

SMITHSONIAN MISCELLANEOUS COLLECTIONS

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Mary Vaux Walcott Fund for  
Publications in Botany

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A REVISION OF THE COLOMBIAN  
SPECIES OF MONNINA  
(POLYGALACEAE)

BY

RAMÓN FERREYRA

University of San Marcos, Lima, Perú



(PUBLICATION 4100)

CITY OF WASHINGTON  
PUBLISHED BY THE SMITHSONIAN INSTITUTION  
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*The Lord Baltimore Press*  
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In the generous bequest of Mrs. Charles D. Walcott to the Smithsonian Institution there was included the undistributed edition of the beautiful illustrations of *North American Wild Flowers*, printed from water colors made by Mrs. Walcott from nature and reproduced by special process under her personal supervision. These plates, in five portfolio volumes, have been highly popular and have been sold in considerable numbers.

In accordance with an indication given to me by Mrs. Walcott in discussing these matters a number of years ago, the Board of Regents of the Smithsonian Institution has set aside the first proceeds derived from these sales as a special fund in Mrs. Walcott's name for publications dealing with the science of botany. It is anticipated that these studies will be mainly technical in nature and will relate to researches made principally in the United States National Herbarium, in which Mrs. Walcott was so deeply interested.

With this paper there is instituted the first of this series, to appear in the Smithsonian Miscellaneous Collections under the heading MARY VAUX WALCOTT FUND FOR PUBLICATIONS IN BOTANY.

ALEXANDER WETMORE,  
*Secretary, Smithsonian Institution.*

September 1952



## PREFACE

The present paper by Dr. Ramón Ferreyra, professor of botany at the University of San Marcos, Lima, Perú, was prepared while he was pursuing studies at the United States National Herbarium as a Fellow of the John Simon Guggenheim Memorial Foundation.

The genus *Monnina* (Polygalaceae) is exclusively American, occurring principally in the Andes of northwestern South America. A revision of the Peruvian species has already been published, and future papers dealing with those of Ecuador and Venezuela are in the course of preparation. Regional treatments are planned since many species are endemic to each country.

There are 32 species herein credited to Colombia, 11 of which are described as new. A discussion of the morphology of *Monnina* is included, as well as a brief discussion of the distribution of the species in Colombia.

JASON R. SWALLEN  
*Head Curator, Department of Botany  
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A REVISION OF THE COLOMBIAN SPECIES OF  
MONNINA (POLYGALACEAE)

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INTRODUCTION

THE present paper is limited to a taxonomic revision of the species of *Monnina* known to occur in Colombia. Since the publication of his revision of the Peruvian species of this genus,<sup>1</sup> the writer has extended his work to a consideration of *Monnina* in other Andean countries and hopes to present future considerations of the species occurring in Ecuador and Venezuela.

The genus is exclusively American and occurs principally in the Andes of northwestern South America. The greatest concentration of species appears to be in the Peruvian Andes, although certain annual species are endemic to the coastal region of Peru, somewhat apart from the Andes. However, the present study, in which 32 species are recognized, indicates that Colombia also is an important distributional center for *Monnina*. Most of the species recognized are endemic to the country, often with a limited distribution, but a few extend southward into Ecuador, Peru, and even Bolivia. During the past 30 years botanical collecting in Colombia has been greatly accelerated; the recent material assembled by Dr. José Cuatrecasas, for example, has added several new entities to *Monnina*.

The genus *Monnina* was founded by Ruiz and Pavon in 1798, with a discussion of several Peruvian species; the type species is *M. polystachya* R. & P. It is a very distinct genus, distinguished from its closest relative, *Polygala* L., by having the stamens conspicuously grouped into two fascicles, the filaments being united upward almost to the attachment of the anthers, and the truncate stigma having two dissimilar lobes.

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<sup>1</sup> A revision of the Peruvian species of *Monnina*. Journ. Arn. Arb. 27: 123-167, pls. 1-10. 1946.

## MORPHOLOGY

Although most species of *Monnina* are shrubs, a few are slender trees. Farther south several of the species are annuals, but in Colombia only one species, *M. santamartensis*, appears to have an annual habit. In this species the root is conspicuously branched and attains a length of about 12 cm., while the branches are flexuose.

The predominant type of stem is, of course, woody, but several species in addition to *M. santamartensis* would be better defined as having herbaceous stems. Such species as *M. chodatiana*, *M. arborescens*, *M. bracteata*, and *M. mollis* have been described by collectors as trees, while several others are characterized by a twining, subscandent habit. Among the latter may be mentioned *M. subscandens*, *M. cuatrecasii*, and *M. speciosa*. The stem in *M. aestuans* is conspicuously branched in the upper part; *M. revoluta* has corymbose branches, while in other cases (*M. involuta* and *M. salicifolia*) the branches are nodose. The branchlets may be either striate or terete, and usually they are more or less pubescent, although in such species as *M. cuatrecasii*, *M. glaberrima*, and *M. oblanceolata* the branchlets are glabrous.

The leaves of *Monnina* are alternate and usually fairly well separated, although in *M. aestuans* and *M. revoluta* they are congested and not obviously alternate. The blades vary in shape from elliptic, oblong, or lanceolate to oblanceolate or almost linear; leaf shape is a fairly consistent character within species. In texture the blades are prevailingly more or less herbaceous, being coriaceous in only a few species, such as *M. cuatrecasii*, *M. obtusifolia*, *M. aestuans*, and *M. pennellii*. The apex is frequently acute to acuminate, less commonly obtuse and mucronate, as in *M. obtusifolia*, *M. aestuans*, and *M. mollis*. The margins, usually entire and flattened, may sometimes be more or less obviously revolute, conspicuously so in such species as *M. revoluta*. The venation is pinnate, the lateral nerves varying from 4 to 12 per side; however, *M. oblanceolata* and *M. revoluta*, owing to their obscure secondaries, are better described as having one-nerved leaves. In the Colombian species the leaves are always petiolate, the length of the petiole ranging from 2 mm. (in *M. revoluta*) to 15 mm. (in *M. subspeciosa*); the petiole is occasionally narrowly winged. Although leaf indument of more or less density is the usual condition, the leaves of many species become glabrate very early or, as in *M. cuatrecasii*, *M. chlamydantha*, *M. glaberrima*, and *M. oblanceolata*, the leaves may be described as strictly glabrous.

As a general rule the indument is composed of short hairs, either

simple or multicellular, which ordinarily are not very persistent, the majority of plants being glabrescent. Sometimes the hairs are rigid and yellowish (in *M. speciosa*), but more frequently they are whitish or grayish.

A considerable number of species of *Monnina* have the inflorescences simply racemose, the racemes being terminal or axillary, while a somewhat smaller group of species have paniculate inflorescences. A peduncle is always present, varying in length, among the Colombian species, from 4 mm. (in *M. revoluta*) to 60 mm. (in *M. chlamydantha*). The lateral branches of paniculate inflorescences are usually ascending but sometimes divaricate, as for instance in *M. crassinervia*, *M. speciosa*, and others.

The flowers of *Monnina* are bisexual and zygomorphic. The persistent calyx consists of five concave sepals, three exterior and two interior, all of them diverse in size. It may be observed that most species with paniculate inflorescences have the two lower sepals (of the outer three) more or less united; on the other hand, the majority of species with simply racemose inflorescences have the two lower sepals completely free. The degree to which the lower sepals are united, if at all, usually provides a dependable specific character. The two inner sepals (wings) are petaloid and usually deep blue in color. Most species of the genus have the three outer sepals smaller than the two inner ones (wings), but the reverse is the case in a few species, such as *M. involuta*, *M. latifolia*, and *M. bracteata*. In *M. involuta* the apices of the outer sepals are strongly involute. The wings are characteristically bent inward and have the dorsal surfaces either glabrous or densely pubescent (as in *M. chodatiana* and *M. latifolia*). The base of the wings is usually obtuse, being acute only in *M. parviflora*, *M. rupestris*, and *M. andreana*. Measurements of calyx parts in my descriptions represent the maximum and minimum observed in the available specimens, but the illustrations have been prepared with reference to the maximum measurements.

The corolla is composed of three petals, a median inferior one called the keel and two superior lateral ones; these lateral ones are more or less ligulate in shape and are united with the staminal tube. The keel is usually yellow and its apex is trilobed, rarely inconspicuously so (as in *M. obtusifolia*, *M. involuta*, and *M. angustata*). In many species the middle lobe is the largest of the three, but in *M. crassinervia*, *M. speciosa*, and *M. parviflora* it is smaller than the lateral lobes. The inner surface of the keel may be either glabrous or pubescent. The superior petals in most species are elongate-spatulate

(sometimes shortly spatulate), and indument is usually present to a certain degree.

The stamens are eight and completely united into two groups. Ordinarily the short free portions of the stamens are glabrous, but in *M. obtusifolia* they show some pubescence. In length the filaments vary from 2.6 mm. (in *M. parviflora*) to 5.5 mm. (in *M. subscandens*). The anthers are always apically dehiscent.

The ovary is usually ovoid or ellipsoid and glabrous. However, *M. crassinervia* and *M. chodatiana* have densely pubescent ovaries, the hairs in the latter case being 2.5 mm. long. In certain species (e. g., *M. subscandens*, *M. cuatrecasasi*, and *M. elongata*) the ovary is partially pubescent, and in *M. colombiana* it is slightly winged in the upper part. The style is usually cylindric and always geniculate, in several species being distally thickened. The style may be either glabrous or, if pubescent, with indument in the middle portion or toward the stigma (as in *M. obtusifolia*). The stigma is bilobed, the lower lobe being almost acute and the upper one tuberculate and papillose. The disk is reduced to a gland at the base of the ovary.

The fruit of *Monnina* is a 1-celled and 1-seeded drupe, usually ellipsoid in shape, but in *M. colombiana* and *M. rupestris* it may be described as samaroid, as the upper portion is slightly winged. The drupe of *M. arborescens* is truncate at base. In most species the fruit is glabrous, *M. chodatiana* being an exception and having a strongly canescent-pubescent fruit.

The pedicels are terete and pubescent, in length ranging from inconspicuous (less than 1 mm. long in *M. pilosa* and *M. pennellii*) to fairly obvious (3.2 mm. long in *M. speciosa*).

#### DISTRIBUTION

In Colombia, *Monnina* occurs in all three cordilleras of the Andes, at elevations of 1,000 to 4,200 meters. *Monnina subspeciosa* has been found at the lower of these extremes, *M. revoluta* at the higher. Many species grow in the forested areas of the subtropical and temperate zones, the major concentration occurring in the central and southwestern parts of the country. Of species occurring in Colombia, *M. salicifolia* has the most extensive distribution, being found southward to Bolivia; *M. pilosa* also occurs southward, extending through Ecuador into Peru. *Monnina phytolaccaefolia* is another common species of wide distribution, being found in Colombia and Ecuador. Many species of the genus, however, are local endemics with a comparatively small range, but future collecting must determine the real geographic limits of species now known from too few specimens.

## MATERIAL

All the available Colombian specimens of *Monnina* in the herbaria of the following institutions have been examined and are cited in this treatment: Chicago Natural History Museum (Ch); Gray Herbarium of Harvard University (GH); New York Botanical Garden (NY); U. S. National Museum (US). To the directors and curators of these institutions I am grateful for the many courtesies they have extended. Many types and photographs have been examined, and without these it would have been impossible to solve satisfactorily certain problems of identification. In many species the superficial vegetative characters are very similar, and therefore it is necessary to examine the floral structure in order to make even provisional identifications. The flowers of each species have been illustrated by the writer, in the hope that these text figures will facilitate identification for those who use this treatment.

## ACKNOWLEDGMENTS

The studies resulting in this publication have been pursued during the writer's tenure as a Fellow of the John Simon Guggenheim Memorial Foundation, and the work was done in the Department of Botany, U. S. National Museum, Smithsonian Institution. To the authorities of these organizations I wish to express sincere thanks for the support and facilities offered. In particular, my friends on the staff of the Smithsonian Institution, Jason R. Swallen, E. P. Killip, A. C. Smith, and L. B. Smith, have given me much encouragement and many useful suggestions.

## SYSTEMATIC TREATMENT

*Monnina* R. & P. Syst. Veg. 169. 1798; for references to subsequent treatments of the genus see Ferreyra in Journ. Arn. Arb. 27: 128. 1946.

Herbs, shrubs, or trees, sometimes scandent. Leaves alternate, entire, without stipules, pubescent or glabrous, mostly lanceolate, elliptic, or oblong, rarely spatulate, linear, or oblanceolate, penninerved or rarely 1-nerved, petiolate. Flowers in terminal or axillary racemes, sometimes in panicles; peduncle short to long, the inflorescence axis bracteate. Sepals 5, the 3 outer ones herbaceous, free or the two lower united, the two inner (wings) petaloid and usually much larger, more or less concave. Petals 3, the lowermost (keel) carinate, the two upper ones ligulate, usually elongate, united below to the staminal sheath. Stamens 8, the filaments united nearly to apex into a sheath

split on the upper side; anthers 2-celled. Ovary 1-celled; style geniculate, glabrous, sometimes pubescent; stigma with two dissimilar lobes, the lower one acute, the upper papillose with 1 tubercle. Disk reduced to a gland at base of ovary (hypogynous). Fruit a drupe with thin fleshy coat, rarely samaroid, the surface rugose, glabrous or pubescent.

## KEY TO THE SPECIES

Inflorescence paniculate, the lateral branches usually divaricate.

Lower sepals usually  $\frac{1}{2}$  or  $\frac{2}{3}$  united, rarely only  $\frac{1}{3}$  or inconspicuously united at base.

Ovary pubescent, sometimes only in the upper part.

Leaves oblong, conspicuously coriaceous, the nerves prominulous beneath, the apex obtuse.....1. *M. crassinervia*

Leaves elliptic-lanceolate, usually membranaceous, rarely coriaceous, the nerves not prominulous beneath, the apex acuminate or acute.

Small tree; branches densely hirsute; leaves acute; outer sepals densely pubescent beneath, the two lower ones  $\frac{1}{2}$  united; ovary with conspicuous indument (hairs to 2.5 mm. long).....2. *M. chodatiana*

Scandent plants; branches glabrous; leaves acuminate; outer sepals glabrous beneath, the two lower ones  $\frac{2}{3}$  or  $\frac{1}{2}$  united; ovary pubescent with very short hairs.

Leaf blades membranaceous; lower sepals  $\frac{2}{3}$  united, acute, 1-nerved; keel densely pubescent within, glabrous without; style glabrous.

3. *M. subscandens*

Leaf blades coriaceous; lower sepals  $\frac{1}{2}$  united, obtuse, 5-nerved; keel glabrous within, pubescent without; style pubescent.

4. *M. cuatrecasatii*

Ovary always completely glabrous.

Scandent plant; leaves ovate-lanceolate, the base conspicuously rounded.

5. *M. speciosa*

Erect shrubs; leaves lanceolate or more or less elliptic, the base attenuate.

Lateral branches of panicle obtuse at apex; leaves large, to 32 cm. long; lower sepals slightly united; ovary slightly winged in the upper part.....6. *M. colombiana*

Lateral branches of panicle acuminate or acute at apex, rarely obtuse; leaves smaller, to 23 cm. long; lower sepals usually  $\frac{2}{3}$ , sometimes  $\frac{1}{2}$ , united; ovary not winged.

Panicle with few divaricate lateral branches (about 3); flowers completely covered with bracts, these broad, glandular beneath; outer sepals obtuse.....7. *M. chlamydantha*

Panicle with crowded, ascending, lateral branches (about 14); flowers with linear bracts, these glabrous beneath; outer sepals acute, rarely obtuse.

Habit tomentose; leaves to 23 cm. long, with 10 or 11 pairs of lateral veins; flowers small (3.5-3.8 mm. long); wings pubescent beneath; keel pubescent within.....8. *M. parviflora*

Habit glabrescent; leaves to 15 cm. long, with 6-8 pairs of lateral veins; flowers larger (4-5 mm. long); wings glabrous beneath; keel glabrous within.

Branches glabrescent, terete; leaves acuminate, not mucronate, the base of lower leaves rounded; axis of inflorescence glabrescent; wings acute at base; style pubescent, cylindrical.

9. *M. glaberrima*

Branches hirsute, striate; leaves acute, mucronate, the base of lower leaves attenuate; axis of inflorescence hirsute; wings obtuse at base; style glabrous, thicker toward apex.

Leaves conspicuously spatulate, revolute; flower-subtending bracts triangular, 3-nerved, to 5.5 mm. long; lower sepals obtuse, 3-nerved.....10. *M. solandraefolia*

Leaves elliptic, not revolute; flower-subtending bracts linear, 1-nerved, to 2.2 mm. long; lower sepals acute, 1-nerved.

11. *M. subspeciosa*

Lower sepals free.

Upper branches conspicuously hirsute; leaves oblong, acute; flower-subtending bracts broadly acute-triangular; outer sepals obtuse.

12. *M. pilosa*

Upper branches slightly tomentose, becoming glabrescent; leaves narrowly lanceolate, acuminate; flower-subtending bracts linear; outer sepals acute.

Leaves always about 4 times as long as wide (up to 160 x 40 mm.), with 7-9 pairs of lateral veins; flower-subtending bracts 3-4 times as long as broad (up to 11.2 x 2.8 mm.); keel pubescent within; arborescent.

13. *M. arborescens*

Leaves more than 5 times as long as wide (up to 225 x 40 mm.), with 10-12 pairs of lateral veins; flower-subtending bracts about 8 times as long as broad (up to 7 x 0.8 mm.); keel glabrous within; frutescent.....14. *M. erecta*

Inflorescence simply racemose.

Lower sepals conspicuously joined, usually  $\frac{1}{2}$  united, sometimes  $\frac{2}{3}$  or rarely only slightly united at base.

Branches glabrous; leaves glabrous, oblanceolate, with inconspicuous lateral veins; bracts of racemes rounded, oblanceolate, 4- or 5-nerved, the base hood-shaped; lower sepals slightly united.....15. *M. oblanceolata*

Branches strigose; leaves finely pubescent, elliptic or lanceolate, with conspicuous lateral veins; bracts of racemes filiform or triangular, 1-nerved; lower sepals  $\frac{1}{2}$  or  $\frac{2}{3}$  united.

Style pubescent, the hairs sometimes only distal.

Leaves lanceolate, to 130 mm. long, acute; axis of racemes elongate, to 29 cm. long, the bracts filiform (7.2-11.5 mm. long); lower sepals  $\frac{2}{3}$  united, acute, 1-nerved.....16. *M. schultesii*

Leaves oblong, to 90 mm. long, obtuse; axis of racemes shorter, to 11.5 cm. long, the bracts ovate-triangular (1-2.2 mm. long); lower sepals  $\frac{1}{2}$  united, obtuse, 3- or 5-nerved.....17. *M. obtusifolia*

Style always glabrous.

Upper branches with crowded leaves, the blade coriaceous, obtuse, mucronate, to 72 mm. long; bracts of racemes triangular; keel pubescent within.....18. *M. aestuans*

Upper branches with comparatively spaced leaves, the blade herbaceous, acuminate or acute, not mucronate, to 225 mm. long; bracts of racemes filiform, rarely triangular; keel glabrous within, sometimes slightly pubescent.

Branches herbaceous; axis of racemes to 28 cm. long, the bracts to 6 mm. long; outer sepals acute (to 4.8 mm. long).

19. *M. santamartensis*

Branches woody; axis of racemes to 15 cm. long, the bracts to 4.2 mm. long; outer sepals obtuse (to 3.2 mm. long).

Leaves herbaceous, acuminate; axis of racemes to 9 cm. long, the bracts filiform; wings acute at base; keel glabrous within.

20. *M. rupestris*

Leaves more or less coriaceous, acute; axis of racemes to 15 cm. long, the bracts triangular; wings obtuse at base; keel pubescent within.....21. *M. phytolaccaefolia*

Lower sepals completely free.

Leaves linear, conspicuously revolute, 1-nerved, decurrent, crowded.

22. *M. revoluta*

Leaves elliptic or lanceolate, not revolute, with several pairs of lateral veins, not decurrent or crowded.

Ovary pubescent, at least in the upper part.

Apex of leaves acuminate, the blade with 8 or 9 pairs of lateral veins; axis of racemes to 11 cm. long, the bracts oblanceolate (6-7 mm. long); outer sepals obtuse; ovary pubescent in the upper part.

23. *M. elongata*

Apex of leaves acute, the blade with 4 or 5 pairs of lateral veins; axis of racemes to 6 cm. long, the bracts linear or narrowly triangular (1.8-3 mm. long); outer sepals acute; ovary entirely pubescent.

24. *M. andrcana*

Ovary completely glabrous.

Outer sepals (to 6 mm. long) larger than the wings.

Branches glabrescent; leaves to 50 mm. long; racemes inconspicuously bracteate; apex of outer sepals strongly involute; wings glabrous beneath; keel glabrous within.....25. *M. involuta*

Branches hirsute; leaves to 215 mm. long; racemes with conspicuous filiform bracts (to 11.6 mm. long); apex of outer sepals not or very slightly involute; wings pubescent beneath; keel pubescent within.

Leaf blades elliptic-lanceolate (to 215 mm. long); petioles to 3 mm. long; axis of racemes to 30 cm. long, the bracts 6-7.2 mm. long; apex of outer sepals straight; wings densely pubescent beneath; style pubescent.....26. *M. latifolia*

Leaf blades lanceolate (to 155 mm. long); petioles to 8 mm. long; axis of racemes to 9.5 cm. long, the bracts 6-11.6 mm. long; apex of outer sepals curved; wings slightly pubescent beneath; style glabrescent.....27. *M. bracteata*

Outer sepals (to 4 mm. long) always smaller than the wings.

Leaves elliptic, coriaceous; bracts of racemes inconspicuous, triangular (up to 4 mm. long).



Leaves acute, to 145 mm. long and 92 mm. wide, with 9 or 10 pairs of lateral veins; lower sepals 5-nerved; style pubescent.

28. *M. pennellii*

Leaves obtuse, to 75 mm. long and 35 mm. wide, with 5 or 6 pairs of lateral veins; lower sepals 3-nerved; style glabrous.

29. *M. salicifolia*

Leaves lanceolate, rarely oblong, herbaceous; bracts of racemes conspicuous, filiform, rarely hood-shaped (usually more than 4 mm. long).

Leaves oblong, obtuse, sometimes acute; bracts of racemes triangular, hood-shaped, densely pubescent beneath. . . . .30. *M. mollis*

Leaves lanceolate, acuminate; bracts of racemes filiform, slightly pubescent beneath.

Branches finely pubescent; axis of racemes to 23 cm. long, the bracts lax (7-14 mm. long); outer sepals obtuse; keel glabrous within. . . . .31. *M. smithii*

Branches conspicuously hirsute; axis of racemes to 11.5 cm. long, the bracts ascending (3-5 mm. long); outer sepals acute; keel pubescent within. . . . .32. *M. angustata*

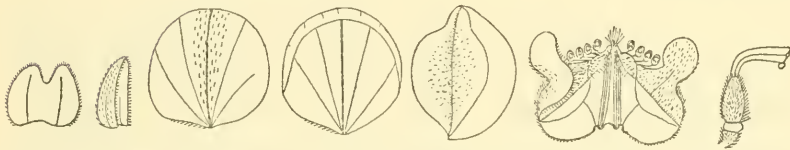


FIG. 1.—*Monnina crassinervia*: Left to right, lower sepals, upper sepal, wing (outer), wing (inner), keel, upper petals and stamens, gynaecium. All  $\times 3$ .

1. *Monnina crassinervia* Tr. & Pl. in Ann. Sci. Nat. IV. 17: 143. 1862.

Frutescent, branched, the branches 3-4 mm. in diameter, tomentose, striate; leaves conspicuously oblong, 44-70 mm. long, 21-35 mm. wide, obtuse, strigose and becoming glabrescent above, hirsute beneath, entire, revolute, attenuate at base, the costa prominulous beneath, with 5 or 6 pairs of prominulous lateral veins; petioles 2-7 mm. long, concave above, convex beneath, hirsute; inflorescence paniculate, the axis to 6 cm. long and 3 mm. in diameter, striate, hirsute, the lateral branches divaricate, acute, 3.5-4.5 cm. long, 7-9 mm. wide, bracteate, the bracts linear, conspicuous, deciduous; flowers 4.2-5.2 mm. long, the pedicels 1-1.2 mm. long, finely hirsute; outer sepals ovate-triangular, obtuse, ciliate, densely pubescent beneath, the two lower ones 2.4-2.5 mm. long, 1.5-1.6 mm. wide,  $\frac{1}{2}$  united, 1-nerved, the upper one 2.8-3 mm. long, 2.4-2.5 mm. wide, 3-5-nerved; wings 4.5-5.5 mm. long, 4.2-5.2 mm. wide, obovate, obtuse at base, 3-nerved, pubescent beneath, ciliate; keel 4.6-5.6 mm. long, 3.2-3.8 mm. wide, orbicular, plicate, pubescent within, obtuse at base, 3-nerved, 3-lobed, the middle lobe obtuse-emarginate, smaller; upper petals elongate-

spatulate, pubescent; stamens 8, the filaments 3–3.2 mm. long, almost entirely united, the free part 0.5–0.8 mm. long, glabrous; ovary ovoid, 1.5–1.8 mm. long, 0.8–1 mm. wide, densely pubescent; style 2–2.4 mm. long, geniculate above base, glabrous, slightly thicker toward apex; stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; fruit unknown.

DISTRIBUTION: Central Colombia, Department of Antioquia, 2,700 meters altitude.

ANTIOQUIA: "Pentes occidentales du páramo d'Herveo," Triana s. n. (fragments of type US; photographs of type Ch, GH, US).

This species, as indicated by fragments and photographs of the type, is distinguished by its coriaceous and oblong leaves with nerves conspicuously prominulous beneath. The description given above is adapted from the original, supplemented by the cited fragments and photograph.

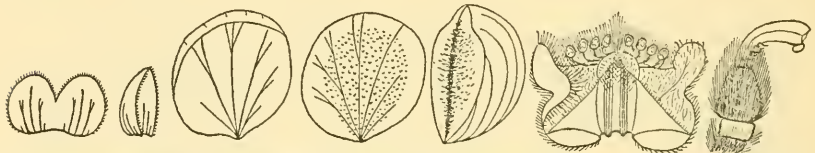


FIG. 2.—*Monnina chodatiana*: Left to right, lower sepals, upper sepal, wing (inner), wing (outer), keel, upper petals and stamens, gynaecium. All  $\times 3$ .

2. *Monnina chodatiana* Ferreyra, sp. nov.

Arbor *M. subscandenti* Tr. & Pl. affinis, habitu hirsuto-lanuginoso, foliis acutis, sepalo exteriore dense pubescente, sepalis duobus inferioribus  $\frac{1}{3}$  connatis differt.

Small tree to 3 m. high, branched, the branches 6–10 mm. in diameter, terete, conspicuously hirsute; leaves elliptic, 37–155 mm. long, 17–80 mm. wide, acute, pubescent above, becoming glabrescent, slightly hirsute beneath, entire, attenuate at base, the costa prominulous beneath, with 9 or 10 pairs of lateral veins; petioles 3–8 mm. long, more or less concave above, convex beneath, pubescent; inflorescence paniculate, the axis 6–12 cm. long, 2–4 mm. in diameter, striate, densely hirsute, the lateral branches 3 or 4 in number, 3–8.5 cm. long, 9–11 mm. wide, acute at apex, pedunculate (peduncle 4–12 mm. long), bracteate, the bracts triangular, 2.8–3 mm. long and wide, acute, densely pubescent beneath, ciliate, deciduous, 3-nerved; flowers 5–6 mm. long, the pedicels 1.6–2 mm. long, densely pubescent; outer sepals ovate, obtuse, ciliate, densely pubescent beneath, the two lower ones 2.2–2.6 mm. long, 2–2.2 mm. wide,  $\frac{1}{3}$  united, 5-nerved, the upper sepal

2.2–3 mm. long, 2.4–2.6 mm. wide, 7-nerved; wings blue, 5.8–6 mm. long, 4.2–5 mm. wide, obovate, obtuse at base, 3- or 4-nerved, densely pubescent beneath, eciliate; keel 5–6.2 mm. long, 3.6–4 mm. wide, orbicular, plicate, pubescent within, obtuse at base, 3- or 4-nerved, 3-lobed, the middle lobe obtuse-emarginate, larger; upper petals elongate-spatulate, densely pubescent; stamens 8, the filaments 4–4.5 mm. long, almost entirely united, the free part 0.5–1.2 mm. long, glabrous; ovary ellipsoid, 2–2.5 mm. long, 1.5–2 mm. wide, strongly pubescent, the hairs ascending, 2–2.5 mm. long; style 2.6–2.8 mm. long, slightly pubescent near base, geniculate at base, more or less cylindrical; stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 7–8 mm. long, 3.5–4.2 mm. wide, densely canescent-pubescent, reticulate.

Type in the herbarium of the Chicago Natural History Museum, No. 1367478, collected in Loma de Barragán, valley of Río Bugalagrande, western slope, Cordillera Central, Department of El Valle, alt. 2,800–2,900 meters, April 18 or 19, 1946, by J. Cuatrecasas (No. 20920).

ADDITIONAL SPECIMEN EXAMINED:

EL VALLE: La Laguna, Barragán, valley of Río Bugalagrande, western slope, Cordillera Central, *Cuatrecasas* 20887 (Ch).

DISTRIBUTION: Endemic in the southwestern Andes of Colombia, between 2,800 and 2,900 meters altitude.

The new species is characterized by its densely hirsute habit, the outer sepals being strongly pubescent beneath, the wings pubescent beneath, and the ovary densely pubescent with hairs up to 2.5 mm. long. It is near *M. subscandens* Tr. & Pl., from which it differs in having the branches almost hirsute-lanuginose, the sepals pubescent beneath, the ovary pubescent, and in its habit. It is a pleasure to name this new species in honor of the distinguished Swiss botanist Dr. R. Chodat, in recognition of his valuable studies of the genus *Monnina*.

3. *Monnina subscandens* Tr. & Pl. in Ann. Sci. Nat. IV. 17: 143. 1862.

Scandent to 2 m. high, branched, the branches 22–32 cm. long, 3–5 mm. in diameter, terete, finely pubescent, becoming glabrescent; leaves elliptic-lanceolate, 40–130 mm. long, 15–58 mm. wide, acuminate, rarely more or less acute, slightly pubescent above, becoming glabrescent, finely pubescent beneath, entire, attenuate at base, the costa prominulous beneath, with 7 or 8 pairs of lateral veins; petioles 2–8 mm. long, concave above, convex beneath, slightly pubescent; inflorescence paniculate, the axis 8.5–18 cm. long, 1.5–2.5 mm. in diameter, striate, finely pubescent, the lateral branches numerous,

almost acute at apex, 3–15 cm. long, 10–12 mm. wide, pedunculate (peduncle 5–11 mm. long), bracteate, the bracts lanceolate-linear, 4.8–5.5 mm. long, 1–1.6 mm. wide, acuminate, slightly pubescent beneath, ciliate, deciduous, 1-nerved; flowers 5.5–7 mm. long, the pedicels 1.6–2 mm. long, finely pubescent; outer sepals more or less triangular, acute, ciliate, glabrescent beneath, the two lower ones 2–3 mm. long, 1.2–2 mm. wide,  $\frac{2}{3}$  united, 3-nerved, the nerves inconspicuous, the upper sepal 3–4.2 mm. long, 1.8–3.8 mm. wide, 5–7-nerved; wings blue, 5–7 mm. long and wide, obovate, obtuse at base, 3- or 4-nerved, slightly pubescent beneath, becoming glabrescent, ciliate at base; keel 5.2–8 mm. long, 3.2–4.8 mm. wide, orbicular, plicate, pubescent within, sometimes glabrescent, obtuse at base, 3- or 4-nerved, 3-lobed, the middle lobe obtuse-emarginate, larger; upper petals elongate-spatulate, pubescent; stamens 8, the filaments 4.5–5.5 mm. long,

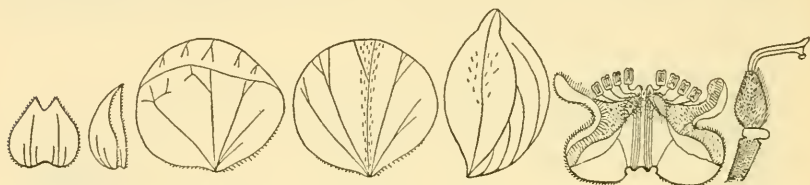


FIG. 3.—*Monnina subscandens*: Left to right, lower sepals, upper sepal, wing (inner), wing (outer), keel, upper petals and stamens, gynaecium. All  $\times 3$ .

almost entirely united, the free part 0.8–1.5 mm. long, glabrous; ovary ellipsoid, 2–2.6 mm. long, 1.2–1.8 mm. wide, usually entirely pubescent, rarely pubescent only in the upper part; style 2.6–3.2 mm. long, geniculate above base, almost cylindric, glabrous; stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 6–10 mm. long, 2.8–7 mm. wide, slightly pubescent, sometimes glabrescent, reticulate.

DISTRIBUTION: From central to southwestern Colombia and northern Ecuador, between 1,950 and 3,600 meters altitude.

CUNDINAMARCA: Facativita-Anolaima highway, *Haught* 6221 (US).

TOLIMA: Quindio, *Triana* s. n. (fragments of type US, photographs of type Ch, GH, US).

CALDAS: Río San Rafael, below Cerro Tatamá, Cordillera Occidental, *Pennell* 10335 (US); "Pinares," above Salento, Cordillera Central, *Pennell* 9395 (US).

EL VALLE: Las Colonias, above Queremál, valley of Río Digua, western slope, Cordillera Occidental, *Cuatrecasas* 23907 (Ch); north of Albán, near the crest between Departments of El Valle and Intendencia del Chocó, western slope, Cordillera Occidental, *Dugand & Jaramillo* 2996 (US); Quebrada de Juntas, Río Pichindé, valley of Río Cali, eastern slope, Cordillera Occidental, *Cuatrecasas* 21616 (Ch); El Cairo, Río Pichindé, Cordillera Occidental, *Cuatrecasas*

21973 (Ch); El Tabor, above Las Brisas, Cordillera Occidental, *Cuatrecasas* 22316 (Ch).

CAUCA: Aguabonita, valley of Río San José, eastern slope, Cordillera Central, *Cuatrecasas* 23518 (Ch); Páramo de Buena Vista, Paez Valley, Cordillera Central, *Pittier* 1477 (US); San Miguel, *Bro. Apollinaire-Marie* 523 (Ch).

This scandent plant is distinguished by the long axis of its inflorescence (to 18 cm. long), the lax and numerous lateral branches, the inconspicuous nerves of the outer sepals, and the large keel (to 8 mm. long).

4. *Monnina cuatrecasasii* Ferreyra, sp. nov.

Frutex scandens a *M. subscandente* Tr. & Pl., cui affinis, foliis coriaceis, sepalo exteriore obtuso, sepalis duobus inferioribus  $\frac{1}{2}$  conatis 5-nerviis, carina intus glabra extus pubescente, stylo pubescente differt; a *M. glaberrima* Chodat foliis basi attenuatis, sepalo exteriore obtuso, carina extus pubescente, ovario puberulo distinguitur.

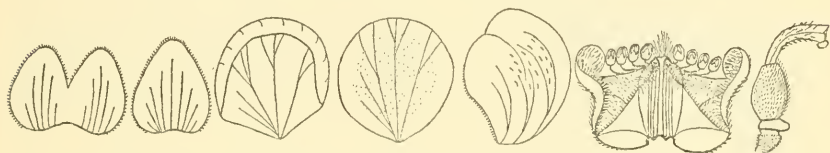


FIG. 4.—*Monnina cuatrecasasii*: Left to right, lower sepals, upper sepal, wing (inner), wing (outer), keel, upper petals and stamens, gynaecium. All  $\times 3$ .

Subscandent, branched, the branches 3.5–5 mm. in diameter, terete, glabrous; leaves coriaceous, elliptic-lanceolate, 44–130 mm. long, 17–52 mm. wide, acuminate, glabrous, entire, attenuate at base, the costa prominulous beneath, with 8 or 9 pairs of lateral veins; petioles 3–5 mm. long, 1–1.2 mm. in diameter, concave above, convex beneath, glabrescent; inflorescence paniculate, the axis 9–9.7 cm. long, 2–2.2 mm. in diameter, striate, glabrescent, the lateral branches more or less numerous, ascending, 3.5–6 cm. long, 10–12 mm. wide, acute at apex, pedunculate (peduncle 11–16 mm. long), bracteate, the bracts lanceolate, 3.2–4 mm. long, 1–1.2 mm. wide, acuminate, slightly pubescent beneath, ciliate, deciduous, 1-nerved; flowers 4.2–5 mm. long, the pedicels 1.5–3 mm. long, finely pubescent; outer sepals ovate, ciliate, obtuse, glabrous beneath, the two lower ones 3.5–3.8 mm. long, 2.2–2.5 mm. wide,  $\frac{1}{2}$  united, 5-nerved, the upper sepal 3.8–4 mm. long, 3.6–3.8 mm. wide, 7-nerved; wings blue, 5–6 mm. long, 5.2–6 mm. wide, fleshy, obovate, obtuse at base, 3-nerved, slightly pubescent beneath, eciliate; keel 4.8–6.5 mm. long, 3.4–5 mm. wide, orbicular, plicate, glabrescent within, more or less acute at base, 3- or 4-nerved, 3-lobed, the middle lobe obtuse-emarginate; upper petals clongate-

spatulate, pubescent; stamens 8, the filaments 3.2-4 mm. long, almost entirely united, the free part 0.6-1 mm. long, glabrous; ovary ellipsoid, 1.5-2.8 mm. long, 1-1.5 mm. wide, pubescent, the hairs conspicuous in the upper part; style 2.5-3 mm. long, geniculate above base, pubescent, more or less cylindrical; stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; drupe ovoid, 8-10 mm. long, 4-6 mm. wide, slightly pubescent, becoming glabrescent, reticulate.

Type in the herbarium of the Chicago Natural History Museum, Nos. 1367796 and 1367797, collected above Las Brisas, between El Tabor and Alto de Mira, Cordillera Occidental, Department of El Valle, alt. 2,200-2,300 meters, October 22-25, 1946, by J. Cuatrecasas (No. 22421).

DISTRIBUTION: Known only from the type collection.

The new species suggests *M. subscandens* Tr. & Pl., but the axis of its inflorescence is shorter (to 9.7 cm. long), the outer sepals are ovate, obtuse, the two lower ones  $\frac{1}{2}$  united and 5-nerved, the keel is pubescent beneath, the style pubescent, etc. It is also related to *M. glaberrima* Chodat, from which it differs in having the leaves attenuate at base, the lateral branches of panicles ascending, the outer sepals obtuse, the wings and keel pubescent beneath, and the ovary conspicuously pubescent.

5. *Monnina speciosa* Tr. & Pl. in Ann. Sci. Nat. IV. 17: 144. 1862.

Scandent, branched, the branches 25-97 cm. long, 2.5-5 mm. in diameter, pubescent, becoming glabrescent, striate; leaves ovate-ob lanceolate, 39-105 mm. long, 15-42 mm. wide, acuminate, conspicuously rounded at base, glabrescent above, pubescent beneath (hairs rigid, yellowish, more numerous on the nerves), entire, slightly revolute, the costa conspicuously prominulous beneath, with 8 or 9 pairs of lateral veins usually prominulous beneath; petioles 3-6 mm. long, concave above, convex beneath, pubescent; inflorescence paniculate, the axis 5-18 cm. long, 1.5-3 mm. in diameter, striate, finely pubescent, becoming glabrescent, the lateral branches (4-8) divaricate, 4.2-17.5 cm. long, 7-9 mm. wide, elongate-acuminate at apex, pedunculate (peduncle 6-20 mm. long), bracteate, the bracts linear, 3.5-5.5 mm. long, 0.6-1 mm. wide, acuminate, with a few hairs beneath, becoming glabrescent, ciliate, deciduous, 1-nerved; flowers 4.2-5.8 mm. long, the pedicels 2.4-3.2 mm. long, pubescent; outer sepals triangular, acute, ciliate, glabrescent beneath, the two lower ones 1.6-2 mm. long, 1-1.4 mm. wide,  $\frac{1}{2}$  or  $\frac{2}{3}$  united, usually 1-nerved, rarely 3-nerved, the upper sepal 2.5-2.8 mm. long, 1.8-2.6 mm. wide, usually 3-nerved, rarely 5-nerved; wings blue, 4.2-5.8 mm. long, 3.8-4.8 mm. wide,

obovate, obtuse at base, 3- or 4-nerved, glabrescent beneath, sometimes slightly pubescent, ciliate at base; keel 4.4–6 mm. long, 3.2–4 mm. wide, orbicular, plicate, glabrous within, obtuse at base, 3- or 4-nerved, 3-lobed, the middle lobe obtuse-emarginate, smaller; upper petals elongate-spatulate, pubescent; stamens 8, the filaments 3.2–4.2 mm. long, almost entirely united, the free part 0.8–1.4 mm. long, glabrous; ovary ellipsoid, 1.8–2.2 mm. long, 0.8–1.2 mm. wide, glabrous; style 2.2–2.8 mm. long, geniculate above base, glabrous, more or less cylindrical; stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 5.5–7 mm. long, 3–4 mm. wide, glabrous, reticulate.

DISTRIBUTION: From northern to southwestern Colombia, between 1,500 and 3,000 meters altitude.



FIG. 5.—*Monnina speciosa*: Left to right, lower sepals, upper sepal, wings (inner), keel, upper petals and stamens, gynaecium. All  $\times 3$ .

HUILA: East of Neiva, Cordillera Oriental, *Rusby & Pennell* 663 (NY, US).

ANTIOQUIA: San Pedro, *Bro. Apollinaire-Marie* 268 (Ch); vicinity of Medellín, *Toro* 1262 (NY), *Gutiérrez & Delisle* 263 (US); Laguna de Guarna, *Bro. Daniel* 2762 (US); Santa Elena, *Archer* 1253 (NY, US).

NARIÑO: Trail from Mayasquer to Tambo, *Mexia* 7578a (US); Altaquer, *Triana* s. n. (fragments and photographs of type, GH, US).

This liana is characterized by its ovate-lanceolate leaves with conspicuously rounded bases, by having the lateral branches of the panicles divaricate, with linear bracts, and by the triangular-acute outer sepals.

#### 6. *Monnina colombiana* Ferreyra, sp. nov.

Frutex *M. glaberrima* Chodat affinis, foliis majoribus lamina spatulata acuminata ad 32 cm. longa, sepalo exteriori obtuso, sepalis duobus inferioribus breviter connatis, stylo glabro differt.

Branching shrub, the branches 4–5 mm. in diameter, more or less terete, hirsute, becoming glabrescent in the lower part; leaves almost spatulate, 260–320 mm. long, 90–115 mm. wide, acuminate, glabrescent above, slightly pubescent beneath, entire, attenuate at base, the costa prominulous beneath, with 10 or 12 pairs of lateral veins; petioles 5–8 mm. long, concave above, convex beneath, pubescent; inflorescence paniculate, the axis 14–16 cm. long, 2.5–3 mm. in diam-

eter, striate, hirsute, the lateral branches about 6, divaricate, 10–12 cm. long, 10–11 mm. wide, obtuse at apex, pedunculate (peduncle 6–14 mm. long), bracteate, the bracts lanceolate, 6–6.5 mm. long, 2–2.2 mm. wide, acute, pubescent beneath, ciliate, deciduous, 1-nerved; flowers 4.5–5 mm. long, the pedicels 1.5–2 mm. long, curved, pubescent; outer sepals ovate, obtuse, ciliate, slightly pubescent beneath, 3-nerved, the two lower ones 2–2.4 mm. long, 1.4–1.8 mm. wide, more or less united at base, sometimes free, the upper sepal 3–3.2 mm. long, 2–2.2 mm. wide; wings 4.5–4.8 mm. long, 3–3.2 mm. wide, obovate, obtuse at base, 3-nerved, ciliate; keel 4.4–5 mm. long, 3–3.6 mm. wide, orbicular, plicate, glabrous within, obtuse at base, 3- or 4-nerved, 3-lobed, the middle lobe obtuse-emarginate, larger; upper petals elongate-spatulate, pubescent; stamens 8, the filaments 3.2–3.6



FIG. 6.—*Monnina colombiana*: Left to right, lower sepals, upper sepal, wings (inner), keel, upper petals and stamens, gynaecium, bract. All  $\times 3$ .

mm. long, almost entirely united, the free part 0.6–1 mm. long, glabrous; ovary ellipsoid, 1.6–1.8 mm. long, 1–1.2 mm. wide, glabrous, the upper part slightly winged; style 1.8–2 mm. long, geniculate at base, glabrous, thicker toward apex; stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; drupe samaroid, 9–11 mm. long, 5.5–6.5 mm. wide, glabrous, conspicuously reticulate, the upper part slightly winged.

Type in the U. S. National Herbarium, No. 1796574, collected below Gabinete, western slope, Cordillera Oriental, Department of Huila, alt. 1,900–2,100 meters, March 24, 1940, by J. Cuatrecasas (No. 8593).

DISTRIBUTION: KNOWN only from the type collection.

This new species is distinguished by its large and more or less spatulate leaves, and by having the ovary slightly winged in the upper part. It resembles *M. glaberrima* Chodat but is quite distinct in its larger, spatulate, and acuminate leaves (to 32 cm. long), in the lower sepals being slightly united at base and obtuse, and in the winged ovary and glabrous style.

7. *Monnina chlamydantha* Ferreyra, sp. nov.

Frutex valde distinctus, bracteis magnis flores involucrantibus distinguendus; *M. parviflora* H.B.K. affinis, ramis teretibus glabris, bracteis florigeris majoribus extus glandulosis, stylo glabro differt.



Frutescent, branched, the branches 3.5–4.5 mm. in diameter, the lower part glabrescent, the upper finely pubescent, terete; leaves more or less elliptic, 50–162 mm. long, 21–67 mm. wide, elongate-acuminate, glabrous above, glabrescent beneath, entire, slightly revolute, attenuate at base, the costa strongly prominulous beneath, with 6 or 7 pairs of lateral veins; petioles 2.5–7 mm. long, concave above, convex beneath, finely pubescent, becoming glabrescent; inflorescence paniculate, the axis 19.8–21.8 cm. long, 2–2.5 mm. in diameter, striate, finely pubescent, the hairs strigose, the lateral branches ascending, obtuse at apex, 2–11 cm. long, 9–12 mm. wide, pedunculate (peduncle 25–60 mm. long), conspicuously bracteate, the bracts fanlike, 9.5–10.5 mm. long, 8.5–9.6 mm. wide, obtuse, slightly glandular beneath, ciliate, deciduous, 4-nerved, completely covering the flowers; flowers 5.2–



FIG. 7.—*Monnina chlamydantha*: Left to right, lower sepals, upper sepal, wings (inner), keel, upper petals and stamens, gynaeceum, all  $\times 3$ ; bract,  $\times 2$ .

6.5 mm. long, the pedicels 1.2–1.8 mm. long, pubescent; outer sepals ovate, ciliate, obtuse, glabrous beneath, concave, the two lower ones 2.4–2.8 mm. long, 1.8–2 mm. wide,  $\frac{2}{3}$  united, 3-nerved, the upper sepal 3–3.5 mm. long, 2.2–2.6 mm. wide, 5-nerved; wings dark blue, 5.5–6 mm. long, 5–5.5 mm. wide, obovate, obtuse at base, 3- or 4-nerved, glabrous beneath, eciliate; keel yellow, 6–7 mm. long, 4–5 mm. wide, orbicular, plicate, slightly pubescent within, obtuse at base, 3-nerved, 3-lobed, the middle lobe obtuse-emarginate, larger; upper petals almost spatulate, pubescent; stamens 8, the filaments 4.8–5 mm. long, unequally united, the free part 1–1.5 mm. long, glabrous; ovary ovoid, 2–2.2 mm. long, 1–1.2 mm. wide, glabrous; style 2.8–3 mm. long, geniculate above base, glabrous, thicker toward apex; stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid (immature), 5–6 mm. long, 2.5–3 mm. wide, glabrous, reticulate.

Type in the herbarium of the Chicago Natural History Museum, No. 1368044, collected in the region of Queremál, valley of Río Digua, western slope, Cordillera Occidental, Department of El Valle, alt. 1,540–1,650 meters, February 25, 1947, by J. Cuatrecasas (No. 23730).

DISTRIBUTION: Known only from the type collection.

The proposed entity is very distinct in its large and conspicuous

flower-subtending bracts and in its elliptic, acuminate, and glabrous leaves. It is related to *M. parviflora* H.B.K. but differs in having the branches terete and glabrescent, the flower-subtending bracts fanlike and glandular beneath, the flowers larger (to 6.5 mm. long), and the style glabrous.

8. *Monnina parviflora* H.B.K. Nov. Gen. & Sp. 5: 419. 1821.

Frutescent, branched, the branches 4–5 mm. in diameter, slightly tomentose, becoming glabrescent, striate; leaves lanceolate-elliptic, 80–230 mm. long, 20–64 mm. wide, acuminate, sometimes acute, finely pubescent above, becoming glabrescent, slightly pubescent beneath, entire, attenuate at base, the costa prominulous beneath, with 10 or 11 pairs of lateral veins; petioles 3–5 mm. long, concave above, convex beneath, pubescent, slightly winged; inflorescence paniculate, the axis 23–25 cm. long, 3–4 mm. in diameter, striate, hirsute, the lateral



FIG. 8.—*Monnina parviflora*: Left to right, lower sepals, upper sepal, wing (outer), wing (inner), keel, upper petals and stamens, gynaeceum, bract. All  $\times 3$ .

branches (3–10) 10.5–20 cm. long, 7–9 mm. wide, acuminate at apex, pedunculate (peduncle 12–23 mm. long), bracteate, the bracts linear, 6–7 mm. long, 0.8–1 mm. wide, acuminate, pubescent beneath, ciliate, deciduous, 1-nerved; flowers 3.5–3.8 mm. long, the pedicels 1.8–2 mm. long, finely pubescent; outer sepals almost lanceolate, acute, ciliate, pubescent beneath, 1-nerved, the two lower ones 2–2.2 mm. long, 0.8–1 mm. wide, nearly  $\frac{2}{3}$  united, the upper sepal 2.4–2.8 mm. long, 1–1.2 mm. wide; wings 3.4–3.6 mm. long, 2.8–2.9 mm. wide, obovate, acute at base, 3-nerved, pubescent beneath, eciliate; keel 3.6–3.8 mm. long, 2.5–2.7 mm. wide, orbicular, plicate, pubescent within, 3-nerved, 3-lobed, the middle lobe obtuse-subemarginate, smaller; upper petals short, spatulate, pubescent; stamens 8, the filaments 2.4–2.6 mm. long, almost entirely united, the free part 0.3–0.6 mm. long, glabrous; ovary ovoid, 1.4–1.5 mm. long, 0.6–0.8 mm. wide, glabrous; style 1.8–2 mm. long, geniculate at base, pubescent, more or less cylindrical; stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 7–8 mm. long, 4–4.5 mm. wide, glabrous, reticulate.

DISTRIBUTION: In the central part of the Colombian Andes, between 1,500 and 2,300 meters altitude.

TOLIMA: "Quindío," *Bonpland* s. n. (photographs of type, GH, Ch, US).

CALDAS: San Bernardino, Cordillera Central, *Pennell & Hazen* 10156 (US).

The conspicuously tomentose habit, the striate and hirsute lateral branches of the panicles, the small flowers, and the linear bracts characterize this species.

9. *Monnina glaberrima* Chodat in Bull. Soc. Bot. Genève II. 25: 215. 1934.

Frutescent, to 2 m. high, branched, the branches 3–6 mm. in diameter, terete, glabrescent; leaves ovate-oblong, sometimes ovate-lanceolate, 32–130 mm. long, 16–70 mm. wide, acuminate, rarely acute, glabrous above, glabrescent beneath, entire, usually rounded at base, the costa prominulous beneath, with 7 or 8 pairs of lateral veins, petioles 2–8 mm. long, 1–1.6 mm. wide, concave above, convex beneath, slightly pubescent, becoming glabrescent; inflorescence paniculate, the axis



FIG. 9.—*Monnina glaberrima*: Left to right, lower sepals, upper sepal, wings (inner), keel, upper petals and stamens, gynaecium. All  $\times 3$ .

6–14 cm. long, 1.8–3 mm. in diameter, striate, glabrescent, the lateral branches 5–14, divaricate, 2.4–9.5 cm. long, 8–10 mm. wide, more or less acute at apex, pedunculate (peduncle 5–15 mm. long), bracteate, the bracts linear-lanceolate, 2–3 mm. long, 0.8–1 mm. wide, deciduous; flowers 4–5 mm. long, the pedicels 1.5–2.2 mm. long, finely pubescent; outer sepals lanceolate, acute, ciliate, slightly pubescent beneath, becoming glabrescent, the two lower ones 1.8–2.8 mm. long, 1.5–2.2 mm. wide,  $\frac{1}{3}$  or  $\frac{2}{3}$  united, 1-nerved, rarely 3-nerved, the upper sepal 2.2–3 mm. long, 1–2 mm. wide, 1-nerved, sometimes 3–5-nerved; wings blue, 4.2–5 mm. long, 3–4.8 mm. wide, obovate, slightly acute at base, 3-nerved, ciliate, usually glabrous beneath, rarely pubescent; keel 4.2–5 mm. long, 2.8–3.4 mm. wide, orbicular, plicate, glabrous within, sometimes with a few hairs, obtuse at base, 3- or 4-nerved, 3-lobed, the middle lobe obtuse-emarginate, larger; upper petals elongate-spatulate, pubescent; stamens 8, the filaments 3–3.5 mm. long, almost entirely united, the free part 0.5–1.2 mm. long, glabrous; ovary ellipsoid, 1.2–1.8 mm. long, 0.8–1.4 mm. wide, glabrous; style 2.2–2.4 mm. long, geniculate above base, pubescent, cylindrical; stigma with 2 lobes,

the lower one acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 6.2–8.5 mm. long, 4.8–5.5 mm. wide, glabrous, reticulate.

DISTRIBUTION: Central and southwestern parts of Colombia, between 1,400 and 3,300 meters altitude.

SANTANDER: Mountains east of Las Vegas, Eastern Cordillera, *Killip & Smith* 15863 (NY, US).

EL VALLE: La Cumbre, Cordillera Occidental, *Killip & Hazen* 11156 (type US, isotype NY); La Cumbre, Cordillera Occidental, *Pennell* 5724 (GH, NY, US).

CAUCA: "La Gallera," Micay Valley, Cordillera Occidental, *Killip* 7794 (US), 7923 (US); Cuesta de Tocotá, road from Buenaventura to Cali, Western Cordillera, *Pittier* 728 (US); without locality, *Triana* s. n. (US).

This species is closely related to *M. solandraefolia* Tr. & Pl., from which it differs in its glabrous habit, its panicle with fewer (rarely as many as 14) lateral branches, its ovate-oblong leaves, acute lower sepals, pubescent style, etc.



FIG. 10.—*Monnina solandraefolia*: Left to right, lower sepals, upper sepal, wings (inner), keel, upper petals and stamens, gynaecium, bract. All  $\times 3$ .

10. *Monnina solandraefolia* Tr. & Pl. in Ann. Sci. Nat. IV. 17: 138. 1862.

*Monnina platyphylla* Chodat in Bull. Herb. Boiss. 2: 170. 1894.

Shrub 1.6–3 m. high, branched, the branches 3–6 mm. in diameter, slightly hirsute, becoming glabrescent, striate; leaves conspicuously spatulate, 45–130 mm. long, 18–70 mm. wide, coriaceous, acute, mucronate, glabrous above, glabrescent beneath, sometimes with small hairs along the nerves, entire, slightly revolute, attenuate at base, the costa prominulous beneath, with 6 or 8 pairs of lateral veins; petioles 3–7 mm. long, concave above, convex beneath, more or less hirsute, becoming glabrescent; inflorescence paniculate, the axis 8.5–14.5 cm. long, 1–2.2 mm. in diameter, striate, hirsute, becoming glabrescent, the lateral branches lax, numerous, acute at apex, divaricate, 4–12 cm. long, 6–8 mm. wide, pedunculate (peduncle 5–15 mm. long), bracteate, the bracts almost acute-triangular, 3.2–5.5 mm. long, 2.6–3.5 mm. wide, deciduous, ciliate, usually 3-nerved, rarely 1- or 2-nerved, pubescent beneath, the base hood-shaped; flowers 4.5–5 mm. long, the pedicels 0.6–1 mm. long, finely pubescent; outer sepals ovate-triangu-

lar, ciliate, slightly pubescent beneath, becoming glabrescent, the two lower ones 2–2.4 mm. long, 0.9–1 mm. wide,  $\frac{1}{2}$  united, obtuse, 3-nerved, the upper sepal 2.2–2.8 mm. long, 2–2.2 mm. wide, acute, 5-nerved; wings blue, 4.2–4.8 mm. long, 3.8–4 mm. wide, obovate, obtuse at base, 3-nerved, glabrous, ciliate; keel 4.6–5 mm. long, 2.8–3 mm. wide, orbicular, plicate, glabrous within, rarely slightly pubescent, obtuse at base, 3-nerved, 3-lobed, the middle lobe obtuse-subemarginate; upper petals elongate-spatulate, pubescent; stamens 8, the filaments 3–3.4 mm. long, almost entirely united, the free part 0.6–1.2 mm. long, glabrous; ovary ovoid, 1.6–2 mm. long, 0.8–1.2 mm. wide, glabrous; style 2–2.5 mm. long, geniculate above base, glabrous, thicker toward apex; stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 4.8–6.2 mm. long, 2.8–3.8 mm. wide, glabrous, reticulate.

DISTRIBUTION: Known only from the northern part of the Colombian Andes, between 2,000 and 2,700 meters altitude.

NORTE DE SANTANDER: Alto de Santa Inés, region of Sarare, Cordillera Oriental, *Cuatrecasas*, *Schultes*, & *E. Smith* 12503 (Ch, US).

ANTIOQUIA: Río Negro, *Archer* 469 (NY, US); between Valdivia and Yarumál, *Metcalf & Cuatrecasas* 30116 (US); "Monte Capiro de la Ceja," *Bro. Daniel* 2252 (US); Cocorná, *Bro. Daniel* 1783 (Ch, US); San Pedro, *Bros. Daniel & Tomás* 1569 (US); Cerro de la Vieja, *Bro. Daniel* 1691 (US); 1 kilometer south of Hoyo Rico, *Franco & Barkley* 18A187 (US); "Montagnes d'Herveo," *Linden* 742 (fragments of type US, photographs of type Ch, GH, US); "Montagnes d'Herveo," *Linden* 742 (photographs of type of *M. platyphylla*, Ch, US).

This shrub is distinguished by its spatulate and mucronate leaves, the numerous and lax lateral branches of its panicle, and by having the flower-subtending bracts conspicuously acute-triangular and hood-shaped at base.

In proposing *M. platyphylla*, Chodat inadvertently overlooked Triana and Planchon's species, for both entities are based upon the same collection number (*Linden* 742).

11. *Monnina subspectiosa* Chodat in Bull. Soc. Bot. Genève II. 25: 203. 1934.

Shrub 5 m. high, branched, the branches 3–6 mm. in diameter, slightly hirsute, becoming glabrescent, striate; leaves elliptic, sometimes oblong, 40–150 mm. long, 20–65 mm. wide, acute, mucronate, glabrous above, glabrescent beneath, sometimes more or less hirsute along the nerves, entire, attenuate at base, the costa prominulous beneath, with 7 or 8 pairs of lateral veins; petioles 3–15 mm. long, concave above, convex beneath, slightly hirsute, becoming glabrescent; inflorescence paniculate, the axis 7.5–18 cm. long, 1.5–2.8 mm. in

diameter, striate, usually slightly hirsute, rarely glabrescent, the lateral branches lax, numerous, acute at apex, 2.4–12 cm. long, 7–9 mm. wide, pedunculate (peduncle 6–12 mm. long), bracteate, the bracts linear-lanceolate, inconspicuous, acute, 1.8–2.2 mm. long, 1–1.2 mm. wide, slightly pubescent beneath, becoming glabrescent, finely pubescent within, 1-nerved, ciliate, deciduous; flowers 4–5 mm. long, the pedicels 0.8–1 mm. long, finely pubescent; outer sepals triangular, ciliate, glabrescent beneath, the two lower ones 1.2–1.8 mm. long, 0.9–1 mm. wide,  $\frac{1}{2}$  united, 1-nerved, rarely 3-nerved, more or less acute, the upper sepal 1.6–2 mm. long, 1–1.4 mm. wide, obtuse, 3-nerved, sometimes 5-nerved; wings 4–4.5 mm. long, 3–3.8 mm. wide, obovate, almost obtuse at base, 3-nerved, glabrous, usually ciliate; keel 4–5.5 mm. long, 2.2–3.8 mm. wide, orbicular, plicate, glabrous within, rarely



FIG. 11.—*Monnina subspeciosa*: Left to right, lower sepals, upper sepal, wings (inner), keel, upper petals and stamens, gynaeceum, bract. All  $\times 3$ .

slightly pubescent, obtuse at base, 3-nerved, 3-lobed, the middle lobe obtuse-emarginate; upper petals elongate-spatulate, pubescent; stamens 8, the filaments 2.2–3.2 mm. long, almost entirely united, the free part 0.6–1 mm. long, glabrous; ovary ovoid, 1.2–1.8 mm. long, 0.5–1 mm. wide, glabrous; style 2–2.8 mm. long, geniculate above base, glabrous, thicker toward apex; stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 4–4.5 mm. long, 2–2.2 mm. wide, glabrous, reticulate.

DISTRIBUTION: From the Andes of central Colombia to northern Ecuador, between 1,000 and 3,200 meters altitude.

PUTUMAYO: Valle de Sibundoy, *Cuatrecasas* 11680 (Ch, US).

HUILA: East of Neiva, Cordillera Oriental, *Rusby & Pennell* 876 (GH, NY, US); between Gabinete and Andalucía, western slope, Cordillera Oriental, *Cuatrecasas* 8584 (Ch, US).

CALDAS: La Linea, Quindío, *Dryander* 2143 (US).

EL VALLE: Alto Mercedes, *Dryander* 351 (NY, US); La Cumbre, Cordillera Occidental, *Pennell & Killip* 5888 (type coll., GH, NY, US); Tareas, Río Pichindé, valley of Río Cali, eastern slope, Cordillera Occidental, *Cuatrecasas* 21589 (Ch); Cali, *Duque-Jaramillo* 1726a (US).

CAUCA: Eastern slope near crest, Cordillera Central, *Cuatrecasas* 23657 (Ch).

A close ally of *M. solandraefolia* Tr. & Pl., *M. subspeciosa* differs in its elliptic leaves and its linear and smaller flower-subtending bracts, as well as in its more southerly distribution.

12. *Monnina pilosa* H.B.K. Nov. Gen. & Sp. 5: 419. 1821.

*Monnina fastigiata* DC. Prodr. 1: 338. 1824.

*Monnina trianae* Chodat in Bull. Soc. Bot. Genève II. 25: 221. 1934.

Shrub or slender tree, 1.5–4 m. high, branched, the branches 3–15 mm. in diameter, conspicuously hirsute, more or less striate; leaves usually elliptic, rarely oblong, 48–220 mm. long, 22–100 mm. wide, usually acute, sometimes acuminate, rarely obtuse, slightly hirsute above, becoming glabrescent, canescent-hirsute beneath, entire, attenuate at base, the costa prominulous beneath, with 9 to 11 pairs of lateral veins; petioles 3–11 mm. long, concave above, convex beneath,



FIG. 12.—*Monnina pilosa*: Left to right, lower sepals, upper sepal, wings (inner), keel, upper petals and stamens, gynoecium, bract. All  $\times 3$ .

hirsute, inconspicuously winged; inflorescence paniculate, the axis 5.5–22 cm. long, 1.2–4 mm. in diameter, striate, hirsute, the lateral branches lax, acute at apex, 1.6–18 cm. long, 8–10 mm. wide, pedunculate (peduncle 4–14 mm. long), conspicuously bracteate, the bracts ovate, concave, acute, 3.5–6.2 mm. long, 2–4 mm. wide, the base hood-shaped, deciduous, ciliate, usually 1-nerved, sometimes 2- or 3-nerved, pubescent beneath, the hairs more conspicuous at base; flowers 4–5.5 mm. long, the pedicels 0.4–0.8 mm. long, finely pubescent; outer sepals free, ovate-triangular, obtuse, ciliate, slightly pubescent beneath, becoming glabrescent, the two lower ones 1.8–3 mm. long, 1.2–2 mm. wide, 3-nerved, the upper sepal 2.2–3.5 mm. long, 1.4–2.2 mm. wide, 5-nerved; wings deep blue, 4–5 mm. long, 3.4–4.2 mm. wide, obovate, obtuse at base, 3-nerved, glabrous; keel 4.4–5.5 mm. long, 2.6–3 mm. wide, orbicular, plicate, glabrous within, sometimes slightly pubescent, becoming glabrescent, obtuse at base, 3-nerved, 3-lobed, the middle lobe obtuse-submarginate, the lateral ones more or less acute; upper petals elongate-spatulate, pubescent; stamens 8, the filaments 2.8–3.8 mm. long, almost entirely united, the free part 0.5–1 mm. long, glabrous; ovary ovoid, 1.2–2.2 mm. long, 1–1.4 mm. wide, glabrous; style 2–2.5 mm. long, geniculate above base, glabrous, almost cylindrical;

stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 5-6 mm. long, 2.8-4 mm. wide, glabrous, reticulate.

DISTRIBUTION: Along the Andes from Colombia to Ecuador and northern Peru, between 1,400 and 2,500 meters altitude.

PUTUMAYO: Sibundoy, Valley of Sibundoy, *Schultes & Villarreal* 7671 (US), *García-Barriga* 4628 (US).

TOLIMA: "Quindío," *Triana* s. n. (authentic material of *M. fastigiata*, NY, US); "in mont. Quindío," *Bonpland* s. n. (photographs of type of *M. fastigiata*, Ch, US).

HUILA: Resina, above Guadalupe, western slope, Cordillera Oriental, *Pérez-Arbeláez & Cuatrecasas* 8380 (Ch).

ANTIOQUIA: Fredonia, vicinity of Medellín, *Toro* 1040 (NY); Salgar, vicinity of Medellín, *Toro* 1046 (NY); vicinity of Medellín, *Toro* 1244 (NY); Valparaíso, vicinity of Medellín, *Toro* 1365 (NY); Cerro de La Vieja, *Bro. Daniel* 1714 (US); Río Negro, *Bro. Daniel* 421 (US).

CALDAS: Río Quindío, above Armenia, Cordillera Central, *Pennell, Killip, & Hazen* 8723 (type coll. of *M. trianae*, GH, NY, US); Salento, Cordillera Central, *Pennell* 8906 (GH, NY, US), *Pennell & Hazen* 10113 (US); Santuario, Cordillera Occidental, *Pennell* 10301 (US); San Clemente, Cordillera Occidental, *Pennell* 10663 (GH, US).

EL VALLE: "El Recuerdo," Valley of Río Cali, Cordillera Occidental, *Duque-Jaramillo* 1604 (US); north of Albán, western slope, Cordillera Occidental, *Dugand & Jaramillo* 3033 (US); Carrizales, north of Las Brisas, Cordillera Occidental, *Cuatrecasas* 22553 (Ch); Alto de Las Brisas, valley of Río Cali, eastern slope, Cordillera Occidental, *Cuatrecasas* 18221 (Ch, US).

CAUCA: Coconuco, Cordillera Central, *Killip* 6868 (GH, NY, US); San Antonio to "San José," Cordillera Occidental, *Pennell & Killip* 7269 (GH, NY, US); San Antonio to Río Ortega, Cordillera Occidental, *Pennell & Killip* 8020 (GH, NY, US); "San Isidro," Puracé, Cordillera Central, *Pennell & Killip* 6418 (US); Carpinterías, between Cerros de Munchique and Altamira, Cordillera Occidental, *Pérez-Arbeláez & Cuatrecasas* 6167 (Ch, US); highlands of Popayán, *Lehmann* 1083 (NY), 353 (Ch, GH, NY), 5524 (Ch, GH, NY); Popayán, *Cuatrecasas* 5759 (Ch, US); Quebrada de Cajibío, *Cuatrecasas* 23751 (Ch); without locality, western Cordillera, *Dryander* 2053 (NY, US).

NARIÑO: Pasto, *Jameson* 443 (US); without locality, *Triana* 298 (US), *Triana* s. n. (US).

This common species has a wide distribution along the Andes from Colombia to Ecuador and northern Peru. It is distinguished by having its branches conspicuously hirsute, its leaves oblong, and its flower-subtending bracts broadly acute-triangular and hood-shaped at base. *Monnina fastigiata* DC., so far as can be discerned from authentic material, including photographs of the type, is essentially identical with *M. pilosa*. The type collection of *M. trianae* Chodat has been examined, and one finds no reason either in this or in the original description to separate the concept from *M. pilosa*.



13. *Monnina arborescens* Ferreyra, sp. nov.

Arbor ad 10 m. alta, a *M. pilosa* H.B.K., cui affinis, habitu robusto, foliis lineari-lanceolatis conspicue angustioribus, bracteis florigeris linearibus, sepalo exteriori acuto differt.

Small tree to 10 m. high, branched, the branches 3–6 mm. in diameter, striate, more or less tomentose, becoming glabrescent; leaves narrowly lanceolate or linear, 60–160 mm. long, 15–40 mm. wide, usually acuminate, rarely acute, slightly pubescent above, becoming glabrescent, canescent-pubescent beneath, entire, attenuate at base, the costa prominulous beneath, with 7 to 9 pairs of lateral veins; petioles 3–7 mm. long, concave above, convex beneath, tomentose, rarely more or less glabrescent and slightly winged at base; inflorescence paniculate, the axis 6.5–15 cm. long, 1.5–2 mm. in diameter,



FIG. 13.—*Monnina arborescens*: Left to right, lower sepals, upper sepal, wings (inner), keel, upper petals and stamens, gynaeceum, all  $\times 3$ ; bract (outer),  $\times 2$ .

striate, tomentose, the lateral branches numerous, 3–10.5 cm. long, 9–10 mm. wide, acute at apex, pedunculate (peduncle 6–14 mm. long), bracteate, the bracts linear-oblongate, 2.5–11.2 mm. long, 1–2.8 mm. wide, acuminate, densely pubescent beneath, ciliate, deciduous, 1-nerved, sometimes inconspicuously 3-nerved; flowers 4.5–5 mm. long, the pedicels 1–1.8 mm. long, finely pubescent; outer sepals free, triangular, acute, ciliate, slightly pubescent beneath, becoming glabrescent, 3-nerved, the two lower ones 1.8–4 mm. long, 1.2–1.8 mm. wide, the upper sepal 2.2–4.2 mm. long, 1.2–1.9 mm. wide; wings blue, 4.2–5 mm. long, 3.8–4.2 mm. wide, obovate, more or less acute at base, 3-nerved; keel 4.2–5.2 mm. long, 3–3.2 mm. wide, orbicular, plicate, pubescent within rarely with a few hairs, obtuse at base, 3-nerved, inconspicuously 3-lobed, the middle lobe obtuse-submarginate; upper petals elongate-spatulate, densely pubescent; stamens 8, the filaments 3–3.5 mm. long, almost entirely united, the free part 1–1.4 mm. long, glabrous; ovary elliptic, 1–1.8 mm. long, 0.6–1 mm. wide, glabrous; style 2.2–2.6 mm. long, geniculate in the middle part, glabrous, almost cylindric; stigma with 2 lobes, the lower one acute,

the upper 1-tubercled, the tubercle papillose; drupe ovoid, 4.8–5.8 mm. long, 2.2–3 mm. wide, glabrous, the base almost truncate, reticulate.

Type in the herbarium of the Chicago Natural History Museum, No. 1367341, collected along Quebrada de Santo Domingo, headwaters of Río Palo, western slope, Cordillera Central, Department of Cauca, alt. 2,700–2,800 m., Dec. 11–14, 1944, by J. Cuatrecasas (No. 19213). Duplicate in the U. S. National Herbarium.

ADDITIONAL SPECIMENS EXAMINED:

NORTE DE SANTANDER: Municipio de Toledo, valley of Samaria, Cordillera Oriental, *Cuatrecasas*, *Schultes*, & *E. Smith* 12799 (Ch, US).

PUTUMAYO: Hill north of valley, Sibundoy, *Schultes* & *Villarreal* 7517 (US); El Encano, *García-Barriga* 7852 (US).

CALDAS: Termales, southwest of Ruiz, western slope, Cordillera Central, *Cuatrecasas* 9236 (Ch, US).

EL VALLE: Almorzadero, eastern slope, Los Farallones, Cordillera Occidental, *Cuatrecasas* 21695 (Ch, US); La Palma, right side of Río Pichindé, valley of Río Cali, eastern slope, Cordillera Occidental, *Cuatrecasas* 21671 (Ch).

CAUCA: Alto del Duende, headwaters of Río Palo, western slope, Cordillera Central, *Cuatrecasas* 18907 (Ch, US); west of Tambo, Cordillera Occidental, *Haught* 5176 (US); Mount Santa Ana, Cordillera Occidental, *Pennell* 7470 (GH, NY, US); "San José," San Antonio, Cordillera Occidental, *Pennell* & *Killip* 7390 (GH, NY, US); between Jardín and San Rafael, Río Marcos, eastern slope, Cordillera Central, *Cuatrecasas* 14805 (Ch, US); Páramo de Puracé, Cordillera Central, *Cuatrecasas* 14683 (Ch, US); "Canaan," Mt. Puracé, Cordillera Central, *Pennell* & *Killip* 6598 (GH, NY, US); Puracé, *Pérez-Arbeláez* & *Cuatrecasas* 5915A (Ch, US).

NARIÑO: Near base of Volcán El Galeras, above Ibonuco, Pasto, *Schultes* & *Villarreal* 8009 (US); road from Ipiales to La Victoria, Páramo La Cortadera, *García-Barriga* & *Hawkes* 13085 (US); between Páramo del Tábano and Laguna, El Encano and Pasto, western slope of the Cordillera, *Cuatrecasas* 11948 (US); "Pasto et Popayán," *Triana* s. n. (NY); trail from Mayasquer to Tambo, *Mexia* 7578 (US).

DEPT. ? : Páramo Las Delicias, *Lehmann* 1051 (GH, NY).

DISTRIBUTION: Northern to southwestern parts of Colombia, between 2,000 and 3,400 meters altitude.

This new species has conspicuously lanceolate leaves and flower-subtending bracts which are linear-oblongate and densely pubescent without. It is a close relative of *M. pilosa* H.B.K., differing in its narrower, almost linear, leaves, its nearly filiform flower-subtending bracts, its acute outer sepals, etc.

14. *Monnina erecta* Ferreyra, sp. nov.

Frutex *M. arborescenti* Ferreyra supra descriptae affinis, habitu plus minusve herbaceo, foliis majoribus lamina ad 22.5 cm. longa, bracteis florigeris angustioribus, carina intus glabra facile distinguitur.

Frutescent, erect, branched, the branches 2.5–5 mm. in diameter, terete, tomentose, becoming more or less glabrescent; leaves lanceolate,

67–225 mm. long, 10–40 mm. wide, acuminate, slightly pubescent above, becoming glabrescent, conspicuously tomentose beneath, entire, almost revolute, attenuate at base, the costa prominulous beneath, with 10 to 12 pairs of lateral veins; petioles 4–12 mm. long, concave above, convex beneath, inconspicuously winged, the wing 1–1.5 mm. wide, pubescent; inflorescence paniculate, the axis 12–17 cm. long, 1.8–3 mm. diameter, striate, tomentose, the lateral branches numerous, acute at apex, 3.5–12 cm. long, 7–10 mm. wide, pedunculate (peduncle 5–28 mm. long), bracteate, the bracts conspicuously linear, 5.5–7 mm. long, 0.6–0.8 mm. wide, acuminate, pubescent beneath, ciliate, deciduous, 1-nerved; flowers 4.5–5 mm. long, the pedicels 1.6–2 mm. long, pubescent; outer sepals free, triangular, acute, ciliate, slightly pubescent beneath, 3-nerved, the two lower ones 2.8–3 mm. long, 1–1.2 mm. wide, the upper sepal 3–3.2 mm. long, 1.2–1.8 mm. wide; wings blue,



FIG. 14.—*Monnina erecta*: Left to right, lower sepals, upper sepal, wings (inner), keel, upper petals and stamens, gynacium, bract (outer). All  $\times 3$ .

4.5–5 mm. long, 3.4–3.8 mm. wide, obovate, obtuse at base, 3-nerved, eciliate; keel 5–5.2 mm. long, 2.8–3 mm. wide, orbicular, plicate, glabrous within, obtuse at base, 3-nerved, ciliate, 3-lobed, the middle lobe obtuse-submarginate; upper petals spatulate, pubescent; stamens 8, the filaments 3.2–3.8 mm. long, almost entirely united, the free part 1–1.2 mm. long, glabrous; ovary ellipsoid, 1.4–1.6 mm. long, 0.9–1 mm. wide, glabrous; style 2.5–3 mm. long, geniculate in the middle part, glabrous, more or less cylindrical; stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 4.5–5 mm. long, 2.4–2.6 mm. wide, glabrous, reticulate.

Type in the herbarium of the Chicago Natural History Museum, No. 1366998, collected between Jardín and San Rafael, Quebrada del Río San Marcos, eastern slope, Cordillera Central, Department of Cauca, alt. 2,700–2,900 meters, July 25, 1943, by J. Cuatrecasas (No. 14802). Duplicate in the U. S. National Herbarium.

DISTRIBUTION: KNOWN only from the type collection.

This new entity is near *M. arborescens* Ferreyra, from which it differs in its frutescent habit, its considerably longer leaves (to 225 mm. long), its very narrow flower-subtending bracts (8 times as long as wide), and in having its keel glabrous within.

15. *Monnina oblanceolata* Ferreyra, sp. nov.

Frutex, ramis glabris striatis, foliis oblanceolatis glabris revolutis, bracteis florigeris oblanceolatis, sepalo exterioro obtuso, sepalis duobus inferioribus breviter connatis distinguendus; a *M. chlamydantha* Ferreyra, cui affinis, racemis simplicibus, foliis minoribus, bracteis florigeris extus glabris, et characteribus supra enumeratis valde differt.

Branching shrub, the branches 2-3 mm. in diameter, glabrous, striate; leaves oblanceolate, 28-72 mm. long, 11-36 mm. wide, acute, glabrous, entire, revolute, attenuate at base, the costa prominulous beneath, with inconspicuous lateral veins; petioles 2-5 mm. long, concave above, convex beneath, glabrous; racemes elongate, obtuse, 8-10 mm. wide, simple, terminal or axillary, pedunculate (peduncle 5-20 mm. long), the axis 4.2-19 cm. long, glabrous, striate, conspicuously bracteate, the bracts broadly oblanceolate, 5-6.5 mm. long, 4.8-6.5 mm.



FIG. 15.—*Monnina oblanceolata*: Left to right, lower sepals, upper sepal, wings (inner), keel, upper petals and stamens, gynaecium, bract. All  $\times 3$ .

wide, more or less acute, hood-shaped, deciduous, ciliate, 3- or 4-nerved, glabrous beneath; flowers 4-4.8 mm. long, the pedicels 1.6-2 mm. long, finely pubescent; outer sepals ovate-triangular, obtuse, ciliate, glabrous beneath, the two lower ones 1.4-2 mm. long, 1-1.4 mm. wide, slightly united, usually 3-nerved, rarely 1-nerved, the upper sepal 1.6-2.4 mm. long, 1.2-2 mm. wide, 5-nerved; wings blue, 4-5 mm. long, 4-4.6 mm. wide, obovate, obtuse at base, 3-nerved, glabrous, ciliate; keel 4-5 mm. long, 3-3.2 mm. wide, orbicular, plicate, glabrous within, obtuse at base, 3-nerved, 3-lobed, the middle lobe obtuse-emarginate; upper petals elongate-spatulate, pubescent; stamens 8, the filaments 3-3.5 mm. long, almost entirely united, the free part 0.6-1.2 mm. long, glabrous; ovary ovoid, 1.4-1.6 mm. long, 0.8-1 mm. wide, glabrous; style 2-2.4 mm. long, geniculate above base, glabrous, more or less cylindrical; stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; fruit unknown.

Type in the herbarium of the New York Botanical Garden, collected in forest, Cascada Chorrón, south of Antizales, Department of Bolívar, alt. 2,400-2,800 meters, February 25, 1918, by F. W. Pennell (No. 4387).

## ADDITIONAL SPECIMEN EXAMINED:

BOLÍVAR: Below Páramo de Chaquiro, Cordillera Occidental, Pennell 4298 (NY).

DISTRIBUTION: Andes of northwestern Colombia, between 2,400 and 3,100 meters altitude.

This new species is characterized by its glabrous habit, its oblanceolate, revolute leaves with inconspicuous lateral veins, its oblanceolate flower-subtending bracts, and by having its lower sepals slightly united. It is related to *M. chlamydantha* Ferreyra, from which it differs in its simple racemes, smaller leaves, glabrous flower-subtending bracts, etc.

16. *Monnina schultesii* Ferreyra, sp. nov.

Frutex *M. obtusifoliae* H.B.K. affinis, foliis conspicue majoribus lamina ad 13 cm. longa acuta, racemis obtusis rhachi elongata ad 29

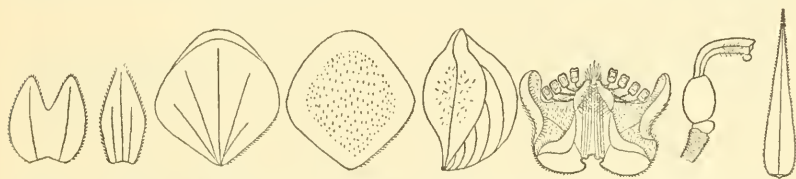


FIG. 16.—*Monnina schultesii*: Left to right, lower sepals, upper sepal, wing (inner), wing (outer), keel, upper petals and stamens, gynaecium, all  $\times 3$ ; bract,  $\times 2$ .

cm. longa, bracteis florigeris filiformibus ad 11.5 mm. longis, sepalo exteriore acuto, sepalis duobus inferioribus  $\frac{2}{3}$  connatis differt.

Frutescent, branched, the branches 23–36 cm. long, 3–8 mm. in diameter, terete, glabrescent; leaves lanceolate (upper) or ovate-lanceolate (lower), 30–130 mm. long, 12–60 mm. wide, acute, sometimes more or less acuminate, glabrous above, glabrescent beneath, entire, attenuate at base (upper) or almost truncate (lower), the costa prominulous beneath, with 8 or 9 pairs of lateral veins; petioles 2–6 mm. long, 0.8–1.8 mm. in diameter, slightly concave above, convex beneath, glabrescent; racemes almost cylindric, obtuse, 8–10 mm. wide, simple, terminal or axillary, pedunculate (peduncle 4–50 mm. long), the axis 3.5–29 cm. long, glabrescent, striate, bracteate, the bracts filiform, 7.2–11.5 mm. long, 1–1.8 mm. wide, acuminate, slightly puberulent beneath, becoming glabrescent, ciliate, deciduous, 1-nerved; flowers 5.2–6 mm. long, the pedicels 1.6–2 mm. long, puberulent; outer sepals lanceolate, ciliate, acute, finely puberulent beneath, the two lower ones 3.4–3.8 mm. long, 3–3.2 mm. wide,  $\frac{2}{3}$  united, 1-nerved, the upper sepal 4.2–4.5 mm. long, 2–2.2 mm. wide, 3-nerved; wings 5.5–6 mm. long,

5.2-5.5 mm. wide, obovate, almost acute at base (fleshy), 3- or 4-nerved, ciliate at base, strigose beneath; keel 5-6 mm. long, 4-4.2 mm. wide, orbicular, plicate, slightly puberulent within, obtuse at base, 3- or 4-nerved, 3-lobed, the middle lobe obtuse-emarginate, larger, with a few strigose hairs beneath; upper petals elongate-spatulate, pubescent; stamens 8, the filaments 4-4.2 mm. long, almost entirely united, the free part 0.6-1.2 mm. long, glabrous; ovary ellipsoid, 1.8-2 mm. long, 1.2-1.5 mm. wide, glabrous; style 3-3.4 mm. long, geniculate above base, pubescent, cylindrical; stigma with 2 lobes, the lower one inconspicuous, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 7-9 mm. long, 4-6.5 mm. wide, glabrous, conspicuously reticulate.

Type in the herbarium of the Chicago Natural History Museum, No. 1241931, collected in the region of Sarare, between Ventanas and Bata, Cordillera Oriental, Department of Norte de Santander, alt. 1,400 meters, October 17, 1941, by J. Cuatrecasas, R. E. Schultes, and E. Smith (No. 12372).

ADDITIONAL SPECIMEN EXAMINED:

NORTE DE SANTANDER: El Amparo, headwaters of Río Negro, valley of Río Margua, region of Sarare, Cordillera Oriental, *Cuatrecasas* 12839 (US).

DISTRIBUTION: KNOWN only from Norte de Santander.

This new species, from northern Colombia, has terete branches, leaves which are lanceolate (upper ones) or ovate-lanceolate (lower ones), and more or less cylindrical racemes which are conspicuously bracteate. It is closely related to *M. obtusifolia* H.B.K., of southern Colombia, differing in its larger leaves (to 130 mm. long) with acute apices, the elongate (to 29 cm. long) axis of its racemes, its filiform and larger (to 11.5 mm. long) bracts, etc.

17. *Monnina obtusifolia* H.B.K. Nov. Gen. & Sp. 5: 411. 1821.

Shrub to 2 m. high, branched, the branches 1.5-5 mm. in diameter, slightly pubescent, becoming glabrescent, striate; leaves oblong, 15-90 mm. long, 9-24 mm. wide, obtuse, mucronate, rarely more or less acute, glabrous above, glabrescent beneath, entire, revolute, coriaceous, attenuate at base, the costa prominulous beneath, with 5 to 7 pairs of lateral veins; petioles 1.2-3 mm. long, slightly concave above, convex beneath, glabrescent; racemes conical, acute, 8-10 mm. wide, simple, terminal or axillary, pedunculate (peduncle 2.5-19 mm. long), the axis 2-11.5 cm. long, strigose, striate, bracteate, the bracts acute-triangular, rarely obtuse, 1-2.2 mm. long, 1-1.2 mm. wide, inconspicuous, deciduous, ciliate, 1-nerved, finely pubescent beneath; flowers 4.2-6 mm. long, the pedicels 0.6-1.2 mm. long, finely pubescent; outer sepals ovate-triangular, ciliate, slightly pubescent beneath, the two

lower ones 1.4–3.2 mm. long, 1.2–1.9 mm. wide,  $\frac{1}{2}$  united, rarely only slightly united, obtuse, usually 3-nerved, rarely 5-nerved, the upper sepal 1.8–3.2 mm. long, 1.8–2.6 mm. wide, obtuse, sometimes more or less acute, 5- or 7-nerved; wings deep blue, 4.8–6 mm. long, 4–6 mm. wide, obovate, almost acute at base, 3-nerved, glabrous, rarely slightly pubescent beneath, ciliate; keel 4.2–6.5 mm. long, 2–4 mm. wide, orbicular, plicate, pubescent within, usually acute at base, sometimes obtuse, 3- or 4-nerved, 3-lobed, the lobes inconspicuous; upper petals more or less elongate-spatulate, pubescent; stamens 8, the filaments 3.2–4.2 mm. long, almost entirely united, the free part 0.5–1.5 mm. long, pubescent; ovary ovoid, 1.2–2.2 mm. long, 0.8–1.2 mm. wide, glabrous; style 2–3 mm. long, geniculate above base, pubescent, more or less cylindrical; stigma with 2 lobes, the lower one acute, the

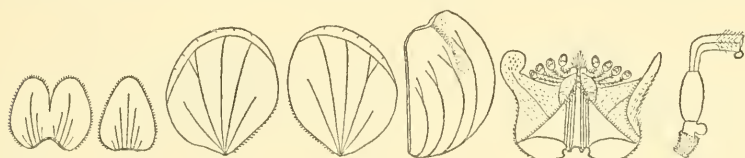


FIG. 17.—*Monnina obtusifolia*: Left to right, lower sepals, upper sepal, wings (inner), keel, upper petals and stamens, gynaecium. All  $\times 3$ .

upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 4.5–5.5 mm. long, 2.2–3.2 mm. wide, glabrous, reticulate.

**DISTRIBUTION:** The Central Cordillera of southwestern Colombia, between 2,600 and 3,600 meters altitude.

**PUTUMAYO:** Páramo de San Antonio del Bordoncillo, between El Encano and Sibundoy, *Cuatrecasas* 11694 (Ch, US).

**EL VALLE:** Barragán, Cerro de La Laguna, valley of Río Bugalagrande, western slope, Cordillera Central, *Cuatrecasas* 20839 (Ch), 20890 (Ch).

**CAUCA:** Mt. Pan de Azúcar, Cordillera Central, *Pennell* 7031 (Ch, NY, US); Páramo de Moras, between Mozoco and Pitayó, Tierra Adentro, *Pittier* 1405 (US); Alto del Duende, headwaters of Río Palo, western slope, Cordillera Central, *Cuatrecasas* 18844 (Ch, US); "road to east from Silva," Cordillera Central, *Haught* 5091 (US), 5091a (US); "Almaguer," Cordillera Central, *Bonpland* s. n. (photographs of type, Ch, US).

**NARIÑO:** Laguna de La Cocha, Isla La Corota, *García-Barriga, Hawkes, & Villarreal* 13056 (US); highway from Túquerres to Ipiales, *García-Barriga & Hawkes* 13063 (US), 13074 (US); region of Pasto, between Pasto and Anganoy, *Schultes & Villarreal* 7429 (US); region of Pasto, road to Arandá, *Schultes & Villarreal* 7467 (US); Túquerres, Pasto, *Triana* s. n. (NY); region of Pedregal, between Pasto and Túquerres, south of Yacuanquer, *Schultes & Villarreal* 7870 (US).

The type locality of this species is "Almaguer," Department of Cauca, in the southwestern part of Colombia. All the material studied

is distinguished by oblong and obtuse leaves and by the pubescent style, although this latter character is not mentioned by Bonpland in his original description.

18. *Monnina aestuans* (L. f.) DC. Prodr. 1: 338. 1824.

*Polygala aestuans* L. f. Suppl. 315. 1781.

*Monnina densa* Pl. & Lind. ex Wedd. Chlor. And. 2: 268. 1855.

Shrub 0.6-4 m. high, branched, the branches 2-8 mm. in diameter, slightly pubescent, becoming glabrescent, striate; leaves subcoriaceous, crowded, usually oblong-lanceolate, sometimes lanceolate, 18-72 mm. long, 4-24 mm. wide, obtuse, rarely acute, mucronate, strigose above, becoming glabrescent, canescent-strigose beneath, entire, slightly revolute, attenuate at base, the costa prominulous beneath, with 6 or 7 pairs of lateral veins; petioles 1.6-5 mm. long, concave above, convex be-



FIG. 18.—*Monnina aestuans*: Left to right, lower sepals, upper sepal, wings (inner), keel, upper petals and stamens, gynaecium, bract. All  $\times 3$ .

neath, articulate, strigose; racemes conical, acute, 8-10 mm. wide, simple, terminal or axillary, pedunculate (peduncle 2-23 mm. long), the axis 1.7-8.5 cm. long, finely pubescent, striate, bracteate, the bracts triangular, acuminate, 2.2-4 mm. long, 1.2-2 mm. wide, deciduous, ciliate, 1-nerved, hood-shaped at base, pubescent beneath; flowers 4.8-5.5 mm. long, the pedicels 0.8-2 mm. long, finely pubescent; outer sepals ovate-triangular, obtuse, ciliate, slightly pubescent beneath, the two lower ones 1.8-3 mm. long, 1.2-1.9 mm. wide, usually  $\frac{1}{2}$ , sometimes  $\frac{1}{3}$ , united, 1-nerved, rarely 3-nerved, the upper sepal 2-3.2 mm. long, 1.5-2.2 mm. wide, 3-nerved, rarely 5-nerved; wings blue, 4-5.4 mm. long, 3.2-5.2 mm. wide, obovate, obtuse at base, 3-nerved, glabrous, ciliate toward base; keel 4.6-6 mm. long, 3-4 mm. wide, orbicular, plicate, pubescent within, rarely glabrescent, obtuse at base, 3-nerved, 3-lobed, the middle lobe obtuse-emarginate; upper petals elongate-spatulate, pubescent; stamens 8, the filaments 3-3.8 mm. long, almost entirely united, the free part 0.6-1.2 mm. long, glabrous; ovary ovoid, 1.2-2 mm. long, 0.8-1.4 mm. wide, glabrous; style 2-3 mm. long, geniculate above base, glabrous, thicker toward apex; stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 5-6.5 mm. long, glabrous, reticulate.



DISTRIBUTION: Northern and central part of the Colombian Andes, and also in Venezuela and Ecuador, between 2,500 and 3,900 meters altitude.

MAGDALENA: Cerro Pintado, Sierra Perijá, *Carriker* 29 (US), 37 (US).

BOLÍVAR: Below Páramo de Chaquiro, Cordillera Occidental, *Pennell* 4311 (NY).

NORTE DE SANTANDER: Páramo de Santurbán enroute from Tona to Mutiscua, *Killip & Smith* 19570 (GH, NY, US); "Cordillères de la province d' Ocaña," *Schlim* 345 (fragments of cotype coll. of *M. densa*, Ch, US; photographs, Ch, US).

CUNDINAMARCA: Monserrate, near Bogotá, *Cuatrecasas* 268 (Ch, US); Salto de Tequendama, *Cuatrecasas* 106 (Ch, US); Guadalupe, Bogotá, *Haught* 5613 (Ch, US), 5623 (US), 5696 (US), 5697 (US); Bogotá, *Dawe* 204 (US), *García-Barriga* 12644 (US); Macizo de Bogotá, *Cuatrecasas* 5050 (US), *Schultes* 7240 (US); above Bogotá, *Rusby & Pennell* 1290 (NY); Boquerón de Chipaque, *Killip* 34197 (NY, US); Ubate-Carupa highway, *Haught* 6175 (US); Páramo de Guasca, *Black* 46-663 (US); between Bogotá and La Calera, *Barkley, García-Barriga, & Vanegas* 17C740 (US); western slopes of Páramo de Cruz Verde, *Cuatrecasas* 328 (Ch).

TOLIMA: Along Quindío Highway, between Cajamarca and summit of the divide, *Killip & Varela* 34642 (NY, US).

DEPT. ? : Without locality, *Rodríguez* 29 (US); San Cristóbal, *Bros. Apollinaire & Arthur* 5 (US).

This species characteristically bears numerous, small, coriaceous, crowded, oblong-lanceolate, mucronate leaves on the upper parts of its branches; the bracts of its racemes are triangular, and the keel is pubescent within. The type was collected by Mutis, very probably in Cundinamarca; the original description agrees well with the cited material from Cundinamarca, and consequently I feel reasonably sure of the identity of the species. The cotype material of *M. densa*, from Norte de Santander, seems scarcely distinguishable from this concept.

19. *Monnina santamartensis* Ferreyra, sp. nov.

Herba annua a *M. rupestre* H.B.K., cui affinis, habitu herbaceo, racemis majoribus rhacli ad 28 cm. longa, sepalo exteriore acuto facile distinguitur.

Herbaceous annual 1.1-1.6 m. high; root 11-12 cm. long, 7-8 mm. in diameter, branched, curved; stem erect, terete, glabrescent, branched in the upper part, the branches 15-27 cm. long, 1.5-4 mm. in diameter, striate, glabrous; leaves broadly lanceolate, 46-225 mm. long, 10-64 mm. wide, conspicuously acuminate, glabrescent, membranaceous, entire, attenuate at base, the costa prominulous beneath, with 8 to 10 pairs of lateral veins; petioles 1.5-10 mm. long, concave above, convex beneath, glabrescent; racemes elongate, acuminate, 8-11 mm. wide,

simple, terminal or axillary, pedunculate (peduncle 14–50 mm. long), the axis 7.2–28 cm. long, slightly canescent-pubescent, becoming glabrescent, striate, bracteate, the bracts filiform, 4.2–6 mm. long, 0.9–1.6 mm. wide, deciduous, ciliate, 1-nerved, finely puberulent beneath; flowers 4.2–6 mm. long, the pedicels 1–1.8 mm. long, finely puberulent; outer sepals more or less lanceolate, acute, ciliate, glabrescent beneath, the two lower ones 1.8–3.2 mm. long, 1–3 mm. wide,  $\frac{1}{2}$  united, 3-nerved, the upper sepal 2.8–4.8 mm. long, 1.6–2 mm. wide, (apex more or less involute) 5-nerved; wings 4.2–5.2 mm. long, 3–4.2 mm. wide, obovate, obtuse at base, 3- or 4-nerved, glabrous, eciliate; keel 4.8–6 mm. long, 2.8–3 mm. wide, orbicular, plicate, glabrous within, rarely slightly pubescent, obtuse at base, 3- or 4-nerved, 3-lobed, the middle lobe obtuse-submarginate, larger; upper petals elongate-spatulate, pubescent; stamens 8, the filaments 2.6–3.5 mm. long, almost



FIG. 19.—*Momina santamartensis*: Left to right, lower sepals, upper sepal, wings (inner), keel, upper petals and stamens, gynaeceum, bract. All  $\times 3$ .

entirely united, the free part 0.5–1.2 mm. long, glabrous; ovary ovoid, 1.5–2.2 mm. long, 1–1.4 mm. wide, glabrous; style 2.4–2.6 mm. long, geniculate above base, glabrous, more or less cylindrical; stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; drupe (immature) 6–6.5 mm. long, 3.4–3.6 mm. wide, glabrous, reticulate.

Type in the herbarium of the New York Botanical Garden, collected in Sierra del Libano, region of Santa Marta, Department of Magdalena, alt. 1,935 meters, March 1898 or 1899, by H. H. Smith (No. 1480). Duplicates in the Gray Herbarium, the U. S. National Herbarium, and the Chicago Natural History Museum.

ADDITIONAL SPECIMENS EXAMINED:

MAGDALENA: Sierra del Libano, Santa Marta, *H. H. Smith* 1557 (GH, NY, US); San Lorenzo Mountains, Santa Marta, *Viereck* s. n. (US); Mount San Lorenzo, near Santa Marta, *Seifriz* 83 (US).

DISTRIBUTION: Northern Colombia, Department of Magdalena, between 1,900 and 2,400 meters altitude.

The proposed species is an herbaceous annual, with oblong-lanceolate, membranaceous, acuminate leaves, and apparently it is endemic to the Santa Marta region. From its close ally, *M. rupestris* H.B.K.,

it differs in its herbaceous habit, its racemes with a longer axis (to 28 cm. long), its larger (to 4.8 mm. long) and acute outer sepals, and its more northern distribution.

20. *Monnina rupestris* H.B.K. Nov. Gen. & Sp. 5: 415. 1821.

*Monnina tenuifolia* Chodat in Bull. Herb. Boiss. 3: 131. 1895.

*Monnina pulchra* Chodat in Bull. Herb. Boiss. 3: 133. 1895.

Shrub to 6 m. high, branched, the branches 1.8–7 mm. in diameter, strigose, becoming glabrescent, striate; leaves subherbaceous, lanceolate, rarely elliptic-lanceolate, 22–115 mm. long, 9–32 mm. wide, usually acuminate, sometimes obtuse or acute, strigose, becoming glabrescent, entire, attenuate at base, the costa prominulous beneath, with 7 or 8 pairs of lateral veins; petioles 2.5–7 mm. long, slightly winged, concave above, convex beneath, articulate, strigose; racemes conical, acute, 8–10 mm. wide, simple, terminal or axillary, pedunculate (peduncle 6–32 mm. long), the axis 2.6–9 cm. long, strigose, striate, bracteate, the bracts filiform, 2.2–3.5 mm. long, 1–1.2 mm. wide, deciduous, ciliate, 1-nerved, pubescent beneath; flowers 4.4–4.8 mm. long, the pedicels 1.8–2.8 mm. long, finely pubescent; outer sepals ovate-triangular, obtuse, rarely acute, ciliate, puberulent beneath, the two lower ones 1.4–1.8 mm. long, 1–1.4 mm. wide,  $\frac{1}{2}$  united, 3-nerved, the upper sepal 1.8–2.2 mm. long, 1.4–1.8 mm. wide, 5-nerved; wings blue, 4–5 mm. long, 3.6–5 mm. wide, obovate, acute at base, 3-nerved, ciliate; keel 4.2–5 mm. long, 2.6–3.2 mm. wide, orbicular, plicate, glabrous within, obtuse at base, 3-nerved, 3-lobed, the middle lobe more or less inconspicuous, emarginate; upper petals elongate-spatulate, pubescent; stamens 8, the filaments 3–3.8 mm. long, almost entirely united, the free part 0.8–1.2 mm. long, glabrous; ovary ovoid, 1.2–2.2 mm. long, 0.9–1.2 mm. wide, glabrous; style 2–3 mm. long, geniculate above base, glabrous, cylindrical; stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; fruit samaroid or more or less drupaceous, ellipsoid, 5–10 mm. long, 3.2–5.2 mm. wide, glabrous, slightly winged, inconspicuously emarginate at apex, the body rugose, reticulate.

DISTRIBUTION: Along the Andes from Central Colombia to the northern part of Ecuador, between 1,300 and 3,000 meters altitude.

CUNDINAMARCA: Pacho-San Cayetano Highway, *Haught* 6022 (Ch, US); Bogotá, *Bro. Apollinaire* s. n. (US); above Bogotá, Río San Francisco, *Pennell* 1940 (GH, NY, US); Guadalupe, near Bogotá, *Bros. Apollinaire & Arthur* 22 (US), *Bro. Ariste-Joseph* A79 (GH, US); vicinity of Bogotá, *Schultze* 5 (US), *Bro. Ariste-Joseph* s. n. (US), *Holton* 23 (NY); Cordillera de Bogotá, *Triana* s. n. (NY); Cordillera Central, south of Bogotá, *Dugand* 3565 (US); Río del Arzobispo, *Herb. Bayon* s. n. (US); Salto de Tequendama, *Cuatrecasas* 65

(Ch, US), *Bro. Ariste-Joseph* s. n. (US); "Zipacón," *Papenoe* 1141 (US); La Florida, *Pérez-Arbeláez* 2303 (US); without locality, *Bro. Ariste-Joseph* s. n. (US).

CAQUETÁ: Gabinete, Cordillera Oriental, *Cuatrecasas* 8411 (Ch, US), *Jużczuk* 6616 (US).

PUTUMAYO: Highway from Sibundoy to Urcusique, Alto de la Cordillera, La Cabaña, *Cuatrecasas* 11526 (US); Portachuelo, valley of Sibundoy, *Schultes & Villarreal* 7728 (US); near Páramo de Bordoncillo, Laguna La Cocha, Ciudadela, above lake on road to Sibundoy, *Schultes & Villarreal* 7569 (US).

HUILA: Balsillas, on Río Balsillas, *Rusby & Pennell* 746 (GH, NY, US); valley of Río Cedro, southeast of Pitalito, *Schultes & Villarreal* 5215 (US); Santa Leticia, region of Moscopán, highway to La Plata, *García-Barriga & Hawkes* 12886 (US).

CAUCA: "La Gallera," Micay Valley, Cordillera Occidental, *Killip* 7964 (GH, NY, US).

NARIÑO: Pasto, *Jameson* 473 (type coll. of *M. pulchra* US, photograph of type US).



FIG. 20.—*Monnina rupestris*: Left to right, lower sepals, upper sepal, wings (inner), keel, upper petals and stamens, gynaeceum, bract. All  $\times 3$ .

The type material of *M. rupestris* was obtained by Bonpland "in monte Saraguru," Ecuador. I have seen fragments and a photograph of the type, which agrees well with the specimens cited above. Chodat's description of *M. tenuifolia* does not disclose any differences from *M. rupestris*; its type locality is "prope San Pablo," in the Department of Nariño. *Monnina pulchra* was based by Chodat upon specimens reputedly collected by Jameson "in Andibus aequatorensis prope Patto." Doubtless this locality is to be transcribed as Pasto, in the Department of Nariño; an isotype of *M. pulchra*, cited above, can scarcely be separated from *M. pulchra*.

The species is characterized by its herbaceous and acuminate leaves, its simple, terminal or axillary racemes, the wings of its flowers being acute at base, and its more or less samaroid fruits.

21. *Monnina phytolaccaefolia* H.B.K. Nov. Gen. & Sp. 5: 419. 1821.

*Monnina floribunda* Tr. & Pl. in Ann. Sci. Nat. IV. 17: 139. 1862.

*Monnina comata* Chodat in Bull. Herb. Boiss. 2: 171. 1894.

*Monnina elliptica* Chodat in Bull. Herb. Boiss. 3: 134. 1895.

Shrub 0.5–3.8 m. high, branched, the branches 2–6 mm. in diameter, hirsute, becoming glabrescent, striate; leaves lanceolate, 4–15.5 cm. long, 1.4–5 cm. wide, almost coriaceous, usually acute, rarely more or

less obtuse, canescent-hirsute, becoming glabrescent, entire, attenuate at base, the costa prominulous beneath, with 7 to 9 pairs of lateral veins; petioles 1.5–6 mm. long, concave above, convex beneath, hirsute, sometimes becoming glabrescent, slightly winged; racemes almost conical, acute, 7–10 mm. wide, simple, terminal or axillary, pedunculate (peduncle 5–35 mm. long), the axis 2–15 cm. long, hirsute, rarely glabrescent, striate, bracteate, the bracts acute-triangular, hood-shaped at base, 2–4.2 mm. long, 1–2.5 mm. wide, deciduous, ciliate, 1-nerved, rarely 3-nerved, pubescent beneath; flowers 4.2–6 mm. long, the pedicels 0.8–1.2 mm. long, hirsute; outer sepals ovate-triangular, obtuse, ciliate, finely pubescent beneath, rarely glabrescent, the two lower ones 1.8–2.8 mm. long, 0.8–2 mm. wide, slightly united, 3-nerved, rarely 5-nerved, the upper sepal 2.2–3.2 mm. long, 1.5–2.4 mm. wide, usually 5-nerved, sometimes 3- or 7-nerved; wings blue, 4.5–6 mm.

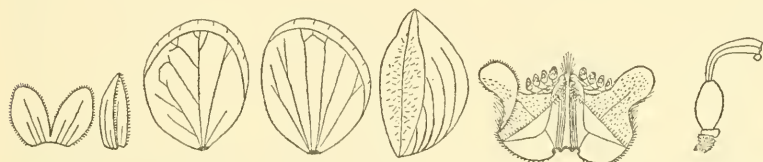


FIG. 21.—*Monnina phytolaccaefolia*: Left to right, lower sepals, upper sepal, wings (inner), keel, upper petals and stamens, gynaecium. All  $\times 3$ .

long, 4–5.5 mm. wide, obovate, obtuse at base, 3-nerved, glabrous, rarely finely pubescent beneath; keel 4.6–6.5 mm. long, 2.8–4 mm. wide, orbicular, plicate, pubescent within, rarely glabrescent, obtuse at base, 3-nerved, 3-lobed, the middle lobe obtuse-emarginate, larger; upper petals elongate-spatulate, pubescent; stamens 8, the filaments 2.8–4.5 mm. long, almost entirely united, the free part 0.8–1.4 mm. long, glabrous; ovary ovoid, 1.2–2.2 mm. long, 0.8–1.4 mm. wide, glabrous; style 2.2–3.2 mm. long, geniculate above base, glabrous, rarely with a few hairs, thicker toward apex; stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 5–7.5 mm. long, 3–4.8 mm. wide, glabrous, sometimes slightly winged, reticulate.

DISTRIBUTION: Along the Andes from northern Colombia to Ecuador, between 1,040 and 3,300 meters altitude.

MAGDALENA: Cerro Quemado region, *Espina & Giacometto* A156 (Ch, NY, US).

BOLÍVAR: Antizales, *Pennell* 4439 (NY).

NORTE DE SANTANDER: Road from Pamplona to Toledo, *Killip & Smith* 19924 (GH, NY, US); vicinity of Chinácota, *Killip & Smith* 20779 (US).

SANTANDER: Vicinity of Charta, *Killip & Smith* 19043 (GH, NY, US); Río Suratá valley, between El Jaboncillo and Suratá, *Killip & Smith* 16449 (GH, NY, US); Mesa de los Santos, *Killip & Smith* 15077 (GH, NY, US); between Piedecuesta and Las Vegas, *Killip & Smith* 15515 (GH, NY, US); mountains east of Las Vegas, *Killip & Smith* 15862 (GH, NY, US); between El Roble and Tona, *Killip & Smith* 19396 (GH, NY, US); between Suratá and California, *Killip & Smith* 16796 (US).

BOYACÁ: Páramo de Santa Rosa, Cordillera Oriental, *Cuatrecasas* 10335 (US); region of Mount Chapón, *Lacrance* 16 (Ch, NY, US).

CUNDINAMARCA: Vicinity of San Bernardo, to Sasaima, *Cuatrecasas* 9577 (Ch, US); Sasaima, near San Bernardo, *García-Barriga* 12619 (US); Estación Santana, above Sasaima, *Dugand & Jaramillo* 3827 (US); Sasaima, *García-Barriga* 11584 (US); El Colegio, *Bro. Ariste-Joseph* 10.49 (US); between El Salto and El Colegio, *Cuatrecasas* 8249 (Ch, US); "Susumuco," southeast of Quetamé, *Pennell* 1736 (GH, NY, US); La Vega, *Pérez-Arbeláez & Cuatrecasas* 5338 (Ch, US); San Antonio de Tena, western slope, Cordillera Oriental, *Dugand & Jaramillo* 2944 (US); Caparrapi, *García-Barriga* 7674 (US); La Palma, highway to Pacho, Río Murca, *García-Barriga* 12402 (US); highway between San Francisco and La Vega, *García-Barriga* 10951 (US); Hacienda Paramillo, west of Guaduas, *García-Barriga* 12325 (US); Macizo de Bogotá, Cerro El Retiro, *Schultes* 7023 (US); Ubalá, Bogotá, *Triana* s. n. (type coll. of *M. floribunda*, NY; photographs of type, Ch, US).

TOLIMA: "La Virginia," Líbano, *Pennell* 3288 (GH, NY, US); "Icononzo" to "Boca de Monte," highway to Melgar, *García-Barriga* 12015 (US); El Líbano, *García-Barriga* 12234 (US); "Mariquita," *Bonpland* s. n. (fragments of type, US; photographs of type, Ch, US).

ANTIOQUIA: Medellín, *Archer* 79 (US); vicinity of Medellín, *Toro* 88 (NY, US); vicinity of Bocana, east of Medellín, *Araque & Barkley* 19An054 (US); "Sonson," *Archer & López* 402 (NY, US); Santa Bárbara, Cauca Valley, *Pennell* 10922 (US); Heliconia, *Bro. Daniel* 3987 (US); Cordillera Central, *Correa* 28 (US).

CALDAS: Salento, Cordillera Central, *Pennell, Killip, & Hazen* 8740 (GH, NY, US), 8741 (GH, NY, US); Santuario, Cordillera Occidental, *Pennell* 10303 (GH, US); near Victoria, *Haught* 2151 (US); "La Palmita," west of Armenia, Cauca Valley, *Pennell, Killip, & Hazen* 8595 (NY, US); Pereira, Cordillera Central, *Killip & Hazen* 11008 (US); "Chinchina," *Cuatrecasas* 23380 (Ch); La Selva, Cordillera Occidental, western slope, *von Sneidern* 5540 (US).

CHOCO: "La Mansa," *Araque & Barkley* 19Ch012 (US).

EL VALLE: La Cumbre, Cordillera Occidental, *Pennell* 5171 (GH, NY, US); Naranjal, valley of Río Sanquinín, western slope, Cordillera Occidental, *Cuatrecasas* 15373 (Ch, US); Morro Pelado, Pichindé, valley of Río Cali, eastern slope, Cordillera Occidental, *Cuatrecasas* 18137 (Ch, US); La Tulia, valley of Río Cali, eastern slope, Cordillera Occidental, *Cuatrecasas* 18529 (Ch); kilometer 54 on Cali-Buenaventura highway, *Haught* 5313 (US); Ciclito, Western Cordillera, *Dryander* 1977 (US); Versalles, Western Cordillera, *Dave* 832 (NY, US); hills near Alcalá, *Cuatrecasas* 22849 (Ch); Las Neives, west of Cali, Western Cordillera, *Killip, Cuatrecasas, & Dryander* 39208 (Ch, US).

CAUCA: Popayán, *Yepes* 133 (Ch, US), *von Sneidern* 5602 (US); highlands of Popayán, *Lehmann* 360 (NY), 361 (Ch, GH, NY); Tambo, *Haught* 5279

(US); "Timbio-Paispampa" highway, *Haught* 5297 (US); between Popayán and Cajeti, toward Tambo, *Cuatrecasas* 13822 (Ch, US).

DEPT. ? : Without locality, *Rodriguez* 5 (US); La Esperanza, *García-Barriga* 3062 (US); San Antonio, *Langlassé* 31 (GH); above Palmira, Cordillera Central, *Pittier* 903 (US); Río Ortega to San Antonio, Cordillera Occidental, *Pennell & Killip* 7261 (NY, US); Estación Uribe, *Bro. Ariste-Joseph*, s. n. (US).

This is a common species of the Andes of Colombia and Ecuador. It is related to *M. rupestris* H.B.K., but is distinct in the more or less coriaceous and acute leaves, the racemes with longer axes (to 15 cm. long), the triangular flower-subtending bracts, the two lower sepals being inconspicuously united at base, and the keel being pubescent within. The type collection of *M. floribunda* Tr. & Pl. shows the same characters, and a comparison of it with fragments and photographs of the type of *M. phytolaccaefolia* demonstrates that only one species is concerned. Moreover, numerous specimens from essentially the type locality of *M. floribunda* (near Bogotá) have been found to be identical with the Bonpland collection. *Monnina comata* Chodat was founded on material collected by André at Salento, Department of El Valle. The type of this species is not now available at Geneva; Professor Baehni informs me that it may have been destroyed in a fire at the University of Genève at the time Chodat was working on this family. However, examination of the original description of *M. comata* shows no reason to consider it a distinct species, and the numerous specimens from El Valle agreeing with Bonpland's material bear out this reduction. The same disposition has been made of the binomial *M. elliptica*, based on material from near Cartago, El Valle, in spite of the fact that Chodat placed this species in a group marked by "ovarium pilosum." No other characters separate Chodat's species, and his characterization of the ovary as pilose has been questionable in other species, i. e., in *M. mathusiana*, from northern Peru.

22. *Monnina revoluta* H.B.K. Nov. Gen. & Sp. 5: 412. 1821.

Shrub, 1–2 m. high, the stem erect, glabrescent, branched, the branches 12–32 cm. long, 2–9 mm. in diameter, slightly pubescent, corymbose; leaves crowded, linear-elliptic, 14–50 mm. long, 3.5–9 mm. wide, obtuse, glabrescent above, finely pubescent beneath, entire, conspicuously revolute, the costa prominulous beneath, with inconspicuous lateral veins; petioles 1.5–2 mm. long, concave above, convex beneath, puberulent; racemes conical, acute, 8–10 mm. wide, simple, terminal, pedunculate (peduncle 3–4 mm. long), the axis 1.6–2.5 cm. long, slightly pubescent, bracteate, the bracts triangular, acute, 1–1.5

mm. long, 1–1.2 mm. wide, pubescent beneath, ciliate, 1-nerved, inconspicuous; flowers 4–5 mm. long, the pedicels 0.8–1 mm. long, finely pubescent; outer sepals free, ovate-triangular, obtuse, ciliate, the two lower ones 1.4–3 mm. long, 1.2–2 mm. wide, usually 1-nerved, rarely 3-nerved, the upper sepal 2–3.2 mm. long, 1.6–2 mm. wide, 3- or 5-nerved; wings deep blue, 4.2–5 mm. long, 3.5–4 mm. wide, obovate, more or less acute at base, 3- or 4-nerved, ciliate, glabrous on both sides; keel 4.2–5.2 mm. long, 2.5–3 mm. wide, orbicular, plicate, glabrous within, sometimes slightly pubescent, obtuse at base, 4-nerved, 3-lobed, the middle lobe obtuse-emarginate, larger; upper petals spatulate, pubescent; stamens 8, the filaments 2.8–4 mm. long, almost entirely united, the free part 0.8–1.5 mm. long, glabrous; ovary ovoid, 1.8–2 mm. long, 1–1.2 mm. wide, glabrous; style 2.2–2.6 mm. long, geniculate near its base, glabrous, cylindrical; stigma with 2 lobes, the

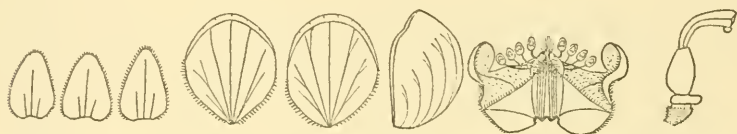


FIG. 22.—*Monnina revoluta*: Left to right, lower sepals, upper sepal, wings (inner), keel, upper petals and stamens, gynacium. All  $\times 3$ .

lower one acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 6–6.5 mm. long, 2.8–3 mm. wide, glabrous, reticulate.

DISTRIBUTION: Central and southwestern parts of Colombia, between 3,250 and 4,200 meters altitude, and also in Ecuador.

CUNDINAMARCA: Páramo de Guasca, Cordillera Oriental, *Hodge* 6478 (Ch).

PUTUMAYO: Between El Encano and Sibundoy, Páramo de San Antonio del Bordoncillo, *Cuatrecasas* 11752 (US).

TOLIMA: Páramo de Ruiz, *Pennell* 3083 (NY); "Mariquita," *Linden* 955 (fragments of authentic material, US).

CALDAS: Above El Bosque, Río Otún, western slope, Cordillera Central, *Cuatrecasas* 23169 (Ch); Páramos de la Laguna del Mosquito, Río Otún, western slope, Cordillera Central, *Cuatrecasas* 23249 (Ch); Páramo del Quindío, Cordillera Central, *Pennell & Hazen* 9986 (GH, NY, US).

CAUCA: Mount Pan de Azúcar, Cordillera Central, *Pennell* 7045 (GH, NY, US); San Francisco, Páramo del Puracé, Cordillera Central, *Cuatrecasas* 14576 (Ch, US), 14576A (Ch); Las Casitas, Río Palo, western slope, Cordillera Central, *Cuatrecasas* 18994 (Ch, US); Puracé, Cordillera Central, *von Sneider* 1815 (NY).

NARIÑO: Pasto, *Bonpland* s. n. (fragments of type Ch, photographs of type, GH, US).

DEPT. ? : *Holton* 829 (GH, NY).

This species, characterized by more or less corymbose branches and conspicuously small, crowded, linear-elliptic, revolute leaves, is typified



by a collection from Pasto, Department of Nariño, of which fragments and photographs have been seen.

23. *Monnina elongata* Pl. & Lind. in Ann. Sci. Nat. IV. 17: 137. 1862.

Frutescent, to 1.6 m. high, branched, the branches 12–24 cm. long, 1.5–2 mm. in diameter, canescent-pubescent, becoming more or less glabrescent; leaves lanceolate, 34–80 mm. long, 12–23 mm. wide, acuminate, rarely acute, pubescent above, becoming almost glabrescent, canescent-pubescent beneath, entire, attenuate at base, the costa slightly prominulous beneath, with 8 or 9 pairs of lateral veins; petioles 2–6 mm. long, concave above, convex beneath, pubescent; racemes more or less conical, obtuse, 8–10 mm. wide, simple, terminal or axillary, pedunculate (peduncle 7–18 mm. long), the axis 2.2–11 cm. long, canescent-pubescent, striate, bracteate, the bracts oblance-



FIG. 23.—*Monnina elongata*: Left to right, lower sepals, upper sepal, wings (inner), keel, upper petals and stamens, gynaecium, bract. All  $\times 3$ .

olate, 6–7 mm. long, 2–2.6 mm. wide, acuminate, 1-nerved, slightly pubescent beneath, becoming glabrescent, deciduous, ciliate; flowers 4–4.5 mm. long, the pedicels 1–1.2 mm. long, finely pubescent; outer sepals free, ovate-triangular, obtuse, ciliate, the two lower ones 2–2.4 mm. long, 1.2–1.5 mm. wide, usually 1-nerved, rarely 2-nerved, glabrous beneath, the upper sepal 2.8–3 mm. long, 1.8–2 mm. wide, 3-nerved, glabrescent beneath; wings deep blue, 4–4.5 mm. long, 3.5–3.8 mm. wide, obovate, obtuse at base, 3-nerved, glabrous beneath, glabrescent within, sometimes with a few hairs at base; keel 4.5–5 mm. long, 2.3–2.8 mm. wide, orbicular, plicate, glabrous within, obtuse at base, 3-nerved, 3-lobed, the middle lobe obtuse-submarginate; upper petals elongate-spatulate, pubescent; stamens 8, the filaments 2.8–3.2 mm. long, almost entirely united, the free part 0.8–1.2 mm. long, glabrous; ovary ovoid, 1.6–2 mm. long, 0.9–1 mm. wide, slightly pubescent, becoming glabrescent, the hairs more conspicuous in the upper part; style 2–2.2 mm. long, geniculate above base, glabrous, cylindrical; stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 5–5.5 mm. long, 3–3.2 mm. wide, slightly pubescent, becoming glabrescent, reticulate.

DISTRIBUTION: Northern part of Colombia, between 1,500 and 3,300 meters altitude.

NORTE DE SANTANDER: Ocaña, *Schlim* 674, 1137 (photographs of cotypes, Ch, GH, US).

SANTANDER: Eastern slope of Páramo de las Coloradas, above La Baja, *Killip & Smith* 18381 (GH, NY, US); without locality, *Linden* 375 (fragments of authentic material, US).

The canescent-pubescent habit, the lanceolate and acuminate leaves, and the obtuse racemes with conspicuous oblanceolate bracts characterize this species.

24. *Monnina andreana* Chodat in Bull. Herb. Boiss. 3: 134. 1895.

*Monnina lehmanniana* Chodat in Bull. Herb. Boiss. 3: 542. 1895.

Frutescent, branched, the branches 1.6–3.8 mm. in diameter, conspicuously hirsute, terete; leaves lanceolate, 18–65 mm. long, 5.5–15 mm. wide, acute, glabrescent above, slightly pubescent beneath, entire,



FIG. 24.—*Monnina andreana*: Left to right, lower sepals, upper sepal, wings (inner), keel, upper petals and stamens, gynaecium, bract. All  $\times 3$ .

attenuate at base, the costa prominulous beneath, with 4 or 5 pairs of lateral veins; petioles 2.5–5.5 mm. long, concave above, convex beneath, pubescent; racemes elongate, acute, 8–10 mm. wide, simple, terminal or axillary, pedunculate (peduncle 3–10 mm.), the axis 2.2–6 cm. long, hirsute, striate, bracteate, the bracts linear or narrowly triangular, 1.8–3 mm. long, 0.5–0.8 mm. wide, deciduous, ciliate, 1-nerved, finely pubescent beneath; flowers 3.8–4 mm. long, the pedicels 1.2–1.4 mm. long, slightly pubescent; outer sepals free, triangular, acute, ciliate, finely pubescent beneath, becoming glabrescent, the two lower ones 2.2–2.5 mm. long, 0.9–1.2 mm. wide, 1-nerved, rarely 3-nerved, the upper sepal 2.6–3.2 mm. long, 1–1.2 mm. wide, 3-nerved; wings 4–4.4 mm. long, 3–3.8 mm. wide, obovate, acute at base, 3-nerved, glabrous beneath, ciliate at base; keel 3.8–5 mm. long, 2.6–3 mm. wide, orbicular, plicate, glabrous within, obtuse at base, 3-nerved, inconspicuously 3-lobed, the middle lobe obtuse-submarginate; upper petals elongate-spatulate, pubescent; stamens 8, the filaments 3.2–3.8 mm. long, almost entirely united, the free part 0.8–1.5 mm. long, glabrous; ovary ovoid, 1–1.8 mm. long, 0.7–1 mm. wide, pubescent;

style 2.5–3 mm. long, geniculate in the middle part, glabrous, more or less cylindrical; stigma with 2 lobes, the lower one conspicuously acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 5–6 mm. long, 2.4–3 mm. wide, pubescent, becoming glabrescent, reticulate.

DISTRIBUTION: Central and southwestern Colombia, between 2,700 and 3,450 meters altitude.

CUNDINAMARCA: Facatativa, *André* 558 (type, in Conservatoire Botanique, Genève).

CAUCA: Páramos near Laguna del Paez, headwaters of Río Paez, western slope, Cordillera Central, *Cuatrecasas* 19047 (Ch, US); Páramo de Guanacas, *Lehmann* 2129 (type coll. of *M. lehmanniana*, US; photographs, GH, US).

This species seems closely related to *M. elongata* Pl. & Lind. but, unlike that species, it has conspicuously hirsute branches, acute leaves with 4 or 5 pairs of lateral veins, racemes with a shorter axis (to 6 cm. long) and with linear or narrowly triangular bracts, acute outer sepals, etc. Direct comparison of type material of the two binomials concerned indicates that they cannot both be maintained, the only apparent difference being the somewhat glabrescent ovary in the type of *M. andreana*. Through the kindness of Professor Baehni, Director of the Conservatoire Botanique, Genève, it has been possible for me to borrow the actual type of *M. andreana*.

25. *Monnina involuta* Ferreyra, sp. nov.

Frutex ad 1 m. altus *M. latifoliae* (Bonpl.) DC. affinis, foliis minoribus lamina ad 5 cm. longa, racemis minoribus rhachi ad 4.5 cm. longa, sepalo exteriore conspicue involuto, stylo glabro differt.

Frutescent, to 1 m. high, branched, the branches 16.5–26.5 cm. long, 2.6–3 mm. in diameter, nodose, glabrescent, striate; leaves lanceolate, 22–50 mm. long, 9–16 mm. wide, acute, glabrescent above, finely pubescent beneath, entire, slightly revolute, attenuate at base, the costa prominulous beneath, with 4 or 5 pairs of lateral veins; petioles 2–2.5 mm. long, concave above, convex beneath, finely pubescent; racemes conical, acute, 7–9 mm. wide, simple, terminal or axillary, pedunculate (peduncle 5–8 mm. long), the axis 2.8–4.5 cm. long, pubescent, striate, bracteate, the bracts inconspicuous; flowers 4.8–5.4 mm. long, the pedicels 1.6–2.2 mm. long, slightly pubescent; outer sepals free, lanceolate, acute, the apex conspicuously involute, ciliate, glabrous beneath, 3-nerved, the two lower ones 4–4.8 mm. long, 1.2–1.6 mm. wide, the upper sepal 4.2–5 mm. long, 1.6–1.8 mm. wide; wings blue, 4–4.6 mm. long, 3.5–4 mm. wide, obovate, obtuse at base, 3- or 4-nerved, glabrous beneath, eciliate; keel 4.5–5.2 mm. long, 2.4–2.8 mm. wide,

orbicular, plicate, glabrous within, obtuse at base, 3- or 4-nerved, subemarginate at apex, inconspicuously 3-lobed; upper petals short, spatulate, pubescent; stamens 8, the filaments 3.2-4 mm. long, almost entirely united, the free part 0.5-1 mm. long, glabrous; ovary ellipsoid, 1-1.4 mm. long, 0.6-0.8 mm. wide, glabrous; style 2-2.2 mm. long, more or less geniculate in the middle part, glabrous, almost cylindrical; stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 4-5 mm. long, 2.2-2.8 mm. wide, glabrous, reticulate.

Type in the herbarium of the Chicago Natural History Museum, No. 1366909, collected on Los Farallones, in thickets on Páramo of Cerro La Torre, Cordillera Occidental, Department of El Valle, alt. 3,750 meters, October 10, 1944, by J. Cuatrecasas (No. 17862).



FIG. 25.—*Monnina involuta*: Left to right, lower sepals, upper sepal, wings (inner), keel, upper petals and stamens, gynaecium. All  $\times 3$ .

DISTRIBUTION: Known only from the type collection.

The new entity has small, lanceolate, acute leaves (to 50 mm. long), the apex of the outer sepals being strongly involute. It is related to *M. latifolia* (Bonpl.) DC., but has smaller leaves, the axis of racemes shorter (to 4.5 cm. long), the outer sepals involute, the keel and style glabrous, etc.

26. *Monnina latifolia* (Bonpl.) DC. Prodr. 1: 338. 1824.

*Hebeandra latifolia* Bonpl. in Ges. Naturf. Freund. Berlin Mag. 2: 43. 1808.

Frutescent to 1 m. high, branched, the branches 3.5-5 mm. in diameter, slightly canescent-pubescent, striate; leaves elliptic-lanceolate, 68-215 mm. long, 19-85 mm. wide, usually acuminate, rarely acute, glabrescent above, finely pubescent beneath, entire, attenuate at base, the costa prominulous beneath, with 8 or 9 pairs of lateral veins; petioles 2-3 mm. long, concave above, convex beneath, finely pubescent; racemes elongate, obtuse, 10-12 mm. wide, simple, terminal or axillary, sometimes inconspicuously aggregate in groups of 2-4, pedunculate (peduncle 16-32 mm. long), the axis 5.8-30 cm. long, canescent-pubescent, striate, bracteate, the bracts linear, 6-7.2 mm. long, 1-1.2 mm. wide, deciduous, ciliate, 1-nerved, finely pubescent beneath; flowers 4.5-5.5 mm. long, the pedicels 1.5-2.5 mm. long, finely pubescent; outer sepals free, ovate, acute, ciliate, pubescent

beneath, the two lower ones 4.8–5.2 mm. long, 2.8–3 mm. wide, 3-nerved, the upper sepal 5–6 mm. long, 3.2–3.9 mm. wide, 5-nerved; wings deep blue, 4.5–5.2 mm. long, 4.6–5.2 mm. wide, obovate, obtuse at base, 3- or 4-nerved, strongly pubescent beneath, the hairs more or less rigid, ascending, glabrous within, ciliate; keel 4.8–5.5 mm. long, 3–3.5 mm. wide, orbicular, plicate, pubescent within, obtuse at base, 3- or 4-nerved, 3-lobed, the middle lobe obtuse-emarginate; upper petals slightly elongate-spatulate, pubescent; stamens 8, the filaments 3.2–4 mm. long, almost entirely united, the free part 0.6–1 mm. long, glabrous; ovary ovoid, 2–2.2 mm. long, 1.2–1.4 mm. wide, glabrous; style 2–2.5 mm. long, conspicuously geniculate at base, pubescent, cylindric; stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 7–8 mm. long, 4–4.5 mm. wide, glabrous, reticulate.

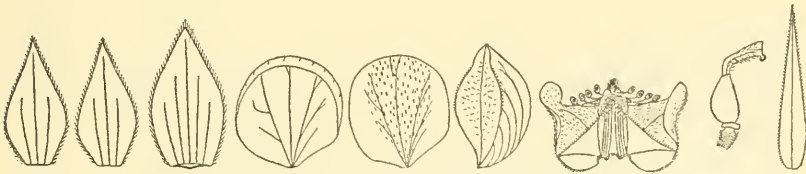


FIG. 26.—*Monnina latifolia*: Left to right, lower sepals, upper sepal, wing (inner), wing (outer), keel, upper petals and stamens, gynaecium, bract. All  $\times 3$ .

**DISTRIBUTION:** Confined to the Andes of Central Colombia, between 2,000 and 2,100 meters altitude.

**CUNDINAMARCA:** Pacho-Paine Highway, *Haught* 6073 (US).

**TOLIMA:** "Quindío," *Goudot* s. n. (US), *Bonpland* s. n. (photograph of type, US).

This small shrub is readily distinguished by its large, acuminate, elliptic-lanceolate leaves, its racemes with elongate axes (to 30 cm. long) and conspicuous linear bracts (to 7.2 mm. long), and by having its outer sepals larger than the wings, its wings strongly pubescent, and its style also pubescent.

27. *Monnina bracteata* Chodat in Bull. Herb. Boiss. 3: 133. 1895.

*Monnina multicomata* Chodat in Bull. Soc. Bot. Genève II. 25: 211. 1934.

Slender tree, branched, the branches 1.8–3 mm. in diameter, striate, hirsute; leaves lanceolate, 38–155 mm. long, 10–55 mm. wide, acuminate, rarely acute, finely pubescent above, becoming glabrescent, canescent-hirsute beneath, entire, attenuate at base, the costa prominent beneath, with 7 to 9 pairs of lateral veins; petioles 1.8–8 mm. long, concave above, convex beneath, articulate, pubescent; racemes

more or less conical, acute, 8–10 mm. wide, simple, terminal or axillary, pedunculate (peduncle 8–20 mm. long), the axis 1.8–9.5 cm. long, hirsute, striate, bracteate, the bracts conspicuously filiform, 6–11.6 mm. long, 1–3.5 mm. wide, deciduous, ciliate, 1-nerved, puberulous beneath; flowers 3.8–5 mm. long, the pedicels 1–1.2 mm. long, finely puberulent; outer sepals free, lanceolate, ciliate, acute (apex involute), pubescent beneath, the two lower ones 3.8–5.5 mm. long, 1.8–3 mm. wide, 5-nerved, rarely 3-nerved, the upper sepal 3.8–6 mm. long, 1.8–3.8 mm. wide, 7-nerved, sometimes 5-nerved; wings blue, 4–4.5 mm. long, 3–4 mm. wide, obovate, obtuse at base, 3-nerved, slightly pubescent beneath, rarely glabrescent, glabrous within, usually eciliate; keel 4–5 mm. long, 2.8–3.2 mm. wide, orbicular, plicate, slightly pubescent within, rarely glabrescent, obtuse at base, 3-nerved, 3-lobed, the middle



FIG. 27.—*Monnina bracteata*: Left to right, lower sepals, upper sepal, wing (inner), wing (outer), keel, upper petals and stamens, gynaecium, all  $\times 3$ ; bract,  $\times 2$ .

lobe inconspicuous, obtuse-subemarginate; upper petals elongate-spatulate, pubescent; stamens 8, the filaments 3–3.2 mm. long, almost entirely united, the free part 0.4–0.8 mm. long, glabrous; ovary ovoid, 1.2–2.2 mm. long, 0.8–1.4 mm. wide, glabrous; style 2–2.4 mm. long, geniculate above base, glabrescent, rarely with a few inconspicuous hairs, more or less cylindrical; stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 5.2–7 mm. long, 3.2–4.4 mm. wide, glabrous, reticulate.

DISTRIBUTION: In the Andes of central and northern Colombia, and the southwestern part of Venezuela, between 2,000 and 3,400 meters altitude.

NORTE DE SANTANDER: Pica-Pica Valley, above Tapatá, north of Toledo, Killip & Smith 20029 (NY, US).

CALDAS: Salento, Cordillera Central, Pennell 8917 (GH, NY, US); "Alaska," above Salento, Pennell 9382 (GH, US); Salento to "Laguneta," Old Quindío Trail, Killip & Hazen 9116 (GH, NY, US); Cerro Tatamá, Cordillera Occidental, Pennell 10500 (US); Río San Rafael, below Cerro Tatamá, Pennell 10386 (type of *M. multicomata* US, isotype GH, NY).

This species was established by Chodat in 1895 from material collected by Moritz in "Truxillo et Mérida," in southwestern Venezuela. The original description and photographs of the type agree well with the specimens here cited and also with the type of *M. multicomata* Chodat. The species suggests *M. latifolia* (Bonpl.) DC. but differs in its smaller and lanceolate leaves (to 155 mm. long), the axes of the racemes being shorter (to 9.5 cm. long), the apex of outer sepals slightly involute, etc.

In connection with my reduction of *M. multicomata* to Chodat's earlier binomial, the following Venezuelan material of *M. bracteata* may be cited: "Truxillo et Mérida," Moritz 1267 (photographs of type, Ch, US); Mérida: Tabay, Gehriger 390 (US), 558 (US); Palmira, Jahn 602 (US).

28. *Monnina pennellii* Ferreyra, sp. nov.

Frutex *M. salicifoliae* R. & P. valde affinis, foliis majoribus lamina ad 14.5 cm. longa, sepalis duobus inferioribus 5-nerviis, stylo pubescente facile distinguendus.

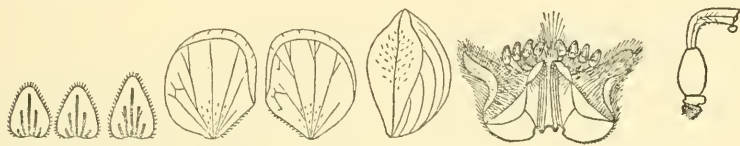


FIG. 28.—*Monnina pennellii*: Left to right, lower sepals, upper sepal, wings (inner), keel, upper petals and stamens, gynaecium. All  $\times 3$ .

Suffrutescent, branched, the branches 3–5 mm. in diameter, striate, slightly pubescent; leaves subcoriaceous, elliptic, 55–145 mm. long, 22–92 mm. wide, acute, finely strigose-pubescent, becoming glabrescent, entire, attenuate at base, the costa prominulous beneath, with 9 or 10 pairs of lateral veins; petioles 2.5–5 mm. long, concave above, convex beneath, finely pubescent; racemes conical, acute, 8–10 mm. wide, simple, terminal or axillary, pedunculate (peduncle 17–24 mm. long), the axis 5.2–6.5 cm. long, finely pubescent, striate, bracteate, the bracts oblanceolate or triangular, acute, 2–2.5 mm. long, 1.2–1.5 mm. wide, deciduous, ciliate, 1-nerved, pubescent beneath; flowers 4.5–5.2 mm. long, the pedicels inconspicuous, 0.4–0.6 mm. long, finely pubescent; outer sepals free, ovate-lanceolate, obtuse, ciliate, slightly pubescent beneath, becoming glabrescent, the two lower ones 1.8–2.2 mm. long, 1.6–1.8 mm. wide, usually 5-nerved (3 nerves conspicuous), rarely 3-nerved, the upper sepal 2.5–2.8 mm. long, 1.6–2 mm. wide, 5-nerved; wings violet-blue, 4.2–5.2 mm. long, 3.6–4.8 mm. wide, obovate, obtuse at base, 3- or 4-nerved, glabrous beneath, with few

hairs within, ciliate at base; keel 5-5.8 mm. long, 3-3.8 mm. wide, orbicular, plicate, pubescent within, obtuse at base, 3- or 4-nerved, 3-lobed, the middle lobe obtuse-subemarginate, larger; upper petals elongate-spatulate, densely pubescent; stamens 8, the filaments 3.8-4 mm. long, almost entirely united, the free part 1-1.5 mm. long, glabrous; ovary ovoid, 1.2-2 mm. long, 0.8-1.4 mm. wide, glabrous; style 2.5-3 mm. long, geniculate above base, pubescent, more or less cylindrical; stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 5.5-7 mm. long, 3-4 mm. wide, glabrous, reticulate.

Type in U. S. National Herbarium, No. 1147652, collected at San José, Cauca Valley, Department of Caldas, alt. 1,400-1,800 meters, September 3, 1922, by F. W. Pennell (No. 10247). Duplicate in the Gray Herbarium.

DISTRIBUTION: Known only from the type collection.

The new species seems closely related to *M. salicifolia* R. & P., from which it differs in its larger, acute leaves (to 145 mm. long) with 9 or 10 pairs of lateral nerves, and in having its lower sepals 5-nerved and its upper petals and style pubescent.

29. *Monnina salicifolia* R. & P. Syst. Veg. 172. 1798.

*Monnina cestrifolia* H.B.K. Nov. Gen. & Sp. 5: 413. t. 502. 1821.

Shrub 0.4-3 m. high, branched, the branches 2-8 mm. in diameter, nodose, pubescent, becoming glabrescent, striate; leaves usually elliptic, rarely lanceolate, 15-75 mm. long, 5-35 mm. wide, obtuse, sometimes acute, finely canescent-pubescent; becoming more or less glabrescent, entire, slightly revolute, attenuate at base, the costa prominent beneath, with 5 or 6 pairs of lateral veins; petioles 1.5-3 mm. long, concave above, convex beneath, articulate, pubescent; racemes conical, acute, 9-12 mm. wide, simple, terminal, pedunculate (peduncle 8-14 mm. long), the axis 2-9 cm. long, pubescent, striate, bracteate, the bracts acute-triangular, 1.4-4 mm. long, 1.4-1.8 mm. wide, deciduous, ciliate, 1-nerved, finely pubescent beneath, becoming glabrescent; flowers 4.2-6.5 mm. long, the pedicels 0.8-1.4 mm. long, pubescent; outer sepals free, ovate-triangular, obtuse, ciliate, slightly pubescent beneath, rarely glabrescent, the two lower ones 1.4-2.5 mm. long, 1.2-2 mm. wide, 3-nerved, the upper sepal 2-3 mm. long, 1.6-2.4 mm. wide, 5-nerved; wings deep blue, 4-6.5 mm. long, 3.6-6 mm. wide, obovate, obtuse at base, 3-nerved, ciliate; keel 4.2-6.8 mm. long, 2.8-4 mm. wide, orbicular, plicate, pubescent within, obtuse at base, 3-nerved, 3-lobed, the middle lobe obtuse-emarginate; upper petals elongate-spatulate, slightly pubescent; stamens 8, the filaments 3-4



mm. long, almost entirely united, the free part 0.8–1.4 mm. long, glabrous; ovary ovoid, 1.2–2.5 mm. long, 0.8–1.5 mm. wide, glabrous; style 2–3 mm. long, geniculate above base, glabrous, thicker toward apex; stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 5.5–7 mm. long, 3.6–4 mm. wide, glabrous, reticulate.

DISTRIBUTION: Along the Andes from northern Colombia to Ecuador, Peru, and Bolivia, between 1,200 and 3,700 meters altitude.

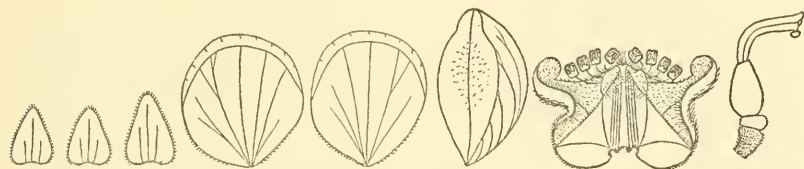


FIG. 29.—*Monnina salicifolia*: Left to right, lower sepals, upper sepal, wings (inner), keel, upper petals and stamens, gynaeceum. All  $\times 3$ .

NORTE DE SANTANDER: Páramo de Tamá, above La Cueva, *Cuatrecasas*, *Schultes & E. Smith* 12649 (Ch, US).

SANTANDER: Vicinity of Charta, *Killip & Smith* 19080 (GH, NY, US), 19231 (GH, NY, US); Páramo de Vetás, *Killip & Smith* 17420 (GH, NY, US); vicinity of Tona, *Killip & Smith* 19476 (GH, NY, US); edge of Páramo de Santurbán, *Killip & Smith* 17927 (Ch, NY, US); vicinity of La Baja, *Killip & Smith* 18746 (GH, NY, US), 18137 (US); western slope of Páramo de las Puentes, above La Baja, *Killip & Smith* 18156 (GH, NY, US).

BOYACÁ: Northeast of Duitama, Quebrada de Becerra, Cordillera Oriental, *Cuatrecasas* 10379 (Ch, US).

CUNDINAMARCA: Bogotá and immediate vicinity, *Bequaert* 2 (Ch, GH, US), *Bro. Ariste-Joseph* A103 (GH, US), A238 (US), *Jusepczuk* 5040 (US), *Schiefer* 532 (GH), *Holton* 830 (GH, NY), *Triana* s. n. (NY); cerro above La Cita, Bogotá, *Schultes* 7119 (US); between El Delirio and Guadalupe, Macizo de Bogotá, *Cuatrecasas* 5166 (US); Guadalupe, near Bogotá, *Haught* 5045 (US), 5046 (US), 5698 (US); Páramo de Guasca, *Balls* 5707 (US), *García-Barriga* 11640 (US); Guasca, *Grant* 7377 (US); road to east from Guasca, *Haught* 5813 (US); Venecia-Pandi, *Herb. Nac. Colomb.* 478 (US); Páramo de Zipaquirá, *Cuatrecasas* 9559 (Ch, US); Páramo de Chocontá, *Cuatrecasas* 9655 (Ch, US); Sopó, *García-Barriga* 13354 (US), 13373 (US); near Sutatausa, *Haught* 6168 (Ch, US); Río Negro valley, between Quetamé and Piperal, *Killip* 34223 (NY, US).

PUTUMAYO: Road between Laguna La Cocha and Páramo de Tábano, *Schultes & Villarréal* 7833q (US).

ANTIOQUIA: Jerico, *Bros. Daniel & Tomás* 3499 (US); between Medellín and Palmitas, Cordillera Central, *Hodge* 6610 (US); north of Santa Rosa de Osos, *Rivera, Franco, & Barkley* 18A048 (US).

CALDAS: Páramos between El Bosque and Plan del Villar, western slope, Cordillera Central, *Cuatrecasas* 23267 (Ch).

EL VALLE: Páramo de Bavaya, valley of Río Bugalagrande, western slope, Cordillera Central, *Cuatrecasas* 20061 (Ch).

CAUCA: Tablón, near Puracé, western slope, Cordillera Central, *Cuatrecasas* 14558 (Ch, US); "San Isidro," Puracé, Cordillera Central, *Pennell & Killip* 6465 (US); San Pedro, *Bro. Daniel* 1363 (Ch); without locality, *Dryander* 1058 (US).

NARIÑO: Pasto, *Bonpland* s. n. (fragments and photograph of type of *M. cestrifolia*, US); "isla Tuquerre," *Herb. Nac. Colomb.* 86 (US).

DEPT. ? : Without locality, *Linden* 781 (GH, US); without locality, *Holton* 831 (NY); without locality, *Triana* 414 (US), 415 (US).

*Monnina salicifolia* is very abundant in the Andes of northwestern South America, its distribution extending from Colombia southward into Bolivia. It was based upon material from central Peru (for a discussion of the Peruvian distribution, see *Journ. Arn. Arb.* 27: 157-158. 1946). The species is characterized by elliptic leaves, racemes which are simple, terminal, conical, and acute, completely free lower sepals, and by the keel being pubescent within.

*Monnina cestrifolia* was described from material collected at Pasto, Department of Nariño, of which fragments and a photograph are available. Although the type specimen of the binomial was sterile, I have no doubt of its identity with *M. salicifolia*.

30. *Monnina mollis* Pl. & Lind. ex Tr. & Pl. in *Ann. Sci. Nat.* IV. 17: 139. 1862.

Frutescent, or slender tree to 6 m. high, branched, the branches 2-7 mm. in diameter, conspicuously hirsute, sometimes becoming more or less glabrescent, striate; leaves oblong, 35-130 mm. long, 14-47 mm. wide, usually obtuse, rarely acute or acuminate, mucronate, slightly hirsute above, becoming glabrescent, hirsute beneath, entire, attenuate at base, the costa prominulous beneath, with 7 or 8 pairs of lateral veins; petioles 4-7 mm. long, concave above, convex beneath, hirsute; racemes conical, acute, 7-9 mm. wide, simple, terminal or axillary, pedunculate (peduncle 8-30 mm. long), the axis 2.5-10.5 cm. long, conspicuously hirsute, striate, bracteate, the bracts hood-shaped, acute, concave, 3.6-6.2 mm. long, 2-2.1 mm. wide, deciduous, ciliate, 1-nerved, densely pubescent beneath; flowers 4.2-5 mm. long, the pedicels 0.6-1 mm. long, finely pubescent; outer sepals free, ovate-triangular, obtuse, ciliate, slightly pubescent beneath, becoming glabrescent, finely puberulent within, the two lower ones 1.8-2.8 mm. long, 1.6-2 mm. wide, 3-nerved, the upper sepal 2-3 mm. long, 1.8-2.4 mm. wide, 5-nerved; wings deep blue, 4.4-5 mm. long, 4.4-5 mm. wide, obovate, obtuse at base, 3-nerved, glabrous, ciliate; keel 4.8-5.4 mm. long, 3.2-4 mm. wide, orbicular, plicate, pubescent within, obtuse

at base, 3-nerved, 3-lobed, the middle lobe obtuse-emarginate; upper petals elongate-spatulate, pubescent; stamens 8, the filaments 2.8–3.2 mm. long, almost entirely united, the free part 0.8–1.2 mm. long, glabrous; ovary ovoid, 1.2–1.4 mm. long, 0.8–1 mm. wide, glabrous; style 2.2–2.5 mm. long, geniculate above base, glabrous, thicker toward apex; stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 5–5.5 mm. long, 3–4 mm. wide, glabrous, reticulate.

DISTRIBUTION: Andes of northern and central Colombia, between 1,500 and 3,300 meters altitude.

MAGDALENA: Hillside at "Africa," Sierra Perija, *Haught* 4492 (US), 4520 (US); Sierra Nevada de Santa Marta, *Schlim* 819 (fragments of type, US; photographs of type, Ch, GH, US).

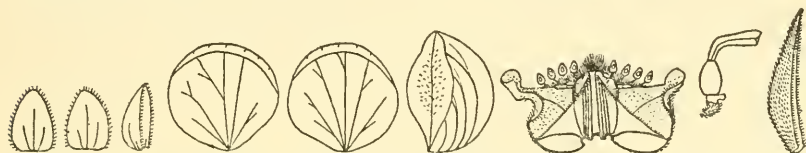


FIG. 30.—*Monnina mollis*: Left to right, lower sepals, upper sepal, wings (inner), keel, upper petals and stamens, gynaecium, bract. All  $\times 3$ .

NORTE DE SANTANDER: Páramo de Fontibón, *Cuatrecasas, Schultes, & E. Smith* 12330 (Ch, US); La Cabuya, valley of Río Chitagá, region of Sarare, *Cuatrecasas, Schultes, & E. Smith* 12175 (US); between Pamplona and La Isla, *Killip & Smith* 19800 (GH, NY, US); between Toledo and Pamplona, *Killip & Smith* 20555 (GH, NY, US); vicinity of Toledo, *Killip & Smith* 20048 (GH, NY, US).

SANTANDER: Vicinity of Vetas, *Killip & Smith* 17890 (Ch, GH, NY, US); mountains east of Las Vegas, *Killip & Smith* 15575 (GH, NY, US); Río Suratá Valley, above Suratá, *Killip & Smith* 16625 (GH, NY, US); vicinity of California, *Killip & Smith* 17008 (GH, US).

CUNDINAMARCA: Vicinity of Fusagasugá, *García-Barriga* 11978 (US), *Jusep-czuk* 5347 (US); Salto de Tequendama, *Cuatrecasas* 98 (Ch, US), *Killip* 34001 (NY, US), *Bro. Ariste-Joseph* A113 (GH, US), *Bros. Apollinaire & Arthur* 80 (US), *Schiefer* 491 (GH); Puente de Seviez, eastern slope, Cordillera Oriental, *Cuatrecasas* 7933 (Ch, US); "Gachetá," *Haught* 5853 (US), 5886 (US).

This slender tree has conspicuously hirsute branches, oblong, obtuse, and mucronate leaves, and the bracts of the racemes are large (to 6.2 mm. long), hood-shaped, and densely pubescent beneath.

31. *Monnina smithii* Chodat in Bull. Soc. Bot. Genève II. 25: 216. 1934.

Frutescent, 1–1.8 m. high, branched, the branches 1.5–5 mm. in diameter, finely canescent-pubescent, becoming more or less glabres-

cent, striate; leaves lanceolate, herbaceous, 35–170 mm. long, 8–47 mm. wide, conspicuously acuminate, slightly pubescent above, becoming glabrescent, finely canescent-pubescent beneath, entire, attenuate at base, the costa prominulous beneath, with 8 or 9 pairs of lateral veins; petioles 1.5–8 mm. long, concave above, convex beneath, slightly winged, canescent-pubescent; racemes elongate, acuminate, 8–10 mm. wide, simple, terminal, pedunculate (peduncle 6–35 mm. long), the axis 2–23 cm. long, canescent-pubescent, striate, bracteate, the bracts linear, acuminate, 7–14 mm. long, 1.6–2 mm. wide, deciduous, ciliate, 1-nerved, slightly puberulent beneath; flowers 4.6–5 mm. long, the pedicels 1.2–2 mm. long, finely puberulent; outer sepals free, triangular, acute, ciliate, glabrous beneath, the two lower ones 2–3.8 mm. long, 1.8–2.5 mm. wide, usually 3-nerved, rarely 5-nerved, the upper sepal 2.2–4 mm. long, 1.8–2.8 mm. wide, usually 5-nerved, sometimes 7-

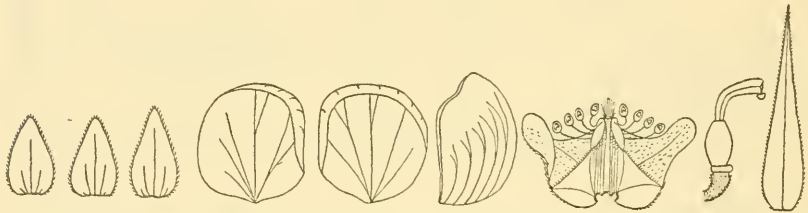


FIG. 31.—*Monnina smithii*: Left to right, lower sepals, upper sepal, wings (inner), keel, upper petals and stamens, gynaecium, all  $\times 3$ ; bract,  $\times 2$ .

nerved; wings deep blue, 4–5 mm. long, 3.5–5.2 mm. wide, obovate, obtuse at base, 3-nerved, glabrous, eciliate; keel 4.8–6 mm. long, 2.8–3.2 mm. wide, orbicular, plicate, glabrous within, obtuse at base, 3-nerved, 3-lobed, the middle lobe inconspicuous, obtuse-subemarginate; upper petals short, spatulate, pubescent; stamens 8, the filaments 3–3.5 mm. long, almost entirely united, the free part 0.5–1 mm. long, glabrous; ovary ovoid, 1.8–2 mm. long, 1.2–1.4 mm. wide, glabrous; style 2.2–2.4 mm. long, geniculate above base, glabrous, more or less cylindrical; stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 5.5–9 mm. long, 3.8–5.5 mm. wide, glabrous, reticulate.

DISTRIBUTION: In the Andes of northern Colombia, between 1,400 and 2,500 meters altitude.

NORTE DE SANTANDER: Vicinity of Toledo, *Killip & Smith 20081* (GH, NY, US); between El Amparo and La Mesa, valley of Río Margua, region of Sarare, *Cuatrecasas 12868* (Ch, US); Ventanas, valley of Río Chitagá, region of Sarare, *Cuatrecasas 12354* (Ch, US); between Ventanas and Bata, valley of Río Chitagá, region of Sarare, *Cuatrecasas, Schultes, & E. Smith 12372a* (US).

SANTANDER: Between Piedecuesta and Las Vegas, *Killip & Smith* 15568 (type US 1351426, isotypes GH, NY), 15533 (US).

COLOMBIA?: Without locality, *Moritz* s. n. (US).

The present species is a relative of *M. angustata* Tr. & Pl., from which it differs in its finely pubescent branches, its racemes with longer axes (to 23 cm. long) and with lax elongate bracts (to 14 mm. long), its obtuse outer sepals, and its keel being glabrous within. It also shows a relationship to *M. mollis* Pl. & Lind., differing in its lanceolate and acuminate leaves, its longer and slightly winged petioles, and the linear bracts of its racemes.

32. *Monnina angustata* Tr. & Pl. in Ann. Sci. Nat. IV. 17: 140. 1862.

Frutescent, branched, the branches 2–5 mm. in diameter, conspicuously hirsute, becoming glabrescent, striate; leaves lanceolate, 30–110 mm. long, 10–25 mm. wide, usually acuminate, rarely acute, finely pubescent above, becoming glabrescent, more or less hirsute beneath,



FIG. 32.—*Monnina angustata*: Left to right, lower sepals, upper sepal, wings (inner), keel, upper petals and stamens, gynaecium, bract. All  $\times 3$ .

the hairs more numerous at the nerves, entire, attenuate at base, the costa prominulous beneath, with 7 or 8 pairs of lateral veins; petioles 2–5 mm. long, concave above, convex beneath, hirsute; racemes elongate, acuminate, 7–9 mm. wide, simple, terminal or axillary, pedunculate (peduncle 9–29 mm. long), the axis 2.2–11.5 cm. long, hirsute, striate, bracteate, the bracts linear, acuminate, 3–5 mm. long, 1–1.2 mm. wide, deciduous, ciliate, 1-nerved, finely puberulent beneath; flowers 3.8–5 mm. long, the pedicels 0.6–2 mm. long, finely pubescent, curved; outer sepals free, triangular, acute, ciliate, finely pubescent beneath, the two lower ones 2–2.8 mm. long, 1–1.8 mm. wide, 3-nerved, sometimes 1- or 2-nerved, the upper sepal 2.4–3.2 mm. long, 1.4–2 mm. wide, usually 5-nerved, rarely 3-nerved; wings blue, 3.8–5.5 mm. long, 3–5 mm. wide, obovate, obtuse at base, 3-nerved, glabrous, eciliate, sometimes ciliate at base; keel 4–5.2 mm. long, 2.4–3.4 mm. wide, orbicular, plicate, pubescent within, obtuse at base, 3-nerved, inconspicuously 3-lobed, the middle lobe obtuse-submarginate; upper petals elongate-spatulate, pubescent; stamens 8, the filaments 2.8–3.2 mm. long, almost entirely united, the free part 0.4–1 mm. long, glabrous;

ovary ovoid, 1.2–2 mm. long, 0.8–1.2 mm. wide, glabrous; style 2.2–2.5 mm. long, geniculate above base, glabrous, thicker toward apex; stigma with 2 lobes, the lower one acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 4.2–6.2 mm. long, 2–3.4 mm. wide, glabrous, reticulate.

DISTRIBUTION: Central to southwestern Colombia, between 1,800 and 3,500 meters altitude.

NORTE DE SANTANDER: Western side of Culagá Valley, north of Toledo, *Killip & Smith* 20283 (GH, NY, US).

BOYACÁ: Sierra del Cocuy, Cordillera Oriental, *Cuatrecasas* 1657 (Ch, US).

TOLIMA: Between Buenavista and Azufral, Old Quindio Trail, Cordillera Central, *Killip & Hazen* 9578 (GH, NY, US).

ANTIOQUIA: San Pedro, *Bro. Tomás* 114 (US); Cerro de La Vieja, *Bro. Daniel* 1698 (US); Santa Elena, *Archer* 1177 (US); Las Minitas, south of Caldas, Cauca Valley, *Pennell* 10956 (GH, US); Río Negro, *Triana* s. n. (fragments and photographs of type, Ch, US).

CALDAS: San Clemente, Cordillera Occidental, *Pennell* 10664 (NY, US).

EL VALLE: Valley of Bugalagrande, between Las Azules and Las Violetas, western slope, Cordillera Central, *Cuatrecasas* 20783 (Ch); Los Farallones, between Alto del Buey and Quebrada de los Ramos, *Cuatrecasas* 18024 (Ch).

CAUCA: Mount El Trueno, Cordillera Occidental, *Pennell* 7537 (GH, NY, US); "Los Volcancitos," *Linden* 1104 (fragments of authentic material US); central Andes of Popayán, *Lehmann* 6664 (Ch); Alto del Duende, western slope, Cordillera Central, *Cuatrecasas* 18838 (Ch); "Calaguala," Coconuco, Cordillera Central, *Pennell* 7144 (GH, US); Popayán, *Lehmann* 4747 (Ch, GH, US); Río Paez Valley, Tierra Adentro, *Pittier* 1225 (US); Río Vinagre, Puracé, *Dryander* 1841 (US).

From *M. mollis* Pl. & Lind., apparently its closest ally, *M. angustata* differs in its narrowly lanceolate and acuminate leaves, its racemes with linear and extrorsely slightly pubescent bracts, its acute-triangular outer sepals, etc.

#### INDEX TO NUMBERED SPECIMENS

The following list includes the numbered specimens studied.

ANDRÉ, E. F.	ARAQUE-M., J., and BARKLEY, F. A.
558. andreana	19An054. phytolaccaefolia
APOLLINAIRE-MARIE, BROTHER	19Cho12. phytolaccaefolia
268. speciosa	ARCHER, W. A.
523. subscandens	79. phytolaccaefolia
APOLLINAIRE-MARIE, BROTHER, and	469. solandraefolia
ARTHUR, BROTHER	1253. speciosa
5. aestuans	ARCHER, W. A., and LÓPEZ, A.
22. rupestris	402. phytolaccaefolia
80. mollis	

## ARISTE-JOSEPH, BROTHER

- A79. rupestris  
A103. salicifolia  
A113. mollis  
A238. salicifolia

## BALLS, E. K.

5707. salicifolia

BARKLEY, F. A., GARCÍA-BARRIGA, H.,  
and VANEGAS, R.

- 17C740. aestuans

## BEQUAERT, J.

2. salicifolia

## BLACK, G.

- 46-663. aestuans

## CARRIKER, M. A.

29. aestuans

## CORREA, J.

28. phytolaccaefolia

## CUATRECASAS, J.

65. rupestris  
98. mollis  
106. aestuans  
268. aestuans  
328. aestuans  
1657. angustata  
5050. aestuans  
5166. salicifolia  
5759. pilosa  
7933. mollis  
8249. phytolaccaefolia  
8411. rupestris  
8584. subspiciosa  
8593. colombiana  
9236. arborescens  
9559. salicifolia  
9577. phytolaccaefolia  
9655. salicifolia  
10335. phytolaccaefolia  
10379. salicifolia  
11526. rupestris  
11680. subspiciosa  
11694. obtusifolia  
11752. revoluta  
11948. arborescens

12354. smithii  
12839. schultesii  
12868. smithii  
13822. phytolaccaefolia  
14558. salicifolia  
14576. revoluta  
14683. arborescens  
14802. erecta  
14805. arborescens  
15373. phytolaccaefolia  
17862. involuta  
18024. angustata  
18137. phytolaccaefolia  
18221. pilosa  
18529. phytolaccaefolia  
18836. angustata  
18844. obtusifolia  
18907. arborescens  
18994. revoluta  
19047. andreana  
19213. arborescens  
20061. salicifolia  
20783. angustata  
20839. obtusifolia  
20887. chodatiana  
20890. obtusifolia  
20920. chodatiana  
21589. subspiciosa  
21616. subscandens  
21671. arborescens  
21695. arborescens  
21973. subscandens  
22316. subscandens  
22421. cuatrecasarii  
22553. pilosa  
22849. phytolaccaefolia  
23169. revoluta  
23249. revoluta  
23267. salicifolia  
23380. phytolaccaefolia  
23518. subscandens  
23657. subspiciosa  
23730. chlamydantha  
23751. pilosa  
23907. subscandens

CUATRECASAS, J., SCHULTES, R. E.,  
and SMITH, E.

12175. mollis  
12330. mollis

12372. schultesii  
 12372a. smithii  
 12503. solandraefolia  
 12649. salicifolia  
 12799. arborescens

DANIEL, BROTHER

421. pilosa  
 1363. salicifolia  
 1691. solandraefolia  
 1698. angustata  
 1714. pilosa  
 1783. solandraefolia  
 2252. solandraefolia  
 2762. speciosa  
 3987. phytolaccaefolia

DANIEL, BROTHER, and TOMÁS,  
 BROTHER

1569. solandraefolia  
 3499. salicifolia

DAWE, M. T.

204. aestuans  
 832. phytolaccaefolia

DRYANDER, E.

351. subspeciosa  
 1058. salicifolia  
 1841. angustata  
 1977. phytolaccaefolia  
 2053. pilosa  
 2143. subspeciosa

DUGAND, A.

3565. rupestris

DUGAND, A., and JARAMILLO, R.

2944. phytolaccaefolia  
 2996. subscandens  
 3033. pilosa  
 3827. phytolaccaefolia

DUQUE-JARAMILLO, J. M.

1604. pilosa  
 1726. subspeciosa

ESPINA, R., and GIACOMETTO, J.

A156. phytolaccaefolia

FRANCO, A., and BARKLEY, F. A.

18A187. solandraefolia

GARCÍA-BARRIGA, H.

4628. pilosa  
 7674. phytolaccaefolia  
 7852. arborescens  
 10951. phytolaccaefolia  
 11584. phytolaccaefolia  
 11640. salicifolia  
 11978. mollis  
 12015. phytolaccaefolia  
 12234. phytolaccaefolia  
 12325. phytolaccaefolia  
 12402. phytolaccaefolia  
 12619. phytolaccaefolia  
 12644. aestuans  
 13354. salicifolia

GARCÍA-BARRIGA, H., and HAWKES,  
 J. G.

12886. rupestris  
 13063. obtusifolia  
 13074. obtusifolia  
 13085. arborescens

GARCÍA-BARRIGA, H., HAWKES,  
 J. G., and VILLARREAL, M.

13056. obtusifolia

GRANT, V.

7377. salicifolia

GUTIÉRREZ, G., and DELISLE, A. L.

263. speciosa

HAUGHT, O. L.

2151. phytolaccaefolia  
 4492. mollis  
 4520. mollis  
 5045. salicifolia  
 5046. salicifolia  
 5091. obtusifolia  
 5091a. obtusifolia  
 5176. arborescens  
 5279. phytolaccaefolia  
 5297. phytolaccaefolia  
 5313. phytolaccaefolia  
 5613. aestuans



5623. *aestuans*  
 5697. *aestuans*  
 5698. *salicifolia*  
 5813. *salicifolia*  
 5853. *mollis*  
 5886. *mollis*  
 6022. *rupestris*  
 6073. *latifolia*  
 6168. *salicifolia*  
 6175. *aestuans*  
 6221. *subscandens*

## HERBARIO NACIONAL COLOMBIANO

86. *salicifolia*  
 478. *salicifolia*

## HODGE, W. H.

6478. *revoluta*  
 6610. *salicifolia*

## HOLTON, I.

23. *rupestris*  
 829. *revoluta*  
 830. *salicifolia*

## JAMESON, W.

443. *pilosa*  
 473. *rupestris*

## JUZEPCZUK, S.

5040. *salicifolia*  
 5347. *mollis*  
 6616. *rupestris*

## KILLIP, E. P.

6868. *pilosa*  
 7794. *glaberrima*  
 7923. *glaberrima*  
 7964. *rupestris*  
 34001. *mollis*  
 34197. *aestuans*  
 34223. *salicifolia*

KILLIP, E. P., CUATRECASAS, J., and  
DRYANDER, E.

39208. *phytolaccaefolia*

## KILLIP, E. P., and HAZEN, T. E.

9116. *bracteata*  
 9578. *angustata*

11008. *phytolaccaefolia*  
 11156. *glaberrima*

## KILLIP, E. P., and SMITH, A. C.

15077. *phytolaccaefolia*  
 15515. *phytolaccaefolia*  
 15533. *smithii*  
 15568. *smithii*  
 15575. *mollis*  
 15862. *phytolaccaefolia*  
 15863. *glaberrima*  
 16449. *phytolaccaefolia*  
 16625. *mollis*  
 16796. *phytolaccaefolia*  
 17008. *mollis*  
 17420. *salicifolia*  
 17890. *mollis*  
 17927. *salicifolia*  
 18137. *salicifolia*  
 18156. *salicifolia*  
 18381. *elongata*  
 18746. *salicifolia*  
 19043. *phytolaccaefolia*  
 19080. *salicifolia*  
 19396. *phytolaccaefolia*  
 19476. *salicifolia*  
 19570. *aestuans*  
 19800. *mollis*  
 19924. *phytolaccaefolia*  
 20029. *bracteata*  
 20048. *mollis*  
 20081. *smithii*  
 20283. *angustata*  
 20555. *mollis*  
 20779. *phytolaccaefolia*

## KILLIP, E. P., and VARELA, G.

34642. *aestuans*

## LANGLASSÉ, E.

31. *phytolaccaefolia*

## LAWRANCE, A. E.

16. *phytolaccaefolia*

## LEHMANN, F. C.

353. *pilosa*  
 360. *phytolaccaefolia*  
 361. *phytolaccaefolia*  
 1051. *arborescens*

1083. pilosa  
2129. andreana  
4747. angustata  
5524. pilosa  
6664. angustata

## LINDEN, J.

375. elongata  
742. solandraefolia  
781. salicifolia  
955. revoluta  
1104. angustata

## METCALF, R. D., and CUATRECASAS, J.

30116. solandraefolia

## MEXIA, Y.

7578. arborescens  
7578a. speciosa

## PENNELL, F. W.

1736. phytolaccaefolia  
1940. rupestris  
3083. revoluta  
3288. phytolaccaefolia  
4298. oblanceolata  
4311. aestuans  
4387. oblanceolata  
4439. phytolaccaefolia  
5171. phytolaccaefolia  
5724. glaberrima  
7031. obtusifolia  
7045. revoluta  
7144. angustata  
7470. arborescens  
7537. angustata  
8906. pilosa  
8917. bracteata  
9382. bracteata  
9395. subscandens  
10247. pennellii  
10301. pilosa  
10303. phytolaccaefolia  
10335. subscandens  
10386. bracteata  
10500. bracteata  
10663. pilosa  
10664. angustata  
10922. phytolaccaefolia  
10956. angustata

## PENNELL, F. W., and HAZEN, T. E.

9086. revoluta  
10113. pilosa  
10156. parviflora

## PENNELL, F. W., and KILLIP, E. P.

5888. subspeciosa  
6418. pilosa  
6465. salicifolia  
6598. arborescens  
7261. phytolaccaefolia  
7269. pilosa  
7390. arborescens  
8020. pilosa

## PENNELL, F. W., KILLIP, E. P., and HAZEN, T. E.

8595. phytolaccaefolia  
8723. pilosa  
8740. phytolaccaefolia  
8741. phytolaccaefolia

## PÉREZ-ARBELÁEZ, E.

2303. rupestris

## PÉREZ-ARBELÁEZ, E., and CUATRECASAS, J.

5915A. arborescens  
6167. pilosa  
8380. pilosa

## PITTIER, H.

728. glaberrima  
903. phytolaccaefolia  
1225. angustata  
1405. obtusifolia  
1477. subscandens

## POPENOE, W.

1141. rupestris

## RIVERA, F., FRANCO, B., and BARKLEY, F. A.

18A048. salicifolia

## RODRIGUEZ, S.

5. phytolaccaefolia  
29. aestuans

RUSBY, H. H., and PENNELL, F. W.

663. *speciosa*  
 746. *rupestris*  
 876. *subspeciosa*  
 1290. *aestuans*

SCHIEFER, H.

491. *mollis*  
 532. *salicifolia*

SCHLIM, L.

345. *aestuans*  
 674. *elongata*  
 819. *mollis*  
 1137. *elongata*

SCHULTES, R. E.

7023. *phytolaccaefolia*  
 7119. *salicifolia*  
 7240. *aestuans*

SCHULTES, R. E., and VILLARREAL, M.

5215. *rupestris*  
 7429. *obtusifolia*  
 7467. *obtusifolia*  
 7517. *arborescens*  
 7569. *rupestris*  
 7671. *pilosa*  
 7728. *rupestris*  
 7833q. *salicifolia*  
 7870. *obtusifolia*  
 8009. *arborescens*

SCHULTZE, A.

5. *rupestris*

SEIFRIZ, W.

83. *santamartensis*

SMITH, H. H.

1480. *santamartensis*  
 1557. *santamartensis*

SNEIDERN, K. VON

1815. *revoluta*  
 5540. *phytolaccaefolia*  
 5602. *phytolaccaefolia*

TOMÁS, BROTHER

114. *angustata*

TORO, R. A.

88. *phytolaccaefolia*  
 1040. *pilosa*  
 1046. *pilosa*  
 1244. *pilosa*  
 1262. *speciosa*  
 1365. *pilosa*

TRIANA, J. J.

298. *pilosa*  
 414. *salicifolia*  
 415. *salicifolia*

YEPES, S.

133. *phytolaccaefolia*