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A REVISION OF THE PERUVIAN SPECIES OF MONNINA

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With ten plates

INTRODUCTION

THE GENUS *Monnina*, of the Polygalaceae, is a strictly American group of approximately 150 species, occurring principally in northwestern South America, the greater number of species being concentrated in Colombia, Ecuador, and Perú. No comprehensive monographic study of the genus in South America has been published, although between 1894 and 1934 Prof. R. Chodat described numerous species of *Monnina* and on one occasion published a synoptic treatment. The present paper is limited in scope to the Peruvian species; at a later date the author hopes to undertake a revision of all the South American species.

Monnina was founded in 1798 by Ruiz & Pavón and included the following species: *M. polystachya*, *M. salicifolia*, *M. conferta*, *M. linearifolia*, *M. macrostachya*, and *M. pterocarpa*. Of these species, five had been discovered in the central part of Perú and one, *M. linearifolia*, in the "Regni Chilensis." The type of the genus is *M. polystachya*. The generic name was dedicated in honor of Don José Moñino, Conde de Floridablanca, who was a patron of scientific expeditions of his period.

MORPHOLOGY

ROOT. Of the 46 species studied and included in the present treatment, the roots of only the annual species have been examined. Among these annual species, *M. graminea* was not available in the material at hand, and the specimens of *M. pterocarpa* all lacked roots. *Monnina amarella*, *M. filifolia*, *M. Macbridei*, and *M. arenicola* have a more or less perpendicular and simple root. In contrast, *M. herbacea*, *M. ramosa*, *M. Weberbaueri*, and *M. macrostachya* have a root that is much branched, sinuous, and with very flexuous branches.

STEM. Although the stems of some species are herbaceous and not very firm, the predominant type of stem in the genus is distinctly woody.

Among the species with herbaceous stems may be mentioned *M. amarella*, *M. filifolia*, *M. graminea*, *M. herbacea*, *M. Macbridei*, *M. arenicola*, *M. Weberbaueri*, and *M. macrostachya*. The remaining species have woody stems, which are either erect or twining. Characteristic of the species with twining stems are *M. ovata*, *M. polystachya*, *M. Pavoni*, *M. pseudopolystachya*, and *M. Mathusiana*. *Monnina marginata* and *M. pilosa* are arborescent species. The stem is sometimes terete, as in all the annual species except *M. herbacea* and in many of the suffruticose species, and sometimes striate, as in *M. herbacea* and the bulk of the suffruticose species. As a rule the stems are branched from the base, but in some cases the branching is corymbose, as in *M. filifolia*, *M. graminea*, *M. macrostachya*, and *M. conferta*. Rarely, as in the arborescent *M. marginata*, the crown of the plant is strongly and copiously branched. Furthermore, the branches may be either decurrent or divaricate. They are decurrent in *M. longibracteata*, *M. huallagensis*, *M. Vitis-Idaea*, and *M. pseudopolystachya*, and divaricate in *M. tomentella*. In *M. Vitis-Idaea* the branches are not only corymbose, but also decurrent. Most species are more or less pubescent, but *M. huallagensis*, *M. glabrifolia*, *M. marginata*, *M. Vitis-Idaea*, and *M. ovata* are glabrous. The stem may also be characterized by having conspicuous nodes, as in *M. andina*, *M. Vitis-Idaea*, *M. salicifolia*, and *M. peruviana*.

LEAVES. In all the species of *Monnina* the leaves are alternate; occasionally they are crowded into groups. The leaf-blades are prevailingly lanceolate or elliptic. Occasionally they are linear, as in *M. filifolia*, *M. graminea*, *M. ramosa*, and *M. Macbridei*, and rarely, as in *M. amarella*, oblanceolate. Foliar dimorphism is present, at least among our species, only in *M. pterocarpa*, of which the upper leaves are linear and the lower ones ovate. The leaf-apex is usually obtuse or acute, but in some species it is acuminate. In *M. amarella* and *M. arenicola* the leaves are obtuse and emarginate at apex, while in *M. graminea* they are acute and mucronate. *Monnina pachycoma* also has the leaf-apex lightly mucronate. The leaf-margins are entire; although Chodat has stated that the leaves of *M. menthoides* are more or less sinuose-dentate, I have not seen herbarium specimens which permit me to verify this observation. Usually the leaf-margins are flattened, being more or less revolute only in *M. ramosa*, *M. andina*, *M. Vitis-Idaea*, *M. conferta*, *M. stipulata*, *M. Lechleriana*, *M. salicifolia*, *M. decurrens*, *M. densecomata*, and *M. pachycoma*. The nervation of the lamina is pinnate, the lateral nerves varying from four to ten pairs. For example, *M. pterocarpa* has four or five pairs of secondaries, while *M. glabrifolia*, *M. macrosepala*, *M. ovata*, and *M. densecomata* have nine or ten pairs. Only *M. filifolia*, *M. ramosa*, and *M. Macbridei* have leaf-blades which are essentially 1-nerved. The midrib is always conspicuous on the lower leaf-surface, with the exception of *M. ramosa*. In texture the blades vary from herbaceous, as in most of the species, to coriaceous in such species as *M. glabrifolia*. Except for *M. filifolia*, the leaves of which lack a petiole, the Peruvian species of *Monnina* have

petiolate leaves, although in *M. ramosa* the petiole is only 1 mm. long. The leaf-surfaces are usually more or less pubescent, but most often becoming glabrescent. They are glabrous even when young only in *M. glabrifolia*, *M. ovata*, and *M. decurrens*, while in *M. Ruiziana*, *M. pilosa*, and *M. tomentella* they are most densely pubescent.

PUBESCENCE. The presence of both simple and multicellular hairs has been observed. As a rule the indument is composed of short hairs which are soon lost, leaving the plant glabrescent. In the few species which have a dense pubescence the hairs are lax and somewhat yellowish, as in *M. polystachya*, where they attain a length of 2 mm.

INFLORESCENCE. The annual species and some of the suffruticose ones have simple racemes, which are either terminal or axillary, while in the other species the inflorescence is paniculate. However, in a few species the racemes may be either simple or aggregated in groups of two or three, as in *M. acutifolia*, *M. Vargasii*, *M. Herrerae*, and *M. pachycoma*. The peduncle varies greatly in length from species to species, being essentially suppressed in *M. decurrens*. The racemes are usually ascending, but in *M. divaristachya*, *M. Ruiziana*, and *M. connectisepala* they are conspicuously divaricate. All the climbing species have striate peduncles.

FLOWERS. The flowers of *Monnina* are zygomorphic and bisexual. The persistent calyx is composed of five concave sepals, three exterior and two interior. The outer sepals are free, while the two inner ones are sometimes united. The inner sepals, or wings, are petaloid and commonly dark blue in color, being pale pink only in *M. arenicola*. The two lower sepals, except in *M. glabrifolia*, are always shorter than the upper sepal. In some species, such as *M. macrosepala* and *M. pachycoma*, the three outer sepals are more or less equal in size to the wings. The wings always have the margin involute, or bent inward; their dorsal surfaces may be either glabrous or pubescent. The measurements of these parts, as given in my descriptions, represent the maximum and minimum observed in the available specimens, but in preparing the illustrations I always referred to the maximum measurements.

The corolla is composed of three petals, a median inferior one called the keel and two superior lateral ones, these being usually ligulate in shape and united with the staminal tube. The keel is usually yellow, but in *M. arenicola* it is essentially white and in *M. macrosepala* var. *latifolia* it is orange in color. The measurements given for the keel were made in its natural position in the flower, being actually measurements of the silhouette. The apex of the keel is commonly trilobed, although in *M. Macbridei*, *M. Vitis-Idaea*, and *M. decurrens* it is bilobed. Numerous species have pubescence on the interior surface of the keel, and some species, such as *M. callimorpha* and *M. pseudo-polystachya*, have the external and convex parts of the keel pubescent. The superior petals are usually spatulate and are more or less similar from species to species, differing only in size; in such species as *M. Weberbaueri* and *M. conferta* they are short, while in *M. Clarkeana* they are conspicuously elongated.

In *M. tomentella* the upper petals are densely pubescent, while in *M. ramosa* and *M. Lechleriana* they are essentially glabrous.

The stamens are six or eight. The only Peruvian species observed by me to have six stamens are *M. amarella* and *M. filifolia*, although it is probable that *M. graminea* (of which I have seen no material) also has six stamens. The stamens are partially or completely united into two groups. The free portion of the stamen is usually glabrous, but in *M. huallagensis* and *M. macrosepala* it is adorned with a few hairs. The length of the free part of the filaments varies from species to species, and the measurements given usually state the maximum and minimum observed. The anthers are bilocular, apically dehiscent, and usually subemarginate, being mucronate in *M. huallagensis*, *M. macrosepala*, *M. Vitis-Idaea*, *M. divaristachya*, and *M. Pavoni*. The apex of the pore may be ascending or outwardly reflexed.

The ovary is generally ellipsoid and glabrous, although when pubescent the hairs may be very dense (as in *M. herbacea*) or merely scattered toward the base, as in *M. divaristachya*, *M. polystachya*, and *M. Vargasii*. Sometimes the ovary bears numerous elongate hairs distally, as in *M. marginata*, *M. ovata*, *M. pseudo-polystachya*, and *M. peruviana*. The style is usually cylindric and geniculate, but in *M. ramosa*, *M. Macbridei*, and *M. arenicola* it is more or less straight, with a small inflexion near the stigma. The style may also be auriculate, as in *M. pterocarpa*, *M. amarella*, *M. filifolia*, and *M. graminea*. Most species have a glabrous style; but in *M. Pavoni*, *M. pseudo-polystachya*, *M. decurrens*, and *M. peruviana* the style bears hairs around its base or toward the middle. The stigma is bilobed, the lower lobe being usually acute and the upper lobe either bituberculate or simply tuberculate and papillose. It is to be noted that Chodat, in his descriptions, referred to the upper lobe of the stigma as the "inferior" one. In *M. filifolia* the stigma is more or less denticulate, the lobes being almost acute. The disk is generally reduced to a gland at the base of the ovary.

The fruit is a one-celled and one-seeded drupe or samara. Sometimes it is intermediate in character between a drupe and a samara, as in *M. herbacea*, *M. glabrifolia*, *M. menthoides*, *M. andina*, and *M. cyanea*. The last four species listed have the fruit cordate and margined and all occur in the same general region in southeastern Perú. *Monnina* has its fruits either glabrous or pubescent; certain of the annual species, such as *M. filifolia*, *M. ramosa*, and *M. macrostachya*, have samaras which are at first finely pubescent but eventually glabrescent.

The pedicels are always terete and usually pubescent; they vary in length but are generally not very conspicuous.

POSITION OF THE GENUS

Monnina is a very distinct genus, being not very closely related to others in the Polygalaceae. It is perhaps most closely allied to *Polygala*, from which it is readily distinguished by the caducous sepals, the stamens conspicuously grouped into two fascicles, the filaments united almost up to

the attachment of the anthers, the more or less truncate stigma with two dissimilar lobes, and finally the indehiscent fruit, which is either a drupe or a samara.

DISTRIBUTION

In South America the distribution of the species of *Monnina* comprises chiefly the region of moderate climates of the Andes, from northern Colombia, with *M. parviflora* and *M. Smithii*, to southern Chile, with *M. linearifolia*, at a latitude of approximately 39°.

It seems evident that the largest concentration is in the Peruvian territory, where there are actually 46 species. The habitat is very distinct. Some species are endemic to the dunes near the ocean, such as *M. arenicola*, and others to the uplands or "punas" between 3500 and 4000 meters altitude, such as *M. densecomata* and *M. pachycoma*. Some are indigenous to the rainy subtropical region called "ceja de montaña," such as *M. macrosepala*.

Colombia also has an important concentration of species. According to the available material, the species of this country are distributed in the Oriental, Central, and Occidental Ranges of the Andes. Apparently there are centers in the Departments of Santander, Tolima, Caldas, Antioquia, and El Cauca, in regions called "templadas y frescas" at an altitude between 1500 and 3500 meters. The concentration decreases to the south, and Chile appears to have only two species, *M. linearifolia* and *M. retusa*. Probably *M. salicifolia* occupies the largest geographic area. It is present in the Andes of Ecuador, Perú, and Bolivia, between 1800 and 3600 meters altitude.

MATERIAL

All the material in the following important herbaria has been examined:

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| Arnold Arboretum, Harvard University | (A) |
| Chicago Natural History Museum | (Ch) |
| U. S. Department of Agriculture (National Arboretum) | (DA) |
| Gray Herbarium, Harvard University | (GH) |
| Missouri Botanical Garden | (M) |
| New York Botanical Garden | (NY) |
| Academy of Natural Sciences of Philadelphia | (Ph) |
| University of California | (UC) |
| United States National Herbarium | (US) |

Many types and photographs and much authentic material belong to these herbaria. The morphological characters of the majority of the species have been illustrated by the author in order to show their differences. Sometimes the plates show only the floral structure of the species, without the habit, due to the absence of material; some species are not represented in the plates because there is no material available.

To the Directors and Curators of these institutions I am deeply grateful for the many courtesies they have extended.

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Gray Herbarium, Harvard University, and the United States National Herbarium, where Drs. M. L. Fernald and W. R. Maxon extended all kinds of facilities. In the Academy of Natural Sciences of Philadelphia, as well as in the Chicago Natural History Museum and the University of California Herbarium, Drs. F. W. Pennell, P. C. Standley, and H. L. Mason also offered the necessary material. Moreover I have received important suggestions from Drs. I. M. Johnston, A. C. Smith, S. F. Blake, and E. P. Killip. To all of these friends the author is deeply grateful.

SYSTEMATIC TREATMENT

Monnina R. & P. Syst. Veg. 169 (1798); Bonpland in Ges. Nat. Freunde Berlin Mag. 2: 40 (1808); H.B.K. Nov. Gen. et Sp. 5: 409 (1821); DC. Prodr. 1: 338 (1824); Presl, Reliq. Haenk. 2: 101 (1827); Benth. & Hook. f. Gen. Pl. 1: 139 (1862); Chodat in E. & P. Nat. Pfl. III. 4: 340 (1896).

Herbs, shrubs, or trees, sometimes scandent. Leaves alternate, entire or rarely denticulate, stipulate or without stipules, glabrous or pubescent, lanceolate, elliptic, linear, or rarely spatulate, sometimes more or less clustered, penninerved or rarely 1-nerved, petiolate or sessile. Flowers in terminal or axillary racemes, rarely in aggregate racemes; peduncle short to very long, the upper part usually with bracts, rarely bractless. Sepals 5, the 3 outer herbaceous, free or the 2 lower united, the 2 inner (wings) petaloid and usually much larger, more or less concave. Petals 3, the lowermost (keel) carinate, the 2 upper ones ligulate, usually elongate, united below to the staminal sheath. Stamens 8 or 6, the filaments united nearly to apex into a sheath split on the upper side; anthers 1- or 2-celled, sometimes emarginate or mucronate. Ovary 1-celled, rarely 2-celled; style geniculate, very rarely more or less straight, auricled or without auricles, glabrous, sometimes pubescent; stigma with 2 dissimilar lobes, the lower more or less acute, the upper papillose with 1 or 2 tubercles. Disk usually reduced to a gland at base of ovary (hypogynous). Fruit a drupe with thin fleshy coat, the surface rugose, glabrous or pubescent, sometimes samaroid, narrowly and subequally winged, glabrous or strigillose.

KEY TO THE SPECIES

Plants annual, small; fruit usually winged, rarely without wings.

Androecium with 6 stamens, rarely with 8 stamens; style with 2 auricles.

Stem relatively thick, to 25 dm. high; lower leaves ovate-lanceolate, the upper linear-lanceolate. 1. *M. pterocarpa*.

Stem slender, always less than 10 dm. high; lower leaves linear-lanceolate or oblanceolate.

Racemes usually with a short axis, 1–2.8 dm. long; apex of leaves obtuse or emarginate, sometimes acuminate; wing of fruit almost always purple. 2. *M. amarella*.

Racemes always with a long axis, 1.8–4.5 dm. long; apex of leaves acute; wing of fruit greenish.

Lower leaves filiform; fruit puberulous; stamens united. 3. *M. filifolia*.

Lower leaves lanceolate; fruit glabrous; stamens free in the upper part, unequal. 4. *M. graminea*.

Androecium always with 8 stamens; style without auricles.

Ovary puberulous; stamens united for two-thirds their length, the free part conspicuous; style geniculate from near its base; fruit cordiform, densely puberulous. 5. *M. herbacea*.

Ovary glabrous; stamens entirely united; style nearly straight or geniculate below the apex; fruit ovate, glabrescent, sometimes finely puberulous.

Blade of leaves linear; keel glabrous within, the apex emarginate; upper petals elongate-spatulate.

Root thick, subfrutescent; stem sparsely branched; margin of leaves revolute; lower sepals 3-nerved, ciliate; style thicker toward apex; fruit finely puberulous.....6. *M. ramosa*.

Root thin, herbaceous; stem simple or with a few branches; margin of leaves not at all revolute; lower sepals 1-nerved, not ciliate; style cylindric; fruit glabrescent.....7. *M. Macbridei*.

Blade of leaves ovate-lanceolate; keel puberulous within, the apex acute; upper petals short.

Flowers white; lower sepals glabrous; base of keel obtuse, glabrous; fruit finely puberulous.....8. *M. arenicola*.

Flowers not white; lower sepals ciliate; base of keel acute, ciliate; fruit more or less glabrescent.

Drupe to 3 mm. long; upper sepal 3-nerved, glabrous beneath; upper stigma-lobe short.....9. *M. Weberbaueri*.

Samara to 5 mm. long; upper sepal 5-nerved, puberulous beneath; upper stigma-lobe elongate, ciliate.....10. *M. macrostachya*.

Plants perennial, frutescent or arborescent, sometimes scandent; fruit without wings, rarely with a very small wing.

Lower sepals united.

Inflorescence to 3.2 dm. long; flowers not crowded, with filiform and conspicuous bracts.

Bracts of racemes with involute apex; leaves usually acute; upper petals short; anthers obtuse or emarginate.....11. *M. longibracteata*.

Bracts of racemes with straight apex; leaves acuminate; upper petals elongate-spatulate; anthers mucronate.....12. *M. huallagensis*.

Inflorescence to 2.2 dm. long; flowers crowded, without filiform bracts.

Racemes simple, terminal; leaves usually lanceolate, rarely more or less elliptic.

Ovary pubescent.

Apex of racemes with oblanceolate bracts to 2 mm. wide, lax; fruit cordiform, strongly flattened; lower sepals 5-nerved and larger than the upper sepal.....13. *M. glabriifolia*.

Apex of racemes without bracts or with narrow bracts less than 1 mm. wide; fruit ovate, slightly flattened; lower sepals 1-3-nerved, always smaller than the upper sepal.

Leaves to 4.5 cm. long; racemes slender, lax; fruit ovate-cordiform, with a very small wing.

Branches tomentose; leaves lanceolate, densely puberulous, acute-mucronate, sinuous-dentate; racemes hirsute...14. *M. menthoides*.

Branches glabrescent; leaves more or less elliptic, glabrescent, obtuse, entire; racemes glabrescent.....15. *M. andina*.

Leaves to 10 cm. long; racemes thicker, straight; fruit elliptic, not at all winged.

Stem with branches corymbose; leaves narrowly lanceolate; lower sepals 1-nerved, the upper 3-nerved; wings puberulous beneath; central Perú.....16. *M. marginata*.

Stem with branches not corymbose; leaves elliptic or more or less lanceolate; lower sepals 3-nerved, the upper 5-nerved; wings glabrous beneath; northern Perú.....17. *M. pseudo-salicifolia*.

Ovary glabrous.

Bracts of racemes conspicuous, linear-lanceolate, 3-6 mm. long; leaves linear-lanceolate, acuminate; outer sepals to 5 mm. long; free part of filaments puberulous.....18. *M. macrosepala*.

Bracts of racemes inconspicuous, ovate-triangular, less than 2.5 mm. long;

- leaves elliptic, rarely more or less lanceolate, obtuse; outer sepals to 3 mm. long; free part of filaments glabrous.
- Branches conspicuously corymbose; leaves usually deciduous, to 4.5 cm. long.
- Stem 3 dm. high; axis of inflorescence less than 1.6 cm. long; lower sepals 1-nerved, the nerve conspicuous; keel 2-lobed, glabrous within; upper petals elongate-spatulate; anthers mucronate.....19. *M. Vitis-Idaea*.
- Stem 18 dm. high; axis of inflorescence 3–10 cm. long; lower sepals 3-nerved, the nerves inconspicuous; keel 3-lobed, puberulous within; upper petals short, narrow; anthers not mucronate.20. *M. conferta*.
- Branches not corymbose; leaves not deciduous, to 9 cm. long.
- Leaves with prominulous nerves, strongly revolute, largely petiolate, the petiole to 6 mm. long; branches densely puberulous; outer sepals 5–7-nerved; wings glabrous within; southern Perú.....21. *M. stipulata*.
- Leaves without prominulous nerves, not revolute, inconspicuously petiolate, the petiole to 2 mm. long; branches almost glabrescent; outer sepals 1–3-nerved; wings more or less puberulous within; central Perú.....22. *M. canescens*.
- Racemes in wide panicles; leaves usually elliptic, rarely more or less lanceolate.
- Ovary pubescent.
- Erect shrub, glabrescent, rarely slightly puberulous.
- Axis of panicle to 25 cm. long, the racemes glabrous; leaves to 13.5 cm. long, the costa with 8 or 9 pairs of lateral veins, the axil without leaflets; outer sepals 3–5-nerved; wings almost acute at the base; anthers mucronate; ovary with a few hairs near its base.....23. *M. divaristachya*.
- Axis of panicle to 13 cm. long, the racemes puberulous; leaves to 9.8 cm. long, the costa with 5 or 6 pairs of lateral veins, the axil with spatulate leaflets; outer sepals 1-nerved; wings obtuse at the base; anthers not at all mucronate; ovary entirely puberulous.....24. *M. callimorpha*.
- Scandent, usually densely hirsute, rarely glabrous.
- Leaves elliptic or ovate, glabrescent, obtuse; branches striate, glabrescent; lower sepals 3-nerved; obtuse.....25. *M. ovata*.
- Leaves almost lanceolate, puberulous, acute; branches terete, densely hirsute; lower sepals 1-nerved, acute.
- Hairs of branches to 2.5 mm. long, lax; leaves densely puberulous above; style glabrous; ovary slightly puberulous near its base.26. *M. polystachya*.
- Hairs of branches to 1 mm. long, rigid; leaves more or less glabrescent above; style puberulous; ovary totally puberulous.
- Axis of panicle to 24 cm. long; branches more or less glabrescent; outer sepals glabrescent or slightly puberulous beneath; wings glabrous; keel densely puberulous within, glabrous on convex longitudinal line; ovary with short, strigose, inconspicuous hairs, sometimes glabrescent; style puberulous near its base; anthers mucronate27. *M. Pavoni*.
- Axis of panicle to 12 cm. long; branches puberulous; outer sepals strongly puberulous beneath, the hairs rigid; wings more or less puberulous beneath, ciliate; keel glabrescent or with a few inconspicuous hairs within, puberulous on convex longitudinal line; ovary with larger, numerous, rigid, ascendent, conspicuous hairs; style puberulous on the upper part; anthers not at all mucronate.28. *M. pseudo-polystachya*.

Ovary glabrous.

Panicles with divaricate racemes; leaves elliptic; androecium with puberulous filaments.

Branches terete, densely hirsute; leaves to 5 cm. long....29. *M. Ruiziana*.

Branches striate, more or less glabrescent; leaves to 10 cm. long.....

.....30. *M. connectisepala*.

Panicles with decurrent or ascendent racemes; leaves lanceolate; androecium with glabrous filaments.

Racemes and flowers conspicuously crowded; lower sepals obtuse, the upper 5-7-nerved; upper petals short.....31. *M. Lechleriana*.

Racemes and flowers not crowded; lower sepals acute, the upper 3-nerved; upper petals elongate-spatulate.....32. *M. Clarkeana*.

Lower sepals free.

Inflorescence in simple racemes, axillary or terminal.

Ovary glabrous.

Apex of racemes with ovate-acute and conspicuous bracts; branches glabrescent; lower sepals glabrous beneath, the upper sepal 7-nerved.....

.....33. *M. ligustrifolia*.

Apex of racemes with triangular-acuminate and inconspicuous bracts; branches puberulous; lower sepals puberulous beneath, the upper sepal 3-5-nerved.

Petioles to 2.5 mm. long; leaves to 7 cm. long, elliptic, obtuse; wings ciliate on lower margin.....34. *M. salicifolia*.

Petioles to 5 mm. long; leaves to 11 cm. long, lanceolate, acuminate; wings glabrous on margin.....35. *M. hirtella*.

Ovary pubescent.

Branches conspicuously canescent-hirsute; length of leaves always less than 3 times their width; drupe cordiform, flattened; lower sepals usually 1-nerved; keel glabrous within, the lateral lobes elongate; style glabrous.

.....36. *M. cyanea*

Branches more or less glabrescent; length of leaves almost always more than 4 times their width; drupe ovate or elliptic; lower sepals 3-nerved; keel puberulous within, the lateral lobes short; style puberulous.

Leaves elliptic, crowded, to 2.8 cm. long, obtuse; bracts of racemes to 1 mm. long, inconspicuous; outer sepals puberulous beneath; wings puberulous within.....37. *M. decurrens*.

Leaves linear-lanceolate, not crowded, to 10.5 cm. long, acute; bracts of racemes to 2.8 mm. long, conspicuous; outer sepals glabrous beneath; wings glabrous within.....38. *M. peruviana*.

Inflorescence in panicles or aggregate racemes.

Apex of leaves acuminate or acute.

Stem scandent, slightly hirsute; racemes numerous, lax, slender, with filiform bracts.....39. *M. Mathusiana*.

Stem not scandent, erect, densely hirsute; racemes not numerous, aggregate, ascendent, thicker, usually with ovate-lanceolate bracts.

Axis of racemes to 31 cm. long; blade of leaves thin, with 5 or 6 pairs of lateral veins.....40. *M. acutifolia*.

Axis of racemes to 10 cm. long; blade of leaves thicker, with 7 or 8 pairs of lateral veins.

Leaves lanceolate; wings ciliate; ovary more or less puberulous; southern Perú.....41. *M. Vargasii*.

Leaves oblong; wings glabrous; ovary glabrous; northern Perú.....

.....42. *M. pilosa*.

Apex of leaves usually obtuse, rarely acute.

Racemes numerous; wings puberulous beneath.

Margin of leaves conspicuously revolute, the apex not attenuate; racemes lax, the axis to 12.5 cm. long; upper sepal obtuse; wings glabrous within; keel puberulous within; southern Perú....43. *M. densecomata*.

Margin of leaves not revolute, the apex more or less attenuate; racemes rigid, the axis to 18 cm. long; upper sepal acute; wings puberulous within; keel glabrous within; northern Perú.....44. *M. tomentella*.

Racemes aggregate, sometimes simple, terminal; wings glabrous beneath.

Leaves acute, to 9 cm. long; petioles to 7 mm. long; outer sepals to 3.5 mm. long, puberulous beneath, the apex straight, the two lower 1-nerved; keel to 6 mm. long.....45. *M. Herrerae*.

Leaves obtuse, to 6 cm. long; petioles to 4.5 mm. long; outer sepals to 7 mm. long, glabrous beneath, the apex involute, the two lower 3-nerved; keel to 8 mm. long.....46. *M. pachycoma*.

1. *Monnina pterocarpa* R. & P. Syst. Veg. 174 (1798); Chodat in Bull. Herb. Boiss. 2: 168 (1894), in Bot. Jahrb. 42: 102 (1908).

Monnina angustifolia DC. Prodr. 1: 340 (1824).

Monnina chanduyensis Chodat in Bull. Herb. Boiss. 2: 167 (1894).

Monnina pterocarpa var. *exauriculata* Chodat in Bull. Soc. Bot. Genève II. 25: 202 (1934).

Annual, more or less herbaceous, 3–25 dm. high; stem 3.5–7 mm. in diameter, erect, terete, branched, the branches 8–78 cm. long, glabrescent; leaves linear (upper) or ovate-lanceolate (lower), 11–55 mm. long, 3–22 mm. wide, usually acute, rarely obtuse, glabrescent above, slightly pubescent beneath, entire, attenuate at base, the costa prominulous beneath, with 4 or 5 pairs of lateral veins; petioles 1–2.5 mm. long, pubescent; racemes more or less conical, acute, 8–11 mm. wide, simple, terminal, with a short peduncle, the axis 7–22 cm. long, finely pubescent, bracteate, the bracts filiform, 2–2.2 mm. long, deciduous, ciliate, 1-nerved, pubescent beneath; flowers 4–4.6 mm. long; pedicels 0.6–1 mm. long, glabrous; outer sepals free, lanceolate, concave, ciliate, acute, pubescent beneath, the two lower 1.6–2 mm. long, 0.8–1.2 mm. wide, 3-nerved, the upper one 2–2.5 mm. long, 0.9–1.4 mm. wide, 3–5-nerved; wings purple, 4–5 mm. long, 3–4 mm. wide, obovate, acute at base, 3–5-nerved, glabrous; keel yellow, 4–4.8 mm. long, 2.2–3.4 mm. wide, almost orbicular, plicate, glabrous within, obtuse at base, 3- or 4-nerved, 3-lobed, the middle lobe obtuse-emarginate, larger; upper petals elongate, pubescent within; stamens 8, the filaments 3–4 mm. long, united almost throughout, the apex acute, pubescent, the anthers emarginate; ovary elliptic, 1–1.4 mm. long, 0.6–0.8 mm. wide, glabrous; style 1.8–2.2 mm. long, geniculate near its base, glabrous, the apex 4–5 times as wide as the base, 2-auricled, the auricles usually conspicuous; stigma with 2 lobes, the lower more or less acute, the upper 2-tubercled; samara ovate, 3.5–8 mm. long, 3–7 mm. wide, gray-strigillose, becoming glabrescent, the wing 1–2.5 mm. wide, membranaceous, deeply emarginate at apex and base, the body rugose-reticulate. (PL. I, FIGS. 1–11.)

DISTRIBUTION: Northern and central parts of the Peruvian coast, between 20 and 2000 meters; also in the southwestern part of Ecuador, Province of Guayas.

ECUADOR: GUAYAS: Puntilla, Salinas, *Svenson* 11221 (US); Punta Centinela, *Svenson* 11390 (US); Chanduy, without date, *Spruce* 6398 (type photograph of *Monnina chanduyensis*, US). PERU: TUMBEZ: Caucas, Province of Tumbes, *Weberbauer* 7757 (isotypes of *Monnina pterocarpa* var. *exauriculata*, US, Ch); PIURA: Talara, *Johnston* 3512 (Ch, GH, US), *Haught* 7 (Ch, NY, US); Paríñas Valley, *Haught* 91 (Ch); Paita, *Pennell* 14812 (Ch, GH, NY, Ph, US); LIMA: Lima, 1838–42, *Wilkes Expedition*, without number (GH, US); near Lima, December 27, 1874–78, *Martinet* without number (Ch, US); Quives, *Pennell* 14298 (Ch, GH, Ph); near Viscas, *Pennell* 14467 (Ch, GH, NY, Ph, US); near Santa Eulalia, Province of Huarochiri, Chosica, *Goodspeed* 11308 (DA, GH, UC); above Chosica, *Mexia* 4007 (GH, M, UC);

vicinity of Chosica, *Rose & Rose 18545* (NY, US); Chosica, *Macbride 2874* (Ch, US), *Macbride & Featherstone 494* (Ch, US), *Grant 7393* (GH, US), *Soukup 2049* (US); DEPT. ? : Without locality and date, *Dombey 28* (Ch), *Gay* without number (fragments, US), *Pavón* without number (type photograph, US); "ex Lima," 1807, *Lagasca 54* (type photograph of *Monnina angustifolia*, US).

The original description of *Monnina angustifolia* indicates the characteristics of *M. pterocarpa*; moreover, the locality is cited as "circa Lima," and most of the specimens identified came from the Department of Lima. A. Gray, Bot. U. S. Expl. Exped. 1: 107 (1854), in his brief description of *M. angustifolia*, collected "between Lima and Yanga," states: "Perhaps not distinct from *M. pterocarpa*."

It was not possible to find important characters to separate *M. chanduyensis* from *M. pterocarpa*; on the contrary the photographs and the original descriptions of both seem to indicate that they are the same species. The species of Chodat was found in Chanduy (*Spruce 6398*), Province of Guayas, situated in the southwestern part of Ecuador; fortunately it was possible to see some specimens, *Svenson 11221* and *11390*, from localities near Chanduy. It has been possible also to examine some material from the northwestern part of Perú near the Province of Guayas. All of these specimens are essentially similar to the material from the Department of Lima. Chodat pointed out the similar qualities of the two species when he said: "Les feuilles, les petites stipules cornées, l'inflorescence et la grandeur des fleurs sont les mêmes." He established the differences in the shape of the samara, which in *M. pterocarpa* is regularly winged and symmetrical, while in *M. chanduyensis* it is irregular and asymmetrical. However, some specimens from Piura show the samara to be symmetrical and, on the contrary, material from Lima appears to have asymmetrical samaras. Therefore the writer prefers to combine the two species. It is desirable to indicate that the specimens *Pennell 14812* and *Svenson 11221* present an inconspicuous winged style; *Pennell 14467* shows small anthers and filaments with the upper part more or less free.

It is probable that Hooker made an error, in Bot. Mag. 58: t. 3122 (1831), in identifying a specimen from Lurín, Department of Lima, as *M. obtusifolia*, which is a species from Colombia. The specimen illustrated is the same as *M. pterocarpa*.

2. *Monnina amarella* Chodat in Bull. Soc. Bot. Genève II. 25: 200 (1934).

Annual, herbaceous, 0.6–8 dm. high; root 3–7 cm. long, 0.8–1.2 mm. in diameter, usually simple, perpendicular; stem erect, terete, branched, the branches 3–50 cm. long, finely pubescent; leaves oblanceolate or linear-lanceolate, 10–44 mm. long, 2–10 mm. wide, usually obtuse, sometimes emarginate, glabrescent, entire, attenuate at base, the costa prominulous beneath with inconspicuous lateral veins; petioles 0.8–1.5 mm. long, glabrescent; racemes conical, acute, 7–9 mm. wide, simple, terminal, with a short peduncle, the axis 2–32 cm. long, slightly pubescent, bracteate, the bracts filiform, 1.5–1.8 mm. long, deciduous, glabrous, inconspicuous; flowers 3–3.8 mm. long; pedicels 0.5–0.7 mm. long, glabrous; outer sepals free, lanceolate, concave, glabrous, acute, the two lower 1–1.4 mm. long,

0.4–0.7 mm. wide, 1-nerved, the upper one 1.5–2.2 mm. long, 1–1.4 mm. wide, 3-nerved, rarely ciliate; wings purple, 2.8–3.2 mm. long, 2–2.2 mm. wide, obovate, acute at base, 3-nerved, glabrous; keel yellow, 3.5–3.8 mm. long, 1.8–2 mm. wide, orbicular, plicate, glabrous, acute at base, 4- or 5-nerved, 3-lobed, the middle lobe obtuse-emarginate, larger; upper petals elongate-spatulate, pubescent within; stamens 6, the filaments 2.8–3 mm. long, united, glabrous, the anthers sessile, emarginate; ovary elliptic, 1–1.8 mm. long, 0.8–1 mm. wide, glabrous; style 1.5–1.6 mm. long, conspicuously geniculate above the base, glabrous, 2-auricled; stigma with 2 lobes, the lower acute, the upper 1-tubercled; samara ovate, 3.5–5 mm. long, 3–3.8 mm. wide, strigillose, becoming glabrescent, the wing 0.8–1.2 mm. wide, membranaceous, deeply emarginate at apex and base, the body rugose-reticulate. (PL. I, FIGS. 12–22.)

DISTRIBUTION: In the central and southern Andes, Departments of Junín and Cuzco, between 2900 and 3600 meters.

PERU: JUNÍN: Between Viques and Ingahuasi, Mantaro Canyon, south of Huan-cayo, *Killip & Smith* 22152 (US); CUZCO: Canyon Chicón, Prov. Urubamba, *Vargas* 11061 (Ch, UC); Pampa de Anta, vicinity of Huarocando, *Herrera* 3538 (Ch); colinas del Saxaihuamán, *Herrera* 2388 (Ch); San Sebastián, *Pennell* 13529 (TYPE Ch, ISOTYPES GH, NY, Ph, US); vicinity of Acomayo, Prov. Acomayo, *Vargas* 491 (Ch); Cuzco, *Herrera* 2393 (Ch); near Cuzco, *Herrera* 681 (Ch, US); Ollantaytambo, *Cook & Gilbert* 522 (US), 530 (US), *Pennell* 13578 (Ph); Cuzco, July, 1923, *Herrera* without number (US); Saxaihuamán, *Pennell* 13589 (Ph); "Urco," Calca, *Vargas* 1774 (GH).

This species is close to *M. filifolia* Chodat, but it differs clearly from the latter in the oblanceolate leaves with an obtuse-emarginate apex; the axis is almost always short and the samara usually has a purple wing.

3. *Monnina filifolia* Chodat in Bull. Soc. Bot. Genève II. 25: 198 (1934).

Annual, herbaceous, 3–7.5 dm. high; root 6–9 cm. long, 1.2–3.5 mm. in diameter, simple or somewhat branched, perpendicular, sometimes curved; stem erect, terete, branched, the branches 10–50 cm. long, corymbose, slightly pubescent; leaves linear, 20–70 mm. long, 1.5–5 mm. wide, acuminate, sometimes acute, glabrescent, entire, attenuate at base, 1-nerved, sessile, the costa prominulous beneath; racemes conical, acute, 6–8 mm. wide, simple, terminal, pedunculate, the peduncle 14–35 mm. long, the axis 18–45 cm. long, finely pubescent, bracteate, the bracts filiform, 1.8–2.5 mm. long, deciduous, ciliate, 1-nerved; flowers 3–3.5 mm. long; pedicels 0.8–1 mm. long, glabrous; outer sepals free, lanceolate, concave, the two lower ones 1.2–1.8 mm. long, 0.5–0.6 mm. wide, glabrous, 1-nerved, acute, the upper one 2–2.2 mm. long, 1–1.2 mm. wide, ciliate, 3-nerved, acuminate; wings purple, 3.2–3.5 mm. long, 2–2.2 mm. wide, obovate, acute at base, 3-nerved, glabrous; keel yellow, 3.4–3.8 mm. long, 1.8–2 mm. wide, orbicular, plicate, glabrous, obtuse at base, 3- or 4-nerved, 3-lobed, the middle lobe obtuse-emarginate, larger; upper petals elongate-spatulate, conspicuously pubescent; stamens 6, the filaments 2–2.5 mm. long, united, pubescent at the apex, the anthers sessile; ovary elliptic, 1–1.5 mm. long, 0.5–0.6 mm. wide, glabrous; style 2–2.4 mm. long, geniculate at the middle, glabrous, with 2 conspicuous auricles; stigma more or less denticulate with 2 lobes, the lower acute, the upper 1-tubercled; samara ovate, 4–5.5 mm. long, 2.5–4.5 mm. wide, gray-strigillose, becoming glabrescent, the wing 0.8–1 mm. wide, membranaceous, deeply emarginate at apex and base, the body rugose-reticulate. (PL. I, FIGS. 23–33.)

DISTRIBUTION: Known only from the Department of Huancavelica in the general region of the central Andes, between 1900 and 2400 meters.

PERU: HUANCAMELICA: Valley of the Mantaro river, below Colcabamba, Province of Tayacaja, *Weberbauer 6454* (TYPE Ch, ISOTYPES GH, NY, US); Mejorada, Prov. Huancavelica, *Stork & Horton 10909* (Ch, UC).

This plant is very close to *M. graminea* Chodat, from northern Perú (Cajamarca), but differs in the lower leaves being filiform, the samara being conspicuously puberulous, and the filaments of the stamens being united throughout. No herbarium material of *M. graminea* is available to the author, and the differences here noted are derived from the original description and a photograph of the type.

4. *Monnina graminea* Chodat in Bot. Jahrb. 42: 103 (1908).

Annual, herbaceous, 2–4 dm. high; root small, branched; stem erect, terete, simple or branched, the branches more or less pubescent, corymbose; leaves lanceolate or linear-lanceolate, 25–40 mm. long, 3–8 mm. wide, acute-mucronate, pubescent, entire, attenuate at base, the costa prominent beneath; petioles short; stipules 1–1.5 mm. long, cylindric; racemes simple, terminal, the axis 10–20 cm. long, finely pubescent, bracteate, the bracts deciduous, inconspicuous; flowers 2–3 mm. long; pedicels 0.5 mm. long; outer sepals acute, glabrous; wings obovate, glabrous, cuneiform at base, the nerves fan-shaped; keel hemispherical, 3-lobed, the lobes obtuse; upper petals short, broad; staminal tube with hairs on the upper part, the filaments united, free in the upper part, glabrous; ovary elliptic, glabrous; style geniculate, 2-auricled; stigma with 2 lobes, the lower acute, the upper 1-tubercled; samara 2–3 mm. long, the wing glabrous, the body rugose-reticulate.

DISTRIBUTION: Confined to the northern part of the Peruvian Andes, Department of Cajamarca, at about 2200 meters.

PERU: CAJAMARCA: Below San Miguel, Prov. Hualgayoc, *Weberbauer 3919* (photograph of TYPE, US).

Material of this species has not been available, and the description given above is adapted from the original. It has also been possible to see the photograph of the type in the United States National Herbarium.

5. *Monnina herbacea* DC. Prodr. 1: 340 (1824).

Monnina polygonoides Chodat in Bull. Soc. Bot. Genève II. 25: 200 (1934).

Annual, herbaceous, 1–4.6 dm. high; root 5–7 cm. long, 1.5–2 mm. in diameter, curved, usually branched; stem almost erect, striate, branched at base, the branches 8–44 cm. long, more or less corymbose, pubescent; leaves usually lanceolate, rarely oblanceolate or elliptic, 8–40 mm. long, 3–12 mm. wide, obtuse, pubescent, becoming glabrescent, entire, attenuate at base, the costa prominent beneath, with 5 or 6 pairs of lateral veins; petioles 0.6–1.5 mm. long, pubescent; racemes conical, acute, 7–8 mm. wide, simple, terminal, with a short peduncle, the axis 1.6–8 cm. long, finely pubescent, bracteate, the bracts filiform, 1.8–2.2 mm. long, deciduous, conspicuous, glabrous; flowers 3.5–4.2 mm. long; pedicels inconspicuous; outer sepals free, lanceolate, concave, ciliate, acute, the two lower 1.4–1.6 mm. long, 0.8–1 mm. wide, usually 3-nerved, sometimes 1-nerved, the upper one 2–2.4 mm. long, 1.2–1.4 mm. wide, 5-nerved; wings purple, 3.5–4.8 mm. long, 2.5–3.5 mm. wide, obovate, acute at base, 3-nerved,

ciliate; keel yellow, 3.8–4.8 mm. long, 2–2.5 mm. wide, orbicular, plicate, glabrous within, obtuse at base, 4-nerved, 3-lobed, the middle lobe obtuse-emarginate, larger, ciliate; upper petals elongate-spatulate, pubescent within; stamens 8, the filaments 3–3.8 mm. long, united two-thirds their length, the free part 1–1.2 mm. long, glabrous, the anthers emarginate; ovary elliptic, 1–1.5 mm. long, 0.6–1 mm. wide, densely pubescent, the hairs rigid, ascendent, short; style 2–2.8 mm. long, geniculate above the base, glabrous, the apex thicker; stigma with 2 lobes, the lower acute, the upper 1-tubercled; fruit more or less samaroid, cordiform, 4–4.2 mm. long, 2.2–2.8 mm. wide, conspicuously pubescent, usually acute at apex, emarginate at base, the wing inconspicuous, the body rugose-reticulate. (Pl. I, FIGS. 34–43.)

DISTRIBUTION: Indigenous in the central Andes, Departments of Huánuco and Junín, between 2100 and 2800 meters.

PERU: HUÁNUCO: Ambo, April 5, 1923, *Macbride 3181* (type of *M. polygonoides* Ch, isotypes GH, NY, US); JUNÍN: Huaraca, *Macbride 3116* (Ch, GH, NY, US); DEPT. ? : Without locality and date, *Dombey 625* (fragments of authentic material from the Paris Herbarium, Ch, US); without locality, 1862, *Mathews* without number (NY); "ex Lima," 1807, *Lagasca 53* (photograph of TYPE, US).

Fortunately it was possible to see authentic material and also a photograph of the type of this species. The label of the type reads: "ex Lima," and the original description by de Candolle gives: "prope Lima"; nevertheless it seems probable that this material was collected in the Departments of Huánuco or Junín, regions visited several times by Ruiz, Pavón, and Dombey. On the other hand, the annual species common about Lima, *M. macrostachya* and *M. Weberbaueri*, are very different from the present species. It has been possible to see the type of *M. polygonoides* Chodat, and obviously it is equal to *M. herbacea*.

6. *Monnina ramosa* I. M. Johnston in Contrib. Gray Herb. 70: 77 (1924).

Annual, more or less herbaceous, 1.5–2 dm. high; root 1.5–2 mm. in diameter, branched, curved; stem erect, terete, conspicuously branched, the branches 4–12 cm. long, canescent-pubescent; leaves linear, 10–30 mm. long, 1–2.5 mm. wide, obtuse, rarely acute, finely pubescent, entire, revolute, attenuate at base, 1-nerved; petioles 0.5–1 mm. long, slightly pubescent; racemes conical, acute, 5–8 mm. wide, simple, terminal, with a short peduncle, the axis 5–10 cm. long, canescent-pubescent, bracteate, the bracts linear or lanceolate, 2.5–3 mm. long, 0.8–1 mm. wide, deciduous, ciliate, 1-nerved, pubescent beneath; flowers 3.5–4.8 mm. long; pedicels 0.5–0.7 mm. long, glabrous; outer sepals free, lanceolate, concave, ciliate, acute, 3-nerved, glabrescent beneath, the two lower ones 1.4–1.7 mm. long, 0.9–1 mm. wide, the upper one 2–2.2 mm. long, 1.2–1.3 mm. wide; wings white, 4–5 mm. long, 2.5–3 mm. wide, obovate, acute at base, 3-nerved, glabrous; keel yellowish, 4–5 mm. long, 2–3 mm. wide, orbicular, plicate, glabrous, obtuse at base, 3-nerved, 3-lobed, the middle lobe emarginate; upper petals elongate-spatulate, pubescent within; stamens 8, the filaments 3–3.5 mm. long, united, glabrous, the anthers subsessile, emarginate; ovary elliptic, 0.8–1 mm. long, 0.5–0.6 mm. wide, glabrous; style 1.5–2.5 mm. long, straight, becoming slightly geniculate in the upper part, glabrous, almost cylindric; stigma 3–4 times as wide as the base of style, with 2 lobes, the lower acute, the upper 1-tubercled, elongate, cylindric; samara

ovate, 3.5–4 mm. long, 3–3.5 mm. wide, gray-strigillose, the wing 0.8–1 mm. wide, membranaceous, deeply emarginate at apex and base, the body rugose-reticulate. (PL. II, FIGS. 1–10.)

DISTRIBUTION: This entity has been found in the southern part of the Department of Arequipa, at about 3300 meters.

PERU: AREQUIPA: On sandy pampa at 3300 m. alt. on south slope of Chachani Mountain near Arequipa, *Hinkley & Hinkley 13* (TYPE GH); Arequipa desert, August 21, 1925, *Cockerell* without number (US).

This species is related to *M. Weberbaueri* Chodat, from which it differs strongly in its leaves being linear with a revolute margin, the fruit being winged and puberulous, the lower sepals with 3 nerves, the keel glabrous, and the upper petals elongate. Furthermore the style is differently shaped.

7. *Monnina Machridei* Chodat in Bull. Soc. Bot. Genève II. 25: 199 (1934).

Annual, herbaceous, 1–3.9 dm. high; root 3.5–8 cm. long, 0.8–1.4 mm. in diameter, usually simple, perpendicular; stem erect, terete, finely canescent-pubescent, simple, sometimes branched, the branches 4–16 cm. long; leaves linear or narrowly lanceolate, 14–45 mm. long, 1.5–5 mm. wide, acute, glabrescent, entire, attenuate at base, 1-nerved, the costa prominulous beneath; petioles 0.8–1.4 mm. long, glabrescent; racemes attenuate, acute, 5–7 mm. wide, simple, terminal, pedunculate, the peduncle 20–60 mm. long, the axis 2–14 cm. long, glabrescent, bracteate, the bracts filiform, 1.5–2 mm. long, deciduous, ciliate, 1-nerved, inconspicuous; flowers 3.5–4 mm. long, pedicels 0.5–0.6 mm. long, glabrous; outer sepals free, lanceolate, concave, glabrous, acute, the two lower ones 1.5–2 mm. long, 0.8–1 mm. wide, 1-nerved, the upper one 2–2.4 mm. long, 1–1.4 mm. wide, 3-nerved; wings purple, 4–4.2 mm. long, 2.4–2.6 mm. wide, obovate, acute at the base, 3- or 4-nerved, glabrous; keel yellow, 3.8–4 mm. long, 1.8–2 mm. wide, orbicular, plicate, obtuse-emarginate at the apex, glabrous, more or less acute at base, 3-nerved; upper petals elongate-spatulate, pubescent within; stamens 8, the filaments 2.8–3.2 mm. long, united, glabrous, the anthers subsessile; ovary elliptic, 0.8–1.5 mm. long, 0.6–0.8 mm. wide, glabrous; style 1.6–2.2 mm. long, straight, glabrous, almost cylindric; stigma with 2 lobes, the lower acute, the upper 1-tubercled, larger, papillose; samara ovate, 2.5–4.5 mm. long, 3–4 mm. wide, glabrous, the wing 0.8–1.2 mm. wide, membranaceous, deeply emarginate at apex and base, the body rugose-reticulate. (PL. II, FIGS. 11–20.)

DISTRIBUTION: Endemic in the southeastern Andes, Department of Arequipa, between 2100 and 3355 meters.

PERU: AREQUIPA: Chachani Mountain, north of Arequipa, *Hinkley & Hinkley 18* (GH); Arequipa, *Pennell 13167* (TYPE Ch, ISOTYPE GH, Ph); Tingo, *Pennell 13110* (Ch, GH, NY, Ph, US).

Very close to *M. ramosa* Johnston, from which it differs in the few-branched stem, the 1-nerved glabrous lower sepals, and the more or less cylindric style.

8. *Monnina arenicola* sp. nov.

Planta herbacea annua, radici gracili perpendiculari simplici 4–7 cm. longa; caulis teres breviter pilosus 0.3–1.6 dm. altus simplex vel plus minusve ramosus; folia herbacea lanceolata vel elliptica 10–25 mm. longa 4–9 mm. lata basim versus elongato-attenuata apice emarginata vel obtusa

glaberrima integerrima, nervo medio prominulo, inconspicue et breviter petiolata, petiolo 0.8–1.5 mm. longo glaberrimo; racemi simplices breves conici 5–6 mm. crassi, rhachi 3–8 cm. longa breviter pilosa, bracteis linearibus 1.5–2 mm. longis 0.4–0.5 mm. latis ciliatis deciduis; flores 2.8–3.2 mm. longi, pedicello 0.4–0.6 mm. longo glabro; sepala exteriora libera lanceolata acuta, duo inferiora 1.4–1.5 mm. longa 0.6–0.8 mm. lata plus minusve patentia glabra uninervia, sepalo superiore 1.6–1.8 mm. longo 1–1.2 mm. lato concavo ciliato 3-nervio; alae plus minusve albae 3–3.5 mm. longae 1.8–2 mm. latae obovatae glabrae basi acutae 3–5-nerviae; carina 3.2–3.5 mm. longa 1.5–1.6 mm. lata orbicularis plicata intus pilosa apice trilobata, lobo mediano acutiusculo, lobis lateralibus minoribus, basi plus minusve obtusiuscula 3-nervia, petalo superiore limbo breviter elongato extus glabro intus piloso; stamina 8 in fasciculis 2 disposita, filamentis 2.5–2.8 mm. longis connatis; antheris sessilibus; ovarium 1–1.2 mm. longum 0.5–0.7 mm. latum oblongum glabrum; stylus 1.2–1.6 mm. longus plus minusve geniculatus glaber cylindricus; stigma apice superiore bituberculatum apice inferiore acutum; samarae 4–5.5 mm. longae 3–4.8 mm. latae ellipticae reticulato-venosae canescentes strigillosae, alis 1–1.6 mm. latis membranaceis apice et basi conspicue emarginatis. (PL. II, FIGS. 21–30.)

DISTRIBUTION: Southern Perú, Department of Arequipa, in sandy plain near ocean, between 15 and 175 meters altitude.

PERU: AREQUIPA: East of Mollendo, sandy plain, *C. R. Worth & J. L. Morrison* 15762 (DA, GH, M); south of Mollendo, sand dunes near ocean, November 17, 1935, *Mexia* 4175 (TYPE Gray Herb., ISOTYPE M, UC).

Related to *M. macrostachya* R. & P. and also to *M. Weberbaueri* Chodat, differing from the first in the puberulous samara, the lower sepals, the glabrous wings and keel, and the stigma with the upper short lobe; from the second it is distinguished by its winged and puberulous fruit and the glabrous wings and keel. It is less closely related to *M. ramosa* Johnston, from which it differs in the lanceolate or elliptic leaves, the more or less simple stem, the lower sepals being 1-nerved, the keel being puberulous within, and the short upper petals.

9. *Monnina Weberbaueri* Chodat in Bot. Jahrb. 42: 102 (1908).

Annual, herbaceous, 1–4.8 dm. high; root 4–12 cm. long, 1–3 mm. in diameter, branched, curved; stem erect, terete, pubescent (hairs short, yellowish), ascendent, branched, the branches 7–26 cm. long; leaves usually lanceolate, rarely elliptic-spatulate, 12–46 mm. long, 6–26 mm. wide, obtuse, sometimes acute, glabrescent, entire, attenuate at base, the costa prominulous beneath with 6 or 7 pairs of lateral veins; petioles 1–2 mm. long, pubescent; racemes conical, acute, 8–12 mm. wide, simple, terminal, pedunculate, the peduncle 15–42 mm. long, the axis 2.5–16 cm. long, finely pubescent, bracteate, the bracts filiform, 1.2–1.6 mm. long, deciduous, ciliate, 1-nerved, inconspicuous; flowers 2.8–5 mm. long, the pedicels 0.5–0.6 mm. long, glabrescent; outer sepals free, lanceolate, concave, ciliate, acute, the two lower ones 1.4–1.6 mm. long, 0.4–0.5 mm. wide, 1-nerved, the upper one 2–2.2 mm. long, 0.6–0.8 mm. wide, 3-nerved, sometimes 1-nerved; wings purple, 2.8–4.2 mm. long, 1.8–2.8 mm. wide, obovate, acute at base, 3- or 4-nerved, ciliate; keel yellow, 3.4–5 mm. long, 1.5–2.8 mm. wide, orbicular, more or less plicate, pubescent within, acute at base,

3- or 4-nerved, 3-lobed, the middle lobe acute, larger, ciliate; upper petals short, pubescent within; stamens 8, the filaments 2.4–3 mm. long, united, glabrous, the anthers sessile, emarginate; ovary elliptic, 1–1.5 mm. long, 0.6–0.8 mm. wide, glabrous; style 1.5–2.8 mm. long, straight, becoming slightly geniculate near apex, glabrous, almost cylindric; stigma with 2 lobes, the lower acute, the upper 2-tubercled; drupe ovate, 1.8–2 mm. long, 1.4–1.5 mm. wide, glabrescent, rugose-reticulate. (PL. II, FIGS. 31–41.)

DISTRIBUTION: In "lomas" of central and southern Perú, Departments of Lima and Arequipa, between 20 and 550 meters.

PERU: LIMA: Lomas Pasamayo, south of Chancay, *Stork & Vargas 9351* (DA, GH, M, UC); lomas south of Lima, *Grant 7440* (GH, M, US); AREQUIPA: Mollendo, hillside directly back of the port, *I. M. Johnston 3551* (Ch, GH, US); Mollendo, *Hitchcock 22422* (US); Posco, between Mollendo and Arequipa, *Cook & Gilbert 47* (US); Mollendo, loma, *Weberbauer 1505* (TYPE photograph, Ch).

This may possibly be related to *M. macrostachya* R. & P., but it is distinguished by its fruit without wings and its slenderer and shorter racemes. Moreover, this species is endemic to the lomas near the ocean, while the species of Ruiz and Pavón comes from the sierra up to 1300 meters.

10. *Monnina macrostachya* R. & P. Syst. Veg. 173 (1798); Chodat in Bull. Herb. Boiss. 2: 168 (1894).

Polygala lanceolata Poir. Encycl. Méth. 5: 498 (1804).

Monnina lanceolata DC. Prodr. 1: 339 (1824).

Monnina macrostachya var. *pumila* A. Gray, Bot. U. S. Expl. Exped. 1: 107 (1854).

Monnina Weberbaueri var. *elongata* Chodat in Bot. Jahrb. 42: 103 (1908).

Monnina Weberbaueri var. *pachyantha* Chodat, l. c.

Monnina Weberbaueri var. *maxima* Chodat, l. c.

Annual, herbaceous, 1.5–5.5 dm. high; root 2.5–8 cm. long, 1–3 mm. in diameter, usually branched, conspicuously curved; stem erect, terete, branched, the branches 7–30 cm. long, ascendent, pubescent, the hairs short, yellowish; leaves lanceolate, rarely more or less spatulate, 10–50 mm. long, 4–20 mm. wide, usually acuminate, sometimes obtuse, glabrescent, entire, attenuate at base, the costa prominulous beneath, with 5 or 6 pairs of lateral veins; petioles 1–2.5 mm. long, slightly pubescent; racemes conical, acute, 9–13 mm. wide, simple, terminal, pedunculate, the peduncle 20–95 mm. long, the axis 3–22 cm. long, finely pubescent, becoming glabrescent, bracteate, the bracts filiform, 1.8–2.5 mm. long, deciduous, ciliate, 1-nerved; flowers 4–6 mm. long; pedicels 0.8–1 mm. long, pubescent; outer sepals free, lanceolate, concave, ciliate, acuminate, the two lower ones 2–2.4 mm. long, 0.9–1 mm. wide, 1-nerved, rarely 3-nerved, the upper one 2.2–3 mm. long, 1.6–1.8 mm. wide, pubescent beneath, 3–5-nerved; wings purple, 4–5.4 mm. long, 3–3.6 mm. wide, obovate, acute at base, 3-nerved, ciliate; keel yellow, 4.4–6 mm. long, 2–2.8 mm. wide, orbicular, plicate, pubescent within, ciliate, acute at base, 3-nerved, 3-lobed, the middle lobe acute, larger; upper petals short, narrow, densely pubescent within; stamens 8, the filaments 3.4–4 mm. long, united, glabrous, the anthers sessile, emarginate; ovary elliptic, 0.8–1.4 mm. long, 0.5–0.8 mm. wide, glabrous; style 2–3 mm. long, straight, becoming geniculate near the apex, glabrous, almost cylindric, thicker in the upper part; stigma with 2 lobes, the lower acute, the upper 2-tubercled, acuminate, ciliate, larger; samara ovate, 3–5 mm. long, 2.5–4 mm. wide, usually

glabrescent, rarely gray-strigillose, the wing 0.6–1 mm. wide, membranaceous, deeply emarginate at apex and base, the body rugose-reticulate. (Pl. III, FIGS. 1–10.)

DISTRIBUTION: The central and southern part of the Peruvian Andes, Departments of Huánuco, Lima, and Moquegua, between 1300 and 3200 meters.

PERU: HUÁNUCO: Mito, *Macbride & Featherstone* 1548 (Ch); LIMA: Canta, *Pennell* 14343 (Ch, GH, NY, Ph, US); Obrajillo, *Pennell* 14372 (Ch, GH, NY, Ph, US); below Obrajillo, *Pennell* 14436 (Ch, GH, NY, Ph, US); below Obrajillo, 1838–42, *Wilkes Expedition* without number (type of *Monnina macrostachya* var. *pumila* US); above Obrajillo, *Pennell* 14373 (Ph); Obrajillo, 1838–42, *Wilkes Expedition* without number (GH); Yanahuanca, *Macbride & Featherstone* 1168 (Ch, US); Puruchuca, *Collector ?* 461 (GH); Cajatambo Province, *Stork* 11451 (GH, UC); above Santa Eulalia, *Goodspeed* 33016 (UC); quebrada southwest of Matucana, *Goodspeed* 11332 (DA, GH, UC); Matucana, *Macbride & Featherstone* 311 (Ch, US), 88 (Ch, US), *Stork & Horton* 9143 (GH, UC); Valley of Lima, *Mathews* 394 (GH); MOQUEGUA: Estuquiña, Province of Moquegua, *Weberbauer* 7451 (Ch, US); Carumas, Province of Moquegua, *Weberbauer* 7301 (Ch, US); DEPT. ? : without locality, *Mathews* 1001 (NY); without locality, 1838–42, *Wilkes Expedition* without number (NY, US); without locality, without date, *Dombey* without number (probably fragments of authentic material of *Polygala lanceolata*, Ch); without locality, without date, *Collector ?* without number (type photograph of *Polygala lanceolata*, US).

The description given by Ruiz & Pavón and also the additional description by Chodat of *M. macrostachya* indicate the characters of this species. According to Ruiz & Pavón the locality of the type is "Cercado et Chancay," situated in the eastern and northern parts of Lima respectively. The majority of the specimens of this species have been collected in this vicinity.

There is no available authentic material of *Polygala lanceolata*. However, it seems that the photograph of the type and the brief original description correspond to *M. macrostachya*.

Asa Gray described *M. macrostachya* var. *pumila* from material collected "below Obrajillo" near Lima; the type appears to the writer to be essentially identical with that of the species.

The three varieties of *M. Weberbaueri* cited above, proposed by Chodat, are based on the following material: var. *elongata* on *Weberbauer* 2724 from Ocros, Province of Cajatambo; var. *pachyantha* on *Weberbauer* 185 from Matucana; and var. *maxima* on *Weberbauer* 3125 from Hacienda Cajabamba, between Samanco and Caraz. These localities are situated in the Andean region at elevations up to 1300 meters. All the available material of *M. macrostachya* comes from this region or from the sierra, while the related *M. Weberbaueri* and *M. arenicola* are strictly confined to the "lomas" and sand-dunes near the ocean. Therefore it is to be presumed that the varieties proposed by Chodat are synonymous with *M. macrostachya*.

11. *Monnina longibracteata* Chodat in Bull. Herb. Boiss. 3: 130 (1895).

Frutescent, branched, the branches 5 mm. in diameter, decurrent, striate, more or less glabrescent; leaves lanceolate or elliptic, sometimes linear-lanceolate, 80–90 mm. long, 25–27 mm. wide, usually acute, rarely acuminate, slightly pubescent, becoming glabrescent, entire, attenuate at base, the costa prominulous beneath, with 8 or 9 pairs of lateral veins;

petioles 4–8 mm. long, pubescent; racemes elongate, almost acute, 8–11 mm. wide, simple, terminal, the axis to 15 cm. long, pubescent in the upper part, bracteate, the bracts conspicuously filiform, 5–6.5 mm. long, 0.8–1 mm. wide, glabrescent, 1-nerved; flowers 3.6–5 mm. long; pedicels 1.2–1.5 mm. long, finely pubescent; outer sepals lanceolate, acute, glabrous, the two lower ones 2.4–2.6 mm. long, 0.6–0.8 mm. wide, almost $\frac{1}{2}$ united, 1-nerved, the nerve conspicuous, the upper sepal 2.6–3 mm. long, 1.2–1.4 mm. wide, 3-nerved; wings 4–4.2 mm. long, 3.6–3.8 mm. wide, obovate, obtuse at base, 3- or 4-nerved, glabrescent beneath, sometimes with a few hairs on the lower part; keel 3–3.2 mm. long, 2–2.2 mm. wide, orbicular, plicate, pubescent within, glabrous on margin, obtuse at base, 3- or 4-nerved, 3-lobed, the middle lobe obtuse-emarginate; upper petals elongate, attenuate, pubescent within; stamens 8, the filaments 2.8–3 mm. long, almost entirely united, the free part 0.5–0.7 mm. long; ovary elliptic, 0.8–1 mm. long, 0.5–0.6 mm. wide, glabrous; style 2–2.2 mm. long, geniculate above the base, glabrous, cylindric; stigma with 2 lobes, the lower more or less obtuse, the upper 1-tubercled, the tubercle papillose; fruit unknown. (PL. III, FIGS. 11–17.)

DISTRIBUTION: Probably found in the northern part of Perú, Department of Amazonas.

PERU: "Habitat in America australi," 1835, *Mathews 2075* (fragments and photograph of the TYPE, US).

This species has elongated terminal or axillary racemes, with the flowers not crowded and the bracts conspicuously linear with an involute apex.

The material of the type was probably collected in the Department of Amazonas, northern Perú, where Mathews lived for several years.

11a. *Monnina longibracteata* var. *ainensis* Chodat in Bull. Soc. Bot. Genève II. 25: 222 (1934).

This variety differs from the typical form in the following characters: acuminate, larger leaves (42–170 mm. long, 11–65 mm. wide); axis of inflorescence to 33 cm. long, the outer sepals ciliate, the lower 3-nerved, the wings strongly pubescent beneath; upper petals densely pubescent; ovary more or less pubescent. (PL. III, FIGS. 18–25.)

PERU: AYACUCHO: Aina, between Huanta and Apurímac River, *Killip & Smith 23188* (TYPE Ch, ISOTYPE NY).

12. *Monnina huallagensis* Chodat in Bull. Soc. Bot. Genève II. 25: 223 (1934).

Plant frutescent, branched, the branches glabrous, decurrent; leaves lanceolate, 38–125 mm. long, 7–38 mm. wide, acuminate, rarely more or less acute, glabrescent, entire, attenuate at base, the costa prominulous beneath, with 7 or 8 pairs of lateral veins; petioles 2–4 mm. long, pubescent, stipulate, the stipules 1–1.4 mm. long, acute, pubescent; racemes elongate, acuminate, 9–11 mm. wide, simple, terminal, pedunculate, the peduncle 16–70 mm. long, the axis 15–30 cm. long, glabrous, bracteate, the bracts conspicuously linear, 3–5 mm. long, 0.6–1 mm. wide, glabrous, 1-nerved; flowers 4–4.8 mm. long; pedicels 1.4–2 mm. long, glabrous; outer sepals lanceolate, acute, the two lower ones 1.8–2 mm. long, 0.6–1 mm. wide, more or less $\frac{2}{3}$ united, 1-nerved, glabrous, sometimes ciliate, the upper one 2.4–2.6 mm. long, 1.2–1.3 mm. wide, 3-nerved, ciliate, glabrous

beneath; wings 4–4.6 mm. long, 3.8–4 mm. wide, obovate, obtuse at base, 3-nerved, more or less pubescent beneath; keel 3.5–4.2 mm. long, 2.4–2.6 mm. wide, orbicular, plicate, pubescent within, glabrous on margin, obtuse at base, 3–5-nerved, 3-lobed, the middle lobe obtuse-emarginate; upper petals elongate-spatulate, pubescent within; stamens 8, the filaments 2.8–3.2 mm. long, almost united entirely, the free part 0.6–1 mm. long, pubescent, the anthers mucronate; ovary elliptic, 1.2–1.5 mm. long, 0.8–1 mm. wide, glabrous; style 2.2–2.5 mm. long, straight, becoming geniculate, glabrous, cylindric; stigma with 2 lobes, the lower acute, the upper 1-tubercled; drupe ovate, 4–6 mm. long, 2.5–3 mm. wide, glabrous, conspicuously reticulate. (PL. III, FIGS. 26–33.)

DISTRIBUTION: Probably limited to the Department of Huánuco, central Perú.

PERU: HUÁNUCO: Pampayacu, *Kanehira* 290 (GH); DEPT. ? : Huallaga, 1600 meters, *Weberbauer* 6805 (TYPE Ch, ISOTYPES GH, NY, US).

Very close to *M. longibracteata* Chodat, from which it differs in the rigid bracts, the acuminate leaves, the stamens with the free upper part of the filaments pubescent, and the mucronate anthers. It is also related to *M. macrosepala* Chodat, from which it is distinguished by its larger inflorescence-axis (to 30 cm. long), the flowers not crowded, the leaves with 7 or 8 pairs of lateral veins, the outer sepals smaller, 1-nerved, the mucronate anthers, etc.

12a. *Monnina huallagensis* var. *pachyphylla* Chodat, l. c.

Differs from the typical form in the stronger branches, the glabrous leaves with reticulate nerves, and the axis of the inflorescence being conspicuously shorter. (PL. III, FIG. 34.)

PERU: HUÁNUCO: Cueva Grande, estación near Pozuzo, alt. 3500 meters, *Macbride* 4786 (TYPE US, ISOTYPE GH).

13. *Monnina glabrifolia* sp. nov.

Frutex ad 20 dm. altus, ramis 2–7 mm. crassis glabris tenuiter striatis; folia lanceolata 4.5–14 cm. longa, 2–6 cm. lata basim versus elongato-attenuata apice acuta vel breviter acuminata integerrima utrinque glabra, nervo medio prominulo, nervis lateralibus 9 vel 10, petiolo 2–3 mm. longo glabro; racemi simplices plus minusve conici 5–7 mm. crassi, rhachi 3.5–23 cm. longa breviter puberula striata, pedunculati, pedunculo 1.5–4.5 cm. longo, bracteis lanceolatis 4.5–6.5 mm. longis, 1.5–2 mm. latis puberulis uninerviis; flores 4.2–4.6 mm. longi, pedicello 1.2–1.8 mm. longo plus minusve puberulo; sepala exteriora concava ciliata lanceolata subtus puberula, duo inferiora 2.6–3 mm. longa 1.3–1.5 mm. lata obtusa ad $\frac{2}{3}$ connata 5-nervia, sepalo superiore minore 2–2.2 mm. longo 1.2–1.4 mm. lato acutiusculo 7-nervio; alae 4.8–5 mm. longae 3.2–3.4 mm. latae obovatae basi plus minusve obtusae ciliatae 3- vel 4-nerviae subtus pubescentes; carina 5–5.2 mm. longa 3–3.4 mm. lata orbiculari-obovata glabra apice trilobata, lobo mediano emarginato, lobis lateralibus obtusiusculis, basi obtusiuscula 3- vel 4-nervia breviter ciliata, petalo superiore breviter elongato pubescente; stamina 8, filamentis 3.5–3.8 mm. longis, antheris subsessilibus vel filamentorum parte libera 0.6–1.2 mm. longa glabra; ovarium 1.5–1.6 mm. longum 1.2–1.3 mm. latum oblongum dense pubescens; stylus 2–2.2 mm. longus geniculatus glaber cylindricus; stigma apice superiore tuberculatum papillosum, apice inferiore acutum; drupae corda-

tae 4.5–6 mm. longae 3.8–5 mm. latae breviter alatae conspicue pubescentes reticulato-venosae. (PL. IV, FIGS. 1–9.)

DISTRIBUTION: Known only from the type collection.

PERU: PUNO: Trail from Santo Domingo to Chabuca mine, Province Carabaya, May 30–June 1, 1942, alt. 1900 meters, *Metcalf 30661* (TYPE UC 690169, ISOTYPE US).

The new species is related to *M. andina* Chodat, but has acuminate and larger leaves (more or less 3 times larger); the racemes with crowded and larger bracts also distinguish it from the latter species. It is also close to *M. Lechleriana* Chodat, from which it sharply differs in the terminal and simple racemes, the pubescent ovary, etc.

14. *Monnina menthoides* Chodat in Bull. Soc. Bot. Genève II. 25: 219 (1934).

Frutescent, branched, the branches 2.5–3 mm. in diameter, canescent-tomentose; leaves lanceolate, 30–40 mm. long, 8–9 mm. wide, acute, sometimes mucronate, pubescent above, densely pubescent beneath, sinuate-denticulate, attenuate at base; petioles 3 mm. long, hirsute; racemes elongate, simple, terminal, 6–8 cm. long, the axis 6–12 cm. long, densely hirsute, bracteate, the bracts linear, pubescent beneath; flowers 5 mm. long; pedicels 1 mm. long, pubescent; outer sepals lanceolate-triangular, ciliate, the two lower united; wings more or less orbicular, slightly unguiculate, ciliate; upper petals linear-spatulate, pubescent; filaments of stamens more or less united; ovary pubescent; style geniculate; samara cordate, 5 mm. long, 5 mm. wide, pubescent, the apex slightly emarginate, the body canescent, reticulate.

DISTRIBUTION: In the southeastern part of Perú, Department of Cuzco.

PERU: CUZCO: Marcapata, Province Quispicanchis, *Weberbauer 7786* (not seen).

Material of the present species has not been available, and therefore the description given above is adapted from the original. It appears to be closely related to *M. andina* Chodat and *M. cyanea* Chodat. It differs from *M. andina* in the tomentose branches and the lanceolate, hirsute, sinuate-dentate leaves with an acute-mucronate apex; it is distinguished from *M. cyanea* chiefly by the sinuate-dentate leaves and the lower sepals being united.

15. *Monnina andina* Chodat in Bot. Jahrb. 42: 104 (1908).

Plant frutescent, about 10 dm. high, branched, the branches nodose; leaves lanceolate-elliptic, 25–45 mm. long, 9–15 mm. wide, obtuse, entire, slightly revolute, attenuate at base, the costa prominulous beneath, pubescent; petioles short; stipules to 0.5 mm. long; racemes thin, simple, terminal, 5–10 cm. long, glabrescent, the axis bracteate, the bracts conspicuous, linear; flowers 2–3 mm. long; outer sepals ovate, obtuse, ciliate, the two lower united; wings orbicular, oblique, attenuate at base, ciliate; upper petals narrow, the apex incurvate; androecium pubescent at the apex, the filaments almost entirely united, the anthers subsessile; ovary oblong, pubescent, the style straight, becoming geniculate; stigma with 2 lobes, the lower more or less acute, the upper globose, sessile; fruit ovate-cordiform, 3–4 mm. long, slightly winged, pubescent, emarginate at apex.

DISTRIBUTION: Known only in the southeastern part of the Peruvian Andes, Department of Puno, between 1800 and 2200 meters altitude.

PERU: PUNO: Between tambo Yuncacoya and tambo Cachicachi, between Sandia and Chunchusmayo, *Weberbauer 1146* (photograph of TYPE, US).

Although there is no available material of this species, the photograph of the type shows some conspicuous characters, such as the following: thin and glabrous branches, short and thin racemes, and the axis of the inflorescence with linear bracts. Some measurements given above were adapted from the photograph.

16. *Monnina marginata* Presl, Reliq. Haenk. 2: 102 (1827).

Monnina laurifolia Chodat in Bull. Soc. Bot. Genève II. 25: 208 (1934).

Monnina petiolaris Chodat, l. c. 214.

Monnina petiolaris var. *elliptica* Chodat, l. c. 215.

Slender tree, 15–45 dm. high, the crown to 10 dm. in diameter, strongly branched, the branches striate, glabrous, to 1 cm. in diameter; leaves lanceolate, 25–100 mm. long, 11–28 mm. wide, acute, rarely more or less obtuse, glabrescent above, slightly pubescent beneath, entire, attenuate at base, the costa prominulous beneath, with 6–8 pairs of lateral veins; petioles 2–10 mm. long, articulate, almost cylindric, finely pubescent, becoming glabrescent; racemes conical, acute, 8–9 mm. wide, shortly pedunculate, simple, terminal, conspicuously corymbose, the axis 2–3 cm. long, finely pubescent, striate, bracteate, the bracts triangular, 1–1.2 mm. long, 1.1–1.3 mm. wide, deciduous, inconspicuous; flowers 4–5 mm. long; pedicels 0.5–1.8 mm. long, slightly pubescent; outer sepals ovate-triangular, ciliate, obtuse, pubescent beneath, the two lower ones 1.8–2 mm. long, 1.2–1.4 mm. wide, $\frac{1}{2}$ united, 1-nerved, the upper one 2–2.4 mm. long, 1.4–1.6 mm. wide, 3-nerved; wings deep blue, 4.5–5.5 mm. long, 3.5–4.4 mm. wide, obovate, more or less obtuse at base, 5-nerved, pubescent beneath, ciliate at base; keel yellow, 4.2–5.5 mm. long, 2.5–3.2 mm. wide, orbicular, plicate, pubescent within, glabrous at margin, obtuse at base, 3- or 4-nerved, 3-lobed, the middle lobe obtuse-emarginate, larger; upper petals spatulate, densely pubescent; stamens 8, the filaments 2.8–3.5 mm. long, united to near the apex, the free part 1–1.2 mm. long, glabrous; ovary elliptic, 1.5–1.6 mm. long, 1–1.1 mm. wide, conspicuously pubescent, the upper longitudinal line with rigid larger hairs; style 2–3 mm. long, geniculate in the middle part, glabrous, cylindric; stigma with 2 lobes, the lower acute, the upper 1-tubercled, papillose; drupe ovate, 4–6 mm. long, 2–3 mm. wide, glabrous, reticulate. (PL. IV, FIGS. 10–17.)

DISTRIBUTION: Endemic in central Perú, Department of Huánuco, between 2800 and 3900 meters altitude.

PERU: HUÁNUCO: Pampayacu to Huánuco, *Kanehira* 190 (A, Ch); Carpish, *Stork & Horton* 9908 (Ch, DA, M, UC); Tambo de Vaca, *Macbride* 4908 (type of *M. petiolaris* var. *elliptica*, Ch); Panao, *Macbride* 3620 (type of *M. petiolaris*, Ch, isotypes A, NY, US); 6 miles south of Mito, *Macbride & Featherstone* 1855 (type of *M. laurifolia*, Ch).

This plant is closely related to *M. conferta* R. & P., but differs in the lanceolate and larger leaves, the racemes being conspicuously corymbose, the lower sepals 1-nerved, the wings pubescent beneath, and the ovary more or less pubescent; finally, this is a tree.

In Bull. Herb. Boiss. 4: 253 (1896), Chodat considers *M. marginata* as a doubtful species. However, the original description is quite adequate. Moreover, Presl stated that this species was found, "in montibus huanocensibus Peruviae." Therefore, in the opinion of the writer, the species of Presl must be maintained.

17. *Monnina pseudo-salicifolia* sp. nov.

Frutex ramosus, ramis 17–26 cm. longis ad 2–4 mm. crassis lignosis tenuiter striatis glabrescentibus; folia elliptica vel plus minusve lanceolata 3.5–9.2 cm. longa 1.8–3.6 cm. lata, basim versus elongato-attenuata, apice acuta vel obtuso-emarginata, supra glabrescentia subtus breviter pubescentia, integerrima, nervo medio prominulo, nervis lateralibus 7 vel 8, petiolo 1–2 mm. longo pubescente basi plus minusve articulato et circumscripto; racemi simplices breves conici 6–8 mm. crassi, rhachi 30–55 mm. longa puberula striata, tenuiter pedunculati, pedunculo 18–20 mm. longo, bracteis lanceolatis 2–2.2 mm. longis 1–1.2 mm. latis subtus minutissime puberulis uninerviis; flores 4.6–5.5 mm. longi, pedicello 1.8–2 mm. longo puberulo; sepala exteriora lanceolata ciliata concava subtus puberula obtusa, duo inferiora 2.3–2.6 mm. longa 1.3–1.5 mm. lata breviter connata 3-nervia, sepalo superiore 3–3.2 mm. longo 1.6–1.8 mm. lato 5-nervio; alae 5–6 mm. longae 4–4.8 mm. latae obovatae basi plus minusve acutae, breviter ciliatae vel eciliatae, 3-nerviae, subtus glabrae, supra basi puberulae; carina 4.5–5 mm. longa 3–3.2 mm. lata orbicularis obovata glabra apice trilobata, lobo mediano obtuso emarginato, lobis lateralibus obtusiusculis, basi plus minusve obtusa trinervia breviter ciliata, petalo superiore elongato-spathulato utrinque conspicue puberulo; stamina 8, filamentis 4–4.4 mm. longis, antheris subsessilibus vel filamentorum parte libera 0.6–1.2 mm. longa glabra; ovarium 1.2–1.5 mm. longum 0.6–0.8 mm. latum oblongum pubescens vel plus minusve glabrescens; stylus 2.5–3 mm. longus brevis erectus deinde geniculatus et subhorizontalis glaber cylindricus; stigma apice superiore tuberculatum papillosum apice inferiore plus minusve acutum; fructus ignotus. (PL. IV, FIGS. 18–25.)

DISTRIBUTION: In the sierra in the northern part of Peru, Department of Piura, at about 3000 meters altitude.

PERU: PIURA: Above Palambla, Province of Huancabamba, April, 1912, *Weberbauer* 6055 (TYPE US 1473497, ISOTYPES Ch, GH).

This species is near *M. marginata* Presl, from central Perú, but it is less robust, the leaves are more or less elliptic, the lower sepals are 3-nerved and slightly united, the upper sepal is 5-nerved, the wings are glabrous beneath but pubescent within, the keel is glabrous within, and the upper petals are densely pubescent. Superficially the new species closely resembles *M. salicifolia* R. & P., from which it differs in its united lower sepals, pubescent ovary, etc.

18. *Monnina macrosepala* Chodat in Bull. Soc. Bot. Genève II. 25: 218 (1934).

Frutescent, 6–24 dm. high, branched, the branches terete, 6 mm. in diameter, slightly pubescent, becoming glabrescent; leaves linear-lanceolate, 55–125 mm. long, 12–28 mm. wide, acuminate, sometimes acute, glabrescent, entire, attenuate at base, the costa prominent beneath, with 9 or 10 pairs of lateral veins; petioles 2–4 mm. long, pubescent; racemes cylindric, acute, 4–5 mm. wide, with a short peduncle, simple, terminal, the axis 6–15 cm. long, pubescent, striate, bracteate, the bracts linear, 3–6 mm. long, lax, conspicuous, deciduous, ciliate, 1-nerved; flowers 4.2–4.8 mm. long; pedicels 1–1.2 mm. long, glabrescent; outer sepals lanceolate, acute, glabrous beneath, the two lower ones 4.4–4.6 mm. long, 3.8–4 mm. wide, $\frac{2}{3}$ united, 5-nerved, ciliate, the upper one 4.5–5 mm.

long, 3–3.2 mm. wide, rarely ciliate, sometimes obtuse, 7–9-nerved; wings 4.6–5 mm. long, 3.6–4 mm. wide, obovate, more or less acute at base, 4- or 5-nerved, pubescent beneath; keel 4–4.5 mm. long, 3–3.2 mm. wide, almost orbicular, plicate, pubescent within, obtuse at base, 4- or 5-nerved, 3-lobed, the middle lobe obtuse-emarginate; upper petals elongate-spatulate, pubescent; stamens 8, the filaments 2.8–3 mm. long, almost entirely united, the free part pubescent, the anthers more or less mucronate; ovary elliptic, 1.4–1.6 mm. long, 0.6–0.7 mm. wide, glabrous; style 2–2.4 mm. long, geniculate above the base, glabrous, cylindric; stigma with 2 lobes, the lower acute, the upper 1-tubercled, papillose; fruit unknown. (PL. IV, FIGS. 26–33.)

DISTRIBUTION: Endemic in the "ceja de montaña," Department of Junín, central Perú, between 900 and 2400 meters.

PERU: JUNÍN: Chanchamayo Valley, *C. Schunke* 487 (TYPE Ch); Huacapistana, *Killip & Smith* 24515 (US); San Ramón, *Killip & Smith* 24754 (US), 24765 (US).

The species is distinguished by large sepals. It resembles *M. longibracteata* Chodat, but is quite distinct in its shorter inflorescence and the absence of filiform bracts.

18a. *Monnina macrosepala* var. *latifolia* Chodat, op. cit. 219.

The variety differs from the typical form in its broad leaves (to 64 cm. wide), longer petioles (4–6 mm. long), smaller upper sepal (to 4.4 mm. long), and the orange keel.

PERU: JUNÍN: La Merced, along sunny stream, 600 meters altitude, *Macbride* 5410 (TYPE Ch).

19. *Monnina Vitis-Idea* Chodat, Bull. Soc. Bot. Genève II. 25: 208 (1934).

Monnina arbuscula Chodat, op. cit. 222.

Frutescent, to 3 dm. high, stem erect, woody, 5–7 mm. in diameter, glabrous, nodose, branched, the branches 9–18 cm. long, decurrent, corymbose, glabrescent; leaves usually elliptic, rarely ovate, 10–20 mm. long, 5–8 mm. wide, obtuse, glabrescent, entire, slightly revolute, the costa prominulous beneath, with 4 or 5 pairs of inconspicuous lateral veins; petioles 1–1.5 mm. long, cylindric, more or less pubescent; racemes conical, acute, 6–8 mm. wide, with a short peduncle, simple, terminal, the axis 1.2–1.6 cm. long, finely pubescent, bracteate, the bracts triangular, inconspicuous, deciduous; flowers 4–4.2 mm. long; pedicels 0.6–0.8 mm. long, finely pubescent; outer sepals ovate-triangular, ciliate, glabrous beneath, the two lower ones 1.8–2 mm. long, 1–1.2 mm. wide, $\frac{1}{2}$ united, obtuse, conspicuously 1-nerved, the upper one 2–2.4 mm. long, 2–2.2 mm. wide, acute, 5-nerved; wings 4–5 mm. long, 3.6–3.8 mm. wide, obovate, obtuse at base, pubescent within, glabrous beneath, 3- or 4-nerved, the nerves conspicuous; keel 3.5–4 mm. long, 2.5–3 mm. wide, more or less orbicular, plicate, glabrous, obtuse at base, 3- or 4-nerved, 2-lobed, the lobes obtuse; upper petals conspicuously elongate-spatulate, pubescent; stamens 8, the filaments 3–3.2 mm. long, almost entirely united, the anthers mucronate; ovary ovate-truncate, 1–1.2 mm. long, 0.6–0.8 mm. wide, glabrous; style 1.8–2 mm. long, geniculate, glabrous, cylindric; stigma with 2 lobes, the lower acute, the upper 1-tubercled, papillose; drupe ovate, 5–8 mm. long, 2–3.6 mm. wide, glabrous, reticulate. (PL. V, FIGS. 1–8.)

DISTRIBUTION: Northern Perú, Department of Piura, at about 3500 meters altitude.

PERU: PIURA: Cordillera east of Huancabamba, Province of Huancabamba, *Weberbauer 6129* (TYPE GH, and type of *M. arbuscula*, Ch).

This glabrous plant has a strong woody and nodose stem. It is a distinct species characterized by its small and coriaceous leaves, its sepals with conspicuous nerves, its keel with 2 lobes rather than 3, and finally by its mucronate anthers.

A duplicate of the type of *M. Vitis-Idaea* was inadvertently described by Chodat as *M. arbuscula*. *Weberbauer's* collection was definitely not a mixture.

20. *Monnina conferta* R. & P. Syst. Veg. 173 (1798).

Monnina myrtilloides DC. Prodr. 1: 339 (1824).

Shrub, 5–18 dm. high, the stem erect, more or less pubescent, becoming glabrescent, branched, the branches 8–29 cm. long, striate, corymbose; leaves usually elliptic, rarely more or less lanceolate, 11–45 mm. long, 5–14 mm. wide, obtuse, glabrescent above, slightly pubescent beneath, entire, sometimes revolute, the costa prominulous beneath, with 4 or 5 pairs of inconspicuous lateral veins; petioles 1.5–2.4 mm. long, concave above, convex beneath, pubescent; racemes conical, acute, 8–10 mm. wide, simple, terminal, pedunculate, the peduncle 6–11 mm. long, the axis 3–10 cm. long, striate, pubescent, bracteate, the bracts triangular, concave, 1.2–1.4 mm. long, 1–1.2 mm. wide, pubescent beneath, acute, ciliate, 1-nerved, inconspicuous; flowers 5–6 mm. long; pedicels 1–1.2 mm. long, finely pubescent; outer sepals ovate-triangular, obtuse, ciliate, pubescent beneath, the two lower ones 2–2.6 mm. long, 1.4–1.8 mm. wide, almost $\frac{2}{3}$ united, 3-nerved, the upper one 2.8–3 mm. long, 1.8–2.4 mm. wide, 5–7-nerved; wings deep blue, 5.2–6 mm. long, 4.4–5.5 mm. wide, obovate, obtuse at base, 4- or 5-nerved, ciliate, usually glabrous beneath, rarely slightly pubescent, sometimes pubescent within; keel yellow, 5.2–6.5 mm. long, 3.4–4 mm. wide, orbicular, plicate, pubescent within, obtuse at base, 4- or 5-nerved, 3-lobed, the middle lobe obtuse-emarginate, larger; upper petals short, narrow, pubescent; stamens 8, the filaments 3.8–4.2 mm. long, almost entirely united, the free part 0.6–1.4 mm. long; ovary elliptic, 1.2–2 mm. long, 0.8–1.4 mm. wide, glabrous; style 2.8–3.6 mm. long, geniculate in the middle part, glabrous, cylindric; stigma with 2 lobes, the lower acute, the upper 1-tubercled, papillose; drupe elliptic, 4.5–7 mm. long, 2–4 mm. wide, glabrous, reticulate. (PL. V, FIGS. 9–16.)

DISTRIBUTION: In the sierra from northern Perú, Department of Cajamarca, to southern Perú, Department of Ayacucho, between 2500 and 3600 meters altitude.

PERU: CAJAMARCA: Pass south of Conchán, Province of Chota, *Stork & Horton 10064* (Ch, UC); LA LIBERTAD: Cachicadan, Province Santiago de Chuco, *Stork & Horton 9955* (Ch, UC); HUÁNUCO: Between Huánuco and Pampayacu, *Kanehira 244* (A, Ch); Mito, *Macbride & Featherstone 1514* (Ch, US); "Tambo nuevo," *Pavón* without number (photograph of authentic material, GH); JUNÍN: Ocopa, *Killip & Smith 21977* (Ch, NY, US); near Huancayo, *Killip & Smith 23348* (Ch, NY, US), *Soukup 1982* (US); HUANCANELICA: Quebrada south of Salcabamba, Province Taya-caja, *Stork & Horton 10298* (Ch, UC); AYACUCHO: Above Yanamonte, between Tambo and Apurimac, *Weberbauer 5659* (Ch, GH, US); Totorabamba, Province Huamanga, *Weberbauer 5488* (Ch, GH, US); DEPT. ? : Without locality and date, *Dombey* without number (fragments of authentic material, Ch, US); without locality, 1807, *Lagasca 56* (photograph of the TYPE, US).

This species has corymbose branches and simple and terminal racemes.

The fragments of authentic material from the Herbarium in Paris and also the photographs fit well the specimens the author refers to this species.

De Candolle described *M. myrtilloides* very briefly. Apparently it is equal to *M. conferta*; Chodat, in Bot. Jahrb. 42: 102 (1908), places it as a synonym.

The specimen *Weberbauer 5488* shows a certain pubescence beneath the wings.

21. *Monnina stipulata* Chodat in Bull. Herb. Boiss. 2: 170 (1894).

Frutescent, to 10 dm. high, branched, the branches 4–7 mm. in diameter, striate, densely pubescent (hairs yellow, lax), becoming more or less glabrescent on the lower part; leaves ovate-elliptic, 35–90 mm. long, 15–40 mm. wide, obtuse, sometimes almost acute, finely pubescent above, becoming glabrescent, conspicuously pubescent beneath, canescent, entire, strongly revolute, the costa prominulous beneath, with 7 or 8 pairs of lateral veins; petioles 3–6 mm. long, densely pubescent, articulate, cylindric; racemes conical, acute, 8–27 mm. long, 7–9 mm. wide, simple, axillary or terminal, subsessile, the axis 1.4–3 cm. long, densely pubescent, bracteate, the bracts triangular, concave, 1.8–2.5 mm. long, 1.6–2 mm. wide, pubescent beneath, acute, ciliate, 1-nerved; flowers 4–6 mm. long; pedicels 0.6–0.8 mm. long, pubescent; outer sepals ovate-triangular, ciliate, obtuse, pubescent beneath, the two lower ones 2–2.2 mm. long, 2.4–3 mm. wide, $\frac{2}{3}$ united, 5-nerved, the upper one 2.8–3 mm. long, 2.2–2.4 mm. wide, 7-nerved; wings 5–6 mm. long, 4–5.2 mm. wide, obovate, obtuse at base, 4- or 5-nerved, slightly pubescent beneath, ciliate at base, glabrous within; keel 5.5–7 mm. long, 4–4.4 mm. wide, orbicular, plicate, pubescent within, obtuse at base, 7- or 8-nerved, 3-lobed, the middle lobe obtuse-emarginate, larger; upper petals more or less spatulate, pubescent; stamens 8, the filaments 4–4.4 mm. long, almost entirely united, the free part 1–1.4 mm. long, the anthers mucronate; ovary elliptic, 1.6–2.2 mm. long, 1–1.6 mm. wide, glabrous, rarely with a few hairs on the upper part; style 2.8–3.2 mm. long, geniculate in the middle part, glabrous; stigma with 2 lobes, the lower acute, the upper 1-tubercled, papillose; fruit unknown. (PL. V, FIGS. 17–24.)

DISTRIBUTION: Southeastern part of the Peruvian Andes to northwestern Bolivia, between 2800 and 3200 meters altitude.

PERU: PUNO: On road 4 km. north of Limbani, Province of Sandia, *D. Metcalf 30511* (UC, US). BOLIVIA: DEPT. ? : "In silvulis viciniis Acaña; carro de Uacani," *Mandon 834* (ISOTYPE GH).

This species is characterized by its short, simple, and terminal racemes and its ovate-elliptic and strongly revolute leaves.

22. *Monnina canescens* sp. nov.

Frutex, ramis 13–28 cm. longis ad 1.5–3.5 mm. crassis lignosis striatis canescentibus breviter puberulis; folia lanceolata 25–60 mm. longa 11–22 mm. lata, basim versus elongato-attenuata, apice acuta, supra tenuiter pubescentia vel glabrescentia, infra canescens pubescentia, integerrima, nervo medio prominulo, nervis lateralibus 4 vel 5, petiolo 1.5–2 mm. longo pubescente basi plus minusve articulado; racemi simplices conici 7–10 mm. crassi, rhachi 6.5–12.5 cm. longa puberula striata, pedunculati, pedunculo 30–35 mm. longo; bracteae ovato-acutae 1.5–2 mm. longae 0.8–1 mm.

latae ciliatae uninerviae subtus pubescentiae; flores 5.5–6.5 mm. longi, pedicello 1–1.2 mm. longo puberulo tereti; sepala exteriora concava ciliata lanceolata obtusa subtus pubescentia, duo inferiora 2–2.4 mm. longa 1.2–1.4 mm. lata $\frac{2}{3}$ connata uninervia, sepalo superiore 2.5–3 mm. longo 1.4–1.6 mm. lato 3-nervio; alae 5.5–6.8 mm. longae 4.2–5 mm. latae obovatae basi plus minusve obtusae ciliatae 4- vel 5-nerviae, nervo mediano conspicuo, subtus breviter puberulae vel glabrae, supra basi breviter puberulae; carina 5.2–7 mm. longa 3–4.2 mm. lata orbiculari-obovata glabra apice trilobata, lobo mediano obtuso emarginato, lobis lateralibus minoribus obtusiusculis, basi obtusa, 3- vel 4-nervia, breviter ciliata, petalo superiore tenuiter elongato spathulato utrinque dense pubescente; stamina 8, filamentis 4.5–5 mm. longis, antheris subsessilibus, filamentorum parte libera 0.6–1 mm. longa glabra; ovarium 1.5–2.4 mm. longum 1.2–1.5 mm. latum oblongum glabrum; stylus 3–3.5 mm. longus erectus deinde geniculatus et subhorizontalis glaber cylindricus; stigma apice superiore tuberculatum papillosum apice inferiore acutum; drupae ovato-oblongae acutae 4.8–6 mm. longae 3–3.6 mm. latae glabrae. (PL. V, FIGS. 25–32.)

DISTRIBUTION: In the central region of the Peruvian Andes, Department of Lima, between 2700 and 3000 meters altitude.

PERU: LIMA: Along Chillón River, above Obrajillo, June 13–23, 1925, *Pennell* 14376 (TYPE US 1340799, ISOTYPES Ch, GH).

The new species seems to be near *M. stipulata* Chodat, but it is distinct in the lanceolate and not revolute leaves, the shorter petiole, and the almost glabrescent branches. The proposed species comes from central Peru, while *M. stipulata* is from southern Peru and Bolivia. *Monnina canescens* is less closely related to *M. conferta* R. & P., from which it differs in having acute leaves, its branches not corymbose, a larger axis of the inflorescence, the keel glabrous within, etc.

23. *Monnina divaristachya* sp. nov.

Frutex ad 18 dm. altus ramosus, ramis 3–4 mm. crassis teretibus glabrescentibus; folia lanceolata 5.2–13.5 cm. longa 1.5–4.8 cm. lata basim versus elongato-attenuata apice acuminata, supra glabrescentia subtus breviter pubescentia, integerrima, nervo medio prominulo, nervis lateralibus 8 vel 9, petiolo 3–5 mm. longo breviter puberulo supra concavo; panícula ampla, ramis simplicibus fragilibus tenuiter pubescentibus striatis divaricatis 7–10 mm. crassis, rhachi 20–25 cm. longa brevi puberula striata, pedunculo 2.5–4.5 cm. longo, bracteis filiformibus 2–2.8 mm. longis ciliatis deciduis uninerviis; flores 3.2–3.5 mm. longi, pedicello 1.2–1.5 mm. longo puberulo; sepala exteriora plus minusve lanceolata ciliata concava subtus puberula vel glabra obtusa, duo inferiora 1.4–1.8 mm. longa 0.6–0.8 mm. lata $\frac{2}{3}$ connata 3-nervia, sepalo superiore 2–2.2 mm. longo 1.4–1.8 mm. lato 5-nervio; alae 3.8–4.2 mm. longae 4–4.2 mm. latae plus minusve obovatae basi acutae 3-nerviae subtus pubescentes; carina obovata 4.2–5.2 mm. longa 2.2–3.2 mm. lata intus puberula apice trilobata, lobo mediano obtuso emarginato, lobis lateralibus obtusiusculis majoribus, basi acuta 3-nervia, petalo superiore elongato spathulato utrinque puberulo; stamina 8, filamentis 3.2–4 mm. longis plus minusve connatis, parte libera 0.5–0.8 mm. longa glabra, antheris mucronatis; ovarium 1–1.6 mm. longum 0.6–0.8 mm. latum ovatum basi breviter puberulum vel glaberri-

mum; stylus 3–3.2 mm. longus erectus deinde geniculatus et horizontalis glaber cylindricus; stigma apice superiore tuberculatum papillosum apice inferiore acutum; drupae ellipticae 5.5–7.5 mm. longae 4.2–5.5 mm. latae glabrae conspicue reticulatae. (PL. VI, FIGS. 1–8.)

DISTRIBUTION: Confined to the “ceja de montaña” of Central Perú, Department of Junín, between 1600 and 1900 meters altitude.

PERU: JUNÍN: Pichis Trail, Eneñas, June 30–July 2, 1929, *Killip & Smith* 25778 (TYPE US 1359873, ISOTYPES Ch, NY); Pichis Trail, *Killip & Smith* 25427 (US).

This species suggests *M. callimorpha* Chodat but differs in several respects, namely the glabrescent branches, larger and glabrescent leaves with 8 or 9 pairs of lateral veins, and the broader panicle with larger and lax racemes.

24. *Monnina callimorpha* Chodat in Bot. Jahrb. 42: 101 (1908).

Monnina Killipii Chodat in Bull. Soc. Bot. Genève II. 25: 204 (1934).

Shrub, 24–30 dm. high, branched, the branches to 15 dm. long and 4 mm. in diameter, striate, conspicuously pubescent, the hairs yellow, lax; leaves lanceolate, 35–98 mm. long, 16–40 mm. wide, usually acuminate, rarely obtuse or acute, finely pubescent above, canescent-pubescent beneath, entire, attenuate at base, the costa prominulous beneath with 5 or 6 pairs of lateral veins; petioles 4–7 mm. long, concave above, convex beneath, pubescent, articulate; stipules 2–4 mm. long, 1–1.5 mm. wide, more or less cylindric, densely pubescent; inflorescence paniculate, the axis 8–13 cm. long, 1.5–2 mm. diameter, almost striate, canescent-pubescent, the racemes subsessile, more or less acute, 2–4 cm. long, 6–8 mm. wide, bracteate, the bracts triangular, 1–1.5 mm. long, 0.7–1 mm. wide, acute, pubescent beneath, deciduous, inconspicuous; flowers 4–5 mm. long, the pedicels 1–2 mm. long, finely pubescent; outer sepals ovate-lanceolate, ciliate, obtuse, slightly pubescent beneath, 1-nerved, the two lower ones 1.8–2 mm. long, 1–1.2 mm. wide, $\frac{1}{2}$ united, the upper one 2–2.2 mm. long, 1.6–1.8 mm. wide; wings blue, 4.4–4.8 mm. long, 3.6–4 mm. wide, obovate, obtuse at base, 3- or 4-nerved, finely pubescent at base, ciliate; keel yellow, 4.6–5 mm. long, 3–3.2 mm. wide, orbicular, plicate, pubescent within, obtuse at base, 3- or 4-nerved, 3-lobed, the middle lobe obtuse-emarginate, larger, slightly pubescent on a convex longitudinal line; upper petals almost elongate-spatulate, pubescent; stamens 8, the filaments 3.4–3.6 mm. long, almost entirely united, the free part 0.7–1.2 mm. long; ovary elliptic, 1.6–2.4 mm. long, 1–1.6 mm. wide, finely pubescent, the hairs short, strigose, becoming glabrescent; style 2.8–3 mm. long, geniculate above base, glabrous, cylindric; stigma with 2 lobes, the lower acute, the upper 1-tubercled, papillose; drupe ovate, 4.2–4.5 mm. long, 3.2–3.5 mm. wide, glabrescent, reticulate. (PL. VI, FIGS. 9–16.)

DISTRIBUTION: In the Andes of central Perú, Department of Junín, between 1800 and 3200 meters altitude.

PERU: JUNÍN: Huacapistana, *Killip & Smith* 24253 (US); Carpapata, above Huacapistana, *Killip & Smith* 24421 (type of *Monnina Killipii* Ch, isotype NY); Huacapistana, *Weberbauer* 2070 (photograph of the TYPE, Ch).

This shrub occurs in the region called “ceja de montaña.” It is close to *M. Pavoni* Chodat but is not scandent, has obtuse outer sepals, pubescent wings, a glabrous style, and the anthers not mucronate.

It seems desirable to accept *M. Killipii* as synonymous, since its type shows the same characters as that of *M. callimorpha* and was found in the same region.

25. *Monnina ovata* sp. nov.

Frutex scandens ramosus, ramis 2–5 mm. crassis lignosis conspicue striatis glabris; folia ovata 3.2–8.6 cm. longa 1.6–3.5 cm. lata apice obtusa utrinque glabra integerrima, nervo medio prominulo, nervis lateralibus 9 vel 10, petiolo 4–6 mm. longo breviter puberulo vel glabro supra concavo; panícula ampla ramosissima, racemis laxis plus minusve elongatis striatis breviter puberulis vel glabris 8–10 mm. crassis conicis, rhachi 12–16 cm. longa glabra striata, tenuiter pedunculatis, pedunculo 4–4.5 cm. longo, bracteis inconspicuis deciduis; flores globosi 4.5–5.5 mm. longi, pedicello 1–1.2 mm. longo breviter puberulo; sepala exteriora lanceolata ciliata concava obtusa, duo inferiora 2.2–2.4 mm. longa 1.6–1.7 mm. lata $\frac{1}{2}$ connata 3-nervia subtus glabrescentia, sepalo superiore 2.8–3 mm. longo 2.6–2.8 mm. lato 5-nervio subtus puberulo; alae 5–5.8 mm. longae 4.5–5 mm. latae obovatae basi plus minusve obtusae 3- vel 4-nerviae conspicue ciliatae subtus breviter pubescentes; carina obovata 5–6 mm. longa 3.2–3.8 mm. lata intus puberula apice trilobata, lobo mediano obtuso emarginato, lobis lateralibus obtusiusculis conspicue ciliatis basi acutis, 3- vel 4-nervia, petalo superiore dilatato vel spathulato utrinque puberulo; stamina 8, filamentis 4–4.4 mm. longis, filamentorum parte libera 0.6–1 mm. longa glabra; ovarium 1.5–2 mm. longum 0.9–1 mm. latum ovatum puberulum; stylus 2.2–2.6 mm. longus geniculatus circa basim glaber; stigma apice superiore tuberculatum papillosum apice inferiore plus minusve obtusum; drupae ellipticae 5.5–7 mm. longae 3.5–4 mm. latae glabrae reticulatae. (PL. VI, FIGS. 17–24.)

DISTRIBUTION: Known only in Central Perú, Department of Huánuco, at about 2700 meters altitude.

PERU: HUÁNUCO: Playapampa, June 16–24, 1923, *Macbride 4493* (TYPE US 1191510, ISOTYPE Ch).

Monnina ovata seems closely related to *M. Ruiziana* Chodat, from which it differs in its glabrous and scandent habit, striate branches, obtuse leaves, and pubescent ovary. From *M. callimorpha* Chodat, another ally, the new species differs in its glabrous habit, obtuse leaves, 3-nerved lower sepals, etc.

26. *Monnina polystachya* R. & P. Syst. Veg. 171 (1798).

Scandent, to 45 dm. high, branched, the branches 4–5 mm. in diameter, striate, densely pubescent, the hairs yellow, 1.2–2 mm. long; leaves lanceolate, 25–76 mm. long, 10–35 mm. wide, usually acute, rarely obtuse, pubescent above, canescent-pubescent beneath, entire, attenuate at base, the costa prominulous beneath, with 5 or 6 pairs of lateral veins; petioles 2–6 mm. long, concave above, convex beneath, densely pubescent, articulate at base; inflorescence paniculate, the axis 7–12 cm. long, 1.5–2.5 mm. in diameter, striate, pubescent, the racemes 4–7, subsessile, more or less acute, 3–10.5 cm. long, 8–10 mm. wide, bracteate, the bracts lanceolate, 2–3.2 mm. long, 0.8–1.2 mm. wide, acuminate, pubescent beneath, ciliate, deciduous, 1-nerved; flowers 4.6–5 mm. long, the pedicels 1–1.2 mm. long, pubescent; outer sepals almost lanceolate, acute, ciliate, the two

lower ones 1.4–1.6 mm. long, 1.8–2 mm. wide, $\frac{2}{3}$ united, 1-nerved, glabrous beneath, the upper one 2.2–2.4 mm. long, 1.6–1.8 mm. wide, 5-nerved, pubescent beneath; wings 5–5.4 mm. long, 4.5–5 mm. wide, obovate, obtuse at base, 4- or 5-nerved, glabrous beneath, ciliate at base; keel 4.8–6 mm. long, 3–3.4 mm. wide, orbicular, plicate, pubescent within, obtuse at base, 3- or 4-nerved, 3-lobed, the middle lobe obtuse-emarginate, larger; upper petals slightly spatulate, pubescent within; stamens 8, the filaments 3–3.8 mm. long, more or less united, the free part 1–1.5 mm. long; ovary ovoid, 1.2–1.6 mm. long, 1–1.2 mm. wide, pubescent near its base, sometimes becoming glabrescent; style 3–3.5 mm. long, geniculate above base, glabrous, cylindric; stigma with 2 lobes, the lower acute, the upper 1-tubercled, the tubercle papillose; drupe elliptic, 5–7.5 mm. long, 3–5 mm. wide, glabrescent, reticulate. (PL. VII, FIGS. 1–8.)

DISTRIBUTION: Central Perú, Department of Huánuco, at about 3000 meters altitude.

PERU: HUÁNUCO: 6 miles south of Mito, *Macbride & Featherstone* 1848 (Ch, US); "in Huanuci Provincia," *Ruiz & Pavón* without number (photograph of TYPE, US).

This species, which in habit is scandent and densely puberulous, with lax racemes, is the type of the genus *Monnina*.

27. *Monnina Pavoni* Chodat in Bull. Herb. Boiss. 3:132 (1895), in Bot. Jahrb. 42: 102 (1908).

Monnina huacachiana Chodat in Bull. Soc. Bot. Genève II. 25: 210 (1934).

Scandent, branched, the branches 3–7 mm. in diameter, conspicuously pubescent, becoming more or less glabrescent, striate; leaves lanceolate, 32–90 mm. long, 12–30 mm. wide, usually acute, sometimes acuminate, pubescent above, conspicuously canescent-pubescent beneath, entire, attenuate at base, the costa prominulous beneath, with 5 or 6 pairs of lateral veins; petioles 2.5–7 mm. long, almost cylindric, pubescent; leaflets occurring in the axils; inflorescence paniculate, the axis 10–24 cm. long, 1.5–2 mm. in diameter, striate, pubescent, the racemes numerous, more or less acute, 7–19 cm. long, 7–10 mm. wide, pedunculate (peduncle 12–24 mm. long), bracteate, the bracts lanceolate, 3–3.6 mm. long, 1–1.2 mm. wide, acuminate, pubescent beneath, ciliate, deciduous, 1-nerved; flowers 4–4.8 mm. long, the pedicels 1.2–1.8 mm. long, pubescent; outer sepals lanceolate, more or less acuminate, ciliate, slightly pubescent beneath, the two lower ones 1.8–2.4 mm. long, 0.8–1 mm. wide, $\frac{1}{2}$ united, 1-nerved, the upper one 2–2.5 mm. long, 1.4–1.6 mm. wide, 3-nerved; wings deep blue, 4–5 mm. long, 3.2–4.8 mm. wide, obovate, more or less obtuse at base, with 3 or 4 nerves, glabrous; keel yellow, 4.6–5.6 mm. long, 2.6–3.2 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, pubescent; stamens 8, the filaments 3.5–4 mm. long, almost entirely united, the free part 1.2–1.5 mm. long, the anthers mucronate; ovary elliptic, 1.2–1.6 mm. long, 0.9–1.3 mm. wide, pubescent, the hairs short, strigose, sometimes more or less glabrescent; style 2.5–3.2 mm. long, geniculate above base, pubescent near base, cylindric; stigma with 2 lobes, the lower acute, the upper 1-tubercled, the tubercle papillose; drupe elliptic, 4.2–5.4 mm. long, 2.2–3.2 mm. wide, usually glabrescent, rarely inconspicuously pubescent, reticulate. (PL. VII, FIGS. 9–16.)

DISTRIBUTION: Central Andes of Perú, Department of Huánuco, between 2000 and 2700 meters altitude.

PERU: HUÁNUCO: Huacachi, Estación near Muña, *Macbride* 3885 (Ch, US), 4124 (type of *M. huacachiana*, Ch); Pano, *Macbride* 3622 (A, Ch, NY).

This species is near *M. polystachya* R. & P. but has the following differences: glabrescent branches, larger panicle up to 24 cm. long, outer sepals almost acuminate, style pubescent near its base, and anthers mucronate.

In Bull. Herb. Boiss. 4: 247 (1896) Chodat states that *M. Pavoni* is synonymous with *M. polystachya*, but later the same author, in Bot. Jahrb. 42: 102 (1908), says: "Non est eadem ac *M. polystachya* Ruiz et Pavón, ut erronee indic. Bull. Herb. Boiss. IV., 247."

The type of *M. huacachiana* agrees well with Chodat's description of *M. Pavoni* and furthermore comes from the same region as the type of the earlier binomial.

28. *Monnina pseudo-polystachya* Chodat in Bull. Soc. Bot. Genève II. 25: 217 (1934).

Scandent, branched, the branches decurrent, 22–34 cm. long, terete, pubescent; leaves more or less lanceolate, 25–100 mm. long, 9–42 mm. wide, acute, pubescent above, conspicuously pubescent beneath, entire, attenuate at base, the costa prominulous beneath, with 4 or 5 pairs of lateral veins; petioles 3–6 mm. long, concave above, convex beneath, densely pubescent; leaflets occurring in the axils; inflorescence paniculate, the axis 8–12 cm. long, 1.2–2 mm. in diameter, more or less striate, densely pubescent, the racemes numerous, 2.5–6 cm. long, 8–10 mm. wide, acute, subsessile, bracteate, the bracts inconspicuous, deciduous; flowers 4.5–5.2 mm. long, the pedicels 0.8–1 mm. long, pubescent; outer sepals triangular, acute, ciliate, strongly pubescent beneath, 1-nerved, the two lower ones 1.4–1.6 mm. long, 0.9–1 mm. wide, $\frac{1}{2}$ united, the upper one 2–2.2 mm. long, 1.4–1.5 mm. wide; wings 4.4–5 mm. long, 4.5–5 mm. wide, obovate, obtuse at base, 4- or 5-nerved, pubescent beneath near base, ciliate at base; keel 4.5–5 mm. long, 3–3.5 mm. wide, orbicular, plicate, glabrescent within, sometimes with a few hairs, obtuse at base, 3- or 4-nerved, submarginate at apex, slightly pubescent on a convex longitudinal line, the hairs 0.5–0.6 mm. long, almost rigid; upper petals spatulate, pubescent; stamens 8, the filaments 3.5–4 mm. long, almost entirely united, the free part 1–1.8 mm. long; ovary elliptic, 1.4–2.2 mm. long, 1–1.3 mm. wide, strongly pubescent, the hairs rigid, ascendent; style 2.5–3.2 mm. long, geniculate above base, conspicuously pubescent in the upper part, cylindric; stigma with 2 lobes, the lower acute, the upper 1-tubercled, the tubercle papillose; fruit unknown. (PL. VII, FIGS. 17–24.)

DISTRIBUTION: The sierra of central Perú, Department of Huánuco, at about 2400 meters altitude.

PERU: HUÁNUCO: Muña, trail to Tambo de Vaca, *Macbride* 4317 (TYPE Ch, ISOTYPE US).

This plant is close to *M. polystachya* R. & P., from which it differs in having larger and thicker leaves, the outer sepals strongly pubescent beneath, the wings more or less pubescent beneath, the keel slightly pubescent on a convex line, the ovary strongly pubescent, and the style with con-

spicuous hairs. It differs from *M. Pavoni* Chodat in having the axis of the panicle to 12 cm. long, the branches densely pubescent, the outer sepals with rigid and conspicuous hairs beneath, the ovary strongly pubescent, etc.

29. *Monnina Ruiziana* Chodat in Bot. Jahrb. 42: 100 (1908).

Shrub, to 30 dm. high, branched, the branches terete, densely hirsute; leaves elliptic, 45–50 mm. long, 35–40 mm. wide, more or less acute, conspicuously hirsute, entire, the costa prominulous beneath; petioles 4–6 mm. long, pubescent; inflorescence paniculate, the racemes divaricate, densely hirsute, lax, bracteate, the bracts almost filiform, deciduous, inconspicuous; flowers 3.5–4 mm. long, with a short pedicel; outer sepals ovate-triangular, obtuse or more or less acute, ciliate, pubescent beneath, the two lower ones united; wings orbicular, attenuate at base; keel hemispheric, yellow, 3-lobed, the lobes obtuse; upper petals linear, or dilated; androecium pubescent in the upper part, the filaments almost entirely united; ovary glabrous, rarely more or less pubescent; style geniculate; stigma with 2 lobes; fruit unknown.

DISTRIBUTION: In the region of Central Perú, Department of Huánuco, between 2000 and 2900 meters altitude.

PERU: HUÁNUCO: Monzón, Province of Huamalíes, *Weberbauer 3355* (photograph of TYPE, US).

The writer has seen no material of this species except the photograph of the type; it would seem to be near *M. polystachya* R. & P. but distinct from it in being a shrub, being more pubescent, having a glabrous ovary, etc. It is also related to *M. Pavoni* Chodat but differs in having terete and densely pubescent branches, lanceolate leaves, a glabrous ovary, and in its shrubby habit.

29a. *Monnina Ruiziana* forma *longepetiolata* Chodat, op. cit. 101.

According to Chodat, the form differs from the typical specimen in having longer petioles, to 7.8 mm. long.

PERU: HUÁNUCO: Monzón, Province of Huamalíes, 2000–2500 meters, *Weberbauer 3527* (TYPE, not seen).

The writer has seen no material of this form.

30. *Monnina connectisepala* Chodat in Bull. Soc. Bot. Genève II. 25: 213 (1934).

Monnina tenuifolia Chodat, op. cit. 212; not Chodat (1895).

Monnina stipulata var. *tenuibracteata* Chodat, op. cit. 205.

Shrub, 15–25 dm. high, branched, more or less pubescent, becoming glabrescent, the branches 3–6 mm. in diameter, conspicuously striate; leaves usually elliptic, rarely more or less lanceolate, 30–100 mm. long, 15–40 mm. wide, acute, sometimes obtuse, glabrescent, entire, attenuate at base, the costa prominulous beneath, with 9 or 10 pairs of lateral veins; petioles 4–8 mm. long, articulate, pubescent; stipules conical-cylindric, 2–3 mm. long, glabrescent; inflorescence paniculate, the axis 7–18 cm. long, 1.5–2.5 mm. in diameter, striate, usually glabrescent, sometimes finely pubescent, the racemes lax, divaricate, acute, 3–14 cm. long, 7–10 mm. wide, bracteate, the bracts ovate, acute, sometimes lanceolate, 2.2–3 mm. long, 1–2 mm. wide, pubescent beneath, 1-nerved, ciliate, deciduous; flowers 5–5.8 mm. long, the pedicels 1–1.6 mm. long, finely pubescent; outer sepals ovate-lanceolate, ciliate, usually obtuse, rarely more or less

acute, the two lower ones 1.8–2.2 mm. long, 1–1.5 mm. wide, united almost $\frac{2}{3}$, glabrescent beneath, 1–3-nerved, the upper one 2.5–3.2 mm. long, 1.8–2.5 mm. wide, finely pubescent beneath, 5–7-nerved; wings dark blue, 5–6 mm. long, 4.6–5.2 mm. wide, obovate, obtuse at base, 3-nerved (middle nerve conspicuous), slightly pubescent beneath, sometimes with a few hairs within, ciliate at base; keel yellow, 5–6 mm. long, 3.2–4.2 mm. wide, orbicular, plicate, pubescent within, rarely glabrescent, obtuse at base, 3- or 4-nerved, 3-lobed, the middle lobe obtuse-emarginate, larger, rarely with a few hairs on a convex longitudinal line; upper petals spatulate, pubescent; stamens 8, the filaments 3.5–4.2 mm. long, unequally united, the free part 0.4–1.6 mm. long; ovary ovoid, 1.4–2.2 mm. long, 1–1.4 mm. wide, glabrous; style 2.6–3.4 mm. long, geniculate above base, glabrous, more or less cylindric; stigma with 2 lobes, the lower acute, the upper 1-tubercled, the tubercle papillose; drupe elliptic, 4–8 mm. long, 2–5 mm. wide, glabrous, reticulate, rarely more or less marginate. (Pl. VII, FIGS. 25–32.)

DISTRIBUTION: Found only in the Andes of southern Perú, Department of Cuzco, between 2200 and 3200 meters altitude.

PERU: Cuzco: Pillahuata, cerro de Cusilluyoc, *Pennell 13977* (type of *Monnina tenuifolia* [1934] Ch, isotypes GH, Ph), *Pennell 14095* (TYPE Ch, ISOTYPE Ph), 14022 (Ch, GH, Ph), 14122 (type of *Monnina stipulata* var. *tenuibracteata* Ch, isotypes GH, M, Ph, US); Laderas de Pillahuata, Province of Paucartambo, *Vargas 81* (Ch); near Pillahuata, Province of Paucartambo, *West 7071* (GH, UC); Distrito Marcachea, Province of Paucartambo, *Vargas 11130* (Ch, UC); summit of Huayna Picchu, *West 6430* (M, UC); Canyon of Cachu-pampa, Araza River, Distrito Marcapata, Province of Quispicanchis, *Vargas 9672* (Ch, UC).

Fortunately it has been possible to see the types of the names above cited, collected in the same locality, and the whole of the material agrees well with the type of the species. Chodat, in 1895, described *M. tenuifolia* from specimens found in Colombia, which is very different from this entity.

The present species is close to *M. Ruiziana* Chodat but differs in the glabrescent branches, the larger leaves (to 10 cm. long), and in its more southern distribution.

31. *Monnina Lechleriana* Chodat in Bull. Herb. Boiss. 3: 129 (1895).

Frutescent, branched, the branches 3–4 mm. in diameter, striate, hirsute in the upper part; leaves lanceolate-elliptic, 60–85 mm. long, 20–32 mm. wide, acute, glabrescent, entire, somewhat revolute, petiolate, the costa prominulous beneath; stipules to 2 mm. long and 0.3 mm. wide, cylindric; inflorescence paniculate, narrow, the axis striate, bracteate, the bracts deciduous, inconspicuous; flowers 4–4.5 mm. long, the pedicels 1.4–1.5 mm. long, slightly pubescent; outer sepals ovate-lanceolate, ciliate, the two lower ones 1.5–1.6 mm. long, 0.8–1 mm. wide, $\frac{1}{2}$ united, 1-nerved, glabrous beneath, obtuse, the upper one 2.2–2.4 mm. long, 1.2–1.3 mm. wide, 5–7-nerved, finely pubescent beneath, acute; wings 4–4.2 mm. long, 4–4.3 mm. wide, obovate, obtuse at base, 5-nerved, glabrous; keel 4–4.4 mm. long, 2.5–2.8 mm. wide, orbicular, plicate, more or less pubescent within, obtuse at base, 4- or 5-nerved, 3-lobed, the middle lobe obtuse-emarginate, larger; upper petals elongate-spatulate, finely pubescent; stamens 8, the filaments 2.6–3 mm. long, united almost $\frac{1}{3}$, the free part 1–1.2 mm. long, glabrous; ovary ovoid, 1–1.2 mm. long, 0.5–0.6 mm. wide,

glabrous; style 2.8–3 mm. long, geniculate, glabrous, cylindric; stigma with 2 lobes, the lower more or less acute, the upper 1-tubercled, the tubercle papillose; fruit unknown. (PL. VIII, FIGS. 1–7.)

DISTRIBUTION: Andes of southern Perú.

PERU: DEPT. ? : "Tabina," *Lechler* 2072 (fragments of TYPE Ch, US; photograph of type US).

It seems probable that this species was found in the southeastern part of Perú, since Lechler collected chiefly in the Department of Puno. The description given above is adapted from the original description and the cited photograph.

32. *Monnina Clarkeana* Chodat in Bull. Herb. Boiss. 4: 246 (1896).

Frutescent, branched, the branches numerous, slightly hirsute on the upper part; leaves numerous, lanceolate, sometimes more or less ovate-lanceolate, 18–54 mm. long, 6–22 mm. wide, acute, finely pubescent, becoming glabrescent, entire, attenuate at base, the costa prominulous beneath, with inconspicuous lateral veins; petioles to 7 mm. long, cylindric, pubescent; inflorescences paniculate, numerous, axillary, conspicuously pedunculate, with a leaflet at base, the leaflet to 35 mm. long, the racemes numerous, lax, 4–6 cm. long, bracteate, the bracts almost filiform, conspicuous in the upper part; flowers 3.8–5 mm. long, the pedicels 1.8–2 mm. long, finely pubescent; outer sepals lanceolate, ciliate, acute, glabrous beneath, the two lower ones 1.2–1.4 mm. long, 0.8–1 mm. wide, $\frac{1}{3}$ united, 1-nerved, the upper one 1.6–1.8 mm. long, 1–1.2 mm. wide, 3-nerved; wings 3.2–4 mm. long, 3.4–3.6 mm. wide, obovate, obtuse at base, with 5 nerves, glabrous; keel 3.6–4.2 mm. long, 2.6–2.8 mm. wide, orbicular, plicate, pubescent within, obtuse at base, 4- or 5-nerved, 3-lobed, the middle lobe obtuse-emarginate, larger; upper petals strongly elongate-spatulate, pubescent; stamens 8, the filaments 3–3.5 mm. long, united almost $\frac{2}{3}$, the free part 1–1.2 mm. long; ovary ellipsoid, 1.2–1.4 mm. long, 0.6–0.8 mm. wide, glabrous; style 2.5–3 mm. long, geniculate, glabrous, cylindric; stigma with 2 lobes, the lower obtuse, the upper 1-tubercled, the tubercle papillose; fruit unknown. (PL. VIII, FIGS. 8–14.)

DISTRIBUTION: Known only from the northern part of the Peruvian Andes.

PERU: DEPT. ? : "in Peruvia," *Mathews* 1192 (fragments and photograph of the TYPE US).

Presumably found in northern Perú, Department of Amazonas, where Mathews spent many years collecting in the Chachapoyas area. The species is near *M. Lechleriana* Chodat, from which it differs in having elongate, numerous, and separate racemes, the lower sepals acute, the upper petals conspicuously elongate-spatulate, etc.

33. *Monnina ligustrifolia* H.B.K. Nov. Gen. et Sp. 5: 417 (1821).

Frutescent, branched, more or less terete, finely pubescent, becoming glabrescent; leaves lanceolate, 36–65 mm. long, 10–20 mm. wide, acute, finely pubescent, entire, attenuate at base, the costa prominulous beneath, the veins more or less reticulate; petioles 1.5–3 mm. long, semiterete, pubescent; racemes conical, acute, simple, terminal or axillary, the axis 3–6.5 cm. long, striate, slightly pubescent, bracteate, the bracts conspicuous, ovate, acute, deciduous, ciliate; flowers 4–4.2 mm. long; pedicels 1.6–1.8 mm. long, pubescent; outer sepals free, ovate-triangular, ciliate, the two

lower ones 1.5–1.6 mm. long, 1.6–1.7 mm. wide, glabrous beneath, obtuse, 5-nerved, the upper one 2–2.2 mm. long, 1.6–1.8 mm. wide, pubescent beneath, acute, 7-nerved; wings 4–4.2 mm. long, 3.5–3.6 mm. wide, obovate, obtuse at base, 3- or 4-nerved, glabrous beneath, ciliate at base; keel 3.8–4 mm. long, 2.3–2.5 mm. wide, orbicular, plicate, pubescent within, obtuse at base, 3-nerved, ciliate, 3-lobed, the middle lobe obtuse-emarginate; upper petals short, finely pubescent; stamens 8, the filaments 2.8–3 mm. long, almost entirely united, the free part 0.6–1 mm. long, glabrous; ovary ellipsoid, 1–1.2 mm. long, 0.6–0.7 mm. wide, glabrous; style 2.2–2.4 mm. long, straight, becoming geniculate in the middle part, cylindric; stigma thicker than the style, with 2 lobes, the lower obtuse, the upper 1-tubercled, the tubercle papillose; drupe ovoid, 4.5–4.8 mm. long, 2.8–3 mm. wide, glabrous, reticulate. (PL. VIII, FIGS. 15–22.)

DISTRIBUTION: Andes of northern Perú, Department of Piura.

PERU: PIURA: Ayavaca, *Bonpland 3491* (fragments and photograph of TYPE US).

Characterized by the simple terminal or axillary racemes with conspicuous ovate acute bracts. The measurements of the leaves are taken from the photograph.

34. *Monnina salicifolia* R. & P. Syst. Veg. 172 (1798).

Monnina crotalarioides DC. Prodr. 1: 339 (1824).

Monnina crotalarioides var. *glabrescens* Chodat in Bot. Jahrb. 42: 99 (1908).

Monnina crotalarioides var. *pseudo-loxensis* Chodat, l. c.

Monnina crotalarioides var. *macrophylla* Chodat, l. c.

Monnina crotalarioides var. *leptostachys* Chodat, l. c.

Shrub 5–25 dm. high, branched, the branches 7–34 cm. long, 1–5 mm. in diameter, nodose, pubescent, becoming glabrescent, striate; leaves usually elliptic, rarely more or less lanceolate, 12–70 mm. long, 7–25 mm. wide, obtuse, sometimes acute, finely pubescent, becoming more or less glabrescent, entire, slightly revolute, attenuate at base, the costa prominulous beneath, with 4 or 5 pairs of lateral veins; petioles 1–2.5 mm. long, concave above, convex beneath, articulate, pubescent; racemes conical, acute, 9–12 mm. wide, simple, terminal, pedunculate, the peduncle 5–12 mm. long, the axis 1–8 cm. long, pubescent, striate, bracteate, the bracts acute-triangular, 1.4–3 mm. long, 1.4–1.8 mm. wide, deciduous, ciliate, 1-nerved, finely pubescent beneath; flowers 4.5–6.5 mm. long, the pedicels 1–1.4 mm. long, finely pubescent; outer sepals free, ovate-triangular, obtuse, ciliate, more or less pubescent beneath, the two lower ones 1.4–2.2 mm. long, 1.6–2 mm. wide, 3-nerved, the upper one 2.2–3 mm. long, 1.8–2.4 mm. wide, 5-nerved; wings indigo-blue, 5.6–6.8 mm. long, 4.8–6 mm. wide, obovate, obtuse at base, 3- or 4-nerved, usually slightly pubescent beneath, glabrescent within, sometimes with a few hairs at base; keel yellow, 5–7 mm. long, 3–4 mm. wide, orbicular, plicate, pubescent within, sometimes glabrescent, obtuse at base, 3- or 4-nerved, 3-lobed, the middle lobe obtuse-emarginate; upper petals more or less elongate, spatulate, pubescent; stamens 8, the filaments 3.8–4.2 mm. long, almost entirely united, the free part 0.8–1.4 mm. long, glabrous; ovary ovoid, 1.6–2.8 mm. long, 1–1.6 mm. wide, glabrous; style 2.8–3.5 mm. long, geniculate, glabrous, cylindric; stigma with 2 lobes, the lower acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 4.8–6 mm. long, 2.5–3.5 mm. wide, glabrous, reticulate. (PL. VIII, FIGS. 23–31.)

DISTRIBUTION: Along the Andes from southern Ecuador to the northwestern part of Bolivia, between 1800 and 3900 meters altitude.

ECUADOR: AZUAY: Road from Cuenca towards Cumbe, *Haught* 3347 (US). PERU: LA LIBERTAD: Eastern base of Cerro Huaylillas, Province of Huamachuco, *West* 8125 (GH, M, UC); HUÁNUCO: 6 km. south of Huánuco, *Stork & Horton* 9375 (Ch, DA, UC); LIMA: Río Blanco, *Killip & Smith* 21621 (Ch, NY, US), 21609 (US), *Macbride & Featherstone* 664 (Ch, US); Matucana, *Macbride & Featherstone* 95 (Ch, US); vicinity of Huarochirí, *Hrdlicka* without number (US); vicinity of San Damián, *Hrdlicka* without number (US); JUNÍN: vicinity of Oroya, *Rose & Rose* 18698 (US); Huancayo, *Museo de Historia Natural de Lima* 83 (US); quebradas east of Huancayo, *Stork & Horton* 10220 (Ch, DA, UC); between Viques and Ingahuasi, south of Huancayo, Mantaro Canyon, *Killip & Smith* 22175 (Ch, NY, US); AYACUCHO: "Tambillo," *West* 3651 (UC); HUANCVELICA: Near Córdova, Province of Castrovirreina, *Metcalfe* 30276 (US, UC); APURIMAC: Pincos, Province of Andahuaylas, *Stork & Horton* 10680 (Ch, UC); Chincheros, near town, *West* 3693 (UC); CUZCO: Paucartambo Valley, *Herrera* 2965 (NY, US); Hacienda Churu, Province of Paucartambo, *Herrera* 1029a (US); Huaillabamba, Paucartambo, *Balls* 6739 (US); near Quencomayo, below Colquipata, Paucartambo, *Pennell* 13784 (Ph); Cerro Macchu Picchu, Province of Urubamba, *Mexia* 8074a (US); summit of Huayna Picchu, *West* 6430 (GH); Ollantaytambo, *Cook & Gilbert* 1219 (US), 273 (US); San Miguel, Urubamba Valley, *Cook & Gilbert* 1154 (US); Urubamba, *Soukup* 33 (Ch); Sacsahuaman, above Cuzco, *Pennell* 13549 (Ch, GH, NY, Ph, US); Colinas del Sacsahuaman, *Herrera* 2376 (Ch); Colinas del Sacsahuaman, *Herrera* without number (Ch); Colinas del Rodadero, *Vargas* 3147 (Ch); Vilcanota, below Caicai, *Pennell* 14188 (Ch, GH, NY, Ph, US); Marcapata, Province of Quispicanchis, *Vargas* 1334 (Ch); Province of Quispicanchis and Cuzco, *Herrera* 682 (US); San Sebastián, *Pennell* 13617 (Ch, GH, NY, Ph); Convención, *Vargas* 1838 (GH); Cuzco, *Herrera* without number (NY, US), 3096 (US); DEPT. ? : Mantaro, *Herrera* 763a (US); without locality and date, *Dombey* 627 (Ch), *Mathews* 3024 (GH); without locality, 1862, *Mathews* without number (NY); without locality, 1839-40, *Gay* without number (Ch); without locality and date, *Neé* without number (photograph of TYPE US), *Paris Herbarium* without number (fragments of authentic material of *M. salicifolia*, US), *Collector* ? without number (fragments of authentic material of *M. crotalarioides*, US). BOLIVIA: LA PAZ: Sorata, *Rusby* 1910 (US), *R. S. Williams* 2381 (US); vicinity of Sorata, *Bang* 1305 (US); DEPT. ? : Titicaca, March, 1924, *Buchtien* without number (US); without locality, *Bang* 2804 (US).

This plant is very common in the sierra. Ruiz & Pavón cited as localities, "Huarocheri, Tarmae et Panatahuarum Provincias." These places are situated in the Departments of Lima and Junín, and most of the available specimens of this species came from that region. Fragments of authentic material of this entity, and also of *M. crotalarioides*, and a photograph of the type were available to the writer. The brief descriptions given by Chodat for his varieties of *M. crotalarioides* agree with *M. salicifolia*. In addition, the localities are in the region of the sierra and some are from essentially the type-locality.

34a. *Monnina salicifolia* var. *pilostylis* var. nov.

A varietate typica differt stylo conspicue piloso.

PERU: LIMA: Río Blanco, April 15-17, 1929, *Killip & Smith* 21569 (TYPE Ch, 632059, ISOTYPES NY, US); HUANCVELICA: 4 km. north of Yauli, Prov. Huancavelica, *Stork & Horton* 10882 (Ch, UC).

35. *Monnina hirtella* sp. nov.

Frutex ad 15 dm. altus conspicue canescenti-pubescens, ramis 2.5-5 mm.

crassis striatis; folia lanceolata 3.5–11 cm. longa 1–3.4 cm. lata basim versus elongato-attenuata apice acuminata, utrinque conspicue pubescentia, integerrima, nervo medio prominulo, nervis lateralibus 6 vel 7, petiolo 2–5 mm. longo puberulo; racemi simplices terminales vel axillares plus minusve conici 7–9 mm. crassi, rhachi 3.5–13 cm. longa puberula striata, pedunculo 8–28 mm. longo, bracteis lanceolatis acutis 1–1.8 mm. longis 0.6–1 mm. latis subtus puberulis uninerviis ciliatis deciduis; flores 4–5 mm. longi, pedicello 1.2–1.4 mm. longo puberulo; sepala exteriora libera plus minusve lanceolata ciliata concava obtusa subtus puberula, duo inferiora 1.8–2.2 mm. longa 1.5–1.6 mm. lata 3-nervia, sepalo superiore 2.4–2.6 mm. longo 1.4–1.6 mm. lato 5-nervio; alae 4.8–5 mm. longae 3.6–4 mm. latae obovatae basi obtusae 3-nerviae subtus basi pubescentes; carina 4.6–5.2 mm. longa 2.6–3 mm. lata orbicularis obovata intus puberula apice trilobata, lobo mediano obtuso emarginato, lobis lateralibus obtusiusculis, basi obtusa 3-nervia, petalo superiore elongato spathulato utrinque conspicue pubescente, pilis 1.2–1.5 mm. longis; stamina 8, filamentis 3.8–4 mm. longis, antheris subsessilibus, filamentorum parte libera 0.8–1 mm. longa glabra; ovarium 1.2–2 mm. longum 0.8–1 mm. latum oblongum glabrum; stylus 3.4–3.5 mm. longus conspicue geniculatus glaber cylindricus; stigma apice superiore tuberculatum papillosum apice inferiore acutum; drupae ellipticae 5.5–7 mm. longae 3.5–4 mm. latae glabrae reticulatae. (PL. VIII, FIGS. 32–41.)

DISTRIBUTION: In the eastern range of the Andes of northern Perú, Department of San Martín, between 1100 and 1200 meters altitude.

PERU: SAN MARTÍN: Jepelacio, near Moyobamba, October–November, 1933, Klug 3337 (TYPE US 1457745, ISOTYPES A, Ch, GH); San Roque, L. Williams 7105 (Ch, NY).

The new species suggests *M. ligustrifolia* H. B. K., but the leaves are almost twice as large and acuminate, and the axis of the racemes is longer, conspicuously pubescent, and without acute-ovate bracts at its apex. It is less closely related to *M. salicifolia* R. & P., from which it differs in the larger and acuminate leaves, to 11 cm. long, the longer petiole, and the pubescent habit.

36. *Monnina cyanea* Chodat in Bot. Jahrb. 42: 100 (1908).

Frutescent, 5–10 dm. high, conspicuously branched, the branches 25.5–57 cm. long, 1.5–3 mm. in diameter, striate, canescent-pubescent, the hairs 0.5–0.7 mm. long, lax; leaves lanceolate, sometimes more or less oblanceolate, 22–60 mm. long, 10–20 mm. wide, usually acute, rarely acuminate, sometimes almost obtuse, finely canescent-pubescent, entire, attenuate at base, the costa prominulous beneath, with 5–7 pairs of lateral veins; petioles 1–2 mm. long, concave above, convex beneath, pubescent; stipules 0.3–0.5 mm. long, glabrous, coriaceous; racemes conical, more or less acute, 8–10 mm. wide, simple, terminal, pedunculate, the peduncle 8–14 mm. long, the axis 2.5–12 cm. long, pubescent, striate, bracteate, the bracts linear-lanceolate, 1.2–2.8 mm. long, deciduous, ciliate, 1-nerved, pubescent beneath; flowers 3.5–3.8 mm. long, the pedicels 1.2–1.3 mm. long, pubescent; outer sepals free, lanceolate, obtuse, ciliate, glabrescent beneath, sometimes more or less pubescent, the two lower ones 1.4–1.5 mm. long, 0.7–0.8 mm. wide, usually 1-nerved, rarely 5-nerved, the upper one 1.8–2 mm. long, 1–1.2 mm. wide, 3–5-nerved; wings deep blue, 3.6–4.2

mm. long, 3.5–3.8 mm. wide, obovate, obtuse at base, ciliate, 2- or 3-nerved, slightly pubescent beneath; keel yellow, 3.8–4.5 mm. long, 3.8–4.2 mm. wide, more or less orbicular, plicate, glabrous within, finely ciliate at base, 3-nerved, 3-lobed, the middle lobe obtuse-emarginate, smaller; upper petals narrow, attenuate, pubescent; stamens 8, the filaments 3–3.2 mm. long, almost entirely united, the free part 0.8–1 mm. long, glabrous; ovary ovoid, 1–1.3 mm. long, 0.6–1 mm. wide, densely pubescent, the hairs ascendent, rigid; style 2.4–2.5 mm. long, geniculate above base, glabrous, almost cylindric; stigma thicker, with 2 lobes, the lower obtuse, the upper 1-tubercled, the tubercle papillose; fruit drupaceous, cordiform-flattened, 4.4–5 mm. long, 4–5 mm. wide, conspicuously pubescent, acute, emarginate at base, slightly reticulate. (PL. VIII, FIGS. 42–51.)

DISTRIBUTION: Southeastern part of Perú, Departments of Cuzco and Puno, between 1800 and 3500 meters altitude.

PERU: Cuzco: Chaupichaca, Marcapata Valley, Province of Quispicanchi, *Weberbauer* 7835 (Ch); Puno: Between Sandia and Cuyocuyo, *Weberbauer* 878 (photograph of TYPE, Ch); near Limbani, Province of Sandia, *Metcalf* 30480 (UC, US).

Characterized by its canescent-hirsute branches, flattened and cordiform drupe, terminal and simple racemes, etc.

37. *Monnina decurrens* sp. nov.

Frutex breviter pubescens, ramis 4–20 cm. longis 1.4–2 mm. crassis striatis plus minusve glabrescentibus; folia decurrentia elliptica 1.2–2.8 cm. longa 5–7 mm. lata basi attenuata apice obtusa utrinque glabrescentia integerrima revoluta, nervo medio prominulo, nervis lateralibus 5 vel 6 inconspicuis, petiolo 1.5–2 mm. longo puberulo supra concavo subtus convexo; racemi simplices conici 6–8 mm. crassi subsessiles, rhachi 1.2–2.5 cm. longa breviter puberula striata; bracteae ovatae 0.6–1 mm. longae inconspicue uninerviae subtus puberulae ciliatae; flores 4.4–5.2 mm. longi, pedicello 1.6–2.5 mm. longo puberulo; sepala exteriora libera triangularia ciliata concava obtusa subtus puberula, duo inferiora 1.5–1.6 mm. longa 1.4–1.5 mm. lata 3-nervia, sepalo superiore 2–2.2 mm. longo 2–2.3 mm. lato 5-nervio; alae 5.6–6 mm. longae 4.3–4.5 mm. latae obovatae basi plus minusve acutae 5- vel 6-nerviae ciliatae subtus et intus plus minusve puberulae; carina 4.2–5 mm. longa 2.6–3 mm. lata obovata intus puberula apice inconspicue trilobata, lobo mediano emarginato, lobis lateralibus minoribus obtusiusculis, basi acutiuscula 4- vel 5-nervia, petalo superiore elongato spathulato utrinque puberulo; stamina 8, filamentis 3–3.4 mm. longis, antheris subsessilibus, filamentorum parte libera 0.6–1 mm. longa glabra; ovarium 1.2–1.6 mm. longum 1–1.2 mm. latum oblongum dense puberulum; stylus 2.8–3 mm. longus conspicue geniculatus puberulus plus minusve cylindricus; stigma apice superiore tuberculatum papillosum apice inferiore acutum; drupae ellipticae 5–7 mm. longae 2.5–3.2 mm. latae puberulae reticulatae. (PL. IX, FIGS. 1–10.)

DISTRIBUTION: The sierra of northern Perú, Department of Cajamarca, between 2800 and 3000 meters altitude.

PERU: CAJAMARCA: Cordillera east of Huancabamba, Province of Jaén, April, 1912, *Weberbauer* 6100 (TYPE GH, ISOTYPES Ch, US).

This species is near *M. Vitis-Idaea* Chodat but differs in that it does not have a nodose stem, in the larger and conical racemes, the lower sepals being 3-nerved, the ovary and style being conspicuously pubescent, etc.

It is close also to *M. peruviana* Chodat, from which it is distinguished by its smaller, numerous, and elliptical leaves, and by the wings being pubescent within.

38. *Monnina peruviana* Chodat in Bull. Herb. Boiss. 3: 133 (1895).

Frutescent, strongly branched, the branches nodose, 5–7 mm. in diameter, striate, finely pubescent, becoming glabrescent; leaves more or less decurrent, linear-lanceolate, 80–120 mm. long, 16–26 mm. wide, acute, rarely almost obtuse, finely pubescent, entire, attenuate at base, the costa prominulous beneath, with 7 or 8 pairs of lateral veins; petioles 2–6 mm. long, concave above, convex beneath, pubescent; racemes more or less cylindric, acute, 5–7 mm. wide, simple, axillary or terminal, subsessile, the peduncle short, the axis 2.8–6.8 cm. long, 1.5–2.5 mm. in diameter, densely pubescent, striate, bracteate, the bracts ovate-triangular, 2.2–2.8 mm. long, 2–2.2 mm. wide, deciduous, ciliate, 1-nerved, pubescent beneath; flowers 4.2–4.5 mm. long; pedicels 1.2–1.4 mm. long, pubescent; outer sepals free, ovate-lanceolate, obtuse, ciliate, glabrous beneath, the two lower ones 1.8–2 mm. long, 1.6–1.8 mm. wide, 3-nerved, the upper one 2.4–2.5 mm. long, 1.6–1.8 mm. wide, 5-nerved; wings deep blue, 4.4–4.6 mm. long, 3.8–4 mm. wide, obovate, obtuse at base, ciliate, 5- or 6-nerved, glabrous within; keel yellow, 4–4.4 mm. long, 2.5–2.6 mm. wide, orbicular, plicate, densely pubescent within, finely ciliate at base, almost obtuse, 3-lobed, the middle lobe obtuse, slightly emarginate; upper petals spatulate, pubescent; stamens 8, the filaments 3.6–4 mm. long, almost entirely united, the free part 0.8–1 mm. long, glabrous; ovary ellipsoid, 1–1.3 mm. long, 0.6–0.7 mm. wide, densely pubescent, the hairs numerous on the upper part, ascendent, rigid; style 2.6–2.8 mm. long, geniculate in middle part, conspicuously pubescent, cylindric; stigma with 2 lobes, the lower obtuse, the upper 1-tubercled, the tubercle papillose; fruit unknown. (PL. IX, FIGS. 11–19.)

DISTRIBUTION: Northern Perú, probably in the Department of Amazonas.

PERU: DEPT. ? : Without locality, 1862, *Mathews* without number (NY).

Presumably this entity is endemic to the northern region of the Peruvian Andes. According to the original description, Mathews gave "prope Chachapoyas" as the type-locality; this is situated in the Department of Amazonas. The species has linear-lanceolate leaves, racemes with conspicuous ovate-triangular bracts, and the ovary and style densely pubescent.

39. *Monnina Mathusiana* Chodat in Bull. Herb. Boiss. 3: 134 (1895).

Monnina scandens Chodat in Bot. Jahrb. 42: 98 (1908).

Scandent, branched, the branches slightly hirsute, striate; leaves lanceolate, 35–80 mm. long, 10–30 mm. wide, acute, sometimes more or less acuminate, finely pubescent above, becoming glabrescent, pubescent beneath, entire, attenuate at base, the costa prominulous beneath, with 4 or 5 pairs of lateral veins; petioles 3–4 mm. long; inflorescence paniculate, the axis to 20 cm. long, striate, pubescent, the racemes numerous, lax, bracteate, the bracts filiform, hirsute, deciduous; flowers to 4.5 mm. in diameter, subglobose, with a short pedicel; outer sepals free, ovate-triangular, ciliate, slightly concave, 1- or 3-nerved; wings 3 times larger than the outer sepals, ovate, obtuse; keel yellowish, 3-lobed, the lobes acute; upper petals fan-like, glabrescent; androecium pubescent, the filaments almost entirely

united; ovary glabrous; style straight, becoming geniculate; stigma with 2 lobes, the lower denticulate, the upper 1-tubercled, the tubercle papillose; fruit unknown.

DISTRIBUTION: In the forest of northern Perú, Departments of Amazonas and Cajamarca, between 2700 and 2900 meters altitude.

PERU: AMAZONAS: Chachapoyas, *Mathews 1190* (photograph of the TYPE, Ch); CAJAMARCA: Chugur, Hualgayoc, *Weberbauer 4072* (photograph of type of *M. scandens*, Ch).

I have seen no material of this species other than the cited photographs of the types. The original description of *M. scandens* and also the photograph of its type show the characters of *M. Mathusiana*.

40. *Monnina acutifolia* Chodat in Bull. Soc. Bot. Genève II. 25: 206 (1934).

Shrub, to 30 dm. high, branched, the branches 3–6 mm. in diameter, striate, slightly pubescent, becoming glabrescent, the hairs 0.5–0.8 mm. long; leaves lanceolate, 22–75 mm. long, 7–20 mm. wide, acuminate, sometimes acute, more or less pubescent, becoming glabrescent, entire, attenuate at base, the costa prominulous beneath, with 5 or 6 pairs of lateral veins; petioles 2–7 mm. long, almost cylindric, pubescent; racemes aggregate, sometimes simple, terminal, more or less acute, 8–11 mm. wide, subsessile, the axis 4.5–31 cm. long, pubescent, the hairs 0.5–0.7 mm. long, striate, bracteate, the bracts filiform, deciduous; flowers 4–5.5 mm. long, the pedicels 0.8–1 mm. long, pubescent; outer sepals free, almost triangular, acute, ciliate, pubescent beneath, the two lower ones 2–2.3 mm. long, 1–1.4 mm. wide, 3-nerved, the upper one 2.4–2.5 mm. long, 1.4–1.7 mm. wide, 5-nerved; wings 4–4.4 mm. long, 3.8–4.2 mm. wide, obovate, obtuse at base, 3-nerved, glabrous; keel 4.6–5.5 mm. long, 3–3.2 mm. wide, orbicular, plicate, glabrous, obtuse at base, 3-nerved, 3-lobed, the middle lobe obtuse-emarginate; upper petals elongate, more or less spatulate, pubescent; stamens 8, the filaments 3.2–3.8 mm. long, almost entirely united, the free part 0.6–1.2 mm. long, glabrous; ovary elliptic, 1.2–1.8 mm. long, 0.8–1.2 mm. wide, glabrous; style 2.6–3 mm. long, geniculate above base, glabrous, cylindric; stigma with 2 lobes, the lower acute, the upper 1-tubercled, the tubercle papillose; drupe elliptic-acute, 5–6 mm. long, 2.6–3.5 mm. wide, glabrous, conspicuously reticulate. (PL. IX, FIGS. 20–28.)

DISTRIBUTION: Southern part of the Peruvian Andes, Department of Ayacucho, between 1000 and 2000 meters altitude.

PERU: AYACUCHO: Ccarrapa, between Huanta and Apurimac River, *Killip & Smith 22448* (ISOTYPE Ch), 23228 (Ch, NY, US).

Monnina acutifolia is related to *M. salicifolia* R. & P., from which it differs in the lanceolate and acuminate leaves, the racemes more than 3 times longer, the filiform bracts, the acute-triangular outer sepals, the glabrous wings, etc.

41. *Monnina Vargasii* sp. nov.

Planta herbacea perennis hirsuta, ramis 2–3 mm. crassis striatis conspicue hirsutis; folia lanceolata 4.5–12 cm. longa 1.4–4.2 cm. lata basim versus elongato-attenuata apice plus minusve acuminata utrinque breviter puberula integerrima, nervo medio prominulo, nervis lateralibus 7 vel 8, petiolo 3–7 mm. longo dense puberulo; racemi pauci aggregati (2–3) plus minusve conici 6–9 mm. crassi apice canescenti-tomentosi, rhachi 5–8.2

cm. longa dense puberula subsessili, bracteis lanceolatis 2.6–4.8 mm. longis 0.8–1.2 mm. latis subtus puberulis uninerviis ciliatis; flores 5–6 mm. longi, pedicello 1.2–1.5 mm. longo puberulo tereti; sepala exteriora libera lanceolata ciliata concava subtus puberula, duo inferiora 2.2–2.4 mm. longa 1.5–1.6 mm. lata 3-nervia acuta, sepalo superiore 2.8–3 mm. longo 1.8–2 mm. lato 5-nervio obtuso; alae 6–7 mm. longae 6–6.2 mm. latae obovatae basi obtusae 4- vel 5-nerviae ciliatae utrinque glabrae; carina 6–6.8 mm. longa 4–4.2 mm. lata orbicularis obovata intus glabrescens vel sparse puberula apice trilobata, lobo mediano obtuso emarginato, lobis lateralibus minoribus obtusiusculis, basi obtusa 4- vel 5-nervia, petalo superiore elongato spathulato utrinque puberulo; stamina 8, filamentis 3.6–4 mm. longis, antheris subsessilibus, filamentorum parte libera 0.8–1.6 mm. longa glabra; ovarium 1.6–2.8 mm. longum 1.2–1.6 mm. latum plus minusve puberulum; stylus 3–3.4 mm. longus geniculatus deinde horizontalis glaber; stigma apice superiore tuberculatum papillosum apice inferiore obtusum; fructus ignotus. (PL. IX, FIGS. 29–37.)

DISTRIBUTION: In the southern part of the Peruvian Andes, Department of Apurímac, at about 3300 meters altitude.

PERU: APURIMAC: Bosques de Ampai, Province of Abancay, January–April, 1938, Vargas 771 (TYPE Ch 942479, ISOTYPE GH).

This species is near *M. pilosa* H. B. K., which occurs in northern Perú, from which it differs in its herbaceous habit, lanceolate leaves, and more or less pubescent ovary. It also suggests *M. acutifolia* Chodat, from which it is distinguished by its smaller racemes and the blade of its leaves with 7 or 8 pairs of lateral veins.

It is a pleasure to dedicate this species to Dr. César Vargas, Professor of Botany at the University of Cuzco.

42. *Monnina pilosa* H.B.K. Nov. Gen. et Sp. 5: 419 (1821).

Tree, the branches densely hirsute, terete; leaves oblong, 76–96 mm. long, 32–40 mm. wide, more or less obtuse, sometimes acuminate, densely pubescent, entire, attenuate at base, the costa prominulous beneath, with 7 or 8 pairs of lateral veins; petioles 3.5–5 mm. long, semiterete, pubescent; panicle corymbose, the axis hirsute, lax, bracteate, the bracts pubescent, deciduous; flowers with a short pedicel; outer sepals free, ovate, ciliate, concave, the two lower ones 3-nerved, acute, the upper one 5-nerved, obtuse; wings twice as large as the sepals, fan-like, 7-nerved, glabrous; keel more or less oblong, plicate, pubescent within, glabrous beneath; upper petals short, glabrous; stamens 8, the filaments united in the lower part, the anthers ovate-obtuse; ovary ovoid, glabrous; style thicker in the upper part, geniculate, glabrous; stigma with 2 lobes, the lower denticulate, the upper 1-tubercled, the tubercle papillose; fruit unknown.

DISTRIBUTION: From the Andes of Ecuador and northern Perú, between 1130 and 1700 meters altitude.

ECUADOR: DEPT. ? : Without locality, 1856, *Remy* without number (fragments US). PERU: PIURA: "prope pagum Ayavacae," without date, "1400 hex.," *Bonpland* 3490 (fragments of TYPE Ch, photograph of TYPE Ch).

The description given above was adapted from the original and also from fragments of the type. This species is distinguished by its dense puberulous indument and by having its panicle more or less corymbose.

42a. *Monnina pilosa* var. *glabrescens* var. nov.

A varietate typica differt indumento paucipiloso et folia majoribus ad 166 mm. longis plus minusve spathulatis acutiusculis. (PL. X, FIGS. 1-10.)

PERU: PIURA: Canchaque, Province of Huancabamba, April 6, 1939, *Stork 11425* (TYPE GH, ISOTYPE DA, UC).

43. *Monnina densecomata* Chodat in Bull. Soc. Bot. Genève II. 25: 209 (1934).

Shrub, branched, the branches 4-5.5 mm. in diameter, striate, densely pubescent, the hairs 0.6-1 mm. long; leaves elliptic, 36-68 mm. long, 20-40 mm. wide, obtuse, pubescent, becoming more or less glabrescent, entire, revolute, the costa prominulous beneath, with 5 or 6 pairs of lateral veins; petioles 3-6 mm. long, almost cylindric, pubescent; stipules conical, to 3 mm. long, hirsute in the lower part; inflorescence paniculate, the axis 8.5-12.5 cm. long, striate, pubescent, the racemes subsessile, lax, almost acute, 7-9 mm. wide, conspicuously pubescent, bracteate, the bracts lanceolate, 3.6-5 mm. long, 1.6-2 mm. wide, acuminate, densely pubescent beneath, lax, conspicuous; flowers 4.5-5.5 mm. long, the pedicels 0.8-1.2 mm. long, pubescent; outer sepals free, lanceolate, ciliate, pubescent beneath, the two lower ones 3-3.4 mm. long, 1.5-1.6 mm. wide, usually acute, 3-nerved, sometimes 1- or 2-nerved, the upper one 3.2-3.8 mm. long, 1.8-2 mm. wide, more or less obtuse, usually 5-nerved, rarely 3-nerved; wings blue, 4.6-5 mm. long, 4-4.8 mm. wide, obovate, obtuse at base, 4- or 5-nerved, pubescent beneath, ciliate at base; keel yellow, 5.4-6 mm. long, 2.6-3.5 mm. wide, orbicular, plicate, pubescent within, obtuse at base, 3- or 4-nerved, ciliate at base, 3-lobed, the middle lobe obtuse, slightly emarginate; upper petals spatulate, pubescent, the hairs 0.8-1 mm. long; stamens 8, the filaments 3.5-4.2 mm. long, almost entirely united, the free part 0.5-1.2 mm. long, glabrous; ovary ovoid, 1.8-2.2 mm. long, 1.2-1.4 mm. wide, glabrous; style 2-2.8 mm. long, geniculate above base, glabrous, cylindric; stigma with 2 lobes, the lower acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid-acute, 4.2-4.6 mm. long, 3-3.2 mm. wide, glabrous, reticulate. (PL. X, FIGS. 11-19.)

DISTRIBUTION: Endemic in the southern part of the Peruvian Andes, Department of Cuzco, between 3800 and 4000 meters altitude.

PERU: CUZCO: Paso de Tres Cruces, Cerro de Cusilluyoc, *Pennell 13821* (TYPE Ch, ISOTYPES GH, Ph); Paucartambo, *Soukup 391* (Ch).

Monnina densecomata is characterized by its densely pubescent habit and conspicuously lax racemes, which are pubescent and have lanceolate bracts toward the apex.

44. *Monnina tomentella* Chodat in Bull. Soc. Bot. Genève II. 25: 210 (1934).

Shrub, branched, the branches divaricate, 2.5-3 mm. in diameter, strongly ligneous, densely canescent-pubescent, the hairs 1-1.2 mm. long, yellow, lax; leaves elliptic or lanceolate, sometimes more or less oblanceolate, 27-82 mm. long, 14-40 mm. wide, obtuse, conspicuously tomentose, entire, the costa prominulous beneath, with 4 or 5 pairs of lateral veins; petioles 2-5 mm. long, concave above, convex beneath, pubescent; inflorescence paniculate, semicorymbose, the axis 10-18 cm. long, canescent-tomentose, the racemes subsessile, with an obtuse apex, 8-10 mm. wide, tomentose, bracteate, the bracts lanceolate, 3-4 mm. long, 0.8-1 mm. wide,

acuminate, densely pubescent beneath, 1-nerved; flowers 4.4–4.6 mm. long, the pedicels 1–1.2 mm. long, pubescent; outer sepals free, more or less lanceolate, ciliate, concave, acute, densely pubescent beneath, the two lower ones 2–2.2 mm. long, 1.3–1.4 mm. wide, 3-nerved, the upper one 2.4–3 mm. long, 1.6–1.8 mm. wide, 5-nerved; wings 4.8–5 mm. long, 4–4.2 mm. wide, suborbicular, obtuse at base, 3-nerved, densely pubescent beneath, more or less pubescent within, ciliate; keel 4.8–5 mm. long, 2.5–2.6 mm. wide, orbicular, plicate, glabrous within, obtuse at base, 3- or 4-nerved, glabrous at margin, 3-lobed, the middle lobe obtuse-emarginate; upper petals elongate, spatulate, densely pubescent; stamens 8, the filaments 3.2–3.8 mm. long, pubescent (hairs 1.2–1.5 mm. long, lax, yellow), almost entirely united, the free part 1–1.4 mm. long, glabrous; ovary ovoid, 1.2–1.8 mm. long, 0.6–0.8 mm. wide, glabrous; style 2.5–2.8 mm. long, geniculate, glabrous, cylindric; stigma with 2 lobes, the lower acute, the upper 1-tubercled, the tubercle papillose; drupe more or less ellipsoid, subacute, 4.5–5 mm. long, 2.4–2.6 mm. wide, glabrous, almost truncate at base, reticulate. (PL. X, FIGS. 20–28.)

DISTRIBUTION: In the sierra of northern Perú, Department of Piura, between 2600 and 2700 meters altitude.

PERU: PIURA: Above Huancabamba, eastern cordillera, *Weberbauer 6139* (TYPE Ch, ISOTYPE GH).

This plant is closely related to *M. densecomata* Chodat, of southern Perú, from which it differs in the following characters: leaves not revolute, the apex more or less attenuate, the racemes ascendent, larger and almost rigid, the upper sepals acute, the wings more or less pubescent within, and the keel glabrous within.

45. *Monnina Herrerae* sp. nov.

Frutex pubescens, ramis 2.8–3 mm. crassis lignosis conspicue pilosis, pilis 0.6–0.8 mm. longis laxis flavescentibus; folia lanceolata 4.5–9 cm. longa 1.5–3 cm. lata basim versus elongato-attenuata apice acuta, supra plus minusve puberula, subtus flavescenti-puberula, integerrima, nervo medio prominulo conspicue puberulo, nervis lateralibus 6 vel 7, petiolo 4.5–7 mm. longo flavescenti-puberulo; racemi simplices vel aggregati plus minusve acuminati 7–10 mm. crassi, rhachi 6–7.8 cm. longa puberula, pedunculo 5–12 mm. longo, bracteis lineari-lanceolatis 3.8–5 mm. longis 1.2–1.4 mm. latis subtus puberulis uninerviis ciliatis; flores 4.8–5.2 mm. longi, pedicello 1–1.2 mm. longo puberulo; sepala exteriora libera lanceolata ciliata concava acuta subtus puberula, duo inferiora 2.8–3 mm. longa 1.5–1.7 mm. lata uninervia, sepalo superiore 3.2–3.5 mm. longo 2–2.2 mm. lato 3–5-nervio; alae 5–5.6 mm. longae 5–5.2 mm. latae obovatae basi obtusae 4- vel 5-nerviae ciliatae utrinque glabrae; carina 5–6 mm. longa 3.2–3.6 mm. lata orbicularis obovata utrinque glabra apice trilobata, lobo mediano obtuso emarginato, lobis lateralibus minoribus obtusiusculis, basi obtusa 3- vel 4-nervia, petalo superiore spathulato utrinque puberulo; stamina 8, filamentis 3.8–4.2 mm. longis, antheris subsessilibus, filamentorum parte libera 0.7–1.4 mm. longa glabra; ovarium 1.2–1.5 mm. longum 0.7–0.9 mm. latum ovatum glabrum; stylus 2.8–3.2 mm. longus geniculatus glaber; stigma apice superiore tuberculatum papillosum apice inferiore acutum; fructus ignotus. (PL. X, FIGS. 29–37.)

DISTRIBUTION: Andes of southern Perú, Department of Apurimac, at about 3400 meters altitude.

PERU: APURIMAC: Between Río Pinkos and Río Apurimac, June 11, 1911, *Weberbauer 5864* (TYPE GH).

The new species is related to *M. Vargasii* Ferreyra, from which it is distinguished by its conspicuously woody branches, its smaller leaves, which are acute at the apex, its 1-nerved lower sepals, its glabrous ovary, etc. From *M. pachycoma* Chodat, another ally, *M. Herrerae* differs in its larger and acute leaves and its much smaller outer sepals, which are 1-nerved and densely pubescent beneath.

The writer is honored to name this interesting species after Dr. Fortunato L. Herrera, the late distinguished Professor of Botany at the Universities of Cuzco and San Marcos, whose unremitting efforts toward making known the flora of Cuzco are appreciated by his many colleagues.

46. *Monnina pachycoma* Chodat in Bull. Soc. Bot. Genève II. 25: 220 (1934).

Shrub, to 20 dm. high, branched, the branches 2–3.5 mm. in diameter, densely pubescent, the hairs 0.8–1.2 mm. long, yellow, lax; leaves lanceolate, sometimes more or less elliptic, 18–60 mm. long, 8–21 mm. wide, obtuse, rarely slightly mucronate, pubescent above, becoming glabrescent, conspicuously pubescent beneath, entire, rarely slightly revolute, the costa prominulous beneath, with 5 or 6 pairs of lateral veins; petioles 2.5–4.5 mm. long, concave above, convex beneath, pubescent; stipules densely hirsute; racemes aggregated, sometimes simple, terminal, almost conical, acute, 11–16 mm. wide, subsessile, the axis 3.5–10 cm. long, densely pubescent, bracteate, the bracts linear-lanceolate, conspicuous, 5–6.5 mm. long, 0.4–0.5 mm. wide, acuminate, pubescent beneath, ciliate, 1-nerved, deciduous; flowers 6–6.8 mm. long, the pedicels 1.5–2 mm. long, pubescent; outer sepals free, lanceolate, ciliate, concave, glabrous beneath, the two lower ones 5.6–6.8 mm. long, 2.3–2.6 mm. wide, 3-nerved, the apex involute, acute, the upper one 6–7 mm. long, 2.8–3 mm. wide, 5–7-nerved, obtuse, the apex slightly involute; wings deep blue, 6.5–7 mm. long, 5.5–6.4 mm. wide, almost elliptic, obtuse at base, 3-nerved, rarely 4- or 5-nerved, glabrous, ciliate at the base; keel yellow, 6–8 mm. long, 3.8–4 mm. wide, orbicular, plicate, glabrous within, obtuse at base, 3–5-nerved, ciliate at base, 3-lobed, the middle lobe obtuse-emarginate, larger; upper petals spatulate, pubescent; stamens 8, the filaments 4.6–5 mm. long, pubescent, almost entirely united, the free part 1–1.5 mm. long, glabrous; ovary ovoid, 2–2.2 mm. long, 1.4–1.5 mm. wide, glabrous; style 2.8–3 mm. long, geniculate above base, glabrous, cylindric; stigma with 2 lobes, the lower acute, the upper 1-tubercled, the tubercle papillose; drupe ellipsoid, 6–9 mm. long, 3.5–5 mm. wide, glabrous, more or less reticulate. (PL. X, FIGS. 38–46.)

DISTRIBUTION: Southeastern part of the Peruvian Andes, Department of Cuzco, between 3500 and 3900 meters altitude.

PERU: Cuzco: Paso de Tres Cruces, Cerro de Cusilluyoc, *Pennell 13834* (ISOTYPES Ch, GH, Ph), *13823* (Ch, GH, NY, Ph, US); Acanacu Pass, Province of Paucartambo, *West 7036* (GH, UC).

The conspicuous outer sepals with their strongly involute apex characterize this species.

EXCLUDED SPECIES

Monnina calophylla Poepp. & Endl. Nov. Gen. ac Sp. 3: 66 (1835) = *Securidaca Corytholobium* A. W. Benn.

DOUBTFUL SPECIES

Monnina polygaloides Chodat in Mém. Soc. Phys. Hist. Nat. Genève, Suppl. 7: t. 9, f. 5 (1891).

The cited figure illustrates a pistil, but I have been able to find no subsequent mention of this binomial.

Monnina nitida Chodat in Bull. Herb. Boiss. 3: 130 (1895).

This species, based upon a specimen collected by Pavón in Perú, without other locality, cannot be placed from the description alone. Concerning it, Chodat writes: "Racemi elongati, bracteis et foliis nitidis primo aspectu cognoscenda."

Monnina rugosa Chodat in Bull. Herb. Boiss. 4: 251 (1896).

I am unable accurately to place this species, which is based upon a plant collected in Perú (without other data). The author writes: "Indumento affinis *M. Rusbyi* Chod. differt alis haud distincte unguiculatis, antheris distincte petiolatis, habitu robustiore, etiam affinis *M. cariocarpace* St-Hil., differt foliis irregulariter denticulatis et indumento crassiore."

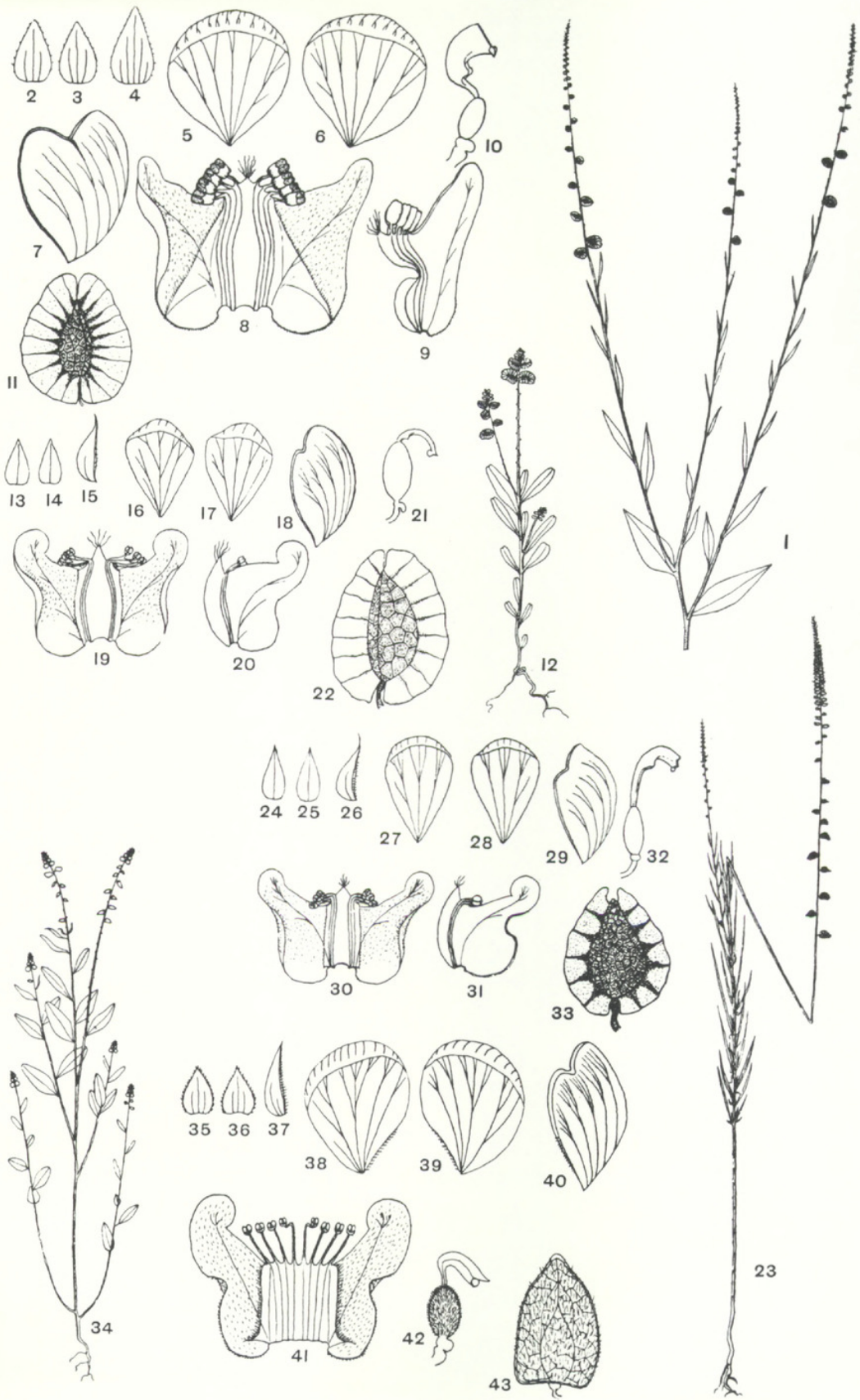
UNIVERSIDAD MAYOR DE SAN MARCOS,

LIMA, PERÚ

EXPLANATION OF PLATES

PLATE I

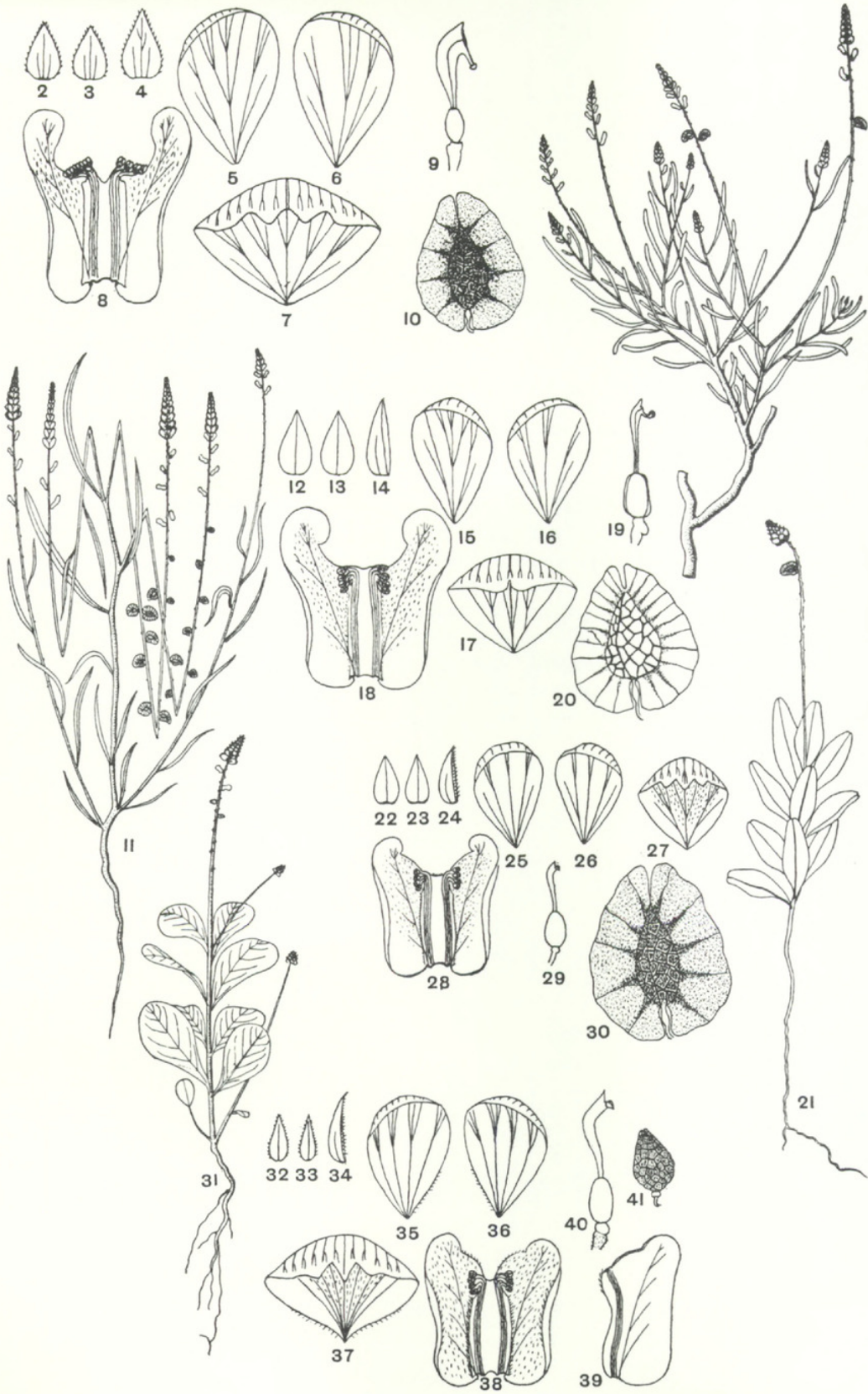
FIGS. 1–11. *Monnina pterocarpa* R. & P. (*Macbride* 2874): 1. habit, $\times \frac{1}{2}$; 2, 3. lower sepals, $\times 8$; 4. upper sepal, $\times 8$; 5, 6. wings, $\times 8$; 7. keel, $\times 8$; 8, 9. androecium and upper petals, $\times 8$; 10. ovary and style, $\times 8$; 11. samara, $\times 4$. FIGS. 12–22. *Monnina amarella* Chodat (*Pennell* 13629): 12. habit, $\times 1$; 13, 14. lower sepals, $\times 8$; 15. upper sepal, $\times 8$; 16, 17. wings, $\times 8$; 18. keel, $\times 8$; 19, 20. androecium and upper petals, $\times 8$; 21. ovary and style, $\times 8$; 22. samara, $\times 8$. FIGS. 23–33. *Monnina filifolia* Chodat (*Weberbauer* 6454): 23. habit, $\times \frac{1}{2}$; 24, 25. lower sepals, $\times 8$; 26. upper sepal, $\times 8$; 27, 28. wings, $\times 8$; 29. keel, $\times 8$; 30, 31. androecium and upper petals, $\times 8$; 32. ovary and style, $\times 8$; 33. samara, $\times 6$. FIGS. 34–43. *Monnina herbacea* DC. (*Macbride* 3181): 34. habit, $\times \frac{1}{2}$; 35, 36. lower sepals, $\times 8$; 37. upper sepal, $\times 8$; 38, 39. wings, $\times 8$; 40. keel, $\times 8$; 41. androecium and upper petals, $\times 8$; 42. ovary and style, $\times 8$; 43. fruit, $\times 8$.



THE PERUVIAN SPECIES OF MONNINA

PLATE II

FIGS. 1-10. *Monnina ramosa* Johnston (*Hinkley 13*): 1. habit, $\times 1$; 2, 3. lower sepals, $\times 8$; 4. upper sepal, $\times 8$; 5, 6. wings, $\times 8$; 7. keel, $\times 8$; 8. androecium and upper petals, $\times 8$; 9. ovary and style, $\times 8$; 10. samara, $\times 8$. FIGS. 11-20. *Monnina Macbridei* Chodat (*Pennell 13110*): 11. habit, $\times 1$; 12, 13. lower sepals, $\times 8$; 14. upper sepal, $\times 8$; 15, 16. wings, $\times 8$; 17. keel, $\times 8$; 18. androecium and upper petals, $\times 8$; 19. ovary and style, $\times 8$; 20. samara, $\times 8$. FIGS. 21-30. *Monnina arenicola* Ferreyra (*Mexia 4175*): 21. habit, $\times 1$; 22, 23. lower sepals, $\times 8$; 24. upper sepal, $\times 8$; 25, 26. wings, $\times 8$; 27. keel, $\times 8$; 28. androecium and upper petals, $\times 8$; 29. ovary and style, $\times 8$; 30. samara, $\times 8$. FIGS. 31-41. *Monnina Weberbaueri* Chodat (*Grant 7440*): 31. habit, $\times 1$; 32, 33. lower sepals, $\times 8$; 34. upper sepal, $\times 8$; 35, 36. wings, $\times 8$; 37. keel, $\times 8$; 38, 39. androecium and upper petals, $\times 8$; 40. ovary and style, $\times 8$; 41. fruit, $\times 8$.



THE PERUVIAN SPECIES OF MONNINA

PLATE III

FIGS. 1-10. *Monnina macrostachya* R. & P. (Pennell 14436): 1. habit, $\times \frac{1}{2}$; 2, 3. lower sepals, $\times 8$; 4. upper sepal, $\times 8$; 5, 6. wings, $\times 8$; 7. keel, $\times 8$; 8. androecium and upper petals, $\times 8$; 9. ovary and style, $\times 8$; 10. samara, $\times 8$. FIGS. 11-17. *Monnina longibracteata* Chodat (Mathews 2075): 11. lower sepals, $\times 8$; 12. upper sepal, $\times 8$; 13, 14. wings, $\times 8$; 15. keel, $\times 8$; 16. androecium and upper petals, $\times 8$; 17. ovary and style $\times 8$. FIGS. 18-25. *Monnina longibracteata* var. *ainensis* Chodat (Killip & Smith 23188): 18. habit, $\times \frac{1}{2}$; 19. lower sepals, $\times 6$; 20. upper sepal, $\times 6$; 21, 22. wings, $\times 6$; 23. keel, $\times 6$; 24. androecium and upper petals, $\times 6$; 25. ovary and style, $\times 6$. FIGS. 26-33. *Monnina huallagensis* Chodat (Weberbauer 6805): 26. habit, $\times \frac{1}{2}$; 27. lower sepals, $\times 8$; 28. upper sepal, $\times 8$; 29, 30. wings, $\times 8$; 31. keel, $\times 8$; 32. androecium and upper petals, $\times 8$; 33. ovary and style, $\times 8$. FIG. 34. *Monnina huallagensis* var. *pachyphylla* Chodat (Macbride 4786): habit, $\times 1$.



THE PERUVIAN SPECIES OF MONNINA

PLATE IV

FIGS. 1-9. *Monnina glabrifolia* Ferreyra (*Metcalf* 30661): 1. habit, $\times \frac{1}{2}$; 2. lower sepals, $\times 6$; 3. upper sepal, $\times 6$; 4, 5. wings, $\times 6$; 6. keel, $\times 6$; 7. androecium and upper petals, $\times 6$; 8. ovary and style, $\times 6$; 9. drupe, $\times 6$. FIGS. 10-17. *Monnina marginata* Presl (*Kanehira* 190): 10. habit, $\times 1$; 11. lower sepals, $\times 6$; 12. upper sepal, $\times 6$; 13, 14. wings, $\times 6$; 15. keel, $\times 6$; 16. androecium and upper petals, $\times 6$; 17. ovary and style, $\times 6$. FIGS. 18-25. *Monnina pseudo-salicifolia* Ferreyra (*Weberbauer* 6055): 18. habit, $\times 1$; 19. lower sepals, $\times 6$; 20. upper sepal, $\times 6$; 21, 22. wings, $\times 6$; 23. keel, $\times 6$; 24. androecium and upper petals, $\times 6$; 25. ovary and style, $\times 6$. FIGS. 26-33. *Monnina macrosepala* Chodat (*C. Schunke* 487): 26. habit, $\times \frac{1}{2}$; 27. lower sepals, $\times 6$; 28. upper sepal, $\times 6$; 29, 30. wings, $\times 6$; 31. keel, $\times 6$; 32. androecium and upper petals, $\times 6$; 33. ovary and style, $\times 6$.



THE PERUVIAN SPECIES OF MONNINA

PLATE V

FIGS. 1-8. *Monnina Vitis-Idaea* Chodat (*Weberbauer 6129*): 1. habit, $\times 1$; 2. lower sepals, $\times 6$; 3. upper sepal, $\times 6$; 4, 5. wings, $\times 6$; 6. keel, $\times 6$; 7. androecium and upper petals, $\times 6$; 8. ovary and style, $\times 6$. FIGS. 9-16. *Monnina conferta* R. & P. (*Weberbauer 5488*): 9. habit, $\times 1$; 10. lower sepals, $\times 6$; 11. upper sepal, $\times 6$; 12, 13. wings, $\times 6$; 14. keel, $\times 6$; 15. androecium and upper petals, $\times 6$; 16. ovary and style, $\times 6$. FIGS. 17-24. *Monnina stipulata* Chodat (*Metcalf 30511*): 17. habit, $\times 1$; 18. lower sepals, $\times 6$; 19. upper sepal, $\times 6$; 20, 21. wings, $\times 6$; 22. keel, $\times 6$; 23. androecium and upper petals, $\times 6$; 24. ovary and style, $\times 6$. FIGS. 25-32. *Monnina canescens* Ferreyra (*Pennell 14376*): 25. habit, $\times 1$; 26. lower sepals, $\times 6$; 27. upper sepal, $\times 6$; 28, 29. wings, $\times 6$; 30. keel, $\times 6$; 31. androecium and upper petals, $\times 6$; 32. ovary and style, $\times 6$.



THE PERUVIAN SPECIES OF MONNINA

PLATE VI

FIGS. 1-8. *Monnina divaristachya* Ferreyra (Killip & Smith 25778): 1. habit, $\times \frac{1}{2}$; 2. lower sepals, $\times 6$; 3. upper sepal, $\times 6$; 4, 5. wings, $\times 6$; 6. keel, $\times 6$; 7. androecium and upper petals, $\times 6$; 8. ovary and style, $\times 6$. FIGS. 9-16. *Monnina callimorpha* Chodat (Killip & Smith 24421): 9. habit, $\times 1$; 10. lower sepals, $\times 6$; 11. upper sepal, $\times 6$; 12, 13. wings, $\times 6$; 14. keel, $\times 6$; 15. androecium and upper petals, $\times 6$; 16. ovary and style, $\times 6$. FIGS. 17-24. *Monnina ovata* Ferreyra (Macbride 4493): 17. habit, $\times 1$; 18. lower sepals, $\times 6$; 19. upper sepal, $\times 6$; 20, 21. wings, $\times 6$; 22. keel $\times 6$; 23. androecium and upper petals, $\times 6$; 24. ovary and style, $\times 6$.



THE PERUVIAN SPECIES OF MONNINA

PLATE VII

FIGS. 1-8. *Monnina polystachya* R. & P. (*Macbride & Featherstone 1848*): 1. habit, $\times 1$; 2. lower sepals, $\times 6$; 3. upper sepal, $\times 6$; 4, 5. wings, $\times 6$; 6. keel, $\times 6$; 7. androecium and upper petals, $\times 6$; 8. ovary and style, $\times 6$. FIGS. 9-16. *Monnina Pavoni* Chodat (*Macbride 4124*): 9. habit, $\times 1$; 10. lower sepals, $\times 6$; 11. upper sepal, $\times 6$; 12, 13. wings, $\times 6$; 14. keel, $\times 6$; 15. androecium and upper petals, $\times 6$; 16. ovary and style, $\times 6$. FIGS. 17-24. *Monnina pseudo-polystachya* Chodat (*Macbride 4317*): 17. habit, $\times 1$; 18. lower sepals, $\times 6$; 19. upper sepal, $\times 6$; 20, 21. wings, $\times 6$; 22. keel, $\times 6$; 23. androecium and upper petals, $\times 6$; 24. ovary and style, $\times 6$. FIGS. 25-32. *Monnina connectisepala* Chodat (*Pennell 13977*): 25. habit, $\times 1$; 26. lower sepals, $\times 6$; 27. upper sepal, $\times 6$; 28, 29. wings, $\times 6$; 30. keel, $\times 6$; 31. androecium and upper petals, $\times 6$; 32. ovary and style, $\times 6$.



THE PERUVIAN SPECIES OF MONNINA

PLATE VIII

FIGS. 1-7. *Monnina Lechleriana* Chodat (*Lechler* 2072): 1. lower sepals, $\times 6$; 2. upper sepal, $\times 6$; 3, 4. wings, $\times 6$; 5. keel, $\times 6$; 6. androecium and upper petals, $\times 6$; 7. ovary and style, $\times 6$. FIGS. 8-14. *Monnina Clarkeana* Chodat (*Mathews* 1192): 8. lower sepals, $\times 6$; 9. upper sepal, $\times 6$; 10, 11. wings, $\times 6$; 12. keel, $\times 6$; 13. androecium and upper petals, $\times 6$; 14. ovary and style, $\times 6$. FIGS. 15-22. *Monnina ligustriifolia* H.B.K. (*Bonpland* 3491): 15, 16. lower sepals, $\times 6$; 17. upper sepal, $\times 6$; 18, 19. wings, $\times 6$; 20. keel, $\times 6$; 21. androecium and upper petals, $\times 6$; 22. ovary and style, $\times 6$. FIGS. 23-31. *Monnina salicifolia* R. & P. (*Stork & Horton* 9375): 23. habit, $\times 1$; 24, 25. lower sepals, $\times 6$; 26. upper sepal, $\times 6$; 27, 28. wings, $\times 6$; 29. keel, $\times 6$; 30. androecium and upper petals, $\times 6$; 31. ovary and style, $\times 6$. FIGS. 32-41. *Monnina hirtella* Ferreyra (*Klug* 3337): 32. habit, $\times 1$; 33, 34. lower sepals, $\times 6$; 35. upper sepal, $\times 6$; 36, 37. wings, $\times 6$; 38. keel, $\times 6$; 39. androecium and upper petals, $\times 6$; 40. ovary and style, $\times 6$; 41. drupe, $\times 6$. FIGS. 42-51. *Monnina cyanea* Chodat (*Weberbauer* 7835): 42. habit, $\times 1$; 43, 44. lower sepals, $\times 6$; 45. upper sepal, $\times 6$; 46, 47. wings, $\times 6$; 48. keel, $\times 6$; 49. androecium and upper petals, $\times 6$; 50. ovary and style, $\times 6$; 51. fruit, $\times 6$.



THE PERUVIAN SPECIES OF MONNINA

PLATE IX

FIGS. 1-10. *Monnina decurrens* Ferreyra (*Weberbauer 6100*): 1. habit, $\times 1$; 2, 3. lower sepals, $\times 6$; 4. upper sepal, $\times 6$; 5, 6. wings, $\times 6$; 7. keel, $\times 6$; 8. androecium and upper petals, $\times 6$; 9. ovary and style, $\times 6$; 10. drupe, $\times 6$. FIGS. 11-19. *Monnina peruviana* Chodat (*Mathews* without number): 11. habit, $\times 1$; 12, 13. lower sepals, $\times 6$; 14. upper sepal, $\times 6$; 15, 16. wings, $\times 6$; 17. keel, $\times 6$; 18. androecium and upper petals, $\times 6$; 19. ovary and style, $\times 6$. FIGS. 20-28. *Monnina acutifolia* Chodat (*Killip & Smith 22448*): 20. habit, $\times 1$; 21, 22. lower sepals, $\times 6$; 23. upper sepal, $\times 6$; 24, 25. wings, $\times 6$; 26. keel, $\times 6$; 27. androecium and upper petals, $\times 6$; 28. ovary and style, $\times 6$. FIGS. 29-37. *Monnina Vargasii* Ferreyra (*Vargas 771*): 29. habit, $\times 1$; 30, 31. lower sepals, $\times 6$; 32. upper sepal, $\times 6$; 33, 34. wings, $\times 6$; 35. keel, $\times 6$; 36. androecium and upper petals, $\times 6$; 37. ovary and style, $\times 6$.



THE PERUVIAN SPECIES OF MONNINA

PLATE X

FIGS. 1-10. *Monnina pilosa* var. *glabrescens* Ferreyra (*Stork 11425*): 1. habit, $\times \frac{1}{2}$; 2, 3. lower sepals, $\times 6$; 4. upper sepal, $\times 6$; 5, 6. wings, $\times 6$; 7. keel, $\times 6$; 8. androecium and upper petals, $\times 6$; 9. ovary and style, $\times 6$; 10. bract, $\times 6$. FIGS. 11-19. *Monnina densecomata* Chodat (*Pennell 13821*): 11. habit, $\times 1$; 12, 13. lower sepals, $\times 6$; 14. upper sepal, $\times 6$; 15, 16. wings, $\times 6$; 17. keel, $\times 6$; 18. androecium and upper petals, $\times 6$; 19. ovary and style, $\times 6$. FIGS. 20-28. *Monnina tomentella* Chodat (*Weberbauer 6139*): 20. habit, $\times \frac{1}{2}$; 21, 22. lower sepals, $\times 6$; 23. upper sepal, $\times 6$; 24, 25. wings, $\times 6$; 26. keel, $\times 6$; 27. androecium and upper petals, $\times 6$; 28. ovary and style, $\times 6$. FIGS. 29-37. *Monnina Herrerae* Ferreyra (*Weberbauer 5864*): 29. habit, $\times 1$; 30, 31. lower sepals, $\times 6$; 32. upper sepal, $\times 6$; 33, 34. wings, $\times 6$; 35. keel, $\times 6$; 36. androecium and upper petals, $\times 6$; 37. ovary and style, $\times 6$. FIGS. 38-46. *Monnina pachycoma* Chodat (*Pennell 13834*): 38. habit, $\times 1$; 39, 40. lower sepals, $\times 6$; 41. upper sepal, $\times 6$; 42, 43. wings, $\times 6$; 44. keel, $\times 6$; 45. androecium and upper petals, $\times 6$; 46. ovary and style, $\times 6$.



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