solitary or geminate, usually biflorous, but also often uniflorous, in the latter case 2.5 mm., in the former case 1 mm. long; pedicels 1.5 mm. long; bracts and bractlets very small,

¹ This is true, however, of several other species belonging to distinct sections of the genus.



FRUITS OF (A) *LONGOCARPUS CAUDATUS* PITTIER, (B) *L. LUTEOMACULATUS* PITTIER, AND (C) *L. COCHLEATUS* PITTIER.

ovate, obtuse, the latter distant from the calyx. Calyx salverform, short and broad (about 3 mm. long and 4 mm. broad), densely brownish-pubescent outside, the lobules shallow, the 2 anterior ones broadly rounded and coalescent, the 3 posterior acute with the middle one longer. Petals purple, the standard with a large ovate, yellow spot at the base; standard orbicular, truncate and slightly marginate at base, emarginate at apex, brownish silky pubescent without, the claw obliquely inserted, 1 to 1.5 mm. long, the blade 10 mm. long and broad; wings glabrous, the claw about 2.5 mm. long, the blade 7.5 to 8 mm. long, 3.5 mm. broad, slightly pubescent at the base, glabrous elsewhere, the claw 2.2 mm. long, the blade about 7.5 mm. long, 4 mm. broad. Vexillar stamen free at the base. Ovary linear, short-stipitate, 2-ovulate, about 8 mm. long, minutely silky-pubescent; style incurved, attenuate, about 3.5 mm. long, sparsely hairy, persistent; stigma capitellate.

Legume flat, coriaceous, 1 or 2-seeded, 4 to 4.5 cm. long, 1.5 to 2.2 cm. broad, glabrous, short-stipitate, the marginal nerve rounded and smooth.

Type in the U. S. National Herbarium, nos. 679271-2, collected along the Río Santa Isabel, Province of Colón, Panama, among bushes near the seashore, flowers and immature fruits, August 13, 1911, by H. Pittier (no. 4170).

Lonchocarpus luteomaculatus seems to stand alone among the Epunctati. It is characterized by the peculiar pubescence on the lower face of the leaflets, the prominent reticulation of the leaflets, the large yellow spot at the base of the standard, and the different shape of the legume.

15. *Lonchocarpus purpureus* Pittier, sp. nov.

FIGURE 13.



FIG. 13.—*Lonchocarpus purpureus*. a, Standard; b, wings; c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From J. D. Smith 3289.

A tree, the young branchlets densely ferruginous-pubescent. Leaves 9 or 11-foliolate, often opposite, the rachis obscurely canaliculate, 8 to 12 cm. long, fulvous-pubescent. Leaflets subcoriaceous, the petiolules subcanaliculate, 5 to 6 mm. long, fulvous-pubescent, the blades oblong or oblong-elliptic, rounded or subacute at the base, obtusely sub acuminate at the apex, 3 to 7 cm. long, 1.5 to 2.5 cm. broad, glabrous or minutely puberulous above, hairy and strongly reticulate beneath, the costa and veins pubescent, immersed above, strongly prominent beneath.

Racemes axillary, the rachis fulvous-pubescent, 5 to 8 cm. long. Peduncles and pedicels densely ferruginous-hairy, the former usually biflorous, about 1 mm. long, the latter 2.5 to 3 mm. long; bracts and bractlets linear, small, ferruginous-hairy, the latter distant from the calyx. Calyx cupulate, broad, 5-toothed, about 3 mm. long, ferruginous-hairy without, the carinal tooth prominent. Petals purple; standard orbicular, concave, callous-plicate at the base, emarginate at the apex, densely ferruginous-pubescent without, the claw obliquely inserted, 1.3 mm. long, the blade 7.5 mm. long, 8 mm. broad, the margins more or less inflexed; wings oblong-elongate, rather narrow, oblique, auriculate, obtusely sub acuminate, minutely yellow-spotted, glabrous, the claw 2 to 2.5 mm. long, the blade about 6 mm. long, 2 mm. broad; carinal petals falcate, rather broad, obtuse, minutely yellow-spotted, ferruginous-hairy along the lower margin, the claw 1.5 to 2 mm. long, the blade 5.5 to 6 mm. long, about 3 mm. broad. Staminal tube glabrous. Ovary linear, softly pubescent, about 5.5 mm. long, 4-ovulate; style arcuate, sparsely pubescent; stigma bilobulate, hairy.

Legume not known.



FIG. 12.—*Lonchocarpus luteomaculatus*. a, Standard; b, wings; c, carinal petals; d, stamens; e, pistil. Natural size. From Pittier 4170.

EXPLANATION OF PLATE 4.—Fruits of 3 species of *Lonchocarpus*. Fig. A, *L. caudatus*, from the type specimen, Nelson 1998; fig. B, *L. luteomaculatus*, from the type specimen, Pittier 4170; fig. C, *L. cochleatus*, from the type specimen, Langlassé 471. Natural size.

Type in the U. S. National Herbarium, no. 258406, collected at El Carrizal, Department of Santa Rosa, Guatemala, at an altitude of about 1,670 meters, in flower, May, 1892, by Heyde and Lux (J. D. Smith, no. 3289).

Determined as *Lonchocarpus sericeus* (Poir.) H. B. K. by the late Micheli, but evidently belonging to the subgenus *Eulonchocarpus*, and to be placed near *L. luteomaculatus*, from which it differs in the number and size of the leaflets, the shape of the branchlets, the dimensions of the floral parts, the yellow-spotted petals, etc.

16. *Lonchocarpus oaxacensis* Pittier, sp. nov.

FIGURE 14.

A tree, the branchlets grayish, lenticellate, at first tomentose.

Leaves 7-foliolate, the rachis brownish-tomentellous, terete, 6 to 8 cm. long. Leaflets subcoriaceous, the petiolules thick, 4 to 5 mm. long, tomentellous, the blades

ovate, rounded and subattenuate at the base, obtuse or subacute at the apex, 4.5 to 8 cm. long, 3 to 4.5 cm. broad, minutely pilosulous and dark green above, paler, pubescent, and reticulate beneath, the costa and veins subimpressed or prominulous above, prominent and fulvous-tomentellous beneath. Stipules not seen.

Racemes axillary and paniculate at the ends of the branchlets, the rachis puberulous-tomentellous, rather slender, 4 to 12 cm. long. Peduncles and pedicels tomentellous, the former biflorous, growing singly along the rachis, 6 to 7 mm. long, the latter 4 to 6 mm. long; bracts and bractlets linear or oblong, very small and fugacious, hairy, the latter not very close to the calyx. Calyx cupulate, obsoletely 5-toothed, minutely brown-pubescent, about 6 mm. long, the 2 carinal teeth rounded and subconiate, the vexillar tooth broadly rounded. Petals whitish without, purplish turning to white toward the base within; standard orbicular, truncate at the base, emarginate at the apex, concave, pubescent

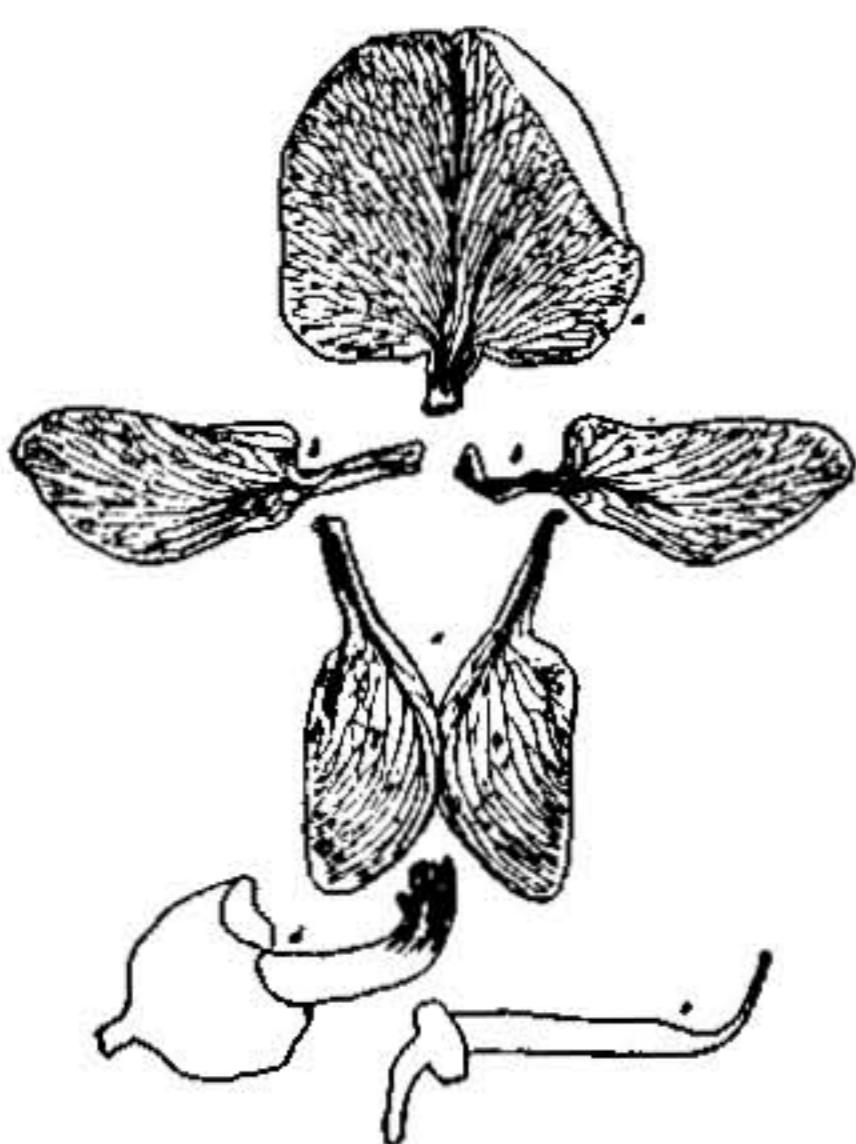


FIG. 14.—*Lonchocarpus oaxacensis*. a, Standard; b, wings; c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From L. C. Smith 454.

without, the claw about 2.5 mm. long, the blade 13 mm. long, 15 mm. broad; wings oblique, oblong, obtuse, auriculate, glabrous, ciliate at the apex, the claw about 5 mm. long, the blade 11.5 to 12 mm. long, 5.5 to 6 mm. broad; carinal petals falcate, subauriculate, obtuse, slightly pubescent at the apex, the claw as in the wings, the blade about 7.5 mm. long and 5.5 mm. broad. Vexillar stamen free at the base. Ovary sessile, linear, densely pubescent, about 9 mm. long, 7 or 8-ovulate; style arcuate, glabrous; stigma capitellate.

Legume not known.

Type in the U. S. National Herbarium, no. 371944, collected at Jayacatlán, State of Oaxaca, Mexico, at an altitude of about 1,500 meters, in flower, April 8, 1895, by Rev. Lucius C. Smith (no. 454).

A beautiful species, related probably to *Lonchocarpus latifolius* (Willd.) H. B. K. and conspicuous for its large flowers.

17. *Lonchocarpus lineatus* Pittier, sp. nov.

FIGURE 15.

A tree, the branchlets grayish, striate, minutely lenticellate, at first ferruginous-hairy.

Leaves (1 to) 5-foliolate, the rachis canaliculate, grayish-hairy, 1.5 to 7.5 cm. long. Leaflets submembranous, the petiolules terete, densely grayish-hairy, 4 to 6 mm. long, the blades ovate, broadly rounded at the base, obtusely acuminate at the apex, 4 to 12 cm. long, 2.5 to 5 cm. broad, puberulous or glabrescent above, softly grayish-pubescent beneath, the costa and veins grayish-hairy and impressed above, ferruginous-hairy and prominent beneath.

Racemes few, axillary or terminal, sub sessile, the rachis ferruginous-pubescent, 4 cm. long or longer. Peduncles and pedicels ferruginous-hairy, the former biflorous, not over 1.5 mm. long, the latter 2 to 3 mm. long; bracts and bractlets very small, ovate, hairy, the latter opposite, inserted near the upper end of the pedicels. Calyx cupulate, truncate or slightly 5-toothed, 2.5 to 3 mm. long, minutely ferruginous-pubescent without, reddish-lineolate. Petals pink, marked with darker lines following the veins; standard suborbicular, flat, 2-lobulate and callous-plicate at the base, emarginate at the apex, sparsely silky-pubescent without, the claw 1.5 mm. long, the blade about 9.5 mm. long, 11 to 11.5 mm. broad; wings oblong, auriculate, broadly obtuse, sparsely pilosulous without, the claw about 3 mm. long, the blade 8.5 mm. long, 3.5 mm. broad; carinal petals oblique, obovate, subfalcate, calcarate at the base of the blade, broadly obtuse, sparsely hairy without and ciliate at the apex, the claw as in the wings, the blade 6.5 to 7 mm. long, 3 to 3.5 mm. broad. Staminal tube glabrous. Ovary linear, grayish-pubescent, about 7 mm. long, 8-ovulate; style glabrous, arcuate; stigma conspicuously bilobulate.

Legume not known.

Type in the John Donnell Smith Herbarium, collected at Cubilquitz, Alta Verapaz, Guatemala, at an altitude of 350 meters, in flower, April, 1901, by H. von Türckheim (J. D. Smith, no. 7853).

Near *Lonchocarpus oaxacensis*, with which it has in common the relatively long, 7 or 8-ovulate ovary and the pubescent leaflets, but from which it differs in the smaller number of the leaflets, in the pink, lineolate petals, and in the peculiar conformation of the base of the blade in the carinal petals.

18. *Lonchocarpus unifoliolatus* Benth. Journ. Proc. Linn. Soc. Bot. 4: Suppl. 90.

1860.

FIGURE 16.

A small tree, the branchlets reddish brown, glabrous.

Leaves unifoliolate, glabrous; petiolules slender, subcanaliculate, thicker and dark-colored at base and apex, 1.3 to 3.5 cm. long; leaflets ovate, rounded at the base, with a long and narrow obtuse acumen at the apex, 10 to 12.5 cm. long, 3.5 to 7 cm. broad, coriaceous, dark green above, paler and reticulate beneath, the costa and veins prominent. Stipules not seen.

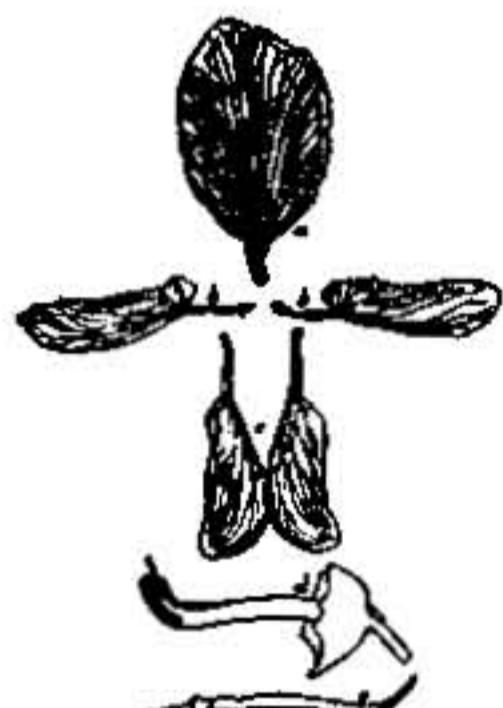


FIG. 16.—*Lonchocarpus unifoliolatus*. a, Standard; b, wings; c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From Galeotti 3457.

Racemes axillary, the rachis sparsely pilosulous, 12 to 15 cm. long. Peduncles and pedicels grayish-pubescent, the former 1 to 2 mm. long, usually geminate and biflorous, the latter 2 to 2.5 mm. long; bracts and bractlets ovate-oblong, grayish-pilosulous, the latter in a pair close to the calyx. Calyx cupulate, grayish-pubescent without, broad, about 2 mm. long, distinctly denticulate, the carinal tooth more prominent. Petals pinkish; standard ovate, flat, callous-plicate but not lobulate at the base, slightly emarginate, pubescent without, the claw 1.8 mm. long, the blade about 9 mm. long and 6 mm. broad; wings adhering to the keel, oblique, oblong, rounded-auriculate, sparsely pubescent at the apex, the claw 2.5 to 3 mm. long, the blade 7 to 7.5 mm. long, 2 mm. broad; carinal petals falcate, pubescent at the apex, the claw 2.5 to 3 mm. long, the blade about 6.5 mm. long and 2.5 mm. broad. Staminal tube broadly dilated, the vexillar stamen free at the base. Ovary linear, stipitate and contracted above the base,



FIG. 15.—*Lonchocarpus lineatus*. a, Standard; b, wings; c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From J. D. Smith 7853.

gray-pubescent, about 6 mm. long, 3-ovulate; style arcuate, pubescent at the base; stigma inconspicuous.

Legume not known.

Type collected in southern Mexico by Jurgensen (no. 717).

The above description is based on a specimen in the U. S. National Herbarium, collected at Chinantla, State of Puebla, Mexico, in flower, July, 1849, by H. Galeotti (no. 3457).

This very curious species is readily distinguished by its unifoliolate leaves. The so-called petiolule is composed of a rudimentary rachis on which the real petiolule, about 6 mm. long, is articulated as in those species with the normal type of leaves.

19. *Lonchocarpus cochleatus* Pittier, sp. nov.

PLATE 4, C (facing p. 65).

A tree 4 to 5 meters high, the branchlets grayish, glabrous, minutely lenticellate.

Leaves 7 or 9-foliolate, glabrous, the rachis slender, canaliculate, 7.5 to 12 cm. long. Leaflets coriaceous, the petiolules canaliculate, slender, 7 to 8 mm. long, the blades ovate, rounded and subattenuate at the base, obtuse or obtusely subacuminate at the apex, 4 to 9.5 cm. long, 2.5 to 4.5 cm. broad, light green on both faces, the costa and veins impressed above, the former strongly, the latter scarcely prominent beneath.

Flowers not known.

Legume lanceolate or elongate, oblique, attenuate-stipitate at the base, rostrate on the carinal side at the apex, light brown with darker margins, glabrous, 1 to 3-seeded, when 1-seeded ovate, about 4.5 cm. long and 2.7 cm. broad, subcochleate or shallowly concavo-convex, when more than 1-seeded more or less arcuate, up to 13 cm. long, constricted between the seeds, the joints cochleate. Seeds, in specimen, immature.

Type in the U. S. National Herbarium, no. 385594, collected at El Cabazal, State of Guerrero, Mexico, with immature fruits, October 18, 1898, by E. Langlassé (no. 471).

Distributed as *Lonchocarpus violaceus* (Poir.) H. B. K., but quite distinct and not identifiable with any of the Central American species. Unfortunately the flowers are wanting and the seeds undeveloped. It seems to be nearest *L. megalanthus* Pittier, but the rachis of the leaves is canaliculate, the leaflets are more numerous with the veins nearer and at a different angle, etc. The fruits of the latter species are not known.

20. *Lonchocarpus caudatus* Pittier, sp. nov.

PLATE 4, A (facing p. 65).

A tree, the branchlets brownish, glabrous, minutely lenticellate.

Leaves 5-foliolate, the rachis slightly canaliculate, glabrescent, 10 to 12 cm. long. Leaflets coriaceous, the petiolules slightly canaliculate, glabrescent, 9 to 10 mm. long, the blades ovate, rounded and subattenuate at the base, long-acuminate at the apex with a narrow and acute acumen, 6.5 to 12.5 cm. long, 3.5 to 6 cm. broad, glabrous, the costa and nerves hardly prominent above, glabrescent, subreticulate, the costa and veins prominent beneath. Stipules not seen.

Flowers not known.

Fruiting racemes axillary, the rachis glabrous or glabrescent, 18 cm. long. Peduncles and pedicels glabrous or softly pubescent, the former about 4 mm. long, the latter about 5 mm. long; bracts and bractlets not seen.

Legume flattened club-shaped or lanceolate, stipitate, apiculate (i. e., bearing the persistent style), glabrous, coriaceous, 1 or 2-seeded, 6 or 10 cm. long, 3 cm. broad, the margin thin-edged (the carinal margin slightly broader). Seeds reniform, brown with white hilum, 10 mm. long, 6 mm. broad, about 1.5 mm. thick.

Type in the U. S. National Herbarium, no. 48925, collected between Petlancingo and Acatlán, State of Puebla, Mexico, November 20, 1894, in fruit, by E. W. Nelson (no. 1998).

The long-acuminate leaflets, broader near the base, distinguish this species from *Lonchocarpus mexicanus* and *L. megalanthus*, to which it is probably closely related. To judge by the remnants of the indument on the leaves, these must be densely tomentose in the first stages of growth, as in the species of the section *Eriophylli*.

21. *Lonchocarpus latifolius* (Willd.) H. B. K. Nov. Gen. & Sp. 6: 383. 1823.

FIGURE 17.

Amerimnum latifolium Willd. Sp. Pl. 3: 909. 1801.

A large tree, 10 meters high and over, the branchlets thick, the bark brownish gray, covered with brown lenticels.

Leaves 5 to 9-foliolate, often opposite, the rachis terete or canaliculate, glabrous, 16 to 22 cm. long. Leaflets large, coriaceous, the petiolules thick, canaliculate, 8 to 10 mm. long, dark-colored, glabrous or at first pubescent, the blades ovate or ovate-oblong, more or less oblique, more or less broadly cuneate-attenuate at the base, short-acuminate and subemarginate at the apex, 8.5 to 23 cm. long, 4.5 to 11 cm. broad, dark green above, paler beneath, the costa and veins prominent. Stipules not seen.

Racemes solitary in the axils of the upper leaves, the rachis glabrous, thick, 5 to 12 cm. long. Peduncles and pedicels minutely pubescent, the former very short (less than 1 mm. long), 1 or 2-flowered, the latter (when present) 2.5 to 3 mm. long; bracts oblong, about 1 mm. long, pubescent; bractlets minute, pubescent, linear. Calyx broadly cupulate, subattenuate at the base, about 3 mm. long, minutely pubescent, distinctly 5-dentate. Petals greenish purple or reddish: standard orbicular, truncate at the base, slightly emarginate at the apex, minutely pubescent without, the claw 1.5 mm. long, the blade slightly callous at the base, 5.5 to 6 mm. long, 8 to 8.5 mm. broad; wings oblong, obtuse, auriculate and plicate on the vexillar side, adhering to the keel, sparsely and minutely pubescent without, the claw 2.3 mm. long, the blade 5.5 mm. long, 2.5 mm. broad; carinal petals adhering, falcate, obtuse, slightly pubescent without, the claw 2.1 or 2.2 mm. long, the blade about 4 mm. long and 2.5 mm. broad. Vexillar stamen free at the base. Ovary sessile, linear, minutely pubescent, attenuate at the apex, about 5 mm. long, 2 to 5-ovulate; style arcuate, pubescent at the base; stigma capitellate.

Legume lanceolate, subsessile, attenuate at both ends, shortly mucronate or obtuse at the apex, submembranous, glabrous, 4.5 to 6.5 cm. long, 1.8 to 2.4 cm. broad, 1 to 5-seeded, the margins thin-edged. Seeds reniform, very thin, about 11 mm. long and 6 mm. broad.

Type from the West Indies.

The following Central American specimens have been examined, the description being based upon those from Panama.

PANAMA: Coiba Island, Pacific coast of Veraguas, in fruit, Seemann 627. Bismarck above Penonomé, Province of Coclé, in flower, March 5, 1908, Williams 317. Río Indio de Fató, Province of Colón, near sea level, in fruit, August 24, 1911, Pittier 4269.

GUATEMALA: Baja Verapaz or Chiquimula, in flower, 1885, Watson 463.

HONDURAS: Island of Ruatán, along the Caribbean Main, in flower, 1885, Gaumer 2025.

In this species the leaves are often opposite, and this together with the thin legumes, wrinkled above the flat seed, somewhat reminds one of the genus *Platymiscium*. The leaflets are very variable in size and shape.

22. *Lonchocarpus darienensis* Pittier, sp. nov.

FIGURE 18.

A small tree 3 to 4 meters high, the trunk 5 to 6 cm. in diameter, sparsely branched; bark gray, with white lenticels; young shoots more or less pubescent.

Leaves 7 or 9-foliolate, entirely glabrous, the rachis terete, 10 to 16 cm. long. Petiolules terete, 7 mm. long. Leaflet blades oblique, ovate to elliptic, rounded or



FIG. 17.—*Lonchocarpus latifolius*. a, Standard; b, wings; c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From R. S. Williams 317.

cuneate at the base, obtusely acuminate at the apex, 5.5 to 11 cm. long, 3 to 5 cm. broad; nervation impressed above, slightly prominent beneath. Stipules not seen.

Racemes axillary or terminal, sometimes geminate, the rachis pubescent, 3 to 11 cm. long. Peduncles and pedicels pubescent, the former either biflorous, then hardly

over 1 mm. long, or uniflorous and about 4 mm. long, the pedicels also about 4 mm. long bracts and bractlets very small, ovate or suborbicular, pubescent, the latter opposite and inserted at the joint of the pedicel and calyx stipe. Calyx broadly salverform, short-stipitate, gray-pubescent, about 5 mm. long, 5-toothed, the 2 anterior teeth coalescent and obsolete. Petals lavender-colored at the apex, gradually shading to white toward the claw, minutely yellow-spotted; standard suborbicular, truncate at the base, emarginate at the apex, the claw slightly oblique, 3 mm. long, the blade about 10 mm. long and 12.5 mm. broad, minutely pubescent without; wings oblong, oblique, prominently auriculate, obtuse, slightly pubescent without, the claw 5.5 mm. long, the blade about 8 mm. long and 4 mm. broad; carinal petals obovate, obtuse, densely pubescent without along the keel, the claw 5 mm. long, the blade about 17.5 mm. long and 4 mm. broad. Vexilar stamen free at the base. Ovary linear, densely whitish-pubescent, about 10.5 mm. long, 5-ovulate; style

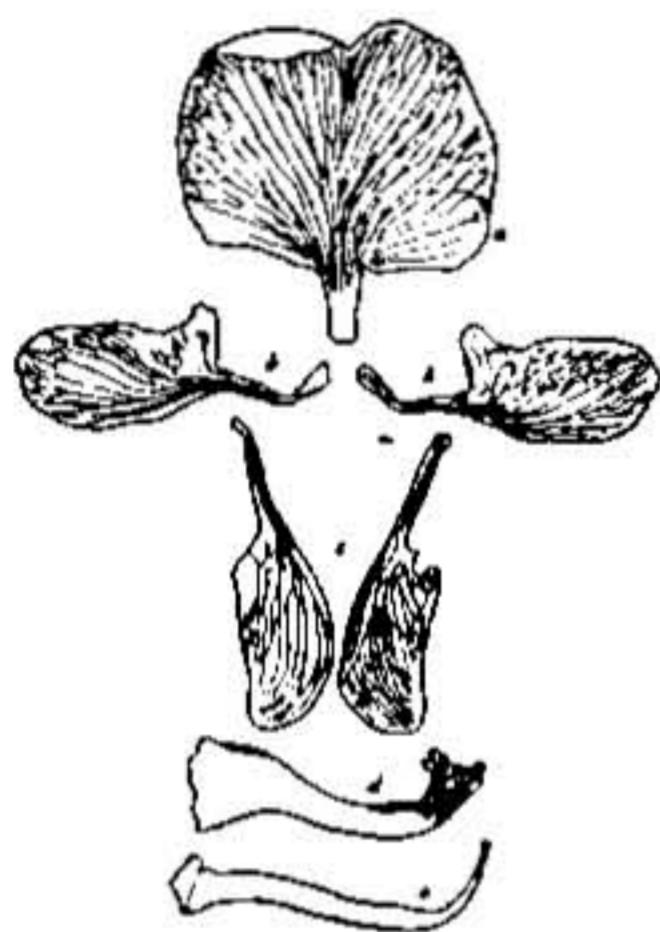


FIG. 18.—*Lonchocarpus dariensis*. a, Standard; b, wings; c, carinal petals; d, stamens; e, pistil. Natural size. From Pittier 5515.

arcuate, subglabrous; stigma capitellate.

Type in the U. S. National Herbarium, no. 715766, collected near Garachiné, southern Darién, Panama, in light woods, in flower, January 28, 1912, by H. Pittier (no. 5515).

In the absence of the legume I place this species tentatively near *Lonchocarpus megalanthus* and *L. mexicanus*, with both of which it seems to have close affinities.

23. *Lonchocarpus megalanthus* Pittier, sp. nov.

FIGURE 19.

A deciduous tree about 10 meters high, low-branched, the branchlets brownish, glabrous, lenticellate.

Leaves 5 or 7-foliolate, glabrous, the rachis terete, 5 to 9 cm. long. Leaflets coriaceous, light green, the petiolules narrowly canaliculate, 1 cm. long, the blades ovate or ovate-oblong, rounded and subattenuate at the base, obtuse or very shortly obtuse-acuminate at the apex, reticulate, 3.5 to 9 cm. long, 2.5 to 4 cm. broad, the costa and veins impressed above, slightly prominent beneath. Stipules not seen.

Racemes growing from nodes on leafless branchlets, densely flowered, glabrous, the rachis stout, 2.5 to 6 cm. long. Peduncles and pedicels minutely pubescent, the former very short (1 mm. long or less), usually biflorous, the latter slender, 3 to 4 mm. long; bracts and bractlets very small and deciduous, ovate-orbicular, pubescent, the latter opposite and close to the base of the calyx. Calyx large, cupulate, truncate or slightly 5-dentate, minutely pubescent without, about 6 mm. long. Petals unusually large, pubescent without; standard suborbicular, truncate and callousplicate at the base, emarginate at the apex, lilac within with a large greenish

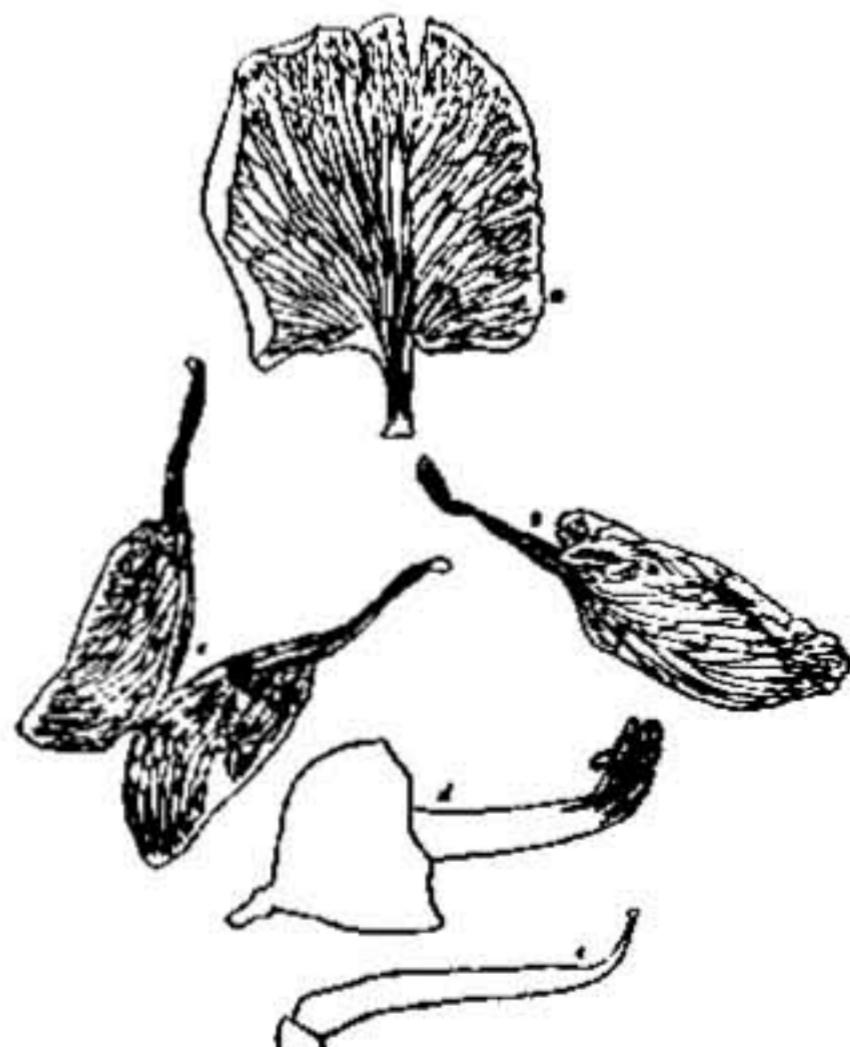


FIG. 19.—*Lonchocarpus megalanthus*. a, Standard; b, wings; c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From Palmer 1997.

yellow patch at the base, the claw slender, 4.5 mm. long, the blade 13.5 to 14 mm. long and broad; wings and keel whitish on the lower half, purple above. Wings oblong, auriculate, obtuse, the claw 7 mm. long, the blade 13 mm. long, about 5.5 mm. broad; carinal petals subfalcate, obtuse, scarcely auriculate on the vexillar side, the claw as in the wings, the blade about 10.5 mm. long, 5 mm. broad. Vexillar stamen free at the base; anthers ovate, large. Ovary linear, stipitate, densely and minutely pubescent, about 10.5 mm. long, 4 or 5-ovulate; style slightly arcuate, pubescent at the base; stigma capitellate.

Legume not known.

Type in the U. S. National Herbarium, no. 305321, collected in a canyon in the vicinity of Tepic, Mexico, in flower, January, 1892, by Edward Palmer (no. 1997).

This species, closely related to *Lonchocarpus mexicanus*, is distinguished by having the largest flowers among the Middle American representatives of the genus.

24. *Lonchocarpus mexicanus* Pittier, sp. nov.

FIGURE 20.

A tree, the branchlets gray, sparsely lenticellate, glabrous.

Leaves 7-foliolate, glabrous, the rachis subcanaliculate, 9 to 11 cm. long. Leaflets large, coriaceous, the petiolules thick, narrowly canaliculate, 5 to 7 mm. long, the blades ovate, broadly rounded at the base, broadly obtuse-acuminate at the apex, 6 to 11 cm. long, 3 to 6 cm. broad, light green above, paler beneath, the costa and veins impressed on the upper face, prominent beneath. Stipules not seen.

Racemes solitary in the axils of the upper leaves, the rachis angulate, minutely pubescent, 6 to 11 cm. long. Peduncles and pedicels white-tomentellous, the former biflorous, 2 to 3 mm. long, the latter about 3 mm. long; bracts and bractlets scarious, ovate, pubescent without, very caducous, the latter inserted on the upper half of the pedicel, not close to the calyx. Calyx cupulate, 5-lobulate in the bud, truncate in the flower, about 5.5 mm. long, silvery-pubescent without. Petals purplish, more or less yellow-dotted; standard orbicular or subquadrangular, concave, slightly plicate at the base, emarginate at the apex, densely tomentellous without, the claw 2.5 to 3 mm. long, the blade 12 mm. long, about 14 mm. broad; wings adhering to the keel, oblong, auriculate, obtuse, glabrous, the claw 4.5 to 5 mm. long, the blade 10 mm. long and 4.5 mm. broad; carinal petals falcate, subauriculate, obtuse, silvery-pubescent without at the apex and along the carinal margin, the claw as in the wings, the blade 7.5 mm. long, 3.5 to 4 mm. broad. Vexillar stamen free at the base. Ovary linear, attenuate into the style, silvery-pubescent, about 6.5 mm. long, 6-ovulate; style long and slightly arcuate, pubescent at the base; stigma capitellate.

Legume not known.

Type in the U. S. National Herbarium, no. 48923, collected at San Andrés Tuxtla, State of Veracruz, Mexico, at an altitude of about 500 meters, in flower, May 7, 1894, by E. W. Nelson (no. 455).

25. *Lonchocarpus minimiflorus* Donn. Smith, Bot. Gaz. 44: 110. 1907.

FIGURE 21.

A tree 8 to 10 meters high, the branchlets brownish, minutely lenticellate, at first grayish-pubescent.

Leaves 7 to 13-foliolate, the rachis slender, canaliculate, angulate, pubescent, 4 to 10 cm. long. Leaflets submembranous, the petiolules canaliculate, hairy, 3 to 5 mm. long, the blades ovate to elliptic-lanceolate, rounded or cuneate at the base, obtuse

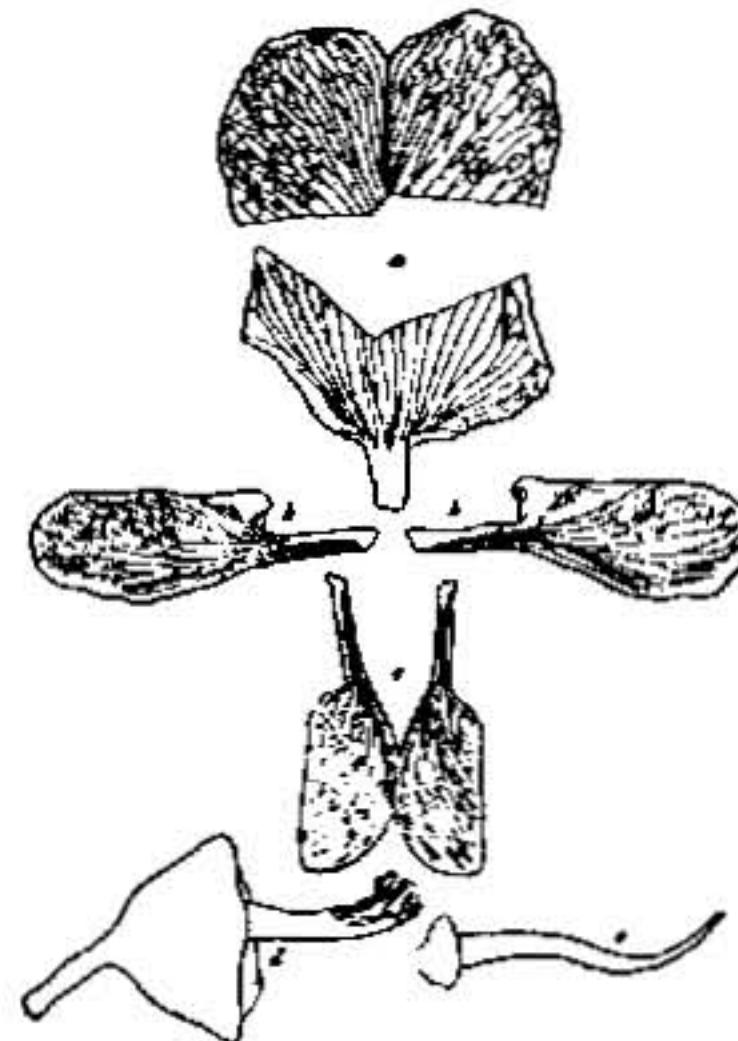


FIG. 20. *Lonchocarpus mexicanus*.
a, Standard; b, wings; c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From Nelson 455.

or subacute at the apex, 2 to 7 cm. long, 1 to 3.5 cm. broad, the lateral ones more or less oblique, minutely pubescent along the costa and veins above, beneath minutely reticulate and pubescent, the costa and veins prominulous. Stipules small, ovate, pubescent, caducous.

Racemes axillary, congested, sometimes 2-branched, almost drooping, the rachis 4-angulate, pubescent, 7 cm. long or less. Peduncles and pedicels pubescent, the former mostly biflorous, 1 mm. long or less, the latter of the same length or little longer; bracts



FIG. 21.—*Lonchocarpus minimiflorus*. a, Standard; b, wings; c, carinal petals. Natural size. From J. D. Smith 6330.

and bractlets ovate, pubescent, the latter opposite and close to the calyx. Calyx cupulate, subtruncate, fulvous-pubescent, about 2 mm. long. Petals purple; standard oblique, orbicular, concave, subcallous and subemarginate at the base, broadly emarginate at the apex, densely silky-pubescent without, the claw about 1 mm. long, the blade 4 to 4.5 mm. long, 4 mm. broad; wings adhering to the keel, rounded-auriculate, rounded-obtuse, glabrous, the claw about 1.8 mm. long, the blade about 3.5 mm. long, 1.3 to 1.4 mm. broad; carinal petals often free from each other, subfalcate, auriculate, obtuse, glabrous, the claw 3.9 mm. long, the blade 3 mm. long, 1.7 mm. broad. Vexillar stamen free at the base. Ovary linear, pubescent, about 3.5 mm. long, 4 to 6-ovulate; style strongly arcuate.

Legume not known.

The type, in the John Donnell Smith Herbarium, was collected at Santa Bárbara, Department of Sololá, Guatemala, at an altitude of about 450 meters, in flower, January, 1894, by Heyde and Lux (J. D. Smith, no. 6330).

Another specimen referred to this species was collected between Jalisco and Aurora, State of Chiapas, Mexico, by G. N. Collins and C. B. Doyle.

This species has close affinities with *L. atropurpureus* Benth., but differs in the pubescence, the size of the flowers, the auriculate carinal petals, etc.

26. *Lonchocarpus atropurpureus* Benth. Journ. Proc. Linn. Soc. Bot. 4: Suppl. 91. 1860.

PLATE 5, B. FIGURE 22.

A tree 3 to 8 meters high, the branchlets grayish, glabrous, minutely lenticellate. Leaves 5 to 9-foliolate, the rachis slender, glabrous, 3 to 7.5 cm. long. Leaflets submembranous, the petiolules canaliculate, 2 to 3 mm. long, glabrous or glabrescent, the blades ovate-oblong or sublanceolate, more or less rounded or cuneate at the base, obtuse or shortly obtuse-acuminate at the apex, 2 to 6.5 cm. long, 1 to 3 cm. broad, dark green above, paler, minutely reticulate, and more or less pilosulous beneath, the costa and veins prominulous on the upper face, prominent on the lower one. Stipules ovate, pubescent, small and caducous.

Spikes axillary or paniculate at the ends of the branchlets, the rachis more or less pubescent, 1.5 to 7.5 cm. long. Peduncles and pedicels slender, pubescent, the former simple or biflorous, 2 to 3 mm. long, the latter about 1 mm. long; bracts and bractlets oblong, pubescent, the latter very small, opposite, appressed to the calyx. Calyx broadly cupulate, minutely pubescent without, about 2 mm. long, at first distinctly 5-toothed, later subtruncate. Petals dark pinkish purple; standard suborbicular, concave, sublobulate and slightly callous at the base, deeply and broadly emarginate and slightly pubescent on the back at the apex, the claw about 0.8 mm. long, the blade 8.5 mm. long, nearly 10 mm. broad, the lateral margins inflexed; wings adhering to the keel, oblong, auriculate, rounded-obtuse at the apex, glabrous, the claw 2.2 mm. long, the blade 7.5 mm. long, 3.2 mm. broad; carinal petals broadly obtuse and sparsely pubescent at the apex, the claw about 2.5 mm. long, the blade 5.5 mm. long, 3 mm. broad. Vexillar stamen free at the base. Ovary stipitate, linear, minutely pubescent, about 5.5 mm. long, 5 or 6-ovulate; style strongly arcuate (retrocurved); stigma capitellate.

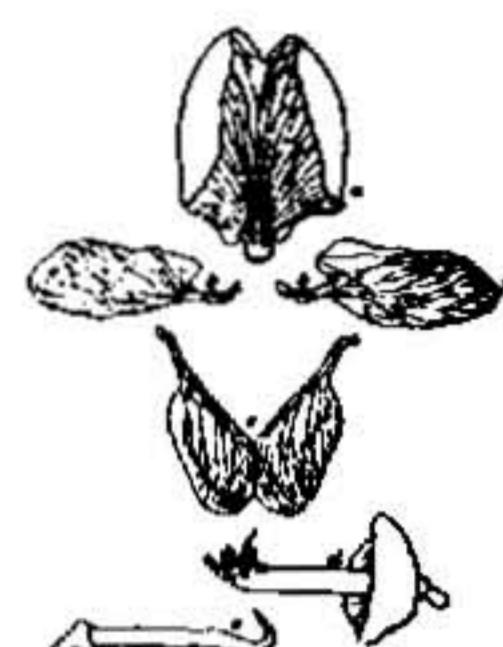
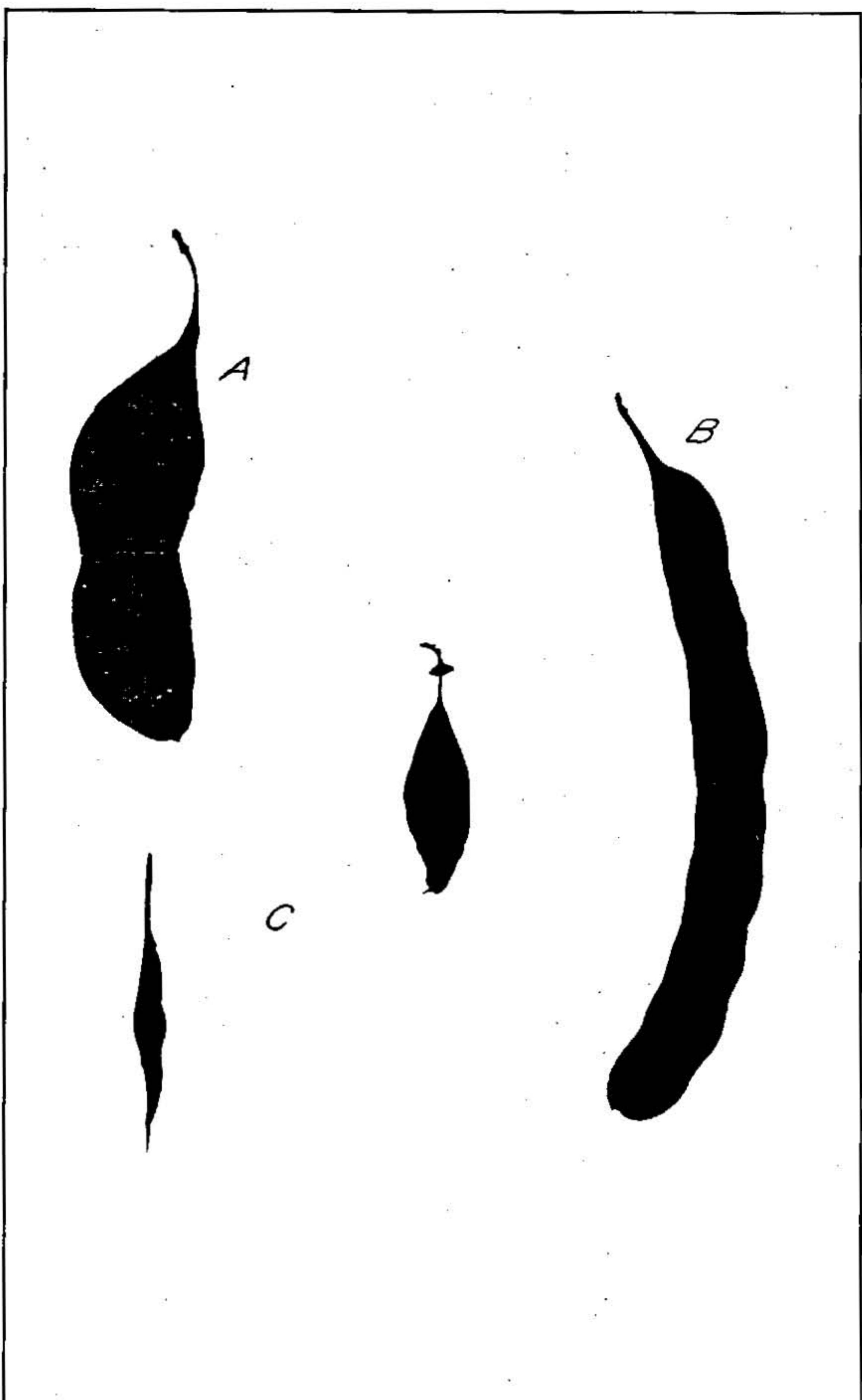


FIG. 22.—*Lonchocarpus atropurpureus*. a, Standard; b, wings; c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From Deam 6367.



FRUITS OF (A) *LONCHOCARPUS OROTINUS* PITTIER, (B) *L. ATROPURPUREUS* BENTH.,
AND (C) *L. LANCEOLATUS* BENTH.

Legume long and slender stipitate, narrow, thin, rounded and mucronate at the apex, thin-edged on the carinal margin, glabrous, 4 to 10 cm. long, 0.9 to 1 cm. broad, 1 to 4-seeded. Mature seeds not seen.

Type from Mexico. The above description is drawn from specimens collected near Bonda, at the foot of the Cordillera de Santa Marta, Colombia, October 23, 1898, by H. H. Smith (no. 22).

ADDITIONAL SPECIMENS EXAMINED:

VENEZUELA: Quebrada del Tigre, near Arenales, State of Lara, alt. about 400 meters, in flower, September 6, 1910, Jahn 187.

ECUADOR: El Recreo, Province of Manabí, flowers and young fruits, Eggers 15766.

GUATEMALA: Gualán, Department of Zacapa, in flower, June 20, 1909, Deam 6367.

Reported also by earlier collectors from Santa Marta, Colombia, and from Maracaibo and the Andes of Trujillo and Mérida, Venezuela.

The identification of the Guatemalan specimens is doubtful. The racemes are sparsely flowered and the rudimentary fruits very short, broad, and pubescent.

27. *Lonchocarpus lanceolatus* Benth. Journ. Proc. Linn. Soc. Bot. 4: Suppl. 92. 1860.

PLATE 5, C. FIGURE 23.

A shrub or small tree, the branchlets flexuous, gray or brownish, lenticellate, the younger parts hairy.

Leaves 9 to 15-foliate, the rachis slender, canaliculate, hairy, 4.5 to 9.5 cm. long. Leaflets small, submembranous, the petiolules hairy, canaliculate, 2 to 3 mm. long, the blades ovate-lanceolate or oblong-lanceolate, rounded or cuneate at the base, shortly obtuse-acuminate at the apex, 2 to 4 cm. long, 0.8 to 1.8 cm. broad, dark green and sparsely pubescent above, paler and more densely pubescent beneath, the costa and veins conspicuous on the upper surface but not slightly prominent as on the lower surface. Stipules small, ovate, hairy, caducous.

Racemes solitary or sometimes one large with 1 or 2 small ones in the axils of the leaves, the rachis pubescent, 2 to 4 cm., rarely only 1 cm. long. Peduncles and pedicels minutely pubescent, the former usually biflorous, 1 to 2 mm. long, the latter 1 to 1.5 mm. long; bracts and bractlets very small, oblong, hairy, caducous, the latter opposite and close to the calyx. Calyx cupulate, truncate, broad, minutely ferruginous-pubescent, 2.5 to 3 mm. long, usually with minute yellow spots around the base. Petals purple, turning to white toward the base, the wings and carina sparsely yellow-spotted; standard orbicular, emarginate, concave, subbilobulate or auriculate and plicate-callous at the base, minutely pubescent without along the veins, the claw about 1 mm. long, the blade about 8.5 mm. long and 9 mm. broad, the margins broadly involute; wings elongate, convex, straight and longitudinally plicate, broadly auriculate, obtuse at the apex, sparsely pubescent or glabrous, the claw 2.5 mm. long, the blade 7.5 mm. long, 3 to 3.5 mm. broad; carinal petals subfalcate, subauriculate, broadly rounded at the apex, longitudinally plicate, glabrous or subciliate at the apex, the claw 2.5 mm. long, the blade 3 mm. broad. Staminal tube and free part of the filaments almost straight, glabrous, the vexillary stamen free at the base. Ovary sessile, linear, finely grayish-pubescent, 5 mm. long, 6 to 8-ovulate; style strongly arcuate, pubescent at the base; stigma inconspicuous.

Legume (immature) short, sublanceolate, more or less oblique, tapering at the base to a filiform stipe, more or less cochleate, glabrous, usually 1-seeded, ending with the

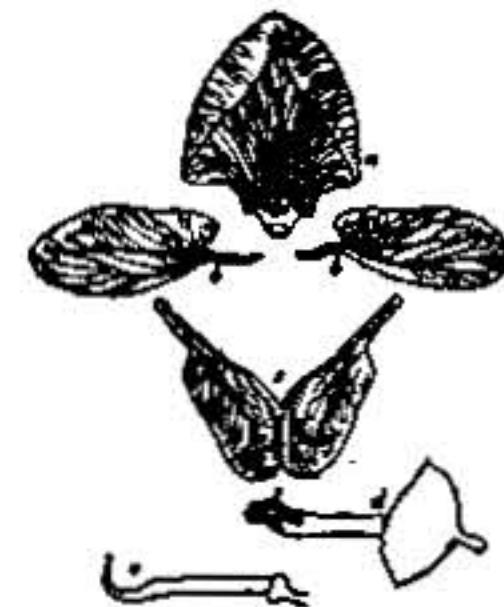


FIG. 23.—*Lonchocarpus lanceolatus*. a, Standard; b, wings; c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From Palmer 1433.

EXPLANATION OF PLATE 5.—Fruits of 3 species of *Lonchocarpus*. Fig. A, *L. orotinus*, from specimen collected by Tonduz (Inst. Fis. Geogr. Costa Rica, no. 13570); fig. B, *L. atropurpureus*, from H. H. Smith 22; fig. C, *L. lanceolatus*, from a Mexican specimen collected by Edward Palmer, U. S. National Herbarium no. 305322. Natural size.

persistent style, 2.5 to 3.5 cm. long, 0.9 cm. broad, the vexillar suture thickened at the seed, concave, about 0.5 mm. broad.

The type of this species, from Mexico, is in Pavon's collections, in the Herbier Boissier.

SPECIMENS EXAMINED:

MEXICO: Imala, Sinaloa, flowers, August, 1891, Palmer 1433; probably from the same locality, immature fruits, Palmer without number or data (U.S. National Herbarium, no. 305322). Between Rosario and Acaponeta, Sinaloa, flowers, July 28, 1897, Rose 1873.

The number of leaflets is often 15 and the fruits on our specimens, though immature, are developed enough to show that this species belongs to the subgenus Neuroscapha, and not to the section Densiflori as suggested by Bentham.

28. *Lonchocarpus yucatanensis* Pittier, sp. nov.

FIGURE 24.

Branchlets stout, gray, lenticellate, the younger parts pubescent.

Leaves 5 or rarely 7-foliolate, the rachis slender, canaliculate, minutely pubescent, 4 to 6 cm. long. Leaflets membranous, the petiolules puberulous-tomentose, canaliculate, about 3 mm. long, the blades ovate-oblong or ovate-elliptic, cuneate at the base, obtuse or subemarginate at the apex, 3 to 6 cm. long, 1.3 to 2.5 cm. broad, reticulate on both faces, sparsely pilosulous or glabrous above except on the hairy costa and veins, paler and sparsely pilosulous beneath, the costa hairy and prominent. Stipules very small, ovate, pubescent, caducous.



FIG. 24.—*Lonchocarpus yucatanensis*. a, Standard; b, wings; c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From Gaumer 1146.

Racemes axillary, the rachis pubescent, about 7 cm. long. Peduncles and pedicels short, densely pubescent, the former usually biflorous, 1.5 mm. long or less, the latter 2 to 2.5 mm. long; bracts and bractlets ovate, pubescent, the latter a single pair close to the calyx. Calyx cupulate, slightly 5-toothed, nearly 3 mm. long, densely grayish-pubescent. Petals pinkish or purplish; standard suborbicular, equally broad at base and apex, concave, 2-lobulate and callous at the base, deeply emarginate at the apex, sparsely pubescent on the back, pubescent inside above the small lobules, the lateral margins involute, the claw about 1 mm. long, the blade 8 mm. long, 7.5 mm. broad; wings adhering to the keel, very oblique, elongate, auriculate, obtuse at the apex, glabrous, the claw 2 to 2.5 mm. long, the blade 6.5 to 7 mm. long, 2 to 2.5 mm. broad; carinal petals often parted, obovate and subfalcate, obtuse, plicate longitudinally, slightly pubescent at the apex, the claw as in the wings, the blade about 6 mm. long and 2.5 to 2.7 mm. long. Anthers large, ovate-elliptic; vexillar stamen free at the base. Ovary linear, densely hairy, about 5.5 mm. long, 7 to 9-ovulate; style glabrous, strongly arcuate.

Legume not known.

Type in the herbarium of the Field Museum of Natural History, no. 437778, collected at El Progreso, Yucatán, Mexico, by Dr. G. F. Gaumer (no. 1146).

A near relative of *L. atropurpureus*, differing in the pubescence, in the smaller number of leaflets, in the shape and size of the petals and of the anthers, in the curvature of the style, etc.

29. *Lonchocarpus orotinus* Pittier, sp. nov.

PLATE 5, A. FIGURE 25.

A small tree, up to 8 meters high, the crown rounded, the branchlets brownish, densely lenticellate, at first sparsely pubescent.

Leaves 7-foliolate, rarely 5 or 9-foliolate, the rachis slender, canaliculate, sparsely pilosulous, 3.5 to 9 cm. long. Leaflets membranous, the petiolules canaliculate, hairy, 1.5 to 3 mm. long, the blades ovate-lanceolate or ovate-elliptic, attenuate and acute at the base, narrowly acuminate and subacute at the apex, 2 to 7.5 cm. long, 1 to 2.5 cm.

broad, minutely reticulate and pilose or pilosulous on the costa and veins above, paler and sparsely pubescent beneath. Stipules small, ovate, cano-pubescent, caducous.

Racemes axillary, the flowers scattered, the rachis sparsely pubescent, 5 to 9 cm. long. Peduncles sparsely pubescent, biflorous, about 2 mm. long; pedicels densely pubescent, 1 to 2 mm. long; bracts and bractlets pubescent, ovate-oblong, the latter opposite and close to the calyx. Calyx cupulate, subtruncate, silky-pubescent without, about 2.5 cm. long. Petals purplish, all minutely pubescent at the apex; standard orbicular, very concave, subbilobulate and emarginate at the base, emarginate at the apex, the claw 1 mm. long or less, the blade about 8.5 mm. long and 9 mm. broad, the basal lobules and lateral margins inflexed; wings adhering to the keel, elongate, auriculate, the claw 2 mm. long, the blade 6.5 to 7 mm. long, 2.3 to 3 mm. broad; carinal petals coherent or free, obovate-oblique, broadly obtuse at the apex, the claw as in the wings, the blade about 5 mm. long, 2 to 2.5 mm. broad. Vexillar stamen free at the base. Ovary linear, densely white-pubescent, about 4.5 mm. long, 5-ovulate; style strongly arcuate; stigma capitellate, subbilobulate.

Legume obovate or elongate, long attenuate stipitate, rounded or acuminate at the apex, coriaceous, glabrous, either 1-seeded, then 3.5 to 4.5 cm. long, 1.6 to 1.7 cm. broad, or 2-seeded, then more or less constricted and thin between the seeds and 6.5 cm. long or more; carinal margin concave, about 4 mm. broad in front of the seeds. Seeds reniform, compressed, about 6 mm. long and 8 mm. broad.

Type in the John Donnell Smith Herbarium, collected on the strand belt at Salinas Bay, Guanacaste, Costa Rica, in flower, June, 1890, by A. Tonduz (Inst. Fis. Geogr. Costa Rica, no. 2731).

ADDITIONAL SPECIMENS EXAMINED:

COSTA RICA: Around Orotina, near San Mateo, in flower, June 15 to 17, 1906,

Maxon 578. Around Nicoya, on wooded hills, in fruit, December, 1899, Tonduz (Inst. Fis. Geogr. Costa Rica, no. 13570).

Capt. Smith gave this species a manuscript name but afterward referred it to *L. atropurpureus* Benth. Although undoubtedly very closely related to that species, its distinctness is quite evident and fully supported by the characters of the fruit, which Capt. Smith had not seen. The leaflets are almost always 7, narrowly and almost acutely acuminate, not obtuse or shortly obtuse-acuminate; furthermore, while in *L. atropurpureus* the groove of the petiolules is broadly open, it is closed and subtubular in the new species. The flowers are slightly smaller, the pubescence of the petals is more marked, and the standard is of a distinct shape at the base. The legume is much broader and does not seem to contain more than 2 seeds. But for the fact that *L. parviflorus* Benth. is described as having almost always 5 leaflets, whereas the leaves of the Costa Rican tree usually show 7, I should feel inclined to refer the latter to that species.

The specific name *calyculatus*, suggested by Capt. Smith, is hardly applicable to a *Lonchocarpus*, since there is no involucre of bractlets imitating a calyx, hence with his courteous consent I have dropped his name and designated the species from one of the localities at which it has been collected.

EXPLANATION OF PLATE 5.—See p. 73.

30. *Lonchocarpus hondurensis* Benth. Journ. Proc. Linn. Soc. Bot. 4: Suppl. 91. 1860.

A small tree 6 to 8 meters high, the branchlets stout, brownish, glabrous, sparsely lenticellate.

Leaves 5-foliate, glabrous, the rachis broadly canaliculate, 4 to 7 cm. long. Leaflets coriaceous, the petiolules stout, narrowly canaliculate, 3 to 4 mm. long, the blades

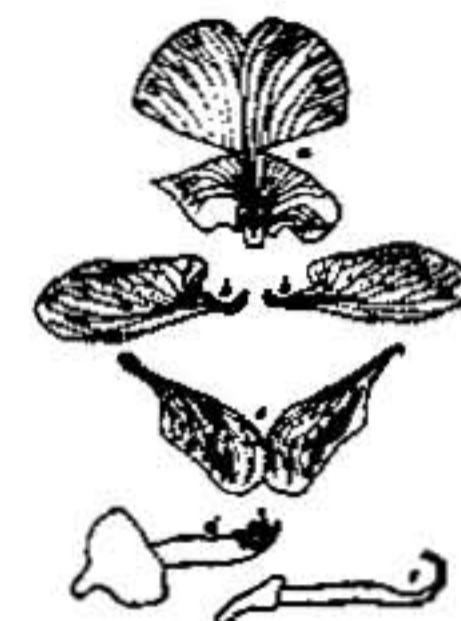


FIG. 25.—*Lonchocarpus orotinus*. a, Standard; b, wings; c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From Inst. Fis. Geogr. Costa Rica 2731.

FIGURE 26.

ovate-oblong, subcuneate at the base, the apex with a short, obtuse acumen, 3.5 to 10 cm. long, 1.5 to 4 cm. broad, sublustrous and light green above, paler beneath, the costa and veins prominent. Stipules not seen.

Racemes erect, solitary in the axils of the upper leaves and forming long panicles at the ends of the branchlets, the rachis glabrous, angulate, densely flowered, 6 to 12

cm. long. Peduncles and pedicels minutely pubescent, the former solitary, mostly biflorous, about 1.5 mm. long, the latter 1 mm. long or less; bracts and bractlets broadly ovate, pubescent, the latter about 0.5 mm. long, opposite and close to the calyx. Calyx broadly cupulate, subdentate, minutely pubescent, about 3.5 mm. long. Petals purplish red; standard broadly orbicular, sublobulate and callous at the base, slightly emarginate at the apex, the claw 2.5 mm. long, the blade minutely pubescent on the back, about 9 mm. long and 10 mm. broad; wings elongate, oblique, adhering to the keel, auriculate, rounded-obtuse at the apex, slightly pubescent, the claw 3.5 mm. long or less, the blade 7.5 mm. long, 3.5 mm. broad; carinal petals elongate, subfalcate, rounded-obtuse, scarcely auriculate, minutely pubescent without, the claw 3.5 to 4 mm. long, the blade 6.5 mm. long, 3 mm. broad. Staminal tube dilated at the base, the vexillar stamen free, the upper free part of the filaments minutely hairy. Ovary stipitate, linear, pubescent, about 6.5 mm. long, 5 to 9-ovulate; style arcuate, pubescent at the base; stigma capitellate.

FIG. 26.—*Lonchocarpus hondurensis*. a, Standard; b, wings; c, carinal petals; d, calyx, stamens, and style; e, pistil. Natural size. From Rovirosa 121.

pubescent, about 6.5 mm. long, 5 to 9-ovulate; style arcuate, pubescent at the base; stigma capitellate.

Legume not known.

Type from Honduras, collected by R. Temple (Banks Herbarium).

The above description is from Wilson 706 (see below).

SPECIMENS EXAMINED:

BRITISH HONDURAS: Botanic Station, Belize, in flower, June, 1898, Campbell.

Near Puerto Sierra, along Highland Creek, in flower, March 8, 1903, Wilson 706.

MEXICO: Llanos del Carrizal, Tabasco (common), in flower, February 28, 1888, Rovirosa 121.

In Tabasco this has the vernacular name "gusano."

A beautiful and striking species, not easily confused. It has already been reported from Tabasco by E. P. Johnson (no. 31).

31. *Lonchocarpus comitensis* Pittier, sp. nov.

A small tree or a shrub, the branchlets stout, grayish, densely lenticellate, the younger parts densely fuscous-tomentose.

Leaves 7 to 11-foliolate, the rachis fuscous-tomentose, terete, 2 to 4 cm. long. Leaflets subcoriaceous, the petiolules tomentose, hardly over 1 mm. long, the blades ovate, oblong, or obovate, rounded and subattenuate at the apex, 1 to 3.5 cm. long, 0.7 to 1.5 cm. broad, pilosulous above, the costa impressed, beneath reticulate, pubescent, the costa and veins prominulous and ferruginous. Stipules not seen.

Racemes axillary, the rachis densely fuscous-pubescent, 4 to 6 cm. long. Flowers about 1.5 cm. long. Peduncles and pedicels fuscous-tomentose, the former biflorous, about 1 mm. long, the latter 4 to 5 mm. long; bracts and bractlets oblong, fuscous-pubescent, 1 to 2 mm. long, the latter opposite and appressed to the calyx. Calyx cupulate, broad, truncate, densely fuscous-tomentose, about 5 mm. long. Petals not seen. Vexillar stamen free. Ovary sessile, linear, pubescent, about 8 mm. long, 5-ovulate; style slightly arcuate, sparsely pubescent.

Fruit not known.

Type in the U. S. National Herbarium, no. 470630, collected at Comitán, State of Chiapas, Mexico, in flower, April 3, 1904, by E. A. Goldman (no. 827).

This species is characterized by its small leaves, not unlike those of *Lonchocarpus atropurpureus* Benth. or other members of the same section, its peculiar pubescence, its large flowers with the style of *L. mexicanus*, etc. Unfortunately the petals have been destroyed by insects and the fruits are wanting.

32. *Lonchocarpus lucidus* Pittier, sp. nov.

Lonchocarpus sericeus var. *glabrescens* Benth. Journ. Proc. Linn. Soc. Bot. 4: Suppl. 88. 1860.

A large tree with rounded crown; bark of the branchlets dark brown, pubescent, lenticellose.

Leaves 7 to 13-foliolate, the rachis 12 to 17 cm. long, more or less ferruginous-pubescent, deeply sulcate. Leaflets coriaceous; petiolules 5 mm. long, subsulcate, hairy; leaflet blades elliptic-ovate or obovate, slightly oblique, rounded at the base, shortly obtuse-acuminate at the apex, 6 to 11 cm. long, 2 to 6 cm. broad, glabrous, dark green and lustrous above, paler and sparsely hairy on the costa and nerves beneath, the nerves impressed above and prominent beneath. Stipules not seen.

Racemes axillary or paniculate at the ends of the branchlets, the rachis 20 to 24 cm. long (as long as or longer than the leaves), slightly ferruginous-pubescent, the peduncular part 5.5 cm. long. Flowers 12 to 14 mm. long (without the pedicels), solitary or 2 or 3 together in distant clusters, the peduncles and pedicels ferruginous-pubescent, the former 1.5 to 2 mm. long, 2-flowered, the latter about 1 mm. long; bracts and bractlets ovate or orbicular, the former about 1 mm. long, ferruginous-pubescent, the latter opposite and contiguous to the calyx, 1.5 mm. long, 2 mm. broad. Calyx cupulate, toothed, about 5 mm. long, densely ferruginous-pubescent, the 2 anterior teeth rounded and coalescent, the 3 posterior acute but almost obsolete. Petals pink; standard ovate or orbicular, 2-lobulate at the base, emarginate at the apex, almost flat, densely silky-hairy on the back, the claw 2 mm. long, the blade 10 mm. long, 8 mm. broad, the basal lobes callous and revolute; wings auriculate, rounded at the apex, adhering to the carina, slightly grayish-pubescent along the median line, the claw 4.5 mm. long, the blade 8.5 to 9 mm. long, 4 mm. broad; carinal petals falcate, rounded at the apex, mostly free, grayish-pubescent, the claw 5 mm. long, the blade 8 mm. long, 3.5 mm. broad. Vexillar stamen free at the base. Ovary 7 mm. long, silky-pubescent, 5-ovulate; style incurved, 3.5 to 4 mm. long, sharply separated from the ovary, hairy almost to the tip; stigma capitellate.

Legume flat, 1 to 4-seeded, coriaceous, glabrescent, 3 to 11 cm. long, 1.7 cm. broad, more or less contracted between the seeds, the vexillar margin broadened opposite the seeds (nearly 5 mm. broad) and slightly concave. Seeds reniform, flat, dark brown, about 11 mm. long and 6 mm. broad.

Type in the U. S. National Herbarium, no. 334017, collected at Santo Domingo de Osa, Costa Rica, in forests, flowers, March, 1896, by A. Tonduz (Inst. Fis. Geogr. Costa Rica, no. 9950). The legume and seeds are described from Pittier 3879, cited below.

OTHER SPECIMENS EXAMINED:

PANAMA: Gatún Valley, in submerged forest, immature flowers, March 25, 1914, Pittier 6508. Along Río Fató, Province of Colón, in forest, fruits, July 8, 1911, Pittier 3879.

This species is very common in Panama. Besides differing from *L. sericeus* (Poir.) H. B. K. in several details of its general description, the type of the legume is distinct, the vexillar margin being concave and broad and not sharply carinate. Consequently

FIGURE 27.



FIG. 27.—*Lonchocarpus lucidus*. a, Standard; b, wings; c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From Inst. Fis. Geogr. Costa Rica 9950.

it can not be considered a form of the latter species. Neither can it be identified with *L. domingensis* DC., which has the fruits of *L. sericeus*, and it is very doubtful whether it corresponds to *L. macrophyllus* H. B. K., as surmised by Bentham.

33. *Lonchocarpus constrictus* Pittier, sp. nov.

PLATE 6, A. FIGURE 28.

An erect shrub or small tree 2 to 5 meters high, deciduous, the bark grayish or reddish, lenticellate on the branchlets; young shoots glabrous.

Leaves 5 to 11-foliolate, mostly 7 to 9-foliolate, the rachis canaliculate, slender, glabrous or glabrescent, 2 to 10 cm. long. Leaflets coriaceous, the petiolules 2.5 to 5 mm. long, canaliculate, at first densely hairy, later sparsely hairy and darkish, the blades ovate or obovate, rounded or cuneate at the base, rounded-obtuse or emarginate at the apex, 1.5 to 7 cm. long, 1.5 to 4 cm. broad, glabrous above, beneath at first softly hairy and later glabrous, the costa and veins prominent. Stipules triangular-acute, about 2 mm. long, densely canescent, deciduous.

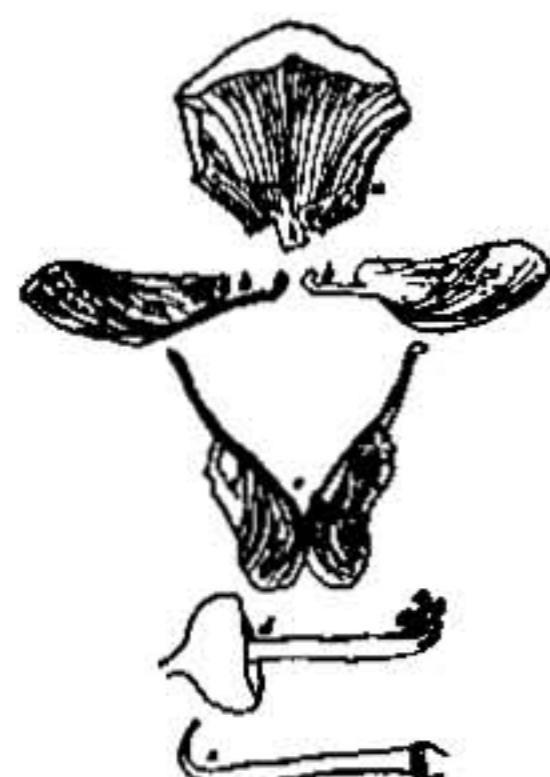


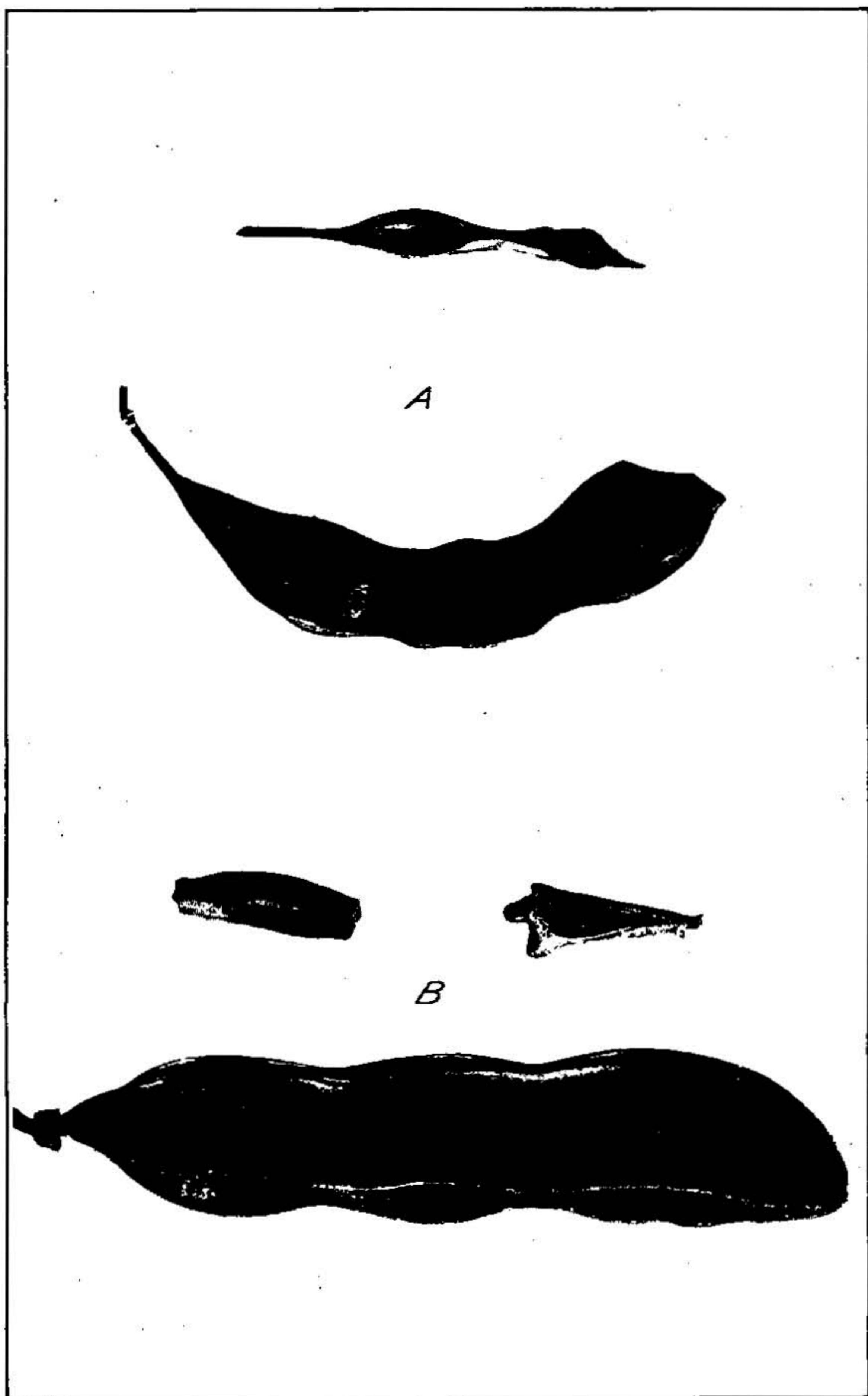
FIG. 28.—*Lonchocarpus constrictus*. a, Standard; b, wings; c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From Palmer 1379.

Racemes appearing before the leaves, solitary on the nodes of young branchlets, the rachis cano-pubescent, 4 to 6 cm. long, provided at the base with an oblong, caducous, canescent-tomentose bract about 3 mm. long; peduncles and pedicels cano-pubescent, the former very short (1 mm. or less), solitary, mostly biflorous, the latter about 2 mm. long; bractlets subulate, hairy, about 1 mm. long, the upper pair a little below the calyx, rather conspicuous. Calyx cupulate, subturbinate at the base, sinuate-denticulate on the margin, fulvous-pubescent without, 3 to 3.5 mm. long. Petals reddish purple; standard orbicular, concave, slightly emarginate at the apex, densely silvery-pubescent without, with a green spot at the base, the claw arcuate and obliquely inserted, 1 to 1.5 mm. long, the blade about 9.5 mm. long and broad, with the basal lobes inconspicuous, callous, each bearing on the inside a short calcarate appendage, the margins involute; wings adhering to the carina, oblique, oblong, rounded-auriculate, rounded at the apex, sparsely pilosulous without at the apex, irregularly spotted, the claw about 3 mm. long, the blade 8 to 8.5 mm. long, about 2.5 mm. broad; carinal petals falcate, convex but not always plicate, scarcely auriculate, rounded-obtuse, densely pubescent along the upper half of the carinal margin, irregularly spotted, the claw about 4 mm. long, the blade 6.5 mm. long, 2.6 mm. broad. Staminal tube glabrous, the vexillar stamen free at the base. Ovary sessile, linear, densely cano-pubescent, about 7.5 mm. long, 6-ovulate; style strongly arcuate, pubescent at the base; stigma capitellate, inconspicuous.

Legume long and slender stipitate, oblique, arcuate, acute at the apex, glabrous, 1.5 cm. broad, either 1-seeded and about 5.5 cm. long, or 2 or 3-seeded and up to 10.5 cm. long, constricted between the seeds, the carinal suture broadened at the seeds, flat, marginate on both sides, 6 to 7 mm. broad. Seeds obovate, hardly incurved on the hilum side, 12 mm. long, 7 mm. broad, about 4.5 mm. thick, reddish brown, the hilum deep, white-bordered.

Type in the U. S. National Herbarium, no. 208513, collected at Manzanillo, State of Colima, Mexico, flowers and young leaves, March, 1891 by Edward Palmer (no. 1379). The description of the adult leaves and fruits is from National Herbarium no. 266224, collected at Acapulco, State of Guerrero, Mexico, along the sea beach, between October, 1894, and March, 1895, Palmer 73.

In the shape of the leaflets and fruits this species departs from all the other members of the subgenus *Neuroscapha*. The standard is curiously plicate and appendiculate at the base, and the spotted wings and carina remind one of the species of the section *Punctati*, but the leaves are not pellucid-punctate. The bractlets also constitute a good distinctive character.



FRUITS OF (A) *LONGHOCARPUS CONSTRICTUS* PITTIER AND (B) *L. SERICEUS* (POIR.)
H. B. K.

34. *Lonchocarpus guatemalensis* Benth. Journ. Proc. Linn. Soc. Bot. 4: Suppl. 87. 1860.

FIGURE 29.

A deciduous tree, the branchlets grayish, glabrous, covered with numerous suborbicular lenticels.

Leaves 5 or 7-foliolate, at maturity entirely glabrous, the rachis terete (not canaliculate), 4.5 to 9.5 cm. long. Leaflets coriaceous, sparsely pellucid-punctate, the petiolules canaliculate, 4 to 6.5 mm. long, the blades ovate-oblong (the terminal one often obovate), subcuneate at the base, shortly obtuse-acuminate at the apex, 4 to 10 cm. long, 2 to 5.2 cm. broad, dark green and sublustrous above, paler beneath, the costa prominent. Stipules not seen.

Racemes axillary on foliate or defoliate nodes, solitary, geminate, 3 to 5-fasciculate, or forming small branched panicles, the rachis more or less grayish-pubescent, 6 to 14 cm. long. Flowers preceding the new leaves or appearing at about the same time. Peduncles and pedicels grayish-pubescent, the former very short (2 mm. long or less), the latter about 4 mm. long; bracts and bractlets ovate-acute, very small, grayish-pubescent without, glabrous within, the latter slightly remote from the calyx. Calyx cupulate, subturbinate at the base, 4.5 to 5 mm. long, densely grayish-pubescent, the margin (distinctly 5-toothed in the bud) sinuate, slightly 5-lobulate. Petals pinkish or purplish, densely yellow-dotted, the carinal ones cohering; standard orbicular, more or less oblique, elobate but callous-plicate at the base, emarginate at the apex, the claw 3.5 mm. long, the blade 9.5 mm. long, 11 mm. broad, densely silky-pubescent without; wings oblong, obtuse at the apex, glabrous, the auricle on the vexillar side very prominent, the claw 4.5 to 5 mm. long, the blade about 8 mm. long and 3.5 mm. broad; carinal petals rounded at the apex, hardly lobulate on the vexillar side, pubescent along the carinal side without, the claw nearly 5 mm. long, the blade 7 to 7.5 mm. long, 3.7 mm. broad. Vexillar stamen free at the base, the margins of the openings in the staminal tube callous-thickened. Ovary sessile, linear, densely grayish-hairy, about 7 mm. long, 7-ovulate; style arcuate, hairy at the base; stigma subcapitellate.

Fruit not known.

Type (in flower) collected in Guatemala by Friedrichsthal.

The above description is from J. D. Smith's no. 7852, collected at Cubilquit, Alta Verapaz, Guatemala, at an altitude of 350 meters by H. von Türkheim, in April, 1901. Bentham cites also Jurgensen 159 from southern Mexico. To this species I refer further Kerber 420, from Mexico; Tonduz (Inst. Fis. Geogr. Costa Rica, no. 13880), collected at Nicoya, Costa Rica; and sheet no. 48928 of the U. S. National Herbarium, collected by C. Wright in Nicaragua.

Bentham places this species at the head of his section *Neuroscaphi* and describes the vexillar suture as concave and 3.2 mm. broad. On the other hand, the tree just described, most of whose characters agree with those ascribed to *L. guatemalensis*, has the pellucid-punctate leaves of the species of the section *Punctati* and the yellow-spotted petals of some of them. It would so be intermediate between the true *Lonchocarpi* and the group forming the genus *Neuroscapha* Tulasne. I do not know, however, whether the immature legume described by Bentham really belongs to the type specimen, and in the negative case, either a confusion or a misplacing of species has been made. The fruits are indispensable to elucidate the point.

Lonchocarpus guatemalensis differs from the species of the section *Punctati* in the absence of basal lobules on the standard and in the more developed auricles

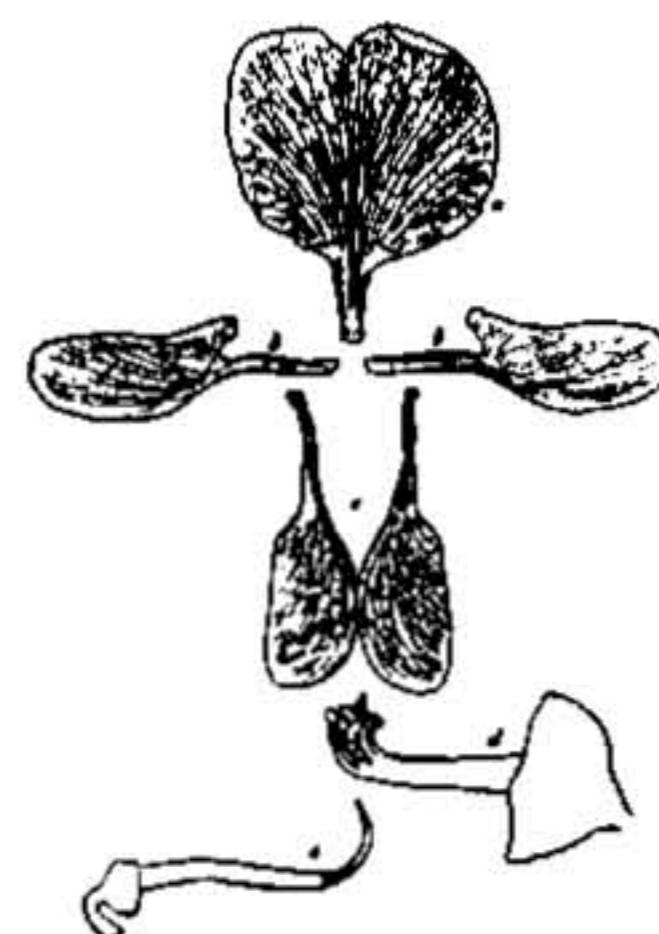


FIG. 29.—*Lonchocarpus guatemalensis*. a, Standard; b, wings; c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From J. D. Smith 7852.

of the wings; its nearest relatives would be, perhaps, *L. proteranthus* and *L. punctatus*.

The above-described specimens were distributed as *Lonchocarpus sericeus* H. B. K. var. *sericeus* Micheli, an obviously mistaken identification.

35. *Lonchocarpus emarginatus* Pittier, sp. nov.

FIGURE 30.

Branchlets short, grayish, lenticellate, at first tomentellous.

Leaves 5 to 11-foliolate, the rachis slightly canaliculate, hairy, 3 to 8.5 cm. long. Leaflets coriaceous, the petiolules canaliculate, hairy, 3 to 4 mm. long, the blades oblong, rounded at the base, emarginate at the apex, 2 to 5 cm. long, sparsely pubescent or glabrescent above, beneath paler, reticulate, sparsely pubescent, the costa and veins prominent. Stipules not seen.

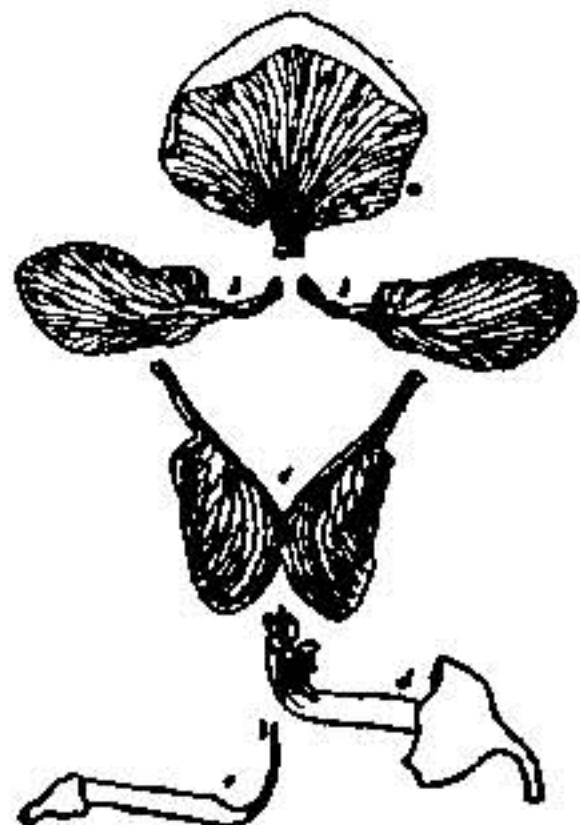


FIG. 30.—*Lonchocarpus emarginatus*. a, Standard; b, wings; c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From Purpus 6814.

base, the staminal tube glabrous. Ovary linear, stipitate, densely cano-pubescent, about 5.5 mm. long, 3 or 4-ovulate; style long, acicular, arcuate, pubescent at the base; stigma capitellate.

Legume not known.

Type in the U. S. National Herbarium, no. 567145, collected at El Picacho, near San Gerónimo, State of Oaxaca, Mexico, in flower, October, 1913, by C. A. Purpus (no. 6814).

This species is distinct from every other in Middle America. In the absence of the fruit its systematic place in the genus remains doubtful. The characters of the flowers, however, point to a close relationship with the species of the section Carinati, series Sericiflori.

36. *Lonchocarpus salvadorensis* Pittier, sp. nov.

FIGURE 31.

A large deciduous tree. Bark of the branchlets brownish, glabrescent, lenticellose; young shoots brownish-pubescent.

Leaves 7-foliolate, the rachis, petiolules, and lower surface of the leaflets at first densely brownish-pubescent, later glabrous; rachis 10 cm. long, sulcate at the base. Leaflets coriaceous, the petiolules terete, 6 to 10 mm. long, the blades ovate to elliptic (the terminal one more or less obovate), subcuneate at the base, acuminate at the apex, 4 to 10 cm. long, 2 to 5 cm. broad, pilosulous above at first, glabrous and lustrous later, the nervation prominent beneath. Stipules very small, hairy.

Racemes paniculate at the ends of defoliate branchlets, short, stout, densely flowered, the rachis 12 to 25 cm. long, pubescent at first, glabrous later. Peduncles usually biflorous, hairy, very short; pedicels 2 mm. long or less; bracts and bractlets grayish-

pubescent, the former short (less than 1 mm. long), broad, early caducous, the upper ones opposite, suborbicular, about 3 mm. long and broad, appressed to the base of the calyx and almost persistent. Calyx truncate, about 5 mm. long, densely grayish-pubescent without. Petals purple, with white claws; standard suborbicular, emarginate at the apex, silky-pubescent on the back, the claw about 3 mm. long, the blade 15 mm. long and broad, the basal lobules small, callous and revolute; wings oblong, auriculate, the claw 5.5 mm. long, the blade 11 mm. long, 5.5 mm. broad, pubescent outside along the lower margin, sparsely so on the claw; carinal petals mostly free, subauriculate, obtuse, pubescent without and within along the lower margin and on the claw, this about 5 mm. long, the blade 10 mm. long, 5 mm. broad. Vexillary stamen free at the base; staminal tube sparsely pubescent all over, about 12 mm. long. Ovary short-stipitate, linear, 9-ovulate, about 9 mm. long, densely grayish-pubescent; style arcuate, sparsely pubescent almost to the tip; stigma capitellate.

Fruit not known.

Type in the U. S. National Herbarium, no. 578330, collected near Nahuizalco, Department of Sonsonate, El Salvador, at an altitude of 550 meters, in flower, February 16, 1907, by H. Pittier (no. 1932).

Another specimen of the same is Renson 238, collected in flower near San Salvador. I refer also to this species J. D. Smith's no. 4143, collected along the Río de los Esclavos, Department of Santa Rosa, in the adjacent coastal belt of Guatemala, by Heyde and Lux. These specimens differ from the type only in the elongate racemes. They were determined by the late Micheli as *L. guatemalensis* Benth., an association which is indicated at first sight as erroneous on account of the large bractlets contiguous to the calyx.

Lonchocarpus salvadorensis is related closely to *L. sericeus*, but differs in the reduced number of leaflets, the short, dense, paniculate inflorescences, blossoming before or simultaneously with the appearance of the new leaves, the large bractlets, the pubescence of the petals and staminal tube, the shape of the standard, etc.

Vernacular name, "sangre de chicho;" local Nahuatl, "i-kua-pelo."

37. *Lonchocarpus palmeri* Rose, Contr. U. S. Nat. Herb. 1: 322. 1895.

FIGURE 32.

A spreading tree 6 to 10 meters high, the trunk 15 to 30 cm. in diameter, the branchlets grayish brown, at first ferruginous-pubescent, lenticellate.

Leaves 7 to 13-foliolate, the rachis narrowly canaliculate, 8 to 15 cm. long, more or less pubescent. Leaflets coriaceous, the petiolules obscurely canaliculate, densely ferruginous-pubescent, 5 to 6 mm. long, the blades ovate, oblong, or obovate, rounded at the base, obtuse or shortly obtuse-acuminate at the apex, 4.5 to 9.5 cm. long, 2.5 to 4.5 cm. broad, glabrous or glabrescent and sublustrous above, finely reticulate and puberulous beneath, the costa and veins more or less hairy and impressed on the upper face, prominent and ferruginous-pubescent beneath. Stipules not seen.

Racemes solitary on defoliate nodes at the ends of the branchlets, the rachis ferruginous-pubescent, 12 to 25 cm. long. Peduncles and pedicels ferruginous-pubescent, the former 3.5 mm. long, 2-pedicellate, the latter about 3 mm. long, each often bearing 2 or 3 flower buds; bracts and bractlets ovate, ferruginous-pubescent, the latter about 2 mm. long, appressed to the calyx. Calyx cupulate, rather narrow, about 5 mm. long, densely ferruginous-pubescent, the margin sinuate-dentate. Petals diversely colored; standard suborbicular, subemarginate at the apex, densely silky-

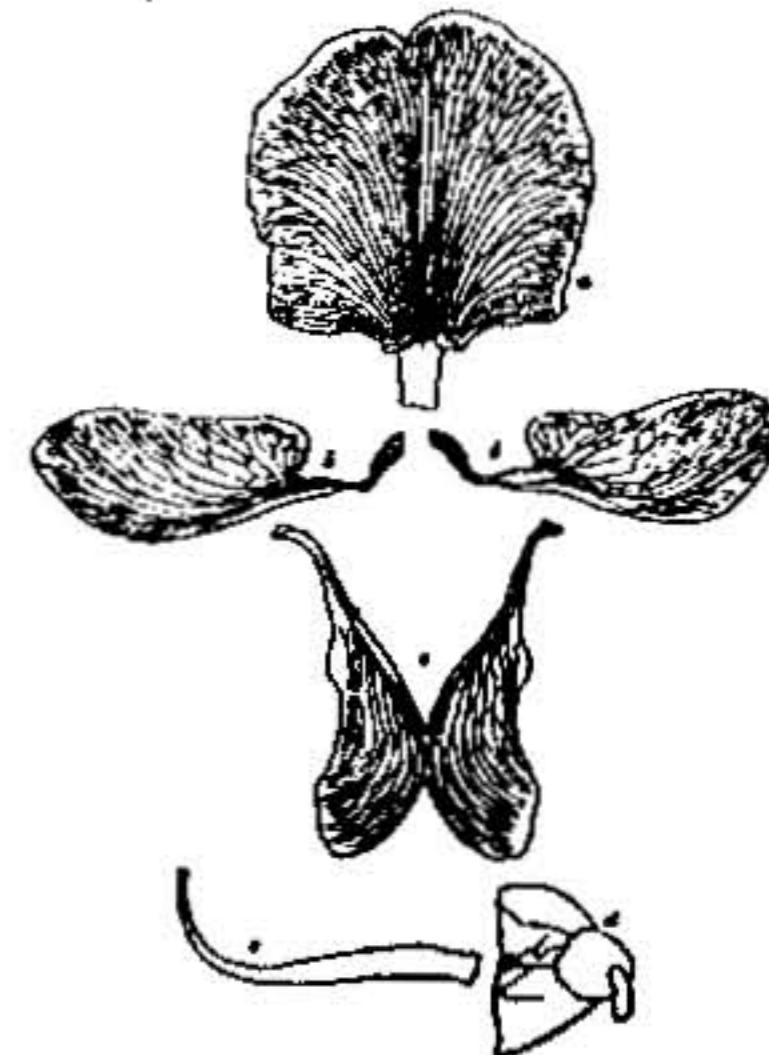


FIG. 31.—*Lonchocarpus salvadorensis*. a, Standard; b, wings; c, carinal petals; d, calyx; e, pistil. Natural size. From Pittier 1932.

pubescent on the back, greenish yellow, the basal lobules remote from the claw and subacute, the claw about 3 mm. long, obliquely inserted, the blade about 13 mm. long and 13.2 mm. broad; wings and keel purplish or light mauve, the former oblong, auriculate on the vexillar side, truncate-obtuse at the apex, sparsely villous along the carinal side down to the claw, adhering to the carina, the claw 4.5 to 5 mm. long, the blade 10 mm. long, 4.5 mm. broad; carinal petals falcate, convex, subacute, auriculate, plicate, slightly cohering, pubescent without along the carinal side and on the claw and within at the base of the blade, the claw 5 mm. long, the blade about 10 mm. long and 3.5 mm. broad. Staminal tube broadly dilated at the base, sparsely hairy along the vexillar side; upper end of the filament villous; vexillar stamen free at the base. Ovary linear, somewhat attenuate at the base, densely villous, about 7 mm. long, 8-ovulate; style arcuate, villous at the base; stigma inconspicuous.

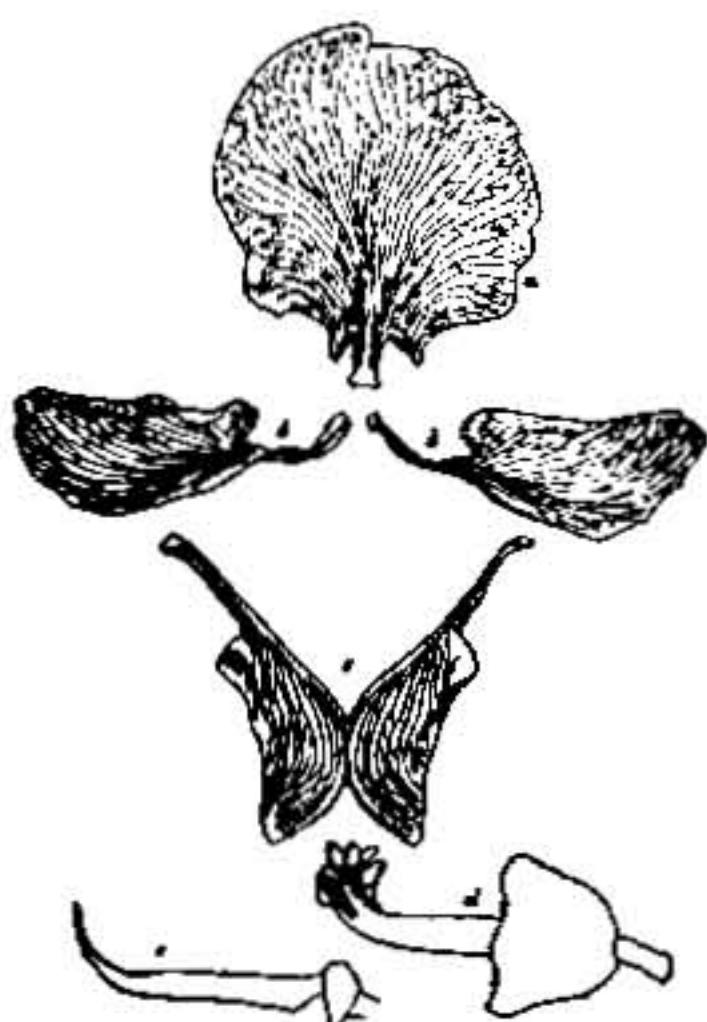


FIG. 32.—*Lonchocarpus palmeri*.
a, Standard; b, wings; c, carinal petals; d, calyx and stamens;
e, pistil. Natural size. From
Palmer 1021.

in flower and fruit, December, 1890, by Edward Palmer (no. 1021).

Closely related to *L. sericeus*, but differing in the size of the flowers, the shape and pubescence of the petals, the hairy stamens, and the greater breadth of the pods.

38. *Lonchocarpus sericeus* (Poir.) H. B. K. Nov. Gen. & Sp. 6: 383. 1823.

PLATE 6, B (facing p. 78). FIGURE 33.

Robinia sericea Poir. in Lam. Encycl. 6: 226. 1804.

A small tree, the branchlets, rachises of the leaves, and those of the inflorescences more or less ferruginous-pubescent, the bark of the branchlets brownish or grayish, lenticellate.

Leaves 7 to 13-foliolate, the rachis 7.5 to 11 cm. long, canaliculate, the groove broader at the insertion of the leaflets, the pubescence dense at first, more or less evanescent later. Leaflets coriaceous, the costa and veins deeply impressed above, prominent beneath, the petiolules 4 to 6 mm. long, more or less ferruginous-hairy, obscurely canaliculate, the blades ovate, obovate, or oblong, rounded at the base, rounded-obtuse or shortly obtuse-acuminate at the apex, 3.5 to 9 cm. long, 2.5 to 3.5 cm. broad, minutely puberulous above at first, glabrous at later stages, minutely pubescent, principally on the costa and veins, beneath. Stipules ovate, obtuse, densely ferruginous-hairy, about 3 mm. long, caducous.

Racemes solitary in the axils of the upper leaves, the rachis (velvety-hairy at first, glabrous in fruiting specimens) 9 to 24 cm. long. Peduncles and pedicels densely ferruginous-pubescent, the former solitary, or 2 or 3 together and then 2-flowered, about 3 mm. long, the latter 2 to 4 mm. long; bracts and bractlets ovate-orbicular, the latter opposite and approximate to the calyx. Calyx cupulate, subtruncate or remotely sinuate-toothed, about 5 mm. long, densely ferruginous-pubescent without. Petals pinkish or purplish; standard suborbicular (broader than long), biauriculate and callous at the base, emarginate at the apex, flat, the claw 2.5 mm. long, the blade 11.5 to 12 mm. long, 14.5 mm. broad, densely silky-pubescent without, and within above the claw; wings adhering to the carina, rounded-auriculate at the base on the vexillar side, obtuse at the apex, slightly silky-pubescent without, the claw 4.5 mm.

long, the blade about 10 mm. long and 5 mm. broad; carinal petals mostly free, falcate, auriculate, more or less distinctly folded along the vexillar margin, densely silky-pubescent on the upper half and along the carinal margin, the claw 4.5 mm. long, the blade about 8.5 mm. long and 3.5 mm. broad. Vexillar stamen free at the base, the tube broadened-auriculate, leaving an ovate opening on each side of the former. Ovary sessile and thickened at the base, linear, roundish, densely canescent-pilose, about 8 mm. long, mostly 7-ovulate; style arcuate, sharply distinguished from the ovary, hairy at the base only; stigma capitellate.

Legume compressed, attenuate at the base, acute at the apex, more or less fulvous-pubescent, the vexillar suture thickened opposite the seeds, sharp on the edge; seeds 1 or 2 to 5, when 1 or 2 the legume ovate-oblique, about 5 cm. long and 2.3 cm. broad, when more, the legume elongate, constricted between the seeds, arcuate with the vexillar side concave, 5 to 12 cm. long, 2.3 cm. broad. Seeds surrounded with a coriaceous endocarp, oblong-reniform, 12 to 14 mm. long, 7 mm. broad, 4 mm. thick, dark chocolate-brown with white hilum.

Type (*Robinia sericea* Poir.) in Jussieu Herbarium, from America. The above description of the flower is based on specimens collected at Castleton Gardens, Jamaica, by Mr. Wm. Harris (no. 9153); that of the fruit from Edward Palmer no. 598, collected at Acapulco, Mexico, October, 1894, to March, 1895.

OTHER SPECIMENS EXAMINED:

MEXICO: María Madre Island, in fruit, May, 1895, Nelson 4310. Sihuataneja,

Guerrero, in fruit, April 9, 1903, Nelson 7011. Between Rosario, Sinaloa, and Concepción, Tepic, July 28, 1897, Rose 3268 (immature specimen).

CUBA: La Herradura, Pinar del Río, in flower, August 26, 1905, van Hermann 119.

PORTO RICO: Los Indios de Guayanillo, along the river, immature flowers and imperfect fruits, July 29, 1886, Sintenis 4991 (determined by Urban but doubtful).

MARTINIQUE: Marigot, in flower, October, 1869, Hahn 1223.

TRINIDAD: Fendler 318, young fruits.

This species seems to be widely spread over the West Indies, extending to Mexico in one direction, to Colombia and Brazil in another. It has not been reported as yet from Central America.

According to Bentham its area of dispersion includes western tropical Africa.

EXPLANATION OF PLATE 6.—See p. 78.

39. *Lonchocarpus robustus* Pittier, sp. nov.

FIGURE 34.

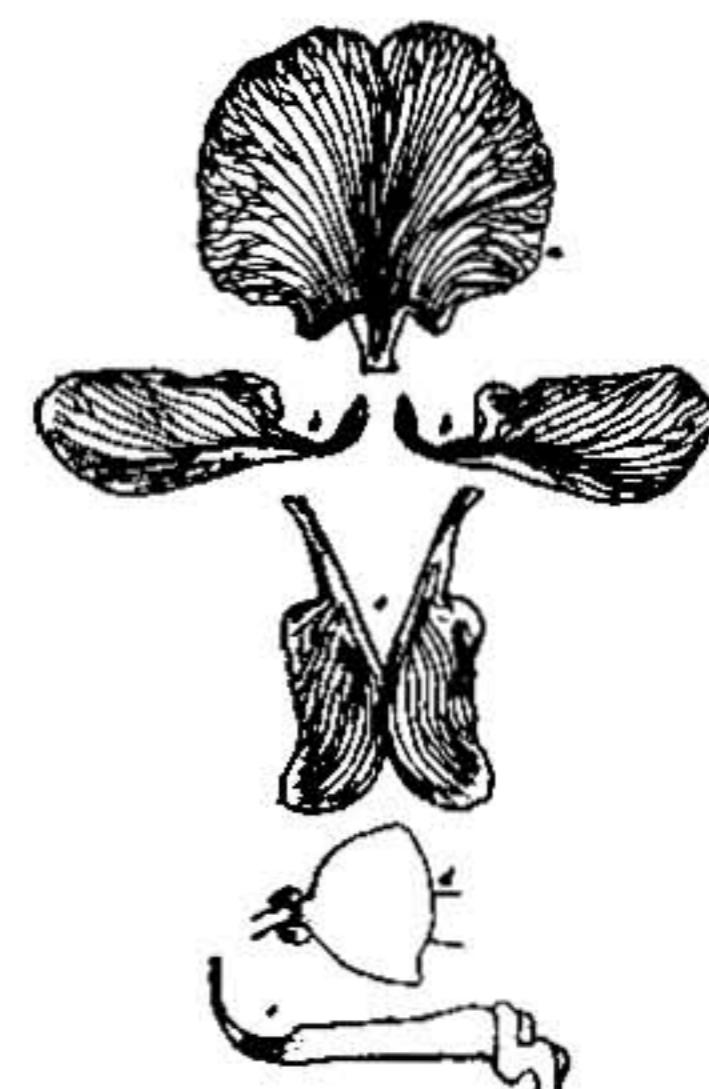


FIG. 33.—*Lonchocarpus sericeus*.
a, Standard; b, wings; c, carinal petals; d, calyx; e, pistil.
Natural size.

A tree, the branchlets thick, nodose, at first ferruginous-pubescent. Leaves 9 to 13-foliolate, the rachis canaliculate, ferruginous-puberulous, 11 to 18 cm. long. Leaflets submembranous, the petiolules canaliculate, ferruginous-hairy, about 5 mm. long, the blades oblique, ovate or oblong, rounded and subattenuate at the base, obtuse-acuminate at the apex, 4 to 8 cm. long, 2 to 3 cm. broad, glabrous and minutely reticulate above, reticulate and minutely pubescent beneath, the costa and veins sparsely ferruginous-hairy, subimmersed above, very prominent beneath.

Racemes axillary, subpanicle at the ends of the branchlets, the rachis striate, ferruginous-hairy, 5.5 to 9 cm. long. Peduncles and pedicels ferruginous-pubescent, about 1 mm. long, the former usually biflorous; bracts and bractlets very small and

caducous, the latter close to the calyx. Petals pinkish or purplish; standard suborbicular, concave, subbilobulate, callous-plicate and broader at the base, emarginate at the apex, silky-pubescent without, the claw about 1.5 mm. long, the blade 8 mm.

long, 8.5 mm. broad, the margins inflexed; wings elongate, oblique, auriculate, subattenuate toward the obtuse apex, sparsely pubescent without, the claw 3 mm. long, the blade about 6 mm. long, 2.7 mm. broad; carinal petals falcate, obtuse, pubescent along the carinal margin and at the apex, the claw as in the wings, the blade 4.5 mm. long, 3.5 mm. broad. Upper part of the staminal tube and free part of the filaments sparsely ferruginous-pilosulous, the vexillar stamen free at the base. Ovary linear, minutely but densely ferruginous-pubescent, about 5.5 mm. long, 3-ovulate; style short, ferruginous-hairy; stigma capitellate, large for the genus.

Legume not known.

Type in the U. S. National Herbarium, no. 252378, collected near Yajalón, State of Chiapas, Mexico, in flower, November 21, 1895, by E. W. Nelson (no. 3413).

A species closely related to *Lonchocarpus sericeus* (Poir.) H. B. K. and *L. santarosanus* Donn. Smith, differing from both in the pubescence, the shape of the leaflets, and the size and indument of the flowers. It comes closer to *L. santarosanus* in the length and shape of the pistil and in the very broad carinal petals, but the ovary is 3-ovulate and the leaflets are distinct in several details.

40. *Lonchocarpus santarosanus* Donn. Smith, Bot. Gaz. 57: 418. 1914.

FIGURE 35.

A tree 6 to 8 meters high, the branchlets grayish, minutely lenticellate, at first pubescent.

Leaves 11 to 15-foliolate, the rachis minutely pubescent, canaliculate, 15 to 21 cm. long. Leaflets membranous or subcoriaceous, the petiolules hairy, canaliculate, 4 to 6 mm. long, the blades lanceolate, oblong, or ovate-oblong, rounded or subacute at the base, rather long and acutely acuminate, 4 to 7.5 cm. long, 1.5 to 2.5 cm. broad, glabrous and minutely reticulate above, beneath paler, densely pubescent, subreticulate, the costa and veins prominent. Stipules not seen.

Racemes axillary, densely flowered, the rachis puberulous, 6 to 12 cm. long. Peduncles and pedicels hairy, the former 4 to 6 mm. long, mostly biflorous, the latter 2 to 3 mm. long; bracts and bractlets small, ovate-oblong, pubescent, the latter inserted a little below the calyx. Calyx cupulate, truncate, broad, 1.5 to 2 mm. long, pubescent. Petals scarlet (fide J. D. Smith); standard orbicular, concave, silky-pubescent without, distinctly callous-plicate at the base, emarginate at the apex, the margins reflexed, the claw about 1 mm. long, arcuate, the blade about 6 mm. long and 7.5 mm. broad; wings adhering to the keel, oblong, auriculate, obtuse, the claw 2 mm. long, the blade about 4 mm. long, 1.8 mm. broad; carinal petals falcate, very oblique, truncate at the base, obtuse, the claw as in the wings, the blade 3.5 mm. long, 2.5 mm. broad. Vexillar stamen free at the base; filaments minutely pubescent. Ovary linear, stipitate, densely pubescent, about 3.5 mm. long, 2-ovulate; style sharply bent at the base; stigma capitellate.

Legume not known.

Type in the John Donnell Smith Herbarium, collected at Mataquesquintla, Department of Santa Rosa, Guatemala, at an altitude of about 1,560 meters, flowers (all fungus-infected), March, 1894, by Heyde and Lux (J. D. Smith, no. 6328).

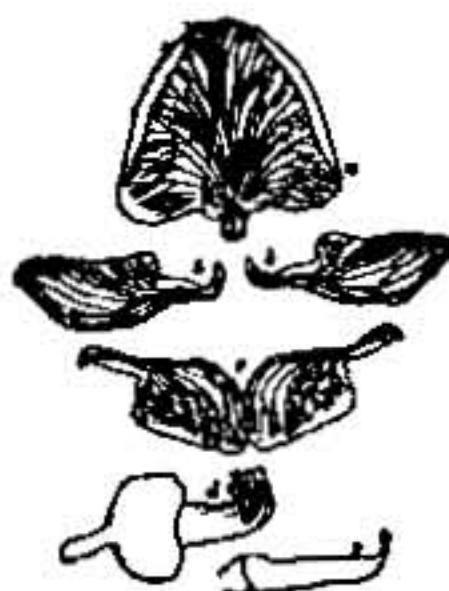


FIG. 34.—*Lonchocarpus robustus*. a, Standard; b, wings; c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From Nelson 3413.



FIG. 35.—*Lonchocarpus santarosanus*. a, Standard; b, wings; c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From J. D. Smith 6328.

The affinities of this species seem to be with *Lonchocarpus sericeus* (Poir.) H. B. K., but the leaflets are more numerous and distinctively shaped, the flowers small, the ovary 2-ovulate, etc.

EXCLUDED OR DOUBTFUL SPECIES.

LONCHOCARPUS ERIOPHYLLUS Benth. Journ. Proc. Linn. Soc. Bot. 4: Suppl. 94. 1860.

FIGURE 36.

This is the type of the section *Eriophylli* Benth. The tree differs from the usual *Lonchocarpus* type in the very numerous leaflets, the long narrow wings, and the numerous ovules. In the absence of the legume it might just as well find a place in the genus *Gliricidia*. Langlassé's specimens, cited below, have been compared with the type, through the kindness of the authorities of the Royal Botanic Gardens at Kew, and are described as follows:

A tree 4 to 5 meters high; young shoots, rachises of the leaves and inflorescences, petiolules, and pedicels softly grayish-tomentose; bark of the branchlets reddish brown, smooth, the lenticels inconspicuous.

Leaves 11 to 23-foliolate, the rachis up to 14 cm. long; petiolules 3 mm. long; leaflet blades oblong, sometimes oblique, broadly rounded at the base, subacute and mucronulate at the apex, 2 to 3.5 cm. long, 1 to 1.5 cm. broad, pubescent above, grayish villous tomentose beneath; costa and veins impressed and often conspicuous on the upper face, prominent beneath. Stipules very small, triangular-acute, early deciduous.

Spikes axillary on the young shoots, erect, 10 to 12 cm. long, rather densely flowered. Flowers geminate, about 2 cm. long from base of calyx to apex of the petals, the peduncles 4 mm. long, the pedicels 5 to 6 mm. long; bracts and bractlets very small, ovate, deciduous. Calyx broadly and shallowly cupulate, 5 to 6 mm. long, softly tomentose without, 5-toothed, the 2 anterior teeth more or less rounded, close together, and almost coalescent, the 3 posterior ones remote and acute. Petals reddish purple, softly villous without, glabrous within; standard suborbicular, the claw 3 mm. long, the blade 17 mm. long, 16 mm. broad, the median axis and claw in a straight line; wings oblong, subfalcate, oblique, slightly adhering to the keel, the claw about 4.5 mm. long, the blade 15 to 15.5 mm. long, 4.5 mm. broad; carinal petals falcate, slightly coherent, the claw 4.5 mm. long, the blade 15 to 15.5 mm. long, 5.5 to 6 mm. broad. Stamens 10, monadelphous, glabrous. Ovary linear, sessile, densely hairy, 11 or 12-ovulate, 12 mm. long; style slender, glabrous, strongly arcuate, 7 to 7.5 mm. long, ending in a lateral, liguliform stigma.

Legume not known.

Type collected near Chilla, in the vicinity of Puebla, Mexico, by Andrieux (no. 439).

A second collection is from Los Hornos, Michoacán or Guerrero, Mexico, altitude 700 meters, in flower, June, 1899, Langlassé.

LONCHOCARPUS OBOVATUS Benth. Journ. Proc. Linn. Soc. Bot. 4: Suppl. 93. 1860.

Of this species I have seen only fragmentary specimens, kindly sent from Kew, consisting of a leaflet, remarkable for its long petiolule and reminding one by

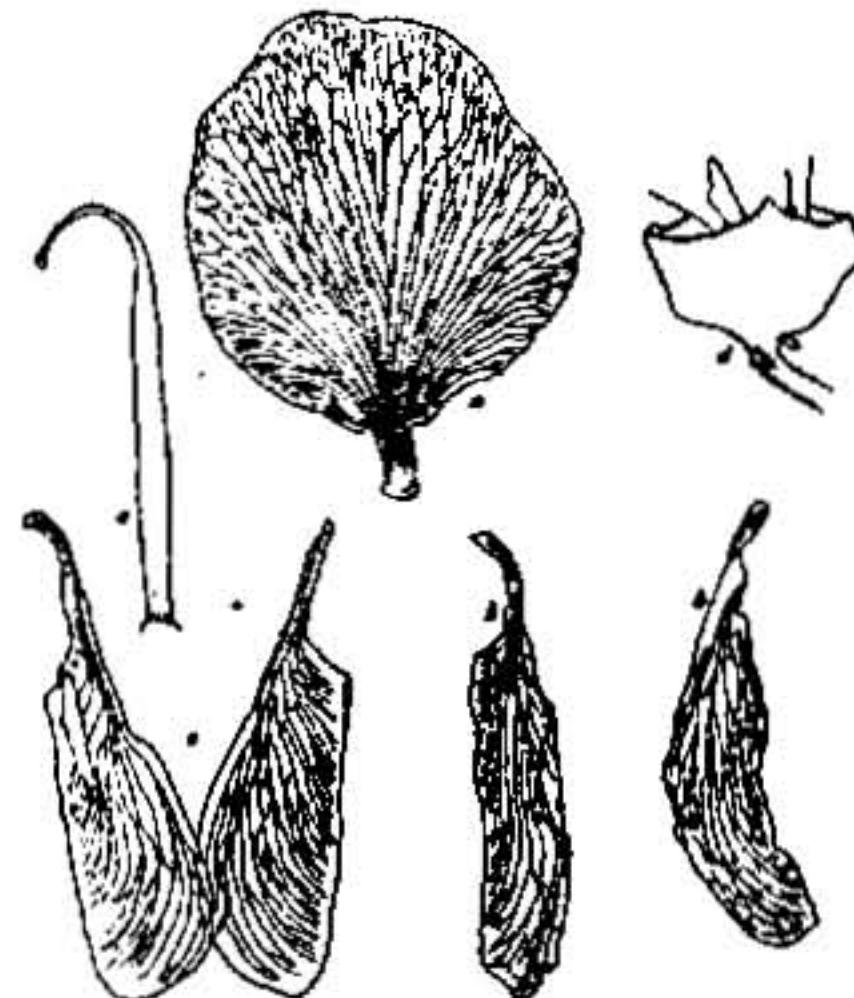


FIG. 36.—*Lonchocarpus eriophyllum*. a, Standard; b, wings; c, carinal petals. Natural size.

its texture of the genus *Dalbergia*, and a flower which does not give any conclusive evidence except that the wings are apparently free. In the absence of better material, especially of the fruit, the status of this species remains doubtful. The type was collected at Chilla, District of Puebla, Mexico, by Andrieux (no. 440).

LONCHOCARPUS PHASEOLIFOLIUS Benth. Journ. Proc. Linn. Soc. Bot. **4**: Suppl. 93. 1860.

Another species of doubtful status, known only from a description of incomplete specimens at Kew. Collected also by Andrieux, near Tehuantepec, Mexico (no. 462).

LONCHOCARPUS PARVIFLORUS Benth. Journ. Proc. Linn. Soc. Bot. **4**: Suppl. 89. 1860.

Certainly a good species, according to the description, but unfortunately not found in the material at my disposal. In the key it should be placed near *L. atropurpureus*.

LONCHOCARPUS LITTORALIS T. S. Brandeg. Zoe **5**: 157. 1903.

According to Brandegee, the only "generic variation is in the calyx, which, instead of being truncate, with very short obsolete teeth, is divided half its length into lanceolate lobes." More important, and, indeed, decisive, as diverging characters, are the dehiscent pods and stipellate leaflets. This plant does not belong in *Lonchocarpus*.

TRANSFERRED SPECIES.

Gliricidia meistophylla (Donn. Smith) Pittier.

Lonchocarpus meistophyllus Donn. Smith, Bot. Gaz. **56**: 55. 1913.

This differs from *Lonchocarpus* in the appearance of the leaves and flowers. Moreover, the staminal tube is split, with the vexillar stamen often almost free, and the basal fenestrellæ are either absent or with very thin margins; the calyx is quite aberrant, and the thickened margins of the ovary seem to indicate a dehiscent legume. For these reasons the transfer, as above, is proposed.

Pringle 5649 and 6748, *Rose* 5869 and 9923, and *Purpus* 1187, labeled as *Lonchocarpus*, all have dehiscent pods and stipellate leaflets; they should be placed among the *Galegeae*, perhaps in or near *Galactia*.

SOUTH AMERICAN AND WEST INDIAN SPECIES.

Many Middle American specimens have been identified as *Lonchocarpus violaceus* Benth., but this name is now found to be untenable. The type of the genus, *L. punctatus* H. B. K., was confused with the supposed *violaceus* by Bentham. To exhibit the distinctive characters of the two and to show how they differ from the Middle American species of the section *Punctati*, they have been included in the above key and are fully described and discussed hereafter.

Among the species collected in Santa Marta, Colombia, by Herbert H. Smith and in Venezuela by J. R. Johnston and the writer some were found to be new, and others to belong to little-known types. Their detailed descriptions are also added to the present paper, as well as that of another species, discovered in Bolivia by H. H. Rusby and belonging to the section *Fasciculati* Benth.

Lonchocarpus benthamianus Pittier.

FIGURE 37.

Lonchocarpus violaceus Benth. Journ. Proc. Linn. Soc. Bot. **4**: Suppl. 95. 1860, not H. B. K. 1823.

A small tree, the branchlets, leaves, and rachis of the inflorescences entirely glabrous.

Leaves 7 to 11-foliolate, the rachis subterete, canaliculate on the basal part, 9 to 20 cm. long. Leaflets membranous, pellucid-punctate, the petiolules canaliculate, 6 mm. long, the blades ovate, more or less oblique, rounded at the base, obtusely acuminate, 4 to 9 cm. long, 3 to 4.5 cm. broad, dark green above, paler beneath; costa and veins (8 or 9) rather prominent beneath. Stipules not seen.

Racemes axillary, 15 to 25 cm. long. Peduncles solitary, 6 to 7 mm. long, biflorous, glabrous; pedicels slender, 7 to 8 mm. long, glabrous; bracts and bractlets ovate, suborbicular, minute, ciliate on the margin, very caducous. Calyx broadly cupulate, rounded at the base, truncate, glabrous, more or less glandular-dotted, about 5 mm. long. Petals whitish without, pale purple or pinkish within; standard orbicular, glabrous, about 15.5 mm. long and broad, projecting at the base in a narrow, bilobate, rounded appendage, deeply emarginate at the rounded apex, emarginate on both sides of the basal appendage, this about 3 mm. long and 3.5 mm. broad, the claw strongly arcuate, 2 mm. long, inserted on the back of the appendage; wings obovate, oblique, auriculate, more or less inflexed on the upper margin, the lower margin strongly arcuate, the claw about 5.5 mm. long, the blade rounded-obtuse at the apex, 11.5 mm. long, 6 mm. broad; carinal petals falcate, convex in the middle, broadly rounded at the apex, sparsely pubescent along the lower margin, the claw about 5 mm. long, the blade 9.5 to 10 mm. long. Vexillar stamen free at the base only. Ovary sessile, linear, minutely pubescent, about 9 mm. long, 3 or 4-ovulate; style arcuate, hairy toward the apex.

Legume lanceolate, compressed, suboblique, long-stipitate, subulate-acuminate, 1-seeded, about 6 cm. long and 3 cm. broad, glabrous, the vexillar suture narrowly marginate, the carinal suture thin-edged and broader. Seed reniform, depressed, dark brown, about 15 mm. long and 10 mm. broad.

Type from the West Indies.

SPECIMENS EXAMINED:

GUADELOUPE: Duss 2663 (small tree, especially abundant on the cliffs and in stony places close to the seashore at Vieux Fort, Le Baillif, Deshaies, etc., at altitudes from 0 to 400 meters; flowers May to August; common name "savonnette").

MARTINIQUE: Duss 1091 (a common tree; delights in the neighborhood of the sea; Case Pilote, Prêcheur; blossoms in July and August; common name "savonnette"). Collines du Bois Brûlé, in fruit, August, 1871, Hahn 1123.

BARBADOS: In flower, December, Waby 9 (a slender, tall tree, rather common, the flowers pale pinkish). In flower, April to June, 1895, Waby 106 (a small tree with white flowers).

The name *Lonchocarpus violaceus* Benth. has no standing under the current rules. As mentioned above (p. 38), when Kunth created the genus he suggested the transfer into it of several species, among them *Robinia violacea* Beauv.¹ This is an African tree, possibly the same as *L. sericeus* (Poir.) H. B. K., or a synonym of *Capassa violacea* Klotzsch² and *L. philenoptera* Benth.,³ but certainly not the same as *Robinia*



FIG. 37.—*Lonchocarpus benthamianus*.
a, Standard; b, wings; c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From Duss 2663.

¹ H. B. K. Nov. Gen. & Sp. 6: 383. 1823.

² In Peters, Reise Mossamb. Bot. 28. pl. 5. 1862.

³ App. Speke's Journ. 632. 1863.

violacea Jacq. from Cartagena. Though Kunth did not actually designate the former species as *Lonchocarpus violaceus*, he obviously indicated the convenience of doing so. On the other hand, the identity of the plant from Cartagena, described by Jacquin, with the West Indian species to which Bentham's name was applied is by no means certain, since the former is described as having 3 or 4-foliolate leaves, short pedicels, flowers with the color and scent of the violet, and diadelphous stamens,¹ all characters conspicuously absent in the latter. Hence the name *Lonchocarpus violaceus* as applied by Bentham must be discarded, first, because it is manifestly a synonym and, second, because Bentham's plant is neither of the species originally designated as *Robinia violacea*. As to *Robinia sepium* Swartz,² it is described as a shrub or small tree often 20 feet high, with 3-foliolate leaves, a bilabiate, 5-toothed calyx, and a lanceolate ovary, all characters which are not found in Bentham's plant. Lastly, I expect to show that *Lonchocarpus punctatus* H. B. K. is a distinct species. Many other forms which appear in our American collections under the name of *L. violaceus* do not belong there.

As understood here, *L. benthamianus* has a very reduced area of distribution, being found, so far as is known, only in Martinique, Guadeloupe, Barbados, and Montserrat. It probably occurs in the intermediate islands also.

***Lonchocarpus punctatus* H. B. K. Nov. Gen. & Sp. 6: 383. 1823.**

FIGURE 38.

A tree, the branchlets terete, grayish, glabrous, lenticellate.

Leaves mostly 7-foliolate, sometimes 5 or 9-foliolate, entirely glabrous, the rachis slender, subterete, more or less distinctly canaliculate, 7 to 12 cm. long. Leaflets sub-

coriaceous, petiolulate, densely pellucid-punctate, the dots appearing (with or without lens) as black spots on the faces of the blade; petiolules glabrous, canaliculate, 4 mm. long; blades ovate-oblong, rounded at the base, obtusely acuminate at the apex, minutely reticulate, 3 to 5 cm. long, 1.5 to 3.8 cm. broad, light green and sublustrous above, paler beneath. Stipules not seen.

Racemes axillary, paniculate at the ends of the branchlets, the flowers sweet-scented, the rachis glabrous, more or less angulate, 7 to 16 cm. long. Peduncles and pedicels glabrous, the former biflorous, 4 to 8 mm. long, the latter about 6 mm. long; bracts and bractlets very small, ovate, ciliate. Calyx broadly cupulate, usually truncate, sometimes subdentate, glabrous, 4.5 to 5 mm. long, more or less spotted (when seen against the light). Petals reddish pink, covered with numerous glandular dots (visible under the lens only); standard suborbicular, concave, bilobulate at the base, deeply emarginate at the apex, the claw inserted on the back of the basal lobules, about 2.8 mm. long, the blade pubescent without above the insertion of the claw, marked at the base with a large dark purple spot, 12 to 13 mm. long, about 15.5 mm. broad; wings obovate, very oblique, auriculate at the base on the vexillar side, obtuse at the apex, the claw about 5 mm. long, the blade 10.5 to 11 mm. long, 6 mm. broad, slightly pubescent at the apex; carinal petals falcate, subauriculate on the vexillar margin, more or less pubescent without, the claw 4.5 mm. long, the blade convex near the base, 9.5 to 10 mm. long, 4 to 5 mm. broad. Vexillar stamen free at the base. Ovary sessile, linear, puberulous at the base, elsewhere glabrous, about 8.5 mm. long, 7 to 9-ovulate; style arcuate, hairy at the base and along the carinal side up to 1 mm. from the apex; stigma ligulate, very small.

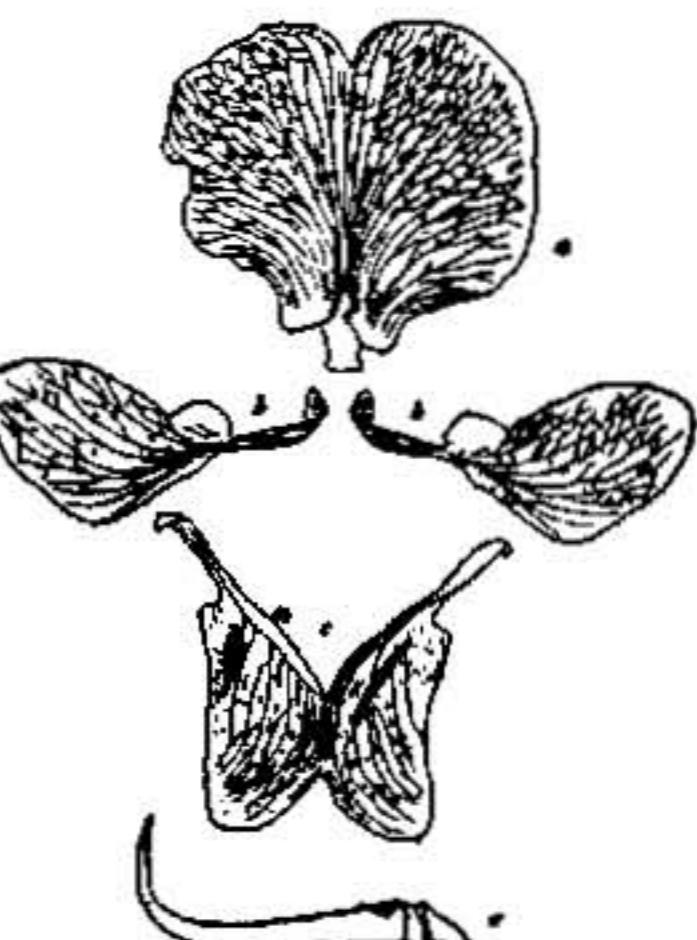


FIG. 38.—*Lonchocarpus punctatus*.

a, Standard; b, wings; c, carinal petals; d, pistil. Natural size.
From Johnston 22.

apex, the claw inserted on the back of the basal lobules, about 2.8 mm. long, the blade pubescent without above the insertion of the claw, marked at the base with a large dark purple spot, 12 to 13 mm. long, about 15.5 mm. broad; wings obovate, very oblique, auriculate at the base on the vexillar side, obtuse at the apex, the claw about 5 mm. long, the blade 10.5 to 11 mm. long, 6 mm. broad, slightly pubescent at the apex; carinal petals falcate, subauriculate on the vexillar margin, more or less pubescent without, the claw 4.5 mm. long, the blade convex near the base, 9.5 to 10 mm. long, 4 to 5 mm. broad. Vexillar stamen free at the base. Ovary sessile, linear, puberulous at the base, elsewhere glabrous, about 8.5 mm. long, 7 to 9-ovulate; style arcuate, hairy at the base and along the carinal side up to 1 mm. from the apex; stigma ligulate, very small.

Legume not known.

Type from Cumaná, Venezuela, collected by Humboldt and Bonpland.

¹ Jacq. Stirp. Amer. 210. pl. 177. f. 49. 1763.

² Fl. Ind. Occ. 1258. 1806.

The specimens examined are Johnston 22 and Johnston & Miller 257, collected at El Valle, Island of Margarita, Venezuela, in July and August, 1901.

This species is the type of the genus *Lonchocarpus*. It differs strikingly from *L. benthamianus*, of the West Indies, in the size of the leaves, the number, shape, and size of the leaflets, the coloration of the petals, the indument of the pistil, the number of the ovules, and several minor details. The transparent dots of the leaflets extend to the petals and on the former are conspicuous on the surface as minute black spots. The dark spot at the base of the standard, quite visible in dry specimens, is also a good distinctive character.

Margarita Island lies very close to the coast of Paria, and not far from Cumaná, the type locality of the species. Notwithstanding slight discrepancies in the details, there can hardly be a doubt as to the identity of the specimens described above with the tree reported by Bonpland. Like that of *L. benthamianus*, the distributional area of this species seems to be very restricted. The tree has been reported from other parts of Venezuela under the vernacular name "aco," which, however, may apply to several species.

***Lonchocarpus densiflorus moritzianus* Benth. Journ. Proc. Linn. Soc. Bot. 4: Suppl. 100. 1860.**

FIGURE 39.

Section Densiflori. A deciduous tree, the branchlets stout, grayish, glabrous.

Leaves 7-foliolate, the rachis broadly canaliculate (the channel aristate at the bottom), glabrous, 17 to 25 cm. long. Leaflets coriaceous, the petiolules thick, 6 mm. long, canaliculate, sparsely pubescent or glabrescent, the blades ovate or oblong, broadly rounded at the base, obtuse-acuminate at the apex, 8 to 16 cm. long, 5 to 6.5 cm. broad, dark green, glabrous, and more or less lustrous above, paler and glabrescent or sparsely pilosulous (on the costa principally) beneath; costa and veins slightly prominent on both sides.

Racemes axillary on the defoliate nodes, the rachis mostly thick, arcuate, rigid, about 18 cm. long, ferruginous or grayish-pubescent. Peduncles fasciculate, simple, pubescent, 3 to 5 mm. long; bracts oblong, pubescent, sinuate on the margin, up to 4 mm. long, early deciduous; bractlets ovate or suborbicular, about 1 mm. long, scarious, pubescent, appressed to the calyx, caducous. Calyx broadly cupulate, sinuate-toothed, 5.5 to 6 mm. long, minutely pubescent, purplish, more or less distinctly pale-striped longitudinally. Petals purple, shading to white toward the base; standard orbicular, emarginate and prominently callous-plicate at the base, concave, broadly rounded and slightly emarginate at the apex, densely white-spotted, softly pubescent without, the claw 4.5 mm. long, the blade about 12 mm. long and 14 mm. broad; wings strongly arcuate-falcate, auriculate, sparsely white-spotted, glabrous or slightly pubescent; carinal petals falcate, concavo-convex and bulging toward the outside at the base, subauriculate, subobtuse at the apex, densely gray-pubescent along the keel, the carinal margin strongly arcuate, the claw 6 mm. long, the blade about 14 mm. long and 6.5 mm. broad. Staminal tube glabrous, slightly dilated and the vexillar stamen narrow at the base, the fenestellæ narrowing in a V-form at the apex. Ovary linear, stipitate, arcuate, gray-pubescent, about 12 mm. long, 8-ovulate; style slightly arcuate, sparsely pubescent throughout; stigma capitellate, ovoid, elongate.

Legume not known.

Type, Moritz 880, from Colombia, without precise locality; presumably in the Kew Herbarium.

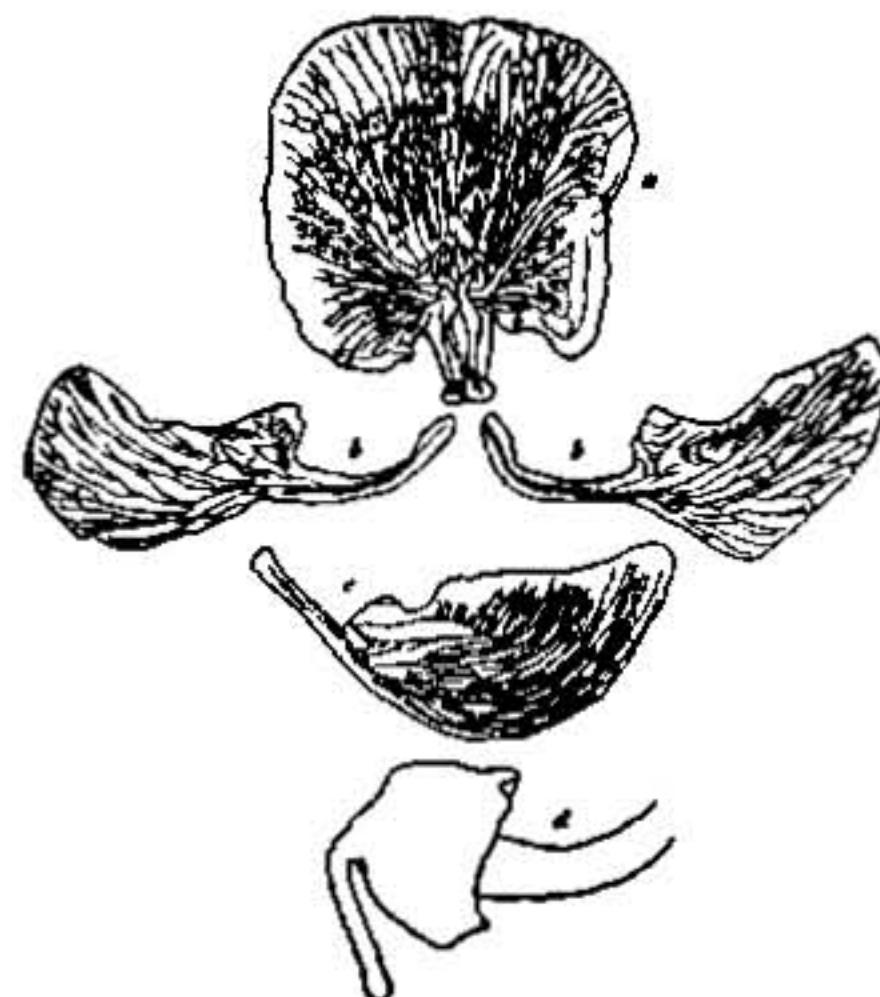


FIG. 39.—*Lonchocarpus densiflorus moritzianus*. a, Standard; b, wings; c, carinal petals; d, calyx. Natural size. From Pittier 5805.

Additional specimens were collected between Mariara and Antequera, State of Aragua, Venezuela, altitude about 600 meters, in flower, February 5, 1913, by H. Pittier (no. 5805).

A striking tree, growing in the open or parklike country and completely leafless at flowering time. I obtained only an imperfect specimen, this accounting for the deficiencies in the description of the flower.

***Lonchocarpus dipteroneurus* Pittier, sp. nov.**

Subgenus *Neuroscapha*. A small tree, the branchlets glabrous, grayish brown, minutely and densely lenticellate.

Leaves 13 or 15-foliolate, the rachis slender, canaliculate, glabrous or minutely pilosulous, 7 to 11.5 cm. long. Leaflets coriaceous, oblique, the petiolules canaliculate, about 2 mm. long, pilosulous, the blades ovate or lanceolate, rounded and ultimately often subattenuate at the base, more or less obtusely attenuate-acuminate at the apex, 3 to 6 cm. long, 1 to 3 cm. broad, dull green and glabrous above, paler and sparsely pubescent beneath, the costa and veins slightly prominent and pilosulous on both faces.

Flowers not known.

Legume ovate-lanceolate, more or less concavo-convex, strongly arcuate on the carinal side, long-stipitate, arcuate-rostrate at the apex, glabrous, either 1-seeded, then about 5 cm. long and 2.5 cm. broad, or 2-seeded, then strongly contracted between the seeds and up to 7 cm. long; carinal margin thin-edged; vexillar margin concave opposite the seeds, about 5 mm. broad, each side broadly winged. Seeds oblong, subcylindrical, subreniform, about 6 mm. long, 12 mm. broad, light brown.

Type in the U. S. National Herbarium, nos. 601697 and 601698, collected on the Guinand Estate (Cárdenas), Sique Valley, State of Miranda, Venezuela, at an altitude of about 600 meters, in fruit, March, 1913, by H. Pittier (no. 5978).

Known among the natives under the name of "grifo," this species is distinct from any of those seen by me. It evidently belongs to the subgenus *Neuroscapha*, but the fruits are remarkable on account of their shape and of the strongly developed double wing on the vexillar margin.

***Lonchocarpus fendleri* Benth. Journ. Proc. Linn. Soc. Bot. 4: Suppl. 94. 1860.**

FIGURE 40.

A deciduous tree 4 to 12 meters high, with depressed crown, the branchlets grayish, lenticellate, at first canescent-tomentellous.

Leaves 7 to 13-foliolate, appearing with the flowers, the rachis terete or subcanaliculate, 3.5 to 9 cm. long, at first tomentose, later ferruginous-pubescent. Leaflets ovate-oblong or obovate, rounded or cuneate at the base, obtuse or subacute at the apex, 3.5 to 9 cm. long, 2 to 4 cm. broad, at first membranous, glabrous and dark green above, the costa and veins pilosulous, softly tomentose beneath, later coriaceous, glabrous and lustrous above, the costa and veins impressed, beneath paler, more or less rufous-tomentose, the costa and veins prominent.



FIG. 40.—*Lonchocarpus fendleri* Benth. Journ. Proc. Linn. Soc. Bot. 4: Suppl. 94. 1860.
a, Standard; b, wings; c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From Pittier 6045.

Racemes axillary, the rachis gray-pubescent, about 14 cm. long or shorter. Peduncles geminate, simple, about 6 mm. long, gray-pubescent; bracts and bractlets elongate-oblong, hardly 1 mm. long, tomentose without, the latter solitary (?) and close to the calyx. Calyx subturbinate-campanulate, obsoletely 5-toothed, about 5 mm. long, gray-pubescent without. Petals pinkish purple; standard orbicular, smooth and attenuate at the base, emarginate at the apex, sparsely pubescent without, the

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claw 2.5 to 3.5 mm. long, the blade about 8.5 mm. long and 11 mm. broad; wings oblong, subfalcate, auriculate, obtuse, glabrous or sparsely pilosulous without, the claw 5 mm. long, the blade about 9 mm. long, 3.5 mm. broad; wings falcate, auriculate, obtuse and narrow at the apex, the claw 5.5 mm. long, the blade 8 mm. long, 3.5 mm. broad. Staminal tube not dilated at the base, the openings narrow, gradually closing toward the apex, the filaments alternately long and short, the anthers ovate, sparsely setulous at the base. Ovary linear, stipitate, densely grayish-pubescent, about 8 mm. long, 6-ovulate; style arcuate, glabrous; stigma inconspicuous.

Legume coriaceous, stipitate, more or less ferruginous-velvety, 1-seeded, lanceolate-acuminate, about 8 cm. long and 2 cm. broad, or sometimes 2 to 4-seeded, up to 12 cm. long and 2 cm. broad. Seeds broadly reniform, flattened, about 11 mm. broad, light brown with white hilum.

The type (in Kew Herbarium) was collected at Colonia Tovar, Venezuela, by A. Fendler (no. 2219¹, flowers, 1863², fruits).

SPECIMENS EXAMINED:

VENEZUELA: La Trinidad de Maracay, Aragua, in light forest, alt. about 440 meters, in flower, April 17, 1913, Pittier 6045; in fruit, February 3, 1913, Pittier 5803. Colonia Tovar, Fendler 1863² (a duplicate of the type specimen, Gray Herb.). Mariara, Aragua, in fruit, February 5, 1913, Pittier 5804.

Bentham placed this species among his Eriophylli and suggested also that it may come near *Lonchocarpus rugosus*, among the Densiflori. It is, however, fundamentally distinct on account of the unbranched peduncles, the shape of the basal openings of the staminal tube, and the setulous anthers.

Lonchocarpus fendleri pubescens Pittier, subsp. nov.

A deciduous tree about 15 meters high, the trunk straight, the crown depressed. Leaves 7-foliolate, imperfectly developed at flowering time. Leaflets oblong, obtuse, glabrous above, minutely but densely pubescent beneath. Floral spikes intensely purple, the calyx and petals also purple.

Type in the U. S. National Herbarium, no. 601779, collected in the valley of El Limón, near Maracay, Aragua, Venezuela, in forests, flowers, April 18, 1913, by H. Pittier (no. 6052).

At Maracay, *Lonchocarpus fendleri* was known under the name of "mahonio" or "majomo," but at Mariara, not far distant, it was pointed out to me as the "mijagua" or "mijao," which is also the current appellation for *Anacardium rhinocarpus*.

Lonchocarpus margaritensis Pittier, sp. nov. FIGURE 41.

A tree or a shrub, the branchlets brownish, lenticellate, at first puberulous.

Leaves 7-foliolate, the rachis slightly canaliculate, shortly ferruginous-hairy, 10 to 12 cm. long. Leaflets subcoriaceous, petiolules about 4 mm. long, densely brown-hairy, the blades ovate or oblong, rounded or subcuneate-attenuate at the base, acute and mucronulate at the apex, 2.5 to 9.5 cm. long, 2.8 to 3.2 cm. broad, puberulous and light green above, paler, reticulate, and softly pubescent beneath, the costa and veins immersed above, prominent beneath. Stipules triangular, apiculate, ferruginous-pubescent, about 5 mm. long, early deciduous.

Racemes axillary, subpanicle at the ends of the branchlets, the rachis ferruginous-hairy, 3 to 7.5 cm. long. Peduncles and pedicels pubescent, the former not over 1 mm. long, the latter 2 to 2.5 mm. long; bracts and bractlets linear, hairy, about

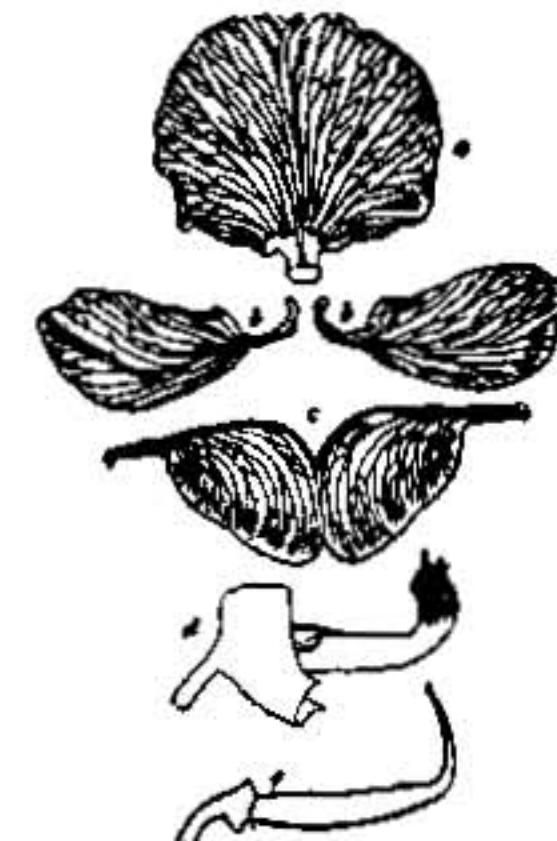


FIG. 41.—*Lonchocarpus margaritensis*. a, Standard; b, wings; c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From Johnston 23.

2 mm. long, early caducous. Calyx cupulate, sinuate-toothed, 3 to 4 mm. long, minutely pubescent without. Petals pink; standard suborbicular, callous-plicate at the base, emarginate at the apex, minutely pubescent without, barbate at the base within, the claw about 1.5 mm. long, the blade 10 mm. long, 12 mm. broad; wings oblique, broadly obovate, slightly winged, obtuse, sparsely pilosulous at the base of the blade without, the claw about 3 mm. long, the blade 8.5 mm. long, 5 mm. broad; carinal petals falcate, broad, obtuse, densely pubescent without, the claw 2.5 mm. long, the blade about 8 mm. long, 5 mm. broad. Staminal tube glabrous, the filaments alternately short and long. Ovary linear, stipitate, densely canopubescent, about 7 mm. long, 4-ovulate; style very long (nearly 5 mm.), geniculate, sparsely ciliate on the inside; stigma subglobose, capitellate.

Legume subchartaceous, lanceolate, stipitate, acuminate and mucronate at the apex, about 9 cm. long, 2.6 cm. broad, 1-seeded, pale brown, pubescent. Seed reniform, compressed, about 6.5 mm. long, 11 mm. broad, dark brown.

Type in the herbarium of the New York Botanical Garden, collected at El Valle, island of Margarita, Venezuela, flowers and detached fruits, July 7, 1903, by J. R. Johnston (no. 23).

Distributed as *L. velutinus* Benth., but very distinct, especially as to floral characters, and related probably to the species of the section Spongopteri.

***Lonchocarpus sanctae-marthae* Pittier, sp. nov.**

PLATE 1, D (facing p. 54). FIGURE 42.

Section Paniculati. A deciduous, spreading tree 10 to 15 meters high, the branchlets grayish, glabrous, covered with inconspicuous lenticels.

Leaves 5 to 9- (mostly 7-) foliolate, glabrous (pubescent at the earliest stage), the rachis obscurely canaliculate, 6 to 14 cm. long. Leaflets membranous, the petiolules slightly canaliculate, 4 to 5 cm. long, the blades ovate or oblong, rounded or broadly cuneate at the base, obtusely subacuminate at the apex, 3.5 to 11 cm. long, 2 to 5 cm. broad, minutely reticulate on both faces, light green above, paler or glaucous beneath, the costa and veins prominent.

Racemes axillary (mostly on defoliate nodes), subpaniculate at the ends of the branchlets, the rachis angular, puberulous or pubescent, 4 to 14 cm. long. Pedicels simple, often geminate, 3 to 6 mm. long, sparsely pubescent; bracts and bractlets very small and deciduous, oblong, pubescent, the latter distant from the calyx. Calyx broadly cupulate, about 4 mm. long, minutely and sparsely pubescent, purplish, the margin sinuate and irregularly short-ciliate. Petals pink; standard orbicular, broadly attenuate at the base, emarginate and pubescent at the apex, the claw about 2 mm. long and broad, the blade 10 mm. long, 11.5 mm. broad; wings oblique, narrow, auriculate, obtuse, callous, concavo-convex and bulging out at the base, sparsely pilosulous without, the claw 4 mm. long, the blade about 9 mm. long, 3.5 to 4 mm. broad; carinal petals falcate, callous, concavo-convex and bulging out at the base, auriculate, subobtuse, slightly pubescent without and ciliate at the apex, the claw 4.5 to 5 mm. long, the blade 7.5 mm. long, 3 to 3.5 mm. broad. Staminal tube almost straight, glabrous, the anthers hairy at the base. Ovary linear, stipitate, minutely pubescent, about 7 mm. long, 6-ovulate; style slightly arcuate, sparsely pubescent at the base; stigma bilobulate, inconspicuous.

Legume ovate-lanceolate or elongate, stipitate, acute or obtuse at the apex, submembranous, glabrous, rounded on the margins, either 1-seeded and 4 to 4.5 cm. long,



FIG. 42.—*Lonchocarpus sanctae-marthae*. a, Standard; b, wings; c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From H. Smith 107.

or 2-seeded and 8 cm. long, 1.6 cm. broad across the seeds. Seeds broadly reniform, about 6 mm. long and 8 mm. broad, flat, reddish brown with a light-colored hilum.

Type in the U. S. National Herbarium, no. 600294, collected in dry forest near Mamatoca, at the foot of the Cordillera de Santa Marta, Colombia, altitude about 30 meters, flowers, April 10, 1899, by Herbert H. Smith (no. 107).

This beautiful species was distributed under the name of *Lonchocarpus sericeus* (Poir.) H. B. K. A look at the floral racemes shows the simple pedicels, and the pods evidently are not those characterizing the subgenus *Neuroscapha*, to which the latter belongs. On the other hand, the Santa Marta tree does not seem to correspond to any of the species with simple peduncles heretofore described.

Under the same number, three distinct collections have been distributed, obtained February 25, April 10, and August 19, 1899. A note by Mr. Smith on one of the New York Herbarium sheets explains that "this species seems to be rare, flowering principally from February to April. In April, the flowering branches were nearly leafless but the rest of the tree was covered with old and young leaves."

EXPLANATION OF PLATE 1.—See p. 54.

***Lonchocarpus boliviensis* Pittier, sp. nov.**

FIGURE 43.

Section *Fasciculati*. A tree or a shrub (?), the branchlets terete, glabrous, obscurely lenticellate.

Leaves 7 or 9-foliolate, the rachis slender, thickened and darker at the base, canaliculate, sparsely pilosulous or glabrescent, 9 to 12 cm. long. Leaflets coriaceous, the petiolules canaliculate, glabrous or sparsely pubescent, 4 to 5 mm. long, the blades oval-elliptic or elliptic-lanceolate, acute or slightly rounded at the base, acute-acuminate and mucronulate at the apex, 2.5 to 7 cm. long, 1.3 to 2.7 cm. broad, dark green, sublustrous, and, except on the impressed costa, glabrous above, paler (or subglaucous), reticulate, and minutely pubescent beneath, the costa and veins subglabrous and prominent. Stipules ovate, acute, pubescent, 3 to 4 mm. long, caducous.

Racemes axillary, the rachis thick, angular, more or less rufous-pubescent, 15 to 30 cm. long, the flowers fasciculate on thick, short peduncles. Pedicels simple, 3 to 5 mm. long, sparsely pubescent; bracts and bractlets suborbicular, about 1 mm. in diameter, densely rufous-pubescent, caducous. Calyx broadly cupulate, sinuate on the margin, about 4 mm. long, densely ferruginous-pubescent without. Petals purplish; standard subflabellate, attenuate at the base into a short claw, emarginate at the apex, about 11 mm. long (without the claw, this 1 mm. long) and 13 mm. broad, minutely dark-punctate, pubescent without; wings narrow, arcuate, long-attenuate at the base, obtuse and subbilobulate at the apex, sparsely pubescent without, ciliate on the lower margin at the base, the claw 4 to 5 mm. long, the blade about 15 mm. long and 3.5 mm. broad; carinal petals strongly falcate, attenuate at the base, acute at the apex, sparsely pubescent along the lower margin without, the claw 1 mm. long, the blade about 11.5 mm. long, 4 to 4.5 mm. broad. Staminal tube strongly arcuate, slightly hairy on the upper side. Ovary short-stipitate, linear, minutely pubescent, about 7 mm. long, 16 to 18-ovulate; style long, filiform, broadly arcuate, sparsely hairy; stigma capitellate, minutely hairy.

Fruit not known.

Type in the U. S. National Herbarium, no. 32680, collected at the junction of the rivers Beni and Madre de Dios, Bolivia, in August, 1886, by H. H. Rusby (no. 2362).

This species differs from all the others in the section *Fasciculati* in its numerous ovules.

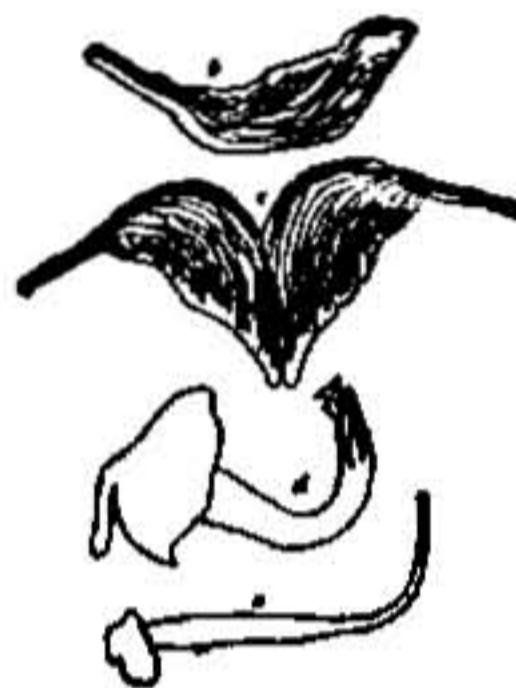


FIG. 43.—*Lonchocarpus boliviensis*. b, Wings; c, carinal petals; d, calyx and stamens; e, pistil. Natural size. From Rusby 2362.