

THE AMERICAN SPECIES OF THIBAUDIEAE

By ALBERT C. SMITH

INTRODUCTION

The attention of the writer was first attracted to the group of plants known as Thibaudieae in 1926 and 1927, at which time he had opportunity to observe them in their natural habitat in the Eastern Cordillera of Colombia. A second trip, to Peru in 1929, furthered this interest and resulted in the addition of specimens of the group to American herbaria. These trips, both of which were under the auspices of the Smithsonian Institution and led by E. P. Killip, added so many specimens of Thibaudieae to the United States National Herbarium that to name them became highly desirable. In addition to these recent collections, a considerable quantity of other unstudied material had accumulated, owing to the efforts of several American collectors, notably Paul C. Standley, in Central America, and F. W. Pennell, H. H. Rusby, E. P. Killip, and J. F. Macbride, in South America.

In attempting to name these specimens it was found that the only comprehensive work on the tribe, that of R. Hoerold in 1909, was quite inadequate, having been based on the specimens in one herbarium only. In preparing the present paper, a task which has occupied much of the writer's time for two years, type material of nearly all previously described species has been seen, a privilege for which he is deeply indebted to Prof. L. Diels, director of the Botanisches Museum, Berlin, and Sir Arthur Hill, director of the Royal Botanic Gardens, Kew. At these two European institutions most of the type specimens had been deposited and were lent to the writer to facilitate his task. In addition it has been a privilege to study the specimens belonging to the Gray Herbarium of Harvard University; the Goeldi Museum of Pará, Brazil; the Field Museum of Natural History; and the New York Botanical Garden. The institutions from which specimens have been studied are thus indicated in citations: Berlin (B), Field Museum (F), Gray Herbarium (G), Goeldi Museum (Go), Kew (K), United States National Museum (N), New York Botanical Garden (Y). To the

directors and curators of the above-mentioned institutions the writer wishes to acknowledge his appreciation of their cooperation.

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HISTORICAL CONSIDERATION

The first mention of any plant which may be placed in the tribe Thibaudieae as it is at present understood was in 1763, when Adanson¹ published a brief description of the genus *Chupalon*. His mention of the plant, in connection with *Oxycoccus* and *Vaccinium*, is so noncommittal that it can not with certainty be applied to any more recent collection. Probably a species of *Cavendishia* was under consideration; but since no specific description is available, the name may be ignored.

Among authentic genera, the first to be formally described was *Ceratostema*, mentioned at some length by Jussieu² in 1789. Although no species is detailed, the specimen referred to was obviously *Ceratostema peruvianum*, subsequently published by Gmelin.³

During the following years no specimens of Thibaudieae were described, probably because collections from tropical America had not yet reached Europe in any quantity. However, the collections of Ruiz and Pavon in Peru discovered several species referable to this tribe. Unfortunately these specimens were described in the fourth volume of *Flora Peruviana et Chilensis*, which consists of plates only and is very rare. It is a question whether this volume was available at such an early date as 1802, but it seems best to consider this the publication date for those plates that have suitable analyses. The descriptions made use of the generic names *Ceratostema* and *Thibaudia*; the plants figured belong to the genera, as at present constituted, *Ceratostema*, *Siphonandra*, *Psammisia*, *Thibaudia*, and *Cavendishia*. One of the plates (384, top) represents a plant best referred to the tribe Euvaccinieae and not considered here.

Concerning first publication of the generic name *Thibaudia*, the above-mentioned plates, although adequate as specific descriptions, are not considered as establishing the genus.⁴ The first formal de-

¹ Fam. Pl. 2: 164. 1763.

² Gen. Pl. 163. 1789.

³ Syst. Nat. 2: 676. 1791.

⁴ On the subject of the value of plates in generic name determination, see Sprague, "*Oreocnide* vs. *Villebrunea*," in Kew Bull. Misc. Inf. no. 10, 1928.

scription of the genus *Thibaudia* is in St. Hilaire.⁵ This description, from the wording, probably antedates the issue of volume 4 of Ruiz and Pavon. Three species are described, obviously from the manuscript of Ruiz and Pavon, but in two cases the specific names have been slightly altered from those that appear on the plates. For the sake of uniformity, the names on the plates are in this paper considered authentic. The species first mentioned by St. Hilaire, which may be considered the type species of the genus, is *T. melliflora* (or *T. mellifera* according to St. Hilaire).

In the subsequent 30 years a few more species were described under the generic name *Thibaudia*, mostly by Humboldt, Bonpland, and Kunth⁶ in 1818. These species have since been referred to various genera of the tribe; the name *Thibaudia* as applied by authors of this period included all plants referable to the tribe.

In 1836 the generic name *Cavendishia* was introduced by Lindley,⁷ but was not understood as being the common Andean genus by subsequent writers, who continued to neglect it, making necessary a large number of comparatively recent correct binominals.

The following year Hooker described the genus *Macleania*⁸ and several species. At this time species of the tribe were introduced into England as horticultural plants by commercial collectors in South America. These were described by several authors in the following years and frequently were illustrated by elaborate plates. The genus *Anthopterus* was described by Hooker⁹ in 1839.

The most elaborate and comprehensive treatment of the tribe up to this date is by Dunal.¹⁰ He describes all species known to him and adds several new descriptions, applying the names *Ceratostema*, *Thibaudia*, *Cavendishia* (in regard to one species only), *Macleania*, and *Anthopterus* to American members of the tribe. Like his predecessors, Dunal used the name *Thibaudia* in its broadest sense. His descriptions are brief and often inadequate, without comment as to relationships.

Among the authors who described tropical American plants at this period, and among them various Thibaudieae, was Bentham, whose new species, founded on the Hartweg collection, included the genus *Oreanthes*.¹¹

⁵ Expos. Fam. Nat. 362. 1805.

⁶ Nov. Gen. & Sp. 3: 268-275. 1818.

⁷ Bot. Reg. 21: sub pl. 1791. 1836.

⁸ Hook. Icon. Pl. 2: pl. 109. 1837.

⁹ Hook. Icon. Pl. 3: pl. 243. 1839.

¹⁰ DC. Prodr. 7: 552-578. 1839.

¹¹ Pl. Hartw. 140. 1844.

In 1851 Klotzsch¹² published his "Studien über die natürliche Klasse Bicornes Linne," a work whose chief value is in the strict delimitation of genera. The elaborate keys to genera published by Klotzsch are by no means natural, but his conceptions, as borne out by the species which he grouped together, were fundamentally modern. Genera of American Thibaudieae added by him include *Tyria*, *Satyria*, *Orthaea*, *Siphonandra*, *Semiramisia*, *Eurygania*, *Polyboea*, *Proclesia*, *Themistoclesia*, and *Psammisia*. To be sure, not all these genera are maintained at the present time, but on the whole they represent very definite conceptions.

In 1856 Planchon and Linden¹³ published a description using the generic name *Gonocalyx*, which has been neglected or placed in *Ceratostema* by subsequent authors. It is considered a distinct genus in the present treatment. In 1857 Grisebach¹⁴ published a short list of names without descriptions. These names, based on Lechler's collections from Peru, are without notation other than the collector's number; they are here considered *nomina nuda*. In 1863 the Brazilian and eastern Peruvian species were considered by Meissner.¹⁵ Here is described the genus *Riedelia*, which is synonymous with *Satyria*.

Another important contribution to the study of the tribe was published in 1876 by Bentham and Hooker.¹⁶ Here, of course, only the genera are discussed, but the relationships between them are more clearly expressed than in previous works. The only generic name added is *Findlaya*, which is synonymous with *Orthaea*. Previously in the same year Hooker¹⁷ had published the genus *Notopora*.

Between this time and 1909 many species were described by various authors, none of whom considered generic relationships in a way to throw light on their phylogeny. The best treatment is that of Drude,¹⁸ whose key is adequate for general use. Niedenzu¹⁹ studied in some detail the anatomy of the leaf in Ericaceae, the results being published in the form of a key that does not aid the taxonomist to a great extent. Another author whose name is found in this period is Hemsley,²⁰ who published a summary of the Central American species, forming several new combinations in *Cavendishia*. The only genus added about this time was *Rusbya* Britton.²¹

¹² *Linnaea* 24: 1-88. 1851.

¹³ *Gard. Chron.* 1856: 152. 1856.

¹⁴ *Lechl. Berb. Amer. Austr.* 58. 1857.

¹⁵ *Mart. Fl. Bras.* 7: 125-127, 171-174. 1863.

¹⁶ *Gen. Pl.* 2: 564-577. 1876.

¹⁷ *Hook. Icon. Pl.* 12: 53. *pl.* 1159. 1876.

¹⁸ *Engl. & Prantl, Pflanzenfam.* 4¹: 53-57. 1891.

¹⁹ *Bot. Jahrb. Engler* 11: 134-263. 1890.

²⁰ *Biol. Centr. Amer. Bot.* 2: 271-274. 1881.

²¹ *Bull. Torrey Club* 20: 68. 1893.

In 1909 Hoerold²² published his "Systematische Gliederung und geographische Verbreitung der amerikanischen Thibaudieen," the most comprehensive treatment of the subject yet presented. After a historical and morphological discussion he gives a key to genera, which shows an understanding of their relationships, followed by keys to the species known to him. This key is incomplete in many places, but serves its purpose to some extent in the identification of specimens. Following is a discussion of geographic distribution, with species listed according to countries. The rest of the paper is occupied with the description of many new species, based on the collections of Sodiro, Triana, Weberbauer, Lehmann, and others. The differences between the fundamental conceptions of genera in Hoerold's paper and in the present treatment are several, and will be brought out in the following pages. The only new genus added by Hoerold was *Englerodoxa*.

Since 1909 many species have been described by several authors, but no consideration of the group as a whole has been undertaken until the present. Authors who have added several species to the growing list of tropical American Thibaudieae are Blake (1922, 1924), Mansfeld (1925), and Fedtschenko and Basilevskaya (1926).

ECONOMIC CONSIDERATION

A great number of species of the tribe Thibaudieae have a horticultural value, in spite of the fact that they are seldom seen in private or public displays. The brilliant red bracts of *Cavendishia*, the long drooping corollas of certain species of *Ceratostema*, and other floral features of various genera make these plants unforgettable to those who have observed them in the mountainous Tropics. In the Andes they form one of the outstanding features of the vegetation, and the compact and colorful little shrubs, such as most species of the group are, should not be difficult to cultivate in greenhouses or in our Southern and Pacific States. In Europe these plants have found their way into cultivation more readily than in North America, and several species were originally described from plants introduced by Lobb, Pearce, and other commercial collectors of the last century. It is to be hoped that in the near future some means will be found of introducing plants of such inherent horticultural value into the United States.

Another, but very minor, economic use of the group is as a food. Several species, mostly from the Andes of Colombia and Ecuador, have fruits that are reported by collectors as edible, but they do

²² Bot. Jahrb. Engler 42: 251-334. 1909.

not form a consequential part of the native fare. Many local names have been reported, some of which serve to designate any member of the group as it has naturally become known to the Indians, while others seem to be applied to only a single species. For instance, in parts of Colombia the name "uva camarona" is used indiscriminately, in Ecuador "hualicon," in Costa Rica "muelas" and "colmillos." These names and others reported by collectors are mentioned under discussions of species.

GEOGRAPHIC DISTRIBUTION

Members of the tribe Thibaudieae are entirely tropical, the American genera being found from southern Mexico southward to northern Bolivia and eastward in South America to British Guiana and northwestern Brazil. A few species grow in the West Indies. As a rule they are found in the higher mountains, at an elevation of 1,000 meters or more, but several have become established at lower elevations. The foothills of the Andes in the upper Amazon Valley, the Pacific slope of the Western Cordillera of Colombia, and the sandstone regions east of Mount Roraima in British Guiana are localities in which certain species are found at low elevations. Fundamentally, however, the tribe may be said to inhabit the Temperate Zone of the American Tropics.

Two Asiatic genera, *Agapetes* G. Don and *Pentapterygium* Kl., have been placed in the tribe Thibaudieae by various authors. They are quite parallel in structure to the American genera, but this situation is more likely due to somewhat parallel evolution than to recent common ancestry. In this paper I have ignored the Asiatic genera on the assumption that neither of them is so closely related to any American genus as the American genera are to each other.

In America the tribe is represented by 20 genera, of which 6 are monotypic, 7 contain from 2 to 6 species, 3 contain from 10 to 20 species, and 4 contain more than 20 species. The total number of species described in this paper is 240, and in addition there are 24 names that I am unable to place. The fact that approximately one-third of the species treated are new must be ascribed to two causes: First, that the group has received no critical treatment for more than 20 years and, second, that the recent interest in South American exploration has yielded an amazing quantity of herbarium material. The situation that prevails in the tribe Thibaudieae is duplicated in any South American group one studies. It is to be anticipated that many unknown species are still to be collected, inasmuch as exploration of the South American Continent, although recently greatly accelerated, has left many localities untouched. For instance, it is practically certain that undiscovered plants of the tribe await collec-

tion in the Andes of northwestern Colombia and in the Pacaraima Mountains of southern Venezuela, to mention only two of the least known and most interesting spots. The total number of species of Thibaudieae will probably reach more than 300 as a result of future collecting.

The center of distribution of Thibaudieae appears to be in the northern Andes, where species are more numerous and more varied than elsewhere. Whether this region was the original home of the tribe is a matter of speculation. The Central American species are fewer in number than the South American, and only in two cases are the same species found in both South and Central America.

The geographic distribution of each genus is discussed in connection with its description. It will be observed that several genera are limited to a small area, while others are found throughout the range of the tribe.

MORPHOLOGICAL DISCUSSION

It is not within the scope of the present treatment of Thibaudieae to discuss morphology in any detail. However, a short discussion of the structure of plants belonging to the tribe may be of some use. All species of this alliance show a great similarity in structure, the most extreme variations taking place in the stamens, which consequently are of most importance in taxonomic consideration.

In habit, Thibaudieae are spreading shrubs, often epiphytic, or low trees. They are inhabitants of the mountainous regions of the Tropics, rarely growing in hot lowlands, more habitually in cool exposed situations. The stems branch below the soil, or sometimes the primary branch is semiprostrate, sending up more or less erect shoots. The branches are as a rule stout and gnarled, clothed with loose grayish bark. Minor branches are numerous and irregular. Often, when the plant is habitually epiphytic, the branches are slender and drooping or even subscandent.

Leaves are usually numerous, variously shaped, entire or subentire, petiolate, coriaceous or thick-coriaceous, rarely chartaceous, pinnate- or pli-nerved, or with several principal nerves spreading from the base. The anatomy of the leaf of this whole family has been studied in great detail by Niedenzu.²³ Stipules are unusual, being present, so far as can be observed from material at hand, only in *Rusbya* and some species of *Ceratostema*.

The inflorescence is axillary, sometimes appearing terminal; the flowers are solitary, in pairs, in small fascicles, in racemes, or in panicles. Form of inflorescence does not appear constant in conjunction with other generic characters, but is generally quite con-

²³ Bot. Jahrb. Engler 11: 134-263. 1890.

stant specifically. Frequently bracts of various size are located at the base of the inflorescence; these reach their maximum development in *Cavendishia*, the only group in which they appear to have a protective function. Small secondary bracts are found at the bases of pedicels, which they subtend. Pedicels are usually bibracteolate, and are sometimes surmounted at the articulation with the calyx by several minute cartilaginous teeth. Like all flower parts, the pedicels may be glabrous or variously pubescent, the degree and type of pubescence being as a rule a constant specific character.

In specific descriptions of Thibaudieae authors have used different terms for parts of the calyx, frequently with no clear comprehension of its anatomy. The calyx of Ericaceae, which is formed by the fused sepals, is inserted on the receptacle below the corolla and ovary. Obviously the same structure is present in Vacciniaceae, except that the calyx has become fused with the wall of the ovary. That this compound structure formed by the fusion of calyx and wall of the ovary is not a stem structure is borne out by a study of its anatomy. The separation of vascular bundles supplying the stamens, corolla, and free portion of the calyx takes place at a level far below the apparent attachment of these organs. Therefore, the point where the swelling of the calyx becomes perceptible (approximately where the first separation of vascular bundles takes place) may be considered the apex of the pedicel and the base of the calyx. In the majority of species of the tribe this point is marked by a more or less conspicuous indentation of tissue, frequently known as the articulation, but sometimes the pedicel leads directly into the calyx without this. The presence or absence of this indentation has no effect on the vascular anatomy, and it appears, therefore, to be a purely external character of little phylogenetic significance.

The parts of the calyx are in this paper designated thus: The portion that is fused with the wall of the ovary is called the *calyx tube*; the free portion, which is erect or spreading, is the *calyx limb*; and the portions of the limb that are free from one another are the *calyx lobes*. The lobes are triangular, ovate, or lanceolate, often reduced to minute apiculate serrations of the limb margin. The tube is short-cylindric, campanulate, obcylindric, or obprismatic, frequently angled or winged. The ovary, in its fusion with the calyx, has become adapted to the shape of that organ; it is fleshy, often thick-coriaceous, and often depressed in the center, at which point it gives rise to the single style, surrounding which is an annular or cup-shaped disk. The locules are as a rule five, thick-walled, and variously shaped. The ovules are numerous and minute, spherical or ellipsoid, attached to a central parietal placenta. Since these organs are constant throughout the tribe, their characters are not repeated

in the following descriptions. The symmetrical stigma, which is single, is truncate, subhemispherical, or peltate.

The corolla and stamens are also structurally fused into the compound wall at their bases, as demonstrated by an examination of vascular structure. Practically, however, they may be considered to have their inception at the base of the calyx limb. At this point they are weakened at maturity and are deciduous, leaving the calyx limb and style persistent upon the fruit. The corolla is tubular, usually subcylindric, frequently contracted to a long and narrow throat, usually carnose, with 5 (sometimes 4 or 6) small lobes, invariably some shade of red in color (or sometimes green or white when young). The stamens, which as a rule are double the number of corolla lobes, have a distinct attachment to the summit of the fusion wall, but they are usually more or less adherent to the corolla and fall from the mature flower with that organ. The filaments are liguliform, carnose or membranous, free or connate in a tube, extended distally into slender connectives which are adherent to the anther sacs dorsally. The anthers are erect, frequently elongate, two-celled, smooth-surfaced or granular, yellow or brown in color, extended into one or two submembranous tubules (vestigial in *Lateropora*) which open by clefts or pores. The stamens show great variation and generic constancy; they have been used as critical characters by taxonomists, and upon them is founded consideration of generic history. Pollen is transferred from anthers to stigma by insects, or by birds in the case of plants that have the corollas greatly elongate. The disk that surmounts the ovary evidently secretes a nectar. In some species of *Vaccinium* it has been ascertained that the plants are self-sterile; in others there is a slight dichogamy to insure cross-pollination. So far as I have been able to discover, no work along these lines has been done with Thibaudieae, but doubtless the same conditions are present.

The fruit of Thibaudieae is a berry or drupe, never very large but frequently used as a food by several primitive tribes. The seeds are small, with fleshy endosperm and straight embryo.

RELATION OF THIBAUDIEAE TO THE FAMILY

It is the purpose of the present paper to consider species and genera within the tribe Thibaudieae as it is understood by modern taxonomists, but a short discussion of the position of the tribe in regard to its family may be of some value. By some authors the family Vacciniaceae is united with the family Ericaceae, a point of view that has much justification. In morphology, anatomy, and habit, the two families are doubtless closely allied; whether they are considered two families or one is immaterial to the present discus-

sion. The family Vacciniaceae may be defined as including those ericaceous genera that have an inferior ovary. It is divided into two tribes, Thibaudieae and Vaccinieae.

Bentham and Hooker distinguish the two groups as follows:

Thibaudieae. Flores magni v. inter majores. Corolla saepissime crasse coriacea v. carnosae. Filamenta brevia v. brevissima, contigua cohaerentia v. connata, rarius discreta.

Euvaccinieae. Flores parvi v. inter minores. Corolla saepius tenuiter coriacea v. membranacea. Filamenta brevia v. elongata, saepissime discreta.

Drude expresses the relationship thus:

Blkr. krugförmig, glockig oder radförmig gespalten. Stb. unter einander getrennt. Frkn. vom Blütenstiel scharf abgesetzt und oft abgegliedert.

Vaccinieae.

Blkr. aus bauchigem Grunde röhrig oder lang cylindrisch, mit kurz 4-5 spaltigem Saum, lederig-fleischig. Stb. getrennt oder zu einer Säule verwachsen. Kelch am Frkn. herablaufend und in den Blütenstiel übergehend (selten abgegliedert)-----*Thibaudieae*.

From the above it may be concluded that in the minds of these authors no sharp distinction between the tribes is obvious. In fact, whatever difference exists is a matter of degree, and any definition must admit many exceptions. In general, the above analyses, however intangible, are suitable for practical purposes. It may be said that the flowers of Thibaudieae as a rule are larger and more carnosae, and have stamens with shorter filaments than those of Euvaccinieae. Of certain Euvaccinieae the ovary is not so strictly inferior as it is in Thibaudieae. It is probable that most genera of Thibaudieae are further removed from the common ericaceous ancestor than most genera of Euvaccinieae. However, it is a matter of real doubt whether these two tribes are natural, and it is quite conceivable that certain genera, such as *Vaccinium* and *Thibaudia*, are closer in their phylogeny than are *Thibaudia* and, for example, *Satyria*.

In view of this indistinct conception of the two tribes that constitute the family Vacciniaceae, it may be seen that an accurate sketch of generic relationships should await detailed study of all species of the family. However, such a project can not be undertaken at present, and the phylogenetic system here proposed is therefore based upon a supposition that the two tribes are really distinct.

From the tribe Thibaudieae certain genera placed there by previous writers are here excluded. Among these are *Hornemannia*, which, with its short campanulate corolla, is surely allied to *Vaccinium*, *Sophoclesia*, and *Sphyrospermum*, which seem intermediate between the two tribes, but whose alliance, I believe, is really with Vaccinieae, and *Disterigma*, which, as pointed out by Blake,²⁴ is very close to *Vaccinium*.

²⁴ Journ. Washington Acad. Sci. 16: 361. 1926.

GENERIC GROUPS

Within the tribe several divergent strains are apparent. There is conceivably no predominant morphological form from which other groups have separated from time to time, but the primary divergences seem to have been ancient. The order in which these main groups were evolved is, of course, a matter of hypothesis.

There are two monotypic genera, *Lateropora* and *Notopora*, whose inception was undoubtedly more ancient than that of the other genera here considered, although they have little in common other than a vast difference from other groups.

If we disregard this very minor section of the tribe, and take for granted a common source for the other genera, there are apparent four strains, of which *Siphonandra*, *Macleania*, *Thibaudia*, and *Cavendishia* may be considered the representative genera. The relation of these groups to one another, and of the genera within them, is discussed in the following paragraphs.

LATEROPORA

This apparently monotypic genus, previously undescribed, has been found only on the summit of Chiriquí Volcano, in western Panama, a station where it may well have been isolated for a long period. Doubtless it represents a very distinct line of evolution, and to associate it with any other genus is impossible. All other members of the tribe show elongation of the anther tubules, a characteristic that must have been present in a pre-thibaudioid type. The remarkable atrophy of the tubules of *Lateropora* is probably to be considered a very early variation from the type, since it is associated with unusually densely pubescent filaments and laterally dehiscent sacs, characteristics that must have been developed over a very long period of time. In other details of flower structure, leaf character, habit, etc., the genus agrees with other members of the tribe.

NOTOPORA

Like *Lateropora*, this monotypic genus inhabits a mountain range long isolated, having thus far been found only in the vicinity of Mount Roraima in western British Guiana. Its outstanding characteristic is the presence of anther tubules that open by extrorse pores, whereas those of all other genera (except *Lateropora*) open introrsely or apically. The flowers are tomentose to a degree found in no other group of the tribe. The presence of these characters indicates an ancient derivation of the genus, which can not be associated with any other modern group in a discussion of descent.

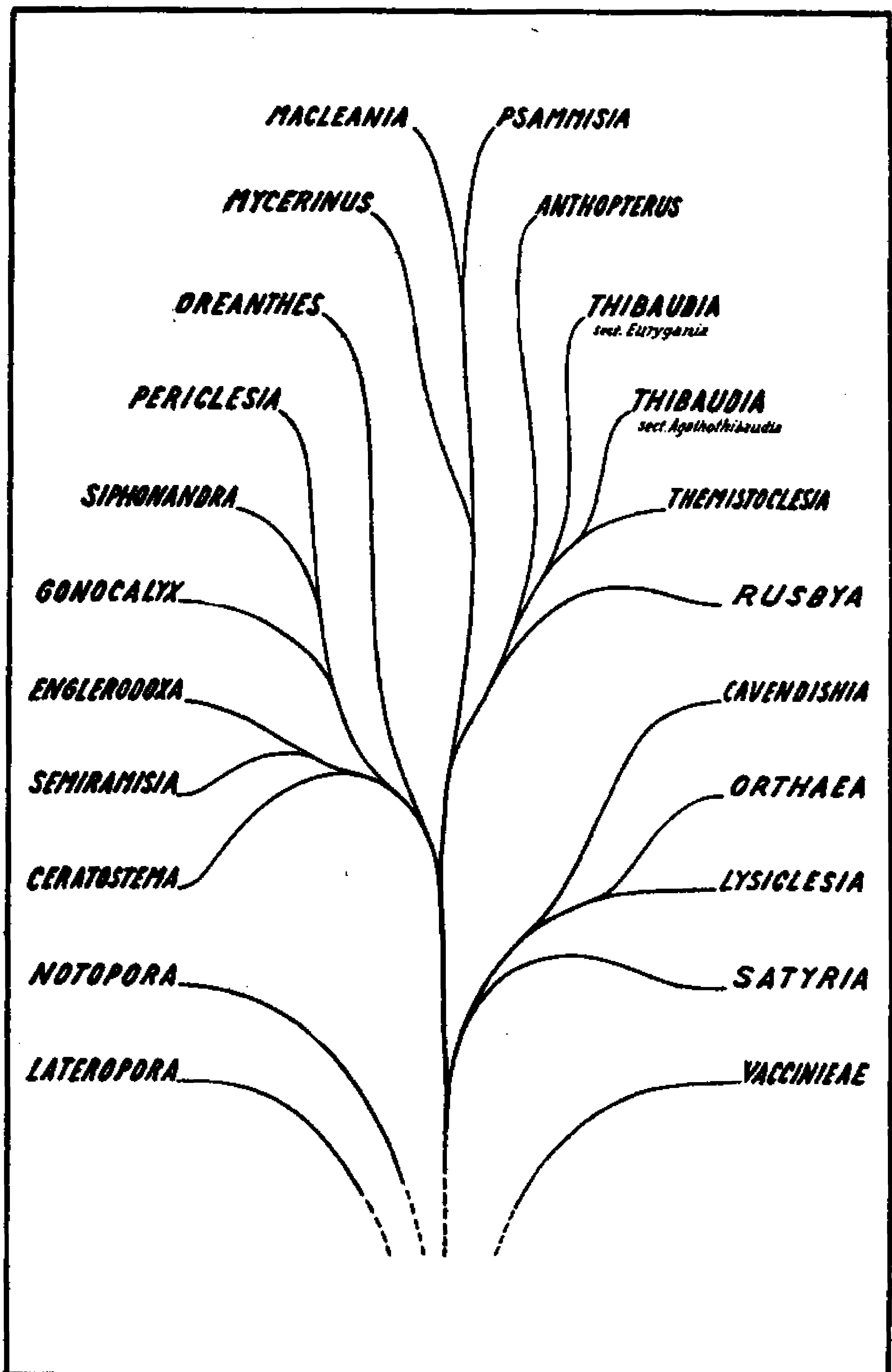


FIGURE 143.—Probable phylogeny of Thibaudieae

This and the preceding genus are quite separate from all the following, and their presence in the tribe may plausibly be questioned. The remaining genera are all closely related, and their derivation from a comparatively recent type stock is to be presumed.

THIBAUDIA AND ITS ALLIES

A discussion of what may be the most primitive group still extant necessarily involves unestablishable hypotheses, since no fossil evidence is available. There are several large genera extant, from each of which small groups have been derived. Of these large genera (*Macleania*, *Psammisia*, *Thibaudia*, and *Cavendishia*), the one that seems the "mean" of the tribe, and that it seems reasonable to consider close to the primitive stock, is *Thibaudia*. Naturally, this is only a theory deduced from study of herbarium and field material, and supported by the facts brought out in this monograph.

THIBAUDIA

The genus that gives its name to the tribe is characterized by cylindrical corollas of medium size, stamens always 10 and nearly as long as the corollas, usually smooth anther sacs, and broad rather flexible tubules, which dehisce by elongate introrse clefts. The tubules are typically about as long as or twice as long as the sacs. Within the genus a sharp line may be drawn between those species with articulate calyces and those with continuous calyces. The value of this as a phylogenetic indication has been previously discussed. The number of species with continuous calyces is much smaller than that of species with articulate calyces. The small group has been designated by Hoerold as the subgenus *Agathothibaudia*; it is well marked, and probably represents the derivative section of the genus, since a vast majority of species in the tribe as a whole have articulate calyces and this predominant feature may best be considered the primitive one. The large group has been mentioned by authors as *Eurygania* Klotzsch and *Neothibaudia* Hoer., these two subgenera being maintained by Hoerold on the basis of the shape of the disk and the integrity or serration of the leaf margins. These characters are certainly of no value in the determination of subgenera, since they have only a specific and not a phylogenetic bearing. If the group that may be designated as *Eurygania* is to be divided at all, the best character seems to be whether the filaments are distinct or connate, in which point an incipient divergence is perceptible.

THEMISTOCLESIA

Along the same line of divergence observed in *Agathothibaudia* (with the calyx continuous) lies the small genus *Themistoclesia*.

The type species (*T. pendula*) has isomorphic stamens and on the basis of its flower structure might well be included in *Agathothibaudia*. But the remaining 5 species of the genus have more or less dimorphic stamens, and give rise to the questions whether *Themistoclesia* is a coherent genus, and whether dimorphism of stamens is a character of any phylogenetic value. As to the latter point, my conclusion has been that in *Cavendishia* and its allies dimorphism is an important feature (for reasons given below), but that in *Themistoclesia* and *Rusbya* it is a comparatively recent development, and that these genera have attained their present condition of dimorphism or subdimorphism through a thibaudioid line of evolution. That the species of *Themistoclesia* with dimorphic stamens and those with isomorphic stamens are congeneric is borne out by the two or three intermediate species and by the close agreement of all the species in geographic and habital characters. The habit of the plants is so characteristic (often epiphytic, with small subcordate leaves) that they are here maintained as distinct from *Agathothibaudia*; another reason is to avoid expanding the generic concept of *Thibaudia* to include any plants with dimorphic stamens. So, although the genus *Themistoclesia* is somewhat artificial, it is maintained as distinct in this treatment.

ANTHOPTERUS

The genus *Anthopterus* was considered by Hoerold a subgenus of *Thibaudia*, but it is so distinct in its winged calyces and corollas that there seems no ground for this combination, in view of modern conceptions of generic limits. In fact, *Anthopterus* is one of the few genera that any botanist can name by a glance at external structure. In its continuous calyx it suggests a descent from a thibaudioid ancestor along the line of *Agathothibaudia*, but it seems to have been distinct from the original *Thibaudia* strain longer than the previously mentioned group.

RUSBYA

The last genus that may be considered a fairly recent derivative of a *Thibaudia* stock is *Rusbya*, a monotypic genus from Bolivia. In flower structure this plant resembles *Themistoclesia*, having a continuous calyx and slightly dimorphic thibaudioid stamens. Its distinguishing feature is its linear leaves, a character found nowhere else in the tribe. Structures that apparently are true stipules are present here; they are to be found also in certain species of *Cerátostema*. Like *Anthopterus*, this is a genus that may be distinguished at a glance. It should be noted that the name is maintained only in regard to the type species, *R. taxifolia*.

MACLEANIA AND ITS ALLIES

This group of two large genera and one monotypic genus is closely allied to the *Thibaudia* group. The coherence of these genera and their point of divergence from a thibaudioid ancestor are best shown in the staminal structure. The anther sacs have become more obviously granular-surfaced, and the tubules are reduced in length and diameter. From the cylindrical, broad, and rather flexible tubule of the *Thibaudia* group has been derived a subconical, narrow, and stiffly erect tubule. Concomitantly, the corollas, instead of being cylindrical, have become as a rule urceolate, much contracted to a long narrow throat. The calyces are always articulated with the pedicels.

MACLEANIA

Macleania is one of the finest examples of a coherent genus from which other genera are in process of being derived. *M. nitida* may be taken as typical of the "average" for the genus; it has a cylindrical or campanulate calyx tube, an elongate-urceolate glabrous corolla, and stamens with distinct filaments and with two tubules laterally connate to the apex. In one trend of evolution the filaments have become connate and the tubules have tended to fuse, resulting in the group of species allied to *M. floribunda*. Concomitantly, in some species the calyx tube has become winged, the wings showing varying stages of development, reaching their maximum in *M. pentaptera*, which, however, is approached by *M. cordifolia*. In some specimens of *M. pentaptera*, notably those from the Dagua Valley of Colombia, the corolla lobes have become spurred. Were the intermediate forms (e. g., *M. pentaptera*, from Ecuador, and *M. cordifolia*) unknown, the Dagua specimens of *M. pentaptera* would constitute a genus in the most satisfactory sense of the word.

Another trend in the single-tubuled group is evident in *M. pubiflora* and culminates in *M. salapa*, namely, the development of a dense floral pubescence, the elongation of calyx lobes, the splitting of the filament tube into distinct filaments, and the loss of calyx wings. This species (*M. salapa*) might well be considered generically distinct, and is indeed the basis of *Tyria* Klotzsch.

On the other hand, from the typical *M. nitida* we have forms in which the tubules are distinct in varying degrees, or even to their bases (e. g., some specimens of *M. glabra*). In some of these specimens the connective is faintly thickened distally, a condition from which it is a slight step to the spurred connective of *Psammisia*. Here also are found modern species that it is difficult to place (*P. hookeriana*, *P. penduliflora*, etc.).

It is seen then that in the group known as *Macleania* are several clearly marked trends, resulting in incipient genera, which, if their evolution is carried on under ideal conditions, will eventually become quite distinct. These are typified by *M. nitida*, *M. floribunda*, *M. pentaptera*, *M. salapa*, and the group known as *Psammisia*. Whether among present-day species five genera or two or one are recognized is purely a matter of personal conception. It is here considered that the species so well known as *Psammisia* merit generic recognition, even though the transition from *Macleania* is quite traceable.

PSAMMISIA

Psammisia, as has been mentioned, has probably been derived from an ancestor resembling such modern species of *Macleania* as *M. nitida*. The tubules have remained distinct while retaining their typical elongate-conical shape, and the connectives, which are formed by the distal part of the filaments adhering to the anthers, have developed lateral spurs. Sometimes these are present on the alternate connectives only, sometimes on all the connectives, and rarely on one margin of a connective only. If all the connectives are spurred, there is a slight alternate difference in their shape and in the pronouncement of their spurs. The anthers are crowded into a ring, and a function of the spurs may be to hold the connectives closely coherent to one another.

Within the genus, a large part of the species seem to have maintained the primitive condition, with elongate and rather large corollas. A smaller group of about five species has developed short conical or almost spherical corollas with accompanying stout and short anthers. Several apparently unrelated species throughout the genus have developed partial fusion of calyx lobes.

MYCERINUS

In certain species of *Macleania* the calyx is winged, but the wings (or angles) are opposite the sinuses of the lobes. On Mount Duida, in southern Venezuela, is found a species in which the wings are opposite the lobes and continued to their apices. The relation of this species to the *Macleania* group is borne out by the stout anthers, with short subconical tubules. The tubules are distinct to the base, and are dorsally marked with distal elongations of the connective. To find such unusual features in a plant from this isolated region is not surprising; the species probably represents an early divergence from a primitive *Macleania* stock.

SIPHONANDRA AND ITS ALLIES

In the present group are placed 7 genera with about 30 species. As a whole the group is characterized by isomorphic stamens (except in some species of *Ceratostema*) and anthers usually much elongated, with slender tubules opening by very short introrse or apical pores. Its point of divergence from a thibaudioid ancestor is probably more ancient than that of the *Macleania* group. *Siphonandra*, although it is a small genus, is taken as the "mean" of its group because of its unmistakable characters and the consequent lack of ambiguity when we speak of "siphonandroid" features.

The 7 genera here mentioned are quite distinct among themselves; in fact, the relationships are so remote that their expression in a key or in a racial diagram is purely theoretical. This wide divergence lends weight to a supposition that these genera represent the ends of ancient and not very successful strains. A plausible reason for this racial failure may be found in the impractical length of the anther tubules and the small pores, which may have made pollen dispersal increasingly difficult. It may be pointed out that *Cavendishia*, *Macleania*, and other genera of the tribe, which have been successful from the viewpoints of geographic extent, number of species, and number of individuals, have short tubules and long clefts, permitting easy release of pollen. In the case of *Ceratostema*, the most successful genus included in the present group, most species have become modified toward this end.

SIPHONANDRA

The genus *Siphonandra* is easily recognized by the above-mentioned characters, the filaments firmly connate in a membranous tube, and the 10 anthers dehiscing through long slender tubules opening by strictly terminal pores. The trend toward apical pores here reaches its climax, and a condition is established that is found again only in *Lysiclesia* and some species of *Ceratostema* and *Orthaea* (where it was doubtless derived by distinct and somewhat parallel courses). In *Siphonandra* the calyx is always articulated with the pedicel.

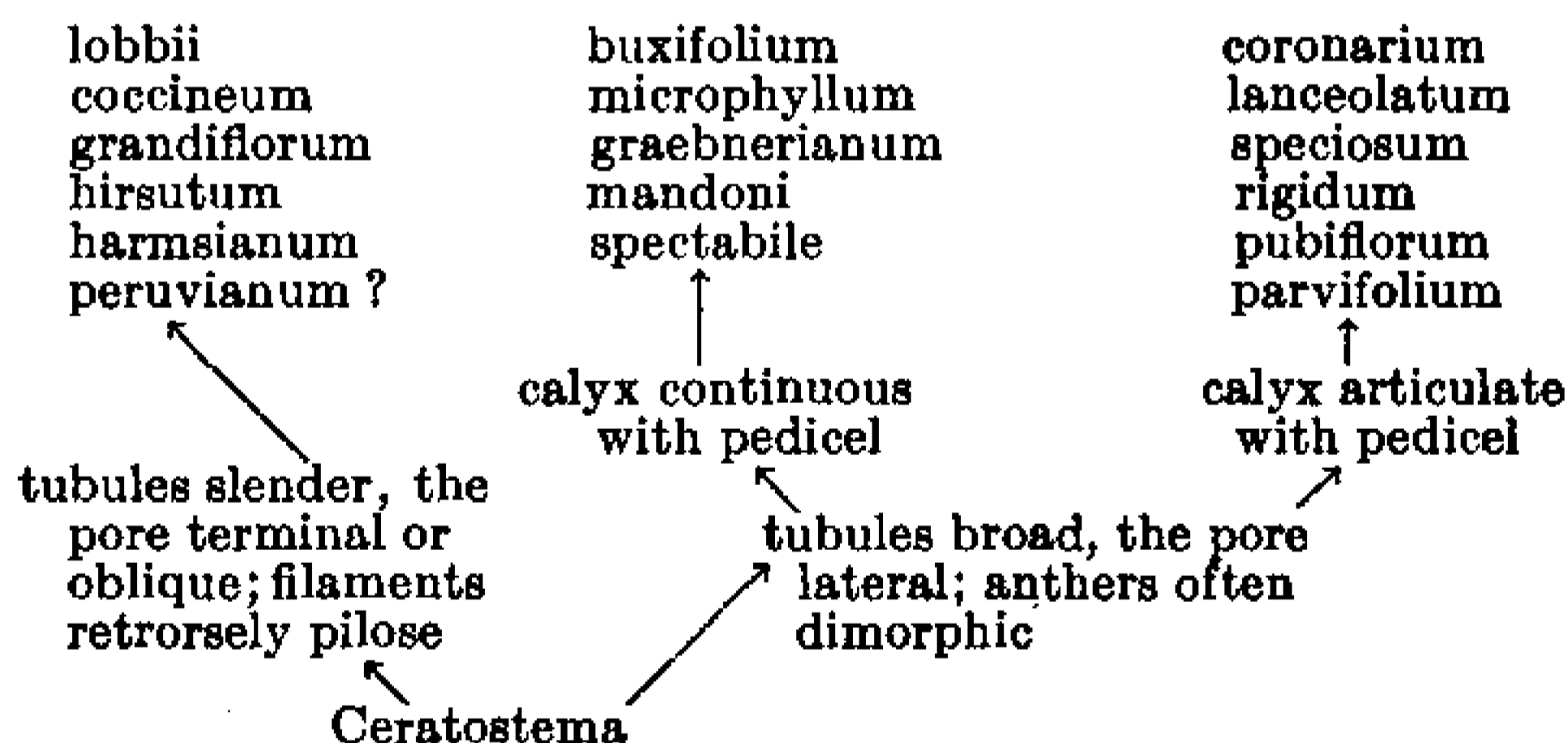
CERATOSTEMA

By all authors except Klotzsch the genera *Ceratostema* and *Siphonandra* have been combined under the former name. Hoerold, in his key to genera, separates *Ceratostema* from *Thibaudia* on the basis of its anther tubules being two to five times as long as the sacs and its stamens being exerted, characters that are not constant for the genus. Whether *Ceratostema* is to be considered a derivative

of a thibaudioid or a siphonandroid ancestor is a question not easy to decide.

On the one hand, there is in *Ceratostema* a group of five or six species with very slender tubules opening by terminal or subterminal pores. These species suggest an unmistakable relationship with *Siphonandra*, from which they differ by their continuous calyces with elongate lobes and their distinct filaments (which are strongly pilose with retrorse hairs). It is apparently the existence of these species that has led students to consider *Siphonandra* congeneric with the remaining species of *Ceratostema*.

On the other hand, the 11 or 12 species that form the second group of *Ceratostema* have anthers suggestive of *Thibaudia*, that is, with flexible tubules opening by clefts of more or less indeterminate length. They differ from *Thibaudia* by their elongate calyx lobes, their usually ample corollas, their elongate tubules, and the occasional presence of stamens of two lengths, as well as by occasional stipules and by habitual differences. In this group are found two trends, one in which the calyces are continuous with the pedicels, and one in which they are articulate, a difference which, as has been previously mentioned, is probably of secondary consequence. The relationship of existing species of *Ceratostema* to one another may be expressed in a diagram:



That the above-named species form a coherent genus is indicated by the existence of specimens more or less intermediate between the first and second groups. *C. lobbii* has oblique, almost elongate pores; *C. microphyllum* and *C. mandoni* have very slender tubules and clefts, which are short in young anthers. All the species have in common elongate calyx lobes and elongate tubules, so that to place them in different genera seems unwarranted.

As to origin, it has been shown that there is evidence for regarding *Ceratostema* as either a siphonandroid or a thibaudioid derivative. In either case, it must be concluded that a group of species has been considerably modified from the ancestral form. In view of the above

facts I am inclined to believe the genus more closely related to *Siphonandra* and its allies than to *Thibaudia*, but this conclusion can not be definitely established.

ENGLERODOXA

To the original species (*E. alata* Hoer.) two more are added in this treatment, both from the Ecuadorian Andes, where the genus seems to be endemic. It is characterized by a long angled corolla much swollen at the base, elongate corolla lobes, and long tubules dehiscing by oblique pores. Its alliance to the group of *Siphonandra* is apparent, but it can not be closely associated with any other genus.

GONOCALYX

Two species of the West Indies (*Thibaudia portoricensis* Urb. and *Vaccinium smilacifolium* Griseb.) have been placed in *Ceratostema* by Hoerold, but they must certainly be considered generically distinct. To these species may be added a third, *Gonocalyx pulcher* Planch. & Lind., which, although authentically published, has been consistently neglected. These three species form a group of generic value, agreeing with the preceding in having the filaments distinct but contrasting with it in having the corollas cylindric and the corolla lobes and anther sacs shorter.

PERICLESIA

The single species placed in this genus, which is here described as new, is quite distinct from all others of the group and is possibly less closely related to *Siphonandra* than to other genera of this relationship. It possesses siphonandroid stamens, but in calyx structure it is more suggestive of certain species of *Ceratostema*. Its membranous calyx lobes, reduced in number to four, are also suggestive of *Lysiclesia*, another previously undescribed genus near *Orthaea*.

SEMIRAMISIA

Semiramisia, with three species, has the largest and most beautiful corollas of any genus of the tribe. Its calyx is continuous with the pedicel and all its flower parts are much enlarged. To compare it with any other genus is difficult, but its source in a siphonandroid stock is certain.

OREANTHES

This monotypic genus is widely divergent from *Siphonandra*, which nevertheless is probably its closest living ally. It has devel-

oped elongate calyx lobes, broadly ovate corolla lobes, a reduction of stamens to five, and slightly oblique rather than terminal pores. In habit it is slender, with small elliptic leaves.

CAVENDISHIA AND ITS ALLIES

The remaining group of Thibaudieae consists of four genera that must have been isolated from the primitive thibaudioid stock for a long period, probably longer than any other group except *Lateropora* and *Notopora*. Also they have been long separated from one another, as brought out by the clear-cut generic characters and the lack of dubiously placed species. All the genera associated here have stamens of two lengths, usually quite distinctly so. In considering this character one of primitive importance perhaps too much emphasis is placed upon it, but this hypothesis is supported by secondary characters, such as the development of large bracts in *Cavendishia* and wide rigid tubules in the anthers of *Satyria*.

Within the group the genera are very distinct. Perhaps the most isolated is *Satyria*, in which the filaments are strictly connate, the anthers rigid and crowded, with narrow sacs and flaring tubules. To place this well-marked genus in the *Cavendishia* group is perhaps inadvisable; it may have been isolated from the thibaudioid strain even longer, and may have developed its dimorphic anthers independently. *Cavendishia*, the largest genus of the tribe, has flowers very similar to those of *Thibaudia*, especially in species in which the dimorphism is not pronounced. In a great majority of the species large bracts are present, surrounding the short young racemes, but the loss of these is not a mark of generic value and seems to have occurred here and there throughout the genus. The two remaining genera, *Orthaea* and *Lysiclesia*, have developed very short stamens, with unequal filaments and subequal anthers. The latter genus has, in place of the usual calyx lobes, three large membranous bracts. Possibly its phylogenetic history is too closely coupled with that of *Orthaea* in this treatment.

CAVENDISHIA

As above mentioned, this genus is superficially marked by the usual presence of large imbricate bracts, the development of which may be associable with the success of the genus. The stamens are frequently subequal, but invariably the filaments and anthers are compensatingly unequal. In shape of anther sacs and tubules the stamens are identical with those of most species of *Thibaudia*, a fact which led most of the earlier authors to describe the species under that genus, overlooking the dimorphic character. Possibly the

phylogenetic divergence of *Cavendishia* is more recent than I have indicated here.

ORTHAEA

This comparatively small genus has stamens much shorter than those of *Cavendishia*, with anthers subequal and filaments invariably unequal and practically free. The mode of dehiscence varies, terminal pores being present in some of the species. Large bracts are not present except in one or two species, in which they are distinctly cavendishoid, suggesting such a recent divergence as is here indicated.

LYSICLESIA

This genus of two species of apparently small range is here first described. The corollas and stamens are precisely like those of *Orthaea*, but a most unusual development of the calyx limb has taken place, the lobes being reduced in number to three and enlarged to membranous bractlike structures. Whether this development is more recent than the staminal structure, or whether it is ancient and the stamens have reached an orthaeoid condition independently, is an open question.

SATYRIA

Satyria is a very coherent genus of wide range. The filaments are always strictly connate, forming a tube on the margin of which the anthers are set at close intervals. The anthers are closely appressed to one another, the sacs leading into the tubules imperceptibly, the tubules themselves broader than the sacs and sometimes flaring. Although the filaments are necessarily equal, the anthers are alternately strictly unequal.

DESCRIPTIVE LIST, WITH KEYS

KEY TO AMERICAN GENERA

Anthers terminating in vestigial tubules, the tubules functionless, not exceeding 0.5 mm. in length, the anthers dehiscing by lateral clefts.

1. **LATEROPORA** (p. 333).

Anthers terminating in tubules, dehiscing by pores or clefts in the tubules.

Tubules opening by extrorse clefts..... 2. **NOTOPORA** (p. 334).

Tubules opening by introrse clefts or terminal pores.

Stamens approximately isomorphic, with filaments and anthers all the same length (slightly dimorphic in genera nos. 3, 15, and 16, alternately spurred in genus no. 12).

Tubules rigid, long, slender, about half as much in diameter as the anther sacs, opening by terminal or oblique pores (pores seldom more than one-tenth the length of tubules, except in some species of genus no. 3).

Stamens twice as many as calyx (10).

Calyx continuous with the pedicel.

Lobes of calyx elongate-triangular, more than 2 mm. long; filaments often densely tomentose with retrorse hairs.

3. **CERATOSTEMA** (p. 335).

Lobes of calyx broadly triangular or apiculate, not more than 1.5 mm. long; filaments glabrous or minutely puberulous.

Tubules 3 or 4 times as long as anther sacs; corolla ample, cylindrical-campanulate, the lobes triangular, as broad as long.

4. **SEMIRAMISIA** (p. 348).

Tubules slightly longer than anther sacs; corolla cylindrical or prismatic, the lobes lanceolate, twice as long as broad.

5. **ENGLERODOXA** (p. 350).

Calyx articulate with the pedicel.

Filaments distinct (sometimes slightly coherent at base).

Corolla swollen at base, deeply cleft, the lobes lanceolate, at least one-fifth the total length; anther sacs elongate, 5.5 to 16 mm. long-----

5. **ENGLERODOXA** (p. 350).

Corolla tubular-cylindrical, shallowly cleft; anther sacs short, 2 to 4 mm. long-----

6. **GONOCALYX** (p. 352).

Filaments connate for nearly their entire length.

Calyx lobes 5, small, not more than 2 mm. long; tubules opening by strictly terminal pores--

7. **SIPHONANDRA** (p. 355).

Calyx lobes 4, large, 20 to 25 mm. long; tubules opening by oblique pores-----

8. **PERICLESIA** (p. 357).

Stamens the same number as calyx lobes (5).

9. **OREANTHES** (p. 358).

Tubules wide, not much narrower than anther sacs, opening by elongate pores or lateral clefts (openings usually one-third the length of tubules or more, slightly shorter in genus no. 15).

Anther sacs very granular; tubules elongate-conical, rigid.

Calyx winged, each wing continuing to the apex of a lobe; connective divided, sending a branch up each tubule dorsally to its summit-----

10. **MYCERINUS** (p. 359).

Calyx cylindrical or angled or winged (in which case the wings are opposite the sinuses); connective terminating at base of tubules.

Connectives unspurred; tubules united or distinct and often laterally connate (sometimes distinct to their bases).

11. **MACLEANIA** (p. 360).

Connectives alternately 2-spurred (sometimes all spurred); tubules distinct to their bases-----

12. **PSAMMISIA** (p. 384).

Anther sacs smooth or slightly granular; tubules cylindrical, flexible.

Leaves variously shaped, several-nerved; stipules lacking (sometimes present in genus no. 3).

Calyx lobes short-triangular; corolla narrowly cylindrical; tubules less than twice as long as the sacs (rarely longer).

Corolla winged, the wings obvious, corresponding to the lobes, membranous, with a vein running parallel to the outer margin-----

13. **ANTHOPTERUS** (p. 406).

Corolla cylindrical or slightly angled.

Calyx articulate with pedicel-----

14. **THIBAUDIA** (p. 410).

Calyx continuous with pedicel.

Stamens all the same length; leaves large, variously shaped, usually cuneate at base.

14. **THIBAUDIA**, sect. *Agathothibaudia* (p. 410).

Stamens usually of two lengths (in some species apparently isomorphic); leaves small, subcordate or truncate at base_____ 15. **THEMISTOCLESIA** (p. 439).

Calyx lobes lanceolate-triangular; corolla ample; tubules 3 to 5 times as long as the sacs_____ 3. **CERATOSTEMA** (p. 335).

Leaves lanceolate, 1-nerved, about 10 times as long as broad; stipules present_____ 16. **RUSBYA** (p. 445).

Stamens obviously of two lengths, the filaments or anthers or both alternately unequal.

Filaments unequal, distinct, or coherent in lower portion only.

Anthers unequal (rarely subequal); stamens nearly as long as corolla (at least half as long); large bracts usually present (but completely lacking in some species)_____ 17. **CAVENDISHIA** (p. 446).

Anthers equal; stamens about one-third as long as corolla; bracts rarely large.

Calyx with 5 short triangular lobes_____ 18. **ORTHAEA** (p. 509).

Calyx with 3 lanceolate-ovate lobes, the lobes bractlike, 25 mm. long or more_____ 19. **LYSICLESIA** (p. 517).

Filaments equal, connate for their entire length.

20. **SATYRIA** (p. 519).

1. **LATEROPORA** A. C. Smith, gen. nov.

Calyx cum pedicello articulatus, tubo campanulato, limbo erecto-patente 5-lobato. Corolla late cylindrica 5-lobata. Stamina 10 quam corolla leviter breviora, filamentis distinctis sicut connectivis dense tomentosis, antheris robustis basi protrusis rimis latis lateralibus dehiscentibus, tubulis rudimentariis. Arbor parva (vel frutex epiphyticus?), laminis coriaceis alternis breviter petiolatis pinnatinerviis. Flores in racemis brevibus paucifloris subterminalibus dispositi.

Calyx articulate with pedicel, the tube campanulate, the limb coriaceous, erecto-patent, 5-lobed, the lobes triangular; corolla coriaceous, broadly cylindric, 5-lobed, the lobes triangular, acute, pubescent within; stamens 10, slightly shorter than corolla; filaments coriaceous-carnose, distinct, attached to the anther dorsally a little below the middle; connective continuous with filament, densely tomentose, as also the upper part of the filament; anthers stout, oblong, granular, strongly curved, the lower one-third protruding horizontally ventrally, the tubules vestigial, the sacs dehiscing by broad lateral clefts extending from the apex at least as far as the angle (two-thirds of the anther length), probably the entire length with age; disk shallowly cup-shaped; ovary 5-locular; style stout, filiform, the stigma truncate.

Small tree (or possibly epiphytic shrub); leaves alternate, short-petioled, pinnate-veined; flowers in short few-flowered subterminal racemes, pedicellate, the pedicels short, with 2 to 4 ovate bractlets near base.

DISTRIBUTION: Known from a single species from Chiriqui Volcano in western Panama.

This is a remarkable and unmistakable genus, clearly marked from all others of the family by its laterally dehiscing anthers.

1. *Lateropora ovata* A. C. Smith, sp. nov.

Arbor parva (vel frutex epiphyticus?) generis characteribus; laminis ovatis basi attenuatis apice subacutis vel subobtusis pinnatinerviis; floribus ut supra descriptis.

Small tree (or possibly epiphytic shrub); branches and branchlets subterete, glabrous, striate, the bark of the branches grayish, of the branchlets brown; petioles thick (2 mm. in diameter), glabrous, about 6 mm. long; leaf blades firm, coriaceous, ovate, 7 to 10 cm. long, 4 to 6 (rarely to 8.5) cm. broad, glabrous, attenuate at base, decurrent on the petiole, subacute or subobtuse at apex, entire and narrowly revolute at margins, pinnate-veined, the secondary veins arcuate-ascending, 3 to 5 to a side, often oriented near base, the midvein and secondary veins plane or slightly impressed above, prominent beneath, the veinlets copiously reticulate, slightly raised on both surfaces; racemes terminal, the rachis stout (2.5 mm. in diameter), short (12 to 16 mm. long), bracteate at base, the bracts 4 to 6, broadly ovate, 4 to 5 mm. long and broad; pedicels stout (about 2 mm. in diameter), about 10 mm. long, bracteolate near base (bractlets 2 to 4, oblong-ovate, subacute or obtuse, 5 mm. long, 3 mm. broad), articulate with calyx; calyx tube campanulate, about 4 mm. long and 4 mm. in diameter at anthesis; limb about 5 mm. long including lobes, glabrous without, faintly pilose within distally, the lobes erect, triangular, subacute, 3 mm. long, 5 mm. broad, the sinuses acute; corolla broadly cylindrical-globose, about 8 mm. long, 7 to 8 mm. in diameter at middle, reduced at both ends, sparsely pubescent without at middle with scattered brown hairs about 0.6 mm. long, the lobes suberect, triangular, acute, 3 mm. long, 4.5 to 5 mm. broad at base, densely pubescent within with crowded white-tomentose hairs 0.5 to 0.7 mm. long; stamens 6 mm. long; filaments fleshy, pale yellow-pink, about 4 mm. long, 1.6 mm. broad across base, gradually reduced to 0.6 mm. at point of attachment, the basal one-third glabrous, the upper part densely tomentose (especially at the margins and dorsally, the ventral hairs fewer and shorter) with pale silky hairs up to 1 mm. long to which are often attached numerous minute brownish nodules (glands?) 0.05 mm. in diameter; connective resembling the filament, extending to about 1 mm. from the apex of the anther; anthers very granular, stout (about 2 mm. in diameter), 5 mm. long vertically, the base protruding horizontally about 2 mm.; tubules submembranous, vestigial on the summit of each anther sac, 0.3 to 0.5 mm. long; style about 7 mm. long.

Type in the U. S. National Herbarium, no. 677,631, collected in humid forest, at summit of Cerro de la Horqueta, Chiriquí, Panama, altitude 2,268 meters, March 18, 1911, by H. Pittier (no. 3234).

DISTRIBUTION: Known only from the type collection.

The collector's notes read: "A small tree, unless epiphytic; flowers greenish white." It is a unique and well-marked plant, as noted in the generic discussion.

EXPLANATION OF PLATE 1.—*Lateropora ovata*, from photograph of type sheet. About one-half natural size.

2. *NOTOPOREA* Hook. f. Icon. Pl. 12: 53. pl. 1159. 1876

Calyx tube obscurely articulate with pedicel, campanulate or cylindrical; limb erect, 5-lobed; corolla subcylindrical, 5-lobed, the lobes triangular, subacute; stamens 10, equal, nearly as long as corolla; filaments membranous, elongate, adherent to corolla for about half its length, attached to the anther dorsally

at base of tubules; anther sacs granular; tubules slightly shorter than sacs, opening by wide extrorse clefts; style about as long as corolla.

Low, slender shrubs with coriaceous pinnate-veined petioled leaves; flowers axillary, solitary or in pairs, pedicelled, densely brown-tomentose on all exterior surfaces.

DISTRIBUTION: Known only from the following species, which is apparently endemic to Mount Roraima, British Guiana.

This monotypic genus is clearly set off from all other Thibaudieae. The dorsally cleft tubules are unique, and the densely ferruginous-tomentose calyces and corollas are not duplicated elsewhere in the family. It is probably an ancient genus, which has long been isolated in the mountainous region of the Brazil-Guiana border. According to the original description and illustration, the filaments are very short and attached high up on the corolla. However, dissection establishes the fact that they are unusually long, being firmly adherent to the corolla for nearly half its length.

1. *Notopora schomburgkii* Hook. f. Icon. Pl. 12:53. pl. 1159. 1876.

Low shrub; branchlets terete, slender, glabrous, cinereous; petioles subterete, rugose, glabrous, 6 to 8 mm. long; leaf blades thick-coriaceous, ovate, 5 to 7 cm. long, 2.5 to 3.5 cm. broad, acute at base, subacute or short-acuminate at apex, entire and slightly thickened at margins, glabrous and lustrous above, when young densely tomentose beneath with short brown hairs, becoming glabrous, pinnate-veined, the midvein slightly impressed above, raised beneath, the secondary veins 3 or 4 to a side, spreading, plane on both surfaces, the veinlets reticulate, plane; flowers solitary or in pairs, axillary, densely brown-tomentose on all exterior surfaces with hairs up to 1 mm. long; pedicels subterete, 2 to 5 mm. long, obscurely bibracteolate, obscurely articulate with calyx; calyx (including tube and limb) about 10 mm. long and 7 mm. in diameter at summit, the lobes triangular, subacute, about 1.5 mm. long; corolla 10 to 16 mm. long, about 6 mm. in diameter; filaments slender, dark castaneous, closely adherent to corolla and appearing fused with it, about 7 mm. long, attached to anthers dorsally at bases of tubules; anther sacs strongly granular, about 3 mm. long; tubules wide, short-cylindric, distinct, about 2 mm. long, opening by wide extrorse clefts about as long; style filiform.

TYPE LOCALITY: British Guiana (doubtless vicinity of Mount Roraima). Type collected by Schomburgk (no. 566 [867]).

DISTRIBUTION: Vicinity of Mount Roraima, British Guiana and northern Brazil.

BRITISH GUIANA: *Schomburgk* 566 (867; K, type), 867 (B). "Our House," Mount Roraima, in *Thurn* 109 (N).

BRAZIL

AMAZONAS: Rio Cuquenam, near Mount Roraima, *Ule* 8669 (Go).

The title of the page on which the original description appears is "Notopora Schomburgkiana." However, the specific name "*schomburgkii*" is applied to the actual description and also to the illustration; and since the type specimen was actually collected by Schomburgk, this form of the name may be preferred.

3. **CERATOSTEMA** Juss. Gen. Pl. 163. 1789

Calyx tube continuous or articulate with pedicel, obconical or campanulate; limb suberect, 5 (rarely 6) lobed, the lobes elongate-triangular or triangular, usually distinctly veined; corolla subcylindric, ample, glabrous or pilose, 5 (rarely 6) lobed, the lobes triangular or elongate-triangular; stamens 10, equal or alternately slightly unequal, nearly as long as corolla or slightly

exserted; filaments distinct, equal or alternately slightly unequal, attached to the anther dorsally near its base, often retrorsely pilose; anthers submembranous, the sacs slightly granular or nearly smooth, the tubules 3 to 5 times longer than the sacs (sometimes twice as long), opening by terminal pores or narrow elongate introrse clefts; style filiform, as long as corolla or slightly exserted.

Compact usually epiphytic shrubs with small, coriaceous, alternate, obscurely nerved, petioled leaves; inflorescence axillary; flowers solitary or in fascicles of 2 or 3, pedicelled, the pedicels deciduously hibracteolate.

DISTRIBUTION: Andes from Colombia to Bolivia, usually at high elevations. Sixteen species are described in this treatment and in addition there are five names which I am unable to place.

As mentioned in the discussion of generic relationships, this group is of doubtful ancestry but is easily recognized by its large calyx lobes. *C. peruvianum* Gmel. is the type species.

KEY TO THE SPECIES

Calyx continuous with pedicel (Peru and Bolivia).

Filaments densely tomentose dorsally with retrorse hairs; tubules opening by terminal or oblique pores (by short clefts in no. 1).

Calyx lobes ovate-lanceolate, 7 to 10 mm. long.

Corolla about 2 cm. long; tubules about twice as long as anther sacs, opening by short clefts----- 1. *C. lobbii*.

Corolla 4 to 5 cm. long; tubules 3 or 4 times as long as anther sacs, opening by terminal pores----- 2. *C. coccineum*.

Calyx lobes ovate-deltoid, 3 to 6 mm. long.

Corolla up to 4 cm. long (rarely 2 to 2.5 cm. long); tubules 3 or 4 times as long as sacs.

Leaves 1.5 to 4 cm. long; base of anthers obtuse— 3. *C. grandiflorum*.

Leaves 3.5 to 5.5 cm. long; base of anthers produced into an acute tip----- 4. *C. hirsutum*.

Corolla 2 cm. long or less; tubules less than twice as long as sacs.

5. *C. harmsianum*.

Filaments pilose with spreading hairs; tubules opening by lateral clefts.

Corolla glabrous.

Pedicels longer than flowers (corolla about 10 mm. long).

6. *C. buxifolium*.

Pedicels shorter than flowers (corolla 18 to 30 mm. long).

Leaves usually shorter than pedicels (leaves 8 to 15 mm. long, rarely more)----- 7. *C. microphyllum*.

Leaves usually longer than pedicels (leaves about 15 to 25 mm. long).

8. *C. graebnerianum*.

Corolla pilose, the hairs usually dense, pale, about 0.2 mm. long.

Flowers slender; corolla 20 to 30 mm. long----- 9. *C. mandoni*.

Flowers ample; corolla 35 to 50 mm. long----- 10. *C. spectabile*.

Calyx articulate with pedicel (Colombia and Ecuador).

Flowers small (corolla about 10 mm. long, slightly longer than pedicels); leaves 12 to 15 mm. long----- 11. *C. coronarium*.

Flowers larger (corolla 15 to 30 mm. long, about 3 times as long as pedicels); leaves rarely less than 15 mm. long.

Leaves lanceolate, attenuate at base----- 12. *C. lanceolatum*.

Leaves oblong or ovate, truncate or subcordate at base.

Leaves 6 to 10 cm. long----- 13. *C. speciosum*.

Leaves up to 4 cm. long.

Corolla glabrous, 25 to 32 mm. long at maturity----- 14. *C. rigidum*.

Corolla pilose (hairs pale, about 0.3 mm. long), 15 to 25 mm. long at maturity.

Calyx lobes lanceolate, 6 to 9 mm. long----- 15. *C. pubiflorum*.

Calyx lobes ovate-deltoid, 2 to 3 mm. long----- 16. *C. parvifolium*.

1. *Ceratostema lobbii* A. C. Smith, sp. nov.

Frutex; ramulis decidue puberulis; laminis ovato-oblongis basi subcordatis apice obtusis utrinque decidue breviter pilosis obscure 5-ple-nerviis; floribus extus pilosis axillaribus solitariis vel in fasciculis parvis; calyce cum pedicello continuo campanulato vel obprismatico, limbo suberecto 5-lobato, lobis ovatis; corolla tenuiter carnosae cylindrica, lobis lanceolatis; staminibus aequalibus, filamentis distinctis extus retrorse pilosis, tubulis longis gracilibus quam loculis duplo longioribus.

Shrub; branchlets terete, brownish, deciduously puberulous with pale hairs up to 0.3 mm. long; stipules frequently present, aristate, 2 to 3 mm. long; petioles subterete, sparsely pilose, 1 to 2 mm. long; leaf blades ovate-oblong, 3.5 to 4.5 cm. long, 1.2 to 2 cm. broad, thin-coriaceous, subcordate at base, obtuse at apex, entire at margins, glabrous or deciduously short-pilose (hairs up to 0.5 mm. long) on both surfaces, obscurely 5-ple-nerved, the midnerve plane or slightly impressed above, raised beneath, the secondary nerves obscure above, slightly raised beneath, the veinlets obscurely reticulate; flowers axillary, solitary or in fascicles of 2 or 3, pilose on all external surfaces with pale spreading hairs up to 0.5 mm. long; pedicels slender, 5 to 12 mm. long, circumscribed at base by several lanceolate bractlets 2 to 3 mm. long, continuous with calyx; calyx tube campanulate or obprismatic, 2 mm. long and 3 mm. in diameter at anthesis; limb 9 to 10 mm. long including lobes, the lobes ovate, acute, several-veined, membranous, about 9 mm. long, 4 to 5 mm. broad; corolla thin-carnose, cylindric, 20 to 22 mm. long; about 5 mm. in diameter, the lobes lanceolate, sometimes spreading, 4 to 6 mm. long, 1.5 to 2 mm. across; stamens equal, about 21 mm. long; filaments about 2 mm. long, densely pubescent with stiff, matted, pale brown retrorse hairs about 0.5 mm. long, continued into slender connectives; anther sacs nearly smooth, narrowed at base, about 7 mm. long; tubules erect, slender, about 14 mm. long, opening by introrse oval clefts less than 1 mm. long; style about as long as corolla, the stigma truncate.

Type in the herbarium of the Royal Botanic Gardens, Kew, collected in "Columbia" (probably in Peru) by W. Lobb (no. 252).

DISTRIBUTION: Doubtful; known only from the type collection.

Although the specimen here described is labeled "Columbia," it is so closely related to the following Peruvian species that I am certain it also is native in the Peruvian Andes. Many of Lobb's specimens bear this erroneous inscription. The present species and the four following form a very distinct group of *Ceratostema*, as mentioned in the discussion of generic relationships at the beginning of this paper, characterized by very slender tubules with small pores and by retrorsely tomentose filaments. From its allies, *C. lobbii* is distinguished by its long calyx lobes, short corollas, and comparatively short tubules opening by short clefts.

EXPLANATION OF PLATE 2.—*Ceratostema lobbii*, from photograph of type sheet. About one-half natural size.

2. *Ceratostema coccineum* Hoer. Bot. Jahrb. Engler 42: 317. 1909.

Shrub about 1 meter high, often epiphytic; branchlets subterete and glabrous when old, when young grooved and loosely pilose; petioles stout (1 mm. in diameter), about 2.5 mm. long, sparsely pilose or glabrescent; leaf blades thick-coriaceous, oblong or ovate-oblong, 3 to 4 cm. long, 1 to 1.5 cm. broad, rounded at base, obtuse or subacute at apex, entire, slightly thickened, and somewhat revolute at margins, glabrous or sparsely short-pilose on both surfaces, sometimes sparsely punctate, pinnate-veined, the midvein impressed above, prominent beneath, the secondary veins plane, obscure, 2 to 4 to a side, oriented near base; flowers axillary, solitary or in fascicles of 2 or 3; pedicels stout (about 1.3 mm. in diameter), 10 to 23 mm. long, rugose, pubescent with pale spreading hairs about 0.25 mm. long, circumscribed at base by several ovate ciliate-margined bractlets about 2 mm. long, continuous with calyx; calyx tube obconical, 4 to 7 mm. long, about 5 mm. in diameter at summit, pubescent as the pedicel; limb subcoriaceous, suberect, 8 to 12 mm. long, sparsely pilose, the lobes lanceolate-triangular, acute, 7 to 10 mm. long, 3 to 4 mm. across base; corolla carnose, glabrous, or sparsely pilose (hairs pale, about 0.2 mm. long), cylindrical, subinflated, 40 to 50 mm. long when mature, about 8 mm. in diameter, the lobes triangular, acute, 3 to 5 mm. long and 4 mm. across base; stamens isomorphic, about 45 mm. long; filaments about 6 mm. long, 0.5 mm. wide, densely pubescent dorsally with fuscous straight appressed retrorse hairs about 0.4 mm. long, attached to the anther dorsally near its base; anther sacs nearly smooth, 8 to 11 mm. long, produced at base; tubules erect, slender (0.4 to 0.5 mm. in diameter), about 35 mm. long, flaring at apex and opening by apical pores, the pores 0.5 mm. in diameter, sometimes lacerated at margin; style slightly exerted, about 0.6 mm. in diameter.

TYPE LOCALITY: East of Palca, Department of Junín, Peru, altitude 3,400 to 3,600 meters. Type collected by Weberbauer (no. 2505).

DISTRIBUTION: Andes of central Peru, altitude 2,300 to 4,000 meters.

PERU.

HUÁNUCO: Huánuco, *Macbride & Featherstone* 2163 (F, N). Cani, *Macbride* 3544 (F). Tambo de Vaca, *Macbride* 4376 (F).

JUNÍN: East of Palca, *Weberbauer* 2505 (B, type).

This is a species with beautiful large flowers, distinguishable from the preceding on the characters mentioned in the key. Anthers of the type specimen do not show the tubules, which are described by Hoerold as "poro elongato vel rima parva dehiscentes." However, this is doubtful, since in all other characters the type agrees with other collections here cited.

3. *Ceratostema grandiflorum* R. & P. Fl. Peruv. Chil. 4: pl. 383. 1802.

Ceratostema longiflorum Lindl.; Lem. Fl. Serr. Jard. I. 4: 346b. pl. 353. 1848.

Ceratostema urbanianum Hoer. Bot. Jahrb. Engler 42: 319. 1909.

Low shrub; branchlets subterete, cinereous, glabrous or minutely puberulous; stipules sometimes present, aristate, about 3 mm. long; petioles subterete, deciduously pilose, 1 to 2 mm. long; leaf blades ovate or ovate-oblong, 1.5 to 3 cm. long, 0.7 to 1.2 cm. broad, rigidly coriaceous, subcordate or rounded at base, subacute or obtuse at apex, entire at margins, glabrous or deciduously short white-pilose, obscurely 3 to 5 nerved from base, the midnerve slightly impressed above, raised beneath, the secondary nerves obscure; flowers axillary, solitary or in fascicles of 2 or 3, frequently short-pilose (hairs about 0.3 mm. long) on all external surfaces, becoming glabrous; pedicels slender, 5 to 15 mm. long, circumscribed at base by several oblong pilose bracts about 2 mm. long, continuous with calyx; calyx tube broadly campanulate or obconical,

rugose, 2 to 3 mm. long, 4 to 5 mm. in diameter at anthesis; limb erecto-patent, 5 to 7 mm. long including lobes, the lobes 5 or 6, triangular-ovate, acute, 4 to 6 mm. long, 3 to 4 mm. broad; corolla thin-carnose, cylindrical, 2 to 4 cm. long, about 6 mm. in diameter, 5 or 6 lobed, the lobes triangular, about 1.5 mm. long; stamens equal, 20 to 30 mm. long; filaments about 3 mm. long, densely pubescent with matted retrorse hairs about 0.5 mm. long, continued into slender connectives; anther sacs nearly smooth, 5 to 6 mm. long; tubules slender, erect, 12 to 25 mm. long, opening by apical or slightly oblique pores; style frequently exerted, the stigma truncate.

TYPE LOCALITY: Andes of central Peru. Type collected by Ruiz and Pavon (or by Dombey?).

DISTRIBUTION: Andes of central Peru, altitude 2,800 to 3,700 meters.

PERU: Huasa-Huasi, *Dombey* (B, type collection?). "Jameson" (K). "Columbia," *Lobb* 3 (K).

HUÁNUCO: Muña, *Pearce*, in May, 1863 (K). Mito, *Macbride* 3361 (F).

JUNÍN: Huacapistana, *Weberbauer* 2202 (B, type of *C. urbanianum*).

Among the above specimens there is some variation in the degree of floral pubescence, a character which in this case seems to be dependent upon maturity. The Lobb specimen is probably erroneously labeled, and the Jameson specimen, which must have come from Peru, may not have been his own collection.

4. *Ceratostema hirsutum* R. & P. Fl. Peruv. Chll. 4: pl. 383. 1802.

Ceratostema cordifolium Dun.; DC. Prodr. 7: 553. 1839.

Thibaudia hirsuta R. & P.; DC. Prodr. 7: 553. 1839, as synonym.

Slender shrub; branchlets terete, cinereous, glabrous; stipules usually present, about 3 mm. long; petioles rugose, 2 to 4 mm. long, nigrescent, glabrous; leaf blades oblong or ovate-oblong, 4 to 5.5 cm. long, 1.5 to 2.5 cm. broad, coriaceous, subcordate at base, acute at apex, entire and slightly revolute at margins, glabrous on both surfaces or sparsely brown-pilose beneath, obscurely 5 to 7 pli-nerved, the midnerve slightly impressed above, raised beneath, the secondary nerves oriented near base, ascending, plane or slightly raised beneath; flowers axillary, solitary or in pairs; pedicels 8 to 12 mm. long, slender, pilose with pale spreading hairs up to 0.2 mm. long, circumscribed at base by several oblong acute fimbriate bractlets 2 to 3 mm. long, continuous with calyx; calyx tube subrugose, campanulate or broadly obconical, 2 to 2.5 mm. long, 3 to 4 mm. in diameter at anthesis; limb suberect, pilose or glabrescent, 4 to 4.5 mm. long including lobes, the lobes ovate, short-acuminate, about 4 mm. long and 3 mm. broad; corolla thin-carnose, subcylindrical, glabrous, up to 35 mm. long, 5 mm. in diameter; stamens equal, about 30 mm. long; filaments 2 to 3 mm. long, densely pubescent with matted retrorse hairs about 0.5 mm. long, continued into slender connectives; anther sacs nearly smooth, about 6 mm. long; tubules slender, erect, about four times longer than the sacs, opening by apical or slightly oblique pores; style as long as corolla, the stigma truncate.

TYPE LOCALITY: Near Muña, Department of Huánuco, Peru. Type collected by Ruiz and Pavon (?).

DISTRIBUTION: Known only from the type locality, altitude about 8,700 meters.

PERU.

HUÁNUCO: Muña, *Pearce*, in June, 1863 (K).

This species is very close to the last, but differs slightly in leaf shape, which character, combined with the acute anther sacs, seems of specific value.

5. *Ceratostema harmsianum* Hoer. Bot. Jahrb. Engler 42:317. 1909.

Low shrub; branchlets subterete, swollen at the bases of petioles, cinerous, essentially glabrous; stipules aristate, about 2 mm. long, deciduous; petioles rugose, glabrous, subnigrescent, 2 to 3 mm. long; leaf blades ovate-oblong, 12 to 17 mm. long, 6 to 8 mm. broad, rigidly coriaceous, rounded or broadly cuneate at base, obtuse or subacute at apex, entire or shallowly crenate at margins, glabrous, obscurely 3 to 5 pli-nerved, the midnerve slightly impressed above, raised beneath, the secondary nerves obscure; flowers axillary, solitary or in pairs, short-pilose on all external surfaces (hairs pale, spreading, about 0.3 mm. long); pedicels 6 to 8 mm. long, circumscribed at base by several imbricate oblong acute bractlets about 2 mm. long, continuous with calyx; calyx tube campanulate, 3 to 3.5 mm. long, about 4 mm. in diameter at anthesis; limb erecto-patent, 4 mm. long including lobes, the lobes ovate-deltoid, acute, about 3 mm. long and 2 mm. across; corolla thin-carnose, cylindric, 16 to 19 mm. long by 5 mm. in diameter, the lobes deltoid, about 2 mm. long; stamens equal, about 18 mm. long; filaments 3 mm. long, densely pubescent with matted retrorse hairs about 0.5 mm. long, continued into slender connectives; anther sacs smooth, about 8 mm. long; tubules slender, longer than the sacs, opening by apparently apical pores; style as long as corolla, the stigma truncate.

TYPE LOCALITY: Monson, Department of Huánuco, Peru, altitude 3,300 to 3,500 meters. Type collected by Weberbauer (no. 3374).

DISTRIBUTION: Known only from the type collection.

PERU.

HUÁNUCO: Monson, *Weberbauer* 3374 (B, type).

Although the corolla is unusually short and the tubules are less elongate than usual, there is no doubt that this plant is a true *Ceratostema*, related to the two preceding species.

6. *Ceratostema buxifolium* Field. & Gardn. Sert. Pl. 1: pl. 7. 1844.

Thibaudia microphylla Lindl. Gard. Chron. 1848:23. 1848.

Themistoclesia buxifolia Klotzsch, Linnaea 24:42. 1851.

Small compact shrub; branchlets straight, striate, cinereous, glabrous, slightly swollen at petioles; stipules sometimes present, up to 2 mm. long; petioles slender, subrugose, 1 to 2 mm. long; leaf blades elliptic, 8 to 15 mm. long, 5 to 8 mm. broad, rigidly coriaceous, rounded or cuneate at base, rounded at apex, entire at margins, essentially glabrous, obscurely pli-nerved, the midnerve slightly impressed above, the secondary nerves immersed; flowers axillary, usually solitary, essentially glabrous in all parts; pedicels nigrescent, slender, flexuose, 10 to 20 mm. long, bibracteolate near base (bractlets lanceolate, 2 to 3 mm. long), continuous with calyx; calyx tube broadly obconical, rugose, about 1 mm. long and 2 mm. in diameter; limb spreading, 3 mm. long including lobes, the lobes ovate, apiculate, about 1.5 mm. long and 4 mm. across; corolla thin-carnose, subcylindric, 10 to 11 mm. long, about 4 mm. in diameter near base, gradually contracted above, the lobes deltoid, about 1 mm. long; stamens equal, 9 to 10 mm. long; filaments subnigrescent, about 2 mm. long, distally pilose, especially at margins, with spreading or ascending hairs about 0.2 mm. long, continued into short slender connectives; anther sacs dark castaneous, slightly granular, about 3.5 mm. long; tubules flexible, 5.5 mm. long, opening by wide clefts nearly as long; style as long as corolla, the stigma truncate or subpeltate.

TYPE LOCALITY: Monte de San José, Peru. Type collected by Mathews (no. 1176).

DISTRIBUTION: Andes of Peru.

PERU: *Maclean* (K). "Columbia," *Lobb* 2 (K, probably type of *Thibaudia microphylla*).

JUNÍN: Huacapistana, 3,000 to 3,100 meters, *Weberbauer* 2075 (B).

This is a pretty little species, without much superficial resemblance to the typical members of the genus. The Lobb collection, which is doubtless from Peru, is probably the type of *Thibaudia microphylla*, which was "raised from seeds gathered in Peru by Mr. William Lobb."

7. *Ceratostema microphyllum* Hoer. Bot. Jahrb. Engler 42:316. 1909.

Shrub 1 to 2 meters high; branchlets subglabrous, subterete when old, channeled when young, swollen at base of petioles; petioles stout (1 mm. in diameter), about 1.5 mm. long, puberulous with very short scattered hairs or glabrescent; leaf blades ovate or oblong-ovate, 8 to 17 mm. long, 6 to 10 mm. broad, rounded at base, acute at apex, entire and slightly thickened at margins, glabrous when old, when young sparsely white-pilose and with a few short appressed stiff brown hairs, obscurely 3 to 5 pinnately-veined, the midnerve slightly depressed above, prominent beneath; flowers numerous near ends of branchlets, solitary or in fascicles of 2 or 3; pedicels slender (about 0.6 mm. in diameter), 10 to 14 mm. long, subterete, glabrous or with a few scattered stiff brown hairs, circumscribed at base by numerous imbricate triangular ciliate-margined bractlets 2 to 3 mm. long, continuous with calyx; calyx tube obconical, 2.5 to 3 mm. long, about 2 mm. in diameter at summit, essentially glabrous; limb about 4 mm. long including lobes, the lobes triangular, acute, 2.5 to 3 mm. long, 2.5 mm. across base, sparsely pilose at margins; corolla essentially glabrous, cylindrical, about 25 mm. long and 4 mm. in diameter, the lobes elongate-triangular, subacute, about 5 mm. long and 2 mm. across base; stamens slightly dimorphic (due to difference in filaments), about as long as corolla; filaments 3 mm. and 4 mm. long respectively, about 0.4 mm. broad at base, densely white-pilose on all surfaces with spreading hairs about 0.2 mm. long, attached to the anther dorsally near its base; anther sacs granular, about 4.5 mm. long; tubules slender, about 19 mm. long, opening by elongate distal clefts of indefinite length; style about as long as corolla, about 0.3 mm. in diameter.

TYPE LOCALITY: Yanamanche, Department of Cuzco, Peru, altitude 3,400 meters. Type collected by *Weberbauer* (no. 4974).

DISTRIBUTION: Andes of southern Peru, altitude 3,300 to 3,700 meters.

PERU.

Cuzco: Yanamanche, *Weberbauer* 4974 (B, type). Cosñipata, *Weberbauer* 6928 (B, F). Marcapata, *Weberbauer* 7790 (F).

8. *Ceratostema graebnerianum* Hoer. Bot. Jahrb. Engler 42:315. 1909.

Shrub; branchlets glabrous, shallowly grooved when young, subterete when old, fuscous, swollen at base of petiole; petioles subterete, glabrous, about 2 mm. long; leaf blades oblong or ovate-oblong, 18 to 26 mm. long, 8 to 12 mm. broad, rounded or subcuneate at base, obtuse or subacute at apex, shallowly crenate at margins, glabrous above, sparsely brown-pilose or glabrous beneath, pinnately-veined, the midvein slightly impressed above, prominent beneath, the secondary veins 2 or 3 to a side, ascending, plane, oriented from midvein near base, the veinlets reticulate, obscure; flowers in fascicles of 2 or 3; pedicels subterete, glabrous, 8 to 12 mm. long, circumscribed at base by a few minute ovate glabrous bractlets, continuous with calyx; calyx tube obconical, about 3 mm. long and 3 mm. in diameter at summit; limb about 5 mm. long including lobes, the lobes lanceolate-triangular, acute, about 3 mm. long, marked with a few black branching subparallel longitudinal veins not quite reaching the margins, the margins sometimes faintly soft-ciliate; corolla bright red, cylindrical,

about 25 mm. long, 3 to 4 mm. in diameter, with a few scattered minute stiff brownish hairs, the lobes lanceolate, subacute, often reflexed, about 7 mm. long; stamens slightly shorter than corolla (alternately slightly dimorphic); filaments about 2.5 mm. and 3.5 mm. long, respectively, distally pubescent with pale substrigose hairs up to 0.3 mm. long, continued into a long slender nigrescent connective; anther sacs slightly granular, about 4 mm. long; tubules slender, about 19 mm. long, opening by short introrse clefts; style about as long as corolla, often exerted, the stigma truncate.

TYPE LOCALITY: Sandía, Department of Cuzco, Peru, altitude 3,100 to 3,300 meters. Type collected by Weberbauer (no. 742).

DISTRIBUTION: Eastern Cordillera of southern Peru and northern Bolivia, altitude 2,800 to 3,600 meters.

PERU: Gachapota, *Lechler* 2585 (K), 2693 (K).

Cuzco: Sandía, *Weberbauer* 742 (B, type). Lucumayo Valley, *Cook & Gilbert* 1310 (N). Cerro de Cusilluyoc, *Pennell* 14096 (F, N, Y).

BOLIVIA.

LA PAZ: Unduavi, *Buchtien* 31 (F, G, Y), 911 (F, N).

Compared with the last species this differs only by its larger leaves. There are more or less intermediate specimens, and the specific identity of the two may well be questioned. Compared with the following species *C. graebnerianum* differs only by having its corollas glabrous rather than pilose. One of the specimens cited under *C. mandoni* (*Bang* 1939) has corollas sometimes pilose and sometimes quite glabrous, indicating that this character is not very trustworthy. The three names here discussed are questionably retained; were they not already established I should prefer to consider them as applying to forms of a single variable species. A local name for *C. graebnerianum* is "pucapinchu."

9. *Ceratostema mandoni* Britton, Bull. Torrey Club 20: 137. 1893.

Ceratostema pilgerianum Hoer. Bot. Jahrb. Engler 42: 318. 1909.

Ceratostema sanguineum Hoer. Bot. Jahrb. Engler 42: 318. 1909.

Shrub; branchlets subterete and glabrous when old, when young grooved and sparsely pilose, swollen at bases of petioles; stipules usually present; petioles subterete, stout (1 mm. in diameter), about 2 mm. long, glabrescent; leaf blades thick-coriaceous, oblong or ovate-oblong, 13 to 28 mm. long, 6 to 13 mm. broad, subcuneate or rounded at base, obtuse or subacute at apex, subentire and slightly thickened at margin, glabrous or sparsely pilose on both surfaces, pinnate-veined, the midvein slightly impressed above, prominent beneath, the secondary veins obscure, oriented near base; flowers axillary or in groups of 2 or 3; pedicels stout (about 1 mm. in diameter), 5 to 15 mm. long, densely pubescent (hairs pale, spreading, about 0.4 mm. long), circumscribed at base by a few oblong acute pilose bractlets about 1.5 mm. long, continuous with calyx; calyx tube obconical, 2 to 3 mm. long, about 2 mm. in diameter at summit, pubescent as the pedicel; limb suberect, 5 to 7 mm. long, pilose (hairs somewhat shorter and sparser than those of the tube), the lobes lanceolate, short-acuminate, 4 to 5 mm. long, about 2 mm. broad at base, with a few subparallel branching veins; corolla thin-carnose, densely pilose (hairs pale, spreading, about 0.25 mm. long), cylindric, subinflated, 20 to 30 mm. long when mature, 6 to 8 mm. in diameter, the lobes elongate-triangular, short-acuminate, 4 to 5 mm. long, 2 mm. across base; stamens 18 to 27 mm. long, approximately equal in length, the alternate filaments and anthers compensatingly unequal; filaments about 3 mm. and 3.5 mm. long, respectively, densely pilose distally on all surfaces (hairs spreading, pale brown, about 0.3 mm. long), attached to the anther dorsally

near its base; anther sacs nearly smooth, 5 to 6 mm. long; tubules slender, 13 to 20 mm. long, opening by elongate clefts; style about as long as corolla.

TYPE LOCALITY: Mapiri, Department of La Paz, Bolivia, altitude about 3,100 meters. Type collected by Rusby (no. 2632).

DISTRIBUTION: Eastern Cordillera of southern Peru and northern Bolivia, altitude 2,700 to 3,600 meters.

PERU.

Cuzco: Sandía, *Weberbauer* 742a (B, type of *C. pilgerianum*). Between Sandía and Myomyo, *Weberbauer* 889 (B, type of *C. sanguineum*).

Cedrobamba, *Heller* 2186 (N). Valle de Santa Ana, *Bues* 2114 (N, Y).

BOLIVIA: *Bang* 1939 (F, G, N, Y). Pelichuco, *Pearce*, in December, 1864 (K).

Tacacoma, *Mandon* 548 (G, N). Tablas, *Herzog* 2147 (B).

LA PAZ: Mapiri, *Rusby* 2632 (Y, type). Cocopunco, *Tate* 312 (Y), 370 (Y).

The taxonomic standing of this species is discussed in connection with *C. graebnerianum*. In the original publication the type is erroneously cited as a Bang collection. The type of *C. pilgerianum* in the original publication is cited as *Weberbauer* 472a. I am unable to find any consequential differences among the three types here involved.

10. *Ceratostema spectabile* Rusby, Bull. N. Y. Bot. Gard. 4: 404. 1907.

Shrub; branchlets subterete, cinereous, soft-pilose with short spreading hairs when young, becoming glabrous, swollen at bases of petioles; petioles pilose as the branchlets, subterete, 2 to 3 mm. long; leaf blades oblong-ovate, 20 to 30 mm. long, 6 to 12 mm. broad, cuneate at base, obtuse at apex, entire and plane at margins, sparsely white-pilose on both surfaces (hairs about 0.4 mm. long), becoming glabrous, pinnate-veined, the midvein slightly impressed above, prominent beneath, the secondary veins 2 or 3 to a side, ascending, oriented from midvein near base, plane, obscure, the veinlets reticulate, obscure; flowers axillary, solitary or in fascicles of 2 or 3; pedicels terete, 6 to 10 mm. long, densely pubescent with pale spreading hairs about 0.4 mm. long, circumscribed at base by a few lanceolate pubescent bractlets up to 7 mm. in length, bibracteolate near middle, continuous with calyx; calyx tube obconical, about 5 mm. long and 4.5 mm. in diameter at summit, pubescent as the pedicel, the limb erect, about 6 mm. long including lobes, the lobes lanceolate-ovate, subacute, about 5 mm. long and 2.5 mm. across base; corolla bright red, densely pilose (hairs spreading, about 0.3 mm. long), cylindrical, 35 to 50 mm. long, 7 to 10 mm. in diameter, longitudinally veined, the lobes triangular, subacute, about 3 mm. long; stamens nearly as long as corolla, the alternate filaments and anthers compensatingly unequal; filaments about 3 mm. and 4 mm. long, respectively, densely pilose distally (hairs pale, spreading, about 0.3 mm. long), continued into a long slender connective; anther sacs slightly granular, about 5 mm. long; tubules slender, about 27 mm. and 26 mm. long, respectively, opening by elongate distal clefts of indefinite length; style about as long as corolla, the stigma truncate.

TYPE LOCALITY: Bolivia (probably Department of La Paz). Type collected by Bang (no. 2605).

DISTRIBUTION: Andes of Peru and Bolivia, altitude 3,000 to 3,600 meters.

PERU.

JUNÍN: Province Jauja, *Weberbauer* 6644 (B, F, N).

Cuzco: Lucumayo, *Pearce* (K).

BOLIVIA: *Bang* 2605 (F, G, N, Y, type).

LA PAZ: Unduavi, *Buchtien* 2979 (N, Y).

This is a species quite distinct from the preceding on the basis of its more robust habit, larger leaves, and larger flowers.

EXPLANATION OF PLATE 3.—*Ceratostema spectabile*, from photograph of type sheet. About one-half natural size.

11. *Ceratostema coronarium* Linden; Hook. f. Bot. Mag. Curtis 92: pl. 5575. 1866, as synonym.

Thibaudia coronaria Hook. f. Bot. Mag. Curtis 92: pl. 5575. 1866.

Themistoclesia coronilla Lind. & André, Illustr. Hort. 17: 176. pl. 33. 1870.

Low compact shrub; branchlets subterete or angled, stramineous, swollen at bases of petioles, when young laxly pilose, hairs about 0.4 mm. long; stipules lacking or early deciduous; petioles subterete, stramineous, essentially glabrous, 1 to 2 mm. long; leaf blades ovate, rigidly coriaceous, 11 to 15 mm. long, 6 to 8 mm. broad, rounded or broadly cuneate at base, rounded or obtuse at apex, entire at margins, glabrous on both surfaces or minutely brown-pilose beneath, obscurely 3-nerved from base, the midnerve slightly impressed above, raised beneath, the secondary nerves immersed; flowers axillary, solitary or in pairs; pedicels rugose, 7 to 10 mm. long, laxly pilose with pale hairs up to 0.5 mm. long, bibracteolate near base (bractlets lanceolate, about 1 mm. long, fimbriate), circumscribed at base by several imbricate ovate bracts up to 2 mm. long, obscurely articulate with calyx; calyx tube prismatic, strongly rugose, pilose as the pedicel, 2 to 2.5 mm. long, 2 to 3 mm. in diameter at anthesis; limb erecto-patent, submembranous, 2.5 mm. long including lobes, the lobes ovate-deltoid, about 2 mm. long, sometimes glandular-margined; corolla submembranous, essentially glabrous, subcylindric, 10 to 11 mm. long, 4 to 5 mm. in diameter, the lobes deltoid, about 1.5 mm. long; stamens, subequal, as long as corolla; filaments 2 mm. long, sparsely pilose at distal margins; anther sacs slightly granular, 3.5 mm. long; tubules flexible, about 6 mm. long, opening by elongate clefts; style filiform, about as long as corolla, the stigma truncate or subpeltate.

TYPE LOCALITY: Near Pamplona, Department of Norte de Santander, Colombia. Type a cultivated plant, introduced by Linden.

DISTRIBUTION: Known only from the type locality.

COLOMBIA.

NORTE DE SANTANDER: Near Pamplona, Linden (K, type). Páramo del Hatico, between Pamplona and Toledo, 2,900 meters, Killip & Smith 20663 (N, Y).

This species and the five following form a distinct group within the genus, separated from the more southern members by having the calyx articulate with the pedicel. The present species is quite distinct in the small size of all its parts.

12. *Ceratostema lanceolatum* Benth. Pl. Hartw. 142. 1844.

Low shrub; branchlets subterete, cinereous, soft-pilose with pale spreading hairs; stipules often present, aristate, 6 to 8 mm. long; petioles subterete, pilose, 2 to 4 mm. long; leaf blades lanceolate-oblong, 5 to 7 cm. long, 1 to 2 cm. broad, coriaceous, attenuate at base, acute at apex, entire and revolute at margins, scabridulous, pilose on both surfaces with pale spreading hairs about 0.5 mm. long, becoming glabrous above, pinnate-veined, the midvein impressed above, prominent beneath, the secondary veins 2 or 3 to a side, ascending, plane or obscure; flowers axillary, apparently solitary; pedicels rugose, stout, about 15 mm. long, laxly pilose (hairs pale, about 0.8 mm. long), circumscribed at base by several ovate bracts 2 to 4 mm. long, bibracteolate near base (bractlets lanceolate, 5 to 6 mm. long, pilose), obscurely articulate with calyx; calyx tube

obprismatic, carnose, winged to sinuses, 3 to 4 mm. long and about 5 mm. in diameter at anthesis, pilose as the pedicel; limb suberect, about 15 mm. long including lobes, subcoriaceous, the lobes lanceolate, about 13 mm. long and 5 mm. across base, sparsely pilose; corolla and stamens not seen in the type specimen but described as "sesquipollicaris, lobis lanceolatis acutis. Antherae vix corolla breviores"; style about 45 mm. long, the stigma truncate.

TYPE LOCALITY: Loja, Province of Loja, Ecuador. Type collected by Hartweg (no. 788).

DISTRIBUTION: Known only from the type collection.

ECUADOR.

LOJA: Loja, Hartweg 788 (K, type).

Although I have not seen a corolla of this species, it appears to belong in this section of the genus. From its allies it is easily distinguished by the leaf shape.

13. *Ceratostema speciosum* André, Illustr. Hort. 17:52. pl. 9. 1870.

Erect shrub; branchlets subterete, sparsely pubescent; petioles subterete, swollen, sparsely pubescent, 5 to 10 mm. long; leaf blades oblong or ovate-oblong, 6 to 10 cm. long, 2 to 3 cm. broad, cordate or subcordate at base, acute at apex, entire and narrowly revolute at margins, glabrous above, sparsely pubescent beneath, pinnate-veined, the secondary veins 3 or 4 to a side; inflorescence axillary, fasciculate, usually 3-flowered; pedicels terete, robust, curved, 12 to 20 mm. long, swollen distally and articulate with calyx; calyx tube obprismatic, short-pilose, 5-angled; limb suberect, about as long as tube, the lobes ovate-triangular; corolla carnose, subcylindric or narrowly 5-angled, 6 times longer than the calyx, glabrous; stamens slightly shorter than corolla, apparently equal; filaments glabrous; anther sacs granular; tubules slender, apparently about twice as long as sacs, opening by clefts; style about as long as corolla, the stigma truncate.

TYPE LOCALITY: Loja, Province of Loja, Ecuador. Type collected by Wallis.

DISTRIBUTION: Known only from the type collection.

I have not seen a specimen of this species, the above notes having been drawn up from the original description and the plate. The large leaves seem to distinguish it from related species.

14. *Ceratostema rigidum* Benth. Pl. Hartw. 220. 1846.

Shrub; branchlets subterete, brownish, slightly rugose; petioles stout (about 2 mm. in diameter), 3 to 4 mm. long, glabrous; leaf blades oblong or ovate-oblong, 3 to 4 cm. long, 1.5 cm. broad, cordate at base, rounded at apex, entire, thickened and slightly revolute at margins, glabrous above, sparsely pilose beneath (hairs scattered, appressed, brownish, about 0.5 mm. long), 5-nerved, the secondary nerves oriented from base or slightly above, with the mid-nerve slightly impressed above, somewhat prominent beneath, the veinlets obscure; inflorescence axillary toward ends of branchlets, 3 or 4 flowered; rachis about 5 mm. long, rugose; pedicels glabrous, striate, about 6 mm. long, deciduously bibracteolate near base, articulate with calyx; calyx tube obprismatic, rugose, short-pilose at base (hairs stout, about 0.3 mm. long), 3 mm. long and 3 mm. in diameter at summit at anthesis; limb about 13 mm. long including lobes, the lobes lanceolate, ovate, subacute, about 12 mm. long and 5 mm. across base, with several longitudinal freely branching veins not quite reaching the margins, the margins ciliate with stout brown hairs about 0.5 mm. long; corolla cylindric, about 32 mm. long, 7 to 11 mm. in diameter, essentially glabrous, viscid, the lobes triangular, subacute, about 2.5 mm. long; stamens slightly shorter than corolla, alternately slightly unequal; filaments connate at base, about 3.5 mm. and 4.5 mm. long, respectively, marginally pilose (hairs copious, about 0.3 mm. long), ventrally subpuberulous,

attached to the anther dorsally near its base; anther sacs slightly granular, about 5 mm. long; tubules wide, about 20 mm. and 19 mm. long, respectively, opening by short distal oblique clefts; style about as long as corolla, the stigma truncate.

TYPE LOCALITY: Laguna de Guanacas, Department of El Cauca, Colombia. Type collected by Hartweg (no. 1208*).

DISTRIBUTION: Central Cordillera of southern Colombia, altitude 3,300 to 3,700 meters.

COLOMBIA: *Lehmann* K172 (K).

EL CAUCA: Páramo de Santo Domingo, *Stuebel* 271a (B). Mount Pan de Azúcar, *Pennell* 7023 (Y).

This is a beautiful species with compact leaves and glossy viscous corollas.

15. *Ceratostema pubiflorum* Wedd. *Chlor. And.* 2: 181. 1855.

Shrub; branchlets subterete, fuscous, slightly puberulous, becoming glabrous; petioles glabrous, stout, about 1.3 mm. in diameter, 2 mm. long; leaf blades oblong or ovate-oblong, 13 to 18 mm. long, 10 to 13 mm. broad, cordate at base, rounded or obtuse at apex, entire and thickened at margins, glabrous above, essentially glabrous beneath, lustrous, obscurely 5-nerved, the secondary nerves oriented slightly above base, with the midnerve plane above, slightly prominent beneath, the veinlets obscure; flowers axillary, solitary (?); pedicels subterete, 3 to 4 mm. long, puberulous or glabrous, deciduously bibracteolate at middle, articulate with calyx; calyx tube subcylindric, glabrous, about 4 mm. long and 4 mm. in diameter; limb erect, about 9 mm. long including lobes, the lobes oblong-lanceolate, subacute, 8 to 9 mm. long, about 3 mm. broad, ciliate with minute stiff reddish-brown hairs up to 0.4 mm. long, the sinuses acute; corolla campanulate-cylindric, densely white-pilose (hairs about 0.2 mm. long), up to 24 mm. long, about 5 mm. in diameter, slightly contracted at throat, the lobes triangular, acute, less than 1 mm. long; stamens slightly shorter than corolla, alternately slightly unequal; filaments firmly connate in a ring, pubescent distally with stiff white hairs up to 0.4 mm. long, 3 mm. and 4 mm. long, respectively, attached to the anther dorsally near its base; anther sacs slightly granular, about 3.5 mm. long; tubules semiflexible, about 16 mm. and 17 mm. long, respectively, opening by distal introrse clefts 3 to 5 mm. long; style about as long as corolla, the stigma truncate.

TYPE LOCALITY: Province of Mariquita, Department of Tolima, Colombia, altitude 3,890 meters. Type collected by Linden (no. 918).

DISTRIBUTION: Central Cordillera of Colombia, altitude 3,500 to 3,900 meters.

COLOMBIA.

TOLIMA: Province of Mariquita, *Linden* 918 (K, type coll.).

CALDAS: Below Páramo del Quindío, *Pennell & Hazen* 10076 (N, Y).

From the following this species is distinguished by its exceptionally elongate calyx lobes.

16. *Ceratostema parvifolium* Benth. *Pl. Hartw.* 220. 1846.

Shrub; branchlets subterete, pubescent with pale spreading hairs about 0.5 mm. long when young, becoming glabrous; petioles subterete, rugose, about 1.2 mm. in diameter, about 2 mm. long, puberulous or glabrescent; leaf blades oblong or ovate-oblong, 20 to 35 mm. long, 9 to 15 mm. broad, cordate at base, rounded or obtuse at apex, entire and slightly revolute at margins, soft-pilose or glabrous above, pilose beneath (hairs pale, spreading, about 0.5 mm. long), becoming glabrous, obscurely 5-nerved, the midnerve slightly impressed above, prominent beneath, the secondary nerves oriented near base, plane, obscure; inflorescence axillary, subfasciculate, 2 to 5 flowered, circumscribed

at base by several deciduous oblong membranous bracts up to 5 mm. long; pedicels subterete, striate, 5 to 8 mm. long, densely and uniformly pilose (hairs pale, spreading, about 0.8 mm. long), deciduously bibracteolate near base (bractlets about 3 mm. long), articulate with calyx; calyx tube obprismatic, 3 to 4 mm. long, 3 to 4 mm. in diameter, pilose as the pedicel; limb 3 mm. long including lobes, the lobes triangular, acute, about 2 mm. long, pilose, especially at margins; corolla cylindric, about 15 mm. long and 6 mm. in diameter, pilose (hairs about 0.4 mm. long), the lobes triangular, acute, 2 mm. long; stamens slightly dimorphic, slightly shorter than corolla; filaments subconnate at base, about 1.5 mm. and 2.5 mm. long, respectively, pilose distally with white hairs up to 0.5 mm. long; anther sacs slightly granular, 2.5 to 3 mm. long; tubules about 7 mm. long, opening by distal introrse clefts 2 to 3 mm. long; style as long as corolla, the stigma truncate; fruit black, becoming glabrous, subspherical, up to 12 mm. in diameter, the calyx limb persistent.

TYPE LOCALITY: Laguna de Guanacas, Department of El Cauca, Colombia, altitude about 3,650 meters. Type collected by Hartweg (no. 1208).

DISTRIBUTION: Andes of Colombia.

COLOMBIA.

CUNDINAMARCA: Eastern páramos of Guasca, toward Gachetá, *Ariste Joseph B.* 112 (N).

I have not seen the type of this species, but the above cited specimen agrees well with the description.

DOUBTFUL SPECIES

CERATOSTEMA ANDREANUM Drake, Journ. de Bot. 3: 75. 1889.

TYPE LOCALITY: Huacapampa, northern Peru. Type collected by Poortmann (no. 222).

The type of this species is not available to me, but from the description, which emphasizes the lack of large calyx lobes, I conclude that it is not a species of *Ceratostema*. Possibly it is to be sought in *Cavendishia*. If so, it is a species not known to me.

CERATOSTEMA CHILLACOHENSE Danguy & Cherm. Bull. Mus. Hist. Nat. 28: 435. 1922.

TYPE LOCALITY: Chillacocha, Ecuador, altitude 3,500 meters. Type collected by Rivet (no. 772).

By the authors this species is compared with *C. harmsianum*, but inasmuch as the plant is from Ecuador and the description indicates an articulate calyx I am inclined to believe it related to the last five species listed in my key. I have not seen material referable to it.

CERATOSTEMA EMARGINATUM R. & P. Fl. Peruv. Chil. 4: pl. 384. 1802.

Thibaudia emarginata Dun.; DC. Prodr. 7: 561. 1839.

The plant pictured and described in the above references is certainly not a species of *Ceratostema*, and I am inclined to think it belongs in the tribe Vaccinieae, rather than Thibaudieae.

CERATOSTEMA OBLONGIFOLIUM Dun.; DC. Prodr. 7: 553. 1839.

TYPE LOCALITY: Peruvian Andes. Type not cited.

The description of this species, of which I have not seen the type, is too incomplete to permit speculation concerning its position.

CERATOSTEMA PERUVIANUM Gmel. Syst. Nat. 2: 676. 1791.

TYPE LOCALITY: Peru. Type collected by Joseph Jussieu.

Unfortunately I have not been able to see the type or a photograph of this species, which is the type of the genus and the earliest described plant of the

tribe Thibaudieae. The description applies equally well to any of the Peruvian species mentioned above, and possibly one of those names will eventually have to be supplanted by this.

4. **SEMIRAMISIA** Klotzsch, *Linnaea* 24:25. 1851

Calyx tube continuous with pedicel, obconical or narrowly angled to sinuses; limb suberect, the lobes 5, apiculate; corolla broadly campanulate, large, the lobes 5, triangular, acute; stamens 10, slightly shorter than corolla; filaments membranous, connate or distinct, attached to the anther dorsally near its base; anthers elongate, the sacs strongly granular, the tubules much longer than the sacs, opening by short introrse clefts; style filiform, nearly as long as corolla.

Slender shrubs, usually epiphytic, with small ovate leaves; leaves coriaceous, alternate, petioled, pli-nerved; flowers solitary or in pairs, axillary; pedicels stout, deciduously bracteolate below middle.

DISTRIBUTION: Andes from Venezuela to Peru. Three species are known, all of which seem comparatively rare and fairly local in distribution.

The beautiful large flowers, the continuous calyces, and the long slender tubules differentiate this genus from its allies. The genotype is *S. speciosa* (Benth.) Klotzsch.

KEY TO THE SPECIES

Filaments distinct; corolla 6 to 10 mm. in diameter (Venezuela).

1. *S. karsteniana*.

Filaments connate below middle; corolla usually more than 10 mm. in diameter (Ecuador and Peru).

Leaves ovate, 4 to 5 cm. broad, subcordate or truncate at base; calyx tube obprismatic, narrowly winged or angled..... 2. *S. speciosa*.

Leaves oblong-ovate, 2 to 4 cm. broad, cuneate at base; calyx tube obconical. 3. *S. weberbaueri*.

1. *Semiramisia karsteniana* Klotzsch, *Linnaea* 24:26. 1851.

Ceratostema karstenianum Hoer. Bot. Jahrb. Engler 42: 276. 1909.

Low slender shrub, probably epiphytic; branchlets subterete, cinereous or brownish, slender, glabrous; petioles terete, subrugose, about 2 mm. long, glabrous; leaf blades ovate or ovate-oblong, 6 to 9 cm. long, about 3.5 cm. broad, rounded at base, acuminate at apex, entire or slightly crenulate at margins, glabrous above, deciduously short-brown-pilose beneath, 5-pi-nerved, the secondary nerves oriented near base, ascending, with the midnerve slightly impressed above, raised beneath, the veinlets reticulate, slightly raised on both surfaces; flowers axillary, solitary (?); pedicels glabrous, subrugose, slender, about 20 mm. long, bibracteolate above middle with lanceolate bractlets about 2 mm. long, continuous with calyx; calyx tube obprismatic, carnose-angled to sinuses, 4 to 6 mm. long, 4 to 5 mm. in diameter at summit at anthesis, deciduously puberulous; limb subspreading, 2 to 3 mm. long including lobes, the lobes broadly ovate, about 1 mm. long and 5 mm. broad; corolla broadly cylindrical, membranous, glabrous or faintly puberulous, 35 to 45 mm. long, 6 to 10 mm. in diameter, slightly swollen at base, the lobes deltoid, 3 to 4 mm. long and broad; stamens equal, nearly as long as corolla; filaments distinct, about 4 mm. long and 1.5 mm. broad, distally pilose with pale spreading hairs about 0.2 mm. long, attached to the anther by short slender connectives; anther sacs incurved at base, 6 mm. long; tubules membranous, slender, about 30 mm. long, opening by oblique pores less than 1 mm. long; style about as long as corolla, the stigma truncate.

TYPE LOCALITY: Puerto Cabello, State of Carabobo, Venezuela. Type collected by Karsten (no. 169).

DISTRIBUTION: Known only from the type collection.

VENEZUELA.

CARABOBO: Puerto Cabello, *Karsten* 169 (B, type).

From the two remaining species of *Semiramisia* the present species is distinguished by its more slender flowers and distinct filaments.

2. *Semiramisia speciosa* (Benth.) Klotzsch, *Linnaea* 24: 25. 1851.

Thibaudia speciosa Benth. *Pl. Hartw.* 141. 1844.

Slender shrub, probably epiphytic; branchlets subterete, slender, flexuose, cinereous or brownish, glabrous; petioles subrugose, 2 to 4 mm. long, glabrous; leaf blades broadly ovate, 7 to 9 cm. long, 3 to 5 cm. broad, rounded or lightly subcordate at base, acuminate at apex, entire at margins, glabrous, 5 to 7 pinnate, the secondary nerves oriented near base, arcuate-ascending, with the midnerve plane above, slightly raised beneath, the veinlets copiously reticulate; flowers axillary, apparently solitary; pedicels striate, glabrous, 25 to 30 mm. long, deciduously bracteolate, continuous with calyx; calyx tube obprismatic, 5-angled or 5-winged to sinuses (wings carnose, up to 1 mm. broad), about 6 mm. long, 5 to 8 mm. in diameter at summit at anthesis, glabrous; limb subspreading, submembranous, reticulate-veined, 3 to 5 mm. long including lobes, the lobes broadly triangular, 1 to 2 mm. long, 6 to 8 mm. broad; corolla campanulate-cylindric, thin-carnose or submembranous, longitudinally veined, glabrous, 35 to 45 mm. long, 12 to 18 mm. in diameter, the lobes deltoid, 4 to 6 mm. long and broad; stamens nearly as long as corolla, equal; filaments connate in a short tube, glabrous, about 2 mm. long; anther sacs incurved at base, 8 to 9 mm. long; tubules membranous, slender, 25 to 30 mm. long, the tips not observed; style about as long as corolla, the stigma truncate.

TYPE LOCALITY: Mountains of Loja, Province of Loja, Ecuador. Type collected by Hartweg (no. 785).

DISTRIBUTION: Known only from the type collection.

ECUADOR.

LOJA: Loja, *Hartweg* 785 (B, K, type, Y).

This species and the following are not sharply distinguished from one another, although the differences in leaf shape and in form of calyx tube are sufficient to permit their identification.

EXPLANATION OF PLATE 4.—*Semiramisia speciosa*, from photograph of type sheet. About one-half natural size.

3. *Semiramisia weberbaueri* Hoer. *Bot. Jahrb. Engler* 42: 310. 1909.

Low slender shrub, probably epiphytic; branchlets terete, slender, glabrous, cinereous; petioles terete, 4 to 5 mm. long, glabrous; leaf blades ovate-oblong, 6 to 8 cm. long, 2 to 3.5 cm. broad, rounded to a truncate base, caudate-acuminate at apex, entire or slightly crenulate at margins, glabrous, 3 to 5 nerved, the secondary nerves spreading from base, with the midnerve plane above, slightly elevated beneath, the veinlets copiously reticulate, slightly raised above, plane beneath; inflorescence axillary at ends of branchlets, 2-flowered (always?); pedicels glabrous, striate, about 3 cm. long, 0.6 mm. in diameter at base, gradually increasing to 2 mm. in diameter at apex, deciduously bibracteolate below middle (bractlets triangular, appressed, about 1 mm. long), continuous with calyx; calyx tube obconical, 8 to 9 mm. long, about 8

mm. in diameter at summit, glabrous; limb erect, about 3 mm. long including lobes, the lobes less than 1 mm. long, 5 to 7 mm. across; corolla broadly campanulate-cylindric, about 40 mm. long and 15 mm. in diameter, thin, orange-red, copiously longitudinally veined, glabrous, the lobes 4 mm. long, 8 to 9 mm. across; stamens equal, 28 to 30 mm. long; filaments membranous, connate in a tube, about 6 mm. long, glabrous, attached to the anther dorsally by a broad connective; anther sacs about 6 mm. long, incurved at base; tubules membranous, rigid, erect, about 0.5 mm. in diameter, 20 mm. or more in length; stigma truncate.

TYPE LOCALITY: East of Chachapoyas, Department of Amazonas, Peru, altitude 2,200 meters. Type collected by Weberbauer (no. 4455).

DISTRIBUTION: Mountains of Ecuador and Peru, altitude 1,200 to 2,200 meters. **ECUADOR:** *André* (K). Río de Uavuncunacu, *André* 4567 (K). Tambo de Savanilla, *André* (K), 4561 (K).

PERU.

AMAZONAS: East of Chachapoyas, *Weberbauer* 4455 (B, type).

SAN MARTÍN: Cerro de Escalero, *Ule* 52p (B).

JUNÍN: Pichis Trail, Dos de Mayo, *Killip & Smith* 25850 (N, Y).

5. ENGLERODOXA Hoer. Bot. Jahrb. Engler 42:310. 1909

Calyx tube articulate with pedicel (continuous in *E. loranthiflora*), prismatic or obconical; limb spreading or suberect, 5-lobed, the lobes triangular, acute; corolla subcylindric or 5-angled, large, broadly apophysate at base, 5-lobed, the lobes lanceolate-triangular; stamens 10, equal, nearly as long as corolla; filaments stout, distinct, attached to the anther dorsally near its base; anthers elongate, the sacs strongly granular, the tubules slender, much longer than the sacs, opening by short subterminal pores; style filiform, about as long as corolla.

Small compact shrubs with small coriaceous alternate pinnate-veined or pinnate-veined petioled leaves; inflorescence axillary, short-racemose; flowers pedicelled, several to an inflorescence; pedicels rugose, deciduously bibracteolate.

DISTRIBUTION: Andes of Ecuador. Three species are known, all apparently of limited range.

As noted in the discussion of generic relationships, the genus is characterized by its long apophysate corolla, elongate corolla lobes, and elongate anther sacs and tubules. As here considered, it includes two species with articulate calyces and one with continuous calyces. *E. alata* Hoer. is the type species.

KEY TO THE SPECIES

Calyx articulate with pedicel; corolla 30 mm. long or more.

Leaves pinnate-veined, crenate-serrate; calyx lobes triangular, 2 mm. long or less..... 1. *E. alata*.

Leaves pinnate-veined, entire; calyx lobes elongate, about 6 mm. long.

2. *E. calycina*.

Calyx continuous with pedicel; corolla less than 20 mm. long.

3. *E. loranthiflora*.

1. *Englerodoxa alata* Hoer. Bot. Jahrb. Engler 42:311. 1909.

Subscandent shrub; branchlets angled or subterete, glabrous; petioles puberulous or glabrous, 2 to 5 mm. long, winged above; leaf blades ovate or oblong, 2 to 5 cm. long, 1 to 2.5 cm. broad, subattenuate at base, subacute and apiculate at apex, strongly revolute and serrate at margins (serrations about 5 per centimeter), glabrous, pinnate-veined, the secondary veins 2 or 3 per side, spreading, ascending at margins, with the midvein impressed above, prominent

beneath, the veinlets reticulate, plane above, slightly raised beneath; inflorescence axillary near ends of branchlets, short-racemose, glabrous in all parts; rachis striate, 1 to 3 cm. long, bracteate at base; pedicels rugose, 15 to 25 mm. long, stout (about 1.5 mm. in diameter near base, swollen to 2.5 mm. in diameter at apex), each subtended by an oblong acute bractlet up to 4 mm. long, bibracteolate slightly below middle, articulate with calyx; calyx tube prismatic, about 6 mm. long and 5 mm. in diameter at anthesis, narrowly winged to sinuses; limb spreading, 2 mm. long including lobes, the lobes subacute, about 1.5 mm. long; corolla 5-angled, strongly apophysate at base, 40 to 50 mm. long, 12 mm. in diameter across apophysis, 6 to 7 mm. in diameter above, the lobes lanceolate, 20 to 25 mm. long, 3 to 4 mm. across base, erect; filaments glabrous, nigrescent, about 4 mm. long; anther sacs incurved at base, about 16 mm. long; tubules very slender, erect, rigid, about 27 mm. long, opening by short oblique pores not more than 1.5 mm. long; stigma truncate.

TYPE LOCALITY: Volcano of Tunguragua, Province of Tunguragua, Ecuador. Type collected by Sodiro (no. 92/4c).

DISTRIBUTION: Mountains of Ecuador (and Peru?).

ECUADOR: Pearce (K).

TUNGURAGUA: Volcano of Tunguragua, Sodiro 92/4c (B, type); altitude about 3,900 meters, Popenoe 1292 (N).

ECUADOR OR PERU: Lobb 80 (K), 161 (K).

2. *Englerodoxa calycina* (Benth. & Hook.) A. C. Smith, sp. nov.

Ceratostema calycinum Benth. & Hook. Gen. Pl. 2: 570. 1876, nomen.

Anthopterus calycinus Spruce, Pl. exs. n. 5094, nomen.

Frutex; laminis oblongo-ovatis integerrimis basi attenuatis apice breviter acuminatis pli-nerviis; floribus racemosis minute puberulis; calyce cum pedicello articulado, limbo quam tubo duplo longiore, lobis elongato-triangularibus; corolla 5-angulata, lobis lanceolatis; filamentis distinctis glabris, tubulis rigidis gracillimis quam oculis paullo longioribus.

Shrub; branchlets subterete, glabrous, brownish; petioles thick (2 mm. in diameter), short (1 to 2 mm. long), glabrous, rugose, winged; leaf blades coriaceous, oblong-ovate, 6 to 8 cm. long, 3 to 3.5 cm. broad, glabrous, attenuate at base, decurrent on petiole, short-acuminate or acute at apex, entire and slightly revolute at margins, 5 to 7 pli-nerved, the secondary nerves sharply ascending, oriented at or near base, the midnerve and secondary nerves deeply impressed above, strongly prominent beneath, the veinlets plane above, slightly raised beneath; racemes axillary, 4 to 8 flowered; rachis subterete, striate, minutely puberulous, about 3 cm. long, bracteate at base with several imbricate ovate acuminate bracts 2 to 3 mm. long; pedicels stout (2 mm. in diameter), rugose, minutely puberulous, 15 to 20 mm. long, bibracteolate near middle with ovate acuminate bractlets about 3 mm. long, slightly swollen at apex, surmounted by a few minute cartilaginous teeth, faintly articulate with calyx; calyx and corolla finely puberulous without, the hairs pale, about 0.2 mm. long; calyx tube subcylindric, longitudinally furrowed, 2.5 mm. long, 3 to 4 mm. in diameter; limb erecto-patent, subcoriaceous, about 7 mm. long including lobes, the lobes elongate-triangular, subacute, 6 mm. long, 4 to 5 mm. broad at base; corolla 5-angled, often twisted, about 35 mm. long, 6 mm. in diameter at base, gradually contracted above, the lobes lanceolate, up to 12 mm. long; stamens erect; filaments coriaceous, glabrous, about 3 mm. long, 1 to 1.2 mm. broad at base, contracted into long slender connectives as long as the anther sacs; sacs 12 to 13 mm. long, the tubules very slender (each 0.2 mm. in diameter), about 14

mm. long, stiff, distinct but closely appressed to one another, opening by minute introrse oval clefts about 1 mm. long; style about 28 mm. long, the stigma truncate; disk shallowly cup-shaped, about 4 mm. in diameter.

Type in the herbarium of the Royal Botanic Gardens, Kew, collected in the Andes of Ecuador by R. Spruce (no. 5094). Duplicates at G, Y.

DISTRIBUTION: Known only from the type collection.

From the preceding species *E. calycina* is distinguished by its entire pinnerved leaves and elongate calyx lobes. There has been no previous description of the species.

EXPLANATION OF PLATE 5.—*Englerodoxa calycina*, from photograph of type sheet. About one-half natural size.

3. *Englerodoxa loranthiflora* (Benth.) A. C. Smith.

Ceratostema loranthiflorum Benth. Pl. Hartw. 142. 1844.

Compact shrub; branches and branchlets subterete, glabrous, brownish, becoming gray with age; petioles stout (1.5 mm. in diameter), glabrous, rugose, 2 to 5 mm. long; leaf blades coriaceous, lanceolate-elliptic, 4 to 6.5 cm. long, 1.2 to 2 cm. broad, glabrous, cuneate at base, slightly decurrent on petiole, acute or subacute at apex, entire at margins, pinnate-veined, the secondary veins 3 to 5 to a side, the lower pair or two sharply ascending, subparallel to margin, the upper pairs short, spreading, the veins and veinlets plane above, raised beneath; racemes axillary, 5 to 8 flowered; rachis rugose, glabrous, stout (2 mm. in diameter), 8 to 20 mm. long, bracteate at base with several imbricate, ovate, subacute, deciduously ciliate-margined bracts 1.5 to 2 mm. long; pedicels stout (1.5 mm. in diameter), rugose, glabrous, 8 to 13 mm. long, bracteolate at or near the base with 1 or 2 bractlets resembling those of the rachis, swollen at apex, continuous with calyx; calyx and corolla glabrous; calyx tube urceolate, strongly rugose, 5 to 6 mm. long, 4 mm. in diameter at summit; limb spreading, subcoriaceous, 2 mm. long including lobes, the lobes 1.5 mm. long, 3 to 4 mm. broad at base, the sinuses subacute; corolla scarlet, carnose, cylindric, subrugose, 15 to 20 mm. long, 6 mm. in diameter near base, reduced above, the lobes erect, lanceolate, acute, 5 to 8 mm. long, 2 mm. broad at base, the sinuses sharp; stamens about as long as corolla, erect; filaments distinct or slightly coherent at base, submembranous, glabrous, about 2 mm. long, contracted into slender connectives as long as anther sacs; sacs strongly granular, 5.5 to 6.5 mm. long; tubules slender (each 0.25 mm. in diameter), 8 to 8.5 mm. long, rigid, opening by minute introrse oval oblique pores about 0.5 mm. long; style filiform, 18 mm. long, exserted, the stigma truncate.

TYPE LOCALITY: Loja, Province of Loja, Ecuador. Type collected by Hartweg (no. 787).

DISTRIBUTION: Mountains of southern Ecuador.

ECUADOR: Jameson (K).

LOJA: Loja, Hartweg 787 (K, type); Lobb (K). Chonta Cruz, Huebsch (K). Vicinity of Catamayo, Huebsch (K). Between La Toma and Loja, Hitchcock 21438 (N, Y).

This is a species resembling the two preceding in its deeply cleft corolla and long rigid tubules, but differing from them in having the calyx continuous with the pedicel. This character alone does not seem to merit generic rank, since the same conditions exist in the genera *Thibaudia* and *Ceratostema*.

6. GONOCALYX Planch. & Lind. Gard. Chron. 1856:152. 1856

Calyx tube articulate with pedicel, somewhat obprismatic; limb erecto-patent, 5-lobed, the lobes triangular, apiculate; corolla subcylindric, 5-lobed, the lobes

triangular, subacute; stamens 10, equal, nearly as long as corolla; filaments distinct, attached to the anther dorsally near its base; anthers elongate, the sacs granular, the tubules longer than the sacs, opening by minute subterminal pores; style filiform, about as long as corolla.

Small compact shrubs, sometimes epiphytic, with alternate, coriaceous, variously shaped leaves; flowers axillary, solitary or in pairs, or in loose few-flowered racemes; pedicels slender, bracteate at base.

DISTRIBUTION: Three species, one each in northern Colombia, Porto Rico, and Dominica, respectively.

The three species here included form a coherent group, although they have not previously been placed together. The genus is distinguished by the shallowly cleft cylindric corolla, the articulate calyx, the free filaments, and the slender tubules. *G. pulcher* Planch. & Lind. is the type species.

KEY TO THE SPECIES

Leaves orbicular-ovate, less than 3 cm. long, rounded or subacute at apex; tubules 3 or 4 times as long as locules.

Corolla 18 to 20 mm. long; tubules opening by short clefts up to 2 mm. long; leaf margin shallowly crenate (Colombia)----- 1. *G. pulcher*.

Corolla 12 to 15 mm. long; tubules opening by subterminal pores not more than 0.5 mm. long; leaf margin entire (Porto Rico)- 2. *G. portoricensis*.

Leaves ovate, 5 to 10 cm. long, acuminate at apex; tubules less than twice as long as locules (Dominica)----- 3. *G. smilacifolius*.

1. *Gonocalyx pulcher* Planch. & Lind. Gard. Chron. 1856:152. 1856.

Shrub; branchlets purplish and angled when young, becoming subterete and brownish, glabrous; petioles puberulous or glabrous, subterete, 2 to 4 mm. long; leaf blades ovate, 18 to 27 mm. long, 10 to 18 mm. broad, rounded and minutely apiculate at apex, cuneate at base, crenate at margins (crenations 4 or 5 per centimeter), glabrous, 5 to 7 nerved, the secondary nerves oriented from base or slightly above, ascending, with the midnerve slightly raised above, plane or slightly raised beneath, the veinlets reticulate, slightly raised above, obscure beneath; flowers axillary toward ends of branchlets, solitary or in pairs; pedicels striate, 15 to 18 mm. long, glabrous, circumscribed at base by a few imbricate ovate bractlets up to 2 mm. long, bibracteolate near base, surmounted by a few minute deciduous cartilaginous teeth, articulate with calyx; calyx tube subcylindric, about 3 mm. long and 3.5 mm. in diameter at anthesis, slightly angled to sinuses, glabrous; limb erect, about 3 mm. long including lobes, the lobes about 1 mm. long; corolla cylindric, about 20 mm. long, 3 to 3.5 mm. in diameter, glabrous without, white-tomentose distally within, the lobes about 2 mm. long; filaments nigrescent, glabrous or sparsely pubescent at margins, about 3.5 mm. long; anther sacs incurved at base, about 4 mm. long; tubules slender, about 11 mm. long, opening by short distal clefts about 2 mm. long; style slightly exerted, the stigma truncate.

TYPE LOCALITY: "Provinces of Pamplona and Ocaña," Department of Norte de Santander, Colombia, altitude about 2,150 meters. Type collected by Schlim.

DISTRIBUTION: Andes of northeastern Colombia.

COLOMBIA: *Purdie* (G, K).

CULTIVATED PLANT: (K, type, raised from original.)

This species and the following are very closely allied and form a distinct genus; the alliance of the third species with them is questionable.

2. *Gonocalyx portoricensis* (Urban) A. C. Smith.

Thibaudia portoricensis Urban, Symb. Antill. 1: 376. 1899.

Ceratostema portoricense Hoer. Bot. Jahrb. Engler 42: 276. 1909.

Low slender branching shrub; branchlets subterete, glabrous; petioles slender, glabrous, 1.5 to 3 mm. long; leaf blades subrotund, 10 to 20 mm. long, 8 to 16 mm. broad, rounded at base, rounded or minutely apiculate at apex, subentire and strongly revolute at margins, glabrous, obscurely 3-nerved, the midnerve slightly impressed above, raised beneath, the secondary nerves ascending from base, near margin, obscure, plane; flowers few, axillary, apparently solitary; pedicels subterete, glabrous, 7 to 9 mm. long, bracteolate at base with a few imbricate ovate bractlets up to 2 mm. long, fringed at summit by a few deciduous glandular hairs, articulate with calyx; calyx tube about 2.5 mm. long and 2.5 mm. in diameter at anthesis, narrowly 5-winged to sinuses; limb 2 mm. long including lobes, the lobes less than 1 mm. long; corolla cylindric, 12 to 14 mm. long and 3 mm. in diameter, broader above, glabrous, the lobes about 2 mm. long; filaments castaneous, about 1.5 mm. long, slightly puberulous distally or glabrous; anther sacs 2.5 mm. long; tubules erect, slender, about 10 mm. long, opening by minute subterminal pores about 0.5 mm. long.

TYPE LOCALITY: Sierra de Luquillo, Mount Jiménez, Porto Rico. Type collected by Sintenis (no. 1363).

DISTRIBUTION: Mountains of Porto Rico.

PORTO RICO: *Blauer*, in 1852 or 1853 (Y). Mount Jiménez, *Sintenis* 1363 (type collection, F, G, N, Y). El Yunque, *Britton & Bruner* 7618 (Y); *Boydton* 8216 (Y); about 1,050 meters, *Gleason & Cook* M186 (Y). Sierra de Naguabo, 690 to 1,035 meters, *Shafer* 3641 (F, G, N, Y).

EXPLANATION OF PLATE 6.—*Gonocalyx portoricensis*, from photograph of sheet of type collection in the U. S. National Herbarium. About one-half natural size.

3. *Gonocalyx smilacifolius* (Griseb.) A. C. Smith.

Vaccinium smilacifolium Griseb. Fl. Brit. W. Ind. 144. 1859.

Hornemannia smilacifolia Benth. & Hook. Gen. Pl. 2: 567. 1876.

Ceratostema smilacifolium Hoer. Bot. Jahrb. Engler 42: 276. 1909.

Shrub; branchlets terete, cinereous; petioles terete, glabrous, 5 to 7 mm. long, stout, about 2 mm. in diameter; leaf blades ovate, 7 to 10 cm. long, 5 to 6 cm. broad, rounded or subcuneate at base, abruptly acuminate at apex, entire and slightly revolute at margins, glabrous, 5 to 7 nerved, the secondary nerves oriented from or near base, arcuate, with the midnerve slightly impressed or plane above, prominent beneath, the veinlets copiously reticulate, plane or obscure above, slightly raised beneath; inflorescence axillary towards ends of branchlets, loosely racemose, 4 to 8 flowered, glabrous in all parts; rachis terete, slender, 2 to 5 cm. long; pedicels rugose, 10 to 18 mm. long, cylindric (0.5 mm. in diameter at base, swollen to nearly 1 mm. in diameter distally), bibracteolate near base with ovate bractlets about 1.3 mm. long, articulate with calyx; calyx tube subcylindric, about 4 mm. long and 3 mm. in diameter at anthesis, narrowly winged to sinuses; limb suberect, 2 to 2.5 mm. long including lobes, the lobes less than 1 mm. long, faintly ciliate at margins; corolla cylindric, about 7 mm. long and 4 mm. in diameter; filaments about 2 mm. long, glabrous; anther sacs abruptly narrowed at base, about 2.5 mm. long; tubules very slender, about 3.5 mm. long, opening by minute subterminal pores less than 0.5 mm. long; stigma truncate.

TYPE LOCALITY: Coulabion Mountains, Dominica. Type collected by Imray.

DISTRIBUTION: Dominica.

DOMINICA: *Eggers* 1038 (K); *Lloyd* 302 (Y). Coulabion Mountains, *Imray* (G, type collection).

This species is very distinct from the two preceding and its place in the genus may be questioned. However, it is surely not a *Ceratostema*, and the flower structure is so close to that of the two preceding species of *Gonocalyx* that the great difference in leaves may be considered of secondary importance.

7. SIPHONANDRA Klotzsch, *Linnaea* 24: 24. 1851

(*Siphonostema* Griseb.; *Lechl. Berb. Amer. Austr.* 58. 1857, nomen)

Calyx tube articulate with pedicel, short-cylindric; limb subspreading, the lobes 5, triangular, acute; corolla cylindric, 5-lobed, the lobes triangular, subacute; stamens 10, equal, nearly as long as corolla; filaments membranous, connate, attached to the anther dorsally near its base; anthers elongate, the sacs granular, the tubules much longer than the sacs, opening by strictly terminal flaring pores; style filiform, frequently exerted.

Small compact shrubs, often epiphytic, with small alternate, somewhat crowded, coriaceous, pinnate-veined, petioled, oblong leaves; inflorescence axillary, short-racemose; flowers pediceled, several to many to an inflorescence; pedicels rugose, deciduously bibracteolate.

DISTRIBUTION: Andes of southern Peru and northern Bolivia at high elevations. Two species are known.

This genus is characterized by connate filaments, terminal pores in the slender tubules, and an articulate calyx. Its relationship to other members of the group has been previously discussed. *S. elliptica* (R. & P.) Klotzsch is the type species.

KEY TO THE SPECIES

Pedicels and calyces persistently pubescent, the hairs crowded, pale, about 0.3 mm. long.----- 1. *S. pilosa*.

Pedicels and calyces essentially glabrous (hairs, if present, sparse and lax).

2. *S. elliptica*.

1. *Siphonandra pilosa* A. C. Smith, sp. nov.

Siphonostema costatum Griseb.; *Lechl. Berb. Amer. Austr.* 58. 1857, nomen.

Frutex; ramulis petiolisque puberulis; laminis oblongis vel leviter obovatis basi cuneatis apice subacutis subtus parce pilosis pinnatinerviis; inflorescentia racemosa ubique breviter pilosa; calyce cylindrico, limbo tubum subaequante; corolla cylindrica; staminibus aequalibus, filamentis glabris connatis, tubulis gracilibus erectis quam oculis 4 ad 5-plo longioribus poris terminalibus dehiscentibus.

Shrub; branchlets subterete, stout, pale puberulous; petioles subterete, rugose, 3 to 5 mm. long, puberulous or glabrous; leaf blades oblong or slightly obovate, 3 to 4.5 cm. long, 1 to 2 cm. broad, cuneate at base, obtuse or subacute at apex, entire and slightly revolute at margins, essentially glabrous above, sparsely pilose beneath (hairs pale, scattered, lax, about 0.4 mm. long), the venation pinnate, the midvein deeply impressed above, somewhat prominent beneath, the secondary veins 3 or 4 to a side, ascending, slightly impressed above, plane beneath, the veinlets reticulate, obscure; inflorescence axillary at ends of branchlets, racemose, 8 to 15 flowered; rachis 1.5 to 2.5 cm. long, pilose (hairs copious, pale, about 0.3 mm. long), bracteate at base with several ovate bracts about 2 mm. long; pedicels rugose, pilose as the rachis, 8 to 13 mm. long, bracteate near base (bracts several, ovate, acuminate, about 1.5 mm. long).

ciliate-margined), articulate with calyx; calyx tube cylindrical, about 4 mm. long and 2.5 mm. in diameter at anthesis, pilose with short pale spreading hairs; limb spreading, about 3.5 mm. long including lobes, the lobes about 1.5 mm. long and 3 mm. across; corolla cylindrical, about 26 mm. long and 5 mm. in diameter, sparsely pilose or glabrous, the lobes triangular, subacute, about 1.5 mm. long; stamens about 25 mm. long; filaments castaneous, firmly connate in a ring, about 5 mm. long, glabrous; anther sacs granular, incurved and faintly setose at base, about 4 mm. long; tubules membranous, erect, about 18 mm. long, slender, 0.3 mm. or less in diameter, opening by strictly terminal flaring pores; style slightly exserted, the stigma peltate; fruit elliptic-ovoid, sparsely pilose, up to 1 cm. long, the calyx limb decurrent.

Type in the herbarium of the New York Botanical Garden, collected in the vicinity of Tacacoma, Cerro de Tuile, Province of Larecaja, Department of La Paz, Bolivia, altitude 3,350 meters, May or June, 1860, by G. Mandon (no. 549). Duplicates at G, K.

DISTRIBUTION: Southern Peru and northern Bolivia.

PERU: Tabina, *Lechler* 2053 (K).

The persistent pubescence of the pedicels and calyces separates this species from the following.

2. *Siphonandra elliptica* (R. & P.) Klotzsch, *Linnaea* 24: 24. 1851.

Thibaudia elliptica R. & P. *Fl. Peruv. Chil.* 4: pl. 384. 1802.

Siphonostema myrtifolium Griseb.; *Lechl. Berb. Amer. Austr.* 58. 1857, nomen.

Ceratostema ellipticum Benth. & Hook. *Gen. Pl.* 2: 570. 1876.

Eurygania elliptica Britton, *Bull. Torrey Club* 20: 137. 1893.

Ceratostema hookeri Britton, *Bull. Torrey Club* 20: 137. 1893.

Ceratostema weberbaueri Hoer. *Bot. Jahrb. Engler* 42: 316. 1909.

Shrub; branchlets subterete, brownish, slightly puberulous when young, becoming glabrous; petioles subterete, glabrous, 4 to 5 mm. long; leaf blades oblong or ovate-oblong, 3.5 to 5.5 cm. long, 1.5 to 2.5 cm. broad, cuneate at base, obtuse or subacute at apex, entire or faintly crenulate and slightly revolute at margins, glabrous or sparsely brownish-pilose above, sparsely pilose beneath (hairs scattered, appressed, dark brown, about 0.5 mm. long), becoming glabrous, the venation pinnate, the midvein impressed above, prominent beneath, the secondary veins 3 to 5 to a side, spreading, ascending at margin, slightly impressed above, raised beneath, the veinlets copiously reticulate, plane; inflorescence axillary near ends of branches, racemose, 5 to 15 flowered; rachis 2 to 5 cm. long, glabrous or slightly pilose with pale spreading hairs up to 0.3 mm. long, striate, deciduously bracteate at base with several ovate bractlets about 1.5 mm. long; pedicels sparsely pilose or glabrous, rugose, 7 to 20 mm. long, bibracteolate toward base (bracts ovate, acuminate, ciliate-margined, up to 3 mm. long), surmounted by several minute cartilaginous teeth; calyx tube about 3.5 mm. long and 2.5 mm. in diameter at anthesis, essentially glabrous; limb 4 to 4.5 mm. long including lobes, the lobes up to 2 mm. long; corolla about 25 mm. long and 4 mm. in diameter, essentially glabrous, the lobes obtuse, about 1 mm. long; filaments glabrous, about 6 mm. long; anther sacs incurved at base, 5 mm. long; tubules erect, slender, less than 0.4 mm. in diameter; style about as long as corolla, the stigma peltate; fruit cylindrical-ovoid, glabrous, up to 12 mm. long, the calyx limb decurrent.

TYPE LOCALITY: Peru. Type collected by Ruiz and Pavon.

ILLUSTRATION: Hook. *Icon. Pl.* 2: pl. 108. 1837.

DISTRIBUTION: Andes of Peru and northern Bolivia, altitude 3,000 to 3,900 meters.

PERU: Huanacabra, *Mathews* 884 (K). San Gavan, *Lechler* 2276 (K).

APURIMAC: Río Pinkos, *Weberbauer* 5861 (B, F, N).

CUZCO: Sandía, *Weberbauer* 740 (B, type of *Ceratostema weberbaueri*).

Cosñipata, *Weberbauer* 6929 (B, F, N). Cerro de Cusilluyoc, *Pennell* 13857 (F, N, Y). Cedrobamba, *Heller* 2190 (N).

BOLIVIA: Eastern Andes, *Pearce* 790 (K).

LA PAZ: Mapiri, *Rusby* 2036 (B, F, G, N, Y). Cocopunco, *Tate* 371 (Y).

Between Okara and Ancoma, *Tate* 862 (Y).

COCHABAMBA: Cochabamba, *Bang* 2003 (Y). Cejawald, *Steinbach* 9529 (Y).

There has been a good deal of disagreement as to the generic position of this species, but as pointed out in the discussion of genera at the beginning of this treatment, it seems to fall into a distinct genus as founded by Klotzsch. Although I have not seen the type of the species, the descriptions and the two available plates agree with the above-cited specimens, including the type of *Ceratostema weberbaueri*.

8. PERICLESIA A. C. Smith, gen. nov.

Calyx cum pedicello articulatus, tubo late obconico, limbo magno erecto 4-lobato, lobis lanceolato-triangularibus. Corolla anguste cylindrica 4-lobata, lobis lanceolatis. Stamina 8 corollam subaequantia, filamentis connatis, antheris elongatis, tubulis gracilibus quam loculis multo longioribus poris obliquis dehiscentibus. Frutex (epiphyticus?), laminis coriaceis alternis petiolatis obscure pli-nerviis. Inflorescentia 1 vel 2-flora subterminalis.

Calyx tube articulate with pedicel, broadly obconical; limb large, suberect, 4-lobed, the lobes lanceolate-deltoid, acute; corolla narrowly cylindrical, 4-lobed, the lobes lanceolate; stamens 8, nearly as long as corolla; filaments membranous, connate; anthers elongate, the sacs granular, the tubules much longer than the sacs, opening by oblique pores; style filiform, about as long as corolla.

Low slender shrubs, perhaps epiphytic, with alternate, coriaceous, obscurely pli-nerved, petioled leaves; inflorescence 1 or 2 flowered, subterminal; flowers pedicelled, the pedicels striate, bracteolate.

DISTRIBUTION: Known only from a single species, the exact geographic locality for which is a matter of doubt. It is from the Andes of either Colombia or Peru.

This genus is immediately recognized by its four large calyx lobes, its connate filaments, and its slender tubules with oblique pores.

Following Klotzsch's custom of naming genera of Vacciniaceae after historical figures, this genus is dedicated to the Greek statesman Pericles.

1. *Periclesia flexuosa* A. C. Smith, sp. nov.

Frutex gracilis generis characteribus; ramulis petiolisque decidue puberulis; laminis lanceolato-oblongis basi attenuatis apice obtuse acuminatis obscure 3 ad 5 pli-nerviis; floribus ut supra descriptis.

Slender shrub, probably epiphytic; branchlets subterete, striate, slender, deciduously puberulous with pale spreading hairs up to 0.2 mm. long; petioles subrugose, about 2 mm. long, deciduously puberulous; leaf blades lanceolate-oblong, 4 to 6 cm. long, 1.2 to 1.8 cm. broad, attenuate at base, obtusely acuminate at apex, entire and narrowly revolute at margins, glabrous on both surfaces; obscurely 3 to 5 pli-nerved, the midnerve slightly impressed above, prominent beneath, the secondary nerves obscure, ascending; inflorescence terminal (or axillary?); flowers solitary or in pairs, the pedicels, calyx tube, and corolla densely pilose, the hairs pale, spreading, up to 0.4 mm. long; pedicels striate,

about 15 mm. long, bracteolate at base and bibracteolate near middle with lanceolate puberulous bractlets 4 to 6 mm. long, articulate with calyx; calyx tube broadly obconical, 3 to 4 mm. long, 3 mm. in diameter at summit at anthesis; limb large, flaring, 20 to 25 mm. long including lobes, the lobes 4, lanceolate-deltoid, acute, membranous, closely reticulate-veined, sparsely pilose at margins, 20 to 25 mm. long, 10 to 12 mm. broad at base; corolla submembranous, about 50 mm. long, 6 to 10 mm. in diameter at base, gradually tapering distally, 4-lobed, the lobes lanceolate, long-acuminate, about 20 mm. long, 3 to 4 mm. across base; stamens 8, nearly as long as corolla; filaments castaneous, membranous, firmly connate in a tube, about 7 mm. long, sparsely pilose at distal margins with hairs about 0.5 mm. long; anthers rigidly erect, the sacs granular, stout, incurved at base, 5 to 6 mm. long, the tubules membranous, very slender, less than 0.3 mm. in diameter at apex, about 35 mm. long, opening by oblique pores 0.5 mm. long; style filiform, as long as corolla, striate, the stigma truncate or subpeltate.

Type in the herbarium of the Royal Botanic Gardens, Kew, collected in woods at "Rosario, Columbia," altitude 1,550 meters, by W. Lobb (no. 79).

DISTRIBUTION: Known only from the type collection.

This beautiful plant is the only species of the genus yet discovered. The doubt concerning the exact locality of the collection of Lobb's plants labeled "Columbia"—whether Colombia or Peru—makes it impossible to assign this genus a definite geographic range.

EXPLANATION OF PLATE 7.—*Periclesia flexuosa*, from photograph of type sheet. About one-half natural size.

9. OREANTHES Benth. Pl. Hartw. 140. 1844

Calyx tube continuous with pedicel, cylindric, often falcate; limb suberect, 5-lobed, the lobes lanceolate, acute; corolla cylindric, 5-lobed, the lobes broadly ovate; stamens 5, equal, nearly as long as corolla; filaments membranous, connate, attached to the anther sacs at about the middle; anthers elongate, the sacs nearly smooth, the tubules longer than the sacs, opening by minute oblique pores; style filiform, slightly exserted.

Low slender epiphytic shrub, with small, coriaceous, alternate, obscurely 5-nerved, ovate leaves, the petioles very short; flowers axillary, solitary or in pairs; pedicels short, minutely bracteate at base.

DISTRIBUTION: One species, in the Andes of Ecuador.

This very distinct genus is distinguished by having only five stamens, elongate calyx lobes, ovate corolla lobes, oblique pores, and an elongate subsessile calyx tube.

1. *Oreanthes buxifolius* Benth. Pl. Hartw. 140. 1844.

Low slender shrub; branchlets subterete, glabrous or short-pilose; petioles slender, glabrous, 1 to 2 mm. long; leaf blades ovate, 2 to 3 cm. long, 1.2 to 1.6 cm. broad, rounded or subcuneate at base, rounded at apex, entire and slightly revolute at margins, glabrous, 5-nerved, the secondary nerves oriented from base or slightly above, with the midnerve slightly raised on both surfaces, somewhat obscure, the veinlets copiously reticulate, obscure in mature leaves; flowers few, axillary, solitary or in pairs; pedicels minute, less than 1 mm. long, bibracteolate at base with ovate triangular bractlets up to 2 mm. long; calyx tube 3 to 5 mm. long, 1 to 1.5 mm. in diameter at anthesis, deciduously pilose with pale hairs about 0.3 mm. long; limb about 6 mm. long including lobes, glabrous, the lobes 5 to 9 mm. long, 1 to 2 mm. across base; corolla about 25 mm. long and 3 mm. in diameter, flaring at apex, glabrous, the lobes suberect, blunt, 5 mm. long and 3 mm. across; filaments castaneous, 9 mm.

long, glabrous; anther sacs about 9 mm. long; tubules very slender, about 12 mm. long, opening by a minute pore less than 0.5 mm. long; stigma peltate; fruit subcylindric, rugose, about 10 mm. long and 2.5 mm. in diameter, surmounted by the persistent calyx lobes.

TYPE LOCALITY: Mount El Sisme, near Loja, Province of Loja, Ecuador. Type collected by Hartweg (no. 783).

DISTRIBUTION: Known only from the type collection.

ECUADOR.

LOJA: Mount El Sisme, near Loja, *Hartweg* 783 (K, type).

The only species of a very distinct genus.

10. MYCERINUS A. C. Smith, Bull. Torrey Club 58: 441. 1931

Calyx articulate with pedicel, turbinate, the base cuneate, the limb dilated, 5-lobed, narrowly winged, each wing continuing to the apex of a lobe; corolla cylindric, carnose, 5-lobed; stamens 10, equal, shorter than corolla; filaments stout, glabrous, distinct, continued into short connectives which divide into 2 slender arms each of which continues to the apex of a tubule; anthers stout, the sacs finely granular, the tubules 2, short, membranous, dehiscing by introrse oval clefts; style stout, the stigma truncate.

A low shrub, the branches and branchlets subterete, glabrous; leaves alternate, thick-coriaceous, short-petiolate, pinnate-veined, rounded or subcuneate at base, obtuse at apex, entire and strongly recurved at margins; inflorescence few-flowered, fasciculate or short-racemose, the flowers pedicellate, the pedicels deciduously bracteolate.

DISTRIBUTION: One species thus far known, from Mount Duida in southern Venezuela.

As previously mentioned, this genus is distinguished from *Macleania* by having its calyx wings opposite the lobes and its divided connective extended to the summit of the tubules.

1. Mycerinus sclerophyllus A. C. Smith, Bull. Torrey Club 58: 442. pl. 36. 1931.

Low shrub; branchlets angled, glabrous; petioles thick, 2 to 5 mm. long, sometimes winged distally; leaf blades thick-coriaceous, ovate-oblong, 4 to 6 cm. long, 2 to 3 cm. broad (appearing narrower because of revolute margins), sparsely black-punctate on both surfaces, obtuse at apex, rounded or subcuneate at base, much thickened and loosely revolute at margins, pinnate-veined, the midvein impressed above, prominent beneath, the secondary veins 6 to 8 to a side, spreading, plane or slightly impressed above, raised beneath, the veinlets reticulate, obscure or plane; flowers fasciculate or short-racemose, 2 to 4 to an inflorescence; pedicels subterete, 15 to 20 mm. long, stout, glabrous, deciduously minute-bracteolate at base and summit; calyx coriaceous, about 8 mm. long, 5 to 6 mm. in diameter near summit, winged for entire length by 5 fleshy coriaceous wings, each of which continues to the apex of a calyx lobe, the lobes incurved, triangular, acute, about 3.5 mm. across base and 2 mm. long; corolla tubular, subcylindric, about 6 mm. long and 5 mm. in diameter at middle (not quite mature); stamens about 4 mm. long; filaments castaneous, carnose, 2 mm. long, loosely connate at base; anther sacs about 3 mm. long, stout, the tubules separable to their bases, opening by clefts about 0.8 mm. long; style cylindric, about 6 mm. long.

TYPE LOCALITY: Summit of Mount Duida, State of Amazonas, Venezuela, altitude about 2,200 meters. Type collected by G. H. H. Tate (no. 603).

DISTRIBUTION: Known only from the type collection.

VENEZUELA.

AMAZONAS: Summit of Mount Duida, *Tate* 603 (Y, type).

11. *MACLEANIA* Hook. Icon. Pl. 2: pl. 109. 1837(? *Birania* Neraud; Freyc. Voy. Uran. Bot. 28. 1826, nomen)(*Tyria* Klotzsch, Linnaea 24:21. 1851)

Calyx tube articulate with pedicel, short-cylindric or campanulate; limb erecto-patent, 5 (rarely 3 or 4) lobed, the lobes triangular, subacute; corolla subcylindric or elongate-urceolate, 5-lobed, the lobes triangular, subacute; stamens 10 (rarely fewer), equal, usually half as long as corolla; filaments distinct or connate, attached to the anther dorsally near its base; anthers stout, the sacs strongly granular, the tubules about as long as the sacs, laterally connate or fused into a single tubule (rarely completely distinct), opening by elongate distinct or fused clefts; style filiform, about as long as corolla or exerted.

Compact shrubs, often epiphytic, with coriaceous alternate pinnate-veined or pinnate-veined leaves; inflorescence axillary or terminal, subfasciculate or racemose; flowers pedicelled, few to many to an inflorescence; pedicels deciduously bibracteolate.

DISTRIBUTION: Continental tropical America from southern Mexico to Peru, usually at high altitudes. Thirty-two species are here described, and in addition there are two names which I am unable to place.

The relationship of *Macleania* to other members of the tribe has already been thoroughly discussed. It is characterized by its conical fused or connate tubules and its unspurred connectives. *M. floribunda* Hook. is the type species.

KEY TO THE SPECIES

Anthers produced into a single tubule.

Filaments connate most of their length; corolla glabrous (or sparsely pilose in no. 15).

Leaf base cuneate (rarely subtruncate).

Mature corolla more than 30 mm. long, 3 times as long as stamens.

Leaves and flowers glabrous; calyx lobes triangular, about 1.5 mm. long----- 1. *M. longiflora*.

Leaves (especially beneath) and flowers (especially pedicels and calyces) farinose with minute reddish hairs; calyx lobes apiculate, about 0.5 mm. long----- 2. *M. macrantha*.

Mature corolla up to 22 mm. long, twice as long as stamens.

Lower surface of leaves and flowers pilose with minute stout reddish hairs----- 3. *M. floribunda*.

Lower surface of leaves and flowers essentially glabrous (or sparsely pilose with pale lax hairs).

Corolla cylindric; leaves narrowly ovate, up to 2.5 cm. broad, attenuate at base, appearing sessile (petiole not more than 2 mm. long, winged)----- 4. *M. antioquiæ*.

Corolla 5-angled; leaves broadly ovate, up to 4.5 cm. broad, truncate or cuneate at base; petiole 2 to 5 mm. long.

Flowers 4 or more to an inflorescence; corolla about 15 mm. long (Colombia) ----- 5. *M. stricta*.

Flowers 3 to an inflorescence; corolla more than 20 mm. long (Peru) ----- 6. *M. angulata*.

Leaf base cordate or subcordate (rarely truncate).

Calyx wings produced beyond lobes, forming perpendicular spurlike appendages; corolla lobes frequently spurred----- 7. *M. pentaptera*.

Calyx wings not produced beyond lobes (or slightly so in no. 14).

Leaves amplexicaul.

Inflorescence short-racemose; calyx lobes apiculate, less than 0.5 mm. long ----- 8. *M. rotundifolia*.

Inflorescence subfasciculate; calyx lobes deltoid, about 2 mm. long. 9. *M. amplexicaulis*.

Leaves not amplexicaul.

Calyx lobes triangular-acute, 1.5 to 2 mm. long, the sinuses acute (Costa Rica and Panama)----- 10. *M. ovata*

Calyx lobes apiculate, up to 1 mm. long, the sinuses rounded or obtuse. Leaves linear-lanceolate, at least 5 times as long as broad, acute at apex----- 11. *M. linearifolia*

Leaves ovate, 2 or 3 times as long as broad, blunt at apex. Inflorescence glabrous.

Flowers small (pedicel 3 to 5 mm. long; corolla 15 to 16 mm. long; stamens 6.5 mm. long)----- 12. *M. compacta*

Flowers comparatively large (pedicel 10 mm. long or more; corolla 20 to 25 (rarely 18) mm. long; stamens 9 to 11 mm. long).

Inflorescence fasciculate; calyx wings not distally produced (Mexico and Guatemala)----- 13. *M. insignis*.

Inflorescence short-racemose; calyx wings slightly produced distally (South America)----- 14. *M. cordifolia*.

Inflorescence pilose (hairs lax, pale, 0.2 to 0.4 mm. long).

15. *M. punctata*.

Filaments distinct; corolla densely pilose.

Calyx lobes apiculate, about 1 mm. long; flowers 5-merous.

16. *M. pubiflora*.

Calyx lobes elongate-triangular, 4 to 7 mm. long; flowers 5 or 6-merous.

17. *M. salapa*.

Anthers produced into two tubules (these usually laterally connate).

Pedicels and calyx glabrous or essentially so.

Leaves deltoid ----- 18. *M. euryphylla*.

Leaves ovate, ovate-lanceolate, or oblong.

Rachis stout, 10 to 20 cm. long at maturity; flowers large (calyx 10 to 12 mm. across summit; corolla 7 to 10 mm. in diameter near base; stamens 14 mm. long or more); leaves 12 to 25 cm. long.

19. *M. crassa*.

Rachis rarely up to 7 cm. long; flowers smaller than above dimensions; leaves seldom up to 15 cm. long.

Leaves glabrous beneath, variously shaped.

Bracts at base of inflorescence numerous, imbricate, oblong-lanceolate, up to 8 mm. long----- 20. *M. benthamiana*.

Bracts at base of inflorescence few, ovate-deltoid, not more than 4 mm. long.

Calyx lobes 5; stamens 10.

Leaves oblong or ovate-oblong, rarely up to 12 cm. long, the veinlets immersed; corolla carnose.

Tubules about as long as anther sacs or slightly longer (never twice as long).

Leaves oblong-spatulate, attenuate at base.

21. *M. poortmanni*.

Leaves oblong or oblong-ovate, cuneate or rounded at base.

Pedicels shorter than flowers or subequal; leaves subacute or hardly rounded at base.

Anthers slender, the tubules about 1.5 times as long as sacs----- 22. *M. pilgeriana*.

Anthers comparatively stout, the tubules about as long as sacs.

Tubules slightly shorter than anther sacs, rarely subequal (South America)----- 23. *M. nitida*.

Tubules slightly longer than anther sacs, rarely subequal (Central America)----- 24. *M. glabra*.

Pedicels longer than flowers; leaves rounded at base (Santa Marta Mountains)----- 25. *M. robusta*.

Tubules twice as long as anther sacs----- 26. *M. attenuata*.

Leaves oblong-lanceolate, rounded at base, 10 to 15 cm. long, the veinlets raised above; corolla soft-carnose-- 27. *M. nervosa*.

Calyx lobes 3 or 4; stamens 6 to 8----- 28. *M. reducta*.

Leaves laxly pale-pilose beneath, broadly ovate, the nerves prominent beneath----- 29. *M. ecuadorensis*.

Pedicels and calyx pubescent or densely farinose.

Inflorescence short-racemose, laxly pilose; leaves oblong, glabrous or laxly pilose beneath (Colombia and Ecuador).

Calyx robust, the limb 5 to 7 mm. long; lower surface of leaves glabrous or essentially so----- 30. *M. loeseneriana*.

Calyx smaller, the limb up to 4 mm. long; lower surface of leaves laxly pilose (glabrous when senescent)----- 31. *M. hirtiflora*.

Inflorescence subfasciculate, densely and closely farinose; leaves obovate, farinose beneath (Peru)----- 32. *M. farinosa*.

1. *Macleania longiflora* Lindl. Bot. Reg. 30: pl. 25. 1844.

Macleania tenuiflora Walp. Repert. Bot. 6: 415. 1847.

Low shrub, probably epiphytic; branchlets slender, terete, clothed with loose cinereous glabrous bark; petioles rugose, glabrous, 4 to 7 mm. long; leaf blades coriaceous, ovate, 6 to 10 cm. long, 2.5 to 5 cm. broad, rounded or broadly cuneate at base, acute at apex, entire at margins, glabrous on both surfaces, 5 to 7 pinnately-veined or pinnate-veined from near base, the midvein slightly impressed above, raised beneath, the secondary veins nearly plane above, slightly raised beneath, the veinlets reticulate, plane or obscure; inflorescence axillary, subfasciculate or short-racemose (rachis not exceeding 5 mm. in length), 3 to 10 flowered, essentially glabrous in all parts; pedicels rugose, 7 to 12 mm. long, each subtended by an ovate bractlet about 2 mm. long, minutely bibracteolate below middle; calyx tube obprismatic, about 4 mm. long and 4 mm. in diameter at anthesis, narrowly winged to sinuses; limb 3 to 5 mm. long including lobes, the lobes 5, broadly triangular, 1.5 mm. long, 5 to 6 mm. across; corolla subcylindric, 30 to 40 mm. long, 5 to 7 mm. in diameter near base, contracted at the long throat, minutely puberulous or glabrous, the lobes about 2 mm. long; stamens 10, equal, 11 to 12 mm. long; filaments nigrescent, coherent in a tube, 2.5 to 4 mm. long, glabrous or sparsely puberulous at distal margins; anther sacs 5.5 to 7 mm. long; tubule single, membranous, elongate-conical, 2.5 to 4 mm. long, opening by a wide introrse pore nearly as long; style about as long as corolla, the stigma truncate.

TYPE LOCALITY: Near Loja, Province of Loja, Ecuador, altitude about 2,500 meters. Type collection not cited.

DISTRIBUTION: Colombia and Ecuador, apparently rare and local in distribution.

COLOMBIA.

NORTE DE SANTANDER: Diamanta, 1,000 meters, *Kalbreyer* 1085 (B).

ECUADOR.

PICHINCHA: Vicinity of Mount Pichincha, *Jameson* (K); *Sodi* 92/2b (B).

The occurrence of this beautiful plant in northern Colombia is surprising, but the Kalbreyer collection is almost certainly conspecific with the Ecuadorian specimens.

2. *Macleania macrantha* Benth. Pl. Hartw. 223. 1846.

Shrub; branchlets terete, glabrous or puberulous with minute pale hairs; petioles stout, 1 to 3 mm. long, winged above; leaf blades coriaceous, ovate, 4 to 9 cm. long, 1.5 to 4 cm. broad, cuneate at base, obtuse or obtusely acuminate at apex, entire and slightly revolute at margins, essentially glabrous above, sparsely pubescent beneath with scattered stiff brown hairs about 0.2 mm. long, 5 to 7 pli-nerved, the nerves impressed above, prominent beneath, the veinlets reticulate, plane; inflorescence axillary near ends of branchlets, fasciculate, 2 to 7 flowered, circumscribed at base by numerous imbricate ovate bractlets about 1.5 mm. long, the pedicels and flowers densely short-pubescent when young (hairs brown, appressed, about 0.2 mm. long), becoming glabrous; pedicels rugose, 7 to 12 mm. long, deciduously bibracteolate near base, obscurely articulate with calyx; calyx tube obpyramidal, 6 to 7 mm. long and 3 mm. in diameter at summit at anthesis, winged to sinuses (wings about 0.5 mm. broad); limb 2 to 3 mm. long, the lobes 5, apiculate, 1 mm. long, 3 mm. broad; corolla cylindrical, 27 to 40 mm. long, 4 to 5 mm. in diameter, contracted to a long throat 3 mm. in diameter, the lobes spreading, about 2.5 mm. long; stamens 10, 11 to 12 mm. long; filaments glabrous, connate in a tube, about 4.5 mm. long; anther sacs 5 to 5.5 mm. long; tubule single, rigid, conical, about 3 mm. long, opening by an introrse distal pore about 2 mm. long.

TYPE LOCALITY: Guayan, western slopes of Mount Pichincha, Province of Pichincha, Ecuador. Type collected by Hartweg (no. 1218*).

DISTRIBUTION: Andes of southern Colombia and northern Ecuador.

COLOMBIA.

NARIÑO: Tuqueres, 2,000 meters, *Triana* 2708 (K).

COLOMBIA OR ECUADOR: *André* (K); *Lobb* (K).

ECUADOR.

PICHINCHA: Andes near Quito, *Jameson* 384 (K); *Couthouy* (G, Y); *Hartweg* 1218* (K, type).

This species is closely allied to the preceding, from which it is marked by the reddish puberulence of flowers and leaves.

3. *Macleania floribunda* Hook. Icon. Pl. 2: pl. 109. 1837.

Low shrub; branchlets terete, clothed with deciduous cinereous glabrous bark; petioles rugose, 3 to 5 mm. long, glabrous; leaf blades ovate, 4 to 6 cm. long, 2 to 3 cm. broad, cuneate or subattenuate at base, acute or short acuminate at apex, entire and narrowly revolute at margins, essentially glabrous on both surfaces, 5-pli-nerved, the secondary nerves oriented above base, arcuate-ascending, with the midnerve impressed above, prominent beneath, the veinlets obscure; inflorescence axillary, the flowers solitary or in small fascicles; pedicels rugose, 6 to 7 mm. long, circumscribed at base by several oblong bractlets 2 to 4 mm. long; calyx tube obprismatic, pilose with minute brownish hairs,

about 5 mm. long and 3.5 mm. in diameter, narrowly winged to sinuses, the wings about 0.8 mm. broad; limb about 3.5 mm. long including lobes, the lobes 5, apiculate, about 1 mm. long and 3 mm. across; corolla subcylindric, deciduously pilose without as calyx, laxly white-pilose within distally, 20 to 22 mm. long, about 5 mm. in diameter, the lobes about 2.5 mm. long; stamens 10, 9.5 to 10 mm. long; filaments castaneous, submembranous, firmly connate in a tube, glabrous, about 4 mm. long; anther sacs 4 to 4.5 mm. long; tubule single, submembranous, 2 to 2.5 mm. long, opening by a wide introrse cleft nearly as long; stigma truncate.

TYPE LOCALITY: Jambrasbamba, Department of Amazonas, Peru. Type collected by Mathews (no. 1442).

DISTRIBUTION: Known only from the type collection.

PERU.

AMAZONAS: Jambrasbamba, *Mathews* 1442 (K, type).

This is the type species of the genus. The name *M. floribunda* has from time to time been placed on other specimens in herbaria, but I have seen no other material which is conspecific with the type.

4. *Macleania antioquiae* Fedtsch. & Basil. Not. Syst. Herb. Hort. Bot. U. S. S. R. 6: 23. 1926.

Epiphytic shrub; branchlets terete, subglabrous; petioles stout (about 1.3 mm. in diameter), 2 mm. long, subglabrous, winged nearly to base; leaf blades coriaceous, ovate or ovate-lanceolate, 3 to 5 cm. long, 1 to 2 cm. broad, attenuate at base, acute or obtuse at apex, entire and slightly recurved at margins, glabrous above, glabrous or sparsely pilose beneath (hairs brown, appressed, about 0.2 mm. long), pinnate-veined, the midvein impressed above, prominent beneath, the secondary veins 2 or 3 to a side, usually oriented near base, arcuate-ascending, plane or slightly impressed above, slightly raised beneath, the veinlets reticulate, obscure; inflorescence axillary near ends of branchlets, the flowers solitary or in pairs, glabrous or sparsely pubescent with appressed scattered pale brown hairs about 0.2 mm. long; pedicels rugose, slender, 4 to 8 mm. long, circumscribed at base by several imbricate ovate bractlets about 1.5 mm. long, bibracteolate near base, obscurely articulate with calyx; calyx tube obpyramidal, about 3 mm. long and 2 mm. in diameter at summit at anthesis, winged to sinuses (wings fleshy, about 0.3 mm. broad); limb erect, 2.5 mm. long, the lobes 5, apiculate, 2 mm. broad; corolla cylindric, 15 to 20 mm. long, 3 to 4 mm. in diameter, contracted at throat, the lobes 1 to 2 mm. long; stamens 10, 9 to 10 mm. long; filaments glabrous, connate in a tube, about 4.5 mm. long; anther sacs 4 mm. long; tubule single, rigid, conical, 2.5 to 3 mm. long, opening by a wide introrse distal cleft 1.5 to 2 mm. long; stigma truncate.

TYPE LOCALITY: Department of Antioquia, Colombia. Type collection not cited.

DISTRIBUTION: Andes of Colombia and Ecuador, altitude 1,500 to 3,700 meters.

COLOMBIA.

EL VALLE: Cuesta de Tocotá, Western Cordillera, *Pittier* 770 (N, Y).

ECUADOR: "Andes," *Pearce* (K).

The type of this species is not available to me. From the description it appears to be more generally pilose than the specimens cited, which nevertheless agree well in all other points.

5. *Macleania stricta* A. C. Smith, sp. nov.

Frutex glaber; laminis ovatis basi cuneatis apice subacutis 5 ad 7 plinerviis; inflorescentia subfasciculata; calyce 5-alato, lobis breviter triangularibus;

corolla angulata; staminibus aequalibus, filamentis basi laxè connatis, tubulo unico quam loculis breviorè.

Shrub; branchlets terete, glabrous, with a loose nigrescent bark; petioles nigrescent, subterete, glabrous, 3 to 4 mm. long, narrowly winged above; leaf blades coriaceous, ovate, 4 to 8 cm. long, 2.5 to 4.5 cm. broad, cuneate or subattenuate at base, bluntly acute at apex, entire and slightly recurved at margins, glabrous, 5 to 7 pli-nerved, the secondary nerves oriented near base, arcuate, with the midnerve impressed above, prominent beneath, the veinlets reticulate, plane on both surfaces; inflorescence axillary, subfasciculate (rachis stout, not exceeding 5 mm. in length), 4 to 15 flowered; pedicels striate, 5 to 9 mm. long, slender, each subtended by an ovate acute bractlet less than 1 mm. long, bibracteolate near middle; calyx tube obprismatic, about 2 mm. long and 2 mm. in diameter at anthesis, narrowly winged to sinuses; limb about 1 mm. long including lobes, the lobes 5, acute, less than 1 mm. long; corolla subcylindric, 5-angled to lobes, about 14 mm. long and 3 mm. in diameter, glabrous without, sparsely white-tomentose distally within, the lobes triangular, acute, about 1 mm. long; stamens 10, equal, about 7 mm. long; filaments membranous, glabrous, loosely connate at base, 2.5 mm. long; anther sacs 3 mm. long; tubule single, membranous, elongate-conical, about 2 mm. long, opening by a wide introrse distal cleft about 1.2 mm. long; style filiform, slightly exserted, the stigma truncate.

Type in the U. S. National Herbarium, no. 1,420,322, collected between Ricaurte and Pipulquer, Tuquerres, Department of Nariño, Colombia, altitude 1,200 to 1,600 meters, July or August, by F. C. Lehmann (no. 5437). Duplicates at B, F, G, K, Y.

DISTRIBUTION: Andes of southern Colombia.

COLOMBIA.

NARIÑO: Pasto, Lobb 81 (K). San Pablo, "Piedra ancha," André 3297 (K).

This is a species of the alliance of *M. floribunda*, most closely related to *M. angulata*, from which it differs by having the corollas shorter and the inflorescences with more numerous flowers.

6. *Macleania angulata* Hook. Bot. Mag. Curtis 69: pl. 3979. 1848.

Shrub; branches and branchlets terete, glabrous; petioles subterete, glabrous, short; leaf blades coriaceous, ovate, 5 to 8 cm. long, 3 to 4 cm. broad, rounded or narrowed at base, obtuse at apex, entire at margins, 5-pli-nerved from near base, the midnerve pinnate above; flowers axillary, fasciculate (usually in groups of 3); pedicels 20 to 25 mm. long; bibracteolate near base, swollen above; calyx tube obprismatic, narrowly winged to sinuses; limb very short, the lobes 5, apiculate; corolla subcylindric, 5-angled, about 20 mm. long or more, glabrous; stamens 10; filaments thin-carnose, united in a tube; anthers erect, the tubule single, opening by a wide introrse cleft about half as long; style nearly as long as corolla, the stigma capitate.

TYPE LOCALITY: Peru. Type a cultivated plant raised from seed collected by Maclean.

I have not seen specimens referable to this species, but from the plate and description given by its author its taxonomic position as an ally of *M. floribunda* seems definite. The above incomplete description is drawn up from the original one.

7. *Macleania pentaptera* Hoer. Bot. Jahrb. Engler 42: 299. 1909.

Climbing or epiphytic shrub; branches and branchlets terete, glabrous (young parts sometimes sparsely puberulous), brownish; petioles thick, about 3 mm. long, glabrous, rugose; leaf blades coriaceous, ovate, 8 to 12 cm. long, 4 to 7 cm.

broad, glabrous, strongly cordate at base, sometimes amplexicaul, rounded or subacute at apex, entire, plane or slightly revolute at margins, pinnate-veined, the secondary veins 3 or 4 to a side, arcuate-ascending, usually oriented near base, with the midvein slightly impressed above, prominent beneath, the veinlets copiously reticulate, slightly raised on both surfaces; inflorescence axillary, short-racemose, 3 to 8 flowered; rachis up to 4 cm. long; pedicels 12 to 18 mm. long, rugose, glabrous or minutely puberulous, deciduously bibracteolate near middle (bractlets ovate, less than 1 mm. long), swollen distally and obscurely articulate with calyx; calyx obconical, glabrous or minutely puberulous distally, 10 to 13 mm. long, about 6 mm. in diameter at base of lobes, narrowly 5-winged to sinuses (wings fleshy, about 0.5 mm. broad, each continuing beyond margin of calyx to form a coriaceous spur), the limb dilated, minutely 5-lobed, the lobes apiculate, often suppressed; corolla scarlet, green distally, coriaceous, cylindric, 13 to 20 mm. long, about 5 mm. in diameter, slightly contracted at throat, glabrous without, densely tomentose within towards apex with pale tangled hairs up to 0.5 mm. long, the lobes erecto-patent, elongate-triangular, acute, about 3 mm. long and 1.5 mm. broad at base, frequently each with a perpendicular fleshy oblong apiculate spur; stamens 10, nearly as long as corolla; filaments glabrous, connate in a tube, about 3 mm. long; anther sacs 5 to 7.5 mm. long; tubule single, elongate-conical, 3 to 5.5 mm. long, opening by a wide introrse cleft about half as long; style often slightly exerted, the stigma truncate.

TYPE LOCALITY: Slopes of Mount Corazón, near Milligolly, Province of Pichincha, Ecuador. Type collected by Sodiro (no. 92/2).

DISTRIBUTION: Western Cordillera of Colombia and northern Ecuador.

COLOMBIA: Along Pacific coast, *Seemann* 1079 (K).

EL VALLE: Buenaventura and vicinity, near sea level, *Killip* 5329 (B, N, Y); *Triana* 2712 (K, Y), 2713 (K); *Pittier* 588 (N).

ECUADOR: *Seemann* (G, K).

PICHINCHA: Slopes of Mount Corazón, near Milligolly, *Sodiro* 92/2 (B, type).

With the exception of the type, all the above-cited specimens are described as growing in mangrove swamps at sea level, a habitat unique among *Thibaudieae*. The calyces have wings so strongly developed that the actual lobes are quite obscured, a condition suggested by *M. cordifolia*, etc., but never approached except in the present species. The presence of spurs on the corolla lobes is a more variable character; the type specimen has them very obscure, but in the material from the Dagua Valley of Colombia they are prominent. In leaf characters the above-cited specimens are fairly constant; the greatest variation is found in the *Seemann* specimen from Colombia, which has the leaves decidedly narrowed.

8. *Macleania rotundifolia* Sod. & Hoer. Bot. Jahrb. Engler 42: 300. 1909.

Shrub; branchlets terete, violaceous, minutely pale-puberulous or glabrous; petioles subrugose, essentially glabrous, 1 to 2 mm. long, stout; leaf blades broadly ovate or suborbicular, 7 to 10 cm. long, 5 to 8 cm. broad, cordate and subamplexicaul at base, rounded or obtuse at apex, entire at margins, glabrous, subcoriaceous, 7 to 9 pli-nerved, the lower pairs of secondary nerves spreading, the upper pair ascending, with the midnerve slightly impressed or plane above, raised beneath, the veinlets reticulate, slightly raised on both surfaces; inflorescence axillary, short-racemose, minutely pale-puberulous or glabrous on all external surfaces, 6 to 8 flowered; rachis striate, about 2 cm. long; pedicels rugose, 8 to 12 mm. long, each subtended by an oblong bractlet about 2 mm.

long; calyx tube obprismatic, about 4 mm. long and 4 mm. in diameter at anthesis, 5-angled or narrowly winged to sinuses; limb 2 to 3 mm. long including lobes, the lobes 5, minutely apiculate, about 3 mm. broad; corolla subcylindric, 20 to 22 mm. long, 5 to 6 mm. in diameter, white-tomentose within distally, the lobes about 2 mm. long; stamens 10, equal, 9.5 to 10 mm. long; filaments submembranous, firmly connate in a tube, 4 mm. long; anther sacs 3.5 to 4 mm. long; tubule single, submembranous, 2.5 to 3 mm. long, opening by a wide introrse pore about half as long; style as long as corolla, the stigma truncate.

TYPE LOCALITY: Near Ito-Muby, Ecuador. Type collected by Sodiro (no. 92/1).

DISTRIBUTION: Known only from the type collection.

EQUADOR: Near Ito-Muby, *Sodiro* 92/1 (B, type).

9. *Macleania amplexicaulis* A. C. Smith, sp. nov.

Frutex subglaber; laminis late ovatis breviter petiolatis basi cordatis amplexicaulibusque apice rotundatis; inflorescentia subfasciculata; calyce 5-alato, lobis elongato-triangularibus; corolla subcylindrica intus superne tomentosa; staminibus aequalibus, filamentis glabris basi connatis, tubulo unico quam loculis paullo brevior.

Shrub; branchlets subterete, with a loose brownish puberulous bark; petioles very short (less than 1 mm. long, the leaves practically sessile); leaf blades broadly ovate, strongly amplexicaul, 5 to 9 cm. long, 4 to 8 cm. broad, strongly cordate and overlapping at base, rounded at apex, entire or faintly crenulate at margins, glabrous, 7 to 13 nerved, the first 2 or 3 pairs oriented from the midnerve near its base, the remaining secondary nerves spreading from the base, with the midnerve plane above, prominent beneath, the veinlets reticulate, plane on both surfaces; inflorescence axillary, subfasciculate, 2 to 5 flowered, bracteate at base with a few subpuberulous ovate bracts up to 2 mm. long; pedicels striate, 6 to 8 mm. long, glabrous; calyx tube about 2.5 mm. long and 2.5 mm. in diameter at anthesis, narrowly 5-winged to sinuses; limb spreading, about 2.5 mm. long including lobes, the lobes 5, elongate-deltoid, about 2 mm. long; corolla subcylindric, about 18 mm. long and 4 mm. in diameter, contracted above, glabrous without, densely white-tomentose distally within, 5-lobed, the lobes elongate-deltoid, about 2 mm. long; stamens 10, equal, 11 to 12 mm. long; filaments membranous, glabrous, connate in basal half, about 2.5 mm. long; anther sacs about 5 mm. long, incurved at base; tubule single, membranous, elongate-conical, about 4.5 mm. long, opening by a wide introrse distal cleft about 2 mm. long; style filiform, about as long as corolla, the stigma truncate.

Type in the herbarium of the New York Botanical Garden, collected on hillside west of Río San Joaquín, La Galera, Micay Valley, Department of El Cauca, Colombia, altitude 1,200 to 1,400 meters, June 29, 1922, by E. P. Killip (no. 7886). Duplicate in U. S. National Herbarium.

DISTRIBUTION: Known only from the type collection.

This species is closely related to *M. rotundifolia*, from which it differs by having the inflorescence subfasciculate rather than racemose and the calyx lobes longer.

EXPLANATION OF PLATE 8.—*Macleania amplexicaulis*, from photograph of type sheet. About one-half natural size.

10. *Macleania ovata* Klotzsch, *Linnaea* 24:20. 1851.

Shrub, probably epiphytic; branchlets terete, cinereous, glabrous; petioles stout, 1 to 2 mm. long, glabrous; leaf blades thick-coriaceous, oblong or

ovate, 2 to 4.5 cm. long, 1 to 2.5 cm. broad, rounded or subcordate at base, obtuse at apex, entire and slightly revolute at margins, glabrous and sparsely punctate above, glabrous beneath, 5 to 7 pli-nerved, the nerves oriented above base, slightly impressed above, prominent beneath, the veinlets reticulate, obscure; inflorescence axillary, fasciculate, 4 to 7 flowered; pedicels rugose, stout, 4 to 8 mm. long, glabrous, circumscribed at base by several ovate puberulous bractlets 2 to 4 mm. long, bibracteolate near base, obscurely articulate with calyx; calyx tube glabrous, obpyramidal, 3 to 5 mm. long and 3 mm. in diameter at summit at anthesis, winged to sinuses (wings 0.5 mm. broad); limb erect, 2 to 5 mm. long including lobes, the lobes 5, subacuminate, 1.5 to 2 mm. long and 3 mm. across base; corolla orange-red, cylindric, glabrous or slightly pubescent towards apex, 21 to 25 mm. long, 4 mm. in diameter, contracted at the elongate throat, slightly 5-angled (angles terminating in lobes), the lobes spreading, about 2.5 mm. long, white-pubescent within; stamens 10, about 10 mm. long; filaments glabrous, connate in a tube, about 4 mm. long; anther sacs 4 to 4.5 mm. long; tubule single, rigid, conical, 2.5 to 3 mm. long, opening by an introrse elongate cleft 1 to 1.5 mm. long; stigma peltate.

TYPE LOCALITY: Veraguas, Panama. Type collected by Warszewicz.

DISTRIBUTION: Costa Rica and western Panama, altitude 1,400 to 1,500 meters.

COSTA RICA: Lankester K79 (K). Pacayas, Wercklé 16650 (N).

CARTAGO: El Muñeco, on Río Navarro, Standley & Torres 50883 (N).

PANAMA: Veraguas, Warszewicz (B, type).

Among the four specimens cited there is considerable variation, and possibly the single feature of the calyx, as described in the key, is not sufficient to give them specific unity. The leaves of the Costa Rican specimens are somewhat larger than those of the type, and of the Wercklé specimen more obviously punctate, but in view of the wide leaf variation throughout the genus the similarity in calyces seems a more constant character.

11. *Macleania linearifolia* (Donn. Smith) A. C. Smith.

Macleania cordata Lem. var. *linearifolia* Donn. Smith, Bot. Gaz. 16:12. 1891.

Shrub; branchlets subterete, subglabrous, with a brown deciduous bark; petioles rugose, 3 to 4 mm. long; leaf blades lanceolate-oblong, 8 to 12 cm. long, 1 to 2 cm. broad, rounded at base, acute at apex, entire at margins, glabrous, 5-pli-nerved, the midnerve impressed above, prominent beneath, the secondary nerves oriented near base, ascending near margins, slightly raised on both surfaces, the veinlets copiously reticulate, raised on both surfaces; flowers axillary, solitary or in pairs, glabrous; pedicels rugose, 8 to 10 mm. long, bibracteolate near base with ovate acute fimbriate bractlets about 1.5 mm. long; calyx tube obprismatic, about 4 mm. long and 4 mm. in diameter at anthesis, winged to sinuses; limb about 2.5 mm. long including lobes, the lobes 5, apiculate, about 0.5 mm. long; corolla cylindric-urceolate, about 22 mm. long, 4 to 5 mm. in diameter, contracted at throat, white-tomentose distally within, the lobes acute, about 1.5 mm. long; stamens 10, 8 to 9 mm. long; filaments glabrous, connate, about 3 mm. long; anther sacs 4 to 4.5 mm. long; tubule single, cylindric-conical, about 2.5 mm. long, opening by a wide introrse cleft about half its length; style about 25 mm. long, the stigma peltate.

TYPE LOCALITY: Pansamalá, Department of Alta Verapaz, Guatemala, altitude about 1,200 meters. Type collected by von Tuerckheim (no. 1332).

DISTRIBUTION: Known only from the type collection.

GUATEMALA.

ALTA VERAPAZ: Pansamalá, von Tuerckheim 1332 (N, type).

The narrowly linear leaves of this plant seem to mark it specifically from *M. insignis*, in view of the fact that there are apparently no intergrading forms.

12. *Macleania compacta* A. C. Smith, sp. nov.

Frutex compactus glaber; laminis ovatis breviter petiolatis basi subcordatis apice obtusis 5-*pli*-nerviis; inflorescentia fasciculata pauciflora; pedicellis brevibus; calyce anguste 5-alato, lobis apiculatis; corolla cylindrica; staminibus aequalibus, filamentis connatis, tubulo unico quam loculis paullo brevior.

Shrub; branchlets terete, glabrous; petioles terete, stout (about 1.5 mm. in diameter), 2 mm. long, glabrous; leaf blades thick-coriaceous, ovate, 3 to 4 cm. long, 2 to 3 cm. broad, cordate or subcordate at base, rounded or obtuse at apex, entire, thickened, and slightly revolute at margins, glabrous, 5-*pli*-nerved, the nerves oriented above base, plane or slightly raised above, raised beneath, the veinlets reticulate, raised above, plane beneath; inflorescence axillary near ends of branchlets, fasciculate, 1 to 3 flowered, the flower parts glabrous; pedicels subterete, stout (1.2 mm. in diameter), 3 to 4.5 mm. long, bibracteolate near base (bractlets minute, ovate, 0.7 mm. long), encircled at summit by several deciduous minute cartilaginous teeth about 0.1 mm. long; calyx tube obpyramidal, about 3 mm. long and 3 mm. in diameter at summit at anthesis, winged to sinuses, the wings fleshy, about 0.3 mm. wide; limb suberect, 2 mm. long including lobes, the lobes 5, apiculate, less than 1 mm. long; corolla cylindric, 15 to 16 mm. long, 4 mm. in diameter near base, contracted distally, the lobes about 1.5 mm. long; stamens 10, about 6.5 mm. long; filaments glabrous, connate in a tube, about 2 mm. long; anther sacs 3 mm. long; tubule single, rigid, conical, 2 mm. long, opening by an introrse elongate cleft about half its length; style about as long as corolla.

Type in the Gray Herbarium, collected at Barranca of Texolo, near Jalapa, State of Veracruz, Mexico, altitude about 1,100 meters, May 22, 1899, by C. G. Pringle (no. 7870).

DISTRIBUTION: Known only from the type collection.

This plant seems to merit specific recognition on the strength of the characters pointed out in the key; it differs from *M. insignis* in its small flowers and particularly in its short pedicels, but in leaf character is essentially similar.

13. *Macleania insignis* Mart. & Gal. Bull. Acad. Sci. Brux. 9:531. 1842.

Thibaudia laurifolia Mart. & Gal. Bull. Acad. Sci. Brux. 9:530. 1842.

Macleania cordata Lem. Fl. Serr. Jard. I. 4:312. 1848.

Birania tuberosa Auct.; Walp. Ann. Bot. 1:478. 1849.

Macleania colorata Klotzsch, Linnaea 24:68. 1851.

Macleania tuberosa Niedenzu, Bot. Jahrb. Engler 11:224. 1889, nomen.

Thibaudia tuberosa Leibold; Niedenzu, Bot. Jahrb. Engler 11:224. 1889, as synonym.

Shrub up to 4 meters high; branchlets terete, dark brown, with a deciduous subpuberulous bark; petioles subterete, glabrous, about 2 mm. long; leaf blades ovate, 3 to 8 cm. long, 1.5 to 4 cm. broad, subcordate at base, obtuse or subacute at apex, entire and slightly revolute at margins, glabrous, 5-*pli*-nerved, the secondary nerves oriented near base, ascending, with the midnerve slightly impressed above, raised beneath, the veinlets reticulate, plane on both surfaces; inflorescence axillary, subfasciculate, 2 or 3 flowered, circumscribed at base by a few minute ovate fimbriate bractlets; pedicels rugose, 8 to 15 mm. long, glabrous, bibracteolate near base with ovate bractlets up to 2 mm. long;

calyx tube glabrous, obprismatic, about 4 mm. long and 4 mm. in diameter at anthesis, winged to sinuses; limb about 2.5 mm. long including lobes, the lobes 5, apiculate, 1.5 mm. long; corolla elongate-urceolate, 20 to 25 mm. long and about 5 mm. in diameter, contracted at throat, glabrous or faintly puberulous without, sparsely tomentose distally within, the lobes acute, about 1.5 mm. long; stamens 10, 9 to 12 mm. long; filaments castaneous, glabrous, firmly connate, 3.5 to 5 mm. long; anther sacs 4 to 5 mm. long; tubule single, cylindrical-conical, 2 to 2.5 mm. long, opening by a wide introrse cleft more than half its length; style exerted in mature flowers, the stigma peltate.

TYPE LOCALITY: Mirador, State of Veracruz, Mexico. Type collected by Galeotti (no. 1827, in part).

DISTRIBUTION: Mountains of southern Mexico and Guatemala, altitude 1,000 to 1,800 meters.

MEXICO: *Leibold* 23 (B, type of *M. tuberosa*); *Sartorius* (B); *Schaffner* 538 (B); *Mueller* (Y).

VERACRUZ: Mirador, *Galeotti* 1827 (K, type coll.); *Purpus* 288 (B); *Liebmann* 8643 (Y), 8645 (N). Canton de Córdoba, *Conzatti* 167 (G). Zacuapán, *Purpus* 6313 (F, G, Y). Orizaba, *Botteri* 614 (G).

OAXACA: Llano Verde, *Galeotti* 1827 (B). Chinantla, *Galeotti* 1814 (B, N, type collection of *Thibaudia laurifolia*). "Sierra," *Galeotti* 1840 (N).

GUATEMALA.

ALTA VERAPAZ: Cobán, *von Tuerckheim* II. 1661 (N). Finca Sepacuité, *Cook & Griggs* 435 (N). Samac, *Johnson* 292 (N).

BAJA VERAPAZ: Santa Rosa, *von Tuerckheim* II. 2153 (F, G, N, Y), 1190 (B, G, N). Purulhá, *Popenoe* 927 (N).

This species is the common Central American one in the single-tubuled group of *Macleania*. *M. insignis* and *M. cordata* have long been retained as distinct species, but study of the above series of specimens fails to reveal any constant distinctions. The flowers are identical on all specimens, and the leaf measurements are without value. The fact that the author of *M. cordata* did not mention *M. insignis* in his description, but compared his plant with *M. longiflora* and *M. cordifolia*, indicates that he was unaware of the earlier name. The type of *M. cordata*, which I have not seen, was a cultivated plant introduced into Europe by Ghiesbreght, presumably from Mexico.

14. *Macleania cordifolia* Benth. Pl. Hartw. 223. 1846.

Macleania speciosissima Hook. f. Bot. Mag. Curtis 90: pl. 5453. 1864.

Low shrub; branchlets pale brown, terete, glabrous; petioles rugose, glabrous, 2 to 5 mm. long; leaf blades ovate or ovate-oblong, 4 to 10 cm. long, 2 to 5 cm. broad (rarely larger), subcordate at base, obtuse or subacute at apex, subentire and slightly thickened at margins, glabrous, sparsely punctate above, 5 to 7 pinnately-veined, the secondary nerves oriented above base, arcuate-ascending, with the midnerve plane above, raised beneath, the veinlets copiously reticulate, slightly raised on both surfaces; inflorescence axillary, short-racemose, 4 to 10 flowered, the rachis rugose, up to 1 cm. long; pedicels rugose, swollen distally, glabrous, 8 to 15 mm. long, each subtended by an ovate acute bractlet up to 2 mm. long, bibracteolate near base; calyx tube obprismatic, glabrous, 3 to 5 mm. long and 4 mm. in diameter at anthesis, broadly winged to sinuses; limb about 2.5 mm. long including lobes, the lobes 5, apiculate, less than 1 mm. long; corolla cylindrical, 14 to 25 mm. long, about 4 mm. in diameter, contracted above, glabrous without, densely white-pubescent distally within, the lobes about 2 mm. long; stamens 10, 9 to 11 mm. long; filaments coherent, about 2.5 mm. long, puberulous; anther sacs 3.5 to 6 mm. long; tubule single, broadly

cylindric-conical, 4 to 5 mm. long, opening by a wide introrse cleft about half its length; style about as long as corolla, the stigma truncate.

TYPE LOCALITY: Hacienda de Iraví, near Perucho, Province of Pichincha, Ecuador. Type collected by Hartweg (no. 1218).

DISTRIBUTION: Andes of Ecuador (and Colombia?).

COLOMBIA?: *Linden* (K, type of *M. speciosissima*).

ECUADOR.

PICHINCHA: Hacienda de Iraví, near Perucho, *Hartweg* 1218 (B, K, type).

CHIMBORAZO: Foot of Mount Chimborazo, 900 meters, *Spruce* 6168 (K).

CULTIVATED PLANTS: Origin unknown but possibly from the Hartweg collection (B, G, K, Y).

This species has been cultivated in botanical gardens and in private greenhouses, but I have not been able to ascertain from what collector the original plant was obtained. Like all others of the genus, it makes a very showy plant for cultivation.

15. *Macleania punctata* Hook. Bot. Mag. Curtis 75: pl. 4426. 1849.

Low shrub; branchlets subterete, brownish, sparsely puberulous, becoming glabrous; petioles subrugose, 3 to 4 mm. long, sparsely puberulous or glabrous; leaf blades coriaceous, ovate or ovate-oblong, 5 to 7 cm. long, 2.5 to 4 cm. broad, truncate or lightly subcordate at base, acute or obtuse at apex, entire and slightly recurved at margins, essentially glabrous and sparsely punctate above, deciduously puberulous on nerves beneath, 7-plex-nerved, the secondary nerves oriented above base, ascending, with the midnerve nearly plane above, raised beneath, the veinlets reticulate, slightly raised or plane on both surfaces; inflorescence axillary, short-racemose, 5 to 10 flowered, pilose on all exterior surfaces with pale spreading hairs about 0.5 mm. long, becoming essentially glabrous; rachis about 5 mm. long; petioles striate, 12 to 20 mm. long, bracteate at base and bibracteolate slightly above middle (bractlets lanceolate-oblong, about 2 mm. long), swollen distally; calyx narrowly winged to sinuses, the tube obprismatic, 6 mm. long and 4 to 5 mm. in diameter at summit at anthesis, the limb 2 to 3 mm. long including lobes, the lobes 5, apiculate, about 4 mm. broad, submembranous at margin; corolla subcylindric, about 22 mm. long, 5 to 6 mm. in diameter, white-tomentose within distally, the lobes about 1.5 mm. long; stamens 10, about 12 mm. long; filaments dark castaneous, 3 to 4 mm. long, connate, glabrous; anther sacs 5 to 6 mm. long; tubule single, 4 mm. long, opening by a wide introrse cleft nearly as long; stigma subpeltate.

TYPE LOCALITY: "Andes of Ecuador." Type a cultivated plant, originally collected by Lobb.

DISTRIBUTION: Andes of northern Ecuador, altitude 2,500 to 3,000 meters.

ECUADOR: *Lobb* (K, type).

PICHINCHA: Western side of Mount Pichincha, *Jameson* 82 (K). Pulu-lagua, *Jameson* (K). Andes of Quito, *Jameson* (K).

This is a species well marked by the pubescence of its inflorescence, but the punctation of the leaves is somewhat obscure and variable, as it is throughout the genus.

15a. *Macleania punctata* Hook. var. *puberula* Danguy & Cherm. Bull. Mus. Hist. Nat. 28: 434. 1922.

TYPE COLLECTION: *Rivet* 520, Danas, Ecuador.

I have not seen the type of this variety, which is mentioned as being more puberulous than the species, with thinner leaves.

16. *Macleania pubiflora* Benth. Pl. Hartw. 224. 1846.

Low shrubs; branchlets stout, terete, densely puberulous with brownish spreading hairs up to 0.2 mm. long; pedicels subterete, 5 to 10 mm. long, puberulous or glabrescent, winged above; leaf blades ovate or slightly obovate, 6 to 8 cm. long, 2 to 3 cm. broad, cuneate or subattenuate at base, obtuse or subacute at apex, entire and slightly thickened at margins, glabrous above, pale puberulous beneath, becoming glabrous, pinnate-veined, the secondary veins 2 or 3 to a side, ascending, oriented from the midvein in the basal half, with the midvein impressed above, prominent beneath, the veinlets obscurely reticulate; inflorescence axillary, subfasciculate, 3 to 5 flowered; pedicels subterete, 6 to 10 mm. long, pale-pubescent (hairs spreading, up to 0.3 mm. long), bibracteolate at middle with acute, partially fused, involucre, pubescent bractlets up to 2 mm. long, swollen distally; calyx tube subcylindric, about 2.5 mm. long and 2 mm. in diameter at anthesis, densely white-pubescent; limb spreading, 3 to 4 mm. long including lobes, the lobes 5, apiculate, about 1 mm. long; corolla cylindric-urceolate, 17 to 18 mm. long, 5 to 6 mm. in diameter at base, about 3 mm. in diameter at throat, pubescent without, especially distally, with pale spreading hairs up to 0.5 mm. long, glabrous within, the lobes acute, about 2 mm. long; stamens 10, about 10 mm. long; filaments nigrescent, glabrous, free, 3 to 4 mm. long; anther sacs incurved at base, 5.5 to 6 mm. long; tubule single, narrowly cylindric-conical, 2.5 mm. long, opening by a short oval introrse cleft, the medial partition sometimes present to tip; stigma truncate.

TYPE LOCALITY: Hacienda de Hato Frío, "Prov. Popayan," Department of El Cauca, Colombia. Type collected by Hartweg (no. 1222).

DISTRIBUTION: Andes of southern Colombia, altitude 2,400 to 3,000 meters.

COLOMBIA.

EL CAUCA: Hacienda de Hato Frío, *Hartweg* 1222 (K, type). San José, near San Antonio, *Pennell* 7566 (B, G, N, Y). Páramo de Achupallas, *Triana* 2672 (B, K).

With the following species this forms a distinct group of *Macleania* with pilose flowers, distinct filaments, single tubules, and a tendency toward elongate calyx lobes. The last character is notable, however, only in *M. salapa*.

17. *Macleania salapa* (Benth.) Benth. & Hook. Gen. Pl. 2:566. 1876.

Ceratostema salapa Benth. Pl. Hartw. 141. 1844.

Tyria salapa Klotzsch, *Linnaea* 24:21. 1851.

Shrub; branchlets subterete, slightly puberulous when young, becoming glabrescent and nigrescent; petioles 3 to 4 mm. long, glabrous, narrowly winged; leaf blades obovate, 3 to 4 cm. long, 1.5 to 2 cm. broad, cuneate at base, obtuse or subacute at apex, entire or faintly crenulate and slightly revolute at margins, glabrous, pinnate-veined, the midnerve slightly impressed above, prominent beneath, the secondary veins 2 or 3 to a side, oriented from the midnerve near base, arcuate-ascending, slightly impressed or plane above, slightly elevated beneath, the veinlets obscure; inflorescence axillary toward ends of branchlets, subfasciculate, 2 to 4 flowered, circumscribed at base by a few triangular puberulous bractlets about 2 mm. long; pedicels 3 to 5 mm. long, densely pilose with pale spreading hairs about 0.2 mm. long, bibracteolate toward base with lanceolate-triangular bractlets about 3 mm. long, obscurely articulate with calyx; calyx tube obprismatic, about 2 mm. long and 3 mm. in diameter at summit at anthesis, narrowly 5 or 6 winged to sinuses, pilose as the pedicels; limb about 8 mm. long including lobes, the lobes 6 (frequently 5), lanceolate, acute, 7 mm. long, 2 to 2.5 mm. across base, sparsely white-pilose on both surfaces, ciliate at margins with short stiff brown hairs; corolla

subcylindric, 6 (or 5) angled, about 15 mm. long, 4 mm. in diameter, contracted above, pilose as the pedicels, 6 (or 5) lobed, the lobes spreading, about 1.5 mm. long; stamens 12 (or 10), 7.5 to 9 mm. long; filaments free, 0.5 to 2 mm. long, glabrous, mahogany-colored, narrowed above; anther sacs 3.5 to 4 mm. long, incurved at base; tubules partially united, erect, elongate-conical, about 3 mm. long, opening by distal introrse elongate pores up to 2 mm. long; style about as long as corolla, the stigma peltate.

TYPE LOCALITY: Loja, Province of Loja, Ecuador. Type collected by Hartweg (no. 784).

DISTRIBUTION: Andes of Ecuador, possibly limited to the region around Loja.

ECUADOR: *André* 4340 (K); *Seemann* (K).

LOJA: Loja, *Hartweg* 784 (B, K, type, Y).

18. *Macleania euryphylla* Blake, Journ. Washington Acad. Sci. 14:291. 1924.

Shrub; branchlets stout, cinereous, subterete, pale-pubescent when young with spreading hairs up to 0.4 mm. long; petioles rugose, narrowly winged, puberulous, 5 to 7 mm. long; leaf blades deltoid-ovate, 5 to 7 cm. long, 4 to 5 cm. broad, truncate at base, rounded at apex, entire and slightly revolute at margins, glabrous, obscurely punctate above, pinnate-veined, the secondary veins 3 to a side, oriented near base, spreading, with the midvein plane above, prominent beneath, the veinlets reticulate, slightly raised on both surfaces; inflorescence axillary, subfasciculate, 5 to 20 flowered, circumscribed at base by numerous broadly ovate, fimbriate bractlets up to 4 mm. long; pedicels subterete, glabrous, 6 to 9 mm. long, bibracteolate near base; calyx tube obconical, about 3 mm. long and 3 mm. in diameter at anthesis, glabrous or faintly puberulous; limb 2 to 2.5 mm. long including lobes, the lobes 5, apiculate, about 1 mm. long; corolla cylindric-urceolate, 14 to 15 mm. long and 5 mm. in diameter, contracted at throat, glabrous, the lobes acute, about 1.5 mm. long; stamens 10, about 9 mm. long; filaments free or slightly coherent at base, about 2.5 mm. long, pilose at margins distally with hairs up to 0.5 mm. long; anther sacs 3 to 4 mm. long; tubules laterally connate, cylindric-conical, 3 to 4 mm. long, opening by a more or less fused cleft about half their length; style stout, slightly exserted, the stigma peltate.

TYPE LOCALITY: Cusatagua, near Ambato, Province of Tunguragua, Ecuador. Type collected by Pachano (no. 179).

DISTRIBUTION: Known only from the type collection.

ECUADOR.

TUNGURAGUA: Cusatagua, near Ambato, *Pachano* 179 (N, type).

This species is distinct in its peculiar deltoid leaves, which are broadest very near the base, and is also characterized by short crowded axillary inflorescences. Local name: "Sagalita."

19. *Macleania crassa* A. C. Smith, sp. nov.

Frutex crassus; petiolis rugosis crassis; laminis oblongis basi rotundatis vel cuneatis apice subacutis pinnatinerviis, nervis subtus prominentibus; inflorescentia longe racemosa, rhachidibus crassis; calyce breviter cylindrico, limbo lato 5-lobato; corolla cylindrico-urceolata carnosacoriacea 5-lobata; staminibus aequalibus, filamentis carnosis distinctis glabris, loculis granulatissimis, tubulis lateraliter connatis quam loculis paullo brevioribus.

Stout shrub; branchlets stout, angled, glabrous; petioles rugose, 12 to 20 mm. long, up to 5 mm. in diameter, glabrous, narrowly winged above; leaf blades oblong, 10 to 25 cm. long, 4 to 9 cm. broad, rounded or cuneate at base, acute or obtuse at apex, entire and slightly revolute at margins, glabrous, sparsely punctate above, pinnate-veined, the midvein stout, slightly raised above, very

prominent beneath, the secondary veins 4 or 5 to a side, arcuate-ascending, slightly impressed above, prominent beneath, the veinlets reticulate, plane above, slightly raised beneath; inflorescence terminal or axillary near ends of branchlets, racemose; rachis stout (up to 7 mm. in diameter), subterete, glabrous, 10 to 25 cm. long; pedicels subterete, stout (about 3 mm. in diameter), 12 to 25 mm. long, glabrous, 1 or 2 per centimeter of rachis, sometimes subtended by leaflike bracts up to 8 cm. long, bibracteolate near middle with ovate rounded bractlets up to 4 mm. long, swollen distally; calyx tube short-cylindric, about 4 mm. long and 5 mm. in diameter at anthesis, glabrous; limb spreading, 6 to 7 mm. long including lobes, the lobes 5, ovate, acute, thick-margined except at the apiculate tip, 4 to 5 mm. long (two sometimes partially fused); corolla cylindric-urceolate, 18 to 25 mm. long, 7 to 10 mm. in diameter at base, contracted at throat, thick-carnose, glabrous, 5-lobed, the lobes triangular, acute, 2 to 3 mm. long; stamens 10, equal, 14 to 15 mm. long in mature flowers; filaments nigrescent, thick, free, 2 to 3 mm. long, glabrous; anther sacs strongly granular, stout (up to 2 mm. in diameter), 7 to 9 mm. long; tubules laterally connate, cylindric-conical, 5 to 6.5 mm. long, opening by introrse frequently fused clefts more than half their length; style stout, up to 1 mm. in diameter, shorter than corolla, the stigma truncate.

Type in the U. S. National Herbarium, no. 1,143,639, collected in shrub zone on Mount Santa Ana, Department of El Cauca, Colombia, altitude 2,700 to 3,000 meters, June 29 or 30, 1922, by F. W. Pennell (no. 7465). Duplicates at B, G, Y.

DISTRIBUTION: Andes of southwestern Colombia.

This plant is larger in every respect than other species of *Macleania* known to me, and is unmistakable in aspect. Possibly a plant collected by Lehmann (no. 5962) near Popayán, deposited at Kew, should be included here.

20. *Macleania benthamiana* Walp. Repert. Bot. 6:415. 1847.

Macleania floribunda Benth. Pl. Hartw. 141. 1844, not Hook. 1837.

Macleania popenoei Blake, Proc. Biol. Soc. Washington 35:122. 1922.

Macleania multibracteata Mansf. Notizbl. Bot. Gart. Berlin 9:436. 1925.

Subscandent shrub 3 to 5 meters high; branchlets brownish, glabrous, subterete, stout; petioles rugose, glabrous, 6 to 20 mm. long, winged above; leaf blades oblong or ovate-oblong, 7 to 18 cm. long, 3 to 5 cm. broad, attenuate at base, obtuse or subacute at apex, subentire and revolute at margins, glabrous, dark-punctate above, pinnate-veined, the secondary veins 2 to 4 to a side, oriented near base, ascending, with the midvein slightly impressed above, prominent beneath, the veinlets reticulate, plane on both surfaces; inflorescence axillary, subfasciculate, 8 to 20 flowered, circumscribed at base by numerous imbricate oblong-lanceolate bractlets up to 8 mm. long; pedicels subterete, glabrous, 6 to 10 mm. long, bibracteolate near base with oblong fimbriate bractlets about 3 mm. long, swollen distally; calyx tube obconical, glabrous, about 2.5 mm. long and 3.5 mm. in diameter at summit at anthesis; limb spreading, 2 to 3 mm. long including lobes, the lobes apiculate, about 1.5 mm. long, thin-margined; corolla cylindric-urceolate, 12 to 15 mm. long, 4 to 5 mm. in diameter at base, contracted at throat, glabrous, the lobes about 2 mm. long; stamens 10, 8 to 9 mm. long; filaments nigrescent, free, about 2 mm. long, pilose at margins distally with hairs up to 0.4 mm. long; anther sacs about 4 mm. long; tubules laterally connate, about 4 mm. long, opening by introrse oval clefts about half their length; style slightly exserted, the stigma truncate.

TYPE LOCALITY: Loja, Province of Loja, Ecuador. Type collected by Hartweg (no. 786).

DISTRIBUTION: Andes of southern Ecuador and northern Peru, altitude 2,500 to 2,800 meters.

ECUADOR.

LOJA: Loja, *Hartweg* 786 (K, type). Cordillera de Zamora, east of Loja, *Popenoe* 1330 (N, type of *M. popenoei*).

PERU.

HUÁNUCO: Chaglla, *Macbride* 3664 (F). Between Chaglla and Mufia, *Weberbauer* 6704 (B, type of *M. multibracteata*, F).

This species is easily distinguished by the bracts, as mentioned in the key. The Peruvian specimens may have slightly narrower leaves than those from Ecuador, but the difference is barely discernible. The synonymy in this case is a fair example of the necessity of seeing type material, rather than depending upon previous descriptions. A local name (vicinity of Loja) is "joyapa."

21. *Macleania poortmanni* Drake, *Journ. de Bot.* 3:74. 1889.

Small tree up to 6 meters high; branchlets subterete, striate, glabrous or subpuberulous; petioles subterete, rugose, 4 to 6 mm. long, glabrous; leaf blades ovate or subspatulate, 4 to 6 cm. long, 1.8 to 2.5 cm. broad, narrowly attenuate at base, rounded or obtuse at apex, entire or faintly crenulate at margins, glabrous, pinnate-veined, the secondary veins 2 or 3 to a side, arcuate-ascending, with the midvein impressed above, prominent beneath, the veinlets reticulate, obscure; inflorescence axillary, subfasciculate, 2 to 8 flowered; pedicels subterete, stout in fruit, 6 to 8 mm. long, glabrous, bibracteolate at middle with ovate bractlets about 1.5 mm. long; calyx tube campanulate, glabrous, 1.5 to 2 mm. long, 2 mm. in diameter at anthesis; limb 1 to 1.5 mm. long including lobes, the lobes 5, about 0.5 mm. long, 1.5 mm. broad; corolla subcylindric, 7 to 9 mm. long, 2 to 3 mm. in diameter, contracted at throat, glabrous, the lobes less than 1 mm. long; stamens 10, nearly as long as corolla; filaments free, 1 to 1.5 mm. long, nigrescent, sparsely pillose at distal margins; anther sacs about 4 mm. long; tubules laterally connate, about 3 mm. long, opening by wide clefts about 1 mm. long; stigma truncate; fruit ovoid, up to 1 cm. in diameter, the calyx limb persistent.

TYPE LOCALITY: Loja, Province of Loja, Ecuador. Type collected by Poortmann (no. 126).

DISTRIBUTION: Vicinity of Loja, southern Ecuador.

ECUADOR.

LOJA: Vicinity of Loja, *André* 4553 (K); *Popenoe* 1329 (N).

This species is marked by exceptionally attenuate-based leaves, but otherwise is not sharply distinct from the complex referred to *M. nitida*. A local name is "joyapa."

22. *Macleania pilgeriana* Hoer. *Bot. Jahrb. Engler* 42:301. 1909.

Low compact shrub; branchlets subterete, rugose, glabrous, pale brown; petioles subrugose, narrowly winged, glabrous, 3 to 4 mm. long; leaf blades oblong, 4 to 5 cm. long, 1.5 to 2 cm. broad, rounded at base, often decurrent on petiole, entire and slightly revolute at margins, coriaceous, glabrous, pinnate-veined, the midvein nearly plane above, prominent beneath, the secondary veins usually 3 to a side, oriented in basal half of leaf, ascending, slightly raised on both surfaces, the veinlets reticulate, slightly raised or plane; inflorescence axillary or subterminal, short-racemose (rachis up to 8 mm. long), 6 to 10 flowered, glabrous in all parts; pedicels rugose, 10 to 13 mm. long, each subtended by a coriaceous oblong subacute bract 2 mm. long, minutely bibracteolate near base; calyx tube rugose, short-cylindric or campanulate, about 2.5 mm. long, 2 to 3 mm. in diameter at anthesis; limb about 2 mm. long including

lobes, the lobes 5, apiculate, 2.5 to 3 mm. broad, the sinuses acute; corolla subcylindric, about 15 mm. long and 4 mm. in diameter, contracted distally, the lobes about 1 mm. long; stamens 10, about 11 mm. long; filaments castaneous, distinct, sparsely pilose at distal margins; anther sacs 3.5 to 4 mm. long; tubules laterally connate, about 6 mm. long, opening by broad clefts nearly as long; stigma truncate or subpeltate.

TYPE LOCALITY: West of Mount Pichincha, Province of Pichincha, Ecuador. Type collected by Sodiro (no. 92/11b).

DISTRIBUTION: Known only from the type collection.

ECUADOR.

PICHINCHA: West of Mount Pichincha, near Alaspongo and Chiquilpa, Sodiro 92/11b (B, type).

This species is distinguished by the slender elongate tubules, as noted in the key, but is distinct from *M. nitida* on no other tangible character.

23. *Macleania nitida* (H. B. K.) Hoer. Bot. Jahrb. Engler 42: 269. 1909.

Thibaudia rupestris H. B. K. Nov. Gen. & Sp. 3: 270. 1818.

Thibaudia nitida H. B. K. Nov. Gen. & Sp. 3: 271. 1818.

Psammisia nitida Klotzsch, Linnaea 24: 45. 1851.

Psammisia rupestris Klotzsch, Linnaea 24: 45. 1851.

Psammisia alpicola Klotzsch, Linnaea 24: 45. 1851.

Macleania alpicola Hoer. Bot. Jahrb. Engler 42: 269. 1909.

Macleania sodiroi Hoer. Bot. Jahrb. Engler 42: 302. 1909.

Macleania trianae Hoer. Bot. Jahrb. Engler 42: 303. 1909.

Shrub or low tree, the branchlets subterete, brownish or cinereous, puberulous when young, becoming glabrous; petioles subterete, rugose, 3 to 10 mm. long, glabrous, narrowly winged above; leaf blades oblong or ovate-oblong or ovate, 4 to 12 cm. long, 1.5 to 6 cm. broad, cuneate or rounded at base, subacute or obtuse at apex, entire and slightly revolute at margins, glabrous and sometimes very sparsely punctate above, when young frequently pilose beneath with hairs up to 0.3 mm. long, becoming glabrous, pinnate-veined, the secondary veins 3 or 4 to a side, arcuate-ascending, with the midvein slightly impressed above, prominent beneath, the veinlets reticulate, nearly plane on both surfaces; inflorescence axillary near ends of branchlets, short-racemose, essentially glabrous in all parts, 4 to 15 flowered, the rachis rugose, 1 to 6 cm. long; pedicels striate, 7 to 20 mm. long, each subtended by an oblong bractlet about 3 mm. long, minutely bibracteolate near base, swollen distally; calyx tube short-cylindric, about 3 mm. long and 3 mm. in diameter at anthesis; limb 3 to 4 mm. long including lobes, the lobes 5, apiculate, 1 to 2 mm. long; corolla cylindric-urceolate, 12 to 22 mm. long, about 6 mm. in diameter at base, contracted at throat, the lobes erect, 1.5 to 2 mm. long; stamens 10, 9 to 13 mm. long; filaments distinct, nigrescent, subglabrous, 2 to 4 mm. long; anther sacs 4.5 to 7 mm. long; tubules laterally connate, cylindric-conical, 4 to 6 mm. long, opening by introrse oval clefts about half their length; style stout, exerted in mature flowers, the stigma peltate.

TYPE LOCALITY: Between Quebrada de Tohecito and La Ceja, in Quindío Andes, Department of Tolima, Colombia. Type collected by Humboldt and Bonpland.

DISTRIBUTION: Andes of Venezuela to northern Peru, common in the northern part of its range, altitude 1,500 to 4,100 meters.

VENEZUELA: *Moritz* 1349 (B, type of *M. alpicola*).

MÉRIDA: Mucurubá, *Gehriger* 324 (N, Y).

COLOMBIA: *Humboldt & Bonpland* (B); *Triana* 4333 (B).

NORTE DE SANTANDER: Mustiscua, Pamplona, etc., *Killip & Smith* 19631 (N, Y), 19738 (N, Y), 19914 (N, Y).

SANTANDER: Various páramo regions, *Killip & Smith* 15722 (N, Y), 15806 (N, Y), 17280 (N, Y), 17281 (N, Y), 17336 (N, Y), 17586 (N, Y), 17698 (N, Y), 17744 (N), 17994 (N, Y), 18222 (N), 18606 (N, Y), 21172 (N).

CUNDINAMARCA: Vicinity of Bogotá, *Triana* 36 (B, type of *M. trianae*), 2703 (K); *Holton* in 1852 (K, Y); *André* 754 (K); *Stuebel* 150b (B); *Schultze* 54 (B, N); *Perez* 1060 (N).

ANTIOQUÍA: Medellín, *Archer* 1211 (N).

CALDAS: Old Quindío Trail, *Killip & Hazen* 9467 (Y).

TOLIMA: Quindío Andes, between Quebrada de Tohecito and La Ceja, *Humboldt & Bonpland* (B, type). Near Páramo de Ruiz, *Pennell* 3116 (N, Y).

COLOMBIA OR ECUADOR: *André* (K). "Piedra ancha," *André* 3344 (K); *André* (K).

ECUADOR: *Jameson* (N).

PICHINCHA: Mount Pichincha, *Sodirol* 92/11 (B, type of *M. sodirol*).

TUNGURAGUA: Baños, *Spruce* 4999 (K, Y).

AZUAY: Nabón, *Rose* 23914 (N). Between Oña and Cuenca, *Hitchcock* 21623 (N, Y).

LOJA: Vicinity of Loja, *Humboldt & Bonpland* (B, type of *Thibaudia rupestris*); *Jameson* in September, 1864 (K).

PERU.

PIURA: Palamba, *Weberbauer* 6041 (B).

CAJAMARCA: Huambos, *Weberbauer* 4182 (B).

In flower structure, length of rachis, pedicels, etc., there are no consequential differences among these specimens. In leaf shape there are slight variations, but certainly none of specific value. In general it may be said that the leaves of the type of *M. nitida* are broadly ovate and obtuse at apex; of the type of *M. alpicola* oblong and somewhat attenuate at base; of the type of *Thibaudia rupestris* lanceolate-oblong; of the type of *M. trianae* elliptic and slightly larger; of the type of *M. sodirol* broadly ovate with deeply impressed nerves. Because these variations occur throughout the above-cited specimens sporadically and without geographic relationship, I do not hesitate to consider the specimens representative of a single species. Local names: "Uva camarona," "cacaguito." The fruit is sometimes eaten.

24. *Macleania glabra* (Klotzsch) Hoer. Bot. Jahrb. Engler 42: 268. 1909.

Psammisia glabra Klotzsch, Linnaea 24: 46. 1851.

Psammisia costaricensis Klotzsch, Linnaea 24: 47. 1851.

Macleania turrialbana Donn. Smith, Bot. Gaz. 27: 339. 1899.

Macleania costaricensis Hoer. Bot. Jahrb. Engler 42: 268. 1909.

Macleania irazuensis Blake, Proc. Biol. Soc. Washington 35: 121. 1922.

Low shrub, usually epiphytic, the branchlets subterete, glabrous; petioles rugose, 4 to 10 mm. long, glabrous, narrowly winged above; leaf blades oblong or ovate-oblong, 4 to 10 cm. long, 2 to 5 cm. broad, cuneate or rounded at base, obtuse or subacute at apex, subentire and slightly revolute at margins, glabrous, sparsely punctate above or smooth, pinnate-veined, the midvein slightly impressed above, prominent beneath, the secondary veins 2 to 4 to

a side, arcuate-ascending, plane above, prominent beneath, the veinlets reticulate, plane above, slightly raised beneath; inflorescence axillary near ends of branchlets, racemose, 4 to 20 flowered, essentially glabrous throughout, the rachis striate, 1 to 8 cm. long; pedicels striate, 10 to 20 mm. long, each subtended by an ovate, slightly fimbriate bractlet up to 3 mm. long, bibracteolate near the base with ovate, sometimes fused bractlets about 3 mm. long, swollen distally; calyx tube short-cylindric, about 2.5 mm. long and 4 mm. in diameter at anthesis; limb subspreading, about 2 mm. long including lobes, the lobes 5, apiculate, about 1 mm. long; corolla cylindric-urceolate, about 20 mm. long and 6 mm. in diameter, contracted at throat to 3 mm. in diameter, the lobes deltoid, about 2 mm. long; stamens 10, 9 to 14 mm. long; filaments free, short-pilose at margins distally; anther sacs incurved at base and apex, 4 to 6 mm. long; tubules laterally connate or distinct nearly to base, rigidly and narrowly cylindric-conical, 4 to 6 mm. long, opening by elongate introrse clefts about half their length; stigma truncate.

TYPE LOCALITY: Mount Veragua, Veraguas, Panama. Type collected by Warszewicz.

DISTRIBUTION: Mountains of Costa Rica and western Panama, altitude 1,500 to 3,300 meters.

COSTA RICA.

SAN JOSÉ: La Palma, *Wercklé* 16588 (B). Cerro de las Vueltas, *Standley & Valerio* 43720 (N), 43907 (N), 44005 (N), 44022 (N). Vicinity of Santa María de Dota, *Standley* 42325 (N), 43048 (N). Vicinity of El Copey, *Standley* 42657 (N), 42683 (N), 42722 (N); *Tonduz* 12251 (N).

CARTAGO: Mount Irazú and vicinity, *Oersted* 8574 (N); *Kuntze* 2346 (Y); *Hoffmann* 555 (B); *Pittier* 13047 (N); *Popenoe* 1017 (N, type of *M. irazuensis*); *Stork* 2070 (F). Cartago, *Oersted* 8648 (N). Volcán de Poás, *Pittier* 2033 (N). Cerro de La Carpintera, *Standley* 34325 (N). Mount Turrialba, *Pittier* 7546 (13090 herb. nat. Cost.) (B, F, G, N, type of *M. turrialbana*, Y); *Standley* 34975a (N), 35257 (N).

PANAMA.

CHIRIQUÍ: Chiriquí Volcano, *Pittier* 3102 (N).

VERAGUAS: *Warszewicz* (B, type of *M. costaricensis*); Mount Veragua, *Warszewicz* (B, type).

The situation with respect to the group of names here listed parallels that concerning *M. nitida*, etc. The type of *M. glabra* has leaves somewhat narrower than the average; the other three types involved are practically identical in leaf shape. As mentioned by Blake under his description of *M. irazuensis*, there is some variation in length of tubules, but this is not sufficiently constant to be of consequence. A good deal of confusion in this group has been caused by a misunderstanding as to whether one or two tubules were present, a situation easily avoided by dissection. A comparison of this species with the South American *M. nitida* shows only the slight distinction mentioned in the key, and perhaps they should be combined. Local names: "Colmillo," "muelas."

25. *Macleania robusta* Rusby, Descr. S. Amer. Pl. 75. 1920.

Macleania arcuata Rusby, Descr. S. Amer. Pl. 76. 1920.

Shrub or low tree 2 to 4 meters high; branchlets terete, brownish, glabrous, straight; petioles rugose, 6 to 10 mm. long, glabrous or faintly puberulous, narrowly winged above; leaf blades ovate or ovate-oblong, 5 to 13 cm. long, 3 to 7 cm. broad, rounded or subcuneate at base, obtuse or subacute at apex, entire and slightly revolute at margins, glabrous, pinnate-veined, the secondary

veins 3 or 4 to a side, arcuate-ascending, with the midvein plane or slightly impressed above, prominent beneath, the veinlets obscurely reticulate; inflorescence axillary near ends of branchlets, racemose, 5 to 10 flowered, glabrous throughout; rachis subterete, rugose, 1.5 to 4 cm. long; pedicels subterete, 13 to 25 mm. long, each subtended by an oblong deciduous bractlet about 4 mm. long, bibracteolate near base with acute bractlets about 3 mm. long, swollen distally; calyx tube short-cylindric, about 2.5 mm. long and 4 mm. in diameter at anthesis; limb 2 to 2.5 mm. long including lobes, the lobes 5, apiculate, about 1 mm. long; corolla cylindric, 14 to 15 mm. long and about 6 mm. in diameter, contracted above, the lobes acute, 1.5 mm. long, faintly pilose within; stamens 10, 8 to 9 mm. long; filaments castaneous, distinct, about 2 mm. long, glabrous; anther sacs about 4 mm. long; tubules laterally connate, cylindric-conical, about 3 mm. long, opening by introrse clefts about half their length; style stout, slightly exserted, the stigma peltate; calyx tube becoming elongate-ovoid in fruit.

TYPE LOCALITY: Sierra del Líbano, Santa Marta, Department of Magdalena, Colombia, altitude 1,800 to 2,200 meters. Type collected by H. H. Smith (no. 1722).

DISTRIBUTION: Known only from the type locality.

COLOMBIA.

MAGDALENA: Sierra del Líbano, Santa Marta, *H. H. Smith* 1722 (N, Y, type), 2789 (N, Y, type of *M. arcuata*).

This species is very close to *M. nitida*, but seems to be specifically distinct on the basis of its robust habit and comparatively wide-spreading inflorescence.

26. *Macleania attenuata* Fedtsch. & Basil. Not. Syst. Herb. Hort. Bot. U. S. S. R. 6:23. 1926.

Compact shrub, the branchlets subterete, rugose, cinereous, glabrous; petioles rugose, glabrous, 2 to 4 mm. long; leaf blades oblong, 5 to 9 cm. long, 2.5 to 3.5 cm. broad, rounded at base, frequently decurrent on petiole, acute, subacute, or obtuse at apex, minutely crenate-undulate at margins, glabrous, sparsely impressed-punctate above, pinnate-veined, the secondary veins 3 to 5 to a side, spreading, ascending near margins, with the midnerve slightly impressed above, raised beneath, the veinlets obscurely reticulate; inflorescence axillary, subfasciculate (peduncle stout, up to 5 mm. long), 5 to 12 flowered, glabrous in all parts; pedicels rugose, stout, 5 to 8 mm. long, each subtended by a small oblong bract, bibracteolate near base (bracts and bractlets ovate-acute, about 2 mm. long); calyx tube rugose, short-cylindric, about 3.5 mm. long and 3 mm. in diameter at anthesis; limb 3 mm. long including lobes, the lobes 5, apiculate, about 3 mm. broad; corolla thin-carnose, cylindric-urceolate, 16 to 17 mm. long, about 5 mm. in diameter, the lobes oblong, subacute, 2 mm. long; stamens 10, about 13 mm. long; filaments dark castaneous, distinct, 3 mm. long, sparsely pilose at distal margins; anther sacs about 4 mm. long; tubules slender, laterally connate, about 8 mm. long, opening by more or less fused clefts more than half as long; style often exserted, the stigma truncate.

TYPE LOCALITY: Western side of Mount Pichincha, Province of Pichincha, Ecuador. Type collected by Jameson (no. 622).

DISTRIBUTION: Known only from the type locality.

ECUADOR.

PICHINCHA: Mount Pichincha, *Jameson* (K, type coll.), 731 (K).

Distinct in the extraordinarily long tubules of its anthers. The leaves of our specimens are not precisely as described by the authors, but I feel certain that the material is placed correctly here.

27. *Macleania nervosa* A. C. Smith, sp. nov.

Frutex; laminis ovato-oblongis basi rotundatis apice obtusis 5 ad 7 pli-nerviis, venulis prominentibus; inflorescentia subfasciculata pauciflora; calyce breviter cylindrico, lobis apiculatis; corolla cylindrica tenuiter carnosae subglabra; staminibus aequalibus, filamentis distinctis ad margines pilosis, tubulis lateraliter connatis loculos subaequantibus.

Shrub; branchlets subterete, when young purplish and puberulous, becoming cinereous and glabrous; petioles rugose, 3 to 7 mm. long, glabrous, narrowly winged above; leaf blades ovate-oblong, 8 to 16 cm. long, 3 to 7 cm. broad, rounded or subcordate at base, obtuse at apex, entire and revolute at margins, glabrous, 5 to 7 pli-nerved, the secondary nerves oriented near base, ascending, with the midnerve slightly impressed above, prominent beneath, the veinlets copiously reticulate, slightly raised above, prominent beneath, white-pilose beneath when young, becoming glabrous; inflorescence axillary, subfasciculate, 2 to 6 flowered; pedicels subterete, 7 to 10 mm. long, puberulous or glabrous, each subtended by a deciduous bractlet about 2 mm. long, bibracteolate near base with minute subpubescent bractlets, swollen distally; calyx tube short-cylindric, sparsely pilose with spreading hairs up to 0.3 mm. long, about 4 mm. long and 4 mm. in diameter at anthesis; limb suberect, about 2 mm. long including lobes, the lobes 5, apiculate, less than 1 mm. long; corolla cylindric, thin-carnose, 16 to 17 mm. long and 5 mm. in diameter at base, contracted above, glabrous or sparsely short-pilose distally, the lobes 1 to 1.5 mm. long; stamens 10, about 11 mm. long; filaments distinct, 4 mm. long, marginally pilose distally with irregular pale hairs up to 0.4 mm. long; anther sacs 4.5 to 5 mm. long; tubules laterally connate, rigidly cylindric-conical, about 4 mm. long, opening by short oval introrse clefts; stigma peltate.

Type in the herbarium of the New York Botanical Garden, collected in forest at Libano, Department of Tolima, Colombia, altitude 1,400 to 1,700 meters, December 26 to 29, 1917, by F. W. Pennell (no. 3405). Duplicate in U. S. National Herbarium.

DISTRIBUTION: Known only from the type collection.

This species has very distinctive leaves, usually broadest below the middle, with veinlets raised above, rather than obscure as they are in most species of the genus. The soft corollas, which readily become flattened against the older parts of the branchlets where they are borne, are also characteristic.

28. *Macleania reducta* A. C. Smith, sp. nov.

Frutex subpuberulus glabrescens; laminis oblongis vel ovato-oblongis basi cuneatis apice obtusis pinnatinerviis; inflorescentia subfasciculata; calyce subcylindrico parce piloso 3 vel 4 lobato, lobis ovato-triangularibus; corolla cylindrico-urceolata 3 vel 4 lobata; staminibus 6 ad 8 aequalibus, filamentis distinctis ad margines pilosis, tubulis lateraliter connatis quam loculis paullo brevioribus.

Shrub; branchlets terete, puberulous and purplish when young; petioles rugose, 3 to 5 mm. long, puberulous or glabrous, narrowly winged above; leaf blades oblong or ovate-oblong, 4 to 6 cm. long, about 2 cm. broad, cuneate at base, obtuse at apex, subentire at margins, puberulous beneath when young, becoming glabrous, sparsely punctate above, pinnate-veined, the secondary veins 2 or 3 to a side, oriented near base, arcuate-ascending, with the midvein nearly plane above, raised beneath, the veinlets reticulate, plane or slightly raised on both surfaces; inflorescence axillary, subfasciculate, 6 to 20 flowered; pedicels subterete, 6 to 8 mm. long, puberulous or glabrous, each subtended by an oblong fimbriate bractlet 2 to 3 mm. long, bibracteolate near

base; calyx tube cylindric, about 3 mm. long and 2 mm. in diameter at anthesis, pilose with scattered pale spreading hairs about 0.3 mm. long; limb spreading, about 4 mm. long including lobes, the lobes 4 (occasionally 3), ovate-triangular, apiculate, 2 to 3.5 mm. long, 4 mm. across, thick-margined; corolla cylindric-urceolate, 11 to 13 mm. long, 3 to 3.5 mm. in diameter, contracted above, essentially glabrous, 4 (or 3) lobed, the lobes triangular, subacute, 1.5 to 2 mm. long; stamens 6, 7, or 8, subequal, 10 to 11 mm. long; filaments dark-castaneous, distinct or loosely coherent at base, about 2.5 mm. long, pilose distally at margins with silky hairs about 0.3 mm. long; anther sacs 4.5 to 5 mm. long; tubules laterally coherent or practically distinct, stiffly cylindric, about 4 mm. long, opening by oval clefts about half their length; style slightly exerted in mature flowers, the stigma truncate.

Type in the herbarium of the New York Botanical Garden, collected in the Andes of Ecuador, without definite locality, 1857 to 1859, by R. Spruce (no. 5842). Duplicates at G, K.

DISTRIBUTION: Known only from the type collection.

This is the only species in this group of *Macleania* which has the calyx lobes and stamens consistently reduced in number. The slender corollas, the densely fasciculate and frequently secund inflorescences, and the narrow oblong leaves are characteristic also.

29. *Macleania ecuadorensis* Hoer. Bot. Jahrb. Engler 42:300. 1909.

Macleania elliptica Hoer. Bot. Jahrb. Engler 42:301. 1909.

Compact shrub; branchlets stout, rugose, cinereous or brownish, puberulous when young, soon glabrous; petioles rugose, essentially glabrous, 3 to 6 mm. long; leaf blades broadly ovate, 4 to 7 cm. long, 2.5 to 6 cm. broad, rounded or broadly cuneate at base, often decurrent on petiole, subentire and slightly revolute at margins, glabrous above, pilose beneath (hairs pale, lax, up to 0.7 mm. long, eventually deciduous), coriaceous, pinnate-veined, the secondary veins usually 3 to a side, arcuate-ascending, connected near margins, with the mid-nerve deeply impressed above, prominent beneath, the veinlets reticulate, obscure above, slightly raised beneath; inflorescence axillary, subfasciculate (peduncle stout, up to 8 mm. long), 8 to 12 flowered, glabrous in all parts; pedicels rugose, 5 to 7 mm. long, each bracteate at base and bibracteolate near base (bracts and bractlets oblong, acute, about 2 mm. long, often glandular-margined); calyx tube short-cylindric, rugose, 2 to 3 mm. long, 3 to 4 mm. in diameter at anthesis; limb 2.5 to 4 mm. long including lobes, the lobes 5, apiculate, 3 to 4 mm. broad; corolla subcylindric, 15 to 16 mm. long, 4 to 5 mm. in diameter, contracted at throat, the lobes 1.5 to 2 mm. long; stamens 10, 11 to 12 mm. long; filaments subnigrescent, distinct, essentially glabrous, 2 to 3 mm. long; anther sacs 4 to 5 mm. long; tubules slender, laterally connate, 5 to 6 mm. long, opening by clefts about half as long; stigma truncate.

TYPE LOCALITY: Volcán Tunguragua, Province of Tunguragua, Ecuador. Type collected by Sodiro (no. 92/2D).

DISTRIBUTION: Andes of Ecuador; apparently rare.

ECUADOR: Mount Atacazo, Sodiro 92/2C (B, type of *M. elliptica*).

TUNGURAGUA: Volcán Tunguragua, Sodiro 92/2D (B, type).

The present plant bears a strong resemblance to certain Ecuadorean specimens of *M. nitida*, from which species it may be considered distinct on the characters mentioned in the key. The types of *M. ecuadorensis* and *M. elliptica* are practically identical, differing only in the slightly larger leaves of the latter.

30. *Macleania loeseneriana* Hoer. Bot. Jahrb. Engler 42:302. 1909.

Macleania laurina Blake, Proc. Biol. Soc. Washington 35:121. 1922.

Subscandent shrub; branchlets terete, subpuberulous and brownish when young, becoming glabrous and cinereous; petioles rugose, glabrous, 6 to 12 mm. long, narrowly winged above; leaf blades oblong-ovate, 5 to 13 cm. long, 2.5 to 6 cm. broad, cuneate or rounded at base, acute or obtuse at apex, entire at margins, glabrous and sometimes sparsely punctate above, essentially glabrous beneath, pinnate-veined, the midvein deeply impressed above, prominent beneath, the secondary veins 3 or 4 to a side, ascending, impressed above, raised beneath, the veinlets obscurely reticulate; inflorescence axillary, short-racemose, 10 to 20 flowered, circumscribed at base by numerous imbricate oblong subpuberulous bracts up to 12 mm. long; pedicels rugose, 16 to 25 mm. long, sparsely puberulous, deciduously bibracteolate near base with minute ovate puberulous bractlets; calyx tube short-cylindric, densely pilose with pale spreading hairs up to 0.3 mm. long, about 3 mm. long and 4 mm. in diameter at anthesis; limb 5 to 7 mm. long including lobes, slightly less pilose than the tube, the lobes 5, apiculate, about 2 mm. long, the sinuses rounded; corolla cylindric-urceolate, pilose as the calyx, becoming subglabrous, up to 21 mm. long and 6 mm. in diameter, contracted at throat, the lobes acute, about 2 mm. long; stamens 10, about 12 mm. long; filaments stout, nigrescent, distinct, about 4 mm. long, densely pilose at margins distally with hairs up to 0.5 mm. long; anther sacs dark castaneous, 5 to 6 mm. long; tubules laterally connate to apex, 4 to 6 mm. long, opening by oval clefts about one-third their length; style about as long as corolla, the stigma truncate.

TYPE LOCALITY: Nanegal Valley, west of Mount Pichincha, Province of Pichincha, Ecuador. Type collected by Sodiro (no. 92/2c).

DISTRIBUTION: Andes of northern Ecuador.

ECUADOR: Sodiro 92/3 (B).

CARCHI: El Angel, about 3,400 meters, Popenoe 1340 (N, type of *M. laurina*).

PICHINCHA: Nanegal Valley, west of Mount Pichincha, Sodiro 92/2c (B, type).

This is a robust and unmistakable species, which, according to Popenoe, is abundant in certain localities. The differences mentioned by Blake in his description of *M. laurina* are observable, but a comparison of the two type specimens leaves no doubt that only one species is represented. Local names: "Chaqui-lulu," "hualicon."

31. *Macleania hirtiflora* (Benth.) A. C. Smith.

Thibaudia hirtiflora Benth. Pl. Hartw. 224. 1846.

Macleania recurva Rusby, Descr. S. Amer. Pl. 76. 1920.

Low shrub about 1 meter high; branchlets terete, densely pilose with pale hairs up to 0.5 mm. long, becoming subglabrous; petioles rugose, 6 to 8 mm. long, puberulous or glabrous, narrowly winged above; leaf blades ovate or ovate-oblong, 6 to 10 cm. long, 2.5 to 4.5 cm. broad, cuneate at base, obtuse or subacute at apex, entire at margins, essentially glabrous above, sparsely pilose beneath with pale spreading hairs up to 0.5 mm. long, pinnate-veined, the midvein slightly impressed above, prominent beneath, the secondary veins 2 or 3 to a side, oriented in basal half, arcuate-ascending, nearly plane above, raised beneath, the veinlets obscurely reticulate; inflorescence axillary, short-racemose, 5 to 15 flowered; rachis rugose, pilose as the branchlets, 1 to 2.5 cm. long; pedicels subterete, sparsely pilose, 8 to 15 mm. long, each subtended by an ovate acute fimbriate bractlet about 3 mm. long, bibracteolate near base, swollen at

apex; calyx tube short-cylindric, irregularly pilose, 3 to 5 mm. long, 3 to 3.5 mm. in diameter at anthesis; limb spreading, 2 to 4 mm. long including lobes, the lobes 5, ovate, apiculate, 1 to 2 mm. long; corolla cylindric-urceolate, 13 to 15 mm. long, 4 to 5 mm. in diameter at base, contracted above, pilose as the calyx (becoming subglabrous), the lobes 1 to 2 mm. long; stamens 10, 9 to 11 mm. long; filaments nigrescent, free, subglabrous, about 2 mm. long; anther sacs 4.5 to 6 mm. long; tubules laterally connate to apex, opening by oval clefts about half their length; stigma peltate.

TYPE LOCALITY: Slopes toward Sotará, Department of El Cauca, Colombia. Type collected by Hartweg (no. 1223).

DISTRIBUTION: Andes of Colombia and Ecuador, altitude 1,800 to 2,800 meters.

COLOMBIA.

MAGDALENA: Santa Marta, *Purdie* (K). Sierra del Libano, *H. H. Smith* 1964 (Y, type of *M. recurva*). San Sebastian, *Funck* 488 (K).

CUNDINAMARCA: Tequendama, *Pennell* 2643 (N, Y), 2646 (Y).

EL CAUCA: Slopes toward Sotará, *Hartweg* 1223 (K, type).

ECUADOR: *Spruce* 5550 (K).

AZUAY: Between Nabón and Oña, *Jameson* (K).

This is a well-marked species, without close relatives; probably it represents an offshoot of the forbear of *M. nitida*. In so far as can be observed, the Santa Marta specimens and those from farther south are identical, although it is quite conceivable that they have a separate racial history. Of the specimens cited, *Pennell* 2646 is the most distinctive, with leaves noticeably narrowed.

32. *Macleania farinosa* Mansf. Notizbl. Bot. Gart. Berlin 9:436. 1925.

Shrub; branchlets nigrescent or cinereous, puberulous when young, becoming glabrous; petioles rugose, 4 to 7 mm. long, essentially glabrous, winged above; leaf blades ovate or obovate, 5.5 to 9 cm. long, 3 to 6 cm. broad, attenuate at base, rounded or obtuse at apex, entire at margins, essentially glabrous above, loosely pubescent beneath with short irregular hairs, becoming subglabrous, pinnate-veined, the secondary veins 3 to 5 to a side, ascending, with the mid-vein slightly impressed above, prominent beneath, the veinlets reticulate, slightly impressed above, plane beneath; inflorescence axillary, subfasciculate, 3 to 6 flowered, all parts densely farinose-pubescent (hairs crowded, pale yellow, up to 0.3 mm. long); pedicels subterete, 3 to 6 mm. long, bibracteolate near base with ovate bractlets about 4 mm. long, obscurely articulate with calyx; calyx tube short-cylindric, about 3 mm. long and 3 mm. in diameter at anthesis; limb 3 to 4 mm. long including lobes, the lobes 5, deltoid, about 2 mm. long; corolla cylindric, 13 to 14 mm. long, about 3 mm. in diameter, the lobes triangular-oblong, 2 to 3 mm. long; stamens 10, 8.5 to 9 mm. long; filaments nigrescent, glabrous, distinct, about 2.5 mm. long; anther sacs about 4 mm. long; tubules laterally connate, about 3.5 mm. long, opening by elongate oval clefts more than half their length; style slightly exerted, the stigma truncate.

TYPE LOCALITY: East of Huancabamba, Department of Cajamarca, Peru, altitude 2,400 to 2,500 meters. Type collected by Weberbauer (no. 6120).

DISTRIBUTION: Known only from the type collection.

PERU.

CAJAMARCA: East of Huancabamba, *Weberbauer* 6120 (B, type, F, N, Y).

An isolated species, so distinct from others of the genus that it can not be placed with accuracy. It bears somewhat the same relation to the 2-tubuled group of *Macleania* that *M. salapa* bears to the single-tubuled group, although the two species have no other points of comparison.

DOUBTFUL SPECIES

MACLEANIA PULCHRA Hook. f. Bot. Mag. Curtis 90: pl. 5465. 1864.

TYPE LOCALITY: Probably Colombia. Type a cultivated plant, the original collector not stated.

Quite probably this plant is identical with *M. cordifolia*, if weight is given to the illustrations and descriptions. There seems to have been confusion, in the mind of the author, as to whether one or two tubules are present. The characteristic form of the winged calyx as illustrated leads me to place this species in the one-tubuled group.

MACLEANIA CRENULATA Fedtsch. & Basil. Not. Syst. Herb. Hort. Bot. U. S. S. R. 6: 24. 1926.

TYPE LOCALITY: Venezuela or Colombia. Type collected by Funck and Schliun (no. 933).

Said to be allied to *M. speciosissima* and *M. pulchra*, which would indicate that there is probably a single anther tubule, rather than the two implied in the description.

12. PSAMMISIA Klotzsch, Linnaea 24: 42. 1851

Calyx tube articulate with pedicel, short-cylindric or campanulate; limb erecto-patent, 5 (rarely 2 to 4) lobed, the lobes ovate or triangular, apiculate or subacute; corolla subcylindric, elongate-urceolate or subglobose, 5-lobed, the lobes triangular, subacute; stamens 10 (rarely 8 or 12), equal in length, often nearly as long as corolla; filaments distinct or connate, attached to the anther dorsally near its base; anthers firm, stout, the sacs strongly granular, the tubules about as long as the sacs, distinct, opening by elongate introrse clefts; connectives distally 2-spurred (spurs present on five or ten stamens, acute and evident or rounded and obscure); style filiform, frequently exerted.

Shrubs of various habit, sometimes epiphytic, with coriaceous alternate pinnerved or pinnate-veined petioled leaves; inflorescence axillary or terminal, subfasciculate or racemose; flowers pedicelled, few to many to an inflorescence; pedicels deciduously bibracteolate.

DISTRIBUTION: Mountainous continental tropical America from Costa Rica to Bolivia and eastward to Mount Roraima in British Guiana and the island of Trinidad. Twenty-five species are here described, and in addition there are three names I am unable to place.

From *Macleania* this genus is distinguished by its usually distinct tubules and spurred connectives. The first species mentioned by Klotzsch is *P. oyathifera* (Benth.) Klotzsch, which is synonymous with *P. falcata* (H. B. K.) Klotzsch.

KEY TO THE SPECIES

Corolla broadly conical or subglobose, up to 14 mm. long.

Flowers subfasciculate (rachis hardly perceptible), 2 to 6 to an inflorescence; pedicels 5 to 12 mm. long----- 1. *P. pennellii*.

Flowers racemose (rachis 0.7 to 6 cm. long), more than 6 to an inflorescence; pedicels 12 to 30 mm. long.

Corolla globose, 3 to 8 mm. long at maturity; anthers up to 4.5 mm. long.

Leaves chartaceous, 10 to 18 cm. long; pedicels slender, about 0.8 mm. in diameter (Colombia)----- 2. *P. breviflora*.

Leaves coriaceous, 20 to 35 cm. long; pedicels about 1.5 mm. in diameter (Peru)----- 3. *P. globosa*.

Corolla conical, 8 to 14 mm. long at maturity; anthers 6 to 8 mm. long.

Leaves 2 or 3 times as long as broad (4 to 8 cm. broad or more); rachis up to 2 cm. long.

Pedicels 12 to 15 mm. long; leaves chartaceous; corolla urceolate-cylindric..... 16. *P. sodiroi*.

Pedicels 18 to 25 mm. long; leaves coriaceous; corolla strictly conical..... 4. *P. graebneriana*.

Leaves 3 or 4 times as long as broad (2.5 to 4 cm. broad, rarely more); rachis 3 to 8 cm. long, rarely less..... 5. *P. lehmannii*.

Corolla cylindric-urceolate, 14 mm. long or more (rarely less).

Calyx lobes large, 4 to 8 mm. long; rachis elongate, 7 to 15 cm. long, the flowers distant.

Inflorescence (rachis, pedicels, calyces, and corollas) subglabrous or short-pilose (hairs pale, less than 0.5 mm. long, obscurely septate); calyx lobes 3 or 4; bractlets of the pedicel less than 5 mm. long.

6. *P. ecuadorensis*.

Inflorescence densely ferruginous-tomentose (hairs 1 mm. long or more, clearly septate); calyx lobes 5; bractlets of the pedicel 10 to 12 mm. long..... 7. *P. ferruginea*.

Calyx lobes not exceeding 4 mm. in length.

Flowers large, the calyx 10 to 15 mm. across summit, the corolla up to 40 mm. long, 10 to 15 mm. in diameter at base; anthers stout, about 2 mm. in diameter..... 8. *P. grandiflora*.

Flowers smaller, the calyx not more than 10 mm. across summit, the corolla 14 to 28 mm. long (up to 40 mm. long in no. 14), 5 to 8 mm. in diameter at base; anthers slender, 1 to 1.5 mm. in diameter.

Anthers (including tubules) 6 mm. long or less.

Filaments connate in a tube for nearly their entire length (Central America)..... 9. *P. ramiflora*.

Filaments distinct or loosely coherent at base (South America and Trinidad).

Texture of leaves chartaceous (Venezuela, Guiana, and Trinidad).

10. *P. urichiana*.

Texture of leaves coriaceous (Bolivia, Peru, and Ecuador).

Leaves oblong-lanceolate, about 3 times as long as broad (usually less than 6.5 cm. in breadth)..... 11. *P. pauciflora*.

Leaves broadly oblong-ovate, about twice as long as broad (about 8 cm. in breadth)..... 12. *P. elliptica*.

Anthers (including tubules) 7 mm. long or more.

Venation 7 to 9 pli-nerved, the leaves broadly ovate, about twice as long as broad.

Leaf base subcordate; tubules about one-fourth as long as anther sacs, the thick connective tissue continued into the subcoriaceous tubules..... 13. *P. killipii*.

Leaf base cuneate; tubules about half as long as anther sacs, the thick connective tissue not continued into the submembranous tubules.

Filaments connate; leaves cuneate-attenuate at base (Trinidad).

14. *P. recurvata*.

Filaments distinct; leaves cuneate at base.

Calyx lobes 3 to 5, often in a state of semifusion, up to 3 mm. long (northern Colombia)..... 15. *P. elegans*.

Calyx lobes 5, about 2 mm. long (Ecuador and Peru).

25. *P. ulbrichiana*.

Venation 5 (rarely 7) pli-nerved or pinnate-veined; leaves oblong-ovate, at least 3 times as long as broad.

Alternate connectives (or all connectives) with noticeable spurs, the spurs nearly twice as broad as the connective immediately below.

Venation pinnate, the secondary veins spreading, 4 to 6 to a side.

16. *P. sodiroi*.

Venation pli-nerved, the secondary nerves ascending, oriented near base, 2 or 3 to a side.

Filaments connate----- 17. *P. columbiensis*.

Filaments distinct.

Branchlets, pedicels, and calyces glabrous.

Filaments and connectives glabrous or essentially so.

18. *P. macrophylla*.

Filaments and connectives pilose distally at margins (hairs 0.1 to 0.4 mm. long).

Anthers (including tubules) 8 to 9 mm. long (rarely more).

19. *P. guyanensis*.

Anthers (including tubules) 10 to 12 mm. long (rarely less).

Rachis 1 to 4 cm. long; flowers 6 to 10 per centimeter on mature rachis (Peru)----- 20. *P. coarctata*.

Rachis 3 to 7 cm. long (rarely 2 cm.); flowers 2 to 4 per centimeter on mature rachis (Colombia).

21. *P. falcata*.

Branchlets, pedicels, and calyces short-pubescent (hairs pale, up to 0.3 mm. long)----- 22. *P. lanceolata*.

Alternate connectives obscurely spurred (spurs rounded, hardly broader than the connective immediately below, rarely sub-acute).

Leaves pilose beneath (hairs dark brown, stout, up to 0.3 mm. long, 2 to 4 per sq. mm. of surface); pedicels with bractlets 3 to 5 mm. long----- 23. *P. penduliflora*.

Leaves glabrous beneath; pedicels minutely bibracteolate, the bractlets less than 2 mm. long.

Pedicels up to 20 mm. long (rarely to 25 mm.); leaves predominantly 5-pi-nerved (Venezuela and northern Colombia).

24. *P. hookeriana*.

Pedicels 20 to 35 mm. long (rarely less); leaves predominantly 7-pi-nerved (Ecuador and Peru)----- 25. *P. ulbrichiana*.

1. *Psammisia pennellii* A. C. Smith, sp. nov.

Frutex parvus; laminis oblongis vel ovato-oblongis petiolatis basi cuneatis vel attenuatis apice acuminatis pinnatinerviis vel pli-nerviis; inflorescentia fasciculata, floribus breviter pedicellatis glabris; corolla conico-subglobosa; staminibus aequalibus alternatim bicalcaratis, calcaribus obtusis, tubulis distinctis quam oculis multo brevioribus.

Low shrub; branchlets terete, glabrous, brownish when young, becoming cinereous; petioles rugose, 4 to 12 mm. long, glabrous, narrowly winged above; leaf blades oblong or ovate-oblong, 7 to 17 cm. long, 3 to 6 cm. broad, cuneate or attenuate at base, acuminate at apex, entire and narrowly revolute at margins, pinnate-veined or pli-nerved, the secondary veins 2 or 3 to a side,

ascending, with the midvein plane above, raised beneath, the veinlets reticulate, nearly plane on both surfaces; inflorescence axillary, fasciculate, 2 to 5 flowered; pedicels striate, 5 to 12 mm. long, glabrous, bibracteolate at base with triangular bractlets about 1 mm. long; calyx glabrous, strongly rugose, the tube short-cylindric, 3 to 4 mm. long and 4 mm. in diameter at anthesis, the limb spreading, 2 to 4 mm. long including lobes, the lobes 5, minutely apiculate, subcartilaginous, about 5 mm. across; corolla broadly conical-subglobose, glabrous, 5 to 7 mm. long, 5 to 6 mm. in diameter at middle, contracted to about 2 mm. in diameter at throat, 5-lobed, the lobes erect or spreading, triangular, subacute, about 1 mm. long; stamens 10, 5 to 5.5 mm. long; filaments thick, dark castaneous, distinct, about 1.5 mm. long and 1 mm. across, leading into similar broad connectives, the connectives sparsely pubescent at margins with pale hairs up to 0.5 mm. long, alternately 2-spurred, the spurs rounded; anther sacs about 3.5 mm. long, stout; tubules distinct to base, 1 to 1.5 mm. long, opening by oval clefts nearly their entire length; style rigid, 4 to 5 mm. long, the stigma truncate.

Type in the U. S. National Herbarium, no. 1,143,644, collected in forest below San José, near San Antonio, Department of El Cauca, Colombia, altitude 2,100 to 2,500 meters, July 1, 1922, by F. W. Pennell (no. 7628). Duplicates at B, G, Y.

DISTRIBUTION: Andes of western Colombia, 1,800 to 2,800 meters.

COLOMBIA.

CALDAS: Pinares, above Salento, *Pennell* 9304 (Y).

EL VALLE: La Cumbre, *Pennell & Killip* 5750 (B, N, Y).

EL CAUCA: San José, near San Antonio, *Pennell & Killip* 7290 (N, Y).

Distinguished from other species of the small-flowered group by its few-flowered inflorescences and short pedicels.

2. *Psammisia breviflora* (Benth.) Klotzsch, *Linnaea* 24: 44. 1851.

Thibaudia breviflora Benth. Pl. Hartw. 224. 1846.

Low shrub; branchlets subterete, brownish, sparsely puberulous when young, becoming glabrous; petioles rugose, 3 to 5 mm. long, glabrous; leaf blades oblong or lanceolate-oblong, 10 to 18 cm. long, 2.5 to 4 cm. broad, subcuneate at base, caudate-acuminate at apex, entire at margins, glabrous, 5-plexi-nerved, the secondary nerves oriented above base to a distance of 2 cm., ascending, with the midnerve plane or slightly impressed above, prominent beneath, the veinlets reticulate, distinctly raised on both surfaces; inflorescence axillary, racemose, 4 to 10 flowered, glabrous in all parts; rachis terete, slender, about 0.8 mm. in diameter, 0.5 to 5 cm. long; pedicels terete, 15 to 30 mm. long, each subtended by a narrowly oblong bractlet 2 to 3 mm. long, minutely bibracteolate near base, gradually swollen distally; calyx tube short, obconical, about 3 mm. long and 4 mm. in diameter at summit at anthesis; limb about 1.5 mm. long including lobes, the lobes 5, triangular, acute, about 1 mm. long; corolla cylindric-subglobular, 5 to 9 mm. long, about 5 mm. in diameter at middle, contracted at base and apex, the lobes about 1 mm. long; stamens 10, about 4.5 mm. long; filaments slender, dark castaneous, distinct, puberulous dorsally and marginally toward apex with brownish hairs up to 0.2 mm. long, leading into slender connectives, the connectives alternately 2-spurred, the spurs rounded; anther sacs incurved at base, about 3 mm. long; tubules cylindric-conical, 1 to 1.5 mm. long, opening by oval clefts nearly as long; style slender, nearly as long as corolla, the stigma subhemispherical.

TYPE LOCALITY: Andes of Popayán, Department of El Cauca, Columbia. Type collected by Hartweg (no. 1225*).

DISTRIBUTION: Andes of western Colombia, altitude 1,500 to 2,800 meters.

COLOMBIA.

BOLÍVAR: Cascada Chorrón, south of Antizales, *Pennell* 4406 (Y).

ANTIOQUÍA: Amalfi, *Kalbreyer* 1670 (B, K).

EL CHOCÓ: Concepción, *Archer* 2002 (N, Y), 2209 (N).

EL CAUCA: San José, near San Antonio, *Pennell* 7629 (N, Y). Vicinity of Popayán, *Hartweg* 1225* (K, type); *Lehmann* 5438 (K).

This species and the following are distinguished from others of the genus by their very short, essentially globose corollas. From the following species, *P. breviflora* is separated by its chartaceous and small leaves and its slender habit.

3. *Psammisia globosa* A. C. Smith, sp. nov.

Frutex subscandens; laminis lanceolato-oblongis petiolatis basi attenuatis apice acuminatis pinnatinerviis; inflorescentia breviter racemosa; floribus glabris; calyce campanulato, limbo erecto; corolla subglobosa parva; staminibus aequalibus, filamentis ad margines pilosis, connectivis alternis obscure bicalcaratis, tubulis gracilibus quam oculis paullo brevioribus.

Subscandent shrub; branches elongate to several meters; branchlets terete, brownish, glabrous; petioles rugose, glabrous, stout, 3 to 5 mm. in diameter, 10 to 20 mm. long, narrowly winged above; leaf blades lanceolate-oblong, 20 to 35 cm. long, 3.5 to 9 cm. broad, attenuate at base, acuminate at apex, entire and slightly revolute at margins, coriaceous, glabrous, pinnate-veined, the mid-vein stout, raised on both surfaces, the secondary veins 5 to 8 per side, spreading, connected near margins, slightly raised on both surfaces, the veinlets reticulate, slightly raised or plane; inflorescence axillary, short-racemose, 6 to 8 flowered, glabrous in all parts; rachis rugose, 7 to 12 mm. long; pedicels subrugose, 8 to 15 mm. long, subtended by a subcoriaceous oblong subacute bract about 2 mm. long, minutely bibracteolate near base, swollen distally; calyx tube subrugose, violaceous or subnigrescent, broadly campanulate, about 3 mm. long and 5 mm. in diameter at anthesis; limb erect, 1 to 2 mm. long including lobes, the lobes 5, broadly triangular, subacute, about 3 mm. across; corolla subglobose, 3 to 4 mm. long, about 4 mm. in diameter (apparently quite mature), the lobes acute, about 1 mm. long; stamens 10, about 3.4 mm. long; filaments broad, nigrescent, about 1.5 mm. long, densely pilose at margins with hairs about 0.1 mm. long, leading imperceptibly into similar broad connectives, the connectives alternately obscurely 2-spurred; anther sacs stout, about 1.8 mm. long; tubules slender, cylindric-conical, about 1.3 mm. long, opening by broad clefts nearly as long; style rigid, subrugose, about as long as corolla, the stigma truncate; fruit subspherical, carnose, rich pink, up to 1 cm. in diameter, the calyx limb persistent.

Type in the herbarium of the Royal Botanic Gardens, Kew, collected in Peru in 1835, by A. Mathews (no. 2077).

DISTRIBUTION: Andes of Peru, altitude 1,400 to 1,700 meters.

PERU.

JUNÍN: Schunke Hacienda, above San Ramón, *Macbride* 5754 (F); *Killip & Smith* 24868 (N, Y).

This is a beautiful plant with elongate branches and drooping leaves, the minute flowers forming delicate little axillary clusters. From the preceding it is distinguished by its larger, more coriaceous leaves and more robust habit.

EXPLANATION OF PLATE 9.—*Psammisia globosa*, from photograph of type sheet. About one-half natural size.

4. *Psammisia graebneriana* Hoer. Bot. Jahrb. Engler 42: 304. 1909.

Low shrub; branchlets terete, stout, brownish, glabrous; petioles rugose, 4 to 12 mm. long, glabrous, winged above; leaf blades ovate-oblong, 7 to 30 cm. long, 4 to 10 cm. broad, cuneate at base, acute or short-acuminate at apex, sub-entire and slightly revolute at margins, glabrous, pinnate-veined, the secondary veins 3 or 4 to a side, ascending, with the midvein slightly impressed above, prominent beneath, the veinlets reticulate, nearly plane on both surfaces; inflorescence axillary, short-racemose, 8 to 16 flowered, glabrous in all parts; pedicels striate, 20 to 30 mm. long at maturity, each subtended by a coriaceous oblong bractlet about 3 mm. long, minutely bibracteolate near base, swollen distally; calyx strongly rugose, the tube short-cylindric, 4 to 5 mm. long and about 6 mm. in diameter at anthesis, the limb spreading, 3 to 4 mm. long including lobes, the lobes triangular, subacute, 2 mm. long; corolla urceolate, 9 to 12 mm. long, about 6 mm. in diameter at base, contracted at throat, the lobes 2 to 3 mm. long; stamens 6 to 7.5 mm. long; filaments stout, dark castaneous, glabrous, 2 to 3 mm. long, leading into broad connectives, the connectives 2-spurred, alternately more slender and more obviously spurred; anther sacs stout, about 4.5 mm. long; tubules slender, 2 to 3 mm. long, opening by oval clefts nearly as long; style stout, nearly as long as corolla, the stigma truncate.

TYPE LOCALITY: Río Pilatón, Province of Pichincha, Ecuador, altitude 800 to 1,000 meters. Type collected by Sodiro (no. 92/14).

DISTRIBUTION: Andes of Colombia and northern Ecuador, altitude 800 to 3,100 meters.

COLOMBIA: *Triana* (B). *Purdie* (G, K).

CUNDINAMARCA: Bogotá, *Tracey* 20 (K). El Peñon, southwest of Sibaté, *Pennell* 2420 (Y).

EL CAUCA: *Triana* 2670 (K, B). Canaan, Mount Puracé, *Pennell & Killip* 6519 (N, Y). Paletara, *Pennell* 6953 (Y).

NARIÑO: Páramo Chimbalan, *André* 3028 (K).

ECUADOR.

PICHINCHA: Río Pilatón, *Sodiro* 92/14 (B, type). Nanegal Valley, *Sodiro* 92/3b (B).

This species shows gradations to the following. Since their ranges are somewhat the same, they possibly hybridize.

5. *Psammisia lehmannii* Hoer. Bot. Jahrb. Engler 42: 305. 1909.

Shrub; branchlets striate, brownish, glabrous; petioles rugose, 6 to 10 mm. long, glabrous, narrowly winged; leaf blades oblong or lanceolate-oblong, 9 to 18 cm. long, 2 to 4 cm. broad, cuneate-attenuate at base, acute at apex, entire and strongly revolute at margins, thick-coriaceous, glabrous, pinnate-veined, the secondary veins 3 to 5 to a side, ascending, with the midvein impressed above, prominent beneath, the veinlets reticulate, nearly plane on both surfaces; inflorescence axillary near ends of branchlets, racemose, 10 to 20 flowered, glabrous in all parts; rachis subterete, 2 to 8 cm. long; pedicels rugose, 18 to 40 mm. long, each subtended by a deciduous oblong bractlet about 3 mm. long, bibracteolate below the middle, 3 to 5 per centimeter of rachis; calyx strongly rugose, the tube short-cylindric, 3 to 4 mm. long and about 5 mm. in diameter at anthesis, the limb spreading, 3 to 5 mm. long including lobes, the lobes ovate-apiculate, 1 to 1.5 mm. long; corolla broadly conical, 8 to 12 mm. long at maturity, 7 mm. in diameter at base, contracted at throat, the lobes erect, thick-carnose, 1.5 to 2 mm. long; stamens 6.5 to 8.5 mm. long; filaments coherent at base, nigrescent, slightly puberulous dorsally near apex, about 2.5

mm. long, narrowed above into short connectives, the connectives 2-spurred, the spurs rounded and alternately larger; anther sacs stout, 3.5 to 5 mm. long; tubules narrowly cylindrical, 2.5 to 3 mm. long, opening by introrse clefts nearly their entire length; style stout, nearly as long as corolla, the stigma truncate; fruit subspherical, up to 12 mm. or more in diameter, the calyx limb persistent.

TYPE LOCALITY: Western slopes of Páramo de Guanacas, Department of El Cauca, Colombia, altitude 2,700 to 3,000 meters. Type collected by Lehmann (no. 4961).

DISTRIBUTION: Andes of Colombia, altitude 2,000 to 3,000 meters.

COLOMBIA: Páramo Purdei, *André* 577 (K, Y).

CUNDINAMARCA: La Selva, *Tracey* 270 (K).

HUILA: Balsillas, on Río Balsillas, *Rusby & Pennell* 750 (F, G, N, Y), 751 (N, Y).

ANTIOQUÍA: Quebrada del Ato, above Bello, *Archer* 202 (N).

EL CAUCA: Western slopes of Páramo de Guanacas, *Lehmann* 4961 (B, type, F, G).

6. *Psammisia ecuadorensis* Hoer. Bot. Jahrb. Engler 42: 308. 1909.

Psammisia kraenzliniana Hoer. Bot. Jahrb. Engler 42: 308. 1909.

Psammisia puberula Hoer. Bot. Jahrb. Engler 42: 309. 1909.

Low shrub; branchlets terete, brownish, glabrous or brown-puberulous; petioles rugose, subglabrous, 3 to 5 mm. long; leaf blades ovate-oblong, 8 to 18 cm. long, 2.5 to 8 cm. broad, rounded or slightly subcordate at base, obtusely acuminate at apex, entire at margins, glabrous above, sparsely puberulous or glabrous beneath, 5 to 7 pinnately-nerved, the secondary nerves oriented near base, with the midnerve impressed above, prominent beneath, the veinlets reticulate, slightly raised on both surfaces; inflorescence axillary near ends of branchlets, racemose, 4 to 16 flowered; rachis subterete, puberulous or glabrous, 7 to 15 cm. long; pedicels about 2 per centimeter of rachis, subterete, 8 to 25 mm. long, each subtended by a small deciduous bractlet, deciduously bibracteolate near base with linear bractlets up to 4 mm. long; calyx tube puberulous or glabrous, subcylindrical or subspherical, 2 to 4 mm. long and 3 to 5 mm. in diameter at anthesis; limb suberect, large, 7 to 12 mm. long including lobes, the lobes 3 (rarely 2 or 4), sometimes in a state of fusion, triangular, acute, 4 to 8 mm. long, 5 to 8 mm. across base; corolla subcylindrical, 14 to 35 mm. long, 5 to 6 mm. in diameter at base, contracted distally, glabrous or puberulous; stamens 10 to 12 mm. long; filaments dark castaneous, distinct, about 4 mm. long, densely pilose distally with pale straight hairs up to 0.6 mm. long, leading into slightly narrower connectives, the connectives 2-spurred, alternately narrower and more obviously spurred (1.5 mm. across spurs, about 0.6 mm. immediately below); anther sacs produced at base, 5 to 6 mm. long; tubules cylindrical, 2 to 4 mm. long; style subterete, about as long as corolla, the stigma truncate.

TYPE LOCALITY: Ecuador. Type collected by Sodiro (no. 92/9).

DISTRIBUTION: Andes of Ecuador and possibly of southern Colombia, altitude 1,400 to 3,000 meters.

ECUADOR OR COLOMBIA: *André* (K). Salitu, *André* 1045 (K). Mindo, *André* (K). Cascajal, *André* 3718 (K). Miebli, *André* (K). San Florencio, *André* (K). Alto San Juan, *André* 2070 (K).

ECUADOR: Sodiro 92/9 (B, type). Corazón, *André* (K). San Pablo, *André* (K). Cauzacito, Guanasa, *Sodiro* 92/7 (B, type of *P. kraenzliniana*).

PICHINCHA: Andes near Quito, *Couthouy* (G). Near Bolona, *Sodiro* 92/4 (B, type of *P. puberula*). Nanegal Valley, *Sodiro* 92/6 (B).

CHIMBORAZO: Mount Chimborazo, *Spruce* 6169 (K).

EL ORO: Between La Chorita and Portovelo, *Hitchcock* 21166 (N, Y).

AZUAY: Cuenca, *Lehmann* K174 (K).

Hoerold's grounds for describing three species in this coherent group are not clear. The only conceivable distinctions are those of degree. For instance, the leaves of *P. puberula* are truncate at base, as compared to the faintly subcordate leaves of the other "types"; the corollas vary from 17 mm. to 35 mm. in length, a condition due to age alone. Of the above specimens, *Hitchcock* 21166 is the most nearly glabrous; the three "types" are identical in degree of pubescence.

As here regarded, this species is very well marked and is quite unmistakable, having as a close relation only the following, from which it is easily distinguished by the key characters.

7. *Psammisia ferruginea* A. C. Smith, sp. nov.

Frutex; ramis ramulisque dense ferrugineo-pilosis; laminis oblongis vel ovato-oblongis breviter petiolatis ferrugineo-pilosis basi truncatis vel subcordatis apice caudato-acuminatis 5 ad 7 plinerviis; inflorescentia longe racemosa dense ferrugineo-pilosa; calyce campanulato, limbo suberecto quam tubo duplo longiore 5-lobato, lobis magnis lanceolato-triangularibus; corolla cylindrica 5-lobata; staminibus aequalibus alternatim bicalcaratis, calcaribus subacutis, filamentis laxè connatis superne pilosis, tubulis quam loculis paulo brevioribus.

Shrub; branchlets subterete, striate, densely pilose (hairs ferruginous, spreading, 1 to 1.5 mm. long); petioles subrugose, 3 to 5 mm. long, pilose as the branchlets; leaf blades oblong or ovate-oblong, 10 to 14 cm. long, 3.5 to 6 cm. broad, truncate or subcordate at base, caudate-acuminate at apex, entire at margins, coriaceous, ferruginous-pilose on both surfaces (hairs spreading, about 1 mm. long, 5 to 10 per square millimeter on lower surface, sparser and deciduous above), 5 to 7 plinerved, the secondary nerves oriented near base, arcuate-ascending, with the midnerve impressed above, prominent beneath, the veinlets copiously reticulate, slightly raised on both surfaces; inflorescence axillary, long-racemose, 10 to 25 flowered, densely ferruginous-pilose on all external surfaces (hairs up to 2 mm. long); rachis stout, 8 to 18 cm. long; pedicels subterete, 8 to 15 mm. long, bracteate at base and bibracteolate near base (bractlets lanceolate, 10 to 12 mm. long); calyx tube short-conical or campanulate, 4 to 5 mm. long, about 4 mm. in diameter at anthesis; limb about 20 mm. long including lobes, the lobes 5, lanceolate-triangular, 7 to 8 mm. long, about 4 mm. broad, parallel-veined; corolla cylindric, 32 to 36 mm. long at maturity, 4 to 5 mm. in diameter near base, contracted at the long throat, the lobes oblong, subacute, 3 mm. long, 1.5 mm. broad; stamens 10, about 13 mm. long; filaments dark castaneous, loosely connate in a tube, about 4 mm. long, dorsally pilose distally with ferruginous hairs, leading into similar slender connectives, the connectives alternately two-spurred, the spurs subacute, obvious; anther sacs about 6 mm. long; tubules subcylindric, about 4 mm. long, opening by clefts more than half as long; style exerted, the stigma truncate or subpeltate.

Type in the herbarium of the Royal Botanic Gardens, Kew, collected near Pilispi, "New Grenada," altitude about 1,200 meters, by W. Lobb (no. 89).

DISTRIBUTION: Probably limited to the Andes of southern Colombia, altitude 1,200 to 2,400 meters.

COLOMBIA.

EL CAUCA: Timbiquí, *Lehmann* K173 (K).

NABIÑO: Between Tuquerres and San Pablo, *Triana* 2681 (K). San Pablo, *André* 8341 (K).

Because of confusion concerning the Lobb collections, it is impossible to determine the precise locality of the type specimen, which is the best sheet of those cited. Most of the Lobb plants appear to have been collected in Peru, in spite of the usual notation "Columbia" or "New Grenada." The present specimen, however, agrees so well with sheets which come from southern Colombia that I am inclined to believe it also was collected there.

Psammisia ferruginea is unmistakably distinct, being sharply marked from the preceding by its ferruginous tomentum, as well as by other characters mentioned in the key. The necessity of describing a new species of this alliance, while at the same time reducing two names of Hoerold as indicated above, is regrettable but unavoidable.

EXPLANATION OF PLATE 10.—*Psammisia ferruginea*, from photograph of type sheet. About one-half natural size.

8. *Psammisia grandiflora* Hoer. Bot. Jahrb. Engler 42:305. 1909.

Low shrub; branchlets terete, glabrous, cinereous; petioles rugose, 3 to 5 mm. long, glabrous, narrowly winged above; leaf blades ovate, 8 to 15 cm. long, 3 to 6 cm. broad, cuneate at base, caudate-acuminate at apex, entire and revolute at margins, glabrous, pinnate-veined, the midvein slightly impressed above, prominent beneath, the secondary veins 2 to 4 to a side, oriented in basal half, arcuate-ascending, nearly plane above, raised beneath, the veinlets reticulate, plane above, slightly raised beneath; inflorescence axillary near ends of branchlets, fasciculate or short-racemose, 2 to 4 flowered, essentially glabrous in all parts; pedicels rugose, 10 to 15 mm. long, each subtended by a triangular bractlet about 2 mm. long, minutely bibracteolate below middle, obscurely articulate with calyx; calyx tube obconical, 4 to 9 mm. long, 5 to 8 mm. in diameter at summit at anthesis; limb 3 to 5 mm. long, nearly truncate (lobes 5, apiculate, 1 to 2 mm. long); corolla membranous, subcylindric, 25 to 40 mm. long at maturity, 8 to 15 mm. in diameter at base, tapering gradually distally, the lobes elongate-triangular, about 3.5 mm. long; stamens 14 to 17 mm. long; filaments castaneous, broad (2.5 mm. across base), distinct or slightly coherent at base, 5 to 6 mm. long, marginally pilose distally with a few pale hairs about 0.3 mm. long, leading into slightly narrower connectives, the connectives 2-spurred (about twice as broad across spurs as immediately below); anther sacs incurved at base, stout, 6 to 7 mm. long; tubules cylindrical, 5 to 10 mm. long; style about as long as corolla.

TYPE LOCALITY: La Ceja, Department of Antioquia, Colombia, altitude 2,200 meters. Type collected by Triana (no. 37).

DISTRIBUTION: Central Cordillera of Colombia, altitude 2,200 to 3,300 meters. COLOMBIA: *Linden* 951 (K).

ANTIOQUIA: La Ceja, *Triana* 37 (B, type).

CALDAS: Río San Rafael, below Cerro Tatamá, *Pennell* 10403 (Y). Cerro Tatamá, *Pennell* 10458 (Y), 10459 (Y).

This beautiful species is distinguishable by its large flowers, which are sometimes suggestive of those of *Semiramisia*. In leaf character and in general habit it resembles *P. pennellii*, from which it differs by the unusual floral development.

9. *Psammisia ramiflora* Klotzsch, *Linnaea* 24:44. 1851.

Psammisia symphystemona Donn. Smith, Bot. Gaz. 20:291. 1895.

Low shrub, usually epiphytic; branchlets slender, terete, glabrous, with a deciduous brownish bark; petioles rugose, 3 to 5 mm. long, glabrous, narrowly winged above; leaf blades oblong or ovate-oblong, 8 to 17 cm. long, 3 to 7 cm.

broad, cuneate at base, caudate-acuminate at apex, entire at margins, glabrous, 5-pinnate, the secondary nerves oriented slightly above base, ascending near margins, with the midnerve slightly impressed or nearly plane above, prominent beneath, the veinlets copiously reticulate, raised on both surfaces; inflorescence axillary, subfasciculate or short-racemose (rachis less than 1 cm. long), essentially glabrous in all parts, 4 to 15 flowered; pedicels slender, striate, 8 to 25 mm. long, each subtended by an oblong bractlet about 2 mm. long, minutely bibracteolate near base; calyx-tube subcylindric or broadly obconical, about 3 mm. long and 2.5 mm. in diameter at summit at anthesis; limb 3.5 to 4 mm. long including lobes, the lobes 5, triangular, acute, about 1.5 mm. long; corolla subcylindric, 20 to 30 mm. long, 4 to 5 mm. in diameter near base, contracted at the long throat, the lobes oblong, about 3 mm. long; stamens 10 (rarely 12, in which case all the flower parts are 6-merous and in a state of partial fusion), 8 to 9 mm. long; filaments membranous, castaneous, connate for their entire length, about 4 mm. long, leading into narrow nigrescent connectives, the connectives marginally pilose (hairs pale, up to 0.2 mm. long), 2-spurred, alternately slightly longer, narrower, and more obviously spurred; anther sacs 3 to 3.2 mm. long; tubules distinct to base or semicoherent, cylindric-conical, 2 to 3 mm. long, opening by oval clefts nearly as long; stigma truncate.

TYPE LOCALITY: Veraguas, Panama. Type collected by Warszewicz.

DISTRIBUTION: Costa Rica and Panama, altitude 1,400 to 2,000 meters.

COSTA RICA: *Wercklé* (?) 26 (B). Cascajal, *Lankester* 109 (K), K247 (K).

Agua Caliente, *Stork* 1313 (F).

ALAJUELA: Mariposa, *Cooper* 5842 (B, G, N, type of *P. symphystemona*).

SAN JOSÉ: La Palma, *Standley* 38211 (N); *Wercklé* 11606 (N).

CAETAGO: Alto de La Estrella, *Standley* 39275 (N).

PANAMA.

VERAGUAS: *Warszewicz* (B, type).

PANAMA: Cerro Azul, *Goldman* 1870 (N).

A well-marked species by its small anthers and connate filaments. A local name in Costa Rica is "colmillo."

10. *Psammisia urichiana* (Britton) A. C. Smith.

Cavendishia urichiana Britton, Bull. Torrey Club 48: 336. 1921.

Low shrub, usually epiphytic; branchlets terete, slender, brownish, glabrous; petioles subterete, 7 to 10 mm. long, glabrous, narrowly winged above; leaf blades ovate or oblong-ovate, 15 to 20 cm. long, 4 to 8 cm. broad, cuneate at base, caudate-acuminate at apex, entire and slightly revolute at margins, glabrous, thin-coriaceous or chartaceous, 5-pinnate, the secondary nerves oriented near base, with the midnerve slightly impressed above, prominent beneath, the veinlets copiously reticulate, slightly raised on both surfaces; inflorescence axillary, subfasciculate or short-racemose (rachis not exceeding 8 mm. in length), essentially glabrous in all parts, 4 to 8 flowered; pedicels striate, 8 to 15 mm. long, each subtended by an oblong bractlet about 3 mm. long, minutely bibracteolate near base; calyx tube subcylindric or broadly obconical, 2 to 4 mm. long, about 3 mm. in diameter at anthesis; limb about 3 mm. long including lobes, the lobes 5, triangular, apiculate, 1 mm. long or less; corolla subcylindric, 23 to 27 mm. long, about 5 mm. in diameter, contracted above, the lobes elongate-triangular, about 3 mm. long; stamens 8 to 9 mm. long; filaments castaneous, slender, distally pilose at margins with sparse hairs about 0.2 mm. long, distinct, 4 to 4.5 mm. long, leading into slender connectives, the connectives 2-spurred (alternately narrower and more obviously spurred), the spurs acute, twice as broad as the connective imme-

diately below; anther sacs 3.5 to 4 mm. long; tubules distinct or coherent at base, elongate-conical, about 2 mm. long; stigma truncate.

TYPE LOCALITY: Heights of Aripo, Trinidad. Type collected by Britton and Freeman (no. 2364).

DISTRIBUTION: Apparently rare in mountains of Trinidad, British Guiana, and Venezuela.

TRINIDAD: Heights of Aripo, *Britton & Freeman* 2364 (N, Y, type).

BRITISH GUIANA: Mount Roraima, 1,700 meters, *Ule* 8714 (B, Go).

VENEZUELA.

ARAGUA: Between El Portachuelo and Ocumare, *Pittier* 11377 (N). Colonia Tovar, 2,000 meters, *Jahn* 1201a (N).

The above-cited specimens are indubitably conspecific, in spite of the unusual distribution. This species, which has been confused with *P. guianensis*, is quite distinct from that on the basis of its small anthers and comparatively thin leaves.

11. *Psammisia pauciflora* Griseb., sp. nov.

Frutex; laminis oblongis basi cuneatis apice caudato-acuminatis 5-*pli*-nerviis; inflorescentia subfasciculata vel breviter racemosa glabra; calyce subcylindrico, limbo suberecto tubum subaequante; corolla subcylindrica; filamentis superne pilosis, connectivis bicalcaratis, tubulis loculos subaequantibus.

Shrub; branchlets terete, brownish, glabrous; petioles slightly rugose, 6 to 10 mm. long, glabrous, narrowly winged above; leaf blades oblong, 15 to 25 cm. long, 5 to 7 cm. broad, cuneate at base, caudate-acuminate at apex, entire at margins, glabrous, thick-coriaceous, 5-*pli*-nerved, the secondary nerves oriented near base, with the midnerve impressed above, strongly prominent beneath, the veinlets copiously reticulate, slightly raised on both surfaces; inflorescence axillary, subfasciculate or short-racemose (rachis seldom up to 1 cm. long), essentially glabrous in all parts, 6 to 10 flowered; pedicels striate, 10 to 15 mm. long, each subtended by an oblong acute bractlet about 2 mm. long, minutely hibracteolate near base; calyx tube subcylindric or broadly obconical, 2.5 to 3 mm. long, about 4 mm. in diameter at anthesis; limb suberect, about 3 mm. long including lobes, the lobes 5, apiculate, usually less than 1 mm. long; corolla subcylindric, 19 to 27 mm. long, 4 to 5 mm. across base, contracted at the long throat, the lobes elongate-triangular, 2.5 to 3 mm. long; stamens 10, 6 to 8 mm. long; filaments castaneous, free, distally pilose, especially at margins, with pale spreading hairs about 0.3 mm. long, leading into slender connectives, the connectives 2-spurred, alternately longer, narrower and more obviously spurred, the spurs subacute, about twice as broad as the connective immediately below; anther sacs 2.5 to 3 mm. long; tubules laterally connate at base, free distally, elongate-conical, 2 to 3 mm. long; stigma truncate; fruit subspherical, up to 1 cm. in diameter, the calyx limb persistent.

Type in the herbarium of the Royal Botanic Gardens, Kew, collected at San Gován, Peru, by Lechler (no. 2386).

DISTRIBUTION: Andes of southeastern Columbia, Peru, and northern Bolivia, altitude 750 to 2,000 meters.

COLOMBIA.

CUNDINAMARCA: Susumuco, *André* 958 (K).

META: Villavicencio, *André* (K). Forest of Upín, *André* (K).

BOLIVIA.

LA PAZ: Mapiri, *Buchtien* 1178 (B), 2013 (N); *Bang* 1516 (B, F, N, Y); *Rusby* 2037 (N, Y). Hacienda Simaco, Tipuani, *Buchtien* 5514 (N, Y), 7431 (B, N, Y).

The species has not been previously described, but the name given by Grisebach²⁸ is fitting and has been used in this treatment. It is a coherent species, forming with *P. wrichiana* and *P. elliptica* a distinct group within the genus. The specimens collected by André have slightly broader leaves than the Bolivian specimens, but appear conspecific.

12. *Psammisia elliptica* (Rusby) A. C. Smith.

Macleania elliptica Rusby, Bull. N. Y. Bot. Gard. 8:111. 1912.

Shrub; branchlets terete, striate, glabrous, brownish; petioles slightly rugose, 8 to 10 mm. long, glabrous, narrowly winged above; leaf blades elliptic-ovate, 16 to 18 cm. long, 8 to 9 cm. broad, cuneate at base, caudate-acuminate at apex (acumen abrupt, slender, up to 15 mm. long), entire at margins, glabrous, thick-coriaceous, 5 to 7 pli-nerved, the secondary nerves oriented slightly above base, with the midnerve impressed above, very prominent beneath, the veinlets copiously reticulate, nearly plane above, raised beneath; inflorescence axillary, short-racemose (rachis less than 1 cm. long), 8 to 12 flowered, glabrous in all parts; pedicels striate, 14 to 18 mm. long, each subtended by an ovate acute bractlet about 1.5 mm. long, minutely bibracteolate near base; calyx tube short-cylindric, about 2 mm. long and 2.5 mm. in diameter at anthesis; limb spreading, about 2.5 mm. long, nearly truncate, the 5 teeth apiculate; corolla subcylindric, 20 to 25 mm. long, about 4 mm. in diameter, contracted above, the lobes oblong, 2 to 3 mm. long; stamens about 8 mm. long; filaments dark castaneous, slender, distinct, about 3 mm. long, distally pilose at margins with stiff spreading hairs about 0.2 mm. long, leading into slender connectives, the connectives 2-spurred, alternately narrower, longer, and more obviously spurred, the spurs subacute, prominent; anther sacs 3 to 3.5 mm. long; tubules laterally connate at base, free distally, elongate-conical, 2.5 to 3 mm. long; style up to 30 mm. long, the stigma subhemispherical.

TYPE LOCALITY: Río Pelichuco, Department of La Paz, Bolivia, altitude about 1,200 meters. Type collected by R. S. Williams (no. 2487).

DISTRIBUTION: Known only from the type collection.

BOLIVIA.

LA PAZ: Río Pelichuco, R. S. Williams 2487 (Y, type).

Very closely allied to the preceding, from which it differs only in its broader leaves. This character alone would hardly appear to be of specific value, but since no intermediate specimens are known the name may be retained.

13. *Psammisia killipii* A. C. Smith, sp. nov.

Frutex parvus; laminis late ovatis basi subcordatis apice acutis 7 ad 9 pli-nerviis; inflorescentia racemosa glabra; floribus longe pedicellatis; calyce campanulato, limbo tubum subaequante; corolla late conica; staminibus aequalibus, filamentis crassis in connectiva crassa bicalcarata ducentibus, tubulis subcoriaceis connatis vel distinctis quam loculis multo brevioribus.

Low shrub in thickets; branchlets subterete, castaneous, glabrous; petioles subterete, slightly angled, 5 to 7 mm. long, glabrous; leaf blades broadly ovate, 10 to 14 cm. long, 6 to 9 cm. broad, subcordate at base, acute at apex, entire or shallowly crenate at margins, glabrous, 7 to 9 pli-nerved, the secondary nerves oriented slightly above base, arcuate-ascending, with the midnerve slightly impressed or nearly plane above, prominent beneath, the veinlets copiously reticulate, raised on both surfaces; inflorescence axillary, racemose, 8 to 12 flowered, glabrous in all parts; rachis subterete, 2.5 to 4 cm. long; pedicels

²⁸ Lechl. Berb. Amer. Austr. 58. 1857.

striate, stout, 18 to 35 mm. long, each subtended by an oblong acute bractlet 3 to 4 mm. long, bibracteolate near base, swollen distally; calyx tube broadly campanulate, 4 to 5 mm. long, about 6 mm. in diameter at summit at anthesis; limb 3 to 4 mm. long including lobes, the lobes ovate, apiculate, about 2 mm. long; corolla broadly conical, 17 to 20 mm. long, 8 to 9 mm. in diameter near base, contracted to about 3 mm. in diameter at throat, the lobes 2.5 mm. long; stamens 10, 9 to 11 mm. long; filaments stout, coherent at base, dark castaneous, glabrous, about 4.5 mm. long, leading into thick connectives which are continued up the tubules dorsally, the connectives 2-spurred, alternately narrower and more noticeably spurred (spurs about 2 mm. across, connectives immediately below them about 1.5 mm. across); anther sacs stout, about 7 mm. long; tubules laterally connate or partially distinct, about 2 mm. long, opening by introrse clefts their whole length; style about as long as corolla, the stigma subhemispherical.

Type in the herbarium of the New York Botanical Garden, collected in low thicket ("machimbi") at Cuatro Esquinas, Department of El Cauca, Colombia, altitude 1,700 to 1,800 meters, June 5, 1922, by F. W. Pennell and E. P. Killip (no. 6324).

DISTRIBUTION: Known only from the type collection.

The flowers of this species approach those of *P. grandiflora* in girth, but they are shorter and the species differs markedly in other points. The tubules of the anthers, which are unusually short, appear to consist of the same dark castaneous coriaceous tissue as the filaments and connectives. Each anther thus seems to be fitted with a callose cap and presents an appearance not to be confused with that of any other species. The many-nerved subcordate-based leaves are also distinctive.

14. *Psammisia recurvata* Britton, Bull. Torrey Club 48: 335. 1921.

Subscandent shrub; branchlets stout, terete, brownish, glabrous; pedicels stout, rugose, 12 to 18 mm. long, glabrous, narrowly winged above; leaf blades thick-coriaceous, broadly ovate-oblong, 15 to 30 cm. long, 10 to 13 cm. broad, cuneate or subattenuate at base, long-acuminate at apex, subentire or shallowly crenate at margins, glabrous, 7 to 9 pli-nerved, the secondary nerves oriented slightly above base, arcuate-ascending, with the midnerve impressed above, prominent beneath, the veinlets reticulate, plane above, slightly raised beneath; inflorescence axillary, short-racemose, 5 to 12 flowered, glabrous in all parts; rachis stout, subterete, 10 to 25 mm. long; pedicels striate, 20 to 40 mm. long, each subtended by a deciduous oblong acute bractlet 3 to 4 mm. long, minutely bibracteolate near base; calyx tube (past maturity) short-cylindric or subspherical, about 5 mm. long and 4 mm. in diameter; limb about 6 mm. long including lobes, the lobes ovate, apiculate, about 2 mm. long; corolla not seen; stamens 10 (?); filaments thick, nigrescent, firmly connate, incomplete in our specimen but probably about 3 mm. long, leading into narrow connectives, the connectives glabrous, alternately slightly 2-spurred; anther sacs about 5 mm. long; tubules narrowly cylindric, 3.5 to 4 mm. long, opening by oval clefts about half their length; style 25 to 30 mm. long, the stigma peltate; fruit spherical, up to 15 mm. in diameter, the calyx limb decurrent.

TYPE LOCALITY: Mount Tocuche, Trinidad. Type collected by Britton, Hazen, and Mendelson (no. 1294).

DISTRIBUTION: Mountains of Trinidad.

TRINIDAD: *Crüger* 1709 (N). Mount Tocuche, *Britton, Hazen and Mendelson* 1294 (N, Y, type). Morne Bleu, *Broadway* 6211 (K). Heights of Aripo, *Broadway* 7121 (K, N).

Notable in its robust habit and large many-nerved cuneate-based leaves. The calyx lobes are often in a state of semifusion. In the original description the corolla is described as "about 4 cm. long, red, the short limb white," but in the type specimen no corolla is available. Three imperfect stamens are present, which were not mentioned in the original description.

15. *Psammisia elegans* Rusby, *Descr. S. Amer. Pl.* 78. 1920.

Subscandent shrub, 8 to 12 meters high; branchlets terete, violaceous or cinereous, glabrous; petioles subterete, glabrous, nigrescent, 8 to 10 mm. long; leaf blades broadly ovate or oblong-ovate, 12 to 20 cm. long, 6 to 11 cm. broad, abruptly cuneate at base, caudate-acuminate at apex, entire at margins, glabrous, 7 to 9 pli-nerved, the secondary nerves oriented near base, with the midnerve slightly impressed above, prominent beneath, the veinlets reticulate, slightly raised on both surfaces; inflorescence axillary near ends of branchlets, short-racemose, glabrous in all parts, 8 to 15 flowered; rachis subterete, 8 to 20 mm. long; pedicels striate, 25 to 40 mm. long, each subtended by a triangular bractlet about 2 mm. long, minutely bibracteolate below middle, swollen distally; calyx tube slightly rugose, campanulate, 3.5 to 4 mm. long and 4 mm. in diameter at anthesis; limb 4 to 5 mm. long including lobes, the lobes 3, 4, or 5, often in a state of semifusion, ovate, apiculate, 2 to 3 mm. long; corolla subcylindric, 20 to 27 mm. long, 5 to 7 mm. in diameter near base, contracted at throat, the lobes about 2 mm. long, reflexed when mature; stamens 10 to 12 mm. long; filaments dark castaneous, distinct, glabrous, 3 to 5 mm. long, leading into slender connectives, the connectives alternately 2-spurred, the spurs subacute, slightly broader than the connective immediately below; anther sacs 5 to 6 mm. long; tubules about 3 mm. long; stigma truncate.

TYPE LOCALITY: Las Nubes, Santa Marta Mountains, Department of Magdalena, Colombia, altitude about 1,400 meters. Type collected by H. H. Smith (no. 1554).

DISTRIBUTION: Known only from the type collection.

COLOMBIA.

MAGDALENA: Las Nubes, Santa Marta Mountains, *H. H. Smith* 1554 (F, N, Y, type).

Probably most closely related to the preceding, from which it differs markedly by the thinner leaves, which are more rounded at the base, and by the distinct filaments. The calyx lobes are commonly reduced in number.

16. *Psammisia sodiroi* Hoer. *Bot. Jahrb. Engler* 42:306. 1909.

Shrub; branchlets subterete, often striate, brownish, glabrous; petioles subrugose, subterete, often nigrescent, 5 to 8 mm. long; leaf blades oblong or ovate-oblong, 13 to 25 cm. long, 5 to 9 cm. broad, broadly cuneate at base, long-acuminate at apex, entire and slightly revolute at margins, glabrous, pinnate-veined, the midvein stout, nearly plane above, very prominent beneath, the secondary veins 4 to 6 to a side, spreading, connected near margins, nearly plane above, prominent beneath, the veinlets copiously reticulate, slightly raised on both surfaces; inflorescence axillary, subfasciculate or short-racemose (rachis stout, not more than 5 mm. long), glabrous in all parts, 6 to 20 flowered; pedicels subrugose, 10 to 15 mm. long, each subtended by an oblong bract 2 to 3 mm. long, minutely bibracteolate near middle; calyx tube campanulate, subnigrescent, 2 to 2.5 mm. long, about 4 mm. in diameter at anthesis; limb about 3 mm. long including lobes, the lobes 5, ovate, acute, about 2 mm. long and 3 mm.

broad, slightly thickened at margins; corolla cylindric-conical, 11 to 13 mm. long, about 5 mm. in diameter near base, the lobes 2 mm. long; stamens about 7 mm. long; filaments subnigrescent, loosely coherent at base, sparsely pilose at margins, about 2 mm. long, leading into broad connectives, the connectives 2-spurred, the spurs alternately subacute and rounded; anther sacs sharply incurved at base, 3 to 4 mm. long; tubules cylindric, narrowed, about 3 mm. long; stigma truncate.

TYPE LOCALITY: Nanegal Valley, Province of Pichincha, Ecuador. Type collected by Sodiro (no. 92/4b).

DISTRIBUTION: Andes of northern Ecuador and southern Colombia.

COLOMBIA: *André* (K).

NARIÑO: San Pablo, *André* 3333 (K).

ECUADOR: Mindo Valley, *Sodiro* 92/12 (B).

PICHINCHA: Nanegal Valley, *Sodiro* 92/4b (B, type). Mount Pichincha, about 2,500 meters, *Jameson* 622 (K, N). Pululague, Quito, 2,300 to 2,700 meters, *Lehmann* 5439 (K). Niebli, *André* 3793 (K).

Marked from all other members of the genus by its numerous secondary nerves. The short corollas also are characteristic.

17. *Psammisia columbiensis* Hoer. Bot. Jahrb. Engler 42:303. 1909.

Slender shrub; branchlets stramineous, striate, glabrous; petioles rugose, glabrous, subnigrescent, 4 to 6 mm. long; leaf blades oblong, 9 to 12 cm. long, 2.5 to 3.5 cm. broad, cuneate at base, obtusely long-acuminate at apex, entire at margins, essentially glabrous, 5-ply-nerved, the secondary nerves oriented near base, ascending, with the midnerve slightly impressed above, prominent beneath, the veinlets copiously reticulate, slightly raised on both surfaces; inflorescence axillary near ends of branchlets, racemose, essentially glabrous in all parts, 8 to 12 flowered; rachis striate, subterete, 5 to 6 cm. long; pedicels striate, slender at base, 20 to 33 mm. long, each subtended by an oblong bract about 2 mm. long, bibracteolate near middle, swollen distally; calyx tube rugose, campanulate, 2.5 to 3 mm. long, about 3 mm. in diameter at anthesis; limb 3 mm. long including lobes, the lobes 5, ovate, apiculate, 2.5 mm. long and 3 mm. broad, often thickened at margins; corolla subcylindric, often falcate, 20 to 27 mm. long, about 6 mm. in diameter at base, contracted at the long throat, the lobes oblong, about 2 mm. long; stamens about 13 mm. long; filaments castaneous, firmly connate in a tube, sparsely pilose at distal margins, about 4 mm. long, leading into slender connectives, the connectives alternately 2-spurred, the spurs subacute, slightly broader than the connective immediately below; anther sacs 6.5 mm. long; tubules subcylindric, distinct or coherent at base, 4.5 mm. long; stigma truncate or subpeltate.

TYPE LOCALITY: Central Andes of Popayán, Department of El Cauca, Colombia, altitude 2,500 to 2,800 meters. Type collected by Lehmann (no. 4452).

DISTRIBUTION: Known only from the type collection.

COLOMBIA.

EL CAUCA: Central Andes of Popayán, *Lehmann* 4452 (B, type).

The present species is of dubious affinity but is probably most closely related to *P. falcata* or *P. lanceolata*, from which it is distinguished by the connate filaments and slender habit.

18. *Psammisia macrophylla* (H. B. K.) Klotzsch, Linnaea 24:45. 1851.

Thibaudia macrophylla H. B. K. Nov. Gen. & Sp. 3:270. 1818.

Spreading shrub 2 to 6 meters high; branchlets terete, with a glabrous deciduous reddish brown bark; petioles subcylindric, terete, 5 to 10 mm. long,

glabrous; leaf blades oblong or lanceolate-oblong, 15 to 35 cm. long, 3 to 11 cm. broad, truncate or broadly cuneate at base, long-acuminate at apex, entire at margins, glabrous, dull olivaceous above, reddish brown beneath, 5 to 7 pinnate, the secondary nerves oriented slightly above base, with the midnerve impressed above, prominent beneath, the veinlets reticulate, plane or slightly raised on both surfaces; inflorescence axillary, short-racemose, essentially glabrous in all parts, 10 to 25 flowered; rachis subterete, dark castaneous, stout, 2 to 4 cm. long; pedicels subterete, lightly striate, 18 to 40 mm. long, 5 to 10 per centimeter of rachis, each subtended by a subcoriaceous oblong bractlet about 2 mm. long, minutely bibracteolate near base; calyx tube broadly campanulate, 5 to 6 mm. long, about 6 mm. in diameter at summit at anthesis; limb thick-coriaceous, 4 to 7 mm. long including lobes, the lobes usually 5 (often 3 or 4, in a state of semifusion), ovate, apiculate, 2 to 4 mm. long; corolla subcylindric or elongate-urceolate, 22 to 30 mm. long, about 7 mm. in diameter at base, contracted to the long throat, the lobes oblong, 2.5 to 5 mm. long; stamens 8 to 12 mm. long; filaments dark castaneous, distinct, glabrous, 3 to 4 mm. long, leading into more slender connectives, the connectives 2-spurred, alternately narrower and more obviously spurred, the spurs subacute, anther sacs 5 to 6 mm. long; tubules distinct to base or frequently laterally connate, 2.5 to 4.5 mm. long; style slightly exerted in mature flowers, the stigma truncate; fruit subspherical, 10 mm. or more in diameter, the broad coriaceous calyx limb persistent.

TYPE LOCALITY: Andes of Popayán, Department of El Cauca, Colombia, altitude about 2,000 meters. Type collected by Humboldt and Bonpland.

DISTRIBUTION: Andes of southern Colombia, altitude 1,400 to 2,700 meters.

COLOMBIA: *Lehmann* K180 (K). Capilla, *Lehmann* BT965 (K, Y).

TOLIMA (?): Quindío Andes, *Humboldt & Bonpland* (B).

CALDAS: Santuario, *Pennell* 10308 (Y), 10315 (Y).

EL VALLE: La Cumbre, *Pennell & Killip* 5751 (B, N, Y).

EL CAUCA: Popayán and vicinity, *Triana* 2669 (B, K); *Lehmann* 8417 (F, G, N), BT439 (Y), BT639 (K, Y); *Hartweg* 1216 (B, K, Y); *Pennell & Killip* 6369 (N, Y), 8130 (Y), 8275 (N, Y), 8305 (N, Y); *Pennell* 8267 (N, Y).

NARIÑO: Alto de Arardo, *Triana* 2674 (B).

This species evidently is limited in geographic range to the Central and Western Cordillera of southern Colombia. It is often confused with *P. falcata*, but may be distinguished by its strictly glabrous fleshy filaments. It may also be noted that the racemes are comparatively short, with crowded flowers.

19. *Psammisia guianensis* Klotzsch, *Linnaea* 24: 43. 1851.

Psammisia leucostoma Benth.; Meissn. in Mart. Fl. Bras. 7: 127. 1863.

Chupalon guianense Kuntze, Rev. Gen. Pl. 2: 384. 1891.

Chupalon leucostomum Kuntze, Rev. Gen. Pl. 2: 384. 1891.

Psammisia ulei Hoer. Verh. Bot. Ver. Brand. 50: 92. 1909.

Shrub; branchlets terete, slender, glabrous, brownish, sometimes puberulous when very young; petioles subterete, 5 to 12 mm. long, essentially glabrous; leaf blades oblong or lanceolate-oblong, 10 to 22 cm. long, 3 to 7 cm. broad, truncate at base, acuminate at apex, subentire and slightly revolute at margins, 5-pinnate, the secondary nerves oriented above base, ascending, with the midnerve impressed above, prominent beneath, the veinlets reticulate, slightly raised or nearly plane on both surfaces; inflorescence axillary, short-racemose, essentially glabrous in all parts, 8 to 20 flowered; rachis subterete, 7 to 20 mm. long; pedicels slightly rugose, sometimes subflexuose, 15 to 25 mm. long, each

subtended by a triangular bractlet about 1.5 mm. long, minutely bibracteolate below middle; calyx tube campanulate, 2 to 4 mm. long and about 3 mm. in diameter at anthesis; limb 2 to 5 mm. long including lobes, the lobes 3, 4, or 5, often in a state of semifusion, ovate, apiculate, 1 to 3 mm. long; corolla subcylindric or elongate-urceolate, 18 to 27 mm. long, about 5 mm. in diameter near base, contracted to the long throat, the lobes oblong, 2 to 4 mm. long; stamens 9 to 12.5 mm. long; filaments dark castaneous, distinct or slightly coherent at base, 3 to 5 mm. long, slightly pilose marginally distally, leading into long slender connectives, the connectives alternately 2-spurred (sometimes all spurred, but the alternate ones more slender and more obviously spurred), the spurs subacute; anther sacs 5 to 6 mm. long; tubules distinct or laterally connate toward base, about 3 mm. long; stigma truncate; fruit subspherical, up to 12 mm. in diameter, surmounted by the broad coriaceous calyx limb.

TYPE LOCALITY: Mount Roraima, British Guiana. Type collected by Schomburgk (no. 974).

DISTRIBUTION: Mount Roraima in British Guiana; also at low elevations on the eastern Andean slope from Colombia to Bolivia; altitude 500 (or less?) to 1,500 meters.

BRITISH GUIANA: Mount Roraima, *Schomburgk* 974 (B, type, K); *in Thurn* 49, in part (K, N).

BRAZIL.

AMAZONAS: Panuré, Rio Uaupes, *Spruce* 2465 (G, K, type of *P. leucostoma*, Y), 2705 (K).

COLOMBIA.

PUTUMAYO: Umbría, 325 meters, *Klug* 1678 (N, Y).

ECUADOR.

TUNGURAGUA: Baños, Río Pastaza, *Spruce* 5036 (G, K, Y).

PERU: *Macleay* (K).

SAN MARTÍN: Tarapoto, *Spruce* 4357 (K). Cerro de Escalero, *Ule* 6340 (B, type of *P. ulei*). San Roque, *L. Williams* 7343 (Y), 7712 (F, Y).

LORETO: Mouth of Río Santiago, *Tessmann* 3954 (B).

HUÁNUCO: Cueva Grande, *Macbride* 4792 (F).

BOLIVIA.

LA PAZ: Mapiri and vicinity, *Rusby* 2038 (F, N, Y); *Buchtien* 1179 (B), 1180 (B, N, Y), 1181 (B, N).

This species has a very wide and unusual distribution for a member of the tribe, but it is observable in many cases that species inhabiting the eastern slopes of the Andes have a far wider distribution than those of the western ranges. In the latter case the mountains are sharply dissected, and often a narrow valley is sufficiently deep to prohibit the spread of a species. On the other hand, the mountains of the eastern Andes are less rugged, and the streams are larger and interconnected by virtue of the Amazon. Possibly this geographic fact accounts for the wide distribution of such species as the present one and *Satyria panurensis*, whereas the species of northwestern Colombia, for example, where the mountains are sharply dissected, are greatly restricted in range.

Among the types here concerned there is little difference. The type of *P. leucostoma* is slightly the slenderest in habit, and another specimen from the Rio Uaupes, *Spruce* 2705, has extraordinarily narrow leaves. The widest leaves are those of the Tessmann specimen, but I am convinced that these forms are no more than extremes in a naturally variable species. This species is possibly more closely related to *P. pauciflora* and *P. urichiana* than is indicated by the key.

20. *Psammisia coarctata* (R. & P.) A. C. Smith.*Thibaudia coarctata* R. & P. Fl. Peruv. Chil. 4: pl. 385. 1802.*Thibaudia bicolor* R. & P.; DC. Prodr. 7: 561. 1839.*Psammisia bicolor* Klotzsch, Linnaea 24: 44. 1851.*Vaccinium bicolor* F. Muell. Sel. Pl. Indust. Cult. 249. 1876.*Psammisia engleriana* Hoer. Bot. Jahrb. Engler 42: 304. 1909.*Psammisia urbaniana* Hoer. Bot. Jahrb. Engler 42: 307. 1909.*Psammisia weberbaueri* Hoer. Bot. Jahrb. Engler 42: 307. 1909.

Shrub, often subscaudent; branchlets stout, subterete, glabrous, brownish or cinereous; petioles subterete, 6 to 10 mm. long, glabrous; leaf blades oblong or ovate-oblong, 10 to 20 cm. long, 3 to 7 cm. broad, cuneate at base, acuminate at apex, subentire or shallowly crenate towards apex, glabrous, 5 to 7 pli-nerved, the secondary nerves oriented near base, with the midnerve slightly impressed above, prominent beneath, the veinlets copiously reticulate, slightly raised on both surfaces; inflorescence axillary, short-racemose, glabrous in all parts, 10 to 20 flowered; rachis subterete, stout, up to 5 mm. in diameter, 1 to 3 cm. long, conspicuously marked with the scars of deciduous pedicels; pedicels striate, 20 to 45 mm. long, each subtended by an oblong bractlet about 4 mm. long, minutely bibracteolate near base, swollen distally; calyx tube broadly campanulate, 2 to 4 mm. long and 4 to 6 mm. in diameter at anthesis; limb 2.5 to 4 mm. long including lobes, the lobes 5, ovate, apiculate, about 1.5 mm. long, thick-margined; corolla cylindric-urceolate, 18 to 27 mm. long, about 8 mm. in diameter near base, contracted to throat, deciduously sparsely brown-pilose without at middle, the lobes 1.5 to 2 mm. long; stamens 10 to 13 mm. long; filaments castaneous, distinct, slightly pilose at margins distally with hairs up to 0.3 mm. long, leading into long slender connectives, the connectives alternately 2-spurred (sometimes spurred on one margin only), the spurs acute, distinct; anther sacs 6 to 8 mm. long; tubules 3 to 4 mm. long.

TYPE LOCALITY: Peru, probably in Department of Huánuco. Type collected by Ruiz and Pavon.

DISTRIBUTION: Eastern Andes of central and southern Peru, altitude 1,600 to 2,400 meters.

PERU: *Macleay* (K); *Mathews* 2078 (K, in part).

HUÁNUCO: Near Monson, *Weberbauer* 3510 (B, type of *P. engleriana*).

Pampayacu, *Sawada* P36 (F).

JUNÍN: Huacapistana, *Weberbauer* 2151 (B, type of *P. weberbaueri*);

Killip & Smith 24138 (N, Y). Schunke Hacienda, San Ramón, *Macbride* 5626 (F).

Cuzco: Sandía, *Weberbauer* 1159 (B, type of *P. urbaniana*).

The necessity of forming a new combination for this species and at the same time reducing so many names is regrettable but inevitable. The name *Thibaudia bicolor* was not published in the fourth volume of Ruiz and Pavon, as was *Thibaudia coarctata*. In making his choice between the two names, Dunal evidently had access to some unpublished manuscript. The three types of Hoerold's species here involved differ from one another only in very minor points. As represented by the above-cited specimens, the species is a very coherent one.

21. *Psammisia falcata* (H. B. K.) Klotzsch, Linnaea 24: 44. 1851.*Thibaudia falcata* H. B. K. Nov. Gen. & Sp. 3: 269. 1818.*Thibaudia cyathifera* Benth. Pl. Hartw. 222. 1846.*Psammisia cyathifera* Klotzsch, Linnaea 24: 43. 1851.

Shrub; branchlets subterete, glabrous, brownish; petioles rugose, glabrous, narrowly winged above, 5 to 15 mm. long; leaf blades oblong or lanceolate-oblong, sometimes falcate, 12 to 35 cm. long, 3.5 to 7 cm. broad, cuneate at base, acuminate at apex, subentire or shallowly crenate or subserrate toward apex, glabrous, 5 to 7 pti-nerved (or somewhat pinnate-nerved), the secondary nerves oriented above base, ascending, with the midnerve slightly impressed above, raised beneath, the veinlets reticulate, plane or slightly raised on both surfaces; inflorescence axillary, racemose, essentially glabrous, 10 to 20 flowered; rachis subterete, stout, 3 to 9 cm. long; pedicels striate, 18 to 40 mm. long, each subtended by an oblong coriaceous bractlet about 4 mm. long, minutely bibracteolate near base; calyx tube short-cylindric or campanulate, about 4 mm. long and 5 mm. in diameter at anthesis; limb coriaceous, 3 to 5 mm. long including lobes, the lobes 5, ovate, apiculate, about 1 mm. long; corolla subcylindric, often slightly falcate, 18 to 28 mm. long, 6 mm. in diameter near base, contracted to about 3 mm. in diameter at throat, the lobes oblong, subacute, about 1.5 mm. long; stamens 12 to 16 mm. long; filaments dark castaneous, distinct, 4 to 6 mm. long, distally pilose at margins with a few straight pale hairs up to 0.6 mm. long, leading into slender connectives, the connectives alternately 2-spurred, the spurs subacute; anther sacs 8 to 9 mm. long; tubules subcylindric, 3 to 5 mm. long; style exerted, the stigma truncate; fruit subspherical, slightly rugose, up to 12 mm. in diameter, surmounted by the broad coriaceous calyx limb.

TYPE LOCALITY: Amalguer, Colombia, altitude about 3,200 meters. Type collected by Humboldt and Bonpland.

DISTRIBUTION: Eastern Cordillera of Colombia, altitude 1,800 to 3,500 meters.

COLOMBIA: *Purdie* (K).

SANTANDER: La Baja, *Killip & Smith* 17174 (N, Y), 18370 (N, Y), 18794 (N, Y).

CUNDINAMARCA: Bogotá, *Schultze* 70 (B, N). Cincha, *Triana* 2685 (K).

Pasca, *Triana* 2686 (B, K). Tequendama, *Holton* 633 (K, N); *Triana*, in March, 1856 (B). Eastern páramos of Guasca, toward Gachetá, *Ariste Joseph B.* 113 (N, Y).

HUILA: East of Neiva, *Rusby & Pennell* 865 (N, Y).

Well marked by its comparatively long rachis and distant long-pedicelled flowers. It is frequently confused with *P. macrophylla*, yet the differences suggested by the key are constant and the ranges of the two species do not seem to overlap.

22. *Psammisia lanceolata* Hoer. Bot. Jahrb. Engler 42: 309. 1909.

Shrub; branchlets terete, cinereous, densely pubescent with pale spreading hairs up to 0.3 mm. long; petioles subcylindric, 5 to 15 mm. long, pubescent as the branchlets, becoming glabrous; leaf blades lanceolate-oblong, 10 to 22 cm. long, 3 to 7 cm. broad, cuneate or truncate at base, acute or acuminate at apex, entire and slightly revolute at margins, 5 to 7 pti-nerved or pinnate-veined with the secondary veins oriented in basal half, the secondary nerves 3 or 4 to a side, ascending, with the midvein impressed above, prominent beneath, the veinlets reticulate, nearly plane on both surfaces, essentially glabrous above, puberulous beneath when young, becoming glabrous; inflorescence axillary, racemose, 8 to 20 flowered; rachis subterete, 2 to 5 cm. long, when young closely pubescent as the branchlets, glabrescent; pedicels subterete, 20 to 30 mm. long, densely puberulous with pale brown hairs about 0.2 mm. long or subglabrous, each subtended by a deciduous bractlet, bibracteolate near base

with triangular acute bractlets about 2 mm. long, swollen distally; calyx tube short-cylindric or subspherical, pilose with spreading scattered hairs about 0.3 mm. long, about 4 mm. long, 5 to 6 mm. in diameter at anthesis; limb spreading, 4 to 6 mm. long including lobes, the lobes 4 or 5 (rarely 3), often in a state of semifusion, ovate, apiculate, 2 to 4 mm. long, 5 to 6 mm. across; corolla subcylindric, 20 to 28 mm. long, about 7 mm. in diameter, contracted above, the lobes 3 to 4 mm. long, reflexed when mature; stamens 12 to 14 mm. long; filaments nigrescent, distinct, 4 to 6 mm. long, distally pilose at margins with hairs up to 0.5 mm. long, leading into long slender connectives, the connectives alternately 2-spurred (spurs acute, about 1.3 mm. across, connective 0.5 mm. across immediately below), the alternate connectives slightly broader; anther sacs 7 to 8.5 mm. long; tubules elongate-conical, 3 to 4 mm. long; style exerted in mature flowers, the stigma truncate; fruit subspherical, glabrous, up to 15 mm. in diameter, the calyx limb decurrent.

TYPE LOCALITY: Pasca, Department of Cundinamarca, Colombia, altitude 2,700 meters. Type collected by Triana (no. 4333/19).

DISTRIBUTION: Eastern Cordillera of Colombia, altitude 1,800 to 2,700 meters.

COLOMBIA: Barroblanco, *André* 1337 (K), 1340 (K), 1498 (K).

CUNDINAMARCA: Pasca, *Triana* 4333/19 (B, type). Fusagasugá, *Pennell* 2705 (N, Y).

HUILA: East of Neiva, *Pennell* 599 (Y), 875 (N, Y).

This species is closely related to the preceding, from which it differs only in the presence of somewhat persistent hairs. The young fruits are subglabrous, and the use of so variable a character as pubescence for specific limitation in this group is perhaps not justified.

23. *Psammisia penduliflora* (Dun.) Klotzsch, *Linnaea* 24: 43. 1851.

Thibaudia penduliflora Dun.; DC. *Prodr.* 7: 562. 1839.

Psammisia planchoniana Decaisne, *Rev. Hort.* IV. 3: 182. 1854.

Chupalon penduliflorum Kuntze, *Rev. Gen. Pl.* 2: 383. 1891.

Macleania kalbreyeri Mansf. *Notizbl. Bot. Gart. Berlin* 9: 435. 1925.

Shrub or low tree, 2 to 6 meters high; branchlets subterete, dark brown, puberulous when young, becoming glabrous; petioles subterete, 3 to 10 mm. long, essentially glabrous, narrowly winged above; leaf blades oblong or ovate-oblong, 7 to 17 cm. long, 3 to 7 cm. broad, cuneate at base, caudate-acuminate at apex, entire at margins, glabrous above, pilose beneath (hairs dark brown, stout, appressed, 0.2 to 0.3 mm. long, averaging 2 to 4 per square millimeter of surface), 5 (rarely 7) pinnately-nerved, the secondary nerves oriented near base, ascending, with the midnerve impressed above, prominent beneath, the veinlets reticulate, plane above, slightly raised beneath; inflorescence axillary, racemose, 4 to 12 flowered; rachis subterete, slightly rugose, 1 to 3 cm. long (rarely 5 cm.) at maturity; pedicels striate, 8 to 15 mm. long, glabrous, each subtended by an oblong bractlet 3 to 5 mm. long, deciduously bibracteolate near middle with similar bractlets; calyx tube subcylindric or subspherical, puberulous with minute silky hairs or glabrous, 2 to 3 mm. long and about 2 mm. in diameter at anthesis; limb 2.5 to 5 mm. long including lobes, the lobes 4 or 5 (sometimes 3), ovate, apiculate, 2 to 4 mm. long; corolla subcylindric, 16 to 23 mm. long, about 4 mm. in diameter, gradually contracted distally, glabrous or minutely puberulous distally, the lobes oblong, 2 to 3 mm. long; stamens 8 to 11 mm. long; filaments dark castaneous, distinct, distally puberulous or glabrous, 2 to 3 mm. long, leading into slender connectives, the connectives alternately 2-spurred, the spurs inconspicuous, rounded or subacute; anther sacs 4 to 6 mm. long; tubules distinct or coherent at base.

elongate-conical, 2 to 4 mm. long, opening by oval clefts of varying length; style about as long as corolla or slightly exserted, the stigma truncate; fruit subspherical, up to 15 mm. in diameter, the calyx limb decurrent.

TYPE LOCALITY: Caracas, Federal District, Venezuela. Type collected by Vargas.

ILLUSTRATIONS: Hook. Bot. Mag. Curtis 86: pl. 5204. 1860. Decaisne, Rev. Hort. IV. 3: pl. 1. 1854.

DISTRIBUTION: Andes of western Venezuela and northeastern Colombia, altitude 1,000 to 2,800 meters.

VENEZUELA.

FEDERAL DISTRICT: Caracas, *Linden* 283 (K).

MÉRIDA: *Moritz* 1347 (B, K), 1347b (B, G); *Schuchardt* (B). Between Tabay and Mucurubá, *Pittier* 12874 (N). Aricagua, *Jahn* 985 (N).

COLOMBIA: *Triana* 345 (B).

MAGDALENA: Santa Marta Mountains, *Purdie* (K, 5 collections).

NORTE DE SANTANDER: Ocaña, *Kalbreyer* 286 (B, type of *Macleania kalbreyeri*, K). Toledo, *Killip & Smith* 20051 (N, Y), 20108 (N, Y), 20481 (N, Y), 20587 (N, Y).

SANTANDER: Mesa de los Santos, *Killip & Smith* 15049 (N, Y), 15108 (N, Y). Suratá, *Killip & Smith* 16621 (N). La Baja, *Killip & Smith* 16777 (N, Y), 18013 (N, Y). California, *Killip & Smith* 17873 (Y). Charta, *Killip & Smith* 18868 (N, Y), 18872 (N, Y), 19099 (N, Y).

This is a very common species throughout its rather limited range, and is easily identified by the stout brown hairs on the lower surface of leaves. The corollas are sometimes sparsely pubescent, but this character is neither constant nor persistent. The fact that spurs are often nearly lacking on the connectives indicates the close relationship of this species to *Macleania*. A local name in Mérida is "coral."

24. *Psammisia hookeriana* Klotzsch, *Linnaea* 24: 46. 1851.

Thibaudia pichinchensis var. *glabra* Hook. Bot. Mag. Curtis 73: pl. 4844. 1847.

Psammisia towarensis Klotzsch, *Linnaea* 24: 44. 1851.

Psammisia sarcantha Decaisne, Rev. Hort. IV. 3: 181. 1854.

Thibaudia sarcantha Hook. f. Bot. Mag. Curtis 90: pl. 5450. 1864.

Thibaudia jessicae Hook. f. Bot. Mag. Curtis 91: pl. 5547. 1865.

Macleania towarensis Hoer. Bot. Jahrb. Engler 42: 269. 1909.

Psammisia jessicae Hoer. Bot. Jahrb. Engler 42: 270. 1909.

Subscandent shrub, the branches 2 to 6 meters long; branchlets terete, brownish, glabrous; petioles subterete, glabrous, 5 to 12 mm. long; leaf blades broadly ovate or ovate-oblong, 12 to 25 cm. long, 5 to 9 cm. broad, cuneate at base, acuminate or long-acuminate at apex, entire at margins, thick-coriaceous, 5 to 7 pli-nerved, the secondary nerves oriented above base, with the mid-nerve impressed or nearly plane above, prominent beneath, the veinlets reticulate, slightly raised on both surfaces; inflorescence axillary, short-racemose, essentially glabrous in all parts, 8 to 20 flowered; rachis slightly rugose, about 1 cm. long; pedicels subterete, slightly striate, 10 to 22 mm. long, each subtended by a subcoriaceous ovate bractlet about 1.5 mm. long, minutely bibracteolate near base; calyx tube short-subcylindric or broadly campanulate, about 3 mm. long and 3 to 4 mm. in diameter at anthesis; limb spreading, 2 to 4 mm. long including lobes, the lobes 4 or 5, ovate, apiculate, 1 to 3 mm. long; corolla subcylindric or cylindric-urceolate, 14 to 16 mm. long (rarely 12 mm.), 5 to 6 mm. in diameter at base, contracted to the

short throat, 5 (rarely 4) lobed, the lobes oblong, acute, 2 to 3 mm. long; stamens 10 (rarely 8), 8 to 10 mm. long; filaments nigrescent, distinct, glabrous or short-pilose distally at margins, leading into slender connectives, the connectives 2-spurred, alternately narrower, the spurs rounded or subacute, frequently obscure; anther sacs 4 to 6 mm. long; tubules distinct or laterally connate at base, 2 to 3.5 mm. long, opening by oval clefts about half their length; stigma peltate; fruit subspherical, 1 cm. or more in diameter, surmounted by the broad coriaceous calyx limb.

TYPE LOCALITY: Mountains of Colombia. Type collected by Purdie.

DISTRIBUTION: Andes of Venezuela and northeastern Colombia.

COLOMBIA: *Purdie* (K, type).

VENEZUELA.

FEDERAL DISTRICT: Caracas, *Linden* 26 (K). Silla de Caracas, *Kuntze* 1636 (N, Y). Altos de Gallipán, 1,800 meters, *Pittier* 9916 (N); *E. Pittier* 129 (N, Y).

MÉRIDA: *Moritz* 479 (B). Colonia Tovar, *Moritz* 772 (B, type of *P. tovarensis*); *Fendler* 737 (G, K, Y); *Allart* 399 (B, N, Y).

CULTIVATED PLANT: Originally from Caracas? (K, type of *Thibaudia jessicae*).

A beautiful species, cultivated in Europe, and probably most closely allied to *P. penduliflora*, from which it is easily distinguished by the lack of pubescence on the leaves and by the small bractlets.

25. *Psammisia ulbrichiana* Hoer. Bot. Jahrb. Engler 42:306. 1909.

Subscandent shrub; branchlets terete, reddish brown and slightly puberulous when young, becoming glabrous, with deciduous cinereous bark; petioles rugose, stout, 10 to 18 mm. long, glabrous, winged above; leaf blades oblong or lanceolate-oblong, 18 to 40 cm. long, 6 to 10 cm. broad, cuneate at base, long-acuminate at apex, subentire at margins, glabrous, dull olivaceous above, olivaceous or reddish beneath, usually 7-parallel-nerved, the secondary nerves oriented above base, with the midnerve impressed above, prominent beneath, the veinlets reticulate, plane or slightly raised on both surfaces; inflorescence axillary, short-racemose, glabrous, 10 to 30 flowered; rachis stout, 1 to 2 cm. long; pedicels striate, 20 to 45 mm. long, each subtended by an oblong subcoriaceous bractlet about 3 mm. long, minutely bibracteolate below middle, swollen distally; calyx tube campanulate, 2.5 to 4 mm. long, 4 to 6 mm. in diameter at anthesis; limb subcoriaceous, about 4 mm. long including lobes, the lobes 5, ovate, apiculate, about 2 mm. long; corolla subcylindric, 18 to 25 mm. long, 5 to 6 mm. in diameter near base, contracted at throat, often conspicuously jointed slightly above middle, the lobes oblong, 2 to 3 mm. long; stamens 9 to 12 mm. long; filaments nigrescent, distinct or slightly coherent at base, sparsely pilose at margins distally (hairs about 0.3 mm. long), leading into slender connectives, the connectives alternately 2-spurred, the spurs rounded, obscure, sometimes lacking; anther sacs 4 to 6.5 mm. long; tubules laterally connate in basal half, 2.5 to 5 mm. long, cylindric-conical; stigma peltate.

TYPE LOCALITY: Mount Pululagua, Province of Pichincha, Ecuador. Type collected by Sodiro (no. 92/4).

DISTRIBUTION: Andes of Ecuador and Peru, altitude 1,000 to 3,300 meters.

ECUADOR.

PICHINCHA: Mount Pululagua, *Sodiro* 92/4 (B, type). Cauzacoto, *Sodiro* 92/5 (B).

EL OBO: Between La Chorita and Portovelo, *Hitchcock* 21194 (N, Y).

AZUAY: Cuenca, *Pearce* 236 (K).

PERU: *Mathews*, in 1862 (Y).

AMAZONAS: Central Cordillera, *L. Williams* 7597 (F, N).

HUÁNUCO: Cushi, *Macbride* 4851 (F).

JUNÍN: Pichis Trail, Porvenir, *Killip & Smith* 25946 (N, Y).

CUZCO: Pillahuata, Cerro de Cusilluyoc, *Pennell* 14028 (F, Y).

A widely distributed but apparently rather rare species, with beautiful large leaves and flowers. It will probably be most often sought in the section of the key which includes plants with 7 to 9 nerved leaves, but because of its suppressed connective spurs it also shows an affinity with the two preceding species.

DOUBTFUL SPECIES

PSAMMISIA LONGICOLLA Hook. f. Bot. Mag. Curtis 91: pl. 5526. 1865.

TYPE LOCALITY: Peru. Type collected by Bateman.

No plant the precise equal of the plate and description of this species has been seen by me. It may be allied to *P. ulbrichiana*, which species does not have the bractlets at the summit of the pedicel, as portrayed in *P. longicolla*. The abruptly contracted corolla also suggests *P. ulbrichiana*, which quite possibly should be supplanted by the earlier name.

PSAMMISIA OBLONGIFOLIA Regel, Ind. Sem. Hort. Petrop. 1866: Suppl. : 33. 1867.

TYPE COLLECTION: Evidently a cultivated plant, the source not mentioned.

From the description it is impossible to assign this name to any species of *Psammisia* I have seen.

PSAMMISIA SCLEROPHYLLA Planch. & Lind. Fl. Serr. Jard. 8: 205. pl. 825. 1853.

TYPE COLLECTION: State of Mérida, Venezuela, altitude about 2,400 meters. Type collected by Funck and Schlim.

This species may be synonymous with either *P. penduliflora* or *P. hookeriana*, but from the oblong leaves and pilose branchlets and pedicels shown in the plate I conclude that it is neither.

13. ANTHOPTERUS Hook. Icon. Pl. 3: pl. 243. 1840

Calyx tube continuous with pedicel, obprismatic, winged to sinuses; limb suberect, 5-lobed, the lobes lanceolate-triangular; corolla subcylindric or subglobose, broadly 5-winged to the lobes, 5-lobed, the lobes triangular, subacute; stamens 10, equal, nearly as long as corolla; filaments membranous, connate at base, attached to the anther dorsally; anthers somewhat membranous, the sacs smooth, the tubules usually longer than the sacs, opening by short introrse clefts; style filiform, about as long as corolla.

Low shrubs with coriaceous alternate pinnately-nerved petioled leaves; inflorescence axillary, racemose, bracteate at base; flowers pedicelled, several to many to an inflorescence, each subtended by a bract.

DISTRIBUTION: Eastern Panama and western Colombia, with one species in northern Peru. Four species are known.

This genus is readily distinguished from *Thibaudia* by its obviously winged corollas and calyces. *A. racemosus* Hook. is the type species.

KEY TO THE SPECIES

Racemes and leaves 10 to 15 cm. long, the leaves lanceolate-elliptic.

1. *A. racemosus*.

Racemes and leaves 5 to 11 cm. long, the leaves ovate.

Leaves cuneate or subattenuate at base, decurrent on the petiole.

2. *A. cuneatus*.

Leaves subcordate or truncate at base.

Bracts of the rachis not exceeding 8 mm. in length; calyx lobes triangular-ovate, 6 to 7 mm. long.----- 3. *A. wardii*.

Bracts of the rachis 12 to 17 mm. long; calyx lobes lanceolate, 9 to 10 mm. long.----- 4. *A. bracteatus*.

1. *Anthopterus racemosus* Hook. Icon. Pl. 3 : pl. 243. 1839.

Thibaudia racemosa Hoer. Bot. Jahrb. Engler 42:274. 1909.

Shrub or low tree, probably epiphytic; branchlets subterete, straight, glabrous; petioles glabrous, stout, angled, short; leaf blades lanceolate-oblong, 10 to 15 cm. long, 3 to 4 cm. broad, glabrous, truncate at base, entire at margins, 3-nerved, the midnerve pinnate-veined above; inflorescence axillary, racemose, apparently glabrous in all parts; rachis up to 15 cm. long; pedicels up to 2 cm. long, each subtended by an oblong bract, bibracteolate at middle; calyx urceolate, 5-winged to sinuses, the wings semiovate, the lobes deltoid, acute; corolla submembranous, conical-urceolate; filaments short, connate in a membranous tube; anthers erect, smooth, the tubules about twice as long as the sacs; stigma truncate.

TYPE LOCALITY: Moyabamba, Department of Amazonas, Peru. Type collected by Mathews.

DISTRIBUTION: Known only from the type collection.

This species is evidently quite distinct from the Colombian ones. No specimens of it are available to me, but from the description and the plate its relationship is apparent.

2. *Anthopterus cuneatus* A. C. Smith, sp. nov.

Frutex; ramulis ad nodos imbricato-bracteatis; laminis ovato-ellipticis basi cuneatis vel subattenuatis apice obtuse acuminatis 7-plexi-nerviis; inflorescentia racemosa bracteata; floribus glabris; calyce urceolato 5-alato, alis anguste semi-ovatis, lobis lanceolato-triangularibus; corolla cylindrica 5-alata, alis late semi-ovatis; staminibus aequalibus, filamentis basi connatis, tubulis flexilibus quam oculis paulo longioribus.

Shrub; branchlets subterete, glabrous, brown, often bracteate above nodes with several tightly imbricate subcoriaceous oblong blunt bracts 3 to 7 mm. long and 2 to 4 mm. broad; petioles terete, glabrous, 1.5 mm. in diameter, 4 to 5 mm. long; leaf blades coriaceous, ovate-elliptic, 8 to 10 (rarely 11) cm. long, 3.5 to 4.5 cm. broad, glabrous or minutely puberulous above near base, cuneate or subattenuate at base, decurrent on petiole, bluntly acuminate at apex (acumen not exceeding 1 cm. in length), entire and slightly revolute at margins, 7 (rarely 5) plexi-nerved, the secondary nerves sharply ascending, oriented at or near base, with the midnerve impressed above, strongly prominent beneath, the veinlets slightly raised on both surfaces; racemes terminal, subtended at base by 2 linear-lanceolate acute bracts 25 mm. long and 3 to 4 mm. broad; rachis grooved, glabrous, up to 11 cm. long, bracteate at base with numerous closely imbricate, oblong or ovate, blunt bracts of varying size, the largest 8 mm. long and 4 mm. broad; pedicels alternate, 1 or 2 per centimeter on mature rachis, subterete, striate, 6 to 10 mm. long, each subtended by a single subcoriaceous oblong subacute bractlet 10 to 12 mm. long and 5 mm. broad; flowers glabrous; calyx tube urceolate, about 5 mm. long and 3 mm. in diameter at summit (exclusive of wings), the wings fleshy, narrowly semiovate, about 1 mm. broad; limb erect, about 5 mm. long including lobes, the lobes lanceolate-triangular,

about 4.5 mm. long, 2 mm. broad at base; corolla membranous, 8 to 9 mm. long, about 3 mm. in diameter exclusive of wings, the wings semiobovate, about 2 mm. broad at the broadest point, each traversed by a single faint longitudinal vein parallel to the margin, the lobes triangular, acute, about 0.8 mm. long and 1 mm. broad at base; stamens erect, 7 mm. long; filaments 2.5 mm. long, connate in a tube for half their length, membranous, glabrous; anther sacs slightly granular, about 2 mm. long, gradually leading into wide flexible tubules 3 mm. long opening by wide introrse clefts 1 to 1.5 mm. long; style 8 to 9 mm. long, the stigma truncate.

Type in the herbarium of the New York Botanical Garden, collected on "páramo," Barbacoas, Department of Nariño, Colombia, altitude 1,000 meters, 1851 to 1857, by J. Triana (no. 2718). Duplicate at K.

DISTRIBUTION: Known only from the type collection.

The collector's notes refer to the habitat as "páramo," although a páramo proper could not exist at such low altitude. It is a species distinguished from others of the genus by its cuneate leaf-base, numerous and varied bracts, and slightly smaller flowers.

3. *Anthopterus wardii* Ball in Hook. Icon. Pl. 15: pl. 1465. 1884.

Thibaudia wardii Hoer. Bot. Jahrb. Engler 42: 274. 1909.

Shrub or low tree; branchlets subterete, faintly puberulous when young, becoming glabrous, cinereous; petioles subterete, glabrous, 2 to 4 mm. long; leaf blades oblong or ovate-oblong, 6 to 12 cm. long, 2.5 to 5 cm. broad, essentially glabrous, subcordate at base, bluntly acuminate at apex, entire and slightly revolute at margins, 5 to 7 pli-nerved, the secondary nerves oriented near base, ascending, with the midnerve slightly impressed or plane above, prominent beneath, the veinlets copiously reticulate, slightly raised on both surfaces; inflorescence axillary, short-racemose; rachis subterete, glabrous, 1 to 2 cm. long, circumscribed at base by a few triangular bractlets up to 5 mm. long; pedicels subterete, glabrous, 10 to 20 mm. long, each subtended by a single oblong bractlet 3 to 6 mm. long; flowers glabrous; calyx tube urceolate, 3 to 4 mm. long and about 2.5 mm. in diameter at summit exclusive of wings, the wings narrowly semiovate, about 1 mm. broad, opaque; limb subspreading, 7 to 8 mm. long including lobes, the lobes triangular-ovate, acute, 6 to 7 mm. long and about 4 mm. across, traversed by about 7 parallel branching veins not quite reaching the margins; corolla membranous, 10 to 11 mm. long, about 4 mm. in diameter, slightly contracted at base and apex, the wings semiobovate, 2 to 3 mm. across their broadest point, each with a single longitudinal vein parallel to the margin, the lobes ovate, about 1 mm. long; stamens 7 to 8 mm. long; filaments about 4 mm. long, membranous, connate for about half their length, glabrous, adherent to corolla; anther sacs about 2 mm. long, gradually leading into flexible tubules about 3 mm. long, opening by introrse clefts about half their length; stigma truncate.

TYPE LOCALITY: Buenaventura, Department of El Valle, Colombia, near sea level. Type collected by R. Ward.

DISTRIBUTION: Pacific slope of Western Cordillera from Panama to southern Colombia, between sea level and 1,200 meters altitude.

PANAMA: Darién, Cerro de Garagará, Sambú basin, *Pittier* 5652 (N.).

COLOMBIA: Río de Santa Rosa, *André* K1335 (K).

EL CHOCÓ: Quibdó, *Archer* 1901 (N, Y).

EL VALLE: Buenaventura, *André* 269 (K); *Lehmann* K179 (K); *Killip* 5223 (B, G, N, Y), 11851 (N, Y).

NARIÑO: Between Barbacoas and Tuquerres, *Triana* 2716 (K, Y).

"PEBU: *Maclean*" (K).

Concerning the last specimen cited there is probably a confusion of labels, as it is quite unlikely that the species would be found in Peru and Colombia and in no intermediate places. It is a species of considerable variation; the Panama specimen has a calyx with broader wings and shorter lobes, a corolla with broader wings, and the leaves smaller than in typical material from Buenaventura. The Triana specimen is more or less intermediate, suggesting that the broader flower may be concomitant with increased altitude. At Buenaventura the species is reported as growing in mangrove swamps.

4. *Anthopterus bracteatus* A. C. Smith, sp. nov.

Frutex; laminis oblongo-ovatis basi subcordatis vel truncatis apice obtuse acuminatis 5 ad 7 pli-nerviis; inflorescentia racemosa bracteata; floribus glabris; calyce urceolato 5-alato 5-lobato, lobis elongatis lanceolato-triangularibus; corolla 5-alata, alis semiobovatis; staminibus aequalibus, filamentis basi connatis, tubulis flexilibus quam loculis duplo longioribus.

Shrub; branchlets subterete or obtusely angled, glabrous or minutely pale-puberulous when young; petioles terete, subglabrous, 1.5 mm. in diameter, about 2 mm. long; leaf blades coriaceous, oblong-ovate, 7 to 9 cm. long, 3 to 4 cm. broad, glabrous or essentially so, subcordate or truncate at base, bluntly acuminate at apex (acumen less than 1 cm. long), entire and plane at margins, 5 to 7 pli-nerved, the secondary nerves sharply ascending, oriented near base, the mid-nerve and secondary nerves impressed above, prominent beneath, the veinlets copiously reticulate, slightly raised on both surfaces; racemes axillary near ends of branchlets; rachis obtusely angled, glabrous, up to 5 cm. long, bracteate at base with numerous closely imbricate, ovate, oblong, or lanceolate bracts, the largest of these 12 mm. long and 3 mm. broad; pedicels alternate, about 3 per centimeter on mature rachis, striate, about 2 cm. long, each subtended by a single oblong-lanceolate acute bractlet 12 to 17 mm. long and 2 to 3 mm. broad; flowers glabrous; calyx tube about 5 mm. long and 3 mm. in diameter at summit exclusive of wings, the wings narrowly semiovate, about 1.5 mm. broad; limb erect, 10 to 11 mm. long including lobes, the lobes lanceolate-triangular, acute, 9 to 10 mm. long, 3.5 mm. broad at base, traversed by several close parallel longitudinal freely branching veins not quite reaching the margins; corolla 12 to 13 mm. long, 4 to 5 mm. in diameter (exclusive of wings) near base, contracted above, the wings semiobovate, about 3.5 mm. across broadest point, each traversed by a single faint longitudinal vein parallel to margin, the lobes erect, 1 mm. long, 1.2 mm. broad at base; stamens erect, 10 mm. long; filaments 5 mm. long, connate in a tube at base, free above, membranous, glabrous; connective short; anther sacs slightly granular, about 2 mm. long, gradually leading into wide flexible tubules 4 mm. long opening by wide introrse clefts half their length; style about 11 mm. long, the stigma truncate.

Type in the herbarium of the New York Botanical Garden, collected at Timbiquí, above Popayán, Department of El Cauca, Colombia, by F. C. Lehmann (no. BT949).

DISTRIBUTION: Known only from the type collection.

The present species is allied to *A. wardii*, from which it is distinguished by its larger bracts and lanceolate calyx lobes.

EXPLANATION OF PLATE 11.—*Anthopterus bracteatus*, from photograph of type sheet. About one-half natural size.

EXCLUDED SPECIES

ANTHOPTERUS MUCRONATUS Benth. Pl. Hartw. 221. 1846.

Thibaudia mucronata Hoer. Bot. Jahrb. Engler 42: 274. 1909.

TYPE LOCALITY: Near Pitayo, Department of El Cauca, Colombia. Type collected by Hartweg (no. 1210).

Examination of the type specimen shows that it must be placed in the tribe Vaccinieae. Probably it is a species of *Vaccinium*.

14. THIBAUDIA R. & P.; St. Hil. Expos. Fam. Nat. 362. 1805

(*Eurygania* Klotzsch, *Linnaea* 24:26. 1851)

Calyx tube articulate with pedicel (continuous in the section *Agathothibaudia*), short-cylindric or campanulate, sometimes narrowly 5-winged to the sinuses; limb erecto-patent, 5-lobed, the lobes triangular, subacute; corolla subcylindric, sometimes 5-angled, 5-lobed, the lobes triangular or oblong, subacute; stamens 10, equal, often nearly as long as corolla; filaments distinct or connate, attached to the anther dorsally near its base; anthers firm or membranous, the sacs smooth or slightly granular, the tubules as long as the sacs or longer (rarely more than twice as long), opening by elongate introrse clefts; style filiform, about as long as corolla, frequently exerted.

Shrubs of various habit, often epiphytic, with coriaceous or subcoriaceous, alternate, pinnate-veined or pinnately-veined, petioled leaves; inflorescence axillary or terminal, subfasciculate or racemose; flowers pedicelled, few to many to an inflorescence; pedicels deciduously bibracteolate.

DISTRIBUTION: Mountainous South America from Colombia to Bolivia and eastward to Mount Roraima in British Guiana (also one species in Costa Rica). Forty species are here described and in addition there are nine names which I am unable to place.

The relationships of this genus have been discussed in a previous section of this treatment. It is characterized by smooth or slightly granular anther sacs and more or less flexible, wide tubules. *T. melliflora* R. & P. is the type species.

KEY TO THE SPECIES

Calyx continuous with pedicel (section *Agathothibaudia* Hoer.).

Leaves acuminate at apex, at least 3 times as long as broad; flowers thin-carnose, racemose.

Leaves oblong or oblong-lanceolate, 3 to 5 times as long as broad

1. *T. floribunda*.

Leaves lanceolate, about 8 times as long as broad..... 2. *T. longifolia*.

Leaves rounded or obtuse at apex, less than twice as long as broad; flowers coriaceous, subfasciculate..... 3. *T. turbinata*.

Calyx articulate with pedicel (section *Eurygania* Kl.).

Filaments distinct (sometimes loosely coherent at base, never connate distally).

Calyx and corolla rigidly carnose; calyx limb suberect, as long as the tube or longer; corolla strictly tubular.

Anthers more than 11 mm. long.

Leaves truncate or subcordate at base.

Leaf margins entire, the principal secondary veins 5 to 8 to a side; flower parts stout, the calyx about 12 mm. long; anthers 20 mm. long, the sacs about 3 times as long as tubules (Colombia)

4. *T. pachyantha*.

Leaf margins serrate, the principal secondary veins 3 to 5 to a side; calyx less than 9 mm. long; anthers up to 14 mm. long, the sacs not more than twice as long as tubules.

- Branchlets rugose, subterete; leaves minutely reddish pilose beneath (Bolivia)----- 5. *T. macrocalyx*.
 Branchlets sulcate-angled; leaves glabrous (Peru)
 6. *T. engleriana*.
- Leaves attenuate or long-cuneate at base.
 Calyx tube strongly papillose; filaments dorsally pilose; leaves not exceeding 6 cm. in length----- 7. *T. axillaris*.
 Calyx tube rugose, not papillose; filaments pilose at margins only; leaves 9 to 18 cm. long.
 Leaf apex acute; calyx apophysate at base, the limb about 3 times as long as tube; anthers about 20 mm. long----- 8. *T. andrei*.
 Leaf apex rounded or obtuse; calyx hardly apophysate, the limb about as long as tube; anthers 12 to 17 mm. long.
 9. *T. rigidiflora*.
- Anthers 9 mm. long or less.
 Calyx campanulate; corolla cylindric; anthers 7 to 9 mm. long (Venezuela and British Guiana).
 Rachis about 2 cm. long; anthers produced at base into a slender tip----- 10. *T. jahnii*.
 Rachis about 1 cm. long or less; anthers not noticeably produced at base.
 Leaves nearly 3 times as long as broad; stamens not exerted or barely so----- 11. *T. formosa*.
 Leaves less than twice as long as broad; stamens exerted at maturity----- 12. *T. roraimae*.
 Calyx strongly apophysate; corolla conical; anthers about 5.5 mm. long (Peru)----- 13. *T. apophysata*.
- Calyx and corolla soft-carnose (usually flattened by pressure of drying).
 Branchlets stiff; leaves subcuneate at base; flowers subfasciculate (rachis stout, less than 1 cm. long); pedicels not much longer than flowers.
 Connectives with vestigial spurs near summit; filaments less than one-third as long as anthers (Amazonian Colombia).
 14. *T. cupatensis*.
- Connectives unspurred; filaments about half as long as anthers (Venezuela and British Guiana).
 Calyx and pedicel bearing persistent glandular hairs 1 to 1.5 mm. long----- 15. *T. glandulifera*.
 Calyx and pedicel without glandular hairs.
 Pedicel surmounted by a persistent involucre of 2 fused bractlets.
 16. *T. involucrata*.
- Pedicel without fused bractlets at summit.
 Corolla, calyx, and pedicel glabrous; calyx lobes triangular, acute, 1 mm. long or more----- 17. *T. nutans*.
 Corolla, calyx, and pedicel minutely and densely pale puberulous; calyx truncate----- 18. *T. truncata*.
- Branchlets slender, lax; leaves truncate or subcordate at base; flowers racemose (rachis slender, 1 to 3 cm. long); pedicels slender, about twice as long as flowers----- 19. *T. laxa*.

Filaments firmly connate in a tube.

Leaves 12 to 17 cm. long, pinnately-nerved or nerved from base.

Inflorescence paniculate; flower parts glabrous or subglabrous; filaments glabrous.

Leaves narrowly oblong, up to 5 cm. broad, long-acuminate; corolla about 10 mm. long (Costa Rica)----- 20. *T. costaricensis*.

Leaves oblong, 5 to 8 cm. broad; corolla 12 to 17 mm. long (Colombia).

Leaves about twice as long as broad, bullate, abruptly acuminate, rounded at base----- 21. *T. paniculata*.

Leaves at least 3 times as long as broad, subacute or bluntly acuminate, cuneate at base----- 22. *T. archeri*.

Inflorescence racemose; flower parts pilose (hairs about 0.25 mm. long); filaments dorsally pilose near summit, the hairs 0.3 mm. long (Colombia)----- 23. *T. pennellii*.

Leaves not exceeding 9 cm. in length, predominantly pinnate-veined.

Leaves sulcate, strongly revolute at margins.

Flowers essentially glabrous, 1 to 3 to an inflorescence (Colombia).

24. *T. parvifolia*.

Flowers densely tomentose, several to an inflorescence (Peru).

25. *T. tomentosa*.

Leaves not noticeably sulcate, plane or slightly revolute at margins.

Calyx limb erect, twice as long as tube (limb about 7 mm. long); inflorescence densely tomentose, associated with cavendishoid bracts----- 26. *T. anomala*.

Calyx limb erecto-patent, hardly longer than tube; inflorescence glabrous or pilose, not associated with large bracts.

Leaf margins serrate (northern and central Peru).

Calyx and pedicel pubescent, the hairs pale, lax, about 0.3 mm. long.

Leaves oblong-lanceolate, 3 or 4 times as long as broad; corolla subglabrous within.

Corolla densely pilose without, the hairs pale, about 0.5 mm. long----- 27. *T. phylliriaefolia*.

Corolla glabrous----- 28. *T. moricandi*.

Leaves obovate-oblong, 2 or 3 times as long as broad; corolla densely tomentose within distally----- 29. *T. obovata*.

Calyx and pedicel glabrous (young pedicels pilose in no. 33).

Filaments strongly pilose at margins distally (hairs up to 0.5 mm. long); anthers 8 to 10 mm. long.

Leaves oblong, up to 2 cm. broad; corolla subglabrous within; anthers subglabrous----- 30. *T. angustifolia*.

Leaves ovate, 3 to 3.5 cm. broad; corolla tomentose within distally; anthers pilose at base----- 31. *T. urbaniana*.

Filaments glabrous or very sparsely pilose; anthers up to 6 mm. long.

Corolla tomentose or pilose within distally; anthers pilose at base; calyx not noticeably rugose.

Leaves ovate, acute or subacute at apex.

Leaves 3 to 4.5 cm. broad----- 32. *T. harmsiana*.

Leaves 1 to 2.5 cm. broad----- 33. *T. ovata*.

Leaves obovate, rounded (or apiculate) at apex.

34. *T. spathulata*.

Corolla glabrous within; anthers glabrous; calyx rugose.

35. *T. ovalifolia*.

Leaf margins entire or shallowly and obscurely crenate (Peru and Bolivia).

Flowers 1 to 3 to an inflorescence; leaves rounded or frequently emarginate at apex..... 36. *T. biflora*.

Flowers several to an inflorescence; leaves subacute or obtuse at apex.

Leaves about 4 times as long as broad. Flowers slender; pedicels about 0.7 mm. in diameter; calyx tube 1.5 mm. in diameter..... 37. *T. herrerae*.

Leaves 2 or 3 times as long as broad.

Lower surface of leaves and young calyx densely white-pilose (hairs spreading, up to 0.5 mm. long)--- 38. *T. regularis*.

Lower surface of leaves and calyx essentially glabrous (rarely somewhat pilose).

Branchlets and inflorescence glabrous; anthers about 4 mm. long (Bolivia)----- 39. *T. boliviensis*.

Branchlets, rachis, and pedicels white-pilose; anthers about 6 mm. long (Peru)----- 40. *T. melliflora*.

1. *Thibaudia floribunda* H. B. K. Nov. Gen. & Sp. 3:269. pl. 254. 1818.

Thibaudia pichinchensis Benth. Pl. Hartw. 223. 1846.

Shrub or low tree with elongate branches; branchlets subterete, brownish and sparsely puberulous when young, becoming glabrous and cinereous; petioles rugose, stout, up to 4 mm. in diameter, 5 to 10 mm. long, glabrous, winged above; leaf blades subcoriaceous, oblong or lanceolate-oblong, 8 to 22 cm. long, 2.5 to 6 cm. broad, cuneate at base, acuminate at apex, entire at margins, glabrous, 5 (rarely 3 or 7)-pinnate, the secondary nerves oriented above base, with the midnerve impressed above, prominent beneath, the veinlets reticulate, plane above, slightly raised beneath; inflorescence axillary, copious, often from large leafless branchlets, racemose, 15 to 30 flowered, essentially glabrous in all parts; rachis slender, striate, 2 to 6 cm. long; pedicels subrugose, 5 to 10 mm. long, each subtended by an oblong bractlet 2 to 4 mm. long, minutely bibracteolate near base (bractlets sometimes fimbriate, rachis and pedicels sometimes minutely puberulous), continuous with calyx; calyx tube campanulate, 2 to 3 mm. long, 2 to 3 mm. in diameter at anthesis; limb subspreading, 1 to 2 mm. long including lobes, the lobes acute, 1 mm. long or less; corolla subcylindric, 12 to 16 mm. long, 3 to 4 mm. in diameter, the lobes 1 to 1.5 mm. long; stamens 8.5 to 15 mm. long; filaments pale castaneous, 2 to 4 mm. long, distinct or loosely coherent, sparsely pilose distally with hairs up to 0.2 mm. long; anther sacs smooth, slender, 2.5 to 4 mm. long; tubules wide, 5 to 8 mm. long, opening by elongate clefts; stigma peltate.

TYPE LOCALITY: Bogotá, Department of Cundinamarca, Colombia, altitude about 3,000 meters. Type collected by Humboldt and Bonpland (or by Mutis?).

DISTRIBUTION: Eastern and Central Cordilleras of Colombia and southward along the Andes to central Peru, altitude 2,400 to 3,600 meters.

COLOMBIA: *Purdie* (K). Barroblanco, *André* 1926 (K).

SANTANDER: Las Vegas, *Killip & Smith* 15820 (N, Y). La Baja and vicinity, *Killip & Smith* 18087 (N, Y), 18791 (N, Y).

CUNDINAMARCA: Bogotá and vicinity, *Humboldt & Bonpland* (B, type); *Holton* 632 (Y); *Dawe* 316 (K, N); *Pennell* 1924 (N, Y). Pacho, *Stuebel* 164a (B).

CALDAS: Old Quindío Trail, *Killip & Hazen* 9482 (N, Y). Cerro Tatamá, *Pennell* 10460 (Y).

EL CAUCA: Páramo de Guanacas, *Hartweg* 1225 (K). Headwaters of Río Lopez, Río Palo basin, Tierra Adentro, *Pittier* 1073 (N). Mount Puracé, *Pennell & Killip* 6524 (B, N, Y). San Antonio, *Pennell & Killip* 7304 (N, Y).

NARIÑO: Barbacoas, *André* (K).

ECUADOR: *Hartweg* 1224 (K).

PICHINCHA: Quito, *Jameson* (K). Mount Pichincha, *Hartweg* 1217 (B, K, type of *T. pichinchensis*); *Sodirol* (B), 92/11b (B), 92/15 (B); *Jameson* 293 (K). *Niebl, André* 3797 (K).

TUNGURAGUA: *Spruce* 6088 (K, Y).

PERU.

HUÁNUCO: *Sawada* P43 (F). Playapampa, *Macbride* 4874 (F).

Study of a large series of specimens referred to *T. floribunda* and *T. pichinchensis* indicates that only one species is represented. The type specimen of *T. floribunda* has glabrous flowers, calyx lobes slightly longer than broad, and linear bractlets. The type specimen of *T. pichinchensis* has short-brown-pilose pedicels and calyces, short triangular calyx lobes, and triangular pilose bractlets. Between these two forms are found specimens with every possible combination of these characters, indicating that they are purely individual and not even characteristic of geographic localities. Of the above-cited specimens, the most distinctive is *Hartweg* 1224, which is very robust, with large truncate-based leaves; however, it does not seem to present differences of specific value. A local name of the Bogotá region is "uva de granis."

2. *Thibaudia longifolia* H. B. K. Nov. Gen. & Sp. 3: 269. 1818.

Psammisia longifolia Klotzsch, Linnaea 24: 43. 1851.

Thibaudia lehmannii Hoer. Bot. Jahrb. Engler 42: 311. 1909.

Shrub; branchlets subterete and puberulous when young, becoming angled, glabrous and cinereous; petioles subterete, 8 to 10 mm. long, glabrous; leaf blades thick-coriaceous, lanceolate-oblong, 16 to 30 cm. long, 2 to 3.5 cm. broad, cuneate or subattenuate at base, acute at apex, entire, glabrous above, sparsely pilose beneath with scattered short appressed hairs, becoming glabrous, 5 to 7 pinnately-veined, the secondary nerves oriented above base, ascending, with the mid-nerve impressed above, prominent beneath, the veinlets reticulate, obscure; inflorescence axillary, racemose, 20 to 40 flowered; rachis slender, striate, deciduously pilose with short dark hairs about 0.2 mm. long, 5 to 14 cm. long; pedicels striate, pubescent as the rachis or glabrous, 7 to 12 mm. long, each subtended by a lanceolate subfimbriate bractlet 3 to 4 mm. long, bibracteolate near base, continuous with calyx; calyx tube subcylindric or narrowly campanulate, 2.5 to 3 mm. long and 2 mm. in diameter at anthesis, subglabrous, rugose; limb 1 to 1.5 mm. long including lobes, the lobes apiculate, less than 1 mm. long; corolla cylindric, glabrous, about 14 mm. long, 2 to 3 mm. in diameter, the lobes about 1 mm. long; stamens about 12 mm. long; filaments castaneous, membranous, 3 to 4 mm. long, connate most of their length, densely pilose at margins distally with pale hairs about 0.2 mm. long; anther sacs smooth, about 3 mm. long, narrowed and sparsely setose at base; tubules wide, erect, 5 to 7 mm. long, opening by clefts about half as long; style slender, striate, about as long as corolla, the stigma peltate.

TYPE LOCALITY: Andes of the Quindío region, near La Ceja, Colombia, altitude about 3,200 meters. Type collected by Humboldt & Bonpland.

DISTRIBUTION: Andes of central and southern Colombia, altitude 2,600 to 3,200 meters.

COLOMBIA.

EL CAUCA: Andes west of Popayán, *Lehmann* 8232 (B, type of *T. lehmanni*, F, N).

Differs from *T. floribunda* only in the lanceolate leaves. There seem to be no specimens intermediate between the two species.

3. *Thibaudia turbinata* (Kuntze) Hoer. Bot. Jahrb. Engler 42:272. 1909.

Chupalon turbinatum Kuntze, Rev. Gen. Pl. 3²:190. 1898.

Low shrub; branchlets subterete, glabrous, cinereous; petioles subrugose, glabrous, narrowly winged, 4 to 5 mm. long; leaf blades coriaceous, ovate or slightly obovate, 5 to 8 cm. long, 3 to 5 cm. broad, subattenuate at base, rounded at apex, entire and slightly revolute at margins, glabrous, sometimes sparsely punctate above, pinnate-veined, the midvein impressed above, prominent beneath, the secondary veins 3 to 5 to a side, spreading or ascending, plane above, raised beneath, the veinlets reticulate, plane or slightly raised on both surfaces; inflorescence axillary, subfasciculate or short-racemose (rachis less than 5 mm. long), 2 to 6 flowered, glabrous in all parts; pedicels rugose, 15 to 20 mm. long, each subtended by an oblong acute bractlet about 2 mm. long, minutely bibracteolate near base, swollen distally and continuous with calyx; calyx coriaceous, rugose, 5-angled (angles corresponding to lobes), the tube obprismatic, 4 to 6 mm. long, 4 to 5 mm. in diameter at anthesis, the limb erect, 4 to 6 mm. in diameter including lobes, the lobes thin-margined, apiculate, 1 to 1.5 mm. long, the sinuses rounded; corolla thick-carnose, rigidly cylindric, 15 to 16 mm. long, about 4 mm. in diameter, the lobes 1.5 mm. long; stamens about 16 mm. long; filaments dark castaneous, about 3 mm. long, loosely coherent at base, pilose at margins distally with pale stiff spreading hairs about 0.2 mm. long; anther sacs slightly granular, slender, 9 to 10 mm. long, incurved at base; tubules wide, 5 to 6 mm. long, opening by oval clefts about one-third their length; style stout, the stigma truncate.

TYPE LOCALITY: Santa Rosa, Bolivia, altitude 2,000 to 2,600 meters. Type collected by Kuntze, April 3, 1892.

DISTRIBUTION: Known only from the type collection.

BOLIVIA: Santa Rosa, *Kuntze* (B, Y, type).

A very distinct species of the section *Agathothibaudia* and sharply distinguished from the two preceding.

4. *Thibaudia pachyantha* A. C. Smith, sp. nov.

Frutex vel arbor parva; laminis ovato-oblongis basi subcordatis vel truncatis apice subacutis pinnatinerviis; inflorescentia breviter racemosa glabra; floribus coriaceo-carnosis; calyce campanulato, limbo erecto quam tubo triplo longiore; corolla rigida cylindrica; staminibus aequalibus, filamentis distinctis, antheris rigide carnosis, tubulis quam loculis triplo brevioribus.

Shrub or low tree; branchlets subterete, violaceous, glabrous; petioles rugose, subterete, 3 to 4 mm. long, glabrous; leaf blades thick-coriaceous, ovate-oblong, 8 to 12 cm. long, 4 to 7 cm. broad, subcordate or truncate at base, subacute at apex, entire and narrowly revolute at margins, glabrous, pinnate-veined, the midvein nearly plane above, strongly prominent beneath, the secondary veins spreading, ascending and connected near margins, 5 to 8 to a side, plane above, prominent beneath, the veinlets reticulate, raised on both surfaces; inflorescence short-racemose, glabrous in all parts, 8 to 12 flowered; rachis stout, violaceous, glabrous, 1.5 to 2.5 cm. long; pedicels rugose, 20 to 30 mm. long, swollen distally, each subtended by a subcoriaceous ovate bractlet about 2 mm. long, articulate with calyx; calyx tube thick-coriaceous, subcylindric or campanulate, subrugose, about 3 mm. long and 5 to 6 mm. in diameter; limb erect, thick-coriaceous, 8 to

9 mm. long including lobes, the lobes deltoid, 1.5 to 2 mm. long, 4 mm. across, the sinuses subacute; corolla thick-coriaceous, rigidly cylindric, 20 to 23 mm. long and about 5 mm. in diameter; stamens often slightly exerted; filaments castaneous, stout, often loosely coherent, 4 to 5 mm. long, glabrous, leading into long, slender connectives; anthers rigidly carnose, granular, 20 to 21 mm. long, including tubules, the tubules about 5 mm. long, coriaceous, distinct, opening by clefts nearly as long; style filiform, striate, about as long as corolla, the stigma truncate.

Type in the herbarium of the Royal Botanic Gardens, Kew, collected near Tuquerres, Department of Nariño, Colombia, altitude 900 meters, by J. Triana (no. 2689).

DISTRIBUTION: Known only from the type collection.

The present specimen, although very incomplete, indicates that the plant is a striking shrub, rigid in all its parts. It is a very distinct species, as indicated in the key.

5. *Thibaudia macrocalyx* Remy, Ann. Sci. Nat. III. Bot. 8: 235. 1847.

Ceratostema serratum Britton, Bull. Torrey Club 20: 138. 1893.

Shrub or low tree 2 to 6 meters high; branchlets subterete or rugose, glabrous, brownish; petioles rugose, 2 to 4 mm. long, glabrous, narrowly angled; leaf blades thick-coriaceous, ovate or oblong-ovate, 5 to 9 cm. long, 2.5 to 4.5 cm. broad, truncate or subcuneate at base, obtuse or subacute at apex, shallowly serrate and slightly revolute at margins (serrations about 2 or 3 per centimeter), glabrous and olivaceous above, deciduously pilose beneath with minute appressed stout reddish hairs up to 0.4 mm. long, pinnate-veined, the midvein impressed above, prominent beneath, the secondary veins spreading, 3 to 4 to a side, nearly plane above, raised beneath, the veinlets reticulate, plane or slightly raised on both surfaces; inflorescence subfasciculate or short-racemose (rachis less than 1 cm. long), glabrous in all parts, 3 to 6 flowered; pedicels rugose, 8 to 12 mm. long, each subtended by a subcoriaceous lanceolate-oblong bractlet 3 to 5 mm. long, bi- or tribracteolate near base, swollen distally; calyx rugose, the tube short-cylindric or broadly campanulate, 4 to 5 mm. long and about 5 mm. in diameter at anthesis, the limb erect, 4 to 5 mm. long including lobes, the lobes acute, 1 to 1.5 mm. long; corolla carnose, rigidly cylindric, about 20 mm. long and 5 mm. in diameter, the lobes oblong, obtuse, about 2.5 mm. long; stamens about 18 mm. long; filaments dark castaneous, slender, 4 to 5 mm. long, pilose at margins distally with pale spreading hairs up to 0.3 mm. long, leading into long slender connectives; anthers golden-yellow, the sacs slightly granular, 9 to 10 mm. long, the tubules erect, flexible, 5 to 6.5 mm. long, opening by elongate clefts; stigma peltate.

TYPE LOCALITY: Cajapi and Tajeti, Yungas, Department of La Paz, Bolivia, altitude 3,500 meters. Type collected by D'Orbigny.

DISTRIBUTION: Eastern Cordillera of Bolivia, altitude 2,000 to 3,700 meters.

BOLIVIA: Huaycani, *Pearce*, in May, 1866 (K).

LA PAZ: Yungas, Unduavi, *Pearce*, in March, 1866 (K); *Rusby* 2035 (F, G, N, Y, type of *Ceratostema serratum*); *Buchtien* 30 (B, F, G, Y), 910 (F, N); *Julio* 447 (N). Pongo, *Tate* 200 (Y).

Although I have not seen the type of this very coherent species, the description agrees exactly with the above specimens. It is an unmistakable species, related as indicated in the key.

6. *Thibaudia engleriana* Hoer. Bot. Jahrb. Engler 42: 312. 1909.

Shrub about 2 meters high; branches subterete, cinereous, glabrous; branchlets brownish, stout, sharply angled, glabrous; petioles rugose, 4 to 6 mm. long,

subterete; leaf blades rigidly coriaceous, oblong, 5 to 7 cm. long, 2 to 3 cm. broad, subcordate or truncate at base, obtuse at apex, strongly revolute and crenate at margins, glabrous, pinnate-veined, the midvein plane or sulcate above, prominent beneath, the secondary veins spreading or ascending, 3 or 4 to a side, plane on both surfaces, the veinlets inconspicuous, immersed; inflorescence short-racemose, 4 to 8 flowered; rachis subrugose, about 2 cm. long, pale puberulous when young; pedicels rugose, nigrescent, 16 to 20 mm. long, glabrous, each subtended by an oblong, coriaceous, deciduously fimbriate bract about 3 mm. long, bibracteolate near base; calyx tube cylindrical, rugose, about 4 mm. long and 3.5 mm. in diameter at anthesis, glabrous or sparsely minutely glandular; limb rigidly coriaceous, about 6 mm. long including lobes, the lobes acute, about 4 mm. long and 4 to 5 mm. broad, the sinuses acute; corolla rigidly carnosose, cylindrical, glabrous, about 18 mm. long and 5 mm. in diameter; stamens slightly shorter than corolla; filaments subcoriaceous, subnigrescent, glabrous, loosely coherent, about 3 mm. long; anther sacs slightly granular, 6 mm. long; tubules flexible, about 8 mm. long, opening by clefts nearly as long; style nigrescent, the stigma truncate.

TYPE LOCALITY: Huacapistana, Department of Junín, Peru, altitude 3,000 to 3,100 meters. Type collected by Weberbauer (no. 2055).

DISTRIBUTION: Known only from the type collection.

PERU.

JUNÍN: Huacapistana, *Weberbauer* 2055 (B, type).

This is a very distinct species, with leaves and flowers approximating the preceding, but with extraordinarily stiff angled branchlets.

7. *Thibaudia axillaris* Rusby, sp. nov.

Frutex; ramulis angulatis; laminis oblongis vel subspathulatis basi attenuatis apice subacutis margine leviter crenatis et valde revolutis pinnatinerviis; inflorescentia subfasciculata glabra; calycis tubo breviter cylindrico papilloso, limbo erecto quam tubo triplo longiore 5-lobato; corolla coriaceo-carnosa rigide cylindrica; staminibus aequalibus, filamentis distinctis tomentosis, antheris longis, tubulis quam loculis duplo brevioribus.

Shrub; branchlets sharply angled, cinereous, glabrous; petioles rugose, 3 to 5 mm. long, angled, glabrous; leaf blades thick-coriaceous, oblong or subspatulate, 4 to 6 cm. long, 1.5 to 2 cm. broad, attenuate at base, obtuse or subacute at apex, strongly revolute at margins and shallowly crenate towards apex, glabrous, pinnate-veined, the midvein impressed above, prominent beneath, the secondary veins spreading, 3 to a side, slightly impressed above, raised beneath, the veinlets reticulate, slightly impressed above, plane beneath; inflorescence subfasciculate, glabrous in all parts, 2 or 3 flowered (?); pedicels rugose, 8 to 13 mm. long, each subtended by an oblong subcoriaceous bractlet about 2 mm. long, deciduously bibracteolate near base, articulate with calyx; calyx tube covered with stout short appressed ascending papillae, short-cylindrical, about 3 mm. long and 5 mm. in diameter at anthesis; limb erect, coriaceous, about 8 mm. long including lobes, the lobes apiculate, about 2 mm. long, the sinuses rounded; corolla thick-carnosose, rigidly cylindrical, 24 to 27 mm. long and about 5 mm. in diameter, the lobes oblong, subacute, about 2 mm. long; stamens as long as corolla or slightly exerted; filaments stout, castaneous, distinct, 6 to 7 mm. long, distally soft-tomentose, especially dorsally, with yellowish hairs about 0.2 mm. long, leading into long slender connectives; anther sacs slightly granular, 16 to 17 mm. long; tubules flexible, 8 to 9 mm. long, opening by clefts nearly as long; style filiform, about as long as corolla, the stigma truncate.

Type in the herbarium of the New York Botanical Garden, collected at Cocopunco, Cordillera Real, Department of La Paz, Bolivia, altitude about 3,100 meters, March 24 to 29, 1926, by G. H. H. Tate (no. 372).

DISTRIBUTION: Known only from the type collection.

Characterized by angled branchlets, stiffly revolute leaves, papillose calyx tube, extraordinarily long anthers, and unusually tomentose filaments. The description is included here at the request of Doctor Rusby.

8. *Thibaudia andrei* A. C. Smith, sp. nov.

Frutex vel arbor parva; laminis oblongis basi attenuatis vel anguste cuneatis apice acutis pinnatinerviis; inflorescentia breviter racemosa glabra; calyce rigide coriaceo rugoso, tubo apophysato, limbo erecto quam tubo triplo longiore; corolla rigide cylindrica; staminibus aequalibus, filamentis distinctis superne pilosis, antheris rigidis, tubulis erectis quam loculis brevioribus.

Shrub or small tree; branches and branchlets subterete, rugose, violaceous, glabrous; petioles rugose, subnigrescent, up to 5 mm. long, winged distally; leaf blades oblong, 10 to 15 cm. long, 4 to 6 cm. broad, attenuate or narrowly cuneate at base, acute at apex, entire and slightly revolute at margins, glabrous, pinnate-veined, the midvein slightly impressed above, very prominent beneath, the secondary veins ascending, 3 or 4 to a side, impressed above, prominent beneath, the veinlets reticulate, raised beneath; inflorescence short-racemose, glabrous in all parts, 6 to 10 flowered; rachis subterete, violaceous, 1.5 to 2 cm. long; pedicels rugose, 18 to 22 mm. long, each subtended by an oblong deciduous fimbriate bractlet about 2 mm. long, bibracteolate near base (bractlets ovate, 1 to 2 mm. long, puberulous, sometimes imbricate), swollen distally, obscurely articulate with calyx; calyx rigidly coriaceous, rugose, the tube apophysate, about 2 mm. long and 5 mm. in diameter at anthesis, the limb erect, 6 to 7 mm. long including lobes, the lobes broadly deltoid, about 1 mm. long and 4 mm. across, the sinuses rounded; corolla rigidly cylindric, 23 to 26 mm. long and about 5 mm. in diameter, the lobes oblong, about 1.5 mm. long and 2 mm. broad; stamens about as long as corolla; filaments castaneous, distinct, 4 to 5 mm. long, distally pilose with hairs about 0.3 mm. long, leading into long slender connectives; anther sacs castaneous, rigid, granular, 11 to 15 mm. long; tubules erect, rigid, 6 to 10 mm. long, opening by clefts nearly as long (total length of anthers about 21 mm.); style angled, the stigma truncate.

Type in the herbarium of the Royal Botanic Gardens, Kew, collected near Barbacoas, Department of Nariño, Colombia, by E. André (with no. 3028).

DISTRIBUTION: Andes of southern Colombia.

COLOMBIA.

NARIÑO: San Pablo, *André*, with 1340 (K).

The above cited specimens are in poor condition, but there is no doubt that they represent a distinct species allied to the following but distinguished from it by having the leaf apex acute, the calyx noticeably apophysate at base and with a long limb, and the anthers longer.

9. *Thibaudia rigidiflora* A. C. Smith, sp. nov.

Frutex; laminis nitidis ellipticis vel obovato-ellipticis basi attenuatis apice obtusis pinnatinerviis; inflorescentia racemosa glabra; calyce cylindrico 5-lobato; corolla rigide cylindrica; staminibus aequalibus, filamentis distinctis superne pilosis, tubulis loculos subaequantibus.

Shrub; branchlets angled, glabrous; petioles glabrous, rugose, thick (3 to 4 mm. in diameter), 4 to 6 mm. long; leaf blades thick-coriaceous, elliptic or obovate-elliptic, 9 to 15 cm. long, 4 to 7 cm. broad, attenuate at base, obtuse at apex, entire and revolute at margins, glabrous, pinnate-veined, the secondary

veins ascending, 2 to 4 to a side, with the midvein nearly plane above, prominent beneath, the veinlets reticulate, slightly raised on both surfaces; inflorescence axillary, racemose; rachis rugose, glabrous, 1 to 3 cm. long, bracteate at base with minute deciduous bracts; pedicels about 8 per centimeter, slender (about 0.8 mm. in diameter), 12 to 20 mm. long, striate, deciduously bibracteolate near base, articulate with calyx; calyx cylindrical, 6 to 6.5 mm. long (including tube and limb), 3.5 to 4 mm. in diameter, the lobes triangular, apiculate, 0.5 to 1 mm. long, 1.5 to 3 mm. across; corolla red, cylindrical, 12 to 19 mm. long, 3 to 5 mm. in diameter, the lobes triangular, acute, 1.5 mm. long; stamens 12 to 18 mm. long; filaments free, 1 to 3 mm. long, pilose at margins above with stiff hairs about 0.3 mm. long, attached to the anther dorsally near its base, leading into narrow elongate connectives; anther sacs slightly granular, 5 to 10 mm. long; tubules erect, slender, flexible, 6 to 9 mm. long, opening by introrse elongate clefts; style about as long as corolla, the stigma truncate; young fruit subspherical, about 6 mm. in diameter, the calyx limb persistent.

Type in the herbarium of the New York Botanical Garden, collected above Bogotá, Department of Cundinamarca, Colombia, altitude 2,700 to 2,800 meters, August 16, 1917, by H. H. Rusby and F. W. Pennell (no. 1290A).

DISTRIBUTION: Andes of Colombia, altitude 1,300 to 3,000 meters.

COLOMBIA.

HUILA: East of Neiva, *Rusby & Pennell* 982 (Y), 983 (F, N, Y).

ANTIOQUÍA: *Jervise* (K). Belmira, Santa Rosa, *Lehmann* 7535 (F, K).

EL VALLE: La Cumbre, *Pennell & Killip* 5802 (B, G, N, Y).

It is surprising that so widely distributed a species has not been previously described. There is no doubt that the above-cited specimens are conspecific, the shiny obovate leaves giving the plant an unmistakable appearance. It may be remarked that the specimens from the Eastern Cordillera have flowers somewhat smaller in all parts than those from the Central and Western Cordilleras. The relation of this species to the preceding has been noted above.

10. *Thibaudia jahnii* Blake, *Contr. U. S. Nat. Herb.* 20: 529. 1924.

Low shrub; branchlets subterete, nigrescent, glabrous; petioles rugose, 3 to 6 mm. long, glabrous, winged above; leaf blades thick-coriaceous, oblong-ovate, 5 to 8 cm. long, 2 to 3.5 cm. broad, cuneate or subattenuate at base, subacute or short-acuminate at apex, entire and slightly revolute at margins, essentially glabrous, pinnate-veined, the midvein slightly impressed above, prominent beneath, the secondary veins 2 or 3 to a side, ascending, plane above, slightly raised beneath, the veinlets obscurely reticulate; inflorescence axillary, racemose, glabrous in all parts, 10 to 20 flowered; rachis subrugose, 2 to 3 cm. long; pedicels rugose, slender, 8 to 12 mm. long, each subtended by an oblong bractlet about 2 mm. long, bibracteolate near base, swollen distally; calyx limb short-cylindrical or campanulate, about 2 mm. long and 2.5 mm. in diameter at anthesis; limb coriaceous, about 2 mm. long including lobes, the lobes short-triangular, less than 1 mm. long; corolla carnose, rigidly cylindrical, somewhat rugose, about 12 mm. long and 3 mm. in diameter, the lobes up to 1.5 mm. long; stamens about 10 mm. long; filaments dark castaneous, distinct, glabrous or very sparsely pilose distally, 2 mm. long, leading into long slender connectives; anther sacs nearly smooth, 4 to 5 mm. long; tubules erect, flexible, about as wide as sacs, 4 to 5 mm. long, opening by oval clefts about half as long; stigma peltate.

TYPE LOCALITY: Páramo de Pifiango, Venezuela, altitude 2,600 meters. Type collected by Jahn (no. 424).

DISTRIBUTION: Known only from the type collection.

VENEZUELA: Páramo de Piñango, *Jahn*, 424 (N, type).

Closely allied to *T. formosa*, from which it is clearly separable on the characters mentioned in the key. A local name is "coralito."

11. *Thibaudia formosa* Klotzsch; Schomb. Versuch Fauna & Fl. Br. Guian. 1088. 1848.

Psammisia formosa Klotzsch, *Linnaea* 24:46. 1851.

Chupalon formosum Kuntze, *Rev. Gen. Pl.* 2:383. 1891.

Shrub with stout subterete glabrous branchlets; leaves sessile or with short stout winged petioles; leaf blades ovate, 7 to 12 cm. long, 3 to 4.5 cm. broad, subacute at apex, attenuate or cuneate at base, entire and slightly revolute at margins, thick-coriaceous, often white-punctate on both surfaces, the lower surface also with less frequent short-stalked glandular hairs, pinnate-veined, the secondary veins arcuate, about 3 to a side, oriented from midvein near its base, raised or nearly plane on both surfaces, the veinlets reticulate, slightly raised above, plane beneath; flowers about 7 to an inflorescence, in axillary racemes; rachis 4 to 10 mm. long; pedicels subterete, 12 to 25 mm. long, dilated at summit, slenderest at base, bracteolate on lower part with several broadly ovate sessile acute bractlets about 0.8 mm. long; calyx campanulate, about 5 mm. long and 5 mm. in diameter at summit, the lobes 1 mm. long; corolla fleshy, cylindric, 8 to 10 mm. long, 2.5 to 3 mm. in diameter at base, with broadly triangular lobes about 1 mm. long; stamens 7.5 to 8.5 mm. long; filaments fleshy, nigrescent, about 1.7 mm. long, sparsely pubescent at their junction with anthers with delicate pale hairs not more than 1 mm. long, coherent at base; anther sacs finely granular, 3 to 4 mm. long; tubules membranous, 3.5 to 4.5 mm. long, with clefts more than half as long; style 9 to 10 mm. long, the stigma flattened, 1 mm. in diameter.

TYPE LOCALITY: Slopes of Mount Roraima, British Guiana. Type collected by Schomburgk (no. 1040).

DISTRIBUTION: Pacaraima Mountains, altitude 1,000 to 1,500 meters.

BRITISH GUIANA: Slopes of Mount Roraima, *Schomburgk* 1040 (B, type).

VENEZUELA.

AMAZONAS: Mount Duida, *Tate* 729 (N, Y), 903 (N, Y).

The name *T. formosa* was originally published without description; three years later Klotzsch described the plant under the generic name *Psammisia*. It is a beautiful sclerophyllous species which should find its way into cultivation, and is to be looked for throughout the mountains between the two extreme localities cited above.

12. *Thibaudia roraimae* Mansf. *Notizbl. Bot. Gart. Berlin* 9:437. 1925.

Low shrub; branchlets subterete, glabrous, brownish; petioles rugose, 5 to 10 mm. long, glabrous, narrowly winged; leaf blades thick-coriaceous, broadly ovate or ovate-oblong, 8 to 14 cm. long, 4.5 to 11 cm. broad, cuneate at base, acute at apex, entire and revolute at margins, essentially glabrous, pinnate-veined, the secondary veins 2 or 3 to a side, arcuate-ascending, with the midvein impressed above, prominent beneath, the veinlets reticulate, plane on both surfaces; inflorescence subfasciculate or short-racemose (rachis not more than 1 cm. long), glabrous in all parts, 6 to 10 flowered; pedicels rugose, 12 to 15 mm. long, each subtended by a subcoriaceous oblong bractlet about 2 mm. long, bibracteolate near base, swollen distally; calyx rugose, short-cylindric or broadly campanulate, the tube about 3 mm. long and 5 mm. in diameter, the limb suberect, coriaceous, about 3 mm. long including lobes, the lobes 5 (rarely 6 or 7), acute, about 1 mm. long, membranous-margined at apex, the sinuses rounded; corolla carnose, rigidly cylindric, 7 to 11 mm. long, 3 mm. in diameter;

stamens 7 to 9 mm. long; filaments dark castaneous, distinct, about 2.5 mm. long, pilose dorsally and marginally towards apex with pale hairs up to 0.2 mm. long; anther sacs nearly smooth, 2.5 to 3 mm. long; tubules wide, flexible, 4 to 5 mm. long; stigma peltate.

TYPE LOCALITY: Mount Roraima, British Guiana, altitude 2,100 meters. Type collected by Ule (no. 8715).

DISTRIBUTION: Known only from the type locality.

BRITISH GUIANA: Mount Roraima, Ule 8715 (B, type, Go, K); *in Thurn* 49, in part (K, N).

This species and the two preceding are doubtless closely related, but they are easily distinguished from one another on the character of leaf shape.

13. *Thibaudia apophysata* Hoer. Bot. Jahrb. Engler 42:314. 1909.

Shrub about 2 meters high; branchlets subterete, slender, castaneous, glabrous; petioles rugose, 1 to 3 mm. long, narrowly winged, glabrous; leaf blades thick-coriaceous, oblong, 6 to 7 cm. long, 1.5 to 2.5 cm. broad, attenuate at base, subacute at apex, slightly revolute and shallowly crenate at margins, glabrous, pinnate-veined, the secondary veins usually 3 to a side, with the midvein slightly impressed above, raised beneath, the veinlets obscure; inflorescence short-racemose, glabrous in all parts, 6 to 10 flowered; rachis and pedicels rugose, violaceous, the rachis about 2 cm. long, the pedicels 18 to 26 mm. long, each subtended by a minute deciduous bractlet, bibracteolate near base (bractlets ovate, acute, about 2 mm. long), swollen distally and obscurely articulate with calyx; calyx rigidly coriaceous, rugose, the tube strongly apophysate, about 1.5 mm. long and 5 to 6 mm. in diameter at anthesis, the limb about 2 mm. long including lobes, the lobes broadly deltoid, about 1 mm. long and 4 mm. across, the sinuses flattened; corolla rigidly coriaceous, short-cylindric, 7 to 9 mm. long and about 4 mm. in diameter; filaments nigrescent or castaneous, coherent at base, free distally, about 2 mm. long, sparsely pilose at margins distally, leading into strong nigrescent connectives; anther sacs slightly granular, about 3 mm. long; tubules flexible, about 2.5 mm. long, opening by large oval clefts; style stout, the stigma truncate.

TYPE LOCALITY: Huacapistana, Department of Junín, Peru, altitude 2,600 to 3,000 meters. Type collected by Weberbauer (no. 2071).

DISTRIBUTION: Known only from the type collection.

PERU.

JUNÍN: Huacapistana, *Weberbauer* 2071 (B, type).

The present species apparently has no close relatives, being quite unrelated to the preceding group from the Pacaraima Mountains, with which it is artificially keyed. In many respects (aspect of foliage, inflorescence, and external appearance of flowers) it is suggestive of such species of *Psammisia* as *P. lehmannii*.

14. *Thibaudia cupatensis* Huber, Bol. Mus. Goeldi 7:304. 1913.

Scandent epiphytic shrub; branches and branchlets subterete, cinereous, glabrous; petioles shallowly grooved above, stout (about 2.5 mm. in diameter), 5 to 7 mm. long, glabrous; leaf blades coriaceous, oblong-ovate, 7 to 10 cm. long, 4 to 5 cm. broad, rounded or subcuneate at base, obtuse at apex, shallowly crenate at margins, glabrous, pinnate-veined, the midvein slightly impressed above, prominent beneath, the secondary veins arcuate-ascending, about 4 to a side, plane above, slightly raised beneath, the veinlets copiously reticulate, plane; inflorescence subfasciculate or short-racemose, 8 to 12 flowered; rachis stout, 3 to 5 mm. long, glabrous; pedicels flexuose, 5 to 7 mm. long, each subtended by a coriaceous ovate bractlet 1.5 mm. long, bibracteolate at

middle; calyx tube short-cylindric or subspherical, 2 mm. long and 2.5 mm. in diameter at anthesis, faintly and deciduously puberulent; limb about 1.5 mm. long including lobes, the lobes apiculate, 0.5 mm. long and 2 mm. across base; corolla minutely puberulous, cylindric, 10 to 12 mm. long, about 4 mm. in diameter, the lobes acute, 1 mm. long; stamens about 9 mm. long; filaments free, stout, about 2.5 mm. long, narrowed above, marginally pubescent above with stiff brown hairs, the connectives slender, alternately equipped with very minute vestigial spurs (as *Psammisia*); anther sacs smooth, about 3 mm. long; tubules erect, wide, flexible, about 5 mm. long, opening by introrse clefts about half their length.

TYPE LOCALITY: Cupati, Río Caquetá, Intendencia of Caquetá, Colombia. Type collected by Ducke (no. 12275).

DISTRIBUTION: Known only from the type collection.

COLOMBIA.

CAQUETÁ: Cupati, Río Caquetá, *Ducke* 12275 (N, type collection).

This is the only species of *Thibaudia* known to me which bears psammisioid spurs on the connectives. In all other respects it is a true *Thibaudia* and is certainly best left in this genus.

15. *Thibaudia glandulifera* A. C. Smith, Bull. Torrey Club 58: 439. 1931.

Straggling shrub about 1 meter high; branchlets grayish, glabrous or sparsely pubescent with deciduously glandular hairs; leaf blades thick-coriaceous, ovate, 2 to 3.5 cm. long, 12 to 18 mm. broad, glabrous or sparsely white-punctate or sparsely pubescent on both surfaces with minute black hairs, subacute at apex, entire or bluntly serrate at margins, rounded or cuneate at base to a thick petiole 2 to 3 mm. long, pinnate-veined, the midvein impressed above, raised beneath, the secondary veins about 3 to a side, arcuate, obscure or faintly raised on both surfaces, the veinlets reticulate, obscure or plane; flowers fasciculate in groups of about 5, the fascicles axillary near ends of branchlets; pedicels slender, striate, 10 to 13 mm. long, pubescent with close minute short pale hairs (0.1 mm. long) and also with scattered erect ferruginous glandular hairs (0.9 to 1.5 mm. long), with a few triangular acute sessile bractlets near base; calyx campanulate, pubescent with glandular hairs, about 4 mm. long and 4 mm. in diameter at summit; corolla cylindric, somewhat carnose, glabrous, 12 to 13 mm. long, 2 to 3 mm. in diameter at base; stamens 9 to 10 mm. long; filaments 3.5 to 5 mm. long, sparsely pilose distally, loosely connate at base; anther sacs granular, about 1.5 mm. long; tubules membranous, about 4.7 mm. long; style about 10 mm. long, the stigma hemispherical; fruit subspherical, 6 mm. or more in diameter, retaining pubescence of calyx.

TYPE LOCALITY: Summit of Mount Duida, State of Amazonas, Venezuela, altitude about 1,925 meters. Type collected by G. H. H. Tate (no. 409).

DISTRIBUTION: Known only from Mount Duida, altitude 1,700 to 2,000 meters.

VENEZUELA.

AMAZONAS: Summit of Mount Duida, *Tate* 409 (Y, type), 457 (Y).

This species and the three following are all closely allied, but are separable on the characters mentioned in the key. They form a group which must have been long isolated from the Andean species. Doubtless other species of this affinity await collection in the Pacaraima Mountains. The present species is well marked from the other three by the glandular hairs of its pedicels and calyces. Possibly two other specimens from Mount Duida (*Tate* 754 and 755) should be included here, but they have larger leaves of a slightly different

texture. Since they are in fruit, it can not be said whether they are really distinct from this species.

16. *Thibaudia involucrata* A. C. Smith, Bull. Torrey Club 58: 440. 1931.

Low shrub; branchlets subterete, glabrous; petioles stout, about 5 mm. long, winged nearly to base; leaf blades thick-coriaceous, broadly ovate, 3.5 to 7 cm. long, 2 to 4 cm. broad, obtuse or subacute at apex, cuneate at base, entire or shallowly serrate at margins, slightly revolute, sparsely black-punctate on both surfaces, pinnate-veined, the midvein impressed above, prominent beneath, the secondary veins 3 to 5 to a side, arcuate or spreading, plane above, raised beneath, the veinlets reticulate, obscure above, raised beneath; flowers in axillary fascicles, 3 to 5 to an inflorescence, each fascicle circumscribed by a few subcoriaceous, triangular, obtuse, faintly ciliate bracts about 1 mm. long; pedicels, involucre, calyces, and corollas finely puberulent with minute pale hairs; pedicels subterete, stout, 3 to 5 mm. long, surmounted by persistent involucre of 2 coriaceous keeled acute fused bracts 1 to 2 mm. long; calyx tube subcylindric, about 2 mm. long, the limb about 1.5 mm. long, the lobes about 1 mm. long; corolla fleshy, cylindric, 7 to 8 mm. long, about 2.5 mm. in diameter at base; stamens 5 to 6 mm. long; filaments about 2.5 mm. long, sparsely pilose distally, loosely connate at base; anther sacs finely granular, about 1.2 mm. long; tubules membranous, about 3 mm. long, opening by introrse clefts; stigma flattened; fruit spherical, 3 to 4 mm. in diameter, coriaceous, the calyx persistent.

TYPE LOCALITY: Summit of Mount Duida, State of Amazonas, Venezuela, altitude 1,850 meters. Type collected by G. H. H. Tate (no. 525).

DISTRIBUTION: Known only from Mount Duida, altitude 1,850 to 1,900 meters.

VENEZUELA.

AMAZONAS: Summit of Mount Duida, *Tate* 525 (Y, type), 694 (N, Y).

Closely allied to the following, but unique in its two fused bractlets surmounting the pedicel.

17. *Thibaudia nutans* Klotzsch; Schomb. Versuch Fauna & Fl. Br. Guian. 1088. 1848, nomen; Mansf. Notizbl. Bot. Gart. Berlin 9: 438. 1925.

Ceratostema nutans Niedenzu, Bot. Jahrb. Engler 11: 224. 1889, nomen.

Psammisia coriacea N. E. Brown, Trans. Linn. Soc. Bot. II. 6: 42. 1901. Not

Thibaudia coriacea Blume, 1825-26.

Ceratostema ulei Mansf. Notizbl. Bot. Gart. Berlin 9: 438. 1925.

Low shrub; branchlets subterete, glabrous, cinereous; petioles rugose, 3 to 8 mm. long, glabrous, angled above; leaf blades thick-coriaceous, ovate, 3 to 10 cm. long, 2.5 to 6 cm. broad, cuneate or rounded at base, rounded or subacute at apex, entire at margins, glabrous, olivaceous or brownish, pinnate-veined, the midvein slightly impressed above, raised beneath, the secondary veins close, 3 to 5 to a side, nearly plane on both surfaces, the veinlets reticulate, obscure above, plane or slightly raised beneath; inflorescence axillary, subfasciculate, glabrous in all parts, 2 to 6 flowered; pedicels rugose, 5 to 15 mm. long, each subtended by an ovate bract 1 to 2 mm. long, bibracteolate near middle, slightly swollen distally; calyx rugose, the tube campanulate, 1.5 to 3 mm. long, 2 to 3 mm. in diameter at anthesis, the limb suberect, 1.5 to 3 mm. long including lobes, the lobes 4 to 6, often in a state of semi-fusion, acute, about 1.5 mm. long; corolla cylindric, glabrous or sparsely farinose, 8 to 14 mm. long, 3 to 5 mm. in diameter, the lobes 5 or 6, 1.5 to 2 mm. long; stamens 10 or 12, equal, 6 to 10 mm. long; filaments dark castaneous, distinct, slender, glabrous or very sparsely pilose distally, 3 to 5 mm. long; anther sacs smooth, 2 to 2.5 mm. long; tubules wide, flexible,

distinct to base, 3 to 4 mm. long, opening by elongate clefts about half their length; style striate, the stigma peltate.

TYPE LOCALITY: Mount Roraima, British Guiana, altitude 1,600 meters. Type collected by Schomburgk (no. 873).

DISTRIBUTION: Highlands of western British Guiana, and westward along the Brazilian-Venezuelan Boundary, altitude 800 to 1,800 meters.

BRITISH GUIANA: *Schomburgk* (K). Kaieteur Savanna, *Jenman* 1031 (K); *in Thurn* (K). Mount Roraima and vicinity, *Schomburgk* 566 (K), 873 (B, type), 567/873 (K), 924 (B); *in Thurn* 56 (K, N); *Ule* br. 40 (B, type of *Ceratostema ulei*), 8719 (B, Go); *Tate* 284 (Y), 402 (Y); *McConnell & Quelch* 662 (K, type of *Psammisia coriacea*).

BRAZILIAN-VENEZUELAN BOUNDARY: Western foothills of Serra Imeri, near Salto de Huá, *Holt & Blake* 499 (N, Y).

Among the above-cited specimens there is a good deal of variation in leaf size, the smallest leaves being found in the *Ule* specimens. However, there is no justification for recognizing more than one species among the specimens I have seen.

This species was not actually described by Klotzsch, the first complete description being by Mansfeld, who failed to note its identity with the *Ule* collection.

18. *Thibaudia truncata* A. C. Smith, Bull. Torrey Club 58: 440. 1931.

Low shrub; branchlets terete, glabrous; petioles about 4 mm. long, stout; leaf blades thick-coriaceous, ovate, 3 to 4.5 cm. long, 2 to 3 cm. broad, glabrous, sometimes sparsely punctate on both surfaces, subacute at apex, rounded at base, entire and plane at margins, decurrent on petiole, pinnate-veined, the midvein impressed above, raised beneath, the secondary veins 3 or 4 to a side, spreading, obscure above, plane or slightly raised beneath, the veinlets reticulate, obscure; flowers axillary, apparently solitary, finely puberulent on all exterior surfaces with minute pale hairs; pedicels striate, slender, 9 to 10 mm. long, with 2 or 3 triangular acute sessile bractlets on the lower half; calyx campanulate, slightly constricted at summit of tube, about 3 mm. long, 4 mm. in diameter at summit, with 5 minute apiculate teeth; corolla somewhat fleshy, cylindrical, 10 mm. long, 2 to 3 mm. in diameter at middle; stamens about 9 mm. long; filaments about 3.5 mm. long, faintly pilose distally, loosely connate at base; anther sacs finely granular, about 2 mm. long, the tubules membranous, about 4 mm. long; stigma peltate.

TYPE LOCALITY: Summit of Mount Duida, State of Amazonas, Venezuela, altitude about 2,200 meters. Type collected by G. H. H. Tate (no. 602).

DISTRIBUTION: Known only from the type collection.

VENEZUELA.

AMAZONAS: Summit of Mount Duida, *Tate* 602 (Y, type).

This species is distinct from the preceding on the basis of its truncate calyx limb and pale puberulous flowers.

19. *Thibaudia laxa* A. C. Smith, sp. nov.

Frutex gracilis; ramis ramulisque laxis glabrescentibus; laminis ovato-oblongis basi subcordatis vel rotundatis apice longe acuminatis 3-nerviis; inflorescentia laxe racemosa molliter pilosa; calyce prismatico 5-angulato; corolla cylindrico-urceolata; staminibus aequalibus, filamentis distinctis superne pilosis, tubulis flexilibus quam loculis longioribus.

Shrub about 3 meters high with lax branches; branchlets subterete, glabrous or sparsely puberulous; petioles about 2 mm. long, essentially glabrous; leaf blades subcoriaceous, ovate-oblong, 4 to 6 cm. long, 1.5 to 2.5 cm. broad, subcordate

or rounded at base, long-acuminate at apex, entire at margins, essentially glabrous (sparsely hispid on midnerve beneath), 3-ply-nerved, the second and third nerves extending about halfway to apex, the midnerve impressed above, prominent beneath, with several secondary nerves; inflorescence racemose; rachis slender, subterete, 1.5 to 2 cm. long, soft-pilose (hairs pale, spreading, about 0.15 mm. long), circumscribed at base by numerous ovate bractlets up to 2 mm. long; pedicels slender (about 0.3 mm. in diameter), 14 to 20 mm. long, striate, pilose as the rachis, each subtended by a lanceolate subpilose bractlet about 2 mm. long and bibracteolate towards base; calyx prismatic, 5-angled (angles opposite the sinuses), pilose as the pedicels, the tube 3 mm. long and 4 mm. in diameter, the limb spreading, about 2 mm. long including lobes, the lobes triangular, acute, 1.5 mm. long, 2 mm. across base; corolla rose-red, sericeous (hairs pale, about 0.2 mm. long), cylindrical-urceolate, 6 to 8 mm. long, 3 to 4 mm. in diameter near base, the lobes triangular, about 1 mm. long; stamens equal, 5 to 6.5 mm. long; filaments free, about 2 mm. long, stiff-pilose above (hairs about 0.3 mm. long), attached to the anther dorsally near its base; anther sacs smooth, 2 to 2.5 mm. long; tubules erect, wide, flexible, 3 to 3.5 mm. long, opening by distal introrse elongate pores up to 2 mm. long; style about 0.2 mm. in diameter, the stigma peltate.

Type in the herbarium of the Field Museum of Natural History, no. 562,442, collected at Putis, Cholmacota Valley, Department of Ayacucho, Peru, altitude 3,200 meters, February 27 to March 12, 1926, by A. Weberbauer (no. 7532).

DISTRIBUTION: Peru, probably limited to the southern part.

PEBU(?): Cuitoc, about 3,000 meters, *Pearce* (K).

This is an isolated species, in habit suggesting *Themistoclesia*, but on the basis of its flower structure it is best placed in *Thibaudia*. Its distinguishing features are the slender lax branchlets with truncate-based leaves, the short racemose flowers, and the slender elongate pedicels.

20. *Thibaudia costaricensis* Hoer. Bot. Jahrb. Engler 42: 311. 1909.

Psammisia rhododelphis K. Schum.; Wercklé, Bol. Fomento Costa Rica 1: 934. 1911, nomen.

Low shrub with elongate branches, usually epiphytic; branchlets terete, cinereous, glabrous; petioles subterete, slightly rugose, 3 to 5 mm. long, winged above, glabrous; leaf blades chartaceous or thin-coriaceous, oblong or lanceolate-oblong, 12 to 20 cm. long, 3.5 to 5 cm. broad, cuneate at base, caudate-acuminate at apex, entire and slightly revolute at margins, glabrous, 5-ply-nerved, the secondary nerves oriented near base, with the midnerve impressed above, prominent beneath, the veinlets reticulate, slightly raised on both surfaces; inflorescence axillary, copious, racemose, 15 to 30 flowered; rachis slender, 2 to 5 cm. long, frequently with a few secondary branches nearly as long, laxly and sparsely puberulous or glabrous; pedicels subterete, 10 to 16 mm. long, dull red, glabrous or puberulous as the rachis, each subtended by a minute deciduous bractlet, deciduously bibracteolate near base, swollen distally; calyx rugose, sparsely puberulous or glabrous, the tube campanulate, about 2 mm. long and 2.5 mm. in diameter at anthesis, the limb 1 to 2 mm. long including lobes, the lobes acute, 0.5 to 1 mm. long, sometimes cartilaginous; corolla 9 to 10 mm. long, cylindrical, 3 to 3.5 mm. in diameter, slightly contracted at throat, the lobes about 1 mm. long; stamens about 7 mm. long, equal or subequal; filaments castaneous, membranous, firmly connate in a tube, glabrous, 3 mm. long, leading into slender connectives; anther sacs smooth, 2 mm. long; tubules wide, flexible, distinct to base, about 3 mm. long, opening by oval clefts about half their length; stigma broadly peltate.

TYPE LOCALITY: La Palma, Province of San José, Costa Rica, altitude 1,500 meters. Type collected by Wercklé (no. 20).

DISTRIBUTION: Mountains of Costa Rica, altitude 1,400 to 1,600 meters.

COSTA RICA: *Wercklé* (?) 3 (B).

SAN JOSÉ: La Palma, *Wercklé* 20 (B, type), 52 (B); *Standley* 33002 (N), 38053 (N), 38072 (N).

CARTAGO: El Muñeco, on Río Navarro, *Standley & Torres* 51292 (N), 51376 (N).

This species, with the three following, forms a very distinct group. It is the only *Thibaudia* found in Central America; with its large leaves and beautiful paniculate inflorescence it would be an excellent plant for cultivation.

21. *Thibaudia paniculata* A. C. Smith, sp. nov.

Frutex vel arbor parva; laminis subbullatis ovato-oblongis basi rotundatis apice abrupte caudato-acuminatis 5 ad 7 pli-nerviis; inflorescentia paniculata multiflora glabra; calyce campanulato rugoso 5-lobato; corolla cylindrica; staminibus subaequalibus, filamentis connatis glabris, tubulis flexilibus loculos subaequantibus.

Shrub or small tree; branchlets terete, slender, glabrous, stramineous, somewhat flexuose; petioles subterete, rugose, 5 to 7 mm. long, glabrous; leaf blades thin-coriaceous, somewhat bullate, ovate-oblong, 11 to 15 cm. long, 5 to 8 cm. broad, rounded at base, abruptly caudate-acuminate at apex (acumen about 1.5 cm. long), entire and narrowly revolute at margins, glabrous, 5 to 7 nerved from the base, the principal nerves impressed above, strongly prominent beneath, the veinlets reticulate, slightly raised above, prominent beneath; inflorescence axillary, paniculate, many-flowered, essentially glabrous in all parts; primary rachis 3 to 4 cm. long, subterete, rugose; secondary branches of the inflorescence about 15, spreading, 2 to 4 cm. long, each subtended by an ovate fimbriate bract about 3 mm. long; pedicels subterete, rugose, flexuose, 10 to 13 mm. long, each bracteate at base and bibracteolate slightly below middle, obscurely articulate with calyx; calyx tube campanulate, rugose, 1 to 1.5 mm. long, 2.5 to 3 mm. in diameter at anthesis; limb 2 to 2.5 mm. long including lobes, the lobes acute, about 1 mm. long and 2 mm. broad, the sinuses rounded; corolla subcarnose, cylindric, 13 to 16 mm. long, 3 to 4 mm. in diameter, the lobes small, triangular; stamens about 10.5 mm. long, alternately slightly unequal; filaments submembranous, castaneous, firmly connate in a tube, glabrous, about 3.5 mm. long, leading into slender connectives; anther sacs slightly granular, about 4 mm. long; tubules wide, flexible, about 4 mm. long, opening by large oval clefts nearly as long; style flexuose, the stigma broadly peltate, 1 mm. in diameter.

Type in the herbarium of the Royal Botanic Gardens, Kew, collected at Timbiquí, Department of El Cauca, Colombia, in 1903, by F. C. Lehmann (no. K176).

DISTRIBUTION: Known only from the type collection.

A handsome plant, related to the preceding, but separable on leaf characters and flower size. The leaves are abruptly caudate-acuminate and noticeably bullate, and the flowers are larger than those of *T. costaricensis*.

22. *Thibaudia archeri* A. C. Smith, sp. nov.

Frutex subscandens; ramis ramulisque glabris fuscis; laminis oblongis basi cuneatis apice subacutis vel breviter acuminatis 7-phi-nerviis; inflorescentia paniculata robusta multiflora subglabra; calyce campanulato 5-lobato; corolla tenuiter carnosae cylindricae; staminibus aequalibus, filamentis connatis glabris, tubulis membranaceis quam loculis paullo brevioribus.

Subscandent shrub about 5 meters high; branches and branchlets terete, stiff, stout, glabrous, brownish; petioles stout, rugose, glabrous, 8 to 13 mm. long; leaf blades coriaceous, olivaceous, glabrous, oblong, 18 to 22 cm. long, 5 to 6.5 cm. broad, cuneate at base, subacute or bluntly short-acuminate at apex, entire at margins, 7-plexi-nerved, the principal nerves oriented near base, plane or slightly raised above, prominent beneath, the veinlets reticulate, obscure; inflorescence from older parts of branchlets, paniculate, many-flowered, minutely and sparsely strigose on external surfaces when young, becoming essentially glabrous; primary rachis slightly angled, stout, 2 to 4 cm. long; secondary branches of inflorescence about 12, widely spreading, 2 to 6 cm. long, each subtended by an ovate submembranous bract about 2 mm. long; pedicels striate, 9 to 16 mm. long, swollen distally, each subtended by a small bract and minutely bibracteolate at middle, articulate with calyx; calyx tube campanulate, about 1.5 mm. long and 3 mm. in diameter at anthesis; limb about 2 mm. long including lobes, the lobes triangular, about 1 mm. long, the sinuses rounded; corolla thin-carnose, 12 to 17 mm. long at maturity, 3 to 4 mm. in diameter, the lobes small, triangular, obtuse; stamens equal, 10 to 11 mm. long; filaments membranous, pale, glabrous, firmly connate in a tube and adherent to corolla at base, 5 to 6 mm. long; anther sacs narrowed at base, 4 mm. long; tubules membranous, flexible, 2.5 to 3 mm. long; stigma broadly peltate.

Type in the U. S. National Herbarium, no. 1,499,338, collected at La Concepción, Department of El Chocó, Colombia, April 30, 1931, by W. A. Archer (no. 2013).

DISTRIBUTION: Known only from the type collection.

In floral characters this species is practically identical with *T. paniculata*, from which it differs by having the leaves narrower in proportion, cuneate rather than rounded at base, and decidedly not bullate. In common with *T. paniculata*, the present species has flowers larger than those of *T. costariensis*, from which it is distinguished also by its larger leaves and more robust inflorescence. The three species are very closely allied.

EXPLANATION OF PLATE 12.—*Thibaudia archeri*, from photograph of type sheet. One-half natural size.

23. *Thibaudia pennellii* A. C. Smith, sp. nov.

Frutex; laminis oblongis vel ovato-oblongis basi cuneatis apice acutis subtus parce pilosis glabrescentibus 5 ad 7 pli-nerviis; inflorescentia racemosa constanter ubique pubescente; calyce campanulato 5-lobato; corolla tenuiter carnosae subcylindricae; filamentis connatis dense pilosis, tubulis loculos subaequantibus.

Shrub; branchlets subterete, stout, puberulous or glabrous, cinereous; petioles subrugose, 6 to 11 mm. long, slightly puberulous or glabrous; leaf blades thick-coriaceous, oblong or ovate-oblong, 14 to 17 cm. long, 4.5 to 5.5 cm. broad, cuneate at base, acute at apex, entire and slightly revolute at margins, glabrous above, sparsely pilose beneath, with minute appressed hairs about 3 per square millimeter of surface, becoming glabrous, 5 to 7 pli-nerved, the secondary nerves oriented near base or slightly above, with midnerve nearly plane above, prominent beneath, the veinlets reticulate, plane or slightly raised on both surfaces; inflorescence axillary, racemose, 10 to 15 flowered; rachis angled, 1.5 to 4 cm. long, regularly and persistently pubescent with pale spreading hairs up to 0.3 mm. long, circumscribed at base by numerous imbricate coriaceous oblong acute bracts up to 10 mm. long; pedicels striate, 6 to 10 mm. long, pubescent as the rachis, each subtended by a minute bractlet and minutely bibracteolate at middle, slightly swollen distally; calyx tube subcylindric or campanulate, 2.5 mm. long and 2.5 mm. in diameter at anthesis, sparsely pilose

with pale hairs about 0.2 mm. long; limb 1.5 to 2 mm. long including lobes, the lobes apiculate, about 1 mm. long; corolla subcylindric, thin-carnose, about 18 mm. long, 2.5 mm. in diameter, sparsely pilose with pale yellow hairs up to 0.3 mm. long, the lobes triangular, about 1 mm. long; stamens 8 to 9 mm. long; filaments castaneous, submembranous, firmly connate in a tube 2 mm. long, densely pilose distally dorsally with pale brown ascending hairs 0.3 mm. long; anther sacs nearly smooth, about 4 mm. long, narrowed and setose at base; tubules wide, flexible, 3 to 4 mm. long, opening by oval clefts nearly as long; stigma truncate.

Type in the herbarium of the New York Botanical Garden, collected in forest at Murillo, Department of Tolima, Colombia, altitude 2,100 to 2,500 meters, December 18, 1917, by F. W. Pennell (no. 3179). Duplicate in the U. S. National Herbarium.

DISTRIBUTION: Known only from the type collection.

This species, which is without close relatives, is sharply distinguished from the two preceding by the uniform pubescence of its flowers.

24. *Thibaudia parvifolia* (Benth.) Hoer. Bot. Jahrb. Engler 42:275. 1909.

Ceratostema parvifolium Benth. Pl. Hartw. 220. 1846.

Eurygania parvifolia Benth. & Hook. Gen. Pl. 2:568. 1876.

Low shrub; branches and branchlets subterete, cinereous or brownish, glabrous or minutely puberulous; petioles subterete, rugose, nigrescent, glabrous, about 2 mm. long; leaf blades oblong, 14 to 18 mm. long, about 5 mm. broad, rounded or broadly cuneate at base, subacute at apex, strongly revolute and crenate at margins, glabrous, rigidly coriaceous, obscurely pinnate-veined, the midvein impressed-sulcate above, raised beneath, the secondary veins 2 or 3 to a side, spreading, usually obscure; inflorescence axillary, near ends of branchlets, fasciculate; flowers 1 or 2 to an inflorescence; pedicels strongly rugose, 5 to 8 mm. long, glabrous, subtended at base by 2 or 3 minute ovate bractlets; calyx coriaceous, rugose, glabrous, the tube cylindric, about 2.5 mm. long, 1.5 to 2 mm. in diameter at anthesis, the limb suberect, 3 to 3.5 mm. long including lobes, the lobes 4 or 5, ovate, apiculate, about 2 mm. long and 2.5 mm. broad; corolla cylindric, subrugose, glabrous or minutely puberulous, 17 to 19 mm. long, 3 to 4 mm. in diameter, the lobes oblong, about 2 mm. long; stamens about 13 mm. long; filaments dark castaneous, about 4 mm. long, firmly connate in a tube, pilose at margins distally with hairs about 0.2 mm. long, continued into slender connectives; anther sacs nearly smooth, about 4.5 mm. long; tubules wide, flexible, about 5.5 mm. long, opening by clefts about half as long; stigma truncate.

TYPE LOCALITY: Near Laguna de Guanacas, Department of El Cauca, Colombia, altitude about 3,700 meters. Type collected by Hartweg (no. 1208).

DISTRIBUTION: Known only from the type collection.

COLOMBIA.

EL CAUCA: Near Laguna de Guanacas, *Hartweg* 1208 (K, type).

A low compact sclerophyllous shrub, distinguishable as suggested in the key.

25. *Thibaudia tomentosa* Hoer. Bot. Jahrb. Engler 42:312. 1909.

Shrub, about 2 meters high; branches and branchlets subterete, covered with a loose, brownish, deciduously pilose bark; petioles subterete, rugose, 2 to 3 mm. long, pale pilose; leaf blades narrowly oblong, 2.5 to 3.5 cm. long, less than 1 cm. broad, attenuate at base, rounded at apex, strongly revolute and crenate at margins, deciduously pilose on both surfaces (hairs pale, up to 0.5 mm. long), pinnate-veined, the midvein impressed-sulcate above, prominent beneath, the secondary veins 2 or 3 to a side, obscure; inflorescence copious

near ends of branchlets, short-racemose, densely tomentose in all parts (hairs pale, matted, about 0.5 mm. long), 6 to 12 flowered; rachis subrugose, about 1 cm. long; pedicels striate, 6 to 10 mm. long, each subtended by an ovate bractlet less than 1 mm. long, deciduously bibracteolate near base; calyx tube campanulate, about 1.5 mm. long and 2 mm. in diameter; limb about 2.5 mm. long including lobes, the lobes 1 to 2 mm. long, about 2.5 mm. broad; corolla subcarnose, cylindric, 12 to 13 mm. long, 3 to 3.5 mm. in diameter, the lobes about 1 mm. long, sparsely short-pilose within; stamens 8.5 to 9 mm. long; filaments castaneous, loosely connate, about 2 mm. long, densely pilose distally with hairs about 0.5 mm. long, continued into slender connectives; anther sacs nearly smooth, about 2.5 mm. long, sparsely pilose at base; tubules flexible, about 5 mm. long, opening by clefts about half as long; stigma truncate.

TYPE LOCALITY: Molinopampa, east of Chachapoyas, Department of Amazonas, Peru, altitude 2,300 to 2,400 meters. Type collected by Weberbauer (no. 4374).

DISTRIBUTION: Known only from the type collection.

PERU.

AMAZONAS: Molinopampa, east of Chachapoyas, *Weberbauer* 4374 (B, type).

The densely tomentose inflorescence of this species is approached only by that of *T. anomala*.

26. *Thibaudia anomala* A. C. Smith, sp. nov.

Frutex compactus; laminis ovato-oblongis basi cuneatis apice subacutis margine subserratis obscure 3-nerviis; inflorescentia subfasciculata basi bracteis magnis deciduis instructa; calyce dense tomentoso, limbo erecto quam tubo duplo longiore 5-lobato, lobis elongato-triangularibus; corolla cylindrica extus tomentosa intus glabra; staminibus aequalibus, filamentis connatis ad margines pilosis, tubulis flexilibus quam loculis duplo brevioribus.

Shrub; branches and branchlets stout, subterete, clothed with a deciduous glabrous nigrescent bark; petioles rugose, narrowly angled, 2 to 3 mm. long, glabrous; leaf blades ovate-oblong, 2.5 to 3.5 cm. long, 1 to 1.5 cm. broad, cuneate or subattenuate at base, acute or subacute at apex, shallowly crenate-serrate at margins, glabrous above, deciduously sparsely pilose beneath with minute brown hairs, obscurely 3-nerved from base, the midnerve slightly impressed above, raised beneath, with 2 or 3 obscure lateral nerves; inflorescence axillary near ends of branchlets, subfasciculate, 3 to 6 flowered, circumscribed at base by several deciduous cavendishoid bracts up to 1 cm. long; pedicels striate, about 1 cm. long, spreading-pilose with pale stiff hairs about 0.7 mm. long, deciduously bibracteolate near base, obscurely articulate with calyx; calyx densely tomentose, especially towards base, with yellowish hairs like those of the pedicel, the tube short-cylindric, 2.5 to 3 mm. long, 2 mm. in diameter at anthesis, the limb erect, thin-coriaceous, 7 mm. long including lobes, the lobes elongate-triangular, acute, about 3 mm. long and 1.5 mm. across; corolla tomentose as the calyx, thin-carnose, cylindric, 10 to 11 mm. long, 2.5 to 3 mm. in diameter, glabrous within, the lobes triangular, about 1 mm. long; stamens about 7 mm. long; filaments castaneous, submembranous, about 2 mm. long, firmly connate in a tube, densely pilose at margins distally with hairs up to 0.4 mm. long, continued into slender connectives; anther sacs nearly smooth, produced at base into a caudate tip, 4 mm. long; tubules flexible, 2 mm. long, opening by clefts about half as long; stigma peltate.

Type in the herbarium of the Royal Botanic Gardens, Kew, collected in Colombia or Ecuador by E. André.

DISTRIBUTION: Doubtful, the type specimen being without definite data.

It is unfortunate that this peculiar little plant is so completely without data. It is not closely allied to any other species of *Thibaudia*, being unique in its long erect calyx limb and its comparatively large bracts. These characters suggest certain species of *Cavendishia*, but in staminal structure our plant is certainly a *Thibaudia*.

27. *Thibaudia phyllireaefolia* Dun.; DC. Prodr. 7:564. 1839.

Eurygania phyllireaefolia Benth. & Hook. Gen. Pl. 2:568. 1876.

Low shrub; branchlets terete, loosely clothed with a cinereous deciduously puberulous bark; petioles subrugose, pilose as the young branchlets, 2 to 3 mm. long; leaf blades narrowly oblong, 3 to 4 cm. long, about 1 cm. broad, narrowly cuneate or attenuate at base, obtuse at apex, crenate-serrate at margins (serrations 4 or 5 per centimeter), essentially glabrous (sometimes on both surfaces pilose with a few lax pale hairs and also with a few stiff brown appressed hairs), pinnate-veined, the midvein slightly impressed above, raised beneath, the secondary veins 2 or 3 to a side, spreading, obscure; inflorescence axillary near ends of branchlets, subfasciculate or short-racemose (rachis not more than 5 mm. long), 4 to 8 flowered; flowers pilose in all parts with spreading yellowish hairs about 0.5 mm. long; pedicels rugose, 5 to 8 mm. long, circumscribed at base by a few ovate bracts 2 to 3 mm. long, bibracteolate near base, obscurely articulate with calyx; calyx tube rugose, campanulate, 2 to 2.5 mm. long, 2.5 to 3 mm. in diameter at anthesis; limb 2.5 to 3 mm. long including lobes, the lobes ovate, apiculate, 1 to 1.5 mm. long, 2.5 mm. across; corolla thin-carnose, 15 to 16 mm. long, about 4 mm. in diameter, 5 or 6 lobed, the lobes about 2 mm. long; stamens 9 to 10 mm. long; filaments castaneous, submembranous, about 4 mm. long, firmly connate in a tube, densely pilose at distal margins with hairs up to 0.5 mm. long, continued into slender connectives; anther sacs nearly smooth, about 4 mm. long; tubules flexible, 4 mm. long; stigma peltate.

TYPE LOCALITY: Chachapoyas, Department of Amazonas, Peru. Type not cited.

DISTRIBUTION: Known only from the type locality.

PERU.

AMAZONAS: Chachapoyas, *Mathews* (K), 3041 (K, in part, type collection?).

28. *Thibaudia moricandi* Dun.; DC. Prodr. 7:563. 1839.

Shrub; branchlets subterete, brownish, short-pilose, becoming glabrous; petioles subrugose, essentially glabrous, 2 to 4 mm. long; leaf blades lanceolate-oblong, 4 to 5 cm. long, 1 cm. broad, cuneate at base, acute at apex, crenate-serrate at margins (serrations 3 or 4 per centimeter), glabrous, pinnate-veined, the midvein slightly impressed above, prominent beneath, the secondary veins obscure, 3 or 4 to a side, spreading; inflorescence axillary near ends of branchlets, subfasciculate or short-racemose (rachis not more than 5 mm. long), 3 to 6 flowered; pedicels subterete, 8 to 13 mm. long, spreading-pilose with pale hairs about 0.3 mm. long, circumscribed at base by a few broadly ovate bracts about 1 mm. long, deciduously bibracteolate near base, slightly swollen distally; calyx subrugose, pubescent as the pedicels, the tube short-cylindric, 2 mm. long and 3 mm. in diameter at anthesis, the limb about 3 mm. long including lobes, the lobes 5, often more or less fused, acute, about 1.5 mm. long; corolla subcylindric, 13 to 14 mm. long, about 4 mm. in diameter, glabrous, the lobes about 1.5 mm. long; stamens 10 to 11 mm. long; filaments dark castaneous, 3 to 3.5 mm. long, firmly connate in a tube about 2 mm. long, densely pilose at margins distally with pale hairs 0.5 mm. long, continued into slender

connectives; anther sacs smooth, 4 mm. long, narrowed at base; tubules wide, 5 to 5.5 mm. long, opening by oval clefts nearly half as long; stigma truncate.

TYPE LOCALITY: Peru. Type collected by Mathews.

DISTRIBUTION: Known only from the central Andes of northern Peru.

PERU.

AMAZONAS: Chachapoyas, *Mathews* (K, Y, type collection?), 3041 (K, in part).

This species is allied to the preceding and possibly is not distinct from it, although in the specimens available the presence or absence of corolla pubescence is never in doubt.

29. *Thibaudia obovata* A. C. Smith, sp. nov.

Frutex; laminis oblongo-obovatis basi attenuatis apice subacutis margine subserratis pinnatinerviis; inflorescentia subfasciculata vel breviter racemosa parce pilosa glabrescente; calyce campanulato 5-lobato; corolla carnosae laxae et deciduae pilosae; staminibus aequalibus, filamentis connatis superne pilosis, tubulis flexilibus quam loculis paulo longioribus.

Shrub; branchlets subterete, glabrous; petioles subterete, glabrous, 2 to 3 mm. long; leaf blades coriaceous, oblong-obovate, 2.5 to 3.5 cm. long, 1.2 to 1.5 cm. broad, attenuate at base, obtuse or subacute at apex, shallowly serrate at margins (serrations 3 or 4 per centimeter), glabrous, pinnate-veined, the midvein slightly impressed above, prominent beneath, the secondary veins arcuate, 2 or 3 to a side, plane above, slightly raised beneath, the veinlets copiously reticulate, plane; inflorescence axillary, subfasciculate or short-racemose, 3 to 6 flowered; rachis stout (about 1.5 mm. in diameter), 4 to 7 mm. long, pilose with pale spreading hairs about 0.4 mm. long; pedicels subterete, about 1 mm. in diameter, 9 to 12 mm. long, pilose as the rachis, each subtended by a deciduous ovate acute ciliate bractlet about 3 mm. long, bibracteolate near base; calyx tube subcylindric, 2 mm. long and 2.5 mm. in diameter at anthesis, pilose as the pedicel; limb about 2.5 mm. long including lobes, the lobes 1 mm. long and 3 mm. across base, ciliate; corolla red, carnosae, pubescent (especially distally) with lax pale hairs about 0.5 mm. long, 12 to 15 mm. long, 3 to 4 mm. in diameter, the lobes triangular, about 2 mm. long; stamens about 11 mm. long; filaments connate in a firm ring, about 2.5 mm. long, glabrous below, densely pubescent at junction with anthers with brown hairs 0.2 mm. long; anther sacs slightly granular, 4 to 4.5 mm. long; tubules wide, flexible, 5.5 to 6 mm. long; stigma truncate.

Type in the Botanisches Museum, Berlin, collected between Tumbilla and San Carlos, Department of Amazonas, Peru, altitude 2,900 to 3,000 meters, June 26, 1915, by A. Weberbauer (no. 7154). Duplicate at F.

DISTRIBUTION: Known only from the type collection.

Somewhat intermediate between the preceding and the following species. In this whole group more material is needed before the relationships and limitations of the species can be definitely settled. The present plant is characterized by its obovate-oblong leaves, pilose calyces and pedicels, and corollas tomentose at the throat.

30. *Thibaudia angustifolia* Hook. *Icon. Pl.* 2: pl. 110. 1837.

Eurygania angustifolia Klotzsch, *Linnaea* 24:26. 1851.

Thibaudia weberbaueri Hoer. *Bot. Jahrb. Engler* 42:313. 1909.

Low shrub; branches and branchlets subrugose, cinereous or brownish, glabrous; petioles rugose, glabrous, 2 to 3 mm. long; leaf blades narrowly oblong, 3.5 to 5.5 cm. long, 1.2 to 2 cm. broad, cuneate or attenuate at base, subacute at apex, serrate at margins (serrations 4 or 5 per centimeter), glabrous, pinnate-veined, the midvein slightly impressed above, raised beneath, the sec-

ondary veins about 3 to a side, spreading, nearly plane, often obscure; inflorescence axillary near ends of branchlets, subfasciculate or short-racemose (rachis rarely 1 cm. long), 3 to 8 flowered, essentially glabrous in all parts; pedicels rugose, 5 to 10 mm. long, bracteate at base and bibracteolate near base with oblong sparsely fimbriate bractlets about 2 mm. long; calyx tube rugose, subcampanulate, about 2.5 mm. long and 3 mm. in diameter at anthesis; limb about 3 mm. long including lobes, the lobes ovate, apiculate, about 1.5 mm. long and 2.5 mm. broad; corolla subcylindric, subrugose, 13 to 16 mm. long, about 4 mm. in diameter, the lobes about 1.5 mm. long; stamens about 11 mm. long; filaments dark castaneous, 2.5 mm. long, firmly connate in a tube, densely pilose distally with hairs up to 0.7 mm. long, continued into slender connectives; anther sacs smooth, 4.5 mm. long, continuing into wide flexible tubules about as long; stigma truncate.

TYPE LOCALITY: Bagasán, near Chachapoyas, Department of Amazonas, Peru. Type collected by Mathews (no. 1443).

DISTRIBUTION: Central Andes of northern Peru, altitude 2,000 to 2,500 meters.

PERU.

AMAZONAS: Bagasán, near Chachapoyas, *Mathews* 1443 (K, type). Molino-pampa, east of Chachapoyas, *Weberbauer* 4339 (B, type of *T. weberbaueri*).

31. *Thibaudia urbaniana* Hoer. Bot. Jahrb. Engler 42: 315. 1909.

Shrub about 2 meters high; branches and branchlets terete, subrugose, violaceous; petioles rugose, glabrous, 4 to 6 mm. long; leaf blades ovate, 6 to 7 cm. long, 3 to 4 cm. broad, attenuate at base, acute at apex, crenate-serrate at margins (serrations about 3 per centimeter), glabrous, dull green above, brownish beneath, pinnate-veined, the secondary veins about 3 to a side, arcuate-ascending, with the midvein slightly impressed above, raised beneath, the veinlets reticulate, plane, often obscure; inflorescence axillary, subfasciculate or short-racemose (rachis rarely more than 5 mm. long), 4 to 8 flowered, glabrous in all parts; pedicels rugose, 8 to 15 mm. long, bracteate at base and deciduously bibracteolate near base (bractlets oblong, about 1.5 mm. long), swollen distally; calyx coriaceous, subrugose, the tube campanulate, about 1.5 mm. long and 2.5 mm. in diameter at anthesis, the limb 2 to 2.5 mm. long including lobes, the lobes about 1 mm. long; corolla cylindric, rugose, tomentose within distally, about 16 mm. long and 4 mm. in diameter, the lobes oblong, about 2.5 mm. long; stamens 10 mm. long; filaments nigrescent, 2.5 mm. long, firmly connate in a tube, distally pilose; anther sacs nearly smooth, 5.5 mm. long; tubules flexible, about 3 mm. long; stigma truncate.

TYPE LOCALITY: Between Bagasán and Almirante, east of Chachapoyas, Department of Amazonas, Peru, altitude 2,200 to 2,300 meters. Type collected by Weberbauer (no. 4449).

DISTRIBUTION: Known only from the type collection.

PERU.

AMAZONAS: East of Chachapoyas, *Weberbauer* 4449 (B, type).

This species bears a very close superficial resemblance to the following, but has much larger flowers.

32. *Thibaudia harmsiana* Hoer. Bot. Jahrb. Engler 42: 314. 1909.

Low shrub; branches and branchlets terete, brownish, glabrous; petioles rugose, subterete, 2 to 4 mm. long, glabrous; leaf blades ovate or slightly obovate, 6 to 7 cm. long, 3 to 4.5 cm. broad, cuneate at base, acute at apex, crenate-serrate at margins (serrations about 4 per centimeter), glabrous, brownish, pinnate-veined, the secondary veins usually 2 per side, oriented near

base, with the midvein plane above, raised beneath, the veinlets reticulate, slightly raised beneath; inflorescence axillary, short-racemose, 10 to 15 flowered, essentially glabrous; rachis rugose, about 2 cm. long; pedicels striate, 10 to 13 mm. long, deciduously bibracteolate near base (bractlets lanceolate, fimbriate-margined, about 2 mm. long), obscurely articulate with calyx; calyx tube coriaceous, campanulate or subglobose, about 2 mm. long and 2.5 mm. in diameter; limb about 1.5 mm. long, the lobes apiculate, about 2 mm. across; corolla carnose, 7 to 8 mm. long, 2.5 to 3 mm. in diameter, the lobes about 1 mm. long, sparsely pilose within; stamens about 4.5 mm. long; filaments castaneous, 1.5 mm. long, firmly connate in a tube, glabrous; anthers stramineous, about 3.5 mm. long, the tubules wide, about as long as the sacs, opening by wide clefts their entire length, the sacs densely pilose at base; stigma truncate.

TYPE LOCALITY: Monzón, Department of Huánuco, Peru, altitude 2,000 to 2,500 meters. Type collected by Weberbauer (no. 3542).

DISTRIBUTION: Known only from the type collection.

PERU.

HUÁNUCO: Monzón, *Weberbauer* 3542 (B, type).

33. *Thibaudia ovata* (Hook. f.) Hoer. Bot. Jahrb. Engler 42: 275. 1909.

Eurygania ovata Hook. f. Bot. Mag. Curtis 104: pl. 6393. 1878.

Thibaudia graebneriana Hoer. Bot. Jahrb. Engler 42: 313. 1909.

Low shrub about 1 meter high; branchlets subterete, glabrous, or deciduously puberulous, with deciduous cinereous bark; petioles subrugose, 2 to 4 mm. long, glabrous, narrowly winged above; leaf blades coriaceous, ovate, 2 to 5 cm. long, 0.8 to 2 cm. broad, cuneate at base, subacute or obtuse at apex, subentire at margins, glabrous, 5-plexi-nerved, the secondary nerves oriented above base, approaching pinnate-veined, with the midnerve plane or slightly impressed above, raised beneath, the veinlets reticulate, nearly plane on both surfaces; inflorescence axillary, short-racemose, essentially glabrous in all parts, 3 to 8 flowered; rachis subrugose, 3 to 10 mm. long; pedicels striate, 8 to 13 mm. long, each subtended by a lanceolate, acute, sparsely fimbriate bractlet about 3 mm. long, minutely bibracteolate near base; calyx tube subcylindric or campanulate, about 2.5 mm. long and 3 mm. in diameter at anthesis; limb 2 to 3 mm. long including lobes, thin-margined, the lobes apiculate, less than 1 mm. long; corolla cylindric, thin-carnose, 8 to 9 mm. long, about 4 mm. in diameter, densely pubescent within at apex with spreading hairs about 0.3 mm. long, the lobes about 1 mm. long; stamens about 6 mm. long; filaments castaneous, firmly connate in a tube 2 to 3.5 mm. long, glabrous or sparsely pilose distally; anthers yellow, the sacs smooth, 2.5 mm. long, sparsely pubescent at base with pale hairs about 0.3 mm. long; tubules flaring, about 2 mm. long; stigma peltate.

TYPE LOCALITY: Peru. Type collected by Lobb.

DISTRIBUTION: Andes of central Peru, altitude 1,800 to 3,100 meters.

PERU: (?) "Columbia," *Lobb* (K, type).

JUNÍN: West of Palca, *Weberbauer* 2436 (B, type of *T. graebneriana*).

Huacapistana, *Killip & Smith* 24244 (N, Y). Carpapata, *Killip & Smith* 24353 (N, Y).

Concerning the type locality of this species, there is again to be mentioned the confusion surrounding the Lobb collection. The specimen at Kew is labeled "W. Lobb, Columbia, No. 1," but the original description places the type from the "Andes of Peru." The type of *T. graebneriana* has no marked points of difference from the other collections, although its leaves are somewhat smaller, a difference which may be owing to the higher locality altitude.

34. *Thibaudia spathulata* A. C. Smith, sp. nov.

Frutex humilis; laminis crasso-coriaceis obovatis basi attenuatis apice obtusis margine subserratis 3 ad 5 pli-nerviis; inflorescentia subfasciculata glabra; calycis tubo breviter cylindrico, limbo patulo 5-lobato; corolla cylindrica; staminibus aequalibus, filamentis connatis glabris, antheris basi pilosis, tubulis flexilibus quam loculis longioribus.

Low shrub; young branchlets striate, mahogany-brown, glabrous; petioles subterete, stout (about 1.5 mm. in diameter), glabrous, 3 to 5 mm. long; leaf blades thick-coriaceous, obovate, 3.5 to 5 cm. long, 1.5 to 2.2 cm. broad, attenuate at base, obtuse or rounded at apex, shallowly and distantly serrate at margins, glabrous, 3 to 5 pli-nerved, the nerves oriented above base, nearly plane above, slightly raised beneath, the veinlets reticulate, obscure; inflorescence axillary, subfasciculate, several-flowered; rachis very short (3 mm. long or less); pedicels subterete, essentially glabrous, about 0.6 mm. in diameter, swollen above, 6 to 10 mm. long, each subtended by an ovate ciliate bractlet about 2 mm. long, bibracteolate near base; flowers glabrous; calyx tube short-cylindric, about 3.5 mm. long and 2.5 mm. in diameter at anthesis; limb spreading, about 4 mm. long including lobes, the lobes acute, 1.5 mm. long, 4 to 5 mm. across base; corolla scarlet, cylindric (flaring a trifle at apex when mature), 10 to 12 mm. long, about 4 mm. in diameter, the lobes triangular, 2 to 2.5 mm. long; stamens about 8 mm. long; filaments glabrous, nigrescent, connate in a tube, about 2.5 mm. long; anther sacs smooth, pilose at base (with a few pale lax hairs 0.2 to 0.5 mm. long), 2 to 2.5 mm. long; tubules wide, 3.5 to 4 mm. long, opening by gaping introrse clefts their entire length; style stout (0.6 mm. in diameter), the stigma truncate.

Type in the herbarium of the Field Museum of Natural History, no. 562,440, collected at Putis, Choimacota Valley, Department of Ayacucho, Peru, altitude 3,300 meters, February 27 to March 12, 1926, by A. Weberbauer (no. 7530).

DISTRIBUTION: Known only from the type collection.

Well marked by its obovate or subspatulate leaves and thick carnose flowers. The anther sacs are unusually pilose at base.

35. *Thibaudia ovalifolia* A. C. Smith, sp. nov.

Frutex humilis; laminis oblongis vel obovato-oblongis breviter petiolatis basi cuneatis vel attenuatis apice subacutis margine subserratis pinnatinerviis; inflorescentia breviter racemosa glabra; calyce campanulato 5-lobato; corolla tenuiter carnosa cylindrica; staminibus aequalibus, filamentis connatis glabris, tubulis latis quam loculis paullo brevioribus.

Low shrub; branches gnarled, cinereous; branchlets subterete, rugose, brownish, glabrous; petioles rugose, 2 to 3 mm. long, glabrous; leaf blades oblong or obovate-oblong, 5 to 7 cm. long, 2 to 3.5 cm. broad, cuneate or attenuate at base, obtuse or subacute at apex, slightly revolute and crenate-serrate at margins (serrations about 3 per centimeter), glabrous, pinnate-veined, the secondary veins 2 or 3 to a side, oriented near base, ascending, with the midvein slightly impressed above, prominent beneath, the veinlets usually obscure; inflorescence short-racemose, glabrous in all parts, 10 to 20 flowered; rachis rugose, subterete, 1 to 1.5 cm. long; pedicels rugose, 12 to 18 mm. long, deciduously bibracteolate near base (bractlets lanceolate-oblong, acute, about 2.5 mm. long, sometimes glandular-margined), swollen distally; calyx rugose, coriaceous, the tube campanulate, 2 to 2.5 mm. long, 4 mm. in diameter at anthesis, the limb about 3 mm. long, the lobes apiculate, minute, 2.5 to 3 mm. across; corolla thin-carnose, short-cylindric, 10 to 11 mm. long, about 4 mm. in diameter, the lobes deltoid, 1.5 mm. long; stamens 7 mm. long; filaments dark castaneous, 2.5 mm. long, connate in a tube, glabrous, continued into slender connectives; anthers

smooth, erect, about 5.5 mm. long, the tubules wide, slightly shorter than the sacs; stigma truncate.

Type in the herbarium of the Royal Botanic Gardens, Kew, collected on Cuesta de Huanacabra, Department of Amazonas (?), Peru, by A. Mathews (no. 883*).

DISTRIBUTION: Probably limited to the Andes of northern Peru.

PERU: *Macleay* (K).

From the three preceding this species differs in its completely glabrous flowers and rugose calyx. The name "*ovalifolia*" was suggested by the collector but was never published.

36. *Thibaudia biflora* (Poepp. & Endl.) Hoer. Bot. Jahrb. Engler 42: 274. 1909.

Ceratostema biflorum Poepp. & Endl. Nov. Gen. & Sp. 1: 6. pl. 10. 1835.

Eurygania biflora Benth. & Hook. Gen. Pl. 2: 568. 1876.

Slender shrub 2 to 3 meters high; branchlets subterete, brownish, densely puberulous with short spreading hairs about 0.2 mm. long, becoming cinereous and glabrous; petioles subterete, sparsely puberulous or glabrous, 1 to 2 mm. long; leaf blades ovate, 15 to 20 mm. long, 10 to 13 mm. broad, rounded at base and apex, entire at margins, essentially glabrous, obscurely 5-plei-nerved, the midnerve plane above, slightly raised beneath, the secondary nerves oriented near base, plane or slightly raised on both surfaces, the veinlets obscure; inflorescence axillary, 1 to 3 flowered, fasciculate; pedicels terete, 4 to 6 mm. long, pilose with spreading hairs about 0.3 mm. long, circumscribed at base by several imbricate oblong pilose bractlets about 2 mm. long; calyx tube short-cylindric, pilose as the pedicels, 2.5 mm. long and 3 mm. in diameter at anthesis; limb 3 mm. long including lobes, the lobes apiculate, less than 1 mm. long; corolla subcylindric, 11 to 15 mm. long, about 2.5 mm. in diameter, sparsely pilose, the lobes oblong, 1 to 2 mm. long, densely pilose within; stamens 7 to 8 mm. long; filaments dark castaneous, connate in a tube about 2 mm. long, glabrous; anther sacs smooth, 2 to 3 mm. long; tubules wide, flexible, about 4 mm. long; fruit subspherical, up to 5 mm. in diameter, the calyx-limb decurrent.

TYPE LOCALITY: Cerro de San Cristóbal, near Cuchero, Peru. Type collected by Poeppig (no. 1350).

DISTRIBUTION: Andes of northern and central Peru, altitude 1,100 to 1,700 meters.

PERU: Cerro de San Cristóbal, near Cuchero, *Poeppig* 1350 (B, type).

SAN MARTÍN: Guayrapurina, near Tarapoto, *Spruce* 4430 (K, Y). Cerro de Escalero, *Ule* 6790 (B, Go).

JUNÍN: Pichis Trill, Eneñas, *Killip & Smith* 25686 (N, Y).

A very distinct species, marked by its few-flowered inflorescences and rounded leaves. The plant from Junín was growing in an open sphagnum swamp; the others are said to have been epiphytic.

37. *Thibaudia herrerae* A. C. Smith, sp. nov.

Frutex; laminis lanceolato-ovatis basi attenuatis apice subacutis margine integerrimis 5-plei-nerviis; inflorescentia breviter racemosa, rhachidibus pedicellis brevis pilosis, floribus glabris; calyce breviter cylindrico, limbo patulo 5-lobato; corolla cylindrico-urceolata; staminibus aequalibus, filamentis connatis glabris, antheris basi setosis, tubulis quam oculis paullo longioribus.

Shrub; branches terete, glabrous; branchlets striate, puberulous (hairs 0.2 to 0.3 mm. long); petioles 2 to 3 mm. long, winged above, rugose, essentially glabrous; leaf blades coriaceous, lanceolate-ovate, 3.5 to 5 cm. long, 1 to 1.2 cm. broad, attenuate at base, obtuse or subacute at apex, entire at margins, glabrous,

5-plied-nerved, the nerves nearly plane above, raised beneath, the veinlets reticulate, obscure; inflorescence axillary near ends of branchlets, short-racemose, 5 to 8 flowered; rachis striate, 5 to 8 cm. long, pilose with pale spreading hairs 0.2 to 0.3 mm. long; pedicels rugose, about 0.6 mm. in diameter, 12 to 16 mm. long, pilose as the rachis, each subtended by an ovate ciliate bractlet 1.5 mm. long, bibracteolate near base; calyx tube subcylindric, 2 mm. long and 1.5 mm. in diameter at anthesis, essentially glabrous; limb spreading, about 1.5 mm. long including lobes, the lobes apiculate, about 0.7 mm. long and 2 mm. across base; corolla red, carnose, essentially glabrous, cylindric-urceolate, about 9 mm. long and 3 mm. in diameter at center, the lobes triangular, about 1 mm. long; stamens about 7 mm. long; filaments glabrous, connate in a tube, about 3.5 mm. long; anther sacs slightly granular, setose at base, about 2.2 mm. long; tubules wide, about 2.6 mm. long; stigma truncate.

Type in the U. S. National Herbarium, no. 1,283,197, collected at Forontoy, Santa Ana Valley, Department of Cuzco, Peru, altitude 2,000 to 2,800 meters, in 1927, by F. L. Herrera (no. 1384).

DISTRIBUTION: Known only from the type collection.

This species is marked by very narrow leaves and a delicate inflorescence.

38. *Thibaudia regularis* A. C. Smith, sp. nov.

Frutex; laminis coriaceis ovatis basi attenuatis apice acutis margine subintegerrimis subtus dense pilosis 5-plied-nerviis; inflorescentia breviter racemosa ubique praeter corollas dense et decidue pilosa; calycis tubo subcylindrico, limbo suberecto tubum subaequante; corolla cylindrica glabra; staminibus aequalibus, filamentis tenuibus connatis, antheris basi parce setosis, tubulis quam loculis paullo brevioribus.

Shrub 1 to 2 meters high; branchlets subterete, puberulous (hairs about 0.2 mm. long); petioles 1 to 2 mm. long, winged to base, pilose; leaf blades coriaceous, ovate, 4 to 5 cm. long, 1.5 to 2.5 cm. broad, attenuate at base, acute at apex, entire or shallowly crenate at margins, essentially glabrous above, densely pilose beneath (hairs pale, spreading, about 0.5 mm. long, 10 to 20 per square mm.), 5-plied-nerved, the nerves oriented near base, plane above, slightly raised beneath, the veinlets reticulate, obscure; inflorescence axillary, short-racemose, 6 to 8 flowered, all parts except corollas densely and regularly pilose with pale hairs about 0.5 mm. long when young, glabrous when mature; rachis striate, about 1 mm. in diameter, about 1 cm. long; pedicels subterete, about 0.6 mm. in diameter, 10 to 18 mm. long, each subtended by an ovate-oblong bractlet about 2 mm. long, bibracteolate near base; calyx tube subcylindric, 3 mm. long and 3 mm. in diameter at anthesis; limb 2.5 to 3 mm. long including lobes, the lobes 1 mm. long, about 2 mm. across base; corolla red, glabrous (or pilose within at apex), 11 to 13 mm. long, 3 to 4 mm. in diameter, the lobes triangular, 1.5 mm. long; stamens about 7.5 mm. long; filaments thin, glabrous, connate in a tube, about 3.5 mm. long; anther sacs smooth, sparsely setose at base, about 3 mm. long; tubules wide, about 2 mm. long; stigma peltate.

Type in the herbarium of the Field Museum of Natural History, no. 580,234, collected at Machupicchu, Valle de San Miguel, Department of Cuzco, Peru, altitude 2,200 to 2,400 meters, July 20, 1928, by F. L. Herrera (no. 2004). Duplicate at Y.

DISTRIBUTION: Known only from the type collection.

The unusually soft and fine pubescence of the leaves and young flowers distinguishes this species from its allies.

EXPLANATION OF PLATE 13.—*Thibaudia regularis*, from photograph of type sheet. About one-half natural size.

39. *Thibaudia boliviensis* (Kuntze) Hoer. Bot. Jahrb. Engler 42: 275. 1909.*Hornemannia boliviensis* Kuntze, Rev. Gen. Pl. 3²: 191. 1898.

Shrub; branchlets subterete, brownish or cinereous, sparsely puberulous or glabrous; petioles rugose, glabrous, 3 to 4 mm. long; leaf blades coriaceous, ovate, 4 to 9 cm. long, 2 to 3.5 cm. broad, cuneate or subattenuate at base, obtuse at apex, entire and slightly revolute at margins, glabrous, 5 to 7 pinnate-veined (or pinnate-veined, the veins oriented near base), the secondary nerves ascending, with the midnerve nearly plane or slightly impressed above, raised beneath, the veinlets reticulate, plane or slightly raised on both surfaces; inflorescence axillary, subfasciculate or short-racemose (rachis less than 1 cm. long), glabrous in all parts, 3 to 8 flowered; pedicels striate, 8 to 20 mm. long, each subtended by an oblong acute bractlet 2 mm. long, bibracteolate near base (bractlets sparsely fimbriate), slightly swollen distally; calyx tube short-cylindric, about 1.5 mm. long, 2 to 3 mm. in diameter at anthesis; limb 1 to 2 mm. long including lobes, the lobes apiculate, less than 1 mm. long; corolla subcylindric, 7 to 11 mm. long, 3 to 4 mm. in diameter, slightly contracted above, the lobes obtuse, about 1.5 mm. long; stamens 5.5 to 6 mm. long; filaments castaneous, firmly connate in a tube, 2 to 3 mm. long, glabrous; anther sacs nearly smooth, sparsely pubescent at base with hairs about 0.2 mm. long, 2 to 2.5 mm. long; tubules wide, 1.5 to 2 mm. long; style stout, rugose, the stigma truncate.

TYPE LOCALITY: Santa Rosa, Bolivia, altitude 3,000 meters. Type collected by Kuntze (April 3, 1892).

DISTRIBUTION: Eastern Cordillera of northern Bolivia, altitude 1,400 to 3,000 meters.

BOLIVIA: Santa Rosa, Kuntze, April 3, 1892 (B, Y, type). Calli6n, Pearce, in 1864 (K).

LA PAZ: Near Yungas, Rusby 2034 (Y). Cargadira, R. S. Williams 1581 (N, Y). Tipuani, Buchtien 7433 (B, N, Y).

40. *Thibaudia melliflora* R. & P. Fl. Peruv. Chil. 4: pl. 387. 1802.*Thibaudia mellifera* R. & P.; St. Hil. Expos. Fam. Nat. 363. 1805.*Eurygania multiflora* Klotzsch, Linnaea 24: 27. 1851.*Thibaudia multiflora* R. & P.; Klotzsch, Linnaea 24: 27. 1851, as synonym.*Vaccinium melliflorum* F. Muell. Sel. Pl. Indust. Cult. 249. 1876.

Sparsely branched shrub about 1 meter high; young branchlets puberulous (hairs pale, up to 0.3 mm. long); petioles stout (2 mm. in diameter), 2 to 3 mm. long, winged to base, puberulous as the branchlets or glabrescent; leaf blades thick-coriaceous, ovate or slightly obovate, 4 to 7 cm. long, 2 to 3 cm. broad, attenuate at base, obtuse or subacute at apex, entire at margins, glabrous or sparsely puberulous near base above, glabrous or pilose with scattered brown hairs beneath, pinnate-veined, the midvein impressed above, prominent beneath, the secondary veins usually oriented near base, arcuate-ascending, 2 or 3 to a side, impressed or plane above, prominent beneath, the veinlets reticulate, obscure; inflorescence axillary, racemose, 7 to 15 flowered; rachis striate, 1 to 2 cm. long, densely pilose with pale spreading hairs about 0.3 mm. long; pedicels striate, about 0.8 mm. in diameter, 6 to 15 mm. long, pilose as the rachis, each subtended by a deciduous bractlet, deciduously bibracteolate near base, the bractlets oblong, ciliate, about 2.5 mm. long; calyx tube subcylindric, rugose, glabrous, 2.5 mm. long and 3.5 mm. in diameter at anthesis; limb 2 mm. long including lobes, the lobes short, apiculate, about 3 mm. across base; corolla scarlet, paler distally, glabrous, cylindric-urceolate, 9 to 11 mm. long and 3 to 4 mm. in diameter when mature, the lobes about 1 mm. long; stamens about 8 mm. long; filaments glabrous, connate in a tube,

about 3.5 mm. long; anther sacs slightly granular, incurved and sparsely setose at base, 3 to 4 mm. long; tubules wide, about 2.8 mm. long; stigma truncate.

TYPE LOCALITY: Department of Huánuco, Peru. Type collected by Ruiz and Pavon.

DISTRIBUTION: Andes of central Peru, altitude 2,000 to 3,000 meters.

PEBU: (?) "Columbia," *Lobb* (K).

HUÁNUCO: Pillao, *Pearce* 126 (K). Mito, *Macbride & Featherstone* 1402 (F).

The only previous adequate description of this plant is from Dunal.* Local names: "Puechato sumacmisqui," "pucosato." The fruit is reported as edible.

DOUBTFUL SPECIES[†]

THIBAUDIA ABDISIAEFOLIA H. B. K. *Nov. Gen. & Sp.* 3:274. 1818.

TYPE LOCALITY: Near Fusagasugá, Department of Cundinamarca, Colombia. Type collected by Humboldt and Bonpland.

I have not seen any specimen answering to the description of this species. Hoerold questions its place in the genus. The type has not been available to me.

THIBAUDIA CAULIALATA R. & P.

See notes at end of *Cavendishia*.

THIBAUDIA CERANDER Dun.; DC. *Prodr.* 7:565. 1839.

TYPE LOCALITY: Not given.

The description of this plant is so incomplete that its affinities can not be guessed. Dunal places it in this genus with doubt.

THIBAUDIA CRENULATA Remy, *Ann. Sci. Nat. III. Bot.* 8:234. 1847.

TYPE LOCALITY: Chupi, Yungas, Bolivia. Type collected by D'Orbigny.

I have seen no specimens which match the description. It may be allied to *T. boliviensis* or possibly equal to it.

THIBAUDIA DIPHYLLA Dun.; DC. *Prodr.* 7:562. 1839.

TYPE LOCALITY: Huasa Huasi and Paleo, Peru. Type collected by Dombey.

Probably this incompletely described species is related to *T. angustifolia* and its allies.

THIBAUDIA JUSSIAEI Dun.; DC. *Prodr.* 7:565. 1839.

TYPE LOCALITY: Peru. Type collected by Joseph de Jussieu.

Like the preceding, the description is too incomplete to permit placing this species.

THIBAUDIA MARTII Melssn.

See notes at end of *Cavendishia*.

THIBAUDIA OCANENSIS Linden, *Cat. no.* 6:4. 1851.

Descriptions of this "species" and of the two others mentioned in the same publication are not available to me. Probably they are simply listed and are to be considered *nomina nuda*.

THIBAUDIA SCHLIMIANA Linden, *Cat. no.* 6:4. 1851.

See under *T. ocanensis*, above.

THIBAUDIA SERRATA Dun.; DC. *Prodr.* 7:563. 1839.

TYPE LOCALITY: Vicinity of Chachapoyas, Department of Amazonas, Peru. Type not cited.

* DC. *Prodr.* 7:561. 1839.

† I have not listed Asiatic species originally described under *Thibaudia*, which have since been transferred to their proper genera.

Possibly this description refers to one of the Mathews collections, such as *T. moricandi*, but it is too incomplete to be considered.

THIBAUDIA TETRAGONA Linden, Cat. no. 6:4. 1851.

See under *T. ocanensis*, above.

EXCLUDED SPECIES

THIBAUDIA DOMINGENSIS Urban, Symb. Antill. 7:319. 1912.

Like the following, this species appears to me to belong to the tribe Vaccinieae. Its correct combination must, however, await further study of the genera there included.

THIBAUDIA KRUGII Urb. & Hoer.; Urban, Symb. Antill. 5:454. 1908.

The several specimens of this species which I have seen, including a sheet of the type collection, incline me to believe it a species of the tribe Euvaccinieae rather than Thibaudieae, although at present its proper generic reference is uncertain.

THIBAUDIA LATIFOLIA Griseb. Fl. Brit. W. Ind. 148. 1864.

This species was transferred to *Vaccinium* by Bentham and Hooker,²⁸ but by Hoerold is again placed in *Thibaudia*. It appears to me to be a true *Vaccinium*.

THIBAUDIA MEXICANA Mart. & Gal. Bull. Acad. Sci. Brux. 9²:530. 1842.

TYPE LOCALITY: Chinantla, State of Oaxaca, Mexico, altitude about 1,200 meters. Type collected by Galeotti (no. 1813).

From the description of this species, of which I have not seen the type, I conclude that it belongs to *Cavendishia*. It may be related to *Cavendishia laurifolia* or *Cavendishia crassifolia*, or identical with one or the other.

THIBAUDIA SUBCRENULATA (Klotzsch) Hoer. Bot. Jahrb. Engler 42:275. 1909.

Vaccinium subcrenulatum Klotzsch; Schomb. Versuch Fauna & Fl. Br. Guian. 1088. 1848, nomen.

Eurygonia subcrenulata Niedenzu, Bot. Jahrb. Engler 11:207. 1890.

There has been no formal description of this species. The type is without flowers and I suspect it belongs to the tribe Euvaccinieae rather than Thibaudieae.

15. THEMISTOCLESIA Klotzsch, Linnaea 24:41. 1851

Calyx tube continuous with pedicel, obconical or short-cylindric, narrowly 5-winged to sinuses; limb erecto-patent, 5-lobed, the lobes triangular, subacute; corolla subcylindric, 5-lobed, the lobes triangular, subacute; stamens 10, alternately unequal or subequal, more than half as long as corolla; filaments submembranous, slender, distinct, alternately unequal or subequal, attached to the anther dorsally near its base; anthers membranous, the sacs smooth, the tubules slightly longer than the sacs (rarely more than twice as long), opening by short introrse clefts; style filiform, about as long as corolla.

Slender shrubs, usually epiphytic, with subcoriaceous, alternate, predominantly subcordate-based, obscurely nerved, petioled leaves; inflorescence axillary, short-racemose; flowers pedicelled, several to an inflorescence; pedicels subtended by small bracts, deciduously bibracteolate.

DISTRIBUTION: Andes of Venezuela to Peru. Six species are known.

This genus is distinguished from *Thibaudia* by its slender habit, small leaves, and often slightly dimorphic stamens. *T. pendula* Klotzsch is the type species.

²⁸ Gen. Pl. 2:575. 1876.

KEY TO THE SPECIES

Corolla essentially glabrous (often tufted-setose at apex).

Rachis about 2 cm. long, circumscribed at base by bracts 2 to 4 mm. in length; filaments conspicuously of two lengths (difference about 1 mm.); anthers not more than 4.5 mm. long----- 1. *T. vegasana*.

Rachis seldom over 1 cm. long, circumscribed at base by bracts less than 2 mm. long; filaments of one length or inconspicuously of two lengths (difference not more than 0.5 mm.); anthers at least 5.5 mm. long.

Leaf base subcordate or rounded; lower surface of leaves glabrous or soft-pilose; pedicels about 10 mm. long or more.

Calyx broader than long; pedicels and rachis pilose (Venezuela).

2. *T. pendula*.

Calyx longer than broad; pedicels and rachis glabrous or essentially so (western Colombia and northern Ecuador)----- 3. *T. dependens*.

Leaf base cuneate; lower surface of leaves hispid with stiff hairs; pedicels 5 to 8 mm. long (Peru)----- 4. *T. peruviana*.

Corolla hispid-pilose, the hairs about 1 mm. long.

Anthers 6.5 mm. long; filaments glabrous----- 5. *T. hirsuta*.

Anthers 4 mm. long; filaments pubescent, the hairs up to 1 mm. long.

6. *T. compacta*.

1. *Themistoclesia vegasana* A. C. Smith, sp. nov.

Frutex pulcherrimus; ramis elongatis subscandentibus decidue pilosis; laminis ovatis vel ovato-oblongis basi late cuneatis vel truncatis apice longe acuminatis decidue pilosis obscure 5-nerviis; inflorescentia racemosa multiflora ubique praeter corollas breve pilosa; calyce obprismatico anguste 5-alato; corolla subcylindrica apice breviter setosa; filamentis distinctis alternatim inaequalibus, antheris subaequalibus, tubulis quam loculis duplo longioribus.

Shrub or low tree with elongate subscandent branches; branchlets striate, densely pilose with stiffly spreading hairs up to 0.8 mm. long, becoming glabrous; petioles slender, 1 to 2 mm. long, pubescent as the branchlets; leaf blades thin-coriaceous, ovate or oblong-ovate, 2 to 4 cm. long, 1 to 1.5 cm. broad, broadly cuneate or truncate at base, long-acuminate at apex, entire and slightly revolute at margins, sparsely pilose above with brownish hairs about 0.3 mm. long, pilose beneath on midnerve, becoming glabrous on both surfaces, obscurely 5-plinerved, the midnerve impressed above, prominent beneath, the secondary nerves oriented near base, nearly plane on both surfaces; inflorescence axillary, racemose, 10 to 20 flowered; rachis slender, striate, 2 to 3 cm. long, densely pilose with spreading pale-brown hairs up to 0.7 mm. long, circumscribed at base by numerous imbricate oblong acute bracts up to 4 mm. long; pedicels slender, pubescent as the rachis, 7 to 10 mm. long, each subtended by an oblong deciduous bract, deciduously bracteolate near base (bractlets fimbriate, lanceolate, about 2 mm. long); calyx pilose as the pedicels, obprismatic, winged to the sinuses, the tube 2.5 to 3 mm. long and about 2 mm. in diameter at summit at anthesis, the limb about 1.5 mm. long including lobes, the lobes apiculate, less than 1 mm. long, the sinuses rounded; corolla thin, subcylindric, 7 to 9 mm. long, glabrous proximally, short-setose at apex, about 3 mm. in diameter, the lobes obtuse, about 1 mm. long; stamens alternately unequal, about 7 mm. and 8 mm. long, respectively; filaments free or slightly coherent at base, slender, glabrous, about 2.5 mm. and 3.5 mm. long, respectively; anther sacs 1 to 1.5 mm. long; tubules wide, about 3 mm. long, opening by oval clefts about one-third their length; stigma truncate.

Type in the U. S. National Herbarium, no. 1,351,618, collected in mountains east of Las Vegas, Department of Santander, Colombia, altitude 3,200 to 3,300 meters, December 21, 1926, by E. P. Killip and A. C. Smith (no. 15794). Duplicate at Y.

DISTRIBUTION: Known only from the type locality in the Eastern Cordillera of Colombia, altitude 2,600 to 3,300 meters.

COLOMBIA.

SANTANDER: Las Vegas, *Killip & Smith* 15880 (N, Y).

A beautiful species with extraordinarily dense clusters of delicate flowers, distinguished from its allies by its comparatively elongate rachis, its larger bracts, its conspicuously dimorphic filaments, and its small anthers.

EXPLANATION OF PLATE 14.—*Themistoclesia vegasana*, from photograph of type sheet. About one-half natural size.

2. *Themistoclesia pendula* Klotzsch, *Linnaea* 24:42. 1851.

Episcopia pendula Moritz; Klotzsch, *Linnaea* 24:42. 1851, as synonym.

Themistoclesia humboldtiana Niedenzu, *Bot. Jahrb. Engler* 11:211. 1889.

Macleania humboldtiana Klotzsch; Niedenzu, *Bot. Jahrb. Engler* 11:211. 1889, as synonym.

Shrub with pendulous branches, usually epiphytic; branchlets subcylindric, rather densely hispid with spreading brown hairs up to 1.3 mm. long, becoming glabrous and cinereous; petioles slender, pubescent as the branchlets, 1 to 2 mm. long; leaf blades coriaceous, ovate or oblong-ovate, 3 to 6 cm. long, 1.2 to 2.5 cm. broad, truncate or subcordate at base, caudate-acuminate at apex, entire and slightly revolute at margins, sparsely pilose on both surfaces when young, retaining pubescence on nerves but otherwise becoming glabrous, obscurely 5-ply-nerved, the midnerve strongly impressed above, prominent beneath, the secondary nerves oriented near base, nearly plane on both surfaces, the veinlets reticulate, obscure; inflorescence axillary, short-racemose, 3 to 10 flowered; rachis slender, subterete, densely pubescent with pale brown spreading hairs up to 1 mm. long, 1 to 2 mm. long, circumscribed at base by a few imbricate oblong fimbriate bracts 1 to 2 mm. long; pedicels slender, pubescent as the rachis, 8 to 12 mm. long, each subtended by an oblong fimbriate bractlet about 2 mm. long, deciduously bibracteolate at middle; calyx pubescent as the pedicels, becoming subglabrous, obprismatic, the tube about 2 mm. long and 2.5 mm. in diameter at anthesis, the limb membranous, spreading, 2 to 2.5 mm. long including lobes, the lobes apiculate, less than 1 mm. long, the sinuses rounded; corolla subcylindric, 9 to 10 mm. long, glabrous proximally, short-setose at apex, about 3.5 mm. in diameter, slightly contracted above, the lobes acute, about 1 mm. long; stamens subequal or slightly alternately unequal, 7 to 7.5 mm. long; filaments castaneous, about 2 mm. long, glabrous; anther sacs about 2 mm. long; tubules flexible, about 4 mm. long, opening by oval clefts about 1 mm. long; stigma truncate; young fruit subcylindric, 4 to 5 mm. in diameter, surmounted by the wide-spreading calyx limb.

TYPE LOCALITY: Colonia Tovar, State of Aragua, Venezuela. Type collected by Moritz (no. 1662).

DISTRIBUTION: Andes of northeastern Venezuela, altitude 1,800 to 2,500 meters.

VENEZUELA: *Karsten* (B, type of *T. humboldtiana*); *Moritz* 1340 (B).

SUCRE: Cerro de Turumiquire, *Tate* 214 (N), 215 (N).

FEDERAL DISTRICT: Apretadero, near Caracas, *Jahn* 204 (N).

ARAGUA: Colonia Tovar, *Moritz* 1662 (B, type, N); *Fendler* 733 (G, Y);

Pittier 9994 (N, Y); *Allart* 304 (N, Y).

MÉRIDA: Tabay, *Gehriger* 612 (N).

The two specimens from the Cerro de Turumiquire differ slightly from typical material by their somewhat narrower leaves with subcuneate bases.

T. humboldtiana is based on a sheet marked "*Macleania humboldtiana* Kl. & Karst.," a name published only in synonymy by Niedenzu. No data concerning the specimen are available, but presumably it was collected by Karsten in Venezuela. There are no differences between it and the type of *T. pendula*.

3. *Themistoclesia dependens* (Benth.) A. C. Smith.

Thibaudia dependens Benth. Pl. Hartw. 220. 1846.

Themistoclesia lehmannii Hoer. Bot. Jahrb. Engler 42:332. 1909.

Shrub; branchlets striate, hispid with spreading pale-brown hairs about 1.5 mm. long; petioles 1 to 1.5 mm. long, hispid as the branchlets (hairs about 0.7 mm. long); leaf blades coriaceous, ovate, 3 to 4 cm. long, about 1.5 cm. broad, subcordate or rounded at base, long-acuminate at apex, entire at margins, essentially glabrous (sparsely hispid near base on midnerve and near margins above), obscurely 5-ply-nerved, the midnerve impressed above, prominent beneath, the secondary nerves obscure, oriented near base; inflorescence short-racemose, 5 to 8 flowered; rachis slender, striate, glabrous, up to 1 cm. in length, circumscribed at base by numerous imbricate ovate acute ciliate-margined bractlets up to 2 mm. long; pedicels slender (about 0.3 mm. in diameter), 10 to 20 mm. long, rugose, glabrous, each subtended by a deciduous lanceolate-oblong ciliate bractlet about 2 mm. long; calyx tube obconical, glabrous, rugose, about 4 mm. long and 4 mm. in diameter at summit; limb 2 mm. long including lobes, the lobes apiculate, less than 1 mm. long, 2.5 mm. across base; corolla glabrous (sometimes sparsely pilose at apex when young), cylindrical, 10 to 11 mm. long, about 4 mm. in diameter near base, gradually narrowed to 2.5 mm. in diameter above, the lobes 1 to 1.5 mm. long, 1 mm. across base; stamens subdimorphic (filaments alternately slightly unequal), about 9 mm. long, the filaments about 1.5 mm. and 2 mm. long, respectively, pale, glabrous, slender; anther sacs smooth, about 2.5 mm. long; tubules flexible, 5.5 to 6 mm. long, opening by introrse elongate pores about 2 mm. long.

TYPE LOCALITY: Near Pitayo, Department of El Cauca, Colombia. Type collected by Hartweg (no. 1209).

DISTRIBUTION: Central Cordillera of Colombia to northern Ecuador, altitude 2,500 to 3,500 meters.

COLOMBIA.

TOLIMA: *Goudot* (K).

ANTIOQUÍA: Alto San José, *Kalbreyer* 1597 (B).

EL CAUCA: Páramo de Guanacas, *Lehmann* 5620 (B, type of *T. lehmannii*).

Páramo de Buena Vista, *Pittier* 1180 (N); Pitayo, *Hartweg* 1209 (K, type).

ECUADOR.

PICHINCHA: Mount Corazón, *Sodirol* 92/35 (B).

4. *Themistoclesia peruviana* A. C. Smith, sp. nov.

Frutex humilis; ramulis petiolisque pilosis; laminis ovatis basi cuneatis apice longe acuminatis subtus hispidis 3 ad 5-ply-nerviis; inflorescentia breve racemosa ubique praeter corollas pilosa; calycis tubo obconico anguste 5-alato; corolla glabra apice pilosa; staminibus subaequalibus, filamentis distinctis glabris, tubulis quam loculis paulo longioribus.

Low shrub; branchlets subterete, pilose with spreading brown hairs about 1 mm. long, swollen at base of petioles; petioles about 2 mm. long, subrugose, pilose as the branchlets; leaf blades coriaceous, ovate, 2 to 3.5 cm. long, 1 to 1.5 cm. broad, cuneate at base, long-acuminate at apex, entire at margins, es-

essentially glabrous above, hispid beneath (hairs 3 or 4 per square mm., stiff, about 1 mm. long), 3 to 5 pli-nerved, the nerves oriented slightly above base, the midnerve impressed above, prominent beneath, the secondary nerves impressed above, obscure beneath, the veinlets reticulate, obscure; inflorescence axillary, short-racemose, 3 to 6 flowered; rachis slender, striate, up to 1 cm. long, pilose with spreading delicate pale-brown hairs about 0.3 mm. long, circumscribed at base by numerous imbricate ovate bractlets about 1 mm. long; pedicels slender (about 0.3 mm. in diameter), 5 to 8 mm. long, striate, pubescent as the rachis, each subtended by an oblong ciliate bractlet about 1.3 mm. long; calyx tube obconical, narrowly 5-winged to sinuses, sparsely pilose (hairs like those of pedicel), about 4 mm. long and 3 mm. in diameter at summit; limb sparsely pilose, about 1.5 mm. long including lobes, the lobes apiculate, about 0.5 mm. long and 2 mm. across base; corolla essentially glabrous near base, sparsely pilose towards apex with stiff brown hairs up to 1 mm. long, cylindrical, 9 to 10 mm. long, about 4 mm. in diameter near base, reduced above, the lobes acute, about 2 mm. long and 1 mm. across base; stamens subequal, 7.5 mm. long, the filaments with a tendency to be alternately slightly unequal; filaments glabrous, pale, about 2 mm. long; anther sacs about 3 mm. long; tubules flexible, about 3.7 mm. long, opening by introrse distal clefts about half their length.

Type in the herbarium of the Field Museum of Natural History, no. 536,005, collected in sphagnum at Villcabamba, on Río Chinchao, Department of Huánuco, Peru, altitude about 1,850 meters, July 17 to 26, 1923, by J. F. Macbride (no. 4964).

DISTRIBUTION: Known only from the type collection.

Distinctly marked from the northern species of the genus by its leaf shape, hispid pubescence, and short pedicels.

5. *Themistoclesia hirsuta* A. C. Smith, sp. nov.

Arbor parva; ramulis petiolisque setoso-pilosis; laminis ovatis basi rotundatis vel late cuneatis apice longe acuminatis utrinque pilosis glabrescentibus obscure 3 ad 5 pli-nerviis; inflorescentia breviter racemosa ubique pilosa; calyce obprismatico anguste 5-alato 5-lobato; corolla subcylindrica; filamentis alternatim inaequalibus distinctis glabris, tubulis flexilibus quam oculis duplo longioribus.

Tree 3 to 7 meters high with elongate branches; branchlets subterete, densely clothed with spreading setiform brown hairs about 2 mm. long, becoming cinereous and subglabrous; petioles slender, 2 to 4 mm. long, pilose as the branchlets; leaf blades coriaceous, ovate, about 4 cm. long and 1.5 cm. broad, rounded or broadly cuneate at base, long-acuminate at apex, entire and slightly revolute at margins, pilose on both surfaces (more densely so beneath), with spreading brownish hairs up to 2 mm. long, becoming subglabrous with age, obscurely 3 to 5 pli-nerved, the midnerve impressed above, prominent beneath, the secondary nerves oriented near base, obscure; inflorescence axillary near ends of branchlets, short-racemose, 5 to 10 flowered; rachis, pedicels, and calyx pilose as the branchlets with hairs about 1 mm. long; rachis slender, 1 to 2 mm. long, circumscribed at base by numerous imbricate oblong fimbriate bracts about 4 mm. long; pedicels slender, striate, 7 to 10 mm. long, deciduously bibracteolate near base; calyx obprismatic, narrowly winged to sinuses, the tube about 2.5 mm. long and 3 mm. in diameter at anthesis, the limb 1 to 1.5 mm. long including lobes, the lobes apiculate, about 0.5 mm. long, the sinuses rounded; corolla subcylindric, sparsely hirsute with brownish hairs up to 1 mm. long, 9 to 11 mm. long, about 3 mm. in diameter, the lobes obtuse, about 1 mm. long; stamens alternately unequal, about 10 mm. and 11 mm. long, respectively (anthers approximately similar, filaments of 2 lengths); filaments castaneous,

glabrous, about 4 mm. and 5 mm. long, respectively; anther sacs smooth, 2 mm. long; tubules flexible, 4 to 5 mm. long, opening by oval clefts about 1 mm. long; stigma truncate; disk cup-shaped, densely setose at base of style; young fruit obprismatic, up to 5 mm. in diameter, surmounted by the broad persistent calyx limb.

Type in the U. S. National Herbarium, no. 1,355,102, collected between Pamplona and Toledo, crossing the divide between Río La Teja (Maracaibo drainage) and Río Mesme (Orinoco drainage), Department of Norte de Santander, Colombia, altitude 3,000 meters, February 28, 1927, by E. P. Killip and A. C. Smith (no. 19936). Duplicate at Y.

DISTRIBUTION: Known only from the type collection.

This species and the following are sharply marked from others of the genus by their uniformly pilose corollas. They are distinguished from each other by staminal characters mentioned in the key and by a considerable difference in habit.

6. *Themistoclesia compacta* A. C. Smith, sp. nov.

Frutex compactus humilis; ramulis petiolisque pilosis glabrescentibus; laminis ovatis basi truncatis vel leviter subcordatis apice acuminatis utrinque setosis glabrescentibus obscure 5-plicinerviis; inflorescentia racemosa ubique dense constanterque hispido-pilosa; calyce obprismatico anguste 5-alato; corolla subcylindrica; filamentis alternatim inaequalibus distinctis pilosis, tubulis quam oculis duplo longioribus.

Low shrub, epiphytic (?); branchlets terete, brownish, laxly pilose with pale hairs up to 0.8 mm. long, becoming glabrous and cinereous; petioles slender, 2 to 3 mm. long, pubescent as the branchlets, the hairs spreading; leaf blades coriaceous, ovate, 20 to 30 mm. long, 13 to 18 mm. broad, truncate or slightly subcordate at base, acuminate at apex, entire and slightly revolute at margins, setose on both surfaces, especially beneath, with pale brown spreading hairs up to 0.8 mm. long, becoming essentially glabrous with age, obscurely 5-plicinerved, the midnerve deeply impressed above, prominent beneath, the secondary nerves oriented at base, slightly impressed above, obscure beneath; inflorescence axillary, racemose, 5 to 10 flowered, all parts (rachis, pedicels, calyces, and corollas) densely and persistently hispid-pilose with pale brown hairs about 0.8 mm. long; rachis slender, 1 to 2.5 cm. long, circumscribed at base by several oblong fimbriate bracts 2 to 3 mm. long; pedicels striate, 5 to 7 mm. long, each subtended by a small bractlet and deciduously bibracteolate at middle; calyx tube obprismatic, narrowly winged to sinuses, about 3 mm. long and 2.5 mm. in diameter at anthesis; limb suberect, about 1.2 mm. long including lobes, the lobes acute, less than 1 mm. long, the sinuses obtuse; corolla subcylindric, about 9 mm. long and 3 mm. in diameter, the lobes about 1 mm. long, reflexed at maturity; stamens alternately unequal, 6 mm. and 7 mm. long, respectively (anthers equal, filaments dimorphic); filaments 3 mm. and 4 mm. long, respectively, pilose on all surfaces, especially distally, with pale spreading hairs up to 1 mm. long; anther sacs about 1.5 mm. long; tubules wide, flexible, 2.5 to 3 mm. long, opening by introrse pores less than 1 mm. long; stigma truncate; disk densely setose at base of style.

Type in the herbarium of the New York Botanical Garden, collected in light forest at El Peñón, southwest of Sibaté, Department of Cundinamarca, Colombia, altitude 2,900 to 3,000 meters, October 29, 1917, by F. W. Pennell (no. 2659).

DISTRIBUTION: Cundinamarca, in the Eastern Cordillera of Colombia.

COLOMBIA.

CUNDINAMARCA: Páramo near Bogotá, Goudot (K).

From the preceding species, *T. compacta* is distinguished by its shorter anthers, pubescent filaments, and compact habit.

16. *RUSBYA* Britton, Bull. Torrey Club 20: 68. 1893

Calyx tube continuous with pedicel, obconical, narrowly winged; limb sub-erect, 5-lobed, the lobes elongate-triangular, acute; corolla cylindrical, 5-lobed, the lobes oblong, subacute; stamens 10, slightly shorter than corolla; filaments of two lengths, distinct, attached to the anther dorsally near its base; anthers of two lengths, the sacs faintly granular, the tubules slightly longer than the sacs, with introrse clefts more than half their length; style filiform, nearly as long as corolla.

An epiphytic shrub with densely leafy branches, the young branchlets deeply ridged; leaves coriaceous, alternate, crowded (sometimes appearing whorled), short-petioled, linear-oblong, 1-nerved; stipules persistent, aristate from a swollen base; flowers solitary, axillary; pedicels slender, minutely bracteolate near base.

DISTRIBUTION: One species from northern Bolivia.

This genus has flowers resembling those of *Themistoclesia*, lanceolate one-nerved leaves, and stipules such as those of certain species of *Ceratostema*.

1. *Rusbya taxifolia* Britton, Bull. Torrey Club 20: 68. 1893.

Anthopterus taxifolius Drude; Engl. & Prantl, Pflanzenfam. Nachtr. 4¹: 270. 1897.

Epiphytic shrub; branchlets brown, subterete when old, when young deeply furrowed, the bark swollen at base of each petiole; stipules persistent, aristate from a swollen base, 2 mm. long, in pairs at the superior base of each petiole; petioles glabrous, less than 1 mm. long, canaliculate above; leaf blades coriaceous and smooth in texture, linear-oblong, 20 to 30 mm. long, 2 mm. broad (rarely laterally fused in pairs, doubling the width), glabrous, cuneate at base, rounded or slightly emarginate at apex, entire and slightly thickened at margins, the midvein depressed above, plane beneath, continuing to apex; flowers sparse, solitary in leaf axils; pedicels circumscribed at base by a few minute ovate ciliate-margined bractlets about 0.6 mm. long, slender (0.2 mm. in diameter), 10 to 12 mm. long, deciduously bracteolate near base (bractlets oblong-ovate, acute, ciliate-margined, about 0.8 mm. long); calyx tube about 3 mm. long and 1 mm. in diameter at summit at anthesis, rugose; limb about 2 mm. long including lobes, the lobes 1.5 mm. long, about 1.3 mm. across base, each with a prominent midnerve, the sinuses acute; corolla glabrous, 8 to 9 mm. long, 4 mm. in diameter near base, contracted to 2 mm. in diameter at throat, the lobes reflexed, about 1.5 mm. long and 1 mm. across base; stamens alternately unequal (about 7 mm. and 7.2 mm. long, respectively); filaments nigrescent, free, 1.5 mm. and 2.5 mm. long, respectively, about 0.4 mm. wide, pubescent at margins with ascending stiff brown hairs about 0.2 mm. long; anther sacs 3 mm. and 2.7 mm. long, respectively; tubules about 3.4 mm. long; style about 7.5 mm. long.

TYPE LOCALITY: Yungas, Department of La Paz, Bolivia, altitude about 1,250 meters. Type collected by Rusby (no. 2692).

DISTRIBUTION: Known only from the type locality.

BOLIVIA.

LA PAZ: Yungas, *Rusby* 2692 (N, Y, type); *Bang* 624 (N, Y).

An isolated species, marked as noted in the generic discussion. Two other species have been referred to this genus on the basis of their stipules, here considered a secondary character.

EXCLUDED SPECIES

RUSBYA PEARCEI Britton, Bull. Torrey Club 20: 68. 1893.

Anthopterus pearcei Drude; Engl. & Prantl, Pflanzenfam. Nachtr. 4¹: 270. 1897.

This species, of which I have seen only a fragment of the type, is probably best placed in some genus of Euvaccinieae, whether *Vaccinium* or an ally can not definitely be said.

RUSBYA BOLIVIANA Britton, Mem. Torrey Club 4: 215. 1895.

Although this species was described without flowers, a single flower is present on a sheet of the type collection borrowed from the Gray Herbarium. This establishes the species unmistakably as near *Vaccinium*, but whether it is a distinct species or one previously described can not be decided at present.

17. CAVENDISHIA Lindl. Bot. Reg. 21: sub pl. 1791. 1836

(? *Chupalon* Adans. Fam. Pl. 2: 164. 1763)

(*Socratesia* Klotzsch, Linnaea 24: 22. 1851)

(*Polyboea* Klotzsch, Linnaea 24: 24. 1851)

(*Proclesia* Klotzsch, Linnaea 24: 32. 1851)

Calyx tube articulate with pedicel, short-cylindric or campanulate; limb erect or spreading, 5-lobed (rarely 3 or 4 lobed), the lobes triangular or ovate; corolla subcylindric, 5-lobed, the lobes triangular or oblong; stamens 10, alternately unequal, nearly as long as corolla; filaments distinct or coherent at base, alternately unequal, attached to the anther dorsally near its base; anthers firm or membranous, the sacs smooth or slightly granular, alternately unequal, the tubules somewhat longer than the sacs (usually not more than twice as long), opening by elongate introrse clefts; style filiform, about as long as corolla, frequently exerted.

Shrubs of various habit, often epiphytic, with coriaceous or subcoriaceous, alternate, pinnate-veined or pinnate-veined, petioled leaves; inflorescence axillary or terminal, subfasciculate or racemose, bracteate at base and usually enveloped when young by large submembranous reddish bracts; flowers pedicelled, few to many to an inflorescence; pedicels deciduously bibracteolate.

DISTRIBUTION: Mountainous tropical continental America from southern Mexico to northern Bolivia and eastward to British Guiana. Seventy-three species are here described, and in addition there are four names which I am unable to place.

This large genus is superficially distinguished by its large floral bracts; it is also characterized by dimorphic stamens, of which the filaments and anthers are both alternately unequal. With the exception of *C. complectens* and *C. quereme*, no species are found in both Central and South America. To facilitate the use of keys and text, the Central American and South American species are treated in separate groups, the two species above mentioned being keyed under each. *C. nobilis* Lindl. is the type species.

KEY TO CENTRAL AMERICAN SPECIES

(Including Mexico and Panama west of the Canal Zone)

Leaf base strongly cordate, amplexicaul; calyx lobes slightly imbricate.

1. *C. complectens*.

Leaf base slightly cordate or variously shaped, never amplexicaul; calyx lobes not imbricate.

Leaves small (less than 3.5 cm. long and 1.5 cm. broad), rounded at apex.

Flowers solitary or in pairs, ebracteate; pedicels about 6 mm. long; corolla more than 18 mm. long; stamens at least 17 mm. long.

2. *C. pterocarpa*.

Flowers in clusters of 3 to 6, surrounded by large bracts; pedicels not exceeding 3 mm. in length; corolla 12 mm. long or less; stamens not exceeding 11 mm. in length.

3. *C. capitulata*.

Leaves larger (rarely less than 5 cm. long and 1.8 cm. broad), acuminate or subacute at apex (rounded in no. 4 only).

Calyx limb erect, subcylindric, longer than the tube, this often constricted at its summit.

Corolla pubescent, the hairs at least 0.3 mm. long; calyx lobes not callose-thickened.

Leaves not more than 7 cm. long, rounded or obtuse or subacute at apex; calyx and pedicel pubescent.

4. *C. quercina*.

Leaves more than 8 cm. long, caudate-acuminate at apex; calyx and pedicel glabrous.

Corolla less than 20 mm. long; stamens about 15 mm. long; branchlets and leaves essentially glabrous (Guatemala).

5. *C. callista*.

Corolla 25 to 30 mm. long; stamens more than 20 mm. long; branchlets and petioles pubescent; leaves usually somewhat pubescent (Costa Rica).

Leaves oblong, about 3 times as long as broad (5 to 10 cm. broad), 7-plexi-nerved.

6. *C. longiflora*.

Leaves lanceolate, 4 or 5 times as long as broad (3.5 to 4.5 cm. broad), 5-plexi-nerved.

7. *C. bullata*.

Corolla glabrous; calyx lobes callose-thickened.

Flowers in an elongate raceme, the rachis 6 to 10 cm. long; bracts small, much shorter than pedicels.

8. *C. melastomoides*.

Flowers in a shorter crowded raceme, the rachis usually less than 3 cm. long; bracts longer than pedicels, often surrounding the inflorescence.

Corolla 16 to 20 mm. long; anthers about 12 and 15 mm. long respectively; leaves 5 to 8 cm. long; calyx tube short apophysate, about 2 mm. long.

9. *C. endresii*.

Corolla 30 to 40 mm. long; anthers about 24 and 28 mm. long respectively; leaves 9 to 13 cm. long; calyx tube somewhat elongate, 3 to 4 mm. long, rugose.

10. *C. wercklei*.

Calyx limb erecto-patent, usually shorter than the tube, this not constricted.

Racemes long, the rachis 3 cm. long or more; bracts often shorter than the pedicels, not covering the inflorescence; corolla less than 15 mm. long; leaves rarely more than 12 cm. long.

Flowers small (corolla 9 to 10 mm. long; stamens about 8 mm. long).

Racemes 5 to 10 cm. long (rarely less); pedicels often up to 18 mm. in length; calyx and corolla with scattered stiff brown hairs (sometimes glabrous), the calyx lobes not margined (Guatemala and Mexico).

11. *C. laurifolia*.

Racemes 3 to 5 cm. long (rarely more); pedicels usually less than 12 mm. in length; calyx and corolla glabrous, the calyx lobes slightly callose-thickened at margin (Costa Rica).

12. *C. quereme*.

Flowers comparatively large (corolla 13 to 15 mm. long; stamens about 12 mm. long)----- 13. *C. crassifolia*.

Racemes shorter, the rachis less than 3 cm. long; bracts longer than the pedicels, often enveloping the inflorescence; corolla more than 15 mm. long; leaves often large.

Corolla 15 to 16 mm. long (Mexico and Guatemala).

Flowers essentially glabrous (calyx sometimes with scattered stiff brown hairs).

Leaves 5 to 6 cm. broad, usually 5-ply-nerved... 14. *C. chiapensis*.

Leaves 6 to 8 cm. broad, 7-ply-nerved----- 15. *C. latifolia*.

Flowers uniformly pale-pubescent (including pedicels, calyces, corollas, and sometimes bracts)----- 16. *C. guatemalensis*.

Corolla more than 19 mm. long (rarely 17 mm.) (Nicaragua, Costa Rica, and western Panama).

Leaves oblong or oblong-obovate, averaging 2.2 times as long as broad, abruptly caudate-acuminate----- 17. *C. smithii*.

Leaves oblong-lanceolate, averaging 3 times as long as broad, long-caudate-acuminate.

Calyx puberulous; corolla sometimes puberulous.

18. *C. veraguensis*.

Calyx glabrous (frequently glandular); corolla glabrous.

Leaves not punctate or sparsely so----- 19. *C. costaricensis*.

Leaves regularly punctate on both surfaces. 20. *C. hoffmannii*.

1. *Cavendishia complectens* Hemsl. Biol. Centr. Amer. Bot. 2: 272. 1881.

Chupalon complectens Kuntze, Rev. Gen. Pl. 2: 383. 1891.

Pendent epiphytic shrub, the branches about 1 meter long; branchlets terete, brownish or cinereous, glabrous, frequently flexuose; leaves practically sessile and strongly amplexicaul, frequently completely surrounding the branchlet, the petioles rugose, glabrous, stout, not more than 1 mm. long, the blades coriaceous, ovate or subrotund, 10 to 16 cm. long, 5 to 11 cm. broad, strongly cordate at base, obtuse or rounded at apex, entire and slightly revolute at margins, glabrous, pinnate-veined, the midvein impressed above, strongly prominent beneath, the secondary veins 6 to 9 to a side, the basal several pairs spreading or reflexed, the upper pairs spreading, ascending, slightly raised above, prominent beneath, the veinlets copiously reticulate, raised on both surfaces; inflorescence terminal or axillary, racemose, glabrous in all parts, 10 to 30 flowered; rachis terete, 3 to 10 cm. long; pedicels subterete, 4 to 8 mm. long, each subtended by an oblong bract (bracts up to 20 mm. long and 15 mm. broad, cuneate and sessile at base, rounded and apiculate at apex, several-veined, subcoriaceous, completely covering the young flowers), deciduously bibraceteolate near base, slightly swollen distally; calyx cylindric, the tube about 3 mm. long and 4 mm. in diameter at anthesis, the limb erect, 4 to 5 mm. long including lobes, the lobes broadly ovate, thin-margined, about 4 mm. long and 4 mm. across, with overlapping margins, the sinuses acute; corolla cylindric, 8 to 9 mm. long and about 4 mm. in diameter, contracted above, the lobes oblong, acute, 1.5 to 2 mm. long; stamens alternately slightly unequal, about 8 mm. and 8.3 mm. long, respectively; filaments nigrescent, distinct, glabrous, 2 mm. and 2.5 mm. long, respectively; anthers 6.5 mm. and 6.2 mm. long, respectively (short filaments belonging to long anthers), the sacs nearly smooth, about 2.5 mm. long, the tubules wide, 4 mm. and 3.7 mm. long, respectively; stigma truncate.

TYPE LOCALITY: Costa Rica. Type collected by Endres (no. 257).

DISTRIBUTION: Mountains of Costa Rica, altitude 1,200 to 2,000 meters; also Western Cordillera of Colombia and Ecuador.

COSTA RICA.

SAN JOSÉ: La Palma, *Wercklé* 11598 (N); *Pittier* 10170 (N); *Brade* 16672 (N); *Tonduz* 7404 (12439 Herb. Nat. Cost.; F, G, N); *W. W. & H. E. Rowlee* 255 (N); *Standley* 32918 (N), 32950 (N), 33205 (N), 38121 (N), 38134 (N). San José, *Alfaro* 5843 (N). La Hondura, *Standley & Valerio* 51928 (N).

CARTAGO: La Estrella, *Standley* 39162 (N). Orosi, *Standley* 39814 (N). El Muñeco, south of Navarro, *Standley* 33906 (N); *Standley & Torres* 51738 (N), 51772 (N).

This is an unmistakable species with amplexicaul leaves, evidently quite common locally in Costa Rica. The above flower dimensions are average, but, of course, there are slight variations in one direction or the other. The stamens frequently appear isomorphic, but examination shows a slight alternate variation in the dimensions of their parts.

The South American specimens are mentioned in the following section of this treatment.

2. *Cavendishia pterocarpa* (Donn. Smith) A. C. Smith.

Themistoclesia pterocarpa Donn. Smith, Bot. Gaz. 44: 113. 1907.

Epiphytic shrub about 1 meter high; branchlets subterete, minutely puberulous or glabrous, dark brown, becoming cinereous; leaves crowded, the petioles about 2 mm. long, narrowly winged, the blades coriaceous, obovate, 15 to 22 mm. long, 8 to 12 mm. broad, attenuate at base, rounded or slightly emarginate at apex, entire, slightly revolute and thickened at margins, sparsely puberulous when young, becoming glabrous, obscurely pinnate-veined, the midvein slightly impressed above, prominent beneath, the secondary veins 2 to 4 to a side, oriented near base, ascending, slightly raised on both surfaces, the veinlets reticulate, obscure or slightly raised on both surfaces; inflorescence axillary, fasciculate, 1 to 2 flowered, essentially glabrous in all parts; pedicels subterete, 5 to 8 mm. long, circumscribed at base by several oblong, minutely fimbriate bractlets about 1.5 mm. long, surmounted at apex by several minute deciduous cartilaginous teeth; calyx obprismatic, narrowly winged to sinuses, the tube about 2 mm. long and 2 mm. in diameter at anthesis, the limb suberect, 2 mm. long including lobes, the lobes triangular, less than 1 mm. long, the sinuses rounded; corolla narrowly cylindric, 20 to 22 mm. long, about 4 mm. in diameter near base, gradually contracted above, glabrous without or minutely puberulous when young, sparsely tomentose within distally, the lobes triangular, subacute, about 1 mm. long; stamens alternately slightly unequal, about 17.5 mm. and 18 mm. long, respectively (anthers similar, filaments dimorphic); filaments loosely coherent at base, dark castaneous, glabrous, 2.5 mm. and 3 mm. long, respectively; anther sacs nearly smooth, incurved at base, about 3 mm. long; tubules flexible, 12.5 to 13 mm. long; stigma peltate.

TYPE LOCALITY: Mount Carizia, Costa Rica, altitude 2,000 meters. Type collected by Pittier (no. 14031).

DISTRIBUTION: Mountains of Costa Rica, altitude 2,000 to 2,400 meters.

COSTA RICA: Mount Carizia, *Pittier* 14031 (N, type).

HEBEDIA: Yerba Buena, northeast of San Isidro, *Standley & Valerio* 49837 (F, N). Cerros de Zurquí, northeast of San Isidro, *Standley & Valerio* 50822 (N).

In spite of its apparent lack of large bracts, there is no doubt that this species is a true *Cavendishia*, easily distinguished from the following on characters mentioned in the key.

3. *Cavendishia capitulata* Donn. Smith, Bot. Gaz. 25:147. 1898.

Low epiphytic shrub about 1 meter high; branchlets subterete or slightly angled, dark brown, glabrous; leaves numerous, the petioles rugose, 1 to 2 mm. long, the blades coriaceous, ovate-oblong or slightly obovate, 18 to 30 mm. long, 7 to 12 mm. broad, cuneate at base, rounded at apex, entire and slightly revolute at margins, glabrous, obscurely 5-plei-nerved, the midnerve impressed above, prominent beneath, the secondary nerves oriented near base, ascending, with the copious veinlets slightly raised on both surfaces; inflorescence axillary, fasciculate (peduncle less than 3 mm. long), 3 to 7 flowered, glabrous in all parts, surrounded by several membranous imbricate bracts, the bracts obovate, up to 2 cm. long and 1 cm. broad, subattenuate at base, red or purple, rarely sparsely brown-pilose; pedicels subterete, 1 to 3 mm. long, deciduously bibracteolate near base; calyx tube subcylindric, 2 to 3 mm. long and about 2 mm. in diameter at anthesis; limb suberect, 2 to 3 mm. long, including lobes, the lobes triangular, less than 1 mm. long, the sinuses rounded; corolla cylindric, 11 to 14 mm. long, 3 to 4 mm. in diameter, the lobes triangular, about 1 mm. long; stamens subequal (alternate filaments and anthers compensatingly unequal); filaments dark castaneous, glabrous, connate in basal half, 2 mm. and 4 mm. long, respectively; anther sacs slightly granular, about 3 mm. long; tubules flexible, about 7 mm. and 5.5 mm. long, respectively; stigma peltate.

TYPE LOCALITY: La Palma, Province of San José, Costa Rica, altitude 1,500 meters. Type collected by Wercklé (no. 11565).

DISTRIBUTION: Mountains of Costa Rica, altitude 600 to 1,700 meters.

COSTA RICA.

GUANACASTE: El Silencio, *Standley & Valerio* 44734 (N), 44822 (N). Los Ayotes, near Tilarán, *Standley & Valerio* 45381 (F, N), 45434 (F, N), 45623 (N).

ALAJUELA: Fraijanes, *Standley & Torres* 47623 (F, N).

SAN JOSÉ: La Palma, *Wercklé* 11565 (N, type). La Hondura, *Standley* 36360 (N), 36395 (N), 37664 (N), 37862 (N).

CARTAGO: La Estrella, *Standley* 39375 (N), 39418 (N), 39538 (N), 39581 (N). El Muñeco, south of Navarro, *Standley* 33507 (N). Orosi, *Standley* 39852 (N), 39634 (N). South of Cartago, *Stork* 363 (N).

A very distinct species, related to the preceding. The flower dimensions stated are from the type specimen. Slightly larger flowers, especially as regards the dimensions of calyces, are often apparent. Frequently the calyx-limb is margined with a few short hairs. The shape and size of the bracts are also subject to variation. The above citations are an illustration of the extent to which Mr. P. C. Standley has broadened our knowledge of Central American plants by his excellent collections.

4. *Cavendishia quercina* A. C. Smith, sp. nov.

Frutex epiphyticus; ramulis decidue puberulentis; laminis oblongis vel ovato-oblongis basi cordatis vel subcordatis apice obtusis 5 ad 7 pli-nerviis; inflorescentia racemosa multibracteata, bracteis oblongis sessilibus; floribus breviter pilosis; calyce breviter cylindrico apophysato, limbo erecto quam tubo longiore 5-lobato, lobis apiculatis; corolla cylindrica; staminibus subaequalibus (filamentis antherisque compensanter inaequalibus), filamentis distinctis superne pilosis, tubulis quam loculis longioribus.

Epiphytic shrub, usually growing on *Quercus*; branchlets subterete, puberulous when young with gray hairs up to 0.5 mm. long, becoming glabrous; petioles subrugose, faintly puberulous or glabrous, 3 to 5 mm. long; leaf blades thick-coriaceous, oblong or ovate-oblong, 4 to 7 cm. long, 2 to 3.5 cm. broad, cordate or subcordate at base, rounded or obtuse at apex, entire and strongly revolute at margins, essentially glabrous (sparsely puberulous on nerves beneath when young), 5 to 7 pli-nerved, the midnerve deeply impressed above, prominent beneath, obscurely pinnate-veined distally, the secondary veins oriented near base, spreading, slightly impressed above, prominent beneath, the veinlets reticulate, nearly plane on both surfaces; inflorescence terminal or axillary, racemose, 8 to 25 flowered; rachis subterete, 2 to 10 cm. long, puberulous with pale spreading hairs about 0.2 mm. long, becoming glabrous; pedicels striate, puberulous, each subtended by bright red membranous bracts (bracts oblong, up to 2 cm. long and 1 cm. broad, sessile and broad at base, subacute at apex), 10 to 15 mm. long at maturity, minutely and deciduously bibracteolate near base, swollen distally; calyx tube short-cylindric, apophysate, 2 to 3 mm. long, about 3 mm. in diameter at anthesis, contracted above, pilose with pale spreading hairs about 0.2 mm. long; limb erect, 4 to 5 mm. long including lobes, the lobes triangular, 1.5 to 2 mm. long, each margined with 4 or 5 small glands, the sinuses rounded; corolla cylindric, 15 to 18 mm. long, about 4 mm. in diameter, pale puberulous with hairs up to 0.3 mm. long, the lobes triangular, obtuse, 1.5 mm. long; stamens subequal (filaments and anthers compensatingly unequal), about 14 mm. long; filaments dark castaneous, distinct, distally pilose with hairs about 0.2 mm. long, 3 mm. and 5.5 mm. long respectively; anther sacs slightly granular, 3 to 4 mm. long; tubules wide, 8.5 mm. and 5.5 mm. long respectively; stigma peltate.

Type in the U. S. National Herbarium, no. 577,938, collected on summit of Cerro de Carizia, Costa Rica, altitude 1,900 meters, September, 1900, by H. Pittier (no. 14030). Duplicate at Y.

DISTRIBUTION: Mountains of Costa Rica, altitude 1,600 to 2,500 meters.

COSTA RICA: Candelaria, *Brade* 2090 (B).

SAN JOSÉ: Between Aserrí and Tarbaca, *Standley* 34145 (N). Finca La Cima, above Los Lotes, north of El Copey, *Standley* 42578 (N), 42677 (N), 42772 (N), 42792 (N). Zurquí, *Standley & Valerio* 48023 (N), 48122 (N). Laguna de la Chonta, northeast of Santa María de Dota, *Standley* 42205 (N).

The present species is without close relatives and is clearly distinguished from its allies by the pubescent pedicels and calyces and by its smaller leaves, which are obtuse at the apex. The racemes often elongate to 10 cm., retaining a brilliant bract at the base of each pedicel. As a rule the corollas are early deciduous.

5. *Cavendishia callista* Donn. Smith, Bot. Gaz. 20: 5. pl. 2. 1895.

Epiphytic shrub; branchlets terete, brownish or cinereous, sparsely setose with hairs about 1 mm. long or glabrous; petioles subrugose, setose or glabrous, 5 to 12 mm. long; leaf blades coriaceous, oblong or ovate-oblong, truncate or subcordate at base, long-acuminate at apex, entire or slightly revolute at margins, glabrous, or sparsely setose on nerves beneath, 5 to 7 pli-nerved, the secondary nerves oriented near base, with the midnerve impressed above, strongly prominent beneath, the veinlets copiously reticulate, slightly raised on both surfaces; inflorescence terminal, racemose, 15 to 35 flowered; racemes solitary or in pairs, circumscribed at base by numerous membranous, oblong or ovate, glabrous bracts up to 2 cm. long; rachis angled, stout, 5 to 10 cm. long, glabrous; pedicels striate, glabrous, 6 to 12 mm. long, each subtended by

a bract similar to those at base of rachis, bibracteolate at middle with oblong bractlets about 5 mm. long, swollen distally; calyx tube subrugose, short-cylindric, glabrous, 2 to 2.5 mm. long, about 3 mm. in diameter at anthesis, slightly contracted above; limb erect, glabrous, 6 to 6.5 mm. long including lobes, the lobes oblong, subacute, about 3.5 mm. long, sparsely glandular-margined or entire, the sinuses acute; corolla cylindric, about 18 mm. long, 4 to 5 mm. in diameter, densely pubescent with persistent pale spreading hairs up to 0.4 mm. long, the lobes triangular, subacute, about 1.5 mm. long; stamens subequal (filaments and anthers compensatingly unequal), about 15 mm. long; filaments castaneous, loosely coherent at base, glabrous or sparsely puberulous distally, 3 mm. and 7 mm. long, respectively; anther sacs slightly granular, 3.5 to 4 mm. long; tubules wide, flexible, 10 mm. and 6 mm. long, respectively; stigma truncate.

TYPE LOCALITY: Between Cobán and Samac, Department of Alta Verapaz, Guatemala, altitude about 1,400 meters. Type collected by von Tuerckheim (no. 941).

DISTRIBUTION: Guatemala, known only from the Department of Alta Verapaz, altitude 300 to 1,400 meters.

GUATEMALA.

ALTA VERAPAZ: Between Cobán and Samac, *von Tuerckheim* 941 (F, G, N, type, Y). Cubilquitz, *von Tuerckheim* 4119 (F, N), 7916 (F, G, N, Y). Cobán, *von Tuerckheim* II. 1795 (G, N, Y). Trece Aguas, near Senahú, *Pittier* 340 (N). Finca Sepaculté, *Cook & Griggs* 418 (N), 617 (N). Chamá, *Johnson* 202 (N).

Evidently a common species in the region mentioned. This species and the two following are very handsome shrubs, readily distinguished from one another on the characters stated in the key.

6. *Cavendishia longiflora* Donn. Smith, Bot. Gaz. 37: 420. 1904.

Shrub (epiphytic?); branchlets subterete or angled, densely and regularly pubescent with brown or cinereous, spreading hairs about 2 mm. long, becoming glabrous with age; petioles rugose, 4 to 11 mm. long, densely pilose as the branchlets; leaf blades coriaceous, broadly oblong, 10 to 23 cm. long, 4.5 to 9 cm. broad, subcordate or truncate at base, caudate-acuminate at apex (acumen about 2 cm. long on large leaves), entire and narrowly revolute at margins, glabrous above or puberulous on nerves, pilose beneath, especially on nerves, with stiff erect brown hairs about 1 mm. long, 7 to 9 pli-nerved, the secondary nerves oriented near base, with the midnerve impressed above, strongly prominent beneath, the veinlets copiously reticulate, slightly impressed or plane above, raised beneath; inflorescence terminal or axillary, racemose, 15 to 25 flowered, circumscribed at base by numerous papyraceous, imbricate, oblong or ovate, glabrous bracts up to 4 cm. long and 3 cm. broad; rachis sharply angled, glabrous, 6 to 10 cm. long; pedicels subrugose, 6 to 12 mm. long, each subtended by a bract similar to those at base of racemes (bracts frequently obovate, 3 times as long as broad), glabrous, bibracteolate below middle with oblong lanceolate bractlets 4 to 5 mm. long; calyx tube rugose, glabrous, slightly apophysate at base, about 4 mm. long and 3.5 mm. in diameter at anthesis; limb erect, about 4 mm. long including lobes, glabrous, the lobes triangular, subacute, about 2 mm. long; corolla cylindric, 26 to 30 mm. long, about 5 mm. in diameter, densely and persistently pubescent with pale brown ascending hairs up to 1 mm. long, the lobes triangular, obtuse, about 1.5 mm. long; stamens subequal (filaments and anthers compensatingly unequal), about 26 mm. long; filaments dark castaneous, loosely coherent at base, glabrous or faintly puberulous distally, 3 mm. long and 6 to 7 mm. long, respectively; anther

sacs nearly smooth, 8 to 9 mm. long; tubules wide, flexible, 17 mm. and 14 mm. long, respectively; stigma peltate.

TYPE LOCALITY: Alto de La Palma, Province of San José, Costa Rica, altitude 1,700 meters. Type collected by Tonduz (no. 7391).

DISTRIBUTION: Known only from type locality, altitude 1,600 to 1,700 meters.

COSTA RICA.

SAN JOSÉ: La Palma, *Tonduz* 7391 (12486 Herb. Nat. Cost.; B, F, G, N, type); *Brade* 51 (B); *Standley* 33089 (N).

7. *Cavendishia bullata* Smith & Standl., sp. nov.

Frutex epiphyticus; ramulis petiolisque pubescentibus glabrescentibus; laminis bullatissimis oblongo-lanceolatis basi abrupte truncatis apice caudato-acuminatis utrinque parce setosis 5 ad 7 pli-nerviis; inflorescentia racemosa multiflora basi bracteis oblongo-ovatis papyraceis imbricatis instructa; calyce glabro, tubo rugoso, limbo erecto quam tubo longiore; corolla cylindrica dense constanterque pubescente; filamentis antherisque alternatim inaequalibus, filamentis distinctis glabris, tubulis quam oculis longioribus.

Epiphytic shrub about 1 meter high; branchlets subterete, brownish, densely pubescent with pale brown setiform hairs about 2 mm. long, becoming glabrous with age; petioles subterete, 8 to 18 mm. long, densely pubescent as the branchlets; leaf blades coriaceous, strongly bullate, oblong-lanceolate, 15 to 28 cm. long, 3.5 to 4.5 cm. broad, abruptly truncate at base, caudate-acuminate at apex, entire and revolute at margins, glabrous above or setose on veins (sometimes sparsely setose on surface), setose on nerves beneath with hairs about 1.3 mm. long (sometimes setose on surface, completely glabrous with age), 5 to 7 pli-nerved, the nerves oriented from base or slightly above, with the midnerve deeply impressed above, very prominent beneath, the veinlets reticulate, slightly raised or plane on both surfaces; inflorescence terminal or axillary, racemose, 30 to 40 flowered at maturity, circumscribed at base by numerous orange papyraceous imbricate oblong-ovate glabrous bracts up to 4 cm. long and 2 cm. broad; rachis stout (4 to 5 mm. in diameter), sharply angled, glabrous, 8 to 11 cm. long at maturity; pedicels arranged on the rachis more or less spirally, striate, 8 to 12 mm. long, each subtended by a deciduous bract similar to those at base of racemes, bibracteolate near base with lanceolate bractlets 4 to 5 mm. long; calyx tube strongly rugose, the basal margin produced below articulation, glabrous, about 3 mm. long and 3 mm. in diameter at anthesis; limb erect, slightly flaring, about 5 mm. long including lobes, glabrous, the lobes triangular, subacute, about 1.5 mm. long, narrowly membranous-margined; corolla cylindric, 26 to 28 mm. long, about 5 mm. in diameter, densely and persistently pubescent with pale subtomentose hairs up to 1 mm. long, the lobes triangular, subacute, about 1 mm. long, deep red at margins (corolla otherwise orange-yellow); stamens subequal (filaments and anthers compensatingly unequal), about 22 mm. long; filaments membranous, pale castaneous, loosely coherent at base, glabrous, 4 mm. and 9 mm. long respectively; anther sacs nearly smooth, 7 to 8 mm. long; tubules wide, flexible, 12 mm. and 8 mm. long respectively, opening by clefts more than half their length; stigma truncate.

Type in the herbarium of the Field Museum of Natural History, no. 598,143, collected at Naranjo, Costa Rica, altitude about 1,700 meters, March 5, 1926, by H. E. Stork (no. 1789).

DISTRIBUTION: Mountains of Costa Rica, altitude 1,400 to 1,700 meters.

COSTA RICA.

CAETAGO: El Muñeco, on Río Navarro, *Standley & Torres* 51279 (N, Y).

A striking species sharply distinguished from the preceding on its leaf shape. In the type specimen the leaves are nearly glabrous. The other collection cited

has a leaf surface more or less densely hispid. In all other respects the two are identical, and this pubescence does not seem a specific character.

8. *Cavendishia melastomoides* (Klotzsch) Hemsl. Biol. Centr. Amer. Bot. 2: 273. 1881.

Socratesia melastomoides Klotzsch, Linnaea 24: 23. 1851.

Cavendishia klotzschiana Niedenzu, Bot. Jahrb. Engler 11: 206. 1890.

Cavendishia graebneriana Hoer. Bot. Jahrb. Engler 42: 324. 1909.

Chupalon melastomoides Kuntze, Rev. Gen. Pl. 2: 383. 1891.

Low epiphytic shrub; branchlets terete, brownish or cinereous, glabrous; petioles subterete, glabrous or sparsely puberulous, 4 to 6 mm. long; leaf blades coriaceous, oblong or ovate-oblong, 4.5 to 8 cm. long and 1 to 3 cm. broad, cuneate at base, long-acuminate at apex, entire and narrowly revolute at margins, glabrous above, glabrous beneath or sparsely pilose with hairs of two types (stout brown appressed hairs about 0.2 mm. long and pale spreading slender hairs up to 0.5 mm. long), obscurely 3 to 5 pinnately-nerved, the mid-nerve impressed above, prominent beneath, the secondary nerves oriented near base, plane or slightly raised on both surfaces, the veinlets reticulate, slightly raised above, plane beneath; inflorescence terminal or axillary; rachis subterete, glabrous or with minute glandular hairs, 6 to 12 cm. long, not always sharply distinguished from the branchlets; pedicels subrugose, 10 to 20 mm. long, glabrous or with minute glandular hairs, 1 or 2 per centimeter of rachis, each subtended by a deciduous greenish papery oblong bract about 1 cm. long, bibracteolate near base with oblong bractlets 2 to 3 mm. long; calyx glabrous, broadly apophysate at base, the tube about 1.5 mm. long and 6 mm. across apophysis, the limb erect, flaring, 4.5 to 5 mm. long including lobes, the lobes triangular, subacute, about 1 mm. long, the sinuses rounded; corolla cylindrical, 28 to 40 mm. long, 4 to 5 mm. in diameter, glabrous, viscid, the lobes triangular, obtuse, 1.5 mm. long, often reflexed at maturity; stamens subequal (filaments and anthers compensatingly unequal), 26 to 35 mm. long; filaments castaneous, slender, slightly coherent at base, pale pubescent distally with hairs up to 0.3 mm. long or subglabrous, 4 to 6 mm. and 10 to 11 mm. long, respectively; anther sacs nearly smooth, 5 to 7 mm. long; tubules flexible, 17 to 24 mm. and 13 to 19 mm. long, respectively; stigma truncate.

TYPE LOCALITY: Costa Rica. Type collected by Warszewicz.

DISTRIBUTION: Mountains of Costa Rica, altitude 1,500 to 2,000 meters.

COSTA RICA: Warszewicz (B, type); Wercklé 29 (B, type of *C. graebneriana*), Estrella road, Stork 2569 (F).

SAN JOSÉ: Las Nubes, Standley 38506 (N), 38741 (N).

CARTAGO: Santa Clara de Cartago, Mazon & Harvey 8187 (N).

The name *C. melastomoides* must be retained for this plant rather than for the Colombian species (*Thibaudia melastomoides* H. B. K.), for which the name *C. miconioides* is proposed in this treatment. The combination *C. melastomoides* was never formally applied to the Colombian plant until 1909 (by Hoerold), whereas it was used in regard to the Costa Rican plant in 1881. There is no need, therefore, for Niedenzu's name *C. klotzschiana*.

The type of *C. graebneriana* has leaves considerably narrower than those of the type of *C. melastomoides*, but the specimens here cited show such intermediate variations in this respect that it can not be considered a specific difference. There is a good deal of variation in the flower dimensions of various specimens. Completely mature flowers seem to average 4 cm. in length. The proportions of flower parts, however, are very constant.

9. *Cavendishia endresii* Hemsl. Biol. Centr. Amer. Bot. 2:273. 1881.

Chupalon endresii Kuntze, Rev. Gen. Pl. 2:383. 1891.

Cavendishia glutinosa Hoer. Bot. Jahrb. Engler 42:321. 1909.

Low shrub, usually epiphytic; branchlets subterete or striate, slender, glabrous, brownish or cinereous; petioles subterete, glabrous, 4 to 8 mm. long; leaf blades ovate-oblong or lanceolate-oblong, 5 to 8.5 cm. long, 1.2 to 2.5 cm. broad, cuneate at base, long-acuminate at apex, entire and slightly revolute at margins, glabrous, obscurely pinnate-veined, the midvein impressed or plane above, somewhat prominent beneath, the secondary veins 2 or 3 to a side, oriented near base, ascending, plane or slightly impressed above, slightly raised beneath, the veinlets reticulate, plane or slightly raised on both surfaces; inflorescence axillary near ends of branchlets, short-racemose, 3 to 6 flowered, glabrous in all parts; rachis subterete, 0.5 to 2 cm. long; pedicels subterete, 7 to 14 mm. long, each subtended by a deciduous papyraceous oblong bract up to 2 cm. long (the entire inflorescence more or less covered by similar imbricate bracts when young), deciduously bibracteolate near base with triangular bractlets less than 1 mm. long; calyx slightly viscid, apophysate at base, the tube 1.5 mm. long and 3 mm. in diameter at anthesis, the limb erect, about 2 mm. long including lobes, the lobes somewhat thickened, triangular, apiculate, less than 1 mm. long, the sinuses rounded; corolla cylindrical, 15 to 17 mm. long, about 3.5 mm. in diameter, the lobes triangular, subacute, about 1 mm. long; stamens subequal (filaments and anthers compensatingly unequal), 14 to 14.5 mm. long; filaments membranaceous, distinct or loosely coherent at base, glabrous, 2.5 mm. and 4.5 mm. long respectively; anther sacs slightly granular, about 2.5 mm. long; tubules flexible, 10.5 mm. and 8.5 mm. long respectively; stigma truncate; young fruit subspherical, up to 5 mm. in diameter, surmounted by the persistent calyx limb.

TYPE LOCALITY: Costa Rica. Type collected by Endres (no. 173).

DISTRIBUTION: Mountains of Costa Rica and western Panama, altitude 1,300 to 2,000 meters.

COSTA RICA: *Endres* 173 (K, type).

SAN JOSÉ: La Palma and vicinity, *Wercklé* 19 (B, type of *C. glutinosa*), 50 (B); *Brade* 2101 (B); *Stork* 429 (N); *Mason & Harvey* 7912 (N), 8018 (N). La Hondura, *Standley* 36258 (N), 37622 (N).

PANAMA.

CHIRIQUI: Cerro de Lino, above El Boquete, *Pittier* 3036 (F, N).

The present species is closely related to *C. wercklei*. The flower dimensions above stated are more or less average for the Costa Rican specimens. The specimens from Panama have slightly larger flowers, the corollas being 2 cm. long and the stamens concomitantly large.

10. *Cavendishia wercklei* Hoer. Bot. Jahrb. Engler 42:325. 1909.

Shrub with elongate branches; branchlets subterete, glabrous, slender, brownish; petioles subrugose, glabrous, 5 to 8 mm. long; leaf blades coriaceous, oblong or ovate-oblong, 9 to 13 cm. long, 2.5 to 6 cm. broad, truncate or subcuneate at base, caudate-acuminate at apex (acumen about 2 cm. long), entire and slightly revolute at margins, glabrous above, glabrous beneath or sparsely pilose with appressed nigrescent hairs about 0.2 mm. long, 5 to 7 pinnerved, the secondary nerves oriented near base, with the midnerve slightly impressed above, prominent beneath, the veinlets copiously reticulate, slightly raised on both surfaces; inflorescence axillary or terminal, racemose, circumscribed at base and completely covered, when young, by numerous imbricate membranous oblong glabrous bracts up to 4 cm. long and 2.5 cm. broad, 5 to 12 flowered, glabrous in all parts; rachis angled, 1 to 2 cm. (up to 7 cm.?) long; pedicels

subterete, about 10 mm. long, each subtended by a deciduous bract similar to those at base of racemes, deciduously bibracteolate near base with ovate bractlets about 1 mm. long, slightly swollen distally; calyx tube strongly rugose, the base produced below the articulation, subcylindric, 4 to 4.5 mm. long and 3 to 4 mm. in diameter at anthesis; limb erect, slightly flaring, about 6 mm. long including lobes, the lobes triangular, about 1.5 mm. long, callose-tipped; corolla cylindric, membranous, 30 to 40 mm. long, 5 to 6 mm. in diameter, the lobes triangular, subacute, about 1 mm. long; stamens subequal (filaments and anthers compensatingly unequal), 28 to 29 mm. long; filaments castaneous proximally, nigrescent distally, distinct, puberulous when young and at margins with hairs up to 0.3 mm. long, 2 mm. and 7.5 mm. long, respectively; anther sacs slightly granular, 8 to 10 mm. long; tubules wide, flexible, 18 to 19 mm. and 14 to 15 mm. long, respectively; stigma truncate.

TYPE LOCALITY: La Palma, Province of San José, Costa Rica, altitude 1,700 meters. Type collected by Wercklé (no. 53).

DISTRIBUTION: Mountains of Costa Rica and western Panama, altitude 1,700 to 2,300 meters.

COSTA RICA.

SAN JOSÉ: La Palma, *Wercklé* 53 (B, type).

PANAMA.

CHIRIQUÍ: Between Alto de las Palmas and Cerro de la Horqueta, *Pittier* 3206 (F, N); *Mason* 5446 (N).

Although the original description gives the length of the rachis as 7 cm., the type specimen is in such poor condition that in the above description I have used the Panama specimens as more illustrative of the plant's usual habit. The Panama specimens have, it is true, somewhat broader leaves and show slight differences in venation, but since they are identical with the type in flower structure I believe them to be conspecific. In foliage this species is larger than the two preceding, to which it is closely allied.

11. *Cavendishia laurifolia* (Klotzsch) Benth. & Hook. Gen. Pl. 2: 570. 1876.

Polyboea laurifolia Klotzsch, Linnaea 24: 31. 1851.

Chupalon laurifolium Kuntze, Rev. Gen. Pl. 2: 383. 1891.

Cavendishia tuerckheimii Hoer. Bot. Jahrb. Engler 42: 323. 1909.

Subscandent shrub, often epiphytic; branchlets subterete, brownish or cinereous, sparsely puberulous when young, becoming glabrous; petioles terete, minutely puberulous or glabrous, 2 to 4 mm. long; leaf blades ovate or oblong-ovate, 5 to 9 cm. long, 2 to 3.5 cm. broad, cuneate or truncate at base, acuminate at apex, entire at margins, glabrous, 5-plexi-nerved, the secondary nerves oriented near base, with the midnerve impressed above, prominent beneath, the veinlets reticulate, plane or slightly raised on both surfaces; inflorescence terminal or axillary near ends of branchlets, racemose, 10 to 30 flowered; rachis subterete, 3 to 14 cm. long, glabrous; pedicels subrugose, glabrous, 10 to 20 mm. long, each subtended by a papyraceous oblong obovate bract up to 1 cm. long, bibracteolate near base with ovate bractlets 1 to 2 mm. long, swollen at apex; calyx tube short-cylindric, 1 to 2 mm. long and about 3 mm. in diameter at anthesis, sparsely brown-puberulous or subglabrous; limb 2 to 2.5 mm. long, including lobes, the lobes triangular, apiculate, about 1 mm. long, thin-margined and sometimes sparsely glandular-margined; corolla subcylindric, 9 to 10 mm. long, about 4 mm. in diameter, contracted above, sparsely brown-puberulous or glabrous, the lobes triangular, subacute, about 1 mm. long; stamens about 7 mm. and 8 mm. long, respectively; filaments castaneous, distinct, distally puberulous, about 2 mm. and 4 mm. long, respectively; anther sacs nearly smooth, about

2 mm. long; tubules wide, about 3.5 mm. and 3 mm. long, respectively; stigma peltate.

TYPE LOCALITY: Department of Alta Verapaz, Guatemala, altitude about 2,150 meters. Type collected by Warszewicz.

DISTRIBUTION: Mountains of southern Mexico and Guatemala, altitude 800 to 2,150 meters.

MEXICO: *Ehrenberg* 630 (B).

CHIAPAS: Tumbala, *Nelson* 3350 (N), 3362 (N).

GUATEMALA.

ALTA VERAPAZ: *Warszewicz* (B, type). Cobán, *von Tuerckheim* 64 (B, type of *C. tuerckheimii*, G, N, Y), II. 1626 (F, G, N, Y). Finca Sepaculté, *Cook & Griggs* 99 (N), 129 (N). Between Panzos and Sepaculté, *Goll* 213 (F, N). Finca Mocca, *Johnson* 134 (N).

This species and the two following were considered by Klotzsch to constitute a distinct genus, *Polyboea*, a view which is somewhat supported by the undeniably close relationship between them. They are readily separated by the characters mentioned in the key. Between the two types here involved there are no important differences.

12. *Cavendishia quereme* (H. B. K.) Benth. & Hook. Gen. Pl. 2:570. 1876.

A description will be found in the section of this treatment dealing with the South American species of this genus.

TYPE LOCALITY: Near Cali, Department of El Valle, Colombia, altitude about 1,000 meters. Type collected by Humboldt and Bonpland.

DISTRIBUTION: Mountains of Costa Rica, also in the Western Cordillera of Colombia, altitude 1,000 to 1,700 meters.

COSTA RICA.

SAN JOSÉ: La Palma, *Wercklé* 11567 (N). La Hondura, *Standley* 36130 (N), 36223 (N), 36552 (N), 37593 (N), 37633 (N), 37807 (N); *Standley & Valerio* 51919 (F, N).

CARTAGO: Orosi, *Pittier* 16610 (N); *Standley* 39832 (N). El Muñeco, *Standley* 33556 (N), 33618 (N); *Standley & Torres* 51400 (N).

Evidently this species is locally common in Costa Rica; the specimens here cited seem identical with those from Colombia.

13. *Cavendishia crassifolia* (Benth.) Hemsl. Biol. Centr. Amer. Bot. 2:273. 1881.

Thibaudia crassifolia Benth. Pl. Hartw. 65. 1840.

Polyboea crassifolia Klotzsch, Linnaea 24:31. 1851.

Chupalon crassifolium Kuntze, Rev. Gen. Pl. 2:383. 1891.

Subscandent shrub, sometimes epiphytic; branchlets subterete, dark brown, glabrous; petioles terete, slightly rugose, glabrous, sometimes nigrescent, 5 to 10 mm. long; leaf blades oblong-ovate, 7 to 13 cm. long, 2.5 to 5 cm. broad, cuneate at base, caudate-acuminate at apex, entire and slightly revolute at margins, glabrous (or very sparsely pilose beneath with appressed brown hairs), 5-plexi-nerved (rarely 7-plexi-nerved), the secondary nerves oriented near base, with the midnerve slightly impressed above, prominent beneath, the veinlets reticulate, nearly plane on both surfaces; inflorescence terminal or axillary, racemose, 10 to 20 flowered; rachis subterete, glabrous, 2 to 5 cm. long; pedicels subrugose, 6 to 11 mm. long, glabrous or minutely brown-puberulous, each subtended by a membranous, oblong or obovate, glabrous bract up to 2 cm. long and 1 cm. broad (bracts deciduous), deciduously bibracteolate near base with oblong lanceolate bractlets about 2 mm. long; calyx tube slightly rugose, subcylindric or broadly campanulate, glabrous or

minutely brown-puberulous, about 2 mm. long and 3 mm. in diameter at anthesis; limb about 2 mm. long including lobes, short-pilose distally with stout brown hairs up to 0.3 mm. long, the lobes triangular, acute, about 1 mm. long, thin-margined and deciduously glandular-margined; corolla subcylindric, about 15 mm. long and 4 to 5 mm. in diameter, glabrous, the lobes triangular, subacute, about 1 mm. long; stamens 12 to 12.5 mm. long; filaments dark castaneous, distinct, sparsely puberulous at margins and ventrally distally, about 2.5 mm. and 4.5 mm. long, respectively; anther sacs nearly smooth, about 2.5 mm. long; tubules wide, 7.5 mm. and 6.5 mm. long, respectively; style slightly exerted, the stigma broadly peltate; young fruit nigrescent, subspherical, glabrous, up to 6 mm. in diameter.

TYPE LOCALITY: Totontepeque, State of Oaxaca, Mexico. Type collected by Hartweg (no. 477).

DISTRIBUTION: Mountains of southern Mexico and Guatemala, altitude 800 to 1,700 meters.

MEXICO: Alpatlahua, *Hanbury* (K).

OAXACA: Totontepeque, *Hartweg* 477 (B, K, type, Y); *Nelson* 778 (N).
Tetalcingo to Choapan, *Reko* 4096 (N).

CHIAPAS: *Ghiesbreght* 645 (G, K). Fenja, *Purpus* 10410 (N, Y).

GUATEMALA.

ALTA VERAPAZ: Between Panzos and Sepacuité, *Goll* 211 (N, Y).

14. *Cavendishia chiapensis* Brandeg. Univ. Calif. Publ. Bot. 6:188. 1915.

Shrub; branchlets subterete, cinereous, glabrous; petioles subterete, slightly rugose, glabrous or minutely puberulous, 12 to 16 mm. long; leaf blades oblong-ovate, 12 to 15 cm. long, 4 to 6 cm. broad, cuneate or truncate at base, long-acuminate at apex, entire and slightly revolute at margins, essentially glabrous above, glabrous beneath or very sparsely pilose with minute appressed nigrescent hairs, 5 to 7 pti-nerved, the secondary nerves oriented near base, with the mid-nerve slightly impressed above, prominent beneath, the veinlets reticulate, nearly plane on both surfaces; inflorescence axillary, short-racemose, 10 to 15 flowered, essentially glabrous in all parts (calyces and pedicels sometimes sparsely puberulous with minute stiff hairs), circumscribed at base by numerous deciduous papyraceous oblong bracts about 2 cm. long and 1 cm. broad; rachis angled, 2 to 2.5 cm. long; pedicels subrugose, 10 to 13 mm. long, each subtended by a deciduous bract similar to those at base of raceme, deciduously bibracteolate near base with oblong fimbriate bractlets about 2 mm. long, swollen distally; calyx tube campanulate, about 2 mm. long and 3 mm. in diameter at anthesis; limb about 2.5 mm. long including lobes, the lobes triangular, acute, about 1 mm. long, thin-margined and sparsely glandular-margined; corolla subcylindric, about 15 mm. long and 4 mm. in diameter, the lobes triangular, subacute, about 1 mm. long; stamens alternately slightly unequal; filaments imperfect in our specimens but apparently short; anther sacs slightly granular, about 2.5 mm. long; tubules wide, about 11 mm. and 9.5 mm. long, respectively; stigma peltate; young fruit somewhat nigrescent, subspherical, 5 mm. in diameter or more.

TYPE LOCALITY: Cerro del Boquerón, State of Chiapas, Mexico. Type collected by Purpus (no. 7342).

DISTRIBUTION: Known only from the type collection.

MEXICO.

CHIAPAS: Cerro del Boquerón, *Purpus* 7342 (type collection, F, G, N, Y).

15. *Cavendishia latifolia* Hemsl. Biol. Centr. Amer. Bot. 2:273. 1881.

Chupalon latifolium Kuntze, Rev. Gen. Pl. 2:383. 1891.

Shrub; branchlets subterete; petioles rugose, glabrous, about 10 mm. long; leaf blades ovate-oblong, 11 to 13 cm. long, 6 to 8 cm. broad, rounded at base, short-acuminate at apex, entire at margins, glabrous, 7-plexi-nerved, the secondary nerves oriented near base, with the midnerve slightly impressed above, raised beneath; inflorescence apparently terminal, short-racemose, glabrous in all parts, deciduously bracteate at base; rachis 3 to 4 cm. long; pedicels 10 to 12 mm. long, bracteate at base; calyx tube campanulate, the lobes broad, obtuse, glandular-ciliate; corolla subcylindric, 12 to 16 mm. long; stamens subequal, the filaments and anthers compensatingly unequal; filaments essentially distinct, slightly hirsute.

TYPE LOCALITY: Pueblo Nuevo, southern Mexico. Type collected by Linden (no. 390).

DISTRIBUTION: Known only from the type collection.

I have not seen the type specimen of this species, which is characterized as above on the basis of the original description and a photograph of the type in the herbarium of the New York Botanical Garden.

16. *Cavendishia guatemalensis* Loesener, Bull. Herb. Boiss. II. 3:221. 1903.

Shrub 2 to 4 meters high, probably epiphytic; branchlets angled, brownish or cinereous, glabrous; petioles slightly rugose, glabrous, 5 to 10 mm. long; leaf blades oblong or ovate-oblong, 10 to 15 cm. long, 3.5 to 6.5 cm. broad, rounded or truncate at base, acuminate at apex, entire and slightly revolute at margins, essentially glabrous, 7-plexi-nerved, the secondary nerves oriented near base, with the midnerve slightly impressed above, prominent beneath, the veinlets reticulate, nearly plane on both surfaces; inflorescence axillary, short-racemose, 10 to 20 flowered, circumscribed at base and surrounded, when young, by numerous bracts, the bracts broadly ovate or oblong, up to 15 mm. long and 12 mm. broad, papyraceous, densely pubescent without with appressed white hairs up to 0.4 mm. long, the hairs sometimes at margins only; rachis subterete, 2 to 3.5 cm. long, densely and persistently pubescent with lax white hairs about 0.4 mm. long; pedicels rugose, pubescent as the rachis, 8 to 12 mm. long, each subtended by a deciduous bract similar to those at base of racemes, bibracteolate near base with oblong pilose bractlets about 2 mm. long, swollen distally; calyx pilose as the pedicel, the tube broadly campanulate, about 2 mm. long and 4 mm. in diameter at anthesis, the limb about 3 mm. long including lobes, the lobes triangular, acute, 2 mm. long, margined with several erect brown glandular hairs about 0.2 mm. long; corolla subcylindric, 15 to 16 mm. long and 4 to 5 mm. in diameter, densely pilose with pale spreading hairs about 0.3 mm. long, the lobes triangular, subacute, about 1 mm. long; stamens 11 to 11.5 mm. long; filaments castaneous, loosely coherent at base, glabrous or distally puberulous, about 2 mm. and 3.5 mm. long, respectively; anther sacs nearly smooth, about 2.5 mm. long; tubules wide, 7.5 mm. and 7 mm. long, respectively; stigma peltate; young fruit subspherical, becoming subglabrous, up to 7 mm. in diameter.

TYPE LOCALITY: Jacaltenango, Department of Huehuetenango, Guatemala, altitude 2,380 meters. Type collected by Seler (no. 3107).

DISTRIBUTION: Mountains of Guatemala, altitude 1,700 to 2,400 meters.

GUATEMALA.

QUICHÉ: San Miguel Uspantán, *Heyde & Lux* 3184 (F, G, N).

HUEHUETENANGO: Jacaltenango, *Seler* 3107 (type collection, B, N, Y).

ALTA VERAPAZ: Chamá to Cobán, *Johnson* 568 (N).

ZACATEPÉQUEZ: Embaulada, *Heyde & Lux* 4532 (F, G, N).

A very distinctive species, being the only one in Central America in which the inflorescence is uniformly pubescent. Its closest relative is the South American *C. pubescens*.

17. *Cavendishia smithii* Hoer. Bot. Jahrb. Engler 42:328. 1909.

Shrub 1 to 5 meters high, sometimes epiphytic; branchlets subterete, brownish, glabrous or sparsely puberulous; petioles rugose, glabrous, 4 to 10 mm. long (rarely longer), angled or narrowly winged above; leaf blades thick-coriaceous, oblong or oblong-obovate, 6 to 11 (rarely to 17) cm. long, 2.5 to 5 (rarely to 9) cm. broad, cuneate or truncate at base, abruptly caudate-acuminate at apex, entire and slightly revolute at margins, glabrous, 5 (rarely 7) pinnerved, the secondary nerves oriented near base, with the midnerve impressed above, prominent beneath, the veinlets reticulate, plane or slightly raised on both surfaces; inflorescence axillary or terminal, short-racemose, 6 to 15 flowered, essentially glabrous in all parts, circumscribed at base and completely enveloped when young by numerous imbricate papyraceous oblong bracts up to 2 cm. long and 1 cm. broad; rachis stout, 1 to 3 cm. long at maturity; pedicels subrugose, 6 to 14 mm. long, each subtended by a deciduous bract similar to those at base of raceme, deciduously bibracteolate near base with oblong bractlets about 3 mm. long; calyx tube campanulate, sometimes very sparsely pilose, about 3 mm. long and 3 mm. in diameter at anthesis; limb about 3 mm. long including lobes, the lobes triangular, acute, sparsely pilose without and densely fimbriate with stout glandular hairs about 0.1 mm. long, the sinuses rounded; corolla 18 to 20 mm. long, about 5 mm. in diameter, slightly contracted above, the lobes triangular, subacute, about 1 mm. long; stamens about 14 mm. and 15 mm. long, respectively; filaments dark castaneous, connate in basal half, sparsely puberulous distally, 3.5 mm. and 5.5 mm. long respectively; anther sacs nearly smooth, incurved at base, 2.5 to 3 mm. long; tubules wide, 9.5 mm. and 7.5 mm. long respectively; stigma truncate; young fruit rugose, subspherical, up to 8 mm. in diameter, surmounted by the persistent calyx limb and style.

TYPE LOCALITY: Volcán Irazú, Province of Cartago, Costa Rica, altitude about 2,500 meters. Type collected by John Donnell Smith (no. 4876).

DISTRIBUTION: Mountains of Nicaragua, Costa Rica, and western Panama, altitude 1,400 to 2,700 meters.

NICARAGUA: *Wright* (G, N). Mombacho Volcano, *Maxon, Harvey & Valentine* 7768 (N).

COSTA RICA: Volcán de Barba, *Hoffmann* 53 (B). Narango, *Oersted* 8572 (Y).

HEREDIA: Yerba Buena, northeast of San Isidro, *Standley & Valerio* 49091 (N).

ALAJUELA: Volcán Poás, *J. D. Smith* 6636 (B, F, G, N, Y); *Tonduz* 10781 (N); *Jiménez* 1030 (N); *Standley* 34878 (N).

SAN JOSÉ: La Palma, *Tonduz* 7462 (F, G, N, Y), 12351 (N), 12657 (N); *Brade* 16333 (N); *Wercklé* 11597 (N), 16684 (N), 17413 (B); *Maxon & Harvey* 7913 (N), 7914 (N); *Standley* 32954 (N), 32987 (N), 32999 (N), 33071 (N), 33088 (N). Las Nubes, *Standley* 38631 (N), 38853 (N). Laguna de la Chonta, *Standley* 42287 (N).

CARTAGO: Volcán Irazú, *J. D. Smith* 4876 (type collection, G, N); *Kuntze* 2346 (N); *Stork* 1264 (F). La Carpintera, *Standley* 35698 (N); *Stork* 1161 (F).

PANAMA: Veraguas, *Bridges* (K).

This is the most common species in Central America and one which shows a good deal of variation, especially in the leaves, which sometimes reach a size

of 17 cm. by 9 cm. The above dimensions are taken from average material. The proportions of leaf length and breadth are fairly constant, but the species is not too clearly separable from the two following. Occasionally in *C. smithii* the calyx is puberulous, but never persistently so.

18. *Cavendishia veraguensis* (Klotzsch) Hemsl. Biol. Centr. Amer. Bot. 2:273. 1881.

Proclesia veraguensis Klotzsch, Linnaea 24:35. 1851.

Chupalon veraguense Kuntze, Rev. Gen. Pl. 2:383. 1891.

Shrub; branchlets subterete or angled, brownish or cinereous, when young pilose with pale spreading hairs about 0.5 mm. long, becoming glabrous; petioles subterete, pilose as the branchlets, 4 to 6 mm. long; leaf blades oblong or lanceolate-oblong, 9 to 14 cm. long, 2.5 to 4 cm. broad, cuneate or truncate at base, long-acuminate at apex, entire and slightly revolute at margins, essentially glabrous above, glabrous beneath or very sparsely puberulous on nerves at base, 5-plexi-nerved, the secondary nerves impressed above, prominent beneath, the veinlets reticulate, slightly raised on both surfaces; inflorescence axillary, short-racemose, 5 to 12 flowered, circumscribed at base and completely enveloped when young by numerous, closely imbricate, papyraceous, glabrous, oblong bracts up to 2.5 cm. long and 1.5 cm. broad; rachis subrugose, 1 to 2 cm. long, essentially glabrous; pedicels subrugose, 8 to 12 mm. long, glabrous or sparsely puberulous, each subtended by a deciduous bract similar to those at base of raceme, minutely and deciduously bibracteolate at base; calyx tube short-cylindric or campanulate, 3.5 mm. long, 4 to 5 mm. in diameter at anthesis, short-puberulous at base; limb 1 to 2 mm. long, including lobes, the lobes triangular, apiculate, less than 1 mm. long, sometimes sparsely glandular-margined; corolla cylindric, 19 to 22 mm. long, about 5 mm. in diameter, glabrous or minutely puberulous distally, the lobes triangular, subacute, about 1 mm. long; stamens 17 to 19 mm. long; filaments dark castaneous, stout, distinct, about 3 mm. and 5 mm. long, respectively, pilose, especially distally, with pale hairs up to 0.3 mm. long; anther sacs slightly granular, sometimes subpuberulous, 3.5 to 4.5 mm. long; tubules wide, flexible, about 12 mm. and 10 mm. long, respectively; stigma peltate; young fruit rugose, subspherical, up to 6 mm. in diameter, surmounted by the persistent calyx limb and style.

TYPE LOCALITY: Costa Rica. Type collected by Warszewicz.

DISTRIBUTION: Mountains of Costa Rica, altitude 1,100 to 2,800 meters.

COSTA RICA: Warszewicz (B, type). Cascajal, Lankester 107 (K).

ALAJUELA: Volcán Poás, Pittier 2033 (N, in part).

SAN JOSÉ: La Palma, Brade 2102 (B).

CARTAGO: Volcán Irazú, Oersted 8569 (N, Y). Volcán Turrialba, Pittier 7547 (13089 Herb. Nat. Cost.; F, G, N). El Rosario de Orosi, Pittier 16609 (N, Y).

Distinguished from the following only by the puberulous calyx, a character which may well be questioned as a basis of specific distinction.

19. *Cavendishia costaricensis* Hoer. Bot. Jahrb. Engler 42:326. 1909.

Slender shrub 2 to 5 meters high, sometimes epiphytic; branchlets subterete or angled, brownish, when young puberulous with spreading hairs about 0.2 mm. long, becoming glabrous; petioles subrugose, sparsely puberulous, becoming glabrous, 4 to 10 mm. long, angled above; leaf blades thick-coriaceous, oblong or ovate-oblong, 8 to 14 cm. long, 2.5 to 5 cm. broad, cuneate at base (rarely truncate or subcordate), long-acuminate at apex, entire and slightly revolute at margins, essentially glabrous, 5 to 7 plexi-nerved, the secondary nerves oriented near base, with the midnerve impressed above, prominent beneath, the vein-

lets reticulate, slightly raised or nearly plane on both surfaces; inflorescence axillary near ends of branchlets, short-racemose, 8 to 12 flowered, essentially glabrous in all parts, circumscribed at base and completely enveloped when young by numerous, imbricate, papyraceous, oblong or ovate bracts up to 2.5 cm. long and 1.5 cm. broad; rachis stout, 1 cm. long or less; pedicels subterete, 7 to 10 mm. long, each subtended by a deciduous bract similar to those at base of raceme, bibracteolate near base with narrow oblong bractlets 1 to 2 mm. long; calyx tube broadly campanulate, subrugose, about 3 mm. long and 4 mm. in diameter at anthesis; limb about 3 mm. long including lobes, the lobes triangular, acute, about 1.5 mm. long, densely margined with minute glandular hairs, sparsely glandular on exterior surfaces or glabrous; corolla subcylindric, 19 to 24 mm. long, about 5 mm. in diameter, the lobes triangular, subacute, about 1 mm. long; stamens 14 to 18 mm. long; filaments castaneous, distinct or loosely coherent at base, about 3.5 mm. and 5 mm. long, respectively, puberulous within distally with hairs up to 0.3 mm. long; anther sacs sparsely granular, 3.5 to 4 mm. long; tubules bright yellow, wide, flexible, 9 to 10 mm. and 7 to 8 mm. long, respectively; stigma peltate; young fruit rugose, up to 6 mm. in diameter, surmounted by the persistent calyx limb.

TYPE LOCALITY: La Palma, Province of San José, Costa Rica, altitude 1,550 meters. Type collected by Wercklé (no. 54).

DISTRIBUTION: Mountains of Costa Rica, altitude 1,500 to 2,400 meters.

COSTA RICA: *Brade* 2354 (B). Cerro Jucosal, *Stork* 1115 (F). Agua Caliente, *Stork* 1316 (F). San Cristóbal Road, *Stork* 2567 (F).

HEREDIA: Cerro de las Caricias, *Standley & Valerio* 52038 (N), 52276 (N), 52311 (N), 52342 (N). Cerros de Zurquí, *Standley & Valerio* 50415 (N), 50752 (N). Cerros de Las Lajas, *Standley & Valerio* 51589 (N). Yerba Buena, *Standley & Valerio* 50189 (N).

SAN JOSÉ: La Palma, *Wercklé* 54 (B, type). Laguna de la Chonta, *Standley* 42190 (F, N). North of El Copey, *Standley* 42650 (N).

CARTAGO: Cartago, *Stevens* 75 (N); *Stork* 390 (N). La Estrella, *Standley* 39469 (N). Cerro de La Carpintera, *Standley* 34329 (N), 34334 (N), 34467 (N).

20. *Cavendishia hoffmannii* Hoer. Bot. Jahrb. Engler 42: 328. 1909.

Shrub; branchlets subterete, rugose, brownish, glabrous; petioles rugose, 4 to 7 mm. long, glabrous; leaf blades oblong, coriaceous, 10 to 15 cm. long, 3.5 to 5 cm. broad, broadly cuneate at base, long-acuminate at apex, entire and often cartilaginous at margins, glabrous and impressed-punctate on both surfaces, 5-*pl*-nerved, the secondary nerves oriented near base, ascending, with the midnerve impressed above, prominent beneath, the veinlets reticulate, obscure; inflorescence axillary near ends of branchlets, subfasciculate or short-racemose (rachis rarely more than 5 mm. long), essentially glabrous in all parts, 8 to 12 flowered, circumscribed at base by numerous, imbricate, oblong or ovate, papyraceous bracts up to 25 mm. long; pedicels rugose, 5 to 10 mm. long, each subtended by a bract similar to those at base of racemes, deciduously bibracteolate near base; calyx tube subrugose, campanulate, about 3 mm. long and 3.5 mm. in diameter at anthesis, minutely pilose when young; limb about 2 mm. long including lobes, the lobes deltoid, about 1 mm. long and 3 mm. broad, sparsely deciduously glandular-margined; corolla subcylindric, about 20 mm. long and 4 mm. in diameter, the lobes oblong, about 1.5 mm. long; stamens 16 to 17 mm. long; filaments castaneous, distinct, sparsely pilose distally, 3 mm. and 6 mm. long, respectively; anther sacs slightly granular, 3 to 3.5 mm. long; tubules flexible, about 10.5 mm. and 8.5 mm. long, respectively; stigma truncate.

TYPE LOCALITY: Volcán Irazú, Province of Cartago, Costa Rica. Type collected by Hoffmann (no. 141).

DISTRIBUTION: Known only from the type collection.

COSTA RICA.

CARTAGO: Volcán Irazú, *Hoffmann* 141 (B, type).

From the two preceding species this plant is distinguished by having the leaves distinctly punctate on both surfaces. In floral characters the three species are very close, and I should hesitate to describe new species on the slender characters that evidently were considered sufficient by Hoerold.

DOUBTFUL CENTRAL AMERICAN SPECIES

CAVENDISHIA WARSZEWICZII (Klotzsch) Hemsl. *Biol. Centr. Amer. Bot.* 2:274. 1881.

Proclesia warszewiczii Klotzsch, *Linnaea* 24:35. 1851.

Chupalon warszewiczii Kuntze, *Rev. Gen. Pl.* 2:383. 1891.

TYPE LOCALITY: Mountains of Guatemala. Type collected by Warszewicz.

I have not seen the type of this species, which, according to the description, probably allies itself to *C. chiapensis*.

KEY TO SOUTH AMERICAN SPECIES

(Including Panama east of the Canal Zone)

Calyx lobes slightly imbricate, the adjoining margins narrowly overlapping.

Leaves amplexicaul at base, rounded at apex..... 1. *C. complectens*.

Leaves cuneate or subcordate at base, acuminate at apex... 2. *C. compacta*.

Calyx lobes not imbricate.

Limb of calyx erect or suberect, subcylindric, 3 to 8 mm. long, longer than tube.

Corolla pubescent, the hairs pale, 0.3 mm. long or more.

Branchlets and leaves glabrous; leaves pinnate-veined; calyx 3 or 4 times as long as broad..... 3. *C. lindauiana*.

Branchlets and lower surface of leaves hispid; leaves pinnate-veined; calyx twice as long as broad..... 4. *C. hispida*.

Corolla glabrous.

Calyx lobes callose-thickened.

Branchlets, petioles, and lower surface of leaves pilose.

5. *C. bomareoides*.

Branchlets, petioles, and lower surface of leaves glabrous.

Corolla 25 to 30 mm. long; calyx limb 3 times as long as the strongly apophysate tube..... 6. *C. splachnoides*.

Corolla 13 to 22 mm. long; calyx limb 1 to 2 times as long as the rugose subapophysate tube.

Inflorescence up to 5 cm. long at maturity; filaments connate at base or free, glabrous (Colombia).

Leaves 13 to 16 cm. long; pedicel without teeth at summit; filaments connate at base; stamens about 16 mm. long.

7. *C. amalfensis*.

Leaves 5 to 7 cm. long; pedicels surmounted by minute teeth; filaments free; stamens about 10 mm. long... 8. *C. purdiei*.

Inflorescence 10 to 14 cm. long at maturity; filaments free, the long ones pilose (Pacaraima Mountains)..... 9. *C. duidae*.

Calyx lobes not callose-thickened.

Inner bracts margined with short-stalked glands-- 10. *C. adenophora*.

Inner bracts not glandular-margined.

Leaves cordate and subamplexicaul at base, obtuse at apex.

18. *C. subamplexicaulis*.

Leaves cuneate or truncate at base, long-acuminate at apex.

Calyx limb minutely glandular-dotted.

Branchlets and leaves glabrous.

Leaves not more than 10 cm. long and 4 cm. broad; bracts membranous, obviously veined; stamens about one-third as long as corolla----- 11. *C. venosa*.

Leaves up to 20 cm. long and 6 cm. broad; bracts subcoriaceous, obscurely veined; stamens nearly as long as corolla.

12. *C. macrocephala*.

Branchlets and lower surface of leaves pale-pilose.

40. *C. glandulosa*.

Calyx limb not glandular-dotted.

Leaves large, up to 40 cm. long and 16 cm. broad; racemes 15 to 25 cm. long----- 13. *C. grandifolia*.

Leaves smaller, not more than 17 cm. long and 7 cm. broad; racemes less than 9 cm. long.

Inflorescence long-racemose, the rachis 4 to 9 cm. long at maturity ----- 14. *C. tarapotana*.

Inflorescence short, the rachis 1 cm. long or less at maturity.

Pedicels glandular-dotted, the glands short-stalked, deciduous after maturity----- 15. *C. engleriana*.

Pedicels eglandular.

Leaves 2 to 3 times as long as broad (4 to 7 cm. broad); stamens about 23 mm. long (Ecuador).

16. *C. gilgiana*.

Leaves 3 to 4 times as long as broad (about 3 cm. broad); stamens about 17 mm. long (northwestern Colombia).

17. *C. kalbreyeri*.

Limb of calyx erecto-patent, usually shorter than tube (rarely erect, then deeply cleft).

Racemes elongate, the rachis 7 to 20 cm. long at maturity.

Rachis simple, or rarely with a few short lateral branches.

Leaves strongly cordate, subamplexicaul---- 18. *C. subamplexicaulis*.

Leaves truncate or lightly subcordate, not amplexicaul.

Pedicels and rachis puberulous; corolla less than 7 mm. long; leaves up to 6 cm. long, not punctate (Colombia)----- 19. *C. spicata*.

Pedicels and rachis glabrous; corolla 11 to 13 mm. long; leaves 10 to 25 cm. long, densely punctate on both surfaces (Peru).

20. *C. punctatifolia*.

Rachis freely branched, the lateral branches elongate, 5 to 10 in number.

Flowers large, the corolla about 20 mm. long; branchlets and petioles robust; primary rachis averaging 7 mm. in diameter (Colombia).

21. *C. divaricata*.

Flowers smaller, the corolla 10 to 12 mm. long; primary rachis averaging 4 mm. in diameter (Peru and Bolivia)- 22. *C. paniculata*.

Racemes comparatively short, the rachis less than 4 cm. long, slightly longer in some specimens of nos. 26 and 37.

Corolla pubescent with pale persistent hairs.

Leaves attenuate at base; flowers solitary or in pairs, subsessile in leaf axils..... 23. *C. sessiliflora*.

Leaves cuneate, truncate, or subcordate at base; flowers several or many to an inflorescence, pediceled.

Bractlets of pedicels glandular-margined; calyx lobes fimbriate with glandular hairs; leaves rounded or obtuse at apex.

24. *C. killipii*.

Bractlets of pedicels not glandular-margined (except no. 29); calyx lobes not glandular-fimbriate (sometimes with sessile glands); leaves various at apex, seldom rounded.

Lower surface of leaves densely nigrescent-pilose (hairs about 0.2 mm. long, 5 to 8 per sq. mm. of surface (Peru).

25. *C. peruviana*.

Lower surface of leaves glabrous or pale-pilose or sparsely brown-pilose.

Leaves 7 to 9 pli-nerved, 10 to 18 cm. long, pilose beneath; calyx lobes elongate-triangular, usually slightly longer than broad..... 26. *C. pubescens*.

Leaves 5 (rarely 3 or 7) pli-nerved or pinnate-veined; calyx lobes triangular, broader than long.

Calyx tube campanulate or short-cylindric, about 3 mm. long; leaves oblong, ovate, or ovate-lanceolate.

Leaves pilose beneath; calyx lobes glandular-margined.

Corolla about 17 mm. long; leaves up to 8 cm. long, short-acuminate (acumen less than 1 cm. long).

26b. *C. pubescens microphylla*.

Corolla 12 to 14 mm. long; leaves 8 to 11 cm. long, long-acuminate (acumen 1 to 2 cm. long).

27. *C. sillarensis*.

Leaves essentially glabrous beneath; calyx lobes eglandular.

Calyx lobes triangular, 1 to 1.5 mm. long.

Leaves about twice as long as broad.

Leaves 35 to 70 mm. long, 20 to 35 mm. broad, subcordate at base (Venezuela, Colombia, and northern Ecuador)..... 28. *C. cordifolia*.

Leaves 30 to 50 mm. long, 15 to 22 mm. broad, truncate or lightly subcordate at base.

Calyx pale-pilose; leaves 5-nerved, hardly scabridulous above (Ecuador).... 29. *C. hartwegiana*.

Calyx glabrous or with a few stiff stout brown hairs; leaves 3-nerved, scabridous above (Peru).

30. *C. bracteata*.

Leaves about 3 times as long as broad, usually truncate at base, rarely lightly subcordate.

- Branchlets puberulous; leaves usually scabridulous on both surfaces (Colombia).
31. *C. scabriuscula*.
- Branchlets usually subglabrous; leaves rarely scabridulous (Peru and Bolivia).
32. *C. beckmanniana*.
- Calyx lobes apiculate, less than 1 mm. long (western Colombia)----- 33. *C. montana*.
- Calyx tube elongate, subfalcate, 6 to 7 mm. long; leaves elongate-deltoid----- 34. *C. durifolia*.
- Corolla glabrous.
- Flowers small, the corolla 5 to 10 mm. long.
- Leaves broadly ovate, 6 to 9 cm. broad, subsessile; inflorescence few-flowered, crowded in leaf axils; corolla less than 6 mm. long.
35. *C. axillaris*.
- Leaves ovate or oblong, not more than 4.5 cm. broad, petioled; inflorescence several to many-flowered; corolla 7 to 10 mm. long. Apex of leaves subacute or obtusely short-acuminate; leaves 3 to 5 cm. long----- 36. *C. guatapeensis*.
- Apex of leaves long-acuminate; leaves 7 to 13 cm. long.
Rachis 2 to 5 cm. long; pedicels 8 to 12 mm. long.
37. *C. querema*.
- Rachis less than 2 cm. long; pedicels 2 to 5 mm. long (rarely more).
Inflorescence subfasciculate; bractlets of pedicels exceeding the calyx in length; calyx campanulate, the lobes large, triangular-ovate----- 38. *C. caudata*.
- Inflorescence laxly short-racemose; bractlets absent or very small; calyx cylindric, the lobes small, triangular-apiculate----- 39. *C. oligantha*.
- Flowers larger, the corolla at least 10 mm. long.
- Calyx tube densely and uniformly covered with minute spherical glands----- 40. *C. glandulosa*.
- Calyx tube not gland-covered.
- Leaves narrowly lanceolate, up to 1 cm. broad.
41. *C. angustifolia*.
- Leaves variously shaped, more than 1.5 cm. broad.
Apex of leaves rounded (rarely obtuse). Plant robust, the branchlets stout, often angled; calyx tube usually rugose; bracts numerous----- 42. *C. obtusa*.
- Apex of leaves subacute or acuminate.
Bractlets at base of pedicels linear, 10 to 13 mm. long, glandular-margined; calyx lobes elongate-triangular, each flanked by a nigrescent elongate callose thickening.
43. *C. marginata*.
- Bractlets at base of pedicels small; calyx lobes not as above.
Venation of leaves 5-pli-nerved.
Leaves lanceolate-oblong, 5 times as long as broad (20 to 25 cm. long)----- 44. *C. rigidifolia*.
- Leaves various, 2 or 3 times as long as broad (up to 15 cm. long).

Calyx tube pilose (at least at base), the hairs pale, about 0.25 mm. long.

Leaves long-acuminate, oblong-lanceolate, 3 times as long as broad (7 to 10 cm. long); pedicels pubescent, the hairs as those of calyx tube (Colombia).

45. *C. lehmannii*.

Leaves acute, ovate, not much longer than broad (3 to 6 cm. long); pedicels essentially glabrous (Ecuador)-----

29. *C. hartwegiana*.

Calyx tube glabrous.

Corolla slender, not more than 2.5 mm. in diameter; plant of slender habit, the petioles usually less than 1 mm. in diameter-----

46. *C. gracilis*.

Corolla 3.5 mm. or more in diameter; habit stouter, the petioles averaging 1.5 mm. or more in diameter.

Bracts, young branchlets, and petioles pilose, the hairs pale, about 0.2 mm. long; leaves subpubescent on principal nerves beneath.

47. *C. pseudopubescens*.

Bracts, young branchlets, and petioles essentially glabrous.

Leaves oblong, subcordate at base, obtusely short-acuminate at apex-----

48. *C. miconioides*.

Leaves ovate-oblong, cuneate or truncate at base, acuminate at apex.

Apex of leaves acuminate (acumen usually less than 1 cm. long); leaves up to 10 (rarely 13) cm. long.

Leaves subcoriaceous, dull, sharply acuminate, predominantly ovate or lanceolate-ovate (western Colombia to Bolivia).

49. *C. acuminata*.

Leaves coriaceous, nitid, predominantly oblong (Venezuela and eastern Colombia).

50. *C. splendens*.

Apex of leaves long-acuminate (acumen about 2 cm. long); leaves 12 to 15 cm. long, dull olivaceous (Peru)---

51. *C. weberbaueri*.

Venation of leaves 7 to 9 pll-nerved.

Nerves oriented near base (rarely joined for more than 1 cm.).

Corolla up to 20 mm. long.

Calyx limb short, the lobes about 1 mm. long (Venezuela and Colombia)-----

50. *C. splendens*.

Calyx limb 2 to 4 mm. long, the lobes usually 1.5 mm. long (Peru)-----

52. *C. ulei*.

Corolla 22 to 30 mm. long.

Bracts glabrous-----

53. *C. capitata*.

Bracts pubescent without-----

54. *C. nobilis*.

Nerves oriented well above the base (coherent 3 to 5 cm.).

55. *C. urbaniana*.

1. *Cavendishia complectens* Hemsl. Biol. Centr. Amer. Bot. 2:272. 1881.

A description of this species will be found in the earlier portion of this treatment dealing with *Cavendishia* in Central America (p. 448).

TYPE LOCALITY: Costa Rica. Type collected by Endres (no. 257).

DISTRIBUTION: Western Cordillera of Colombia and Ecuador; also in Costa Rica; altitude 1,200 to 2,000 meters.

COLOMBIA.

EL CAUCA: La Gallera, Micay Valley, Killip 7909 (Y).

ECUADOR: Nono, Sodiro 92/36 (B).

The specimens here cited seem identical with those from Costa Rica, where the species is more common. It is an isolated species, not closely related to any other *Cavendishia*.

2. *Cavendishia compacta* A. C. Smith, sp. nov.

Frutex; laminis oblongis basi cuneatis vel subcordatis apice caudato-acuminatis 7-plex-nerviis; inflorescentia racemosa glabra; calycis tubo rugoso breve cylindrico, limbo suberecto quam tubo longiore 5-lobato, lobis anguste imbricatis; corolla subcylindrica; filamentis antherisque compensanter inaequalibus, filamentis subdistinctis subglabris, tubulis quam loculis duplo longioribus.

Shrub; branchlets terete, brownish, glabrous; petioles rugose, terete, 4 to 8 mm. long; leaf blades thick-coriaceous, oblong, 11 to 15 cm. long, 5 to 6 cm. broad, broadly cuneate or subcordate at base, caudate-acuminate at apex (acumen 1.5 cm. long), entire and slightly revolute at margins, glabrous, sparsely punctate on both surfaces, 7-plex-nerved, the secondary nerves oriented above base to a distance of 2 or 3 cm., ascending, with the midnerve slightly impressed above, prominent beneath, the veinlets copiously reticulate, slightly raised on both surfaces; inflorescence axillary near ends of branchlets, racemose, 10 to 15 flowered, glabrous in all parts; rachis subterete, swollen at bases of pedicels, 6 to 8 cm. long; pedicels strongly rugose, stout, 2 to 3 mm. in diameter, 2 to 4 mm. long, each subtended by a coriaceous deciduous oblong bract about 20 mm. long and 12 mm. broad; calyx tube strongly rugose, short-cylindric, about 3 mm. long and 4 mm. in diameter at anthesis; limb subcoriaceous, about 5 mm. long including lobes, the lobes ovate-oblong, rounded or obtuse, about 5 mm. long, 3 to 4 mm. broad, thickened at margins, narrowly imbricate; corolla subcylindric, 18 to 20 mm. long, about 5 mm. in diameter, the lobes oblong, subacute, 1.5 mm. long; stamens 15 to 16 mm. long; filaments subnigrescent, distinct or loosely coherent, sparsely pilose at distal margins, 2 to 3 mm. and 4 to 5 mm. long, respectively; anther sacs slightly granular, about 4.5 mm. long; tubules flexible, 10 mm. and 8.5 mm. long, respectively, opening by clefts nearly as long; stigma truncate or subpeltate; young fruit extremely rugose, up to 8 mm. in diameter, surmounted by the persistent imbricate calyx lobes.

Type in the herbarium of the Royal Botanic Gardens, Kew, collected in the Cordillera of El Chocó, Intendencia of El Chocó, Colombia, altitude 1,800 meters, 1851 to 1857, by J. Triana (no. 2699).

DISTRIBUTION: Andes of northwestern Colombia, altitude 1,400 to 1,800 meters.

COLOMBIA.

BOLÍVAR: Boca Antizales, on Río Esmeralda, Pennell 4488 (Y).

This is a species without close relatives, distinguished not only by its imbricate calyx lobes but also by its short-pedicelled flowers and coriaceous bracts. The Pennell specimen is without flowers, but is accompanied by a few corollas of a *Satyria*, which I conclude belong to Pennell 4484 (from the same locality), the type of *Satyria latifolia*.

3. *Cavendishia lindauiana* Hoer. Bot. Jahrb. Engler 42: 330. 1909.

Shrub; branchlets subterete, brownish, essentially glabrous; petioles rugose, stout, glabrous, 7 to 9 mm. long; leaf blades oblong, coriaceous, 13 to 18 cm. long, 4.5 to 6 cm. broad, cordate at base, obtusely acuminate at apex, entire and revolute at margins, glabrous, pinnate-veined, the midvein stout, slightly raised above, very prominent beneath, the secondary veins 4 or 5 to a side, oriented in basal half, arcuate-ascending, nearly plane above, raised beneath, the veinlets copiously reticulate; inflorescence axillary near ends of branchlets, racemose, 15 to 25 flowered; rachis subterete, violaceous, glabrous, 15 to 22 cm. long; pedicels rugose, slender, glabrous, about 5 mm. long when young, increasing to 40 mm. at maturity, each subtended by a submembranous glabrous oblong bract about 2 cm. long and 1 cm. broad, bibracteolate near middle, the bractlets glabrous, oblong, 2 to 3 mm. long; calyx tube rugose, cylindrical, about 5 mm. long and 3 mm. in diameter at anthesis, glabrous; limb erect, coriaceous, about 8 mm. long including lobes, the lobes deltoid, subacute, 1.5 to 2 mm. long, callose-thickened; corolla narrowly cylindrical, up to 25 mm. long, 3 to 4 mm. in diameter, densely pilose, the hairs pale, spreading, up to 0.5 mm. long; stamens 23 to 24 mm. long; filaments castaneous, slender, distinct, sparsely puberulous ventrally, 1 to 2 mm. and 9 mm. long, respectively; anther sacs slightly granular, 10 mm. and 8 mm. long, respectively; tubules flexible, scabridulous, 13 mm. and 10 mm. long, respectively; stigma truncate.

TYPE LOCALITY: Frontino, Department of Antioquia, Colombia, altitude 800 to 1,700 meters. Type collected by Lehmann (no. 7525).

DISTRIBUTION: Known only from the type collection.

COLOMBIA.

ANTIOQUIA: Frontino, *Lehmann 7525* (B, type).

This species and the following, although doubtless related to one another, are readily distinguished on key characters and are quite remote from other species.

4. *Cavendishia hispida* A. C. Smith, sp. nov.

Frutex; ramulis petiolisque decidue hispido-pilosis; laminis oblongis basi truncatis vel leviter subcordatis apice acuminatis subtus pilosis 7 ad 9 plinerviis; inflorescentia racemosa basi bracteis oblongis deciduis instructa; calycis tubo rugoso subcylindrico, limbo erecto quam tubo longiore 5-lobato, lobis triangularibus callosis; corolla cylindrica dense pubescente; filamentis antherisque compensanter inaequalibus, filamentis distinctis subglabris, tubulis quam oculis duplo longioribus.

Shrub; branchlets terete, deciduously pilose with pale brown hispid hairs about 2 mm. long; pedicels rugose, 6 to 10 mm. long, pilose as the branchlets; leaf blades oblong, 14 to 18 cm. long, 6.5 to 7.5 cm. broad, coriaceous, truncate or lightly subcordate at base, acuminate at apex, entire and narrowly revolute at margins, essentially glabrous above, pilose beneath with hairs like those of the branchlets, 7 to 9 plinerved, the secondary nerves oriented slightly above base, ascending, with the midnerve impressed above, strongly prominent beneath, the veinlets copiously reticulate, impressed above, raised beneath; inflorescence axillary, racemose, 15 to 25 flowered, deciduously bracteate at base; rachis subterete, glabrous, about 5 cm. long; pedicels striate, 5 to 8 mm. long, glabrous, each subtended by a submembranous oblong bract about 15 mm. long, deciduously bibracteolate near base; calyx tube rugose, subcylindrical, about 3 mm. long and 3 mm. in diameter at anthesis, glabrous; limb erect, coriaceous, about 4 mm. long including lobes, the lobes triangular, subacute, about 1.5 mm. long, callose-thickened; corolla cylindrical, 22 to 25 mm. long, 4 to 5 mm. in diameter, densely pubescent with spreading pale brown hairs about 1 mm.

long, the lobes triangular, about 1.5 mm. long; stamens 20 to 21 mm. long; filaments dark castaneous, slender, distinct, glabrous or slightly pilose distally, 2 mm. and 6 mm. long, respectively; anther sacs slightly granular, about 6 mm. long; tubules about 14 mm. and 10 mm. long respectively, opening by clefts nearly as long; style as long as corolla or slightly exerted, the stigma truncate or subpeltate.

Type in the herbarium of the Royal Botanic Gardens, Kew, collected at Tamaná, Intendencia of El Chocó, Colombia, altitude 250 meters, 1851 to 1857, by J. Triana (no. 2709).

DISTRIBUTION: Known only from the type collection.

Allied to *C. lindaulana*, from which it differs by the hispid lower surface of the leaves and the comparatively short calyx limb, as well as in leaf venation. It is related also to the Costa Rican *C. longiflora* Donn. Smith.

5. *Cavendishia bomareoides* A. C. Smith, sp. nov.

Frutex; ramulis saepe subscandentibus dense pubescentibus; laminis oblongis basi truncatis vel leviter cordatis apice caudato-acuminatis supra decidue puberulentis subtus constanter pilosis 7 ad 9 pli-nerviis; inflorescentia racemosa basi bracteis imbricatis glabris instructa; floribus glabris; calycis tubo rugoso, limbo erecto quam tubo longiore 5-lobato, lobis callosis; corolla subcylindrica, lobis callosis; filamentis antherisque alternatim inaequalibus, filamentis distinctis puberulis, tubulis quam loculis longioribus.

Shrub; branchlets subterete, stout, brownish, densely pubescent with pale brown spreading hairs up to 1 mm. long, becoming subglabrous; petioles subterete, pubescent as the branchlets, 4 to 7 mm. long; leaf blades oblong, coriaceous, 9 to 17 cm. long, 4 to 5.5 cm. broad, truncate or lightly cordate at base, caudate-acuminate at apex, entire and slightly revolute at margins, puberulous above with brownish hairs up to 0.3 mm. long, becoming glabrous, persistently pilose beneath with spreading hairs about 0.7 mm. long, 7 to 9 pli-nerved, the secondary nerves oriented above base, with the midnerve slightly impressed above, prominent beneath, the veinlets reticulate, slightly raised on both surfaces; inflorescence terminal or axillary, racemose, 20 to 30 flowered, circumscribed at base by numerous deciduous imbricate oblong-ovate papyraceous glabrous bracts up to 2.5 cm. long and 2 cm. broad; rachis angled, glabrous, 5 to 7 cm. long at maturity; pedicels subrugose, glabrous, 7 to 12 mm. long, each subtended by a deciduous bract similar to those at base of racemes, bilacteolate near base with oblong bractlets up to 3 mm. long; calyx tube rugose, about 3 mm. long and 3.5 mm. in diameter at anthesis, glabrous; limb erect, cylindrical, 5 to 6 mm. long including lobes, the lobes triangular, subacute, about 1 mm. long, callose-thickened at tip; corolla subcylindric, 28 to 30 mm. long, about 5 mm. in diameter, membranous, glabrous, the lobes triangular, subacute, about 1 mm. long, callose-thickened at tip; stamens about 27 mm. long; filaments castaneous, slender, distinct, puberulous distally within with pale lax hairs about 0.4 mm. long, 2 mm. and 8 mm. long, respectively; anther sacs slightly granular, 10 mm. and 8 mm. long, respectively; tubules flexible, 16 mm. and 13 mm. long, respectively, opening by clefts nearly one-half their length; stigma truncate; young fruit extremely rugose, surmounted by the persistent calyx limb.

Type in the herbarium of the New York Botanical Garden, collected on rocky stream bank in forest, Río San Rafael, below Cerro Tatamá, Department of Caldas, Colombia, altitude 2,500 to 2,800 meters, September 7 to 11, 1922, by F. W. Pennell (no. 10402).

DISTRIBUTION: Western Cordillera of Colombia and southern Darién, altitude 500 to 2,800 meters.

PANAMA.

DARIÉN: Cerro de Garagará, Sambú Basin, *Pittier* 5651 (N).

COLOMBIA.

EL CHOCÓ: Dauro, *Toro* 1172 (Y).

The three specimens above cited show some variation, but in all essential characters they seem to me conspecific. The *Toro* collection has the leaves cordate at base, slightly different in texture, and with less pubescence. This species and the four following, of which two also are here described for the first time, form a coherent group of the genus by virtue of their elongate calyx limb with thickened lobes. They are readily distinguished from one another by the characters indicated in the key. The northeastern Andes of Colombia have yielded a surprisingly large number of new species of this genus, but owing to the paucity of herbarium material from this rich region it is as yet impossible to say whether or not these are purely local in distribution. The present species is marked by having the branchlets and the petioles and lower surface of the leaves pilose.

6. *Cavendishia splachnoides* A. C. Smith, sp. nov.

Frutex; laminis oblongis basi truncatis vel leviter subcordatis apice caudato-acuminatis glabris pinnatinerviis; inflorescentia racemosa glabra basi decidue bracteata; calycis tubo rugoso valde apophysato, limbo erecto quam tubo triplo longiore, lobis callosis; corolla subcylindrica; filamentis antherisque compensanter inaequalibus, tubulis quam loculis longioribus.

Shrub; branchlets subterete, brownish, glabrous; petioles slightly rugose, 5 to 7 mm. long, sparsely pilose ventrally or glabrous; leaf blades coriaceous, oblong, 9 to 16 cm. long, 3.5 to 6 cm. broad, truncate or lightly subcordate at base, caudate-acuminate at apex, entire and narrowly revolute at margins, glabrous, pinnate-veined, the midvein slightly impressed or plane above, prominent beneath, the secondary veins 2 or 3 to a side, arcuate-ascending, slightly impressed above, raised beneath, the veinlets reticulate, slightly raised on both surfaces; inflorescence subterminal, racemose, 18 to 30 flowered, deciduously bracteate at base, glabrous in all parts; rachis angled, 5 to 9 cm. long; pedicels subterete, 17 to 20 mm. long, each subtended by a deciduous papyraceous oblong bract up to 1.5 cm. long and 1 cm. broad, deciduously bibracteolate near base with bractlets up to 3 mm. long, slightly swollen distally; calyx subcylindric, strongly apophysate at base, the tube strongly rugose, about 2 mm. long and 6 mm. in diameter across the apophysis at anthesis, the limb erect, 6 to 7 mm. long including lobes, the lobes triangular, acute, about 1.5 mm. long, callose-tipped; corolla subcylindric, membranous, 25 to 30 mm. long, 5 to 6 mm. in diameter; stamens about 22 mm. long; filaments castaneous, imperfect in our specimen; anther sacs slightly granular, about 8 mm. and 6 mm. long, respectively; tubules flexible, pale red, about 12 mm. and 10 mm. long, respectively, opening by clefts more than half as long; stigma truncate.

Type in the U. S. National Herbarium, no. 715,929, collected on Cerro de Garagará, Sambú Basin, southern Darién, Panama, altitude 500 to 974 meters, February 7, 1912, by H. Pittier (no. 5647). Another collection from the same locality is *Pittier* 5659 (N).

DISTRIBUTION: Known only from the type locality.

In no other species that I have seen is the calyx so strikingly apophysate as here; the specific name refers to *Splachnum*, a genus of mosses with an apophysate capsule. The above flower dimensions are taken from the only available flower. There is probably some variation. It is not possible to say whether the filaments are free or coherent, pubescent or glabrous.

7. *Cavendishia amalfiensis* Mansf. Notizbl. Bot. Gart. Berlin 9:440. 1925.

Shrub with elongate branches; branchlets terete, cinereous or brownish, glabrous; petioles rugose, glabrous, 4 to 5 mm. long; leaf blades oblong, coriaceous, glabrous, somewhat shining, 13 to 16 cm. long, 3 to 5 cm. broad, subcordate at base, long-acuminate at apex, entire at margins, pinnate-veined, the midvein slightly raised above, prominent beneath, the secondary veins 3 or 4 to a side, the basal pair ascending, the upper pair subspreading, nearly plane above, slightly raised beneath, the veinlets reticulate, slightly raised above; inflorescence axillary near ends of branchlets, racemose, 8 to 12 flowered, glabrous in all parts, deciduously bracteate at base; rachis subterete, striate, about 3 cm. long; pedicels striate, 5 to 10 mm. long, each subtended by a deciduous membranous oblong bract up to 20 mm. long and 12 mm. broad, minutely bibracteolate near base, swollen distally; calyx tube subrugose, slightly apophysate, about 1.5 mm. long and 4 mm. in diameter at anthesis; limb erect, about 4 mm. long including lobes, the lobes triangular, subacute, 1 to 1.5 mm. long, callose-thickened at tip; corolla submembranous, cylindric, about 18 mm. long and 5 mm. in diameter, the lobes triangular, about 1.5 mm. long; stamens equal, about 16 mm. long; filaments membranous, loosely coherent, castaneous, essentially glabrous, about 2 mm. and 5 mm. long, respectively; anther sacs slightly granular, about 5 mm. long; tubules flexible, scabridulous, 9 mm. and 7 mm. long, respectively; stigma truncate.

TYPE LOCALITY: Amalfi, Department of Antioquia, Colombia, altitude about 1,750 meters. Type collected by Kalbreyer (no. 1669).

DISTRIBUTION: Known only from the type collection.

COLOMBIA.

ANTIOQUIA: Amalfi, *Kalbreyer 1669* (B, type, K).

8. *Cavendishia purdiei* A. C. Smith, sp. nov.

Frutex gracilis; laminis oblongis vel lanceolato-oblongis basi truncatis vel leviter subcordatis apice longe acuminatis glabris 5-plexi-nerviis; inflorescentia subfasciculata basi bracteis submembranaceis oblongis instructa; pedicellis apice dentes minimos gerentibus; calycis tubo rugoso, limbo erecto quam tubo longiore, lobis triangularibus apice callosis; corolla subcylindrica; filamentis antherisque compensanter inaequalibus, filamentis distinctis subglabris, tubulis quam loculis duplo longioribus.

Slender shrub; branchlets terete, striate, brownish, minutely puberulous, becoming glabrous; petioles slender, 2 to 3 mm. long, essentially glabrous; leaf blades oblong or lanceolate-oblong, 5 to 7 cm. long, 1.2 to 2 cm. broad, truncate or lightly subcordate at base, long-acuminate at apex, entire at margins, glabrous, thin-coriaceous, 5-plexi-nerved, the secondary nerves oriented above base, sharply ascending, with the midnerve slightly impressed above, raised beneath, the veinlets copiously reticulate, slightly raised above, prominent beneath; inflorescence axillary near ends of branchlets, subfasciculate, 2 to 5 flowered, circumscribed at base by several submembranous oblong bracts about 2 cm. long, glabrous in all parts; pedicels terete, 3 to 5 mm. long, bracteolate (?), swollen distally and surmounted at apex by a ring of minute cartilaginous teeth; calyx tube rugose, subcylindric, about 2 mm. long and 1.5 mm. in diameter at anthesis; limb erect, subcoriaceous, about 3 mm. long including lobes, the lobes triangular, about 1.5 mm. long and broad, callose-thickened at tip; corolla membranous, subcylindric, 13 to 15 mm. long, about 3 mm. in diameter, the lobes triangular, about 1 mm. long; stamens equal, about 10 mm. long; filaments castaneous, distinct, essentially glabrous, about 1.5 mm. and 4 mm. long, respectively; anthers about 9 mm. and 7 mm. long, respectively, the sacs

slightly granular, about 3 mm. long, the tubules opening by clefts most of their length; stigma truncate.

Type in the herbarium of the Royal Botanic Gardens, Kew, collected in Colombia by W. Purdie.

DISTRIBUTION: Unknown; the type, which is the only specimen yet seen, is without precise data.

Related to the preceding but distinguished by the smaller size of all its parts. It is unfortunate that the specimen is in rather poor condition and that the exact locality is unknown, but there is no doubt that it represents a previously undescribed species.

9. *Cavendishia duidae* A. C. Smith, Bull. Torrey Club 58: 443. 1931.

Low shrub with slender branches; branchlets terete, glabrous; petioles stout, 4 to 7 mm. long, glabrous or subpuberulous; leaf blades coriaceous, ovate-oblong or ovate-lanceolate, 6 to 10 cm. long, 3 to 5.5 cm. broad, glabrous, rounded to a subcordate or truncate base, acuminate at apex, entire and somewhat reflexed at margins, 5-plexi-nerved, the primary nerves impressed above, prominent beneath, the veinlets reticulate, raised above, plane beneath; flowers in terminal racemes, the rachis subterete, glabrous, up to 11 cm. long when mature; bracts papyraceous, pale red, glabrous, ovate, 15 to 25 mm. long, 12 to 15 mm. broad, rounded at apex, entire or crenulate at margins, with 5 to 8 subparallel veins, deciduous; pedicels stout, subterete, glabrous, 8 to 12 mm. long, bracteolate near base; calyx tube cylindrical, about 2 mm. long, rugose at base; limb campanulate, 2 to 2.5 mm. long, the lobes triangular, subacute, cartilaginous; corolla membranaceous, cylindrical, 18 to 22 mm. long, about 3 mm. in diameter at base; stamens 16 to 17 mm. long, the filaments and anthers compensatingly unequal; filaments loosely connate at base, glabrous or sparsely short-pilose, 2 mm. and 3 to 4 mm. long, respectively; anther sacs slightly granular, about 5.5 mm. and 4.5 mm. long, respectively; tubules membranous, about 11 mm. and 9 mm. long, respectively; style shorter than corolla, the stigma truncate.

TYPE LOCALITY: Summit of Mount Duida, State of Amazonas, Venezuela, altitude about 1,100 meters. Type collected by G. H. H. Tate (no. 1048).

DISTRIBUTION: Pacaraima Mountains of southern Venezuela and British Guiana.

BRITISH GUIANA: (Probably vicinity of Mount Roraima), *Schomburgk* 1018 (K). VENEZUELA.

AMAZONAS: Summit of Mount Duida, *Tate* 703 (Y), 1048 (Y, type). Cerro Yapacana, upper Río Orinoco, 1,000 to 1,200 meters, *Holt & Blake* 708 (N, Y).

BRAZILIAN-VENEZUELAN BOUNDARY: Western foothills of Serra Imeri, near Salto de Huá, *Holt & Blake* 489 (N, Y).

This beautiful plant is the only species of *Cavendishia* yet known from the Pacaraima Mountains; it is to be anticipated from the region between Mount Roraima and Mount Duida. The Schomburgk specimen has slightly narrower leaves.

From its allies the present species is distinguished by its elongate inflorescence and pilose long filaments, as well as by leaf characters.

10. *Cavendishia adenophora* Mansf. Notizbl. Bot. Gart. Berlin 9: 439. 1925.

Subscandent shrub; branchlets subterete or angled, brownish, glabrous; petioles subrugose, 3 to 10 mm. long; leaf blades thick-coriaceous, ovate or oblong-ovate, 7 to 12 cm. long, 3 to 6 cm. broad, truncate, cuneate or rarely subcordate at base, obtuse or subacute at apex, entire and slightly revolute at margins, glabrous, 5 to 7 pli-nerved, the secondary nerves oriented above base, with the midnerve slightly impressed above, prominent beneath, the veinlets

copiously reticulate, slightly raised on both surfaces; inflorescence terminal or axillary, appearing subfasciculate (rachis stout, not more than 1 cm. long), 8 to 15 flowered, circumscribed at base and enveloped when young by numerous imbricate obovate papyraceous bracts up to 3 cm. long and 2 cm. broad; pedicels subterete, glabrous, 5 to 8 mm. long, each subtended by a bract similar in texture to those at base of inflorescence but narrower and persistently margined with numerous stalked glands (glands nigrescent, subspherical, about 0.3 mm. in diameter, supported on stalks about 0.4 mm. long), deciduously bibracteolate near base; calyx tube strongly rugose, coriaceous, subcylindric, about 5 mm. long and 5 mm. in diameter at anthesis; limb erect, about 5 mm. long including lobes, the lobes triangular, acute, about 1 mm. long, each flanked by two linear glands; corolla subcylindric, about 19 mm. long and 5 mm. in diameter, the lobes triangular, subacute, about 1 mm. long; stamens about 15 mm. long; filaments castaneous, distinct or loosely coherent at base, sparsely puberulous within and at margins distally, 2.5 mm. and 7 mm. long, respectively; anther sacs slightly granular, 5 to 6 mm. long; tubules wide, 8 mm. and 5 mm. long, respectively; stigma peltate.

TYPE LOCALITY: Caldera, Department of Antioquia, Colombia, altitude 1,500 to 1,850 meters. Type collected by Kalbreyer (no. 1306).

DISTRIBUTION: Western and Central Cordilleras of Colombia, altitude 1,500 to 2,800 meters.

COLOMBIA: *Dawe* 846 (N). Hatice, *Lehmann* K168 (K). Las Juntas, *Lehmann* K169 (K). Western Cordillera, *Dawe* 849 (K, Y).

ANTIOQUIA: *Jervis* (K). Caldera, *Kalbreyer* 1306 (B, type, K).

CALDAS: Río San Rafael, below Cerro Tatamá, *Pennell* 10401 (Y).

EL VALLE: La Cumbre, *Pennell & Killip* 5796 (N, Y); *Killip* 11376 (Y).

By its glandular-margined bracts and its nitid coriaceous leaves this species is immediately distinguished from its allies. The specimens from La Cumbre differ from typical material in having the leaf apex caudate-acuminate and the leaves darker in color. The same glandular bracts and characteristic calyx are evidenced, however. The calyx is said to be pink, and the corolla violet or "blue and white."

11. *Cavendishia venosa* A. C. Smith, sp. nov.

Frutex gracilis; laminis papyraceis oblongo-lanceolatis basi cuneatis apice longe acuminatis glabris 5-plex-nerviis; inflorescentia breviter racemosa basi bracteis numerosis oblongo-spathulatis manifeste venosis instructa; floribus glabris; calycis limbo parce glanduloso quam tubo duplo longiore; corolla glabra vel parce glandulosa; staminibus brevibus alternatim inaequalibus, tubulis loculos subaequantibus.

Slender shrub; branchlets terete, rugose, essentially glabrous; petioles slender, subrugose, glabrous, 2 to 3 mm. long; leaf blades papyraceous, oblong-lanceolate, 7 to 10 cm. long, 2 to 3 cm. broad, cuneate at base, long-acuminate at apex, entire at margins, glabrous, 5-nerved from base, the nerves nearly plane above, raised beneath, the veinlets copiously reticulate, raised on both surfaces; inflorescence axillary or subterminal, short-racemose (rachis stout, 5 to 10 mm. long), 8 to 15 flowered, circumscribed at base and enveloped when young by numerous imbricate, oblong-spatulate, submembranous, longitudinally veined bracts up to 4 cm. long and 1 cm. broad; pedicels terete, glabrous, 4 to 6 mm. long, each subtended by a bract similar to those at base of inflorescence; calyx tube coriaceous, campanulate or subglobose, about 2.5 mm. in diameter, glabrous; limb erect, sparsely nigrescent, glandular-dotted, about 6.5 mm. long including lobes, the lobes elongate-triangular, about 2 mm. long, sparsely glandular-margined, the sinuses rounded; corolla submembranous, gla-

brous or sparsely glandular-dotted, about 26 mm. long and 3 mm. in diameter, the lobes triangular, about 1 mm. long; stamens incomplete in our specimens but apparently about one-third as long as corolla, the short anthers about 7 mm. long, the tubules about half as long, opening by elongate clefts, the long anthers and style not seen.

Type in the herbarium of the Royal Botanic Gardens, Kew, collected in Colombia or Ecuador by E. André.

DISTRIBUTION: Andes of Colombia and Ecuador, probably limited to the region between Popayán and Quito.

COLOMBIA.

NARIÑO: Altaquer, André (K).

ECUADOR: Río Pilatón, Sodiro 92/20 (B). Armada, André 3430 (K).

The specimen designated as the type is the best of the above, although it is completely without geographic data. The species is keyed with the following because of the presence of minute glands upon the calyx, although the two are not very closely allied naturally. The present species bears a close superficial resemblance to *C. purdiei*, from which it can readily be distinguished by the lack of callose-tipped calyx lobes and the presence of glands. The thin obviously veined bracts are also characteristic of *C. venosa*.

12. *Cavendishia macrocephala* A. C. Smith, sp. nov.

Frutex robustus; laminis oblongis basi truncatis apice acuminatis glabris 5 ad 7-plinerviis; inflorescentia breviter racemosa basi bracteis magnis oblongis subcoriaceis instructa; floribus glabris; calycis parce nigrescento-glandulosi limbo quam tubo longiore; corolla cylindrica; filamentis antherisque compensanter inaequalibus, filamentis puberulentis, tubulis quam loculis 2 ad 3-plo longioribus.

Robust shrub; branchlets angled, brownish, essentially glabrous; petioles subrugose, glabrous, 5 to 8 mm. long; leaf blades oblong, 12 to 20 cm. long, 4.5 to 6 cm. broad, truncate or lightly subcordate at base, acuminate at apex, entire and slightly revolute at margins, coriaceous, glabrous, 5 to 7 pli-nerved, the secondary nerves oriented near base, with the midnerve impressed above, prominent beneath, the veinlets reticulate, plane or slightly raised on both surfaces; inflorescence axillary, short-racemose, appearing subfasciculate (rachis stout, rarely up to 1 cm. in length), 8 to 12 flowered, circumscribed at base and enveloped when young by numerous imbricate subcoriaceous oblong bracts up to 4 cm. long and 2 cm. broad; pedicels rugose, glabrous, 5 to 8 mm. long, each bracteate at base and bibracteolate near base, the bractlets lanceolate, 3 to 7 mm. long; calyx tube prismatic, coriaceous, about 4 mm. long and 3 mm. in diameter at anthesis, glabrous or sparsely glandular; limb erect, 6 to 7 mm. long, sparsely nigrescent glandular-dotted, the lobes lanceolate-triangular, 3 mm. long, 1.5 to 2 mm. broad, membranous at margins and sparsely glandular-fimbriate; corolla cylindric, thin-carnose, glabrous, 22 to 25 mm. long, 4 to 5 mm. in diameter, the lobes triangular, about 1 mm. long; stamens about 22 mm. long; filaments dark castaneous, loosely coherent at base, puberulous within with hairs about 0.2 mm. long, 3 mm. and 7 mm. long, respectively; anther sacs slightly granular, about 5 mm. long; tubules wide, flexible, 16 mm. and 11 mm. long, respectively; stigma truncate.

Type in the herbarium of the Royal Botanic Gardens, Kew, collected at La Ceja, Quindío Region, Department of Tolima, Colombia, altitude 3,200 meters, March 10, 1876, by E. André (no. 2255).

DISTRIBUTION: Central Cordillera of Colombia.

COLOMBIA: Linden 949 (K).

A robust plant, readily identified by the minute glands of the calyx, the large bracts, and the ample leaves.

13. *Cavendishia grandifolia* Hoer. Bot. Jahrb. Engler 42:321. 1909.

Robust shrub; branchlets stout, angled, brownish, essentially glabrous; petioles strongly rugose, stout, about 4 mm. in diameter, 18 to 23 mm. long, glabrous; leaf blades thick-coriaceous, oblong or ovate-oblong, 30 to 40 cm. long, 12 to 16 cm. broad, cuneate at base, sharp-acuminate at apex, entire and slightly revolute at margins, on both surfaces glabrous or sparsely pilose with pale stiff hairs about 0.7 mm. long, more noticeably pilose beneath, 7-nerved from base, the principal nerves stout, slightly raised above, prominent beneath, each pinnate-nerved with several pairs of ascending or spreading secondary nerves raised on both surfaces, the veinlets reticulate, slightly raised on both surfaces; inflorescence axillary, long-racemose, deciduously bracteate at base, essentially glabrous in all parts; rachis stout, striate, 15 to 25 cm. long; pedicels strongly rugose, 20 to 25 mm. long, deciduously bibracteolate, swollen distally; calyx strongly rugose, the tube apophysate, 1 to 1.5 mm. long, 5 to 6 mm. in diameter, the limb erect, about 5 mm. long including lobes, the lobes triangular, thickened at margins, about 1.5 mm. long and 3 mm. across; other flower parts not seen, but described as: "corolla cyhndrico-tubulosa, membranaceo-carnosa, 3.0 cm. longa et 0.4 cm. diam., 5-dentata; dentes triangulares, obtusi, induplicato-valvati; stamina 10 corolla paulo breviora superne subaequilonga, filamentis basi in tubum connatis, 0.1 et 0.9 cm. longis; antherarum inferiores partes 1.3 et 1.1 cm. longae tubulis 2 distinctis 1.5 et 0.9 cm. longis pollen rima longa demittentibus; ovarium 5-loculare; stylus filiformis stigmatate truncatulo; discus cupuliformis."

TYPE LOCALITY: Angamarca, near Pangoa, Ecuador. Type collected by Sodiro (no. 92/18c).

DISTRIBUTION: Known only from the type collection.

ECUADOR: Angamarca, near Pangoa, Sodiro 92/18c (B, type).

The magnificent large leaves of this species distinguish it immediately from all others of the genus.

14. *Cavendishia tarapotana* (Meissn.) Benth. & Hook. Gen. Pl. 2:570. 1876.

Thibaudia tarapotana Meissn. in Mart. Fl. Bras. 7:126. 1863.

Chupalon tarapotanum Kuntze, Rev. Gen. Pl. 2:384. 1891.

Shrub; branchlets terete, brownish, slender, glabrous; petioles subterete, glabrous, 7 to 9 mm. long; leaf blades thick-coriaceous, oblong, 9 to 13 cm. long, 3.5 to 5 cm. broad, cuneate at base, caudate-acuminate at apex (acumen about 1.5 cm. long), entire and slightly revolute at margins, glabrous, 5-pinnerved, the secondary nerves oriented near base, with the midnerve slightly impressed above, prominent beneath, the veinlets reticulate, plane on both surfaces; inflorescence axillary or terminal, laxly racemose, 8 to 12-flowered, deciduously bracteate at base, essentially glabrous in all parts; rachis terete, somewhat flexuose, 3 to 6 cm. long; pedicels subterete, slightly rugose, 8 to 14 mm. long, each subtended by a deciduous oblong-obovate papyraceous bract up to 1.5 cm. long and 1 cm. broad, deciduously bibracteolate near base; calyx tube subcylindric, slightly apophysate at base and produced below articulation, about 2 mm. long and 3.5 mm. in diameter at anthesis; limb erect, about 5 mm. long including lobes, the lobes triangular, subacute, 1.5 to 2 mm. long, laterally callose-margined; corolla subcylindric, 18 to 19 mm. long, about 4 mm. in diameter, contracted distally, the lobes triangular, subacute, about 1 mm. long; stamens about 13 mm. and 14 mm. long, respectively; filaments dark castaneous, membranous, distinct, glabrous or sparsely puberulous within distally, 3 mm. and 7 mm. long, respectively; anther sacs slightly granular, 4 to 5 mm. long; tubules flexible, 6 mm. and 4.5 mm. long, respectively; stigma peltate; young

fruit cylindrical-sub spherical, about 5 mm. in diameter, surmounted by the persistent withered calyx limb.

TYPE LOCALITY: Río Mayo, near Tarapoto, Department of San Martín, Peru. Type collected by Spruce (no. 4302).

DISTRIBUTION: Rare, on the eastern slopes of the Andes, Colombia to Peru, altitude 1,200 to 1,700 meters.

COLOMBIA.

NORTE DE SANTANDER: Batatal, between Ocaña and Pamplona, *Kalbreyer* 905 (B, K).

ECUADOR: *Spruce* 5074 (G, K, Y).

TUNGURAGUA: Palmera, Río Pastaza, *Tate* 670 (N).

PERU.

SAN MARTÍN: Río Mayo, near Tarapoto, *Spruce* 4302 (K, type, Y).

A very well marked species, of unusual distribution; the Colombian specimens appear quite identical with those from farther south. The calyx limb is only slightly longer than the tube, yet the affinities of the plant appear to be in this section of the genus.

15. *Cavendishia engleriana* Hoer. Bot. Jahrb. Engler 42:327. 1909.

Subscandent shrub; branchlets subterete, striate, brownish, glabrous; petioles terete, glabrous, 6 to 8 mm. long; leaf blades coriaceous, glabrous, oblong, 10 to 14 cm. long, 3 to 4 cm. broad, broadly cuneate or truncate at base, caudate-acuminate at apex, entire and narrowly revolute at margins, 5-nerved from base, the second and third nerves ascending to apex, the fourth and fifth nerves close to margins about half their length, with the midnerve plane or slightly impressed above, prominent beneath, the veinlets reticulate, raised on both surfaces; inflorescence axillary, subfasciculate (rachis stout, not more than 5 mm. long), 5 to 8 flowered, circumscribed at base and enveloped when young by numerous imbricate submembranous ovate-oblong bracts up to 3 cm. long and 1.5 cm. broad; pedicels stramineous, sharply angled, stout, 10 to 13 mm. long, bearing numerous short-stalked glands, each subtended by a deciduous bract, slightly swollen distally; calyx tube strongly rugose, coriaceous, glabrous, much enlarged, broadly campanulate, 3 mm. long, 6 to 7 mm. in diameter at anthesis; limb erect, coriaceous, about 7 mm. long including lobes, the lobes deltoid, acute, 1.5 to 2 mm. long, nigrescent and callose-thickened at margins; corolla thin-carnose, glabrous, cylindrical, about 30 mm. long and 4 mm. in diameter; stamens 27 to 28 mm. long; filaments castaneous, distinct, sparsely pilose distally, 1.5 mm. and 10 to 11 mm. long, respectively; anther sacs granular, 9 to 10 mm. long; tubules scabridulous, 18 mm. and 9 mm. long, respectively.

TYPE LOCALITY: Río Pilatón, Ecuador. Type collected by Sodiro (no. 92/19, in part).

DISTRIBUTION: Known only from the type collection.

ECUADOR: Río Pilatón, *Sodiro* 92/19, in part (B, type).

Very closely related to the following, from which it is distinguished by the glandular pedicels, the extraordinarily rugose calyces, and the slightly narrower leaves.

16. *Cavendishia gilgiana* Hoer. Bot. Jahrb. Engler 42:327. 1909.

Robust shrub; branchlets slender, subterete, brownish, glabrous; petioles subrugose, terete, 6 to 9 mm. long; leaf blades oblong, coriaceous, glabrous, 12 to 16 cm. long, 4 to 6.5 cm. broad, cuneate at base, caudate-acuminate at apex (acumen 2 to 3 cm. long), entire and slightly revolute at margins, 5-parallel-nerved, the secondary nerves oriented near base (second and third nerves ascending to apex), with the midnerve slightly impressed above, prominent beneath, the

veinlets reticulate, plane or slightly raised on both surfaces; inflorescence axillary, appearing subfasciculate (rachis about 1 cm. long), 5 to 10 flowered, circumscribed at base and enveloped when young by several imbricate papyraceous oblong-ovate bracts up to 3 cm. long and 2 cm. broad; pedicels rugose, 10 to 15 mm. long, each subtended by a large bract, deciduously bibracteolate near base, the bractlets lanceolate, about 4 mm. long; calyx tube rugose, short-cylindric, about 3 mm. long and 5 mm. in diameter at anthesis; limb erect, about 6 mm. long including lobes, the lobes triangular, about 1 mm. long and 3 mm. broad, thick-margined; corolla thin-carnose, cylindric, about 25 mm. long and 4 mm. in diameter, the lobes triangular, 1.5 mm. long; stamens 22 to 23 mm. long; filaments castaneous, distinct, sparsely puberulous within, 2 mm. and 6 to 7 mm. long, respectively; anther sacs slightly granular, 5 to 6 mm. long; tubules membranous, flexible, 16 mm. and 11 mm. long, respectively; stigma truncate or subpeltate.

TYPE LOCALITY: Alaspongo, Mount Pichincha, Province of Pichincha, Ecuador. Type collected by Sodiro (no. 92/18c).

DISTRIBUTION: Andes of northern Ecuador (and southern Colombia?).

COLOMBIA OR ECUADOR: Mindo, *André* 3841 (K). Piedra ancha, *André* 3458 (K). **ECUADOR:** Napa, *Sodiro* 92/19 (B, in part).

PICHINCHA: Alaspongo, Mount Pichincha, *Sodiro* 92/18c (B, type).

Probably this species is more remote from the following than is indicated in the key. However, they bear a strong superficial resemblance to each other and appear distinguishable only on points of degree.

17. *Cavendishia kalbreyeri* Mansf. Notizbl. Bot. Gart. Berlin 9: 441. 1925.

Subscandent shrub; branchlets subterete, striate, slender, glabrous; petioles subnigrescent, terete, 4 to 5 mm. long; leaf blades coriaceous, glabrous, oblong, 10 to 12 cm. long, 2.5 to 3.5 cm. broad, cuneate or subattenuate at base, long-acuminate at apex, entire at margins, 5-plexi-nerved, the secondary nerves ascending, oriented slightly above base, with the midnerve nearly plane above, raised beneath, the veinlets reticulate, plane on both surfaces; inflorescence axillary, subfasciculate (peduncle stout, not more than 5 mm. long), 4 to 8 flowered, circumscribed at base and enveloped when young by numerous submembranous oblong bracts up to 3 cm. long and 1 cm. broad, glabrous in all parts; pedicels rugose, 5 to 7 mm. long, each subtended by a large bract, bibracteolate near base, the bractlets oblong-lanceolate, 2 mm. long, deciduously glandular-margined; calyx tube coriaceous, subcylindric, about 3.5 mm. long and 4 mm. in diameter at anthesis; limb erect, about 6 mm. long including lobes, the lobes deltoid, acute, about 2 mm. long, thickened at margins; corolla submembranous, cylindric, up to 23 mm. long and 4 mm. in diameter, the lobes about 1 mm. long; stamens about 17 mm. long; filaments dark castaneous, distinct, glabrous or sparsely puberulous within, 2 mm. and 5 mm. long, respectively; anther sacs slightly granular, 5 to 6 mm. long; tubules submembranous, scabridulous, 11 to 12 mm. and 7 to 8 mm. long, respectively; stigma subpeltate.

TYPE LOCALITY: San José, Department of Antioquia, Colombia, altitude about 2,900 meters. Type collected by Kalbreyer (no. 1620).

DISTRIBUTION: Known only from the type collection.

COLOMBIA.

ANTIOQUIA: San José, *Kalbreyer* 1620 (B, type, K).

18. *Cavendishia subamplexicaulis* A. C. Smith, sp. nov.

Frutex humilis; laminis coriaceis subsessilibus oblongis basi cordatis subamplexicaulibusque apice obtusis plexi-nerviis; inflorescentia longe racemosa glabra ubique decidue bracteata; calycis rugosi subapophysati limbo tubum

aequante, lobis apiculatis; corolla subcylindrica; staminibus alternatim leviter inaequalibus, filamentis distinctis ad margines pilosis, tubulis quam loculis paullo longioribus.

Low shrub; branchlets subterete, brownish, glabrous; petioles subterete, glabrous, 2 to 3 mm. long; leaf blades coriaceous, appearing sessile, oblong, 7 to 10 cm. long, 3 to 6 cm. broad, strongly cordate and subamplexicaul at base, obtuse at apex, entire at margins, glabrous, sparsely punctate beneath, pinnerved, the lateral veins 4 to 6 to a side, the basal pairs spreading, the upper pairs oriented near base, ascending, with the midnerve nearly plane above, raised beneath, the veinlets reticulate, slightly raised on both surfaces; inflorescence terminal or axillary, racemose, 15 to 30 flowered, deciduously bracteate at base, glabrous in all parts; rachis stout, 3 to 4 mm. in diameter, terete, 7 to 9 cm. long at maturity; pedicels 3 or 4 per centimeter of rachis, subterete, 10 to 15 mm. long, each subtended by a deciduous oblong or obovate papyraceous bract up to 2.5 cm. long and 1.2 cm. broad, deciduously bibracteolate near base with ovate-oblong bractlets about 5 mm. long, swollen distally; calyx slightly rugose, greenish yellow, slightly apophysate at base, the tube short-cylindric, about 3 mm. long and 4 to 5 mm. in diameter at anthesis, the limb erect, about 3 mm. long including lobes, the lobes triangular, apiculate, less than 1 mm. long; corolla subcylindric, "white, distally pink," 13 to 15 mm. long, 4 to 5 mm. in diameter, contracted distally, the lobes triangular, subacute, about 1 mm. long; stamens about 13 mm. and 14 mm. long, respectively; filaments castaneous, distinct, pilose at margins with white hairs about 0.2 mm. long, 2 mm. and 4 to 5 mm. long, respectively; anther sacs nearly smooth, about 5.5 mm. long; tubules wide, about 6.5 mm. and 5.5 mm. long, respectively; stigma peltate; young fruit subspherical, fleshy, up to 7 mm. in diameter.

Type in the herbarium of the New York Botanical Garden, collected in shrub zone below Páramo de Chaquiro, Cordillera Occidental, Department of Bolívar, Colombia, altitude 2,800 to 3,100 meters, February 24, 1918, by F. W. Pennell (no. 4299).

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

COLOMBIA.

BOLÍVAR: Cascada Chorrón, south of Antizales, Pennell 4378 (Y).

A beautiful plant, of dubious relationship, but readily identified by its cordate-based, subamplexicaul leaves.

19. *Cavendishia spicata* A. C. Smith, sp. nov.

Arbor parva pulcherrima; ramulis petiolisque decidue puberulis; laminis oblongis basi truncatis vel subcuneatis apice obtuse breviter acuminatis subtus minute decidue pilosis 5-pinnerviis; inflorescentia gracilliter et longe racemosa basi bracteis parvis instructa; rhachidibus pedicellisque minute puberulis; floribus glabris; calycis limbo tubum subaequante; corolla subcylindrica; filamentis antherisque compensanter inaequalibus, antheris parvis, tubulis quam loculis duplo longioribus.

Low tree; branchlets subterete, cinereous, short-puberulous or glabrous; pedicels subterete, short-puberulous when young, 3 to 5 mm. long; leaf blades coriaceous, oblong, 5 to 6 cm. long, 2 to 3 cm. broad, truncate or subcuneate at base, obtusely short-acuminate at apex, entire and revolute at margins, glabrous or minutely and sparsely pilose above, pilose beneath with sparse minute ascending nigrescent hairs about 0.2 mm. long, becoming glabrous, 5-pinnerved, the secondary nerves oriented above base, with the midnerve slightly impressed above, prominent beneath, the veinlets obscurely reticulate; inflorescence axillary, slenderly racemose, 40 to 70 flowered, bracteate at base with

several minute, imbricate, broadly ovate bractlets up to 2 mm. long; rachis subterete or angled, slender, 10 to 18 cm. long at maturity, puberulous with spreading cinereous hairs about 0.1 mm. long; pedicels 4 to 7 per centimeter of rachis, slightly rugose, puberulous as the rachis, 4 to 5 mm. long, each subtended by a deciduous membranous oblong bractlet 3 to 4 mm. long, slightly swollen distally; calyx rugose, nigrescent, the tube short-cylindric, 1.5 mm. long and 2 mm. in diameter at anthesis, the limb suberect, about 2 mm. long including lobes, the lobes triangular, subacute, less than 1 mm. long, each flanked by 2 or 3 minute stalked glands about 0.1 mm. long; corolla sub-cylindric, 6 to 7 mm. long, about 3 mm. in diameter, slightly contracted distally, glabrous, the lobes triangular, acute, about 1 mm. long; stamens about 5 mm. long; filaments dark castaneous, loosely connate at base, glabrous or sparsely puberulous within distally, about 1.4 mm. and 2.2 mm. long, respectively; anther sacs nearly smooth, about 1.3 mm. long; tubules wide, about 3 mm. and 2.3 mm. long, respectively, opening by clefts about half their length; style about as long as corolla or slightly exserted, the stigma peltate; young fruit fleshy, nigrescent, subspherical, rugose, 5 to 8 mm. in diameter.

Type in the U. S. National Herbarium, no. 1,143,601, collected in forest on peak southeast of La Cumbre, Department of El Valle, Western Cordillera, Colombia, altitude 2,200 to 2,400 meters, May 14 to 19, 1922, by F. W. Pennell and E. P. Killip (no. 5801). Duplicates at B, Y.

DISTRIBUTION: Known only from the type collection.

The small coriaceous leaves, the long graceful racemes, and the numerous delicate flowers of this plant distinguish it at once. It would be a fine species to introduce into cultivation.

EXPLANATION OF PLATE 15.—*Cavendishia spicata*, from photograph of type sheet. About one-half natural size.

20. *Cavendishia punctatifolia* (R. & P.) Hoer. Bot. Jahrb. Engler 42: 279. 1909.

Thibaudia punctatifolia R. & P. Fl. Peruv. Chil. 4: pl. 387. 1802.

Thibaudia punctata R. & P.; St. Hil. Exp. Fam. Nat. 363. 1805.

Cavendishia kraenzliniana Hoer. Bot. Jahrb. Engler 42: 322. 1909.

Subscandent shrub with branches up to 4 meters long; branchlets stout, subterete, brownish, glabrous; petioles subrugose, 6 to 10 mm. long, stout, 3 to 4 mm. in diameter, glabrous; leaf blades oblong, 12 to 25 cm. long, 6 to 11 cm. broad, truncate at base, subacute or short-acuminate at apex, entire and slightly revolute at margins, glabrous, copiously impressed-punctate on both surfaces (punctations 1 or 2 per square mm.), 7-plied-nerved, the secondary nerves oriented above base, slightly impressed above, very prominent beneath, the veinlets reticulate, nearly plane on both surfaces; inflorescence axillary, elongate-racemose, 30 to 60 flowered, deciduously bracteate at base with numerous imbricate ovate fimbriate glabrous bracts up to 2 cm. long and 1.5 cm. broad, glabrous in all parts; rachis angled, stout, 3 to 5 mm. in diameter, 10 to 30 cm. long at maturity; pedicels 1 to 5 per centimeter of rachis, rugose, 10 to 18 mm. long, each subtended by a deciduous bract, minutely bibracteolate near base, swollen distally; calyx strongly rugose, slightly apophysate at base, the tube short-cylindric, about 2.5 mm. long and 3.5 to 4 mm. in diameter at anthesis, the limb suberect, 2 to 3.5 mm. long including lobes, the lobes ovate, apiculate, 1 to 2 mm. long; corolla subcylindric, greenish white, 11 to 14 mm. long, 4 to 5 mm. in diameter, contracted distally, the lobes triangular, subacute, about 1 mm. long; stamens 9 to 10 mm. long; filaments dark castaneous, distinct or loosely coherent at base, sparsely puberulous distally with hairs up to 0.2 mm. long, 2.5 mm. and 3.5 mm. long, respectively; anther sacs nearly

smooth, 3 to 4 mm. long; tubules wide, flexible, about 5 mm. and 4 mm. long, respectively; stigma peltate; young fruit subspherical or broadly conical, up to 10 mm. in diameter.

TYPE LOCALITY: Andes of Peru. Type collected by Ruiz and Pavon (or by Dombey?).

DISTRIBUTION: Andes of central Peru, altitude 1,700 to 3,200 meters.

PERU: *Dombey* 431 (B, type collection?).

HUÁNUCO: Chaglla, *Macbride* 3632 (F).

JUNÍN: Huacapistana, *Weberbauer* 1972 (B, type of *C. kraenzliniana*); *Killip & Smith* 24256 (N, Y). Carpapata, above Huacapistana, *Killip & Smith* 24473 (N, Y).

The species treated in this section of the genus are quite distinct from one another on the characters mentioned in the key; the present species and the preceding differ from the two following by having the rachis unbranched.

21. *Cavendishia divaricata* A. C. Smith, sp. nov.

Frutex robustus; ramulis petiolisque crassis glabris; laminis crasso-coriaceis oblongis basi subcordatis apice subacutis supra leviter punctatis 7-plex-nerviis; inflorescentia paniculata crassa multiflora ubique glabra; calycis rugosi limbo tubum subaequante, lobis magnis ovatis; corolla subcylindrica; filamentis antherisque compensanter inaequalibus, tubulis quam oculis longioribus.

Stout shrub; branchlets thick, frequently 10 mm. in diameter near termination, angled, brownish, glabrous; petioles rugose, stout, about 5 mm. in diameter, 5 to 10 mm. long, glabrous; leaf blades thick-coriaceous, oblong, 12 to 20 cm. long, 6 to 8 cm. broad, lightly subcordate at base, obtuse or subacute at apex, entire and revolute at margins, glabrous, shallowly punctate above, 7-plex-nerved, the secondary nerves oriented slightly above base, with the midnerve impressed above, very prominent beneath, the veinlets reticulate, plane above, slightly raised beneath; inflorescence axillary near ends of branchlets, paniced, 50 to 100 flowered, deciduously bracteate at base, glabrous in all parts; branches of inflorescence angled, stout, up to 8 mm. in diameter, the primary branch 20 to 30 cm. long, with about 10 secondary branches up to 15 cm. long, and with tertiary branches sometimes present, up to 4 cm. long; pedicels 1 or 2 per centimeter of rachis, rugose, 10 to 20 mm. long, each subtended by a deciduous papyraceous oblong bract up to 25 mm. long and 10 mm. broad, deciduously bibracteolate near base; calyx rugose, the tube short-cylindric, about 2.5 mm. long and 4 mm. in diameter at anthesis, the limb spreading, 4 mm. long including lobes, the lobes ovate, apiculate, about 3 mm. long, thick-margined except at apex; corolla subcylindric or elongate-urceolate, grayish red, 20 to 22 mm. long, 7 to 8 mm. in diameter, contracted distally, the lobes triangular, subacute, about 2 mm. long; stamens 16 to 17 mm. long; filaments castaneous, distinct, pilose ventrally and at margins distally with hairs up to 0.4 mm. long, 2.5 mm. and 3.5 mm. long, respectively; anther sacs slightly granular, incurved at base, about 5 mm. long; tubules wide, about 9.5 mm. and 9 mm. long, respectively; style about as long as corolla or slightly exerted, the stigma peltate; fruit coriaceous, strongly rugose, dark red, up to 12 mm. in diameter.

Type in the herbarium of the New York Botanical Garden, collected in forest at San José, near San Antonio, Department of El Cauca, Western Cordillera, Colombia, altitude 2,400 to 2,700 meters, June 30, 1922, by F. W. Pennell (no. 7557). Duplicate in the U. S. National Herbarium.

DISTRIBUTION: Western and Central Cordilleras of southern Colombia, altitude 2,300 to 2,800 meters.

COLOMBIA.

EL CAUCA: San Antonio, *Pennell & Killip* 7384 (Y). Central Cordillera, near Popayán, *Lehmann* 4763 (K).

As noted in the key, this species is marked by its robust habit and copiously branching inflorescence. The stamens frequently show very slight variations, and casual dissection might lead one to consider them isomorphic.

22. *Cavendishia paniculata* Rusby, Mem. Torrey Club 4: 215. 1895.

Chupalon viridiflorum Kuntze, Rev. Gen. Pl. 3²: 190. 1898.

Thibaudia viridiflora K. Schum. Just's Bot. Jahresh. 26¹: 385. 1900.

Cavendishia muschleriana Hoer. Bot. Jahrb. Engler 42: 326. 1909.

Shrub or low tree 3 to 6 meters high with drooping branches; branchlets subterete or irregularly striate, brownish, sparsely pubescent when young, becoming glabrous; petioles subrugose, narrowly angled, sparsely puberulous when young, becoming glabrous, 5 to 10 mm. long; leaf blades thick-coriaceous, oblong, somewhat bullate, 9 to 20 cm. long, 5 to 9 cm. broad, lightly subcordate or truncate at base, acute or acuminate at apex, entire and slightly revolute at margins, glabrous above, finely puberulous beneath with spreading white hairs up to 0.3 mm. long, also bearing scattered castaneous glandular hairs about 0.2 mm. long, becoming essentially glabrous, 7-plex-nerved, the secondary nerves oriented near base, impressed above, prominent beneath, the veinlets reticulate, plane above, slightly raised beneath; inflorescence terminal or axillary, paniced, 50 to 150 flowered, deciduously bracteate at base; branches of inflorescence subterete or angled, sparsely puberulous or glabrous, somewhat lax, the primary branch 8 to 25 cm. long, the secondary branches 5 to 10, ascending, somewhat flexuose, 6 to 12 cm. long, the tertiary branches often present, up to 6 cm. long; pedicels 1 to 3 per centimeter of rachis, subrugose, glabrous, 5 to 12 mm. long, each subtended by a deciduous bract up to 1 cm. long and minutely bibracteolate near base with membranous ovate bractlets up to 2 mm. long; calyx rugose, the tube subcylindric or slightly angled to the sinuses, sometimes slightly apophysate at base, glabrous, 2 to 2.5 mm. long, 3 to 4 mm. in diameter at anthesis, the limb spreading, 2 to 2.5 mm. long including lobes, the lobes ovate, apiculate, about 1.5 mm. long, thick-margined; corolla subcylindric, 10 to 11 mm. long, 4 to 5 mm. in diameter, contracted distally, the lobes triangular, subacute, about 1 mm. long; stamens 7.5 to 8.5 mm. long; filaments castaneous, distinct, sparsely puberulous distally, about 2 mm. and 3 lobes triangular, subacute, about 1 mm. long; stamens 7.5 to 8.5 mm. long; tubules wide, about 5 mm. and 4 mm. long, respectively; young fruit subspherical, rigidly coriaceous, up to 8 mm. in diameter.

TYPE LOCALITY: Yungas, Bolivia. Type collected by Bang (no. 721).

DISTRIBUTION: Andes of southern Peru and northern Bolivia, altitude 750 to 2,400 meters.

PERU.

AYACUCHO: Aina, between Huanta and Río Apurímac, *Killip & Smith* 22199 (N, Y). Ccarrapa, between Huanta and Río Apurímac, *Killip & Smith* 22432 (N, Y).

Cuzco: Near Santa Ana, Province Convención, *Weberbauer* 5009 (B, type of *C. muschleriana*). Cerro de Cusilluyoc, *Pennell* 13962 (F). Machu Picchu, *Cook & Gilbert* 862 (N).

BOLIVIA: *Bang* 721 (F, G, N, Y, type). Río Juntas, *Kuntze*, in April, 1892 (Y, type of *Chupalon viridiflorum*).

LA PAZ: Mapiri, *Rusby* 2403 (Y). Tipuani, *Buchtien* 7612 (B, Y). La Joya, Cordillera Real, *Tate* 1048 (Y).

A very well marked and coherent species, the three types involved showing no essential differences. A local name in southern Peru is "monte frutilla."

23. *Cavendishia sessiliflora* A. C. Smith, sp. nov.

Frutex; laminis ovatis vel leviter obovatis basi anguste attenuatis apice obtusis 3 ad 5 pli-nerviis; floribus axillaribus solitariis vel binis basi bracteis minutis instructis dense albo-pubescentibus; calycis subcampanulati limbo quam tubo paullo brevior; corolla subcylindrica; filamentis antherisque compensanter inaequalibus, tubulis quam loculis longioribus.

Shrub; branchlets subterete, slightly rugose, glabrous; petioles rugose, essentially glabrous, angled or narrowly winged above, 4 to 6 mm. long; leaf blades ovate or slightly obovate, 3 to 5 cm. long, 1.5 to 2.5 cm. broad, narrowly attenuate at base, obtuse at apex, entire and slightly revolute at margins, thick-coriaceous, glabrous and shining above, glabrous and sparsely brown-punctate beneath, 3 to 5 pli-nerved, the midnerve slightly impressed above, raised beneath, the secondary veins oriented above base, arcuate, nearly plane above, slightly raised beneath, the veinlets obscurely reticulate; flowers axillary, solitary or in pairs, circumscribed at base by a few submembranous ovate puberulous bractlets up to 3 mm. long; pedicels subterete, about 1 mm. long, bibracteolate at base with similar bractlets, pubescent as the calyx; calyx strongly rugose, densely white-pubescent with spreading hairs up to 0.3 mm. long, the tube subcylindric or campanulate, 3 to 4 mm. long and about 3 mm. in diameter at anthesis, the limb suberect, 2 to 3 mm. long including lobes, the lobes triangular, subacute, 1.5 to 2 mm. long, pubescent as the tube and also distally pilose with a few appressed brown hairs about 0.3 mm. long; corolla subcylindric, 9 to 11 mm. long, 3 to 4 mm. in diameter, contracted at base and apex, pilose with persistent short spreading hairs as the calyx, the lobes triangular, subacute, about 1 mm. long; stamens subequal (alternate filaments and anthers compensatingly unequal), 7 to 8 mm. long; filaments nigrescent, glabrous or sparsely puberulous distally, about 2 mm. and 3.5 mm. long, respectively; anther sacs slightly granular, 2 to 3 mm. long; tubules flexible, about 5 mm. and 4 mm. long, respectively, opening by clefts nearly as long; stigma truncate.

Type in the herbarium of the New York Botanical Garden, collected in forest above Cascada Chorrón, south of Antizales, Department of Bolívar, Colombia, altitude 2,400 to 2,800 meters, February 25, 1918, by F. W. Pennell (no. 4377).

DISTRIBUTION: Andes of northwestern Colombia.

COLOMBIA.

BOLÍVAR: Río Sinú, Pennell 4780 (Y).

Like many other plants from the northwestern section of Colombia, this species is apparently local in distribution and is quite isolated from other species of the genus. It is immediately distinguished by its attenuate-based leaves, its essentially solitary subsessile flowers, and its pilose corolla.

24. *Cavendishia killipii* A. C. Smith, sp. nov.

Frutex; ramulis petiolisque pilosis; laminis oblongo-ellipticis basi cuneatis apice rotundatis subtus pilosis 5 ad 7 pli-nerviis; inflorescentia subfasciculata basi bracteis submembranaceis oblongis glabris instructa; floribus albo-pilosis; calycis subcampanulati limbo quam tubo brevior glanduloso-marginato; corolla subcylindrica; filamentis antherisque compensanter inaequalibus, tubulis quam loculis longioribus.

Spreading shrub 2 to 4 meters high; branchlets terete, cinereous, pilose with pale spreading hairs about 0.2 mm. long, becoming glabrous; petioles subrugose, pilose as the branchlets, 3 to 5 mm. long; leaf blades oblong-elliptic, 5 to 7 cm.

long, 2 to 2.5 cm. broad, cuneate at base, rounded at apex, entire and slightly revolute at margins, short-pilose above on nerves and at margins, pilose beneath on nerves with stiff hairs about 0.3 mm. long, also with scattered deciduous appressed brownish hairs about 0.2 mm. long, 5 to 7 pli-nerved, the secondary nerves oriented slightly above base, ascending, with the midnerve slightly impressed above, raised beneath, the veinlets reticulate, slightly raised above; inflorescence axillary or terminal, subfasciculate, 8 to 15 flowered, bracteate at base and enveloped when young by several imbricate, submembranous, deep red, oblong, glabrous bracts up to 2 cm. long and 1 cm. broad; pedicels subrugose, sparsely puberulous, 4 to 5 mm. long, each subtended by a deciduous bract similar to those at base of inflorescence, bibracteolate near base with submembranous oblong-lanceolate glandular-margined bractlets 2 to 2.5 mm. long; calyx subcoriaceous, densely pubescent with spreading white hairs up to 0.3 mm. long, the tube subcylindric or campanulate, about 3 mm. long and 2.5 mm. in diameter at anthesis, the limb suberect, about 2 mm. long including lobes, the lobes triangular, acute, about 1 mm. long, fimbriate with numerous glandular hairs about 0.2 mm. long, the sinuses rounded; corolla red, pinkish white distally, subcylindric, 11 to 12 mm. long, about 3.5 mm. in diameter, pilose as the calyx, the lobes oblong, subacute, 2 to 2.5 mm. long; stamens subequal (alternate filaments and anthers compensatingly unequal), 10 to 10.5 mm. long; filaments castaneous, slender, distinct, sparsely puberulous distally, about 2.5 mm. and 5 mm. long, respectively; anther sacs slightly granular, about 3 mm. long; tubules wide, about 5.5 mm. and 3 mm. long, respectively, opening by clefts nearly as long; stigma peltate.

Type in the U. S. National Herbarium, no. 1,351,059, collected in woods on Mesa de los Santos, Department of Santander, Eastern Cordillera, Colombia, altitude 1,500 meters, December 12, 1926, by E. P. Killip and A. C. Smith (no. 15124). Duplicate at Y.

DISTRIBUTION: Known only from the type collection.

This species, which is probably closest related to *C. pubescens*, is quite distinct on the basis of its smaller leaves (obtuse at apex) and its glandular-margined bractlets and calyx lobes.

25. *Cavendishia peruviana* Hoer. Bot. Jahrb. Engler 42: 332. 1909.

Compact shrub; branchlets subterete or angled, brownish, glabrous; petioles nigrescent, rugose, stout, glabrous, 5 to 6 mm. long; leaf blades oblong, 11 to 14 cm. long, 2.5 to 5 cm. broad, truncate at base, obtusely short-acuminate at apex, entire and revolute at margins, thick-coriaceous, glabrous above, pilose beneath (hairs nigrescent, appressed, stout, about 0.2 mm. long, 5 to 8 per square millimeter of surface), 7 to 9 pli-nerved, the secondary nerves oriented above base, ascending, with the midnerve impressed above, prominent beneath; inflorescence axillary, subfasciculate (rachis stout, elongating at maturity to 3 cm.), 10 to 20 flowered, bracteate at base and enveloped when young by several imbricate, subcoriaceous, externally pale-pilose, ovate bracts up to 2 cm. long and 1.5 cm. broad; pedicels subterete, glabrous, about 10 mm. long, deciduously bibracteolate at base; calyx tube coriaceous, sparsely pilose or glabrous, campanulate, about 3.5 mm. long and 4 mm. in diameter at anthesis; limb erecto-patent, about 2 mm. long including lobes, the lobes deltoid, 1.5 mm. long, sparsely glandular-margined; corolla thin-carnose, cylindric, about 14 mm. long and 4 mm. in diameter, pale pilose with short spreading hairs, becoming subglabrous, the lobes triangular, about 1 mm. long; stamens 11 to 12 mm. long; filaments nigrescent, distinct, puberulous, about 2.5 mm. and 4 mm. long, respectively; anther sacs slightly granular, about 3.5 mm. long; tubules wide, about 7 mm. and 5.5 mm. long, respectively; stigma truncate.

TYPE LOCALITY: Between the tambos Jehubamba and Yuncacoya, between Sandía and Chunchusmayo, Department of Cuzco, Peru, altitude 1,800 to 2,600 meters. Type collected by Weberbauer (no. 1081).

DISTRIBUTION: Known only from the type collection.

PERU.

Cuzco: Between Sandía and Chunchusmayo, *Weberbauer* 1081 (B, type).

In its pubescent bracts and flowers this species shares the characters of *C. pubescens*, from which it is distinguished by the different type of pubescence on the lower surface of leaves.

26. *Cavendishia pubescens* (H. B. K.) Hemsl. Biol. Centr. Amer. Bot. 2: 273. 1881.

Thibaudia pubescens H. B. K. Nov. Gen. & Sp. 3: 273. 1818.

Thibaudia oblongifolia Remy, Ann. Sci. Nat. III. Bot. 8: 233. 1847.

Proclesia pubescens Klotzsch, Linnaea 24: 33. 1851.

Thibaudia cinnamomifolia Willd.; Walp. Ann. Bot. 2: 1087. 1852, as synonym.

Thibaudia septemnervia Willd.; Walp. Ann. Bot. 2: 1087. 1852, as synonym.

Polyboea velutina Griseb.; Lechl. Berb. Amer. Austr. 58. 1857, nomen.

Chupalon pubescens Kuntze, Rev. Gen. Pl. 2: 383. 1891.

Shrub or small tree to 5 meters high; branchlets subterete, brownish, softly tomentose with pale spreading hairs up to 0.5 mm. long, becoming glabrous with age; petioles subterete, pilose as the branchlets, 6 to 10 mm. long; leaf blades oblong or ovate-oblong, 10 to 20 cm. long, 4 to 9 cm. broad, cuneate at base, acuminate or caudate-acuminate at apex, entire and slightly revolute at margins, glabrous or short-pilose above, pilose beneath, especially on nerves, with pale spreading hairs up to 0.5 mm. long, 5 to 7 pli-nerved, the secondary nerves oriented above base, ascending, with the midnerve slightly impressed above, prominent beneath, the veinlets slightly raised on both surfaces; inflorescence axillary or terminal, racemose, 10 to 25 flowered, circumscribed at base and enveloped when young by numerous imbricate bracts, the bracts oblong-ovate, submembranous, up to 25 mm. long and 15 mm. broad, densely short-pilose without, becoming glabrous, thin-margined; rachis 1 to 4 cm. long at maturity (rarely to 7 cm. long), stout, often to 5 mm. in diameter, densely pilose as the branchlets; pedicels subterete, striate, densely pilose with pale spreading hairs up to 0.3 mm. long, 6 to 10 mm. long, each subtended by a deciduous bract similar to those at base of inflorescence, deciduously bibracteolate near base with oblong pilose bractlets 2 to 3 mm. long, slightly swollen distally; calyx tube short-cylindric or campanulate, densely pilose with appressed white hairs about 0.2 mm. long, 3.5 to 5 mm. long, 3 to 5 mm. in diameter at anthesis; limb suberect, 2.5 to 5 mm. long including lobes, slightly less pilose than the tube, the lobes triangular or lanceolate-triangular, acute, 2 to 4 mm. long, deciduously glandular-margined, the sinuses sharp; corolla subcylindric, 20 to 26 mm. long, 4 to 6 mm. in diameter, slightly contracted distally, pilose as calyx, the lobes triangular, subacute, 1 to 1.5 mm. long; stamens 13 to 18 mm. long; filaments dark castaneous, distinct or loosely coherent at base, pilose ventrally and at margins distally, 3 to 4 mm. and 5 to 8 mm. long, respectively; anther sacs granular, 5 to 8 mm. long; tubules wide, about 9 mm. and 7 mm. long, respectively, opening by clefts nearly as long; stigma peltate; fruit spherical, up to 12 mm. in diameter, densely and persistently pilose, surmounted by the persistent calyx limb and style.

TYPE LOCALITY: Near Caracas, Federal District, Venezuela. Type collected by Humboldt and Bonpland.

DISTRIBUTION: Common throughout the Andes, from Venezuela to Bolivia, altitude 600 to 3,000 meters.

This is a well-marked species which falls into several forms, none of which seem to me to merit varietal rank, although two have been recognized as varieties by Hoerold. In this treatment his names are retained, but no new ones are added.

The above flower description is taken from a typical specimen from eastern Colombia. There is great variation in flower dimensions, the stamens ranging from 11 to 20 mm. in length, depending upon habitat. The dense pubescence of the flowers is usually sufficiently well marked to identify the plant; the elongate calyx lobes also are characteristic. A local name in Colombia is "uva de monte."

The typical form, with densely pubescent calyx, elongate calyx lobes, and long-acuminate leaves, is represented by the following specimens:

VENEZUELA: *Curran & Haman* 1118 (G).

FEDERAL DISTRICT: Caracas and vicinity: *Humboldt & Bonpland* (B, type); *Berschel* (K); *L. H. & E. Z. Bailey* 992 (Y); *Pittier* 5872 (N, Y), 9175 (G, N, Y). Gallipán, *Kuntze* 1572 (N, Y); *E. Pittier* 81 (N, Y).

ARAGUA: Colonia Tovar, *Fendler* 738 (G, Y).

TRUJILLO: Between Valera and Monte Carmelo, *de Bellard* (N).

MÉRIDA: *Moritz* 1346 (B).

COLOMBIA: *Purdie* (K); *Goudot* (K).

NORTE DE SANTANDER: Toledo, *Killip & Smith* 20055 (N, Y).

SANTANDER: Between Piedecuesta and Las Vegas, *Killip & Smith* 15465 (N, Y), 15918 (N, Y). Charta, *Killip & Smith* 18883 (N, Y), 19039 (N, Y), 19091 (N, Y), 19308 (N, Y). Tona, *Killip & Smith* 19435 (N, Y), 19460 (N, Y).

CUNDINAMARCA: Fusagasugá, *Tracey* 336 (K); *Pennell* 2695 (N, Y).

TOLIMA (?): Quindío Region, *André* (K); *Holton* 634 (Y).

HUILA: East of Neiva, *Rusby & Pennell* 939 (F, G, N, Y), 563 (Y).

ANTIOQUÍA: South of Caldas, *Pennell* 10933 (N, Y). Fredonia, *Toro* 191 (Y). Quebrada del Ato, *Archer* 176 (N). Río Negro, *Archer* 316 (N, Y). Medellín, *Archer* 1363 (N, Y), 1592 (N, Y).

CALDAS: North of Supía, *Pennell* 10722 (Y), 10744 (N, Y).

PERU: *Maclean* (K). Tabina, *Leohler* 1924a (K).

Cuzco: Sandía, *Weberbauer* 594 (B).

BOLIVIA: *Pentland* (K).

LA PAZ: Milliguaya, *Buchtien* 715 (F, Y). Coroico, *Pearce*, in March, 1866 (K); *Buchtien* 3870 (Y). Yungas, *Rusby* 2033 (F, G, N, Y); *Bang* 290 (F, G, N, Y). Sirupaya, *Buchtien* 503 (N, Y).

A form more glabrous throughout than the above specimens, distributed locally in Colombia, Peru, and Bolivia, is represented by the following specimens:

COLOMBIA.

TOLIMA: Ibagué, *Triana* 2668 (Y). Murillo, *Pennell* 3192 (N, Y).

PERU: *Ruiz & Pavón* (K).

JUNÍN: Carpapata, *Killip & Smith* 24489 (N, Y). San Ramón, *Killip & Smith* 24882 (N, Y). Pichis Trail, Porvenir, *Killip & Smith* 25938 (N, Y).

BOLIVIA.

COCHABAMBA: Locotal, *Steinbach* 9023 (Y).

26a. *Cavendishia pubescens* var. *boliviensis* Hoer. Bot. Jahrb. Engler 42: 332. 1909.

A form with more slender, bluntly acuminate leaves.

TYPE LOCALITY: Between Guanai and Tipuani, Department of La Paz, Bolivia. Type collected by Bang (no. 1383).

BOLIVIA.

LA PAZ: Between Guanai and Tipuani, *Bang* 1383 (B, type, F, G, N, Y).

26b. *Cavendishia pubescens* var. *microphylla* Hoer. Bot. Jahrb. Engler 42: 332. 1909.

A form smaller in all parts, the leaves about 6 cm. long and 3 cm. broad.

TYPE LOCALITY: Peru. Type collected by Weberbauer (no. 1081a).

PERU: *Weberbauer* 1081a (B, type).

27. *Cavendishia sillarensis* Herzog, Med. Rijks. Herb. Leiden 27:20. 1915.

Compact branching shrub; branchlets subterete, striate, cinerous, deciduously pilose with pale spreading hairs up to 0.2 mm. long; petioles terete, subrugose, pilose as the branchlets, 5 to 7 mm. long; leaf blades oblong or ovate-oblong, 8 to 11 cm. long, 3.5 to 4.5 cm. broad, truncate or broadly cuneate at base, caudate-acuminate at apex, entire and slightly revolute at margins, coriaceous, glabrous and shining above, pilose beneath (hairs pale, spreading, densest on nerves, up to 0.4 mm. long), 5 (rarely 7) pli-nerved, the secondary nerves oriented near base, arcuate-ascending, with the midnerve slightly impressed above, prominent beneath, the veinlets reticulate, plane on both surfaces; inflorescence axillary, short-racemose at maturity (rachis glabrous, 2 to 3 cm. long), 10 to 15 flowered, bracteate at base and enveloped when young by several imbricate submembranous oblong bracts up to 15 mm. long and 8 mm. broad; pedicels striate, glabrous, 8 to 10 mm. long, each bracteate at base and deciduously bracteolate near base; calyx coriaceous, deciduously white-pilose, the tube campanulate, about 2 mm. long and 3 mm. in diameter at anthesis, the limb suberect, 2 to 3 mm. long including lobes, the lobes broadly triangular, about 1.5 mm. long, densely glandular-margined; corolla thin-carnose, sparsely pale-pilose, cylindrical, 12 to 14 mm. long, about 4 mm. in diameter, the lobes deltoid, about 1 mm. long; stamens 10 to 11 mm. long; filaments dark castaneous, distinct, distally pilose, about 2 mm. and 3.5 mm. long, respectively; anther sacs 2 to 3 mm. long; tubules submembranous, about 7 mm. and 6 mm. long, respectively; stigma peltate.

TYPE LOCALITY: Sillar, Cordillera de Santa Cruz, Bolivia, altitude about 1,700 meters. Type collected by Herzog (no. 1639).

DISTRIBUTION: Known only from the type collection.

BOLIVIA: Sillar, Cordillera de Santa Cruz, *Herzog* 1639 (B, type).

I doubt if this plant, which is distinguished from *C. pubescens* by its smaller leaves and corollas, merits the specific rank assigned to it, but I hesitate definitely to reduce the species.

28. *Cavendishia cordifolia* (H. B. K.) Hoer. Bot. Jahrb. Engler 42:280. 1909.

Thibaudia cordifolia H. B. K. Nov. Gen. & Sp. 3:271. 1818.

Proclesia cordifolia Klotzsch, Linnaea 24:32. 1851.

Proclesia cordata Klotzsch, Linnaea 24:33. 1851.

Chupalon cordifolium Kuntze, Rev. Gen. Pl. 2:384. 1891.

Chupalon cordatum Kuntze, Rev. Gen. Pl. 2:384. 1891.

Cavendishia cordata Hoer. Bot. Jahrb. Engler 42:280. 1909.

Shrub up to 5 meters high with elongate branches; branchlets subterete, slender, cinereous, pilose with pale spreading hairs about 0.3 mm. long; petioles subrugose, pilose as the branchlets, becoming glabrous, 2 to 5 mm. long; leaf blades coriaceous, oblong or ovate-oblong, subcordate at base, suba-

cute at apex, entire and slightly revolute at margins, 3.5 to 8 cm. long, 2 to 4 cm. broad, glabrous above or sparsely pilose with pale spreading hairs about 0.3 mm. long, glabrous beneath or minutely puberulous, 5 (rarely 7) pinnately-veined, the secondary nerves oriented near base, with the midnerve slightly impressed above, raised beneath, the veinlets obscurely reticulate; inflorescence axillary near ends of branchlets, subfasciculate or short-racemose (rachis rarely 3 cm. long), 5 to 15 flowered, bracteate at base and enveloped when young by deciduous submembranous glabrous oblong bracts up to 2 cm. long and 1 cm. broad; pedicels subrugose, puberulous or glabrous, 5 to 10 mm. long, each subtended by a deciduous bract similar to those at base of racemes, deciduously minutely bibracteolate near base; calyx tube campanulate, about 3 mm. long and 3 mm. in diameter at anthesis, densely and usually persistently pilose with pale spreading hairs up to 0.3 mm. long; limb erecto-patent, 1 to 2 mm. long including lobes, the lobes triangular, subacute, 1 to 1.5 mm. long; corolla subcylindric, 14 to 18 mm. long, about 4 mm. in diameter, slightly contracted above, densely and regularly pilose as the calyx, the lobes triangular, subacute, about 1.5 mm. long, often reflexed; stamens subequal (long and short stamens differing by about 1 mm., with alternately unequal filaments and anthers), 13 to 17 mm. long; filaments dark castaneous, distinct or loosely coherent at base, pilose distally with pale brown hairs, about 3 mm. and 5 mm. long, respectively; anther sacs slightly granular, about 3 mm. long; tubules wide, about 8.5 mm. and 7 mm. long, respectively; stigma peltate; young fruit subspherical, up to 9 mm. in diameter, densely pilose, eventually becoming glabrous.

TYPE LOCALITY: Andes of Colombia. Type collected by Humboldt and Bonpland.

DISTRIBUTION: Andes of Venezuela, Eastern Cordillera of Colombia, and northern Ecuador, altitude 1,300 to 3,000 meters.

VENEZUELA.

MÉRIDA: *Moritz* 1348 (B, type of *C. cordata*, G, K). Páramo La Trampa, *Jahn* 997 (N, Y). Between Tabay and Mucurubá, *Pittier* 12874 (Y). Mucurubá, *Gehriger* 275 (N, Y).

COLOMBIA: *Humboldt & Bonpland* (B, type); "*Lobb* 224" (K).

NORTE DE SANTANDER: San Pedro, between Ocaña and Pamplona, *Kalbreyer* 1027 (B).

SANTANDER: Charta, *Killip & Smith* 18875 (N, Y), 21218 (N).

CUNDINAMARCA: Vicinity of Bogotá, *Triana* (K), 2877 (Y); *Linden* 1304 (K, N); *Holton* 630 (G, Y); *Dawe* 338 (K); *Tracey* 14 (K); *Stuebel* 120b (B); *Popenoe* 1170 (N); *Schultze* 15 (B, N); *Niemeyer* 141a (N), 143 (N). Southeast of Quetamé, *Pennell* 1769 (N, Y), 1770 (G, N, Y), 1782 (Y). Tequendama, *Pennell* 1968 (Y). Sibaté, *Pennell* 2447 (N, Y).

HUILA: East of Neiva, *Rusby & Pennell* 567 (N, Y), 567A (Y, in part), 989 (Y), 991 (G, N, Y).

NARIÑO: Altaquer, *André* 3475 (K).

COLOMBIA OR ECUADOR: San Miguel, *André* 828 (K).

ECUADOR.

PICHINCHA: Calacali, *Lehmann* 6299 (B). Páramo de Chimbalan, *André* 3002 (K).

Among the above-cited specimens, those which show the greatest deviation from the type are the Rusby and Pennell collections from Huila, which have somewhat larger and caudate-acuminate leaves (sparsely soft-pilose beneath)

and pilose petioles and branchlets. These differences are possibly of varietal value.

Local names for *C. cordifolia* are: "Uva camarona," "uva de anís" (Bogotá), "coral" (Venezuela).

The five species considered in this section of the key (nos. 28 to 32) are of doubtful value. Since the names already exist, however, and since the slight and rather unsatisfactory differences mentioned in the key are correlated with geographic distribution, the specific names are retained in this treatment. The situation existing in this group is not uncommon in the study of most South American genera. Whether the five forms are to be considered species, varieties, slight and unstable variations, or individual forms, is purely a matter of personal opinion and experience. The possibility of some of these specimens being hybrids is not to be overlooked. Personally, I am inclined not to believe these forms of specific rank, but previous workers have demonstrated different opinions and the resulting names have in some cases become well known. For instance, to reduce the name *C. cordifolia* (the well-known form of the Bogotá region) to *C. bracteata* (the oldest of these names) would cause some confusion. This previous establishment of names and the facts of geographic distribution are my only important reasons for retaining the five species.

29. *Cavendishia hartwegiana* (Klotzsch) Hoer. Bot. Jahrb. Engler 42: 281. 1909.

Proclesia hartwegiana Klotzsch, Linnaea 24: 35. 1851.

Chupalon hartwegianum Kuntze, Rev. Gen. Pl. 2: 384. 1891.

Shrub; branchlets subterete, when young laxly pale-pilose with hairs about 0.2 mm. long; petioles rugose, sparsely pilose or glabrous, 2 to 3 mm. long; leaf blades ovate or oblong-ovate, 3 to 5 cm. long, 1.5 to 2.2 cm. broad, broadly cuneate or truncate at base, subacute or obtusely short-acuminate at apex, entire at margins, essentially glabrous above, glabrous beneath or sparsely pilose with scattered minute brown hairs, obscurely 5-plied-nerved, the secondary nerves oriented near base, nearly plane above, slightly raised beneath, the veinlets obscurely reticulate; inflorescence axillary or subterminal, racemose, 6 to 12 flowered, bracteate at base with a few papyraceous glabrous oblong bracts up to 20 mm. long and 8 mm. broad; rachis terete, glabrous, up to 6 cm. long; pedicels rugose, glabrous, 4 to 8 mm. long, each subtended by a deciduous bract similar to those at base of inflorescence, bibracteolate near base with linear, subcoriaceous, sparsely glandular-margined bractlets about 2 mm. long; calyx tube broadly campanulate, about 2 mm. long and 3 mm. in diameter at anthesis, laxly white-pubescent with hairs about 0.3 mm. long; limb subspreading, essentially glabrous, about 2 mm. long including lobes, the lobes triangular, acute, about 1 mm. long, thick-margined towards apex, the sinuses rounded; corolla cylindrical, glabrous, 16 to 17 mm. long, about 4 mm. in diameter, the lobes triangular, acute, about 1.5 mm. long; stamens 13 to 14 mm. long; filaments castaneous, loosely connate at base, sparsely puberulous distally, about 2 mm. and 3 mm. long, respectively; anther sacs slightly granular, sparsely puberulous, about 4 mm. long; tubules wide, about 8.5 mm. and 7.5 mm. long, respectively, opening by clefts about one-third their length; stigma truncate.

TYPE LOCALITY: Loja, Province of Loja, Ecuador. Type collected by Hartweg (no. 789).

DISTRIBUTION: Andes of Ecuador.

ECUADOR: Spruce 5095 (G, K, Y); Jameson (N, Y); Seemann (G).

TUNGURAGUA: Baños, Pachano 223 (N); Tate 629 (N).

LOJA: Loja, Hartweg 789 (B, type, K, Y); Popenoe 1315 (N).

The relationship of this species to the preceding is indicated in the key and is discussed under *C. cordifolia*. Local names for *C. hartwegiana* are: "Salapa," "sagalita."

30. *Cavendishia bracteata* (R. & P.) Hoer. Bot. Jahrb. Engler 42:280. 1909.

Thibaudia bracteata R. & P. Fl. Peruv. Chil. 4: pl. 388. 1802.

Proclesia bracteata Klotzsch, Linnaea 24:34. 1851.

Chupalon bracteatum Kuntze, Rev. Gen. Pl. 2:383. 1891.

Cavendishia ulbrichiana Hoer. Bot. Jahrb. Engler 42:330. 1909.

Compact branching shrub; branchlets subterete, cinereous or brownish, deciduously pilose with lax pale hairs; petioles subterete, 1 to 3 mm. long, essentially glabrous; leaf blades oblong, 3 to 4 cm. long, 1.3 to 1.8 cm. broad, truncate or lightly subcordate at base, obtusely short-acuminate at apex, entire at margins, coriaceous, glabrous and scabridous above, glabrous or minutely brown-pilose beneath, 3-nerved from base (rarely 5-nerved), the nerves plane above, slightly raised beneath, the veinlets obscure; inflorescence axillary, subfasciculate, 3 to 8 flowered, bracteate at base and enveloped when young by several imbricate submembranous glabrous oblong bracts up to 12 mm. long and 8 mm. broad; pedicels subterete, glabrous, 3 to 4 mm. long, each bracteate at base and deciduously bilbracteolate at middle; calyx coriaceous, deciduously pilose with minute appressed brown hairs, the tube campanulate, 2 to 3 mm. long, about 3 mm. in diameter at anthesis; limb erecto-patent, 1 to 1.5 mm. long including lobes, the lobes deltoid, about 1 mm. long, glandular-margined; corolla thin-carnose, cylindric, 12 to 15 mm. long, 2.5 to 3 mm. in diameter, densely white-pilose, the hairs pale, spreading, about 0.5 mm. long, eventually deciduous; stamens 12 to 13 mm. long; filaments dark castaneous, distinct, essentially glabrous, about 2 mm. and 4 mm. long, respectively; anther sacs slightly granular, about 3 mm. long; tubules wide, flexible, about 8 mm. and 6 mm. long, respectively; stigma peltate.

TYPE LOCALITY: Andes of Peru. Type collected by Dombey.

DISTRIBUTION: Andes of Central Peru.

PERU.

JUNÍN: Huasa-Huasi, *Dombey* (B, probably type collection). Between Palca and Huacapistana, 2,200 to 2,600 meters, *Weberbauer* 1770 (B, type of *C. ulbrichiana*).

The two types above cited come almost from the same locality and show no essential differences. The species is very closely related to *C. hartwegiana*.

31. *Cavendishia scabriuscula* (H. B. K.) Hoer. Bot. Jahrb. Engler 42:281. 1909.

Thibaudia scabriuscula H. B. K. Nov. Gen. & Sp. 3:272. 1818.

Proclesia scabriuscula Klotzsch, Linnaea 24:33. 1851.

Chupalon scabriusculum Kuntze, Rev. Gen. Pl. 2:384. 1891.

Low shrub with elongate branches; branchlets subterete, brownish, puberulous with short pale spreading hairs, becoming glabrous; petioles subrugose, deciduously puberulous, 3 to 4 mm. long; leaf blades oblong or oblong-lanceolate, 4 to 7 cm. long, 1.5 to 2.5 cm. broad, truncate or lightly subcordate at base, obtuse or obtusely short-acuminate at apex, entire at margins, coriaceous, usually scabridous on both surfaces, glabrous above, subglabrous beneath (frequently sparsely brown-pilose and white-puberulous on nerves), 5-plexi-nerved, the secondary nerves oriented near base, ascending, with the midnerve plane or slightly impressed above, raised beneath, the veinlets reticulate, obscure or plane on both surfaces; inflorescence axillary, subfasciculate or short-racemose (rachis rarely exceeding 2 cm. in length), 3 to 8 flowered, bracteate

at base and enveloped when young by several imbricate membranous glabrous oblong bracts up to 2 cm. long and 1 cm. broad; pedicels subterete, essentially glabrous, 5 to 8 mm. long, each bracteate at base and minutely deciduously bibracteolate; calyx pilose (usually persistently) with spreading white hairs up to 0.5 mm. long, the tube campanulate, about 2 mm. long and 3 mm. in diameter at anthesis, the limb erecto-patent, submembranous, 1.5 to 2 mm. long including lobes, the lobes deltoid, membranous-margined, about 1 mm. long; corolla membranous, cylindric, 12 to 18 mm. long, 3 to 4 mm. in diameter, pilose as the calyx; stamens 14 to 16 mm. long; filaments castaneous, membranous, distinct or loosely coherent at base, sparsely pilose distally within, about 3 mm. and 5 mm. long, respectively; anther sacs slightly granular, 3 to 4 mm. long; tubules flexible, 8 to 12 mm. and 7 to 10 mm. long, respectively; stigma truncate or subpeltate.

TYPE LOCALITY: Andes of the Quindío Region, Department of Tolima, Colombia, altitude about 3,000 meters. Type collected by Humboldt and Bonpland.

DISTRIBUTION: Eastern and Central Cordilleras of Colombia, altitude 2,000 to 3,500 meters.

COLOMBIA.

MAGDALENA: Santa Marta, *Purdie* (K). San Sebastián, *Funck* 487 (K).

NORTE DE SANTANDER: Pamplona, *Killip & Smith* 19781 (N, Y). Páramo del Hatico, *Killip & Smith* 20731 (N, Y).

SANTANDER: Las Vegas, *Killip & Smith* 15803 (N, Y), 16100 (N, Y). Páramo Rico, *Killip & Smith* 17857 (N, Y). Quebrada del País, north of La Baja, *Killip & Smith* 18784 (N, Y). Charta, *Killip & Smith* 18888 (N, Y), 19312 (N, Y).

TOLIMA: *Goudot* (K). Quindío Trail, *Killip & Hazen* 12144 (N).

CALDAS: Salento, *Pennell* 8862 (G, N, Y); *Pennell & Hazen* 10115 (N, Y). Cerro Tatamá, *Pennell* 10539 (Y).

The differences between this species and the following are neither very marked nor constant, but the geographic isolation of the two from one another seems to indicate a different ancestry.

32. *Cavendishia beckmanniana* Hoer. Bot. Jahrb. Engler 42: 329. 1909.

Slender shrub with elongate branches; branchlets subterete, brownish, subglabrous; petioles subrugose, terete, puberulous or glabrous, 3 to 4 mm. long; leaf blades oblong, 5 to 9 cm. long, 1.8 to 3 cm. broad, truncate or lightly subcordate at base, obtuse or obtusely acuminate at apex, entire and slightly revolute at margins, usually smooth on both surfaces, glabrous on both surfaces or sparsely pilose beneath, 5-nerved from base or 5-pli-nerved, the primary nerves slightly impressed above, raised beneath, the veinlets obscure or plane on both surfaces; inflorescence axillary, short-racemose (mature rachis 1 to 2 cm. long), 5 to 10 flowered, bracteate at base and enveloped when young by several imbricate membranous glabrous oblong bracts up to 2 cm. long and 1 cm. broad; pedicels striate, glabrous, 3 to 10 mm. long, deciduously bracteate at base and bibracteolate near base; calyx subrugose, sparsely and deciduously pilose with short spreading white hairs, the tube campanulate, 2 to 3 mm. long, about 3 mm. in diameter at anthesis, the limb erecto-patent, about 2 mm. long including lobes, the lobes deltoid, about 1.5 mm. long, membranous at margins; corolla submembranous, pilose with spreading white hairs up to 0.4 mm. long, 14 to 16 mm. long, 4 to 5 mm. in diameter; stamens 13 to 15 mm. long; filaments dark castaneous, distinct, glabrous or slightly puberulous, 2 to 3 mm. and 4 to 5 mm. long, respectively; anther sacs nearly smooth, about 3 mm. long; tubules flexible, about 10 mm. and 8 mm. long, respectively; stigma subpeltate; young fruit subspherical, soon glabrous, up to 8 mm. in diameter.

TYPE LOCALITY: Sandía, Department of Cuzco, Peru, altitude 2,300 to 2,400 meters. Type collected by Weberbauer (no. 636).

DISTRIBUTION: Andes of central Peru to northern Bolivia, altitude 1,000 to 3,000 meters.

PERU: Tabina, *Lechler* 1875 (K). San Gován, *Lechler* 2198 (K).

JUNÍN: Huacapistana, *Killip & Smith* 24269 (N, Y).

AYACUCHO: Ccarrapa, between Huanta and Río Apurímac, *Killip & Smith* 22297 (N, Y), 22387 (N, Y), 22489 (N, Y), 23209 (N, Y). Aina, between Huanta and Río Apurímac, *Killip & Smith* 23141 (N, Y).

Cuzco: Sandía, *Weberbauer* 636 (B, type). Between Torontoy and Machu Picchu, *Cook & Gilbert* 833 (N). Urubamba Valley, *Cook & Gilbert* 879 (N); *Herrera* 1562 (N).

BOLIVIA.

LA PAZ: Unduavi, *Buchtien* 2981 (B, N, Y).

COCHABAMBA: Incachaca, *Steinbach* 8860 (Y).

Local names in southern Peru are: "Boton-boton," "maycha."

33. *Cavendishia montana* A. C. Smith, sp. nov.

Frutex; laminis oblongo-ovatis basi late cuneatis apice subacutis 5 ad 7 pli-nerviis; inflorescentia breviter racemosa basi bracteis papyraceis oblongis fimbriatis instructa; calycis rugosi subprismatici limbo quam tubo brevioris, lobis apiculatis; corolla subcylindrica laxe albo-pilosa; staminibus alternatim leviter inaequalibus, filamentis pilosis, tubulis quam loculis duplo longioribus.

Shrub; branchlets rugose or subterete, pubescent when young with pale lax hairs about 0.4 mm. long, becoming glabrous and cinereous; petioles subrugose, narrowly angled, sparsely pilose or glabrous, 6 to 8 mm. long; leaf blades oblong-ovate, 6 to 10 cm. long, 3 to 4.5 cm. broad, broadly cuneate at base, subacute or short-acuminate at apex, entire at margins, glabrous or short-pilose on nerves on both surfaces, 5 to 7 pli-nerved, the secondary nerves oriented near base, ascending, with the midnerve slightly impressed above, raised beneath, the veinlets nearly plane on both surfaces; inflorescence axillary, short-racemose, 4 to 10 flowered, bracteate at base and partly enveloped by several imbricate papyraceous oblong fimbriate bracts up to 2 cm. long and 1.2 cm. broad; pedicels subrugose, glabrous or sparsely puberulous when young, 4 to 6 mm. long, each subtended by a deciduous bract similar to those at base of inflorescence, deciduously bibracteolate near base with oblong-lanceolate bractlets about 2 mm. long; calyx tube rugose, campanulate, narrowly and bluntly winged to sinuses, glabrous (or sparsely pubescent when young), about 3 mm. long and 4 mm. in diameter at anthesis; limb erecto-patent, 2 to 2.5 mm. long including lobes, the lobes apiculate, less than 1 mm. long, sparsely pilose at margins; corolla subcylindric, 17 to 18 mm. long, 5 to 6 mm. in diameter, contracted distally, laxly white-pubescent with hairs about 0.4 mm. long, the lobes triangular, subacute, about 1.5 mm. long; stamens 13 to 14 mm. long; filaments dark castaneous, distinct or loosely coherent, densely pilose ventrally and at margins distally with spreading brown hairs about 0.4 mm. long, 2 mm. and 4 mm. long respectively; anther sacs slightly granular, 3 to 4 mm. long; tubules wide, flexible, about 8 mm. and 7 mm. long respectively; style stout, slightly exerted in mature flowers, the stigma peltate.

Type in the U. S. National Herbarium, no. 1,143,663, collected in forest at Pinares, above Salento, Department of Caldas, Central Cordillera, Colombia, altitude 2,600 to 2,800 meters, August 2 to 10, 1922, by F. W. Pennell (no. 9305). Duplicates at B, G, Y.

DISTRIBUTION: Central Cordillera of Colombia, altitude 2,600 to 3,500 meters.

COLOMBIA.

TOLIMA: La Ceja, Quindío Trail, Killip & Hazen 9520 (N, Y).

CALDAS: Magafia, Quindío Trail, Killip & Hazen 9170 (N, Y).

The present species is set off from the preceding complex (*C. cordifolia* and relatives) by its minute calyx lobes, short pedicels, and compact inflorescences.

34. *Cavendishia durifolia* A. C. Smith, sp. nov.

Frutex robustus; laminis crasso-coriaceis oblongis vel deltoideo-oblongis basi truncatis apice acuminatis 5 ad 7 pli-nerviis; inflorescentia subfasciculata basi bracteis imbricatis oblongo-ovatis parce puberulis instructa; calycis tubo elongato-campanulato saepe falcato, limbo breve; corolla subcylindrica dense pubescente; staminibus alternatim leviter inaequalibus; tubulis quam loculis longioribus.

Shrub; branchlets stout, subterete, glabrous, brownish; petioles slightly rugose, 7 to 9 mm. long, glabrous; leaf blades thick-coriaceous, glabrous, oblong or deltoid-oblong, 9 to 14 cm. long, 3.5 to 4.5 cm. broad (broadest towards base), truncate at base, acuminate at apex, entire and slightly revolute at margins, 5 to 7 pli-nerved, the secondary nerves oriented near base, with the midnerve shallowly impressed above, prominent beneath, the veinlets reticulate, plane above, slightly raised beneath; inflorescence axillary, subfasciculate (peduncle stout, not more than 5 mm. long), 4 to 10 flowered, bracteate at base and enveloped when young by numerous imbricate, submembranous, oblong-ovate, sparsely puberulous bracts up to 2.5 cm. long and 1.5 cm. broad; pedicels subterete, glabrous or puberulous, 4 to 6 mm. long, each subtended by a bract similar to those at base of inflorescence, deciduously bibracteolate near base; calyx tube elongate-campanulate, usually strongly falcate, glabrous, nigrescent, 6 to 7 mm. long, 4 to 4.5 mm. in diameter at anthesis; limb suberect, about 3 mm. long, including lobes, the lobes triangular, acute, glabrous or sparsely puberulous, about 2 mm. long, the sinuses rounded; corolla subcylindric, 20 to 24 mm. long, about 5 mm. in diameter, densely pubescent with pale spreading hairs about 0.5 mm. long, the lobes oblong, subacute, about 2 mm. long; stamens about 15 mm. and 16 mm. long, respectively; filaments nigrescent, marginally and ventrally pilose with hairs about 0.3 mm. long, 3 mm. and 5.5 mm. long, respectively; anther sacs slightly granular, 4 to 5 mm. long; tubules flexible, about 9 mm. and 8 mm. long, respectively; stigma peltate; young fruit sub-spherical, coriaceous, glabrous, up to 1 cm. in diameter.

Type in the herbarium of the New York Botanical Garden, collected in forest at Murillo, Department of Tolima, Colombia, altitude 2,100 to 2,500 meters, December 18, 1917, by F. W. Pennell (no. 3178).

DISTRIBUTION: Known only from the type specimen.

Distinguished by very short pedicels and a peculiarly elongate calyx tube. The leaves, which are rigidly coriaceous and are broadest near the base, are also characteristic.

35. *Cavendishia axillaris* A. C. Smith, sp. nov.

Frutex; laminis subsessilibus oblongis vel oblongo-rotundatis basi leviter subcordatis apice breviter acuminatis pinnatinerviis; inflorescentia breviter racemosa basi bracteis subcoriaceis ovatis decidue fimbriatis instructa ubique glabra; floribus subsessilibus; calycis campanulati tubo quam limbo longiore; corolla coriacea subcylindrica; filamentis antherisque compensanter inaequalibus, filamentis distinctis glabris.

Shrub, branchlets subterete or striate, glabrous, brownish; petioles subterete, glabrous, 4 mm. long or less; leaf blades appearing sessile, oblong or oblong-rotund, 10 to 13 cm. long, 6 to 8.5 cm. broad, lightly subcordate at base, short-acuminate at apex, entire and slightly revolute at margins, glabrous, pinnate-

veined, the midvein slightly raised above, prominent beneath, the secondary veins 4 to a side, spreading, arcuate near margins, plane or slightly impressed above, prominent beneath, the veinlets reticulate, slightly raised above, plane beneath; inflorescence axillary, short-racemose (rachis usually less than 1 cm. long), 5 to 10 flowered, circumscribed at base and partially enveloped by several subcoriaceous, ovate, deciduously fimbriate bracts up to 7 mm. long and 5 mm. broad, essentially glabrous in all parts; flowers subsessile, the pedicels 1 mm. long or less, each subtended by a bract similar to those at base of inflorescence and partially covering the flower individually; calyx coriaceous, the tube short-cylindric or campanulate, about 3 mm. long and 3 mm. in diameter at anthesis, the limb erect, about 2 mm. long including lobes, the lobes triangular, acute, about 1 mm. long; corolla immature in our specimen, coriaceous, subcylindric or subspherical, about 5 mm. long and 3 mm. in diameter; stamens about 4.8 mm. long; filaments nigrescent, distinct, carnose, glabrous, about 1 mm. and 2 mm. long, respectively; anther sacs slightly granular, about 3.5 mm. and 3 mm. long, respectively; tubules (immature) about 1 mm. long, opening by clefts nearly as long; stigma peltate.

Type in the herbarium of the New York Botanical Garden, collected in forest above Cascada Chorrón, south of Antizales, Department of Bolívar, Colombia, altitude 2,300 to 2,700 meters, February 25, 1918, by F. W. Pennell (no. 4375).

DISTRIBUTION: Known only from the type collection.

A very distinct species of dubious relationship, marked by its crowded few-flowered inflorescences, small flowers, and broad subsessile leaves.

36. *Cavendishia guatapeensis* Mansf. Notizbl. Bot. Gart. Berlin 9:440. 1925.

Low shrub; branchlets subterete, glabrous, with a loose cinereous bark; petioles subterete, glabrous, 2 to 3 mm. long; leaf blades oblong or oblong-ovate, 3 to 5 cm. long, 1.5 to 2.3 cm. broad, truncate or lightly subcordate at base, subacute or obtusely acuminate at apex, entire at margins, glabrous, sometimes sparsely pilose beneath when young with minute appressed brownish hairs about 0.1 mm. long, 5-ply-nerved, the secondary nerves oriented near base, with the midnerve slightly impressed above, raised beneath, the veinlets obscurely reticulate; inflorescence axillary, subfasciculate or short-racemose (rachis rarely more than 1 cm. long), 8 to 15 flowered, bracteate at base and enveloped when young by several papyraceous oblong bracts about 10 mm. long and 6 mm. broad, essentially glabrous in all parts; pedicels up to 3 mm. long (flowers often appearing sessile), each subtended by a bract similar to those at base of racemes, bibracteolate at base with papyraceous oblong acute bractlets up to 8 mm. long, the bractlets sometimes covering the calyx; calyx tube short-cylindric, about 2 mm. long and 2.5 mm. in diameter at anthesis; limb suberect, about 2.5 mm. long including lobes, the lobes ovate, apiculate, about 1 mm. long, thick-margined except at apex; corolla subcylindric, 8 to 9 mm. long, 3 to 4 mm. in diameter, dark red, paler at lobes, glabrous or rarely short-pubescent with scattered appressed brownish hairs, the lobes triangular, subacute, about 1 mm. long; stamens about 6.5 mm. and 7.5 mm. long, respectively; filaments castaneous, distinct, marginally pilose with hairs up to 0.2 mm. long or subglabrous, 2 mm. and 3.5 mm. long, respectively; anther sacs slightly granular, 2.5 to 3 mm. long; tubules wide, about 3 mm. and 2 mm. long, respectively; stigma truncate.

TYPE LOCALITY: Río Guatapé, between Medellín and Nare, Department of Antioquia, Colombia, altitude about 2,300 meters. Type collected by Kalbreyer (no. 1468).

DISTRIBUTION: Western and Central Cordilleras of northern Colombia, altitude 2,000 to 3,100 meters.

COLOMBIA.

BOLÍVAR: Below Páramo de Chaquiro, Western Cordillera, *Pennell* 4300 (Y), 4307 (Y), 4332 (G, N, Y).

ANTIOQUÍA: Río Guatapé, between Medellín and Nare, *Kalbreyer* 1468 (B, type, K). Santa Rosa, *Lehmann* 7527 (K). Medellín, *Toro* 468 (Y). Santa Elena, *Archer* 1289a (N, Y).

TOLIMA: Murillo, *Pennell* 3193 (Y).

Distinguished not only by its small blunt leaves, but also by its very short pedicels and its large bractlets, these sometimes covering the calyces.

37. *Cavendishia quereme* (H. B. K.) Benth. & Hook. Gen. Pl. 2:570. 1876.

Thibaudia quereme H. B. K. Nov. Gen. & Sp. 3:274. 1818.

Polyboea quereme Klotzsch, Linnaea 24:31. 1851.

Ceratostema odoratissimum Willd.; Klotzsch, Linnaea 24:31. 1851, as synonym.

Chupalon quereme Kuntze, Rev. Gen. Pl. 2:384. 1891.

Orthaea lehmannii Fedtsch. & Basil. Not. Syst. Herb. Hort. Bot. U. S. S. R. 6:24. 1926.

Low epiphytic shrub about 1 meter high; branchlets subterete, brownish, glabrous; petioles terete, slightly rugose, 3 to 7 mm. long, glabrous; leaf blades oblong-ovate, 6 to 12 cm. long, 1.5 to 4 cm. broad, cuneate at base, caudate-acuminate at apex, entire and slightly revolute at margins, glabrous, 5-pleined, the secondary nerves oriented near base, ascending, with the mid-nerve deeply impressed above, prominent beneath, the veinlets reticulate, slightly raised on both surfaces or plane; inflorescence terminal and axillary, racemose, essentially glabrous in all parts, 10 to 20 flowered; rachis angled, 2 to 5 cm. long; pedicels subrugose, 8 to 12 mm. long, each subtended by an oblong acute membranous bract up to 2 cm. long, deciduously bibracteolate at base with bractlets up to 1 mm. long, swollen at apex; calyx tube short-cylindric, 1 to 1.5 mm. long and 3 to 4 mm. in diameter at anthesis; limb suberect, 2 to 2.5 mm. long including lobes, the lobes ovate, apiculate, about 1.5 mm. long, thin-margined and rarely sparsely glandular-margined; corolla subcylindric, 9 to 10 mm. long, about 4 mm. in diameter at base, contracted above, the lobes triangular, subacute, about 1 mm. long; stamens 7.5 mm. and 8.5 mm. long, respectively; filaments castaneous, distinct, glabrous, about 1.5 mm. and 3.5 mm. long, respectively; anther sacs nearly smooth, 2 to 2.5 mm. long; tubules wide, about 5 mm. and 3.5 mm. long, respectively; stigma truncate.

TYPE LOCALITY: Near Cali, Department of El Valle, Colombia, altitude about 1,000 meters. Type collected by Humboldt and Bonpland.

DISTRIBUTION: Western Cordillera of Colombia and mountains of Costa Rica, altitude 1,000 to 1,700 meters.

COLOMBIA.²⁹

EL VALLE: Near Cali, *Humboldt & Bonpland* (B, type collection); *Merck* (?) (B). Upper Río Dagua, *Lehmann* 2954 (type collection of *Orthaea lehmannii*, B, N). Valle del Salado, *Triana* 2671 (K, N, Y).

EL CAUCA: Popayán, in cultivation, *Hartweg* 1221 (K); *Stuebel* 317a (B). Between Popayán and Alto del Cauca, *Stuebel* 340a (B).

This species, which appears to be locally common in the Western Cordillera of Colombia and again in Costa Rica, is well marked by its bullate leaves and by the characters mentioned in the key. A local name in the Cali region is "quereme."

²⁹ For Costa Rican specimens see page 457.

38. *Cavendishia caudata* A. C. Smith, sp. nov.

Frutex; laminis oblongo-ovatis basi rotundatis vel late cuneatis apice longe acuminatis glabris 5-plex-nerviis; inflorescentia subfasciculata basi decidue bracteata; pedicellis brevibus bibracteolatis, bracteolis papyraceis oblongis venosis; floribus subglabris; calycis campanulati limbo tubum subaequante; corolla subcylindrica; staminibus alternatim leviter inaequalibus, filamentis parce pilosis, tubulis loculos subaequantibus.

Shrub; branchlets subterete, brownish, minutely puberulous; petioles subterete, slender, puberulous, 2 to 4 mm. long; leaf blades oblong-ovate, 10 to 13 cm. long, 3 to 4 cm. broad, rounded or broadly cuneate at base, long-acuminate at apex (acumen 2 to 3 cm. long), entire and slightly revolute at margins, glabrous, 5-plex-nerved, the secondary nerves oriented slightly above base, with the midnerve slightly impressed above, raised beneath, the veinlets reticulate, slightly raised on both surfaces; inflorescence axillary or terminal, subfasciculate, deciduously bracteate at base; pedicels subterete, about 2 mm. long, glabrous, subtended by bracts (?), bibracteolate at middle (bractlets papyraceous, oblong, about 8 mm. long and 4 mm. broad, sparsely fimbriate, coarse-veined, completely covering the calyx), obscurely articulate with calyx; calyx tube campanulate, essentially glabrous, about 2 mm. long and 3 mm. in diameter at anthesis; limb suberect, about 3 mm. long including lobes, the lobes ovate, apiculate, about 1.5 mm. long, the sinuses sharp; corolla subcylindric, 7 to 10 mm. long, 3 to 4 mm. in diameter, contracted distally, glabrous; stamens imperfect in our specimen but apparently subequal, 5 to 6 mm. long; filaments castaneous, pilose ventrally and at margins distally with short pale hairs, about 1.5 mm. and 3 mm. long, respectively; anther sacs slightly granular, about 2 mm. long; tubules about 2.5 mm. and 1.5 mm. long; stigma peltate.

Type in the herbarium of the New York Botanical Garden, collected in forest at Antizales, Department of Bolívar, Colombia, altitude 1,700 to 2,000 meters, February 25 or 26, 1918, by F. W. Pennell (no. 4441).

DISTRIBUTION: Known only from the type collection.

A very unusual species, of which the described specimen is somewhat incomplete. However, the short pedicels with large bracts which cover the calyces, together with the long-acuminate leaves and slender petioles, serve to distinguish it from its allies.

39. *Cavendishia oligantha* A. C. Smith, sp. nov.

Frutex; laminis oblongo-ovatis subbullatis basi cuneatis vel subattenuatis apice longe acuminatis 5 ad 7 pli-nerviis; inflorescentia laxe et breviter racemosa decidue bracteata ubique glabra; calycis campanulati limbo quam tubo paullo longiore, lobis brevibus; corolla subcylindrica; filamentis antherisque compensanter inaequalibus, tubulis quam loculis duplo longioribus.

Shrub; branchlets rugose, slender, glabrous; petioles subrugose, glabrous, 5 to 7 mm. long; leaf blades oblong-ovate, 9 to 11 cm. long, 3 to 4 cm. broad, somewhat bullate, cuneate or subattenuate at base, long-acuminate at apex, entire and slightly revolute at margins, glabrous, nitid, 5 to 7 pli-nerved, the secondary nerves oriented above base, sharply ascending, with the midnerve impressed above, prominent beneath, the veinlets reticulate, slightly raised on both surfaces; inflorescence axillary, laxly short-racemose, 3 to 6 flowered, deciduously bracteate (bracts not present in our specimen), essentially glabrous; rachis subterete, slender, flexuose, about 1 cm. long; pedicels subterete, 3 to 6 mm. long, the bractlets small, deciduous; calyx tube short-cylindric or campanulate, rugose, bluntly angled to sinuses, about 1.5 mm. long and 1.5 mm. in

diameter at anthesis; limb erect, 2 to 3 mm. long including lobes, the lobes triangular, acute, about 1 mm. long, membranous-margined and sparsely fimbriate with minute glandular hairs; corolla subcylindric, 8 to 9 mm. long, about 3.5 mm. in diameter, the lobes reflexed at maturity, triangular, obtuse, about 1 mm. long; stamens subequal (alternate filaments and anthers compensatingly unequal), 6.5 to 7 mm. long; filaments nigrescent, slender, distinct, marginally pilose or glabrous, about 1.5 mm. and 2.5 mm. long, respectively; anther sacs nearly smooth, about 1.5 mm. long; tubules flexible, about 4 mm. and 3 mm. long, respectively, opening by clefts about half as long; stigma truncate.

Type in the herbarium of the New York Botanical Garden, collected near Tuquerres, Department of Nariño, Colombia, altitude 2,700 meters, 1851 to 1857, by J. Triana (no. 2675). Duplicate at K.

DISTRIBUTION: Known only from the type collection.

From the preceding species this plant is distinguished by the smaller bractlets, the small calyx lobes, and the leaves being more attenuate at base.

40. *Cavendishia glandulosa* A. C. Smith, sp. nov.

Frutex epiphyticus; ramulis gracilibus pendulis setosis; laminis lanceolato-oblongis basi rotundatis vel truncatis apice acuminatis utrinque pilosis obscure 5-pinnatis; inflorescentia subfasciculata vel breviter racemosa basi bracteata; calyce parce puberulo et dense glanduloso (glandulis castaneis globosis sessilibus), limbo tubum subaequante; corolla subcylindrica glabra; staminibus alternatim leviter inaequalibus, filamentis connatis, tubulis quam loculis paullo longioribus.

Epiphytic shrub with pendent branches; branchlets rugose, slender, lax, brownish, densely pubescent with pale brown setiform hairs about 0.8 mm. long; petioles rugose, pubescent as the branchlets, about 1 mm. long; leaf blades lanceolate-oblong, 35 to 45 mm. long, 10 to 16 mm. broad, rounded or truncate at base, acuminate at apex, entire at margins, pilose on both surfaces (more sparsely so above) with pale stiff hairs about 0.6 mm. long (hairs not more than five per square millimeter except on veins), obscurely 5-pinnate, the midnerve slightly impressed above, raised beneath, the secondary nerves ascending from base, slightly raised on both surfaces, the veinlets reticulate, plane on both surfaces; inflorescence terminal or axillary, subfasciculate or short-racemose (rachis up to 2 cm. long, stout, setose), 5 to 10 flowered, bracteate at base and partly enveloped by several imbricate submembranous oblong-obovate puberulous bracts about 15 mm. long and 8 mm. broad; pedicels subrugose, sparsely pilose distally with spreading hairs about 0.3 mm. long, 3 to 5 mm. long, each subtended by a deciduous bract similar to those at base of inflorescence, obscurely articulate with calyx; calyx coriaceous, sparsely puberulous as the pedicel and also densely covered with minute castaneous spherical sessile glands (glands about 0.1 mm. in diameter, densely covering the surface of the calyx tube), the tube campanulate, about 3.5 mm. long and 3.5 mm. in diameter at anthesis, the limb suberect, about 4 mm. long including lobes, the lobes triangular, subacute, 1.5 to 2 mm. long, the sinuses rounded; corolla "white," subcylindric, 12 to 14 mm. long, 6 mm. in diameter, slightly contracted at base and apex, glabrous, the lobes triangular, subacute, reflexed at maturity, about 1.5 mm. long; stamens about 7 mm. and 8 mm. long, respectively; filaments castaneous, glabrous or sparsely puberulous distally, about 3.5 mm. and 4 mm. long, respectively, firmly connate in a tube about 3 mm. long; anther sacs nearly smooth, 1.5 to 2 mm. long; tubules flexible, about 3 mm. and 2 mm. long, respectively; stigma truncate.

Type in the herbarium of the New York Botanical Garden, collected in shrub zone below Páramo de Chaquíro, Western Cordillera, Department of Bolívar, Colombia, altitude 2,800 to 3,100 meters, February 24, 1918, by F. W. Pennell (no. 4301).

DISTRIBUTION: Known only from the type specimen.

This plant, which is without close relatives, is one of the most remarkable species known from the extraordinarily rich region of northern Colombia. It is unique in the possession of a densely gland-covered calyx and in its firmly connate filaments.

41. *Cavendishia angustifolia* Mansf. Notizbl. Bot. Gart. Berlin 9: 439. 1925.

Compact branching shrub; branchlets subterete, brownish, minutely puberulous or glabrous; petioles subrugose, subglabrous, about 2 mm. long; leaf blades lanceolate, 3.5 to 6.5 cm. long, 0.6 to 1 cm. broad, truncate at base, obtusely short-acuminate at apex, entire at margins, subcoriaceous, glabrous on both surfaces, 3-plexi-nerved, the secondary nerves oriented about 5 mm. above base, sharply ascending, with the midnerve impressed above, prominent beneath, the veinlets slightly impressed above, obscure beneath; inflorescence axillary, subfasciculate or short-racemose (rachis up to 1 cm. long), 8 to 12 flowered, glabrous in all parts, bracteate at base and enveloped by numerous imbricate papyraceous oblong bracts up to 18 mm. long and 8 mm. broad; pedicels subterete, slender, 3 to 5 mm. long, each bracteate at base; calyx tube coriaceous, short-cylindric or subprismatic, about 2 mm. long and 2 mm. in diameter at anthesis; limb suberect, subcoriaceous, about 2 mm. long including lobes, the lobes triangular, blunt, thickened, about 1 mm. long and 1.5 mm. broad, the sinuses rounded; corolla submembranous, cylindric, 12 to 13 mm. long, about 3 mm. in diameter, the lobes triangular, 1 mm. long; stamens nearly as long as corolla; filaments castaneous, distinct, sparsely pilose distally, about 1 mm. and 2.5 mm. long, respectively; anther sacs slightly granular, about 2.5 mm. long; tubules membranous, 9 mm. and 7.5 mm. long, respectively; stigma truncate or subpeltate.

TYPE LOCALITY: Carolina, Department of Antioquia, Colombia, altitude 1,850 to 2,300 meters. Type collected by Kalbreyer (no. 1624).

DISTRIBUTION: Known only from the type collection.

COLOMBIA.

ANTIOQUÍA: Carolina, *Kalbreyer* 1624 (B, type, K).

A very handsome and compact little plant, easily identified by its small lanceolate leaves.

42. *Cavendishia obtusa* A. C. Smith, sp. nov.

Frutex robustus; laminis oblongis basi truncatis vel leviter subcordatis apice rotundatis subtus punctatis et decidue pilosis 5 ad 7 pli-nerviis; inflorescentia breviter racemosa basi bracteis ovato-oblongis imbricatis instructa ubique glabra; calycis prismatici rugosi limbo tubum subaequante; corolla subcylindrica; staminibus alternatim leviter inaequalibus, tubulis quam loculis 2 ad 3-plo longioribus.

Stout shrub; branchlets subterete or angled, brownish, glabrous, up to 6 mm. in diameter near their termination; petioles subrugose, 4 to 10 mm. long, glabrous; leaf blades oblong, 10 to 22 cm. long, 3.5 to 6 cm. broad, truncate or lightly subcordate at base, rounded at apex, entire and strongly revolute at margins, glabrous and sometimes sparsely punctate above, punctate beneath and deciduously pilose with scattered appressed brownish hairs about 0.3 mm. long, 5 to 7 pli-nerved, the midnerve impressed above, very prominent beneath, the secondary nerves oriented near base, ascending, slightly impressed above,

prominent beneath, the veinlets reticulate, plane above, slightly raised beneath; inflorescence axillary near ends of branchlets, short-racemose, 10 to 30 flowered, bracteate at base and partially enveloped by numerous imbricate papyraceous ovate-oblong bracts up to 3 cm. long and 2 cm. broad, glabrous in all parts; rachis subrugose, stout, 1 to 3 cm. long; pedicels rugose, 8 to 12 mm. long, each subtended by a bract similar to those at base of inflorescence, deciduously bibracteolate near base; calyx tube strongly rugose, angled to sinuses, prismatic, 3.5 to 4 mm. long, about 4 mm. in diameter at anthesis; limb suberect, coriaceous, 4 to 5 mm. long including lobes, the lobes triangular, apiculate, about 1.5 mm. long, thick-margined except at apex; corolla subcylindric, dark red, white distally and sometimes slightly farinose at lobes, about 24 mm. long and 6 mm. in diameter, contracted distally, the lobes reflexed at maturity, triangular, subacute, about 2 mm. long; stamens 10, about 18.5 mm. and 19.5 mm. long; filaments castaneous, distinct, puberulous within distally with brownish hairs up to 0.3 mm. long, about 4 mm. and 5 mm. long, respectively; anther sacs granular, 4 to 4.5 mm. long; tubules wide, about 12.5 mm. and 11 mm. long; style exerted in mature flowers, longitudinally striate, the stigma truncate; young fruit subcylindric, strongly rugose, up to 8 mm. in diameter.

Type in the U. S. National Herbarium, no. 1,042,353, collected in thicket on slope of Mount Chuscal, west of Zipaquirá, Department of Cundinamarca, Colombia, altitude 3,000 to 3,100 meters, October 22, 1917, by F. W. Pennell (no. 2572). Duplicates at G, Y.

DISTRIBUTION: Eastern and Central Cordilleras of central Colombia, altitude 2,200 to 3,100 meters.

COLOMBIA.

CUNDINAMARCA: Tequendama, *Holton* 631 (K, Y). Between Fusagasugá and Bogotá, *Stuebel* 149a (B). Facatativá, *Tracey* 269 (K).

HUILA: East of Neiva, *Rusby & Pennell* 676 (Y).

CALDAS: Between Salento and Laguneta, Quindío Trail, *Killip & Hazen* 9104 (N, Y). Pinares, above Salento, *Pennell* 9303 (N, Y).

This robust and beautiful species is apparently common locally, but has previously escaped description. It is readily recognized by the rounded or obtuse leaves, the large and rugose calyx, and the numerous large bracts.

EXPLANATION OF PLATE 16.—*Cavendishia obtusa*, from photograph of type sheet. About one-half natural size.

43. *Cavendishia marginata* A. C. Smith, sp. nov.

Frutex; laminis oblongis vel ovato-oblongis basi cuneatis apice caudato-acuminatis 5-plex-nerviis; inflorescentia subfasciculata vel breviter racemosa, basi bracteis imbricatis papyraceis oblongis vel ovatis instructa, ubique glabra; pedicellis bibracteolatis, bracteolis linearibus glanduloso-marginatis; calycis limbo tubum subaequante, lobis elongato-triangularibus lateraliter callosomarginatis. Corolla et stamina desunt.

Shrub; branchlets striate, stramineous, glabrous; petioles subterete, canaliculate, 4 to 6 mm. long; leaf blades oblong or ovate-oblong, 8 to 12 cm. long, 3.5 to 4 cm. broad, cuneate at base, caudate-acuminate at apex, entire and revolute at margins, glabrous, nitid, sparsely brown-punctate beneath, 5-plex-nerved, the secondary nerves oriented at base, slightly impressed above, raised beneath, the veinlets obscurely reticulate; inflorescence terminal or axillary, subfasciculate or short-racemose (rachis stout, up to 5 mm. in diameter, less than 1 cm. long), 8 to 15 flowered, bracteate at base and enveloped when young by several imbricate, papyraceous, oblong or ovate bracts up to 35 mm. long and 20 mm. broad, glabrous in all parts; pedicels rugose, 6 to 8 mm. long, each subtended by a deciduous bract similar to those at base of

inflorescence, bibracteolate at base (bractlets linear, 10 to 13 mm. long, about 1 mm. broad, glandular-margined, glands about 15 per side, spherical), slightly swollen distally; calyx coriaceous, glabrous, the tube short-cylindric, about 3.5 mm. long and 5 mm. in diameter (past maturity), the limb erect, about 3.5 mm. long including lobes, the lobes elongate-triangular, about 2.5 mm. long, acute, each flanked by a nigrescent elongate callose thickening, the sinuses rounded; corolla (?); style filiform, 30 to 35 mm. long, the stigma peltate.

Type in the herbarium of the New York Botanical Garden, collected in forest at La Gallera, Micay Valley, Western Cordillera, Department of El Cauca, Colombia, altitude 1,400 to 2,100 meters, June 29 or 30, 1922, by E. P. Killip (no. 7691).

DISTRIBUTION: Known only from the type specimen.

In spite of the absence of corolla and stamens in the type specimen, this species is marked as distinct by its extraordinary bractlets and peculiar calyx lobes. The length of the style and the robust aspect of the calyx indicate its affinity with the large-flowered group of species.

44. *Cavendishia rigidifolia* A. C. Smith, sp. nov.

Arbor parva rigida; laminis lanceolato-oblongis basi anguste subtruncatis apice longe acuminatis 5-plex-nerviis; inflorescentia fasciculata glabra bracteis numerosis papyraceis ovato-oblongis circumdata; calycis rugosi tubo campanulato, limbo quam tubo brevior; corolla cylindrica; filamentis antherisque alternatim compensanter inaequalibus, tubulis quam loculis paullo longioribus.

Small tree with stiff branches; branchlets angled or subterete, rugose, brownish, glabrous, 4 to 5 mm. in diameter near apices; petioles strongly rugose, glabrous, stout, about 3 mm. in diameter, 6 to 10 mm. long; leaf blades lanceolate-oblong, 20 to 25 cm. long, 4 to 5 cm. broad, narrowed and subtruncate at base, long-acuminate at apex, entire at margins, thick-coriaceous, glabrous on both surfaces, 5-plex-nerved, the second and third nerves oriented 1 to 2 cm. above base, ascending to apex, the fourth and fifth nerves oriented from base, the 5 primary nerves impressed above, prominent beneath, the veinlets slightly raised above, plane beneath; inflorescence axillary near ends of branchlets, fasciculate (peduncle stout, short, about 8 mm. long and broad), 10 to 20 flowered, glabrous in all parts, enveloped by numerous imbricate papyraceous ovate-oblong bracts up to 3 cm. long and 2.5 cm. broad; pedicels subterete, stout, about 3 mm. in diameter, 4 to 6 mm. long, deciduously bibracteolate near base, swollen distally; calyx thick, coriaceous, the tube campanulate, about 5 mm. long and 6 mm. in diameter at anthesis, the limb suberect, about 3 mm. long including lobes, the lobes subtriangular, 2 to 3 mm. long, sparsely glandular, the sinuses subacute; corolla thin-carnose, cylindric, about 22 mm. long, 5 to 7 mm. in diameter, the lobes triangular, about 1 mm. long; stamens about 17 mm. long; filaments castaneous, distinct, sparsely puberulous, 5 mm. and 7 mm. long, respectively; anther sacs nearly smooth, about 6 mm. long; tubules membranous, about 8 mm. and 5 mm. long, respectively; stigma truncate; young fruit campanulate, 8 to 10 mm. in diameter, surmounted by the incurved calyx lobes.

Type in the herbarium of the Royal Botanic Gardens, Kew, collected at Las Minitas, between Medellín and Manizales, Department of Antioquia, Colombia, altitude about 2,400 meters, July, 1921, by Mrs. I. A. Tracey (no. 335).

DISTRIBUTION: Known only from the type specimen.

Readily distinguished from related species by its large lanceolate leaves.

45. *Cavendishia lehmannii* Hoer. Bot. Jahrb. Engler 42:331. 1909.

Shrub; branchlets subterete, brownish, slender, white-pilose when young with spreading hairs up to 0.5 mm. long; petioles terete, slender, pilose as the branch-

lets, 3 to 4 mm. long; leaf blades oblong or lanceolate-oblong, 8 to 10 cm. long, 2 to 3 cm. broad, broadly cuneate at base, long-acuminate at apex, entire at margins, glabrous above, pilose beneath when young, especially on nerves, with hairs about 0.3 mm. long, 5-ply-nerved, the secondary nerves oriented near base, ascending, with the midnerve slightly impressed above, prominent beneath, the veinlets reticulate, nearly plane on both surfaces; inflorescence terminal or axillary, subfasciculate or short-racemose (rachis less than 1 cm. long), 6 to 10 flowered, bracteate at base and partly enveloped by several submembranous oblong glabrous bracts up to 25 mm. long and 12 mm. broad; pedicels subterete, densely and persistently pilose with minute spreading pale hairs, 4 to 6 mm. long, each subtended by a deciduous bract similar to those at base of inflorescence, deciduously bracteolate near base with linear, subcoriaceous, sparsely fimbriate bractlets about 4 mm. long; calyx coriaceous, pilose at base as the pedicels, the tube subcylindric or campanulate, about 2 mm. long and 3 mm. in diameter at anthesis, the limb suberect, about 3.5 mm. long, including lobes, the lobes triangular, acute, about 1 mm. long, each margined with several minute irregular glands; corolla subcylindric, 18 to 20 mm. long, about 4 mm. in diameter, glabrous, the lobes triangular, subacute, about 1 mm. long; stamens subequal (alternate filaments and anthers compensatingly unequal), 15 to 16 mm. long; filaments nigrescent, minutely pilose distally or glabrous, loosely coherent at base, about 3 mm. and 6 mm. long, respectively; anther sacs granular, 3.5 to 4 mm. long; tubules erect, wide, about 10 mm. and 7 mm. long, respectively; stigma truncate.

TYPE LOCALITY: Amalfi, Department of Antioquia, Colombia, altitude 1,600 to 1,800 meters. Type collected by Lehmann (no. 7895).

DISTRIBUTION: Known only from the type locality.

COLOMBIA.

ANTIOQUIA: Amalfi, *Lehmann* 7895 (B, type, F), CCXXX (N).

This species is distinguished from its allies by the pilose pedicels and calyx tube.

46. *Cavendishia gracilis* A. C. Smith, sp. nov.

Frutex gracilis; laminis oblongis vel ovato-oblongis basi cuneatis apice longe acuminatis obscure 5-ply-nerviis; inflorescentia breviter racemosa glabra basi bracteis submembranaceis oblongis instructa; calycis tubo subrugoso campanulato limbum subaequante; corolla cylindrica tenui; filamentis anther-longioribus.

Slender shrub up to 5 meters high; branchlets subterete, glabrous, slender, brownish, becoming cinereous; petioles rugose, 4 to 6 mm. long, slender, glabrous; leaf blades oblong or ovate-oblong, 4.5 to 7 cm. long, 1.5 to 2.5 cm. broad, cuneate at base, long-acuminate at apex, entire at margins, glabrous or sparsely and minutely brown-pilose beneath, obscurely 5-ply-nerved, the secondary nerves oriented near base, with the midnerve nearly plane above, slightly raised beneath, the veinlets reticulate, slightly raised on both surfaces; inflorescence terminal or axillary, short-racemose (rachis slender, not more than 2 cm. long), 5 to 10 flowered, glabrous in all parts, deciduously bracteate at base with submembranous oblong bracts up to 2 cm. long and 1 cm. broad; pedicels rugose, 3 to 5 mm. long, each subtended by a deciduous bract, deciduously bibracteolate near base with oblong bractlets about 1 mm. long; calyx tube subrugose, campanulate, about 2 mm. long and 3 mm. in diameter at anthesis; limb suberect, submembranous, 1 to 2 mm. long including lobes, the lobes triangular, acute, about 1 mm. long, each flanked by an elongate callose thickening; corolla cylindric, thin-carnose, 12 to 14

mm. long, about 2.5 mm. in diameter, the lobes triangular, subacute, about 1 mm. long; stamens subequal (alternate filaments and anthers compensatingly unequal), 10 to 12 mm. long; filaments castaneous, slender, distinct, glabrous or sparsely puberulous distally, about 2 mm. and 4 mm. long, respectively; anthers pale yellow, submembranous, the sacs slightly granular, 2.5 to 3 mm. long, the tubules flexible, about 7 mm. and 5.5 mm. long, respectively; stigma peltate; young fruit coriaceous, subspherical, up to 5 mm. in diameter, surmounted by the persistent calyx limb.

Type in the U. S. National Herbarium, no. 1,351,688, collected on open hillside in mountains east of Las Vegas, Department of Santander, Eastern Cordillera, Colombia, altitude 3,000 to 3,200 meters, December 21, 1926, by E. P. Killip and A. C. Smith (no. 15871). Duplicate at Y.

DISTRIBUTION: Eastern and Central Cordilleras of central Colombia, altitude 1,600 to 3,200 meters.

COLOMBIA.

SANTANDER: Las Vegas, *Killip & Smith* 15997 (N, Y).

ANTIOQUIA: Santa Rosa, *Lehmann* 7447 (B, F, G, K, N).

These specimens seem to merit specific recognition on the basis of their slender habit. The specimens from Antioquia are slightly more robust than those from the Eastern Cordillera, but are best placed with this species.

47. *Cavendishia pseudopubescens* (Klotzsch) Hoer. Bot. Jahrb. Engler 42: 280. 1909.

Thibaudia pubescens var. *parvifolia* Benth. Pl. Hartw. 224. 1846.

Proclesia pseudopubescens Klotzsch, Linnaea 24: 33. 1851.

Chupalon pseudopubescens Kuntze, Rev. Gen. Pl. 2: 384. 1891.

Shrub; branchlets subterete, brownish or cinereous, pubescent with pale spreading hairs up to 0.4 mm. long, becoming glabrous; petioles subterete, 4 to 7 mm. long, sparsely pilose or glabrous; leaf blades oblong or ovate-oblong, 8 to 11 cm. long, 3.5 to 4 cm. broad, cuneate or rounded at base, obtuse or obtusely acuminate at apex, entire and slightly revolute at margins, glabrous or sometimes puberulous on nerves beneath and sparsely pilose with minute brown hairs, 5-plex-nerved, the secondary nerves oriented near base, ascending, with the midnerve slightly impressed above, prominent beneath, the veinlets obscurely reticulate; inflorescence terminal, subfasciculate (rachis less than 1 cm. long), 5 to 10 flowered, bracteate at base and partly enveloped by several subcoriaceous, ovate, thin-margined, deciduously sparse-puberulous bracts up to 2 cm. long and 1.2 cm. broad; pedicels subterete, glabrous, 4 to 5 mm. long, each subtended by a deciduous bract, bibracteolate near base with ovate glandular-margined bractlets about 1.5 mm. long; calyx coriaceous, glabrous, the tube broadly campanulate, about 3 mm. long and 4 mm. in diameter at anthesis, the limb suberect, submembranous, about 1 mm. long including lobes, the lobes triangular, apiculate, less than 1 mm. long, thin-margined; corolla subcylindric, 16 to 20 mm. long, about 4 mm. in diameter, glabrous, the lobes triangular, subacute, about 1 mm. long; stamens incomplete in our specimens but apparently subequal and nearly as long as corolla; tubules 8 to 10 mm. long; stigma truncate.

TYPE LOCALITY: Mount Pitayo, Department of El Cauca, Colombia, altitude 3,100 to 3,400 meters. Type collected by Hartweg (no. 1220).

DISTRIBUTION: Known only from the type collection.

COLOMBIA.

EL CAUCA: Mount Pitayo, *Hartweg* 1220 (B, type, K, Y).

A species of doubtful affinity, marked by its subpuberulous character. The pubescence of the bracts is especially noticeable.

48. *Cavendishia miconioides* A. C. Smith.*Thibaudia melastomoides* H. B. K. Nov. Gen. & Sp. 3: 272. 1818.*Proclesia melastomoides* Klotzsch, Linnaea 24: 32. 1851.*Cavendishia melastomoides* Hoer. Bot. Jahrb. Engler 42: 279. 1909, not Hemsl. 1881.

Shrub or low tree with subscaudent branches; branchlets subterete or longitudinally striate, brownish, glabrous, slender; petioles subterete or slightly rugose, glabrous, 3 to 4 mm. long; leaf blades coriaceous, oblong, 5 to 7 cm. long, 2 to 3 cm. broad, subcordate at base, subacute or obtusely acuminate at apex, entire at margins, glabrous, 5-plexi-nerved, the secondary nerves oriented near base, with the midnerve slightly impressed above, prominent beneath, the veinlets obscurely reticulate; inflorescence short-racemose, axillary near ends of branchlets, 5 to 10 flowered, glabrous in all parts, bracteate at base and enveloped when young by several submembranous oblong-ovate bracts up to 2 cm. long and 1 cm. broad; pedicels rugose, 5 to 8 mm. long, each subtended by a deciduous bract similar to those at base of racemes, deciduously bibracteolate near base with bractlets about 1 mm. long; calyx tube campanulate, 1.5 to 2 mm. long and about 2.5 mm. in diameter at anthesis; limb erecto-patent, about 2 mm. long including lobes, the lobes triangular, acute, 1 to 1.5 mm. long, somewhat thickened at margins, the sinuses rounded; corolla cylindric, 15 to 17 mm. long, about 4 mm. in diameter, the lobes oblong, subacute, about 1.5 mm. long, often reflexed; stamens subequal (alternately differing by about 1 mm.), about 13 mm. and 14 mm. long, respectively; filaments castaneous, distinct or loosely coherent at base, sparsely pilose distally, about 2 mm. and 4 mm. long, respectively; anther sacs slightly granular, 5 to 6 mm. long; tubules flexible, 5.5 to 7 mm. long; stigma peltate; young fruit spherical, rugose, grayish green, glabrous, up to 8 mm. in diameter.

TYPE LOCALITY: Andes of Colombia, altitude 2,400 to 2,800 meters. Type collected by Humboldt and Bonpland.

DISTRIBUTION: Andes of southern Colombia, altitude 1,300 to 2,800 meters.

COLOMBIA.

HUILA: East of Neiva, *Rusby & Pennell* 567A, in part (Y), 847 (N, Y), 990 (F, N, Y).

EL CAUCA: Río Paez Valley, Tierra Adentro, *Pittier* 1226 (N). Popayán, *Lehmann* 8418 (F, G, K, N). Between Cuatro Esquinas and Río Piendamó, *Pennell & Killip* 6397 (N, Y).

This species is separated from *C. acuminata* by its strictly oblong leaves, obtuse leaf apex, and subcordate leaf base. Although I have not seen type material, the above specimens appear to agree precisely with the original description.

The necessity for a new name has already been discussed, in connection with the Central American *C. melastomoides*.

49. *Cavendishia acuminata* (Hook.) Hemsl. Biol. Centr. Amer. Bot. 2: 272. 1881.*Thibaudia acuminata* Hook. Icon. Pl. 2: pl. 111. 1837.*Thibaudia hookeri* Walp. Repert. Bot. 6: 412. 1847.*Proclesia acuminata* Klotzsch, Linnaea 24: 34. 1851.*Proclesia benthamiana* Klotzsch, Linnaea 24: 33. 1851.*Thibaudia hendersoni* Regel, Gartenflora 24: 258. pl. 840. 1875.*Chupalon acuminatum* Kuntze, Rev. Gen. Pl. 2: 383. 1891.*Chupalon benthamianum* Kuntze, Rev. Gen. Pl. 2: 384. 1891.*Cavendishia benthamiana* Hoer. Bot. Jahrb. Engler 42: 278. 1909.

?*Cavendishia hendersoni* Hoer. Bot. Jahrb. Engler 42: 281. 1909.

Cavendishia pilgeriana Hoer. Bot. Jahrb. Engler 42: 322. 1909.

Cavendishia secundiflora Hoer. Bot. Jahrb. Engler 42: 323. 1909.

Shrub up to 10 meters high; branchlets striate, glabrous, brownish or cinereous; petioles rugose, glabrous, 3 to 7 mm. long; leaf blades ovate or ovate-oblong, 6 to 9 cm. long, 2.5 to 4 cm. broad, rounded or broadly cuneate at base, acuminate at apex, entire at margins, glabrous or sparsely pilose on both surfaces with scattered short appressed brown hairs, 5 to 7 pinnately-nerved, the secondary nerves oriented near base, with the midnerve slightly impressed above, raised beneath, the veinlets obscurely reticulate; inflorescence axillary or terminal, subfasciculate or short-racemose, 6 to 15 flowered, bracteate at base and partly enveloped by numerous papyraceous oblong-ovate bracts up to 2 cm. long and 1 cm. broad; pedicels rugose, 6 to 8 mm. long, glabrous, each subtended by a bract similar to those at base of inflorescence, deciduously bibracteolate at base with oblong sparsely glandular-margined bractlets about 2.5 mm. long; calyx rugose, glabrous, the tube short-cylindric, about 3 mm. long and 4 mm. in diameter at anthesis, the limb suberect, about 3.5 mm. long including lobes, the lobes triangular, acute, about 2 mm. long, sparsely pilose-margined, sometimes glandular-margined (glands minute, short-stalked); corolla subcylindric, glabrous, 18 to 25 mm. long, 5 to 6 mm. in diameter, the lobes triangular, subacute, about 1 mm. long; stamens 13 to 19 mm. long; filaments nigrescent, slender, puberulous distally with lax hairs about 0.2 mm. long, distinct, about 4 mm. and 6 mm. long, respectively; anthers pale yellow, membranaceous, the sacs smooth, 4 to 5 mm. long, the tubules flexible, 7 to 11 mm. and 5 to 9 mm. long, respectively; stigma peltate.

TYPE LOCALITY: Quito, Province of Pichincha, Ecuador. Type collected by Hall (no. 40).

DISTRIBUTION: Andes of western Colombia to Bolivia, altitude 1,700 to 3,500 meters.

COLOMBIA: *Purdie* (G, Y).

CALDAS: Santa Elena, above Santuario, *Pennell* 10314 (N, Y). Cerro Tatamá, *Pennell* 10509 (Y), 10538 (Y).

EL CAUCA: Río Palo Basin, Tierra Adentro, *Pittier* 1071 (N).

NARIÑO: Pasto, *Jameson* 444 (K); *André* (K). Tabano, *André* (K), 3004 (K).

ECUADOR: *Jameson* 290 (K); *Sodi* 92/18 (B, type of *C. pilgeriana*). Mindo, *André* (K). Chillo Valley, *Anthony & Tate* 210 (N).

PICHINCHA: Vicinity of Quito, Mount Pichincha, etc., without collector (G); *Jameson* (B, G, Y), 166 (K), 226 (K), 321 (K); *Couthouy*, in 1855 (F, G, Y); *Hartweg* 1219 (B, type of *C. benthamiana*, K, Y); *Hill*, in 1833 (B); *Lehmann* 160 (N); *Sodi* 92/16 (B), 92/17 (B); *Hitchcock* 20879 (N, Y); *Firmin* 172 (N), 320 (N, Y); *Hall* 40 (K, type).

TUNGURAGUA: Mount Tunguragua, *Sodi* 92/18c (B, type of *C. secundiflora*). Las Juntas, *Rose, Pachano, & Rose* 23169 (N, Y). Ambato, *J. N. & G. Rose* 22378 (N, Y), 23777 (N).

LOJA: Loja, *Popenoe* 1328 (N).

PERU: *Lobb* (K), *Macleod* (K).

AMAZONAS: Chachapoyas, *Mathews* 1444 (K).

HUÁNUCO: Panao, *Macbride & Featherstone* 2227 (F). María del Valle, *Macbride* 3558 (F).

JUNÍN: Pichis Trail, Eneñas, *Killip & Smith* 25677 (N, Y).

BOLIVIA: Ananca, Cerro de Gilusani, *Mandon* 550 (K).

LA PAZ: Coroico, *Bang* 2373 (B, F, G, N, Y).

Precisely the same situation as that which prevails in the *cordifolia-bracteata* group is found here. The species recognized in this section of the key have very slight morphological differences, but names have been given to them by previous students and a fairly constant geographic status is observable. The typical Ecuador form, with ovate sharp-acuminate subcoriaceous dull leaves is not difficult to distinguish from the Venezuelan form (*C. splendens*) with its oblong coriaceous nitid leaves. But there are several collections, especially those from western Colombia, which seem intermediate. The form described as *C. weberbaueri* appears to be somewhat more distinct, but the differences are those of habit and are difficult to express. In my opinion *C. pilgeriana* and *C. secundiflora* show no essential differences from other Ecuador material.

Local names for *C. acuminata* in Ecuador are: "Joyapa," "hualicon."

50. *Cavendishia splendens* (Klotzsch) Hoer. Bot. Jahrb. Engler 42:279. 1909.

Proclesia splendens Klotzsch, Linnaea 24:34. 1851.

Chupalon splendens Kuntze, Rev. Gen. Pl. 2:384. 1891.

Compact shrub 2 to 4 meters high; branchlets subterete, brownish, glabrous; petioles rugose, nigrescent or brownish, slightly angled, 4 to 8 mm. long; leaf blades oblong or ovate-oblong, thick-coriaceous, 6 to 10 cm. long, 3 to 5 cm. broad, subcordate or truncate or broadly cuneate at base, subacuminate at apex, entire at margins, glabrous, sparsely brown-punctate beneath, 5 to 7 pinnerved, the secondary nerves oriented near base, arcuate-ascending, approximate, with the midnerve shallowly impressed above, raised beneath, the veinlets reticulate, slightly impressed above, plane beneath; inflorescence axillary or terminal, subfasciculate or short-racemose (rachis less than 1 centimeter long), 5 to 10 flowered, glabrous in all parts, bracteate at base and partially enveloped by papyraceous oblong bracts up to 2 cm. long and 1 cm. broad; pedicels subterete, 3 to 7 mm. long, each subtended by a deciduous bract, bibracteolate at base with ovate acute bractlets about 1.5 mm. long; calyx tube campanulate, about 2.5 mm. long and 3 mm. in diameter at anthesis; limb suberect, about 2 mm. long including lobes, the lobes ovate, acute, about 1 mm. long, glabrous or sparsely margined with glandular hairs up to 0.2 mm. long, the sinuses rounded; corolla cylindric, 13 to 15 mm. long, about 3.5 mm. in diameter, contracted above, the lobes triangular, subacute, about 1 mm. long; stamens about 14 mm. and 15 mm. long, respectively; filaments dark castaneous, distinct, pilose at margins distally with hairs about 0.2 mm. long, about 2 mm. and 3 mm. long, respectively; anther sacs slightly granular, about 4 mm. and 5 mm. long respectively; tubules wide, flexible, about 10 mm. and 8 mm. long, respectively; stigma peltate; young fruit subspherical, up to 7 mm. in diameter, glabrous.

TYPE LOCALITY: Venezuela or Colombia. Type collected by Karsten (no. 6).

DISTRIBUTION: Andes of Venezuela and eastern Colombia, altitude 1,000 to 3,000 meters.

VENEZUELA.

FEDERAL DISTRICT: Caracas, *Linden* 50 (K), 355 (K); *Jahn* 199 (N).

ARAGUA: Colonia Tovar, *Moritz* 1663 (B, K); *Fendler* 736 (G, K, Y);

Pittier 9263 (G, N, Y); *Jahn* 1311 (N, Y); *Allart* 384 (N).

MÉRIDA: Páramo del Tambor, *Jahn* 745 (N). Tabay, *Gehriger* 405 (Y). 583 (N).

COLOMBIA OR VENEZUELA: *Karsten* 6 (B, type).

COLOMBIA: *Purdie* (K).

NORTE DE SANTANDER: Province of Ocaña, *Schlim* 1095 (K). Páramo del Hatico, between Pamplona and Toledo, *Killip & Smith* 20588 (N, Y), 20674 (N, Y), 20676 (N, Y).

SANTANDER: Las Vegas, *Killip & Smith* 15978 (N, Y), 15980 (N, Y), 16090 (N, Y). California, *Killip & Smith* 16764 (N, Y). Charta, *Killip & Smith* 18950 (N, Y).

The relationship of this plant to *C. acuminata* is discussed in connection with that species. A local name in Venezuela is "coral."

51. *Cavendishia weberbaueri* Hoer. Bot. Jahrb. Engler 42: 324. 1909.

Shrub about 3 meters high; branchlets subterete, stramineous, glabrous; petioles terete, castaneous, glabrous, 6 to 8 mm. long; leaf blades oblong or ovate-oblong, 11 to 15 cm. long, 4 to 6 cm. broad, broadly cuneate at base, caudate-acuminate at apex, entire at margins, glabrous, 5-plexi-nerved, the secondary nerves oriented near base, with the midnerve slightly impressed above, prominent beneath, the veinlets obscurely reticulate; inflorescence axillary or terminal, racemose, 8 to 15 flowered, glabrous in all parts, bracteate at base and partly enveloped by several submembranous oblong-ovate bracts up to 20 mm. long and 12 mm. broad; rachis subterete, 2 to 4 cm. long at maturity; pedicels subrugose, 8 to 10 mm. long, each subtended by a deciduous bract similar to those at base of racemes, bibracteolate near base with linear-oblong subcoriaceous thick-margined bractlets about 4 mm. long; calyx tube campanulate, about 3 mm. long and 4 mm. in diameter at anthesis; limb suberect, about 2.5 mm. long including lobes, the lobes triangular, subacute, 1.5 to 2 mm. long, thick-margined except at apex, usually eglandular; corolla carnose, cylindrical, 16 to 18 mm. long, about 5 mm. in diameter, the lobes triangular, subacute, about 1 mm. long; stamens 13 to 15 mm. long; filaments dark castaneous, carnose, distinct, sparsely puberulous at margins distally, about 3 mm. and 6 mm. long, respectively; anther sacs slightly granular, 4.5 to 5 mm. long; tubules wide, about 6.5 mm. and 5 mm. long, respectively; stigma peltate.

TYPE LOCALITY: Moyobamba, Department of Amazonas, Peru, altitude 1,300 to 1,400 meters. Type collected by Weberbauer (no. 4739).

DISTRIBUTION: Andes of Peru, altitude 1,300 to 2,400 meters.

PERU.

AMAZONAS: Moyobamba, *Weberbauer* 4739 (B, type).

CUZCO: Marcapata Valley, *Weberbauer* 7816 (F). Cerro de Cusilluyoc, *Pennell* 14009 (F), 14015 (F).

The absence of this plant in collections from central Peru is surprising, but possibly is owing to scant collecting in that region. It is very close to *C. acuminata*, from which it is distinguished by its larger and longer-acuminate leaves.

52. *Cavendishia ulei* Hoer. Verh. Bot. Ver. Brand. 50: 93. 1909.

Branching shrub 1 to 3 meters high; branchlets subterete, subrugose, glabrous; petioles rugose, stout, 2 to 3 mm. in diameter, 7 to 9 mm. long, glabrous; leaf blades oblong, 10 to 13 cm. long, 3.5 to 5 cm. broad, rounded at base, short-acuminate at apex, entire and slightly revolute at margins, glabrous above, glabrous beneath or sparsely pilose with short brown appressed hairs, 7-plexi-nerved, the secondary nerves oriented near base, ascending, with the midnerve impressed above, prominent beneath, the veinlets reticulate, nearly plane on both surfaces; inflorescence axillary, short-racemose, 10 to 15 flowered,

glabrous in all parts, bracteate at base and enveloped when young by numerous papyraceous oblong-ovate bracts up to 2 cm. long and 1.5 cm. broad; rachis stout, angled, 3 cm. long at maturity; pedicels subrugose, stout, 6 to 8 mm. long, each bracteate at base (bracts similar to those at base of inflorescence), bibracteolate near base (bractlets lanceolate, about 4 mm. long), slightly swollen distally; calyx tube coriaceous, campanulate, 3 to 4 mm. long, 3 to 5 mm. in diameter at anthesis; limb suberect, 2 to 4 mm. long including lobes, the lobes deltoid, acute, 1.5 to 3 mm. long, glandular-margined; corolla thin-carnose, 16 to 17 mm. long, 4 to 5 mm. in diameter, the lobes about 1 mm. long; stamens about 13 mm. long; filaments dark castaneous, distinct, glabrous, 1.5 to 2 mm. and about 3 mm. long, respectively; anther sacs slightly granular, 3 to 4 mm. long; tubules membranous, about 9 mm. and 8 mm. long, respectively; stigma truncate; young fruit campanulate, surmounted by the incurved calyx lobes.

TYPE LOCALITY: Cerro de Escalero, Department of San Martín, Peru, altitude 1,300 meters. Type collected by Ule (no. 6789).

DISTRIBUTION: Andes of northern Peru, altitude 1,300 to 2,500 meters.

PERU.

CAJAMARCA: Huancabamba, *Weberbauer* 6122 (B, F).

SAN MARTÍN: Cerro de Escalero, *Ule* 6789 (B, type, Go).

This species and the three following are all closely related, but are specifically distinct on characters of leaf venation and flower size, as mentioned in the key.

53. *Cavendishia capitata* (Benth.) Hoer. Bot. Jahrb. Engler 42: 279. 1909.

Thibaudia capitata Benth. Pl. Hartw. 142. 1844.

Proclesia capitata Klotzsch, Linnaea 24: 34. 1851.

Chupalon capitatum Kuntze, Rev. Gen. Pl. 2: 384. 1891.

Stout branching shrub; branchlets subterete or angled, stout, about 5 mm. in diameter near apices; petioles rugose, glabrous, stout, 7 to 10 mm. long; leaf blades coriaceous, glabrous on both surfaces, oblong or ovate-oblong, 14 to 16 cm. long, 6 to 7 cm. broad, rounded or broadly cuneate at base, short-acuminate at apex, entire or slightly revolute at margins, 7 to 9 pinnately-nerved, the secondary nerves oriented near base, ascending, with the mid-nerve impressed above, prominent beneath, the veinlets reticulate, plane on both surfaces; inflorescence axillary, subfasciculate or short-racemose (rachis stout, not more than 1 cm. long), 8 to 15 flowered, glabrous in all parts, enveloped by numerous subcoriaceous oblong-ovate bracts up to 3 cm. long and broad; pedicels subterete, stout, 1 to 2 mm. in diameter, about 2 mm. long, each bracteate at base and deciduously bibracteolate near base; calyx tube coriaceous, campanulate, 4 to 5 mm. long, about 5 mm. in diameter at anthesis; limb suberect, subcoriaceous, about 3 mm. long including lobes, the lobes triangular, about 2.5 mm. long, glandular-margined and sparsely glandular without; corolla subcoriaceous, cylindric, 22 to 30 mm. long, 4 to 5 mm. in diameter, the lobes about 1.5 mm. long; stamens about 22 mm. long; filaments dark castaneous, distinct, sparsely pilose distally, 4 mm. and 6 mm. long, respectively; anther sacs slightly granular, about 5 mm. long; tubules flexible, about 14 mm. and 12 mm. long, respectively; stigma peltate.

TYPE LOCALITY: Mount Yangana, Province of Loja, Ecuador. Type collected by Hartweg (no. 786*).

DISTRIBUTION: Known only from the type collection.

ECUADOR.

LOJA: Mount Yangana, *Hartweg* 786* (K, type).

54. *Cavendishia nobilis* Lindl. Bot. Reg. 21 : sub pl. 1791. 1836.

Chupalon nobile Kuntze, Rev. Gen. Pl. 2 : 384. 1891.

Stout branching shrub; branchlets terete, stramineous, glabrous, stout; petioles subrugose, stout, 2 to 3 mm. in diameter, 7 to 8 mm. long, glabrous; leaf blades oblong, 12 to 16 cm. long, 5 to 6 cm. broad, rounded or broadly cuneate at base, acute at apex(?), entire and slightly reflexed at margins, glabrous above, glabrous or very sparsely brown-pilose beneath, 7 to 9 plicately-nerved, the secondary nerves oriented near base, ascending, with the midnerve impressed above, prominent beneath, the veinlets reticulate, slightly raised on both surfaces; inflorescence axillary (traumatic in our specimen?), bracteate at base with numerous papyraceous oblong-ovate bracts up to 4 cm. long and 3 cm. broad (bracts pilose without with spreading white hairs up to 0.5 mm. long); flowers not seen.

TYPE LOCALITY: Peru. Type collected by Mathews (number not cited).

DISTRIBUTION: Known only from the Andes of Peru.

PERU: Mathews 2078 in part (K, type).

The description of the flower by Lindley is that of a flower of *Psammisia coarctata*, which was collected by Mathews under the same number. As this is the type species of *Cavendishia*, the matter is of some importance. The specimen at Kew is without flowers, and it is a matter of doubt to me whether or not Lindley saw the flowers which belonged to the plant. Hoerold referred the name *C. nobilis* to *C. capitata* (a later name), but I believe the two plants are distinct on the basis of the pubescent bracts of *C. nobilis*.

55. *Cavendishia urbaniana* Hoer. Bot. Jahrb. Engler 42: 329. 1909.

Robust branching shrub up to 4 meters high; branchlets subterete or angled, stramineous, glabrous, stout; petioles subrugose, glabrous, stout, 8 to 12 mm. long; leaf blades oblong, 14 to 18 cm. long, 4 to 5.5 cm. broad, rounded at base, obtusely acuminate at apex, entire and slightly revolute at margins, glabrous above, glabrous and nigrescent-punctate beneath, rigidly coriaceous, 7 to 9 plicately-nerved, the nerves oriented above base to a distance of 5 cm. ascending, with the midnerve impressed above, prominent beneath, the veinlets reticulate, nearly plane on both surfaces; inflorescence axillary, subfasciculate or short-racemose (rachis stout, up to 15 mm. long), 12 to 20 flowered, glabrous in all parts, enveloped when young by numerous papyraceous oblong-ovate bracts up to 2.5 cm. long and 2 cm. broad; pedicels subrugose, stout, about 2 mm. in diameter and 4 mm. long, each bracteate at base and bibracteolate near base, the bractlets lanceolate, about 2.5 mm. long; calyx rigidly coriaceous, the tube campanulate, about 4 mm. long and 4 mm. in diameter at anthesis, the limb suberect, 2 to 3 mm. long including lobes, the lobes triangular, acute, 1.5 mm. long, sparsely glandular-margined; corolla thin-carnose, about 22 mm. long, 5 to 7 mm. in diameter, the lobes triangular, about 1 mm. long; stamens nearly as long as corolla; filaments dark castaneous, distinct, puberulous within, about 4 mm. and 6 mm. long, respectively; anther sacs nearly smooth, 5 to 6 mm. long; tubules about 11 mm. and 8 mm. long, respectively; stigma subpeltate.

TYPE LOCALITY: Monson, Department of Huánuco, Peru, altitude 1,600 to 1,900 meters. Type collected by Weberbauer (no. 3518).

DISTRIBUTION: Known only from the type collection.

PERU.

HUÁNUCO: Monson, Weberbauer 3518 (B, type).

From the three preceding species *C. urbaniana* is distinguished by having the nerves united for some distance above the leaf base.

DOUBTFUL SOUTH AMERICAN SPECIES

THIBAUDIA CAULIALATA R. & P. Fl. Peruv. Chil. 4: pl. 386. 1802.

Thibaudia alata Dun.; DC. Prodr. 7:562. 1839.

Proclesia alata Klotzsch, Linnaea 24:34. 1851.

Chupalon alatum Kuntze, Rev. Gen. Pl. 2:384. 1891.

Cavendishia alata Hoer. Bot. Jahrb. Engler 42:279. 1909.

TYPE LOCALITY: Peru. Type collected by Dombey (?).

The plant figured by Ruiz and Pavon under the name *Thibaudia caulialata* and subsequently described by Dunal as *Thibaudia alata* is apparently a true *Cavendishia*, but I am unable to associate it with any species known to me. In view of the fact that I have not seen the type, I hesitate definitely to make the implied combination.

THIBAUDIA MARTII Meissn. in Mart. Fl. Bras. 7:173. 1863.

TYPE LOCALITY: Brazil. Type collected by Martius.

From the description of this species I conclude that it is a *Cavendishia* rather than a *Thibaudia*, but failing to see the type I do not definitely make the combination.

CAVENDISHIA STROBILIFERA (H. B. K.) Hoer. Bot. Jahrb. Engler 42:279. 1909.

Thibaudia strobilifera H. B. K. Nov. Gen. & Sp. 3:272. 1818.

Proclesia strobilifera Klotzsch, Linnaea 24:32. 1851.

Chupalon strobiliferum Kuntze, Rev. Gen. Pl. 2:384. 1891.

TYPE LOCALITY: Near Loja, Province of Loja, Ecuador. Type collected by Humboldt and Bonpland.

I have not seen type material of this species, which is probably allied to or possibly equal to *C. acuminata*.

18. ORTHAEA Klotzsch, Linnaea 24:23. 1851

(*Findlaya* Hook. f. in Benth. & Hook. Gen. Pl. 2:569. 1876)

Calyx tube articulate with pedicel, subcylindric or campanulate; limb suberect, 5-lobed (rarely more), the lobes triangular, sometimes truncate; corolla subcylindric, 5-lobed; stamens 10, alternately unequal, usually about one-third as long as corolla; filaments attached to the anther dorsally near its base, alternately unequal; anthers submembranous, equal or subequal, the sacs nearly smooth, the tubules about as long as the sacs, wide, opening by terminal or oblique pores; style filiform, about as long as corolla.

Low shrubs, frequently epiphytic, with alternate, pinnate-veined or pinnately-veined, petioled, subcoriaceous leaves; inflorescence axillary or terminal, racemose, subfasciculate, or 1 or 2 flowered; flowers pedicelled, the pedicels sometimes subtended by large bracts, deciduously bibracteolate.

DISTRIBUTION: Tropical South America from Colombia to northern Bolivia and eastward to British Guiana and Trinidad. Eleven species are here described and in addition there is one name which I am unable to place.

This genus is marked by short stamens with alternately unequal filaments and subequal anthers. *O. secundiflora* (Poepp. & Endl.) Klotzsch is the type species.

KEY TO THE SPECIES

Leaves broadly oblong, 5 to 7 cm. broad, cordate at base (Eastern Cordillera of Colombia).

Inflorescence about 15 cm. long, pubescent in all parts, without large bracts.

1. *O. cordata*.

Inflorescence short (rachis about 1 cm. long), glabrous in all parts, with cavendishoid bracts----- 2. *O. cavendishioides*.
Leaves oblong, not more than 4 cm. broad, attenuate, cuneate, or truncate at base.

Anthers opening by terminal or essentially terminal pores.

Inflorescence nearly as long as or longer than leaves (rachis 4 to 10 cm. long); flowers secund.

Corolla about 25 mm. long; flowers about 1 per cm. of rachis; leaves 3 to 4 cm. broad (northern Peru)----- 3. *O. secundiflora*.

Corolla 11 to 14 mm. long; flowers 2 to 4 per cm. of rachis; leaves about 2 cm. broad (northern Bolivia)----- 4. *O. constans*.

Inflorescence short (rachis less than 3 cm. long, rarely 4 cm. long in no. 5).

Leaves chartaceous, the secondary nerves raised above; rachis more than 1.5 cm. long (Bolivia)----- 5. *O. boliviensis*.

Leaves coriaceous, the secondary nerves plane or impressed above; rachis not more than 1 cm. long.

Branchlets and inflorescence glabrous; pedicels 4 to 6 mm. long; corolla about 10 mm. long; anthers less than 2 mm. long (southern Peru).

6. *O. breviflora*.

Branchlets and inflorescence often puberulous; pedicels 10 to 12 mm. long; corolla about 30 mm. long; anthers 4 mm. long (northern Peru)----- 7. *O. engleriana*.

Anthers opening by oblique clefts.

Inflorescence a many-flowered raceme 2 cm. long or more; calyx lobes triangular, apiculate, about 1 mm. long (Peru).

Anthers 2.5 to 3 mm. long; calyx limb callose-thickened at margins except at lobe tips; leaves pinnate-nerved----- 8. *O. weberbaueri*.

Anthers 4 to 4.5 mm. long; calyx limb not callose-thickened at margins; leaves often pinnate-nerved----- 9. *O. pinnatinervia*.

Inflorescence 1 or 2 flowered; calyx limb essentially truncate (Trinidad and British Guiana).

Calyx and branchlets glabrous (Trinidad)----- 10. *O. apophysata*.

Calyx densely hirsute (hairs 3 to 5 mm. long); branchlets copiously hispid-pilose (British Guiana)----- 11. *O. hispida*.

1. *Orthaea cordata* Oliver in Hook. Icon. Pl. 25: pl. 2412. 1895.

Shrub with elongate branches; branchlets striate, stout, stramineous, sparsely puberulous or glabrous; leaf blades sessile, oblong or ovate-oblong, 13 to 16 cm. long, 5 to 6 cm. broad, cordate and frequently subamplexicaul at base, obtusely acuminate at apex, entire and recurved at margins, coriaceous, essentially glabrous above, deciduously pilose beneath with pale spreading hairs about 0.3 mm. long, 7-nerved from base, the basal pairs of nerves divaricate, the upper pair ascending, with the midnerve nearly plane above, prominent beneath, the veinlets copiously reticulate, slightly raised above, plane beneath; inflorescence apparently terminal, long-racemose, uniformly pilose on all external surfaces with pale spreading hairs about 0.3 mm. long; rachis stout, about 15 cm. long, striate; pedicels 2 to 4 per centimeter of rachis, rugose, 12 to 16 mm. long, bibracteolate near base (bractlets lanceolate, about 2 mm. long, margined with glandular hairs), swollen distally; calyx tube strongly apophysate, about 3 mm. long and 5 mm. in diameter across apophysis; limb divided to base, the lobes 5, 6, or 7, lanceolate-triangular, about 4 mm. long and 2 mm. broad at base, the sinuses acute; corolla 22 to 26 mm. long, 4 to 6 mm. in diameter at base, gradually contracted above, 5-lobed (apparently

always); stamens about 4.5 mm. and 5.5 mm. long, respectively; filaments castaneous, loosely connate, densely pilose without, with spreading white hairs up to 0.5 mm. long, continued into slender connectives which frequently extend into tubules, about 2 mm. and 3 mm. long, respectively; anther sacs 3 mm. long; tubules erect, wide, about 1.5 mm. long, opening by wide terminal pores; stigma subpeltate.

TYPE LOCALITY: Between Ocaña and Pamplona, Department of Norte de Santander, Colombia, altitude about 1,850 meters. Type collected by Kalbreyer (no. 1059).

DISTRIBUTION: Known only from the type collection.

COLOMBIA.

NORTE DE SANTANDER: Between Ocaña and Pamplona, *Kalbreyer* 1059 (B, K, type).

This is a very distinct species by virtue of its large leaves, long inflorescence, and pubescent flowers.

2. *Orthaea cavendishioides* A. C. Smith, sp. nov.

Frutex robustus; laminis oblongis vel ovato-oblongis basi subcordatis apice breviter acuminatis subtus parce pilosis 7-plex-nerviis; inflorescentia subfasciculata vel breviter racemosa glabra, basi bracteis submembranaceis ovato-oblongis instructa; calycis tubo rugoso campanulato limbum subaequante; corolla subcylindrica; staminibus alternatim inaequalibus, filamentis pilosis, antheris leviter inaequalibus, tubulis quam loculis paullo brevioribus poris obliquo-terminalibus dehiscentibus.

Shrub 3 to 4 meters high; branchlets stout, angled or subterete, glabrous, brownish or cinereous; petioles rugose, stout, glabrous, 1 to 3 mm. long; leaf blades oblong or ovate-oblong, 9 to 12 cm. long, 5 to 6 cm. broad, subcordate at base, acute or short-acuminate at apex, entire at margins, glabrous above, deciduously pilose beneath with scattered stiff appressed brown hairs about 0.3 mm. long, 7-plex-nerved, the secondary nerves oriented above base, with the midnerve plane or slightly raised above, prominent beneath, the veinlets reticulate, slightly raised on both surfaces; inflorescence axillary, subfasciculate or short-racemose (rachis about 1 cm. long), 15 to 25 flowered, glabrous in all parts, bracteate at base and partly enveloped by several submembranous, ovate-oblong or obovate bracts up to 3 cm. long and 1 cm. broad; pedicels rugose, 15 to 20 mm. long, each subtended by a bract similar to those at base of racemes, bibracteolate near base with linear, sparsely fimbriate bractlets about 4 mm. long; calyx tube rugose, subcylindric or broadly campanulate, about 2.5 mm. long and 3 mm. in diameter at anthesis; limb subspreading, submembranous, about 2 mm. long including lobes, the lobes apiculate, about 1 mm. long, the sinuses rounded; corolla light red, paler distally, subcylindric, 27 to 33 mm. long, 5 to 6 mm. in diameter, contracted distally, the lobes triangular, subacute, 1 to 1.5 mm. long; stamens about 8.5 mm. and 10.5 mm. long, respectively; filaments castaneous, distinct or loosely coherent at base, densely pilose distally with brown hairs about 0.3 mm. long, 4.5 mm. and 6 mm. long, respectively; anther sacs granular, about 3.5 mm. long; tubules erect, wide, about 2.5 mm. and 1.8 mm. long, respectively, opening by slightly oblique irregular-edged pores; stigma narrowly peltate.

Type in the U. S. National Herbarium, no. 1,351,775, collected in woods at Las Vegas, Department of Santander, Eastern Cordillera, Colombia, altitude 2,600 to 2,900 meters, December 23, 1926, by E. P. Killip and A. C. Smith (no. 15987). Duplicate at Y.

DISTRIBUTION: Known only from the type collection.

Related to *O. cordata* Oliver, from which it differs by having the flowers glabrous and the inflorescence very short-racemose. It should be noted that this is the only *Orthaea* in which the anthers are slightly unequal; also that it is the only species in which the floral bracts are so conspicuous. The presence of these two characters seems to indicate a transitional stage between this genus and *Cavendishia*.

3. *Orthaea secundiflora* (Poepp. & Endl.) Klotzsch, *Linnaea* 24: 24. 1851.

Thibaudia secundiflora Poepp. & Endl. *Nov. Gen. & Sp.* 1: 5. *pl.* 9. 1835.

Slender shrub with elongate branches; branchlets subterete or angled, smooth, glabrous; petioles subterete, about 6 mm. long; leaf blades elliptic or elliptic-lanceolate, 4 to 11 cm. long, 3 to 4 cm. broad, cuneate at base, rigidly acuminate at apex, entire, glabrous, 5-ple-nerved, the secondary nerves oriented near base; inflorescence axillary, long-racemose, spreading, bracteate at base, glabrous on all external surfaces; rachis slender, 7 to 10 cm. long; pedicels slender, 12 to 20 mm. long; calyx campanulate, about 4 mm. long, the limb suberect, the lobes obtuse, sparsely glandular-margined; corolla subcarinose, cylindric-conical, about 25 mm. long; filaments submembranous, connate in the basal half, the long ones distally pilose; anthers equal, the sacs sparsely setose at base, the tubules slightly longer than the sacs, opening by subterminal pores; stigma subhemispherical.

TYPE LOCALITY: Between Cassapi and Cuchero, Peru. Type collected by Poeppig.

DISTRIBUTION: Apparently known only from the type collection.

I have not seen any specimens referable to this species, which I have redescribed and keyed from the original plate and description.

4. *Orthaea constans* A. C. Smith, *sp. nov.*

Frutex rigidus; laminis oblongo-lanceolatis basi subattenuatis apice acuminatis obscure 5-ple-nerviis; inflorescentia racemosa secunda glabra; calycis tubo campanulato quam limbo duplo longiore, lobis apiculatis; corolla subcylindrica; staminibus alternatim inaequalibus, antheris aequalibus, tubulis loculos subaequantibus poris terminalibus dehiscentibus.

Shrub with stiff branches; branchlets subterete, brownish, glabrous; petioles subrugose, glabrous, about 3 mm. long; leaf blades oblong-lanceolate, 7 to 8 cm. long, 1.5 to 2 cm. broad, subattenuate at base, sharp-acuminate at apex, entire at margins, glabrous, obscurely 5-ple-nerved, the midnerve nearly plane above, raised beneath, the secondary nerves and veinlets slightly raised or plane on both surfaces; inflorescence axillary, racemose, secund, 15 to 20 flowered, glabrous in all parts; rachis straight, striate, 4 to 6 cm. long; pedicels rugose, 8 to 12 mm. long, deciduously bibracteolate near base, swollen distally; calyx tube campanulate, 3 mm. long, 3 to 4 mm. in diameter at anthesis; limb submembranous, 1 to 1.5 mm. long including lobes, the lobes minutely apiculate, about 2 mm. across; corolla submembranous, 11 to 12 mm. long, about 4 mm. in diameter; stamens about 4 mm. and 5 mm. long, respectively; filaments subnigrescent, coherent at base, pilose at distal margins with spreading hairs about 0.2 mm. long, about 1.5 mm. and 2.5 mm. long, respectively; anther sacs slightly granular, 1.5 mm. long; tubules erect, wide, 1.5 mm. long, opening by terminal or subterminal pores; stigma subpeltate.

Type in the herbarium of the Royal Botanic Gardens, Kew, collected at Sandillani, Department of La Paz, Bolivia, altitude 2,150 to 2,450 meters, April, 1866, by R. Pearce.

DISTRIBUTION: Andes of Bolivia, altitude 2,150 to 3,100 meters.

BOLIVIA: Eastern Andes, *Pearce* 814 (K).

Apparently most nearly related to *O. secundiflora*, from which it is separated by the smaller size of all its parts and the more crowded flowers.

EXPLANATION OF PLATE 17.—*Orthaea constans*, from photograph of type sheet. About one-half natural size.

5. *Orthaea boliviensis* Fedtsch. & Basil. Not. Syst. Herb. Hort. Bot. U. S. S. R. 6: 25. 1926.

Low epiphytic shrub; branchlets slender, subterete, brownish, glabrous; petioles rugose, glabrous, 2 to 3 mm. long; leaf blades ovate-oblong, 5 to 8 cm. long, 1.5 to 2.5 cm. broad, cuneate at base, long-acuminate at apex, entire at margins, glabrous, 5-plexi-nerved, the secondary nerves oriented near base, ascending, with the midnerve plane or slightly raised above, raised beneath, the veinlets reticulate, slightly raised on both surfaces; inflorescence axillary or terminal, laxly racemose, 6 to 12 flowered, essentially glabrous in all parts, deciduously bracteolate at base by several submembranous oblong bractlets up to 1 cm. long; rachis rugose, 1.5 to 3 cm. long; pedicels subrugose, slender, 10 to 20 mm. long, each subtended by a deciduous bract, bibracteolate near base with linear fimbriate bractlets 2 to 4 mm. long, swollen distally; calyx tube rugose, subcylindric, about 2 mm. long and 3 mm. in diameter at anthesis; limb submembranous, about 2 mm. long including lobes, the lobes apiculate, about 1 mm. long, sparsely glandular-margined, the sinuses rounded; corolla membranous, 15 to 33 mm. long, 3 to 4 mm. in diameter, slightly contracted distally, the lobes triangular, subacute, less than 1 mm. long; stamens 4.5 to 6 mm. and 6 to 7.5 mm. long, respectively; filaments pale castaneous, membranous, connate in the basal half, pilose distally with lax hairs about 0.3 mm. long, 2 to 4 mm. and 3.5 to 5.5 mm. long, respectively; anther sacs slightly granular, about 1 mm. long; tubules wide, about 1.6 mm. long, opening by terminal or subterminal slightly flaring pores; stigma truncate.

TYPE LOCALITY: Bolivia (latitude 15° to 18° south), altitude "2,000 to 13,000 feet." Type collected by Bridges (no. 103).

DISTRIBUTION: Andes of northern Bolivia, altitude about 1,400 meters.

BOLIVIA: *Bridges* (K, type collection?); *Pearce* 731 (K). Quichara, *Pearce*, in November, 1864 (K).

LA PAZ: Tipuani, *Buchtien* 5517 (B, N), 5518 (N, Y), 7432 (B, N, Y).

The Bridges specimen here cited, which agrees exactly with the original description, has shorter corollas than the other specimens, but surely is conspecific with them. The rather lax inflorescence and the thin leaves distinguish this species from its allies.

6. *Orthaea breviflora* A. C. Smith, sp. nov.

Frutex; laminis oblongis vel ovato-oblongis basi late cuneatis apice acuminatis subtus decidue pilosis obscure 5 ad 7 pli-nerviis; inflorescentia subfasciculata vel breve racemosa glabra; calycis tubo subrugoso quam limbo paullo brevior; corolla cylindrica; staminibus alternatim inaequalibus, antheris aequalibus brevibus, tubulis quam loculis paullo brevioribus poris terminalibus dehiscentibus.

Shrub; branchlets terete, glabrous, brownish; petioles subrugose, canaliculate above, 4 to 6 mm. long; leaf blades thick-coriaceous, oblong or ovate-oblong, 5 to 8 cm. long, 2 to 2.5 cm. broad, rounded or broadly cuneate at base, acuminate at apex, entire and slightly revolute at margins, glabrous above, sparsely pilose beneath with appressed brownish hairs about 0.3 mm. long, becoming glabrous, obscurely 5 to 7 pli-nerved, the midnerve slightly impressed above, prominent beneath, the secondary nerves oriented near base, ascending, plane above, slight-

ly raised beneath, the veinlets obscurely reticulate; inflorescence subfasciculate or short-racemose (rachis rugose, rarely more than 1 cm. long), 6 to 10 flowered, glabrous in all parts, deciduously bracteate at base with several submembranous ovate short-fimbriate bracts up to 5 mm. long; pedicels rugose, 4 to 6 mm. long, deciduously bibracteolate near base with linear oblong submembranous bractlets about 2.5 mm. long; calyx tube short-cylindric, subrugose, about 1.5 mm. long and 2 mm. in diameter at anthesis; limb submembranous, about 2.5 mm. long including lobes, the lobes apiculate, about 1 mm. long, the sinuses rounded; corolla red, paler distally, about 10 mm. long, 3 mm. in diameter, contracted distally, the lobes triangular, subacute, about 1 mm. long; stamens about 3 mm. and 3.5 mm. long, respectively; filaments castaneous, membranous, distinct or coherent at base, densely pilose distally with pale soft hairs about 0.2 mm. long, about 1.8 mm. and 2.6 mm. long respectively; anther sacs nearly smooth, about 1 mm. long; tubules erect, wide, about 0.7 mm. long, opening by terminal slightly flaring pores; stigma truncate.

Type in the herbarium of the Field Museum of Natural History, no. 558,218, collected in forest at Pillahuata, Cerro de Cusilluyoc, Department of Cuzco, Peru, altitude 2,200 to 2,400 meters, May 3 to 6, 1925, by F. W. Pennell (no. 13972).

DISTRIBUTION: Known only from the type specimen.

Characterized by its very small flowers, rigid branchlets, and coriaceous leaves.

7. *Orthaea engleriana* Hoer. Bot. Jahrb. Engler 42:320. 1909.

Small epiphytic shrub; branchlets subterete, cinereous, deciduously pilose with short pale spreading hairs; petioles subrugose, deciduously puberulous, 2 to 3 mm. long; leaf blades oblong-lanceolate, 8 to 10 cm. long, 2.5 to 3 cm. broad, rounded at base, acuminate at apex, entire at margins, glabrous above, sparsely pilose beneath (hairs brown, appressed, about 0.2 mm. long), 5 to 7 pli-nerved, the secondary nerves oriented near base, sharply ascending, with the midnerve slightly impressed above, raised beneath, the veinlets reticulate, plane or slightly raised on both surfaces; inflorescence axillary, short-racemose (rachis puberulous or glabrous, 5 to 10 mm. long), 6 to 10 flowered, circumscribed at base by several deciduous, papyraceous, oblong or spatulate bracts up to 20 mm. long and 7 mm. broad; pedicels striate, sparsely white-pilose, 9 to 12 mm. long, deciduously bracteate at base, bibracteolate near base, the bractlets linear, 1.5 mm. long, puberulous; calyx tube rugose, subcampanulate, sparsely white-pilose, 1.5 to 2 mm. long, 2.5 to 3 mm. in diameter at anthesis; limb submembranous, 1 to 1.5 mm. long including lobes, the lobes 5 or 6, minutely apiculate, about 2 mm. across; corolla submembranous, essentially glabrous, 28 to 32 mm. long, about 5 mm. in diameter, slightly contracted at base and apex, the lobes minutely apiculate; stamens about 7 mm. and 8.5 mm. long, respectively; filaments castaneous, connate in basal half, puberulous or subglabrous, about 3.5 mm. and 5.5 mm. long, respectively; anther sacs slightly granular, 2 mm. long; tubules wide, 2 mm. long, opening by terminal or subterminal pores; stigma truncate.

TYPE LOCALITY: Moyobamba, Department of Amazonas, Peru, altitude 1,400 to 1,500 meters. Type collected by Weberbauer (no. 4753).

DISTRIBUTION: Known only from the type collection.

PERU.

AMAZONAS: Moyobamba, *Weberbauer* 4753 (B, type).

Marked by its large flowers, cavendishoid bracts, and characters of pubescence. The bracts are more noticeable in this species than in any other of the genus excepting *O. cavendishoides*.

8. *Orthaea weberbaueri* Hoer. Bot. Jahrb. Engler 42:320. 1909.

Compact shrub up to 3 meters high; branchlets subterete, brownish, glabrous; petioles rugose, 4 to 6 mm. long, glabrous; leaf blades oblong or lanceolate-oblong, 8 to 12 cm. long, 2.5 to 3.5 cm. broad, rounded or broadly cuneate at base, sharp-acuminate at apex, entire and narrowly revolute at margins, glabrous above, sparsely pilose beneath (hairs brown, appressed, not more than 0.2 mm. long), 5 to 7 pinnately-nerved, the secondary nerves oriented near base, ascending, with the midnerve nearly plane above, raised beneath, the veinlets copiously reticulate, slightly raised or plane on both surfaces; inflorescence axillary, racemose, 15 to 25 flowered, essentially glabrous in all parts, the flowers secund; rachis straight, stout, 3 to 5 cm. long; pedicels rugose, 8 to 13 mm. long, deciduously bibracteolate near base (bractlets about 1 mm. long), swollen distally; calyx tube strongly rugose, apophysate, about 2.5 mm. long and 3 mm. in diameter at anthesis; limb submembranous, about 1.5 mm. long including lobes, the lobes triangular-ovate, 1 to 1.5 mm. long, callose-margined except at apices, the sinuses acute; corolla submembranous, 15 to 18 mm. long, about 4 mm. in diameter, the lobes triangular, apiculate; stamens about 4.5 mm. and 6.5 mm. long, respectively; filaments castaneous, loosely coherent at base, pilose within with pale spreading hairs, about 2.5 mm. and 4 mm. long, respectively; anther sacs 1.5 mm. long; tubules 1 mm. long, opening by wide introrse clefts nearly as long; stigma truncate or subpeltate.

TYPE LOCALITY: Sandía, Department of Cuzco, Peru, altitude 2,900 meters. Type collected by Weberbauer (no. 684).

DISTRIBUTION: Andes of southern Peru and northern Bolivia, altitude 2,500 to 2,900 meters.

PERU.

CUZCO: Sandía, *Weberbauer* 684 (B, type).

BOLIVIA.

LA PAZ: Sandillani, *Pearce*, in April, 1866 (K).

This species and the following make up a distinct group within the genus, having in common a racemose inflorescence and tubules with oblique pores. They are readily distinguished from one another as noted in the key.

9. *Orthaea pinnatinervia* Mansf. Notizbl. Bot. Gart. Berlin 9:438. 1925.

Subscandent shrub up to 4 meters high; branchlets subterete, slender, castaneous or cinereous, puberulous when young with pale hairs about 0.2 mm. long; petioles subrugose, puberulous or glabrous, 2 to 4 mm. long; leaf blades oblong, 4 to 7 cm. long, 1.5 to 2 cm. broad, truncate at base, long-acuminate at apex, subentire at margins, essentially glabrous above, sparsely pilose beneath with appressed slender brown hairs about 0.3 mm. long, becoming glabrous, pinnate-veined, the midvein slightly impressed above, prominent beneath, the secondary veins 2 to 4 per side, ascending or spreading, plane above, slightly raised beneath, the veinlets reticulate, slightly raised beneath; inflorescence axillary, short-racemose, 8 to 15 flowered, deciduously bracteate at base with oblong bracts about 5 mm. long; rachis rugose, 1 to 2 cm. long, glabrous or sparsely puberulous; pedicels rugose, 5 to 8 mm. long, glabrous, each subtended by a deciduous bract, bibracteolate near base with linear-oblong glabrous bractlets 3 to 4 mm. long, slightly swollen distally; calyx tube rugose, subcylindric, slightly apophysate at base, glabrous, 2 to 2.5 mm. long, about 3.5 mm. in diameter at base, contracted above; limb spreading, submembranous, about 3 mm. long including lobes, the lobes apiculate, about 1 mm. long, the sinuses rounded; corolla subcoriaceous, pale red, greenish white distally, 15 to 18 mm. long, contracted distally, the lobes triangular, subacute, about 1.5 mm.

long; stamens about 5 mm. and 6.5 mm. long, respectively; filaments castaneous, distinct, pilose distally with lax pale hairs up to 0.2 mm. long, about 2 mm. and 3 mm. long, respectively; anther sacs slightly granular, slender, glabrous or subpuberulous at base, about 2 mm. long; tubules flaring, about 2.5 mm. long, opening by broad oval pores about half as long; stigma truncate.

TYPE LOCALITY: Cosñipata, between the tambos Tres Cruces and Tamhomayo, Department of Cuzco, Peru, altitude 3,300 to 3,400 meters. Type collected by Weberbauer (no. 6925).

DISTRIBUTION: Andes of southern Peru, altitude 3,000 to 3,400 meters.

PERU.

Cuzco: Cosñipata, *Weberbauer* 6925 (B, type, F, N). Marcapata, *Weberbauer* 7814 (F).

10. *Orthaea apophysata* (Griseb.) A. C. Smith.

Sophoclesia apophysata Griseb. Fl. Brit. W. Ind. 143. 1864.

Findlaya apophysata Hook. f. in Benth. & Hook. Gen. Pl. 2:569. 1876.

Subscandent epiphytic shrub; branchlets terete, brownish or cinereous, glabrous; petioles subrugose, glabrous, 3 to 5 mm. long; leaf blades coriaceous, ovate, 5 to 7 cm. long, 2.5 to 3 cm. broad, broadly cuneate at base, long-acuminate at apex, entire at margins, glabrous, somewhat nitid, pinnate-veined, the midvein slightly impressed or plane above, prominent beneath, the secondary veins 2 or 3 to a side, ascending, plane or slightly raised above, raised beneath, the veinlets reticulate, plane or slightly raised on both surfaces; inflorescence axillary, 1 or 2 flowered, glabrous in all parts; pedicels rugose, 15 to 17 mm. long, bibracteolate near middle with ovate acute bractlets about 1 mm. long, swollen distally; calyx tube slightly rugose, coriaceous, short-cylindric, slightly apophysate at base, about 2.5 mm. long at anthesis, 4 mm. in diameter at base, contracted above; limb coriaceous, about 1.5 mm. long, truncate or minutely 5-apiculate; corolla bright red, carnose, subcylindric, 20 to 22 mm. long, 6 to 7 mm. in diameter, contracted distally, the lobes oblong, subacute, about 4 mm. long; stamens about 6.5 mm. and 7.5 mm. long, respectively; filaments castaneous, submembranous, distinct, distally pilose with minute pale hairs, about 3.5 mm. and 5 mm. long, respectively; anther sacs slightly granular, about 2 mm. long; tubules about 2 mm. long, opening by oblique oval pores less than 1 mm. long; stigma truncate; young fruit sub-cylindric, slightly apophysate, thick-coriaceous, up to 8 mm. in diameter.

TYPE LOCALITY: Between Arima and Aripa de Abaja, Tocuche, Trinidad. Type collected by Purdie (a collection by Crüger also is cited).

DISTRIBUTION: Trinidad.

TRINIDAD: *Purdie* 103 (K, type); *Fendler* 489 (K). Tocuche, *Crüger* 3 (K). Aripo, *Crüger* (G), 1009 (K); *Broadway* 5333 (K, Y). Valencia, *Britton, Britton, & Hazen* 1018 (G, N, Y); *Britton, Hazen, & Mendelson* 1814 (G, N, Y).

This species and the following constitute a very distinct section of *Orthaea*, marked by the truncate calyx limb and the solitary or paired flowers. *O. apophysata* is the type species of the genus *Findlaya*, characterized by Hoerold as having 15 stamens. This feature has not been observed in any specimens I have seen, and I do not consider the characters just mentioned as of generic worth. It may be noted that both these species are found in the hills of British Guiana and Trinidad, that the first two species treated in my key are found in northeastern Colombia, and that all the remaining species are found farther south in the Andes. This correlation of morphological charac-

ters with geographic distribution makes the genus an excellent example of regional evolution.

11. *Orthaea hispida* A. C. Smith, sp. nov.

Frutex gracilis ramosus; ramulis dense hispidopilosis; laminis ovatis basi rotundatis apice breve acuminatis subglabris pinnatinerviis; floribus solitariis vel binis; calyce dense constanterque hispidopiloso subcampanulato, limbo subtruncato; corolla glabra; staminibus alternatim inaequalibus, antheris aequalibus, tubulis loculos subaequantibus poris ovalibus obliquis dehiscentibus.

Slender branching shrub; branchlets terete, densely hispid-pilose with dark brown spreading hairs 1 to 2 mm. long; petioles subrugose, 2 to 3 mm. long, glabrous or sparsely hispid; leaf blades ovate, 5 to 7 cm. long, 3 to 4 cm. broad, rounded at base, obtusely short-acuminate at apex, entire at margins, glabrous or deciduously short-pilose on both surfaces, pinnate-veined, the midvein slightly impressed above, raised beneath, the secondary veins 2 or 3 to a side, spreading, plane above, slightly raised beneath, the veinlets reticulate, nearly plane on both surfaces; inflorescence axillary, 1 or 2 flowered; pedicels subrugose, 3 to 6 mm. long, hispid as the branchlets, bibracteolate at middle, the bractlets ovate, fimbriate, about 1 mm. long; calyx obscured by numerous spreading hairs 3 to 5 mm. long, the tube subcampanulate, 3 to 4 mm. long, about 3 mm. in diameter at anthesis, the limb suberect, 2 to 3 mm. long, subtruncate; corolla submembranous, glabrous, 13 to 16 mm. long, about 3 mm. in diameter, the lobes not observed; stamens about 6 mm. and 7 mm. long respectively; filaments dark castaneous, distinct, sparsely pilose distally, about 2.5 mm. and 4 mm. long, respectively; anther sacs slightly granular, about 2 mm. long; tubules erect, about 2 mm. long, opening by oblique oval pores 1 mm. long; stigma truncate.

Type in the herbarium of the Royal Botanic Gardens, Kew, collected in British Guiana (probably in the sandstone region toward Mount Roraima), by R. Schomburgk (no. 35).

DISTRIBUTION: Known only from the type collection.

This species is undoubtedly related to the preceding, but is very distinct in its copiously hispid-pilose branchlets and calyces.

DOUBTFUL SPECIES

ORTHAEA ABBREVIATA Drake; Journ. de Bot. 3: 75. 1889.

TYPE LOCALITY: Río de San Francisco, Ecuador. Type collected by Poortmann (no. 314).

I have not seen any specimens answering to the description of this species, which I take to be allied to *O. engleriana*.

19. *LYSICLESIA* A. C. Smith, gen. nov.

Calyx cum pedicello articulatus 3-alatus, limbo erecto 3-lobato, lobis submembranaceis lanceolato-triangularibus vel ovatis. Corolla subcylindrica 4 vel 5-lobata. Stamina 8 vel 10 alternatim inaequalia quam corolla triplo breviora, filamentis distinctis vel cohaerentibus alternatim inaequalibus, antheris submembranaceis aequalibus, tubulis loculos subaequantibus poris terminalibus dehiscentibus. Frutices parvi (epiphytici?), laminis alternis subcoriaceis petiolatis pli-nerviis. Flores solitarii in ramulis terminalibus dispositi.

Calyx tube articulate with pedicel, 3-winged (wings formed by bases of lobes); limb erect, 3-lobed, the lobes bractlike, submembranous, lanceolate-triangular or ovate; corolla subcylindric, 4 or 5 lobed, the lobes triangular, subacute; stamens 8 or 10, alternately unequal, about one-third as long as

corolla; filaments distinct or coherent at base, alternately unequal, attached to the anther dorsally near its base; anthers submembranous, equal, the sacs nearly smooth, the tubules about as long as the sacs, wide, opening by terminal irregular-edged pores; style filiform, about as long as corolla, the stigma truncate.

Low shrubs, probably epiphytic, with alternate pinnately-nerved petioled subcoriaceous leaves; flowers solitary on leafless terminal branchlets, the pedicels bibracteolate at base.

DISTRIBUTION: Andes of northwestern Colombia. Two species are known.

In structure of corolla and stamens this genus resembles *Orthaca*, from which it differs by its three large calyx lobes. *L. caudata* is designated as the type species.

Named after Lysicles, a Greek statesman at the time of the Peloponnesian War.

KEY TO THE SPECIES

Leaves long-acuminate, 6 to 7 cm. long, 2.5 to 3 cm. broad; calyx lobes ovate, 12 mm. across near base; stamens 8 (always?), 6 mm. and 8 mm. long, respectively; filaments distinct or loosely coherent..... 1. *L. caudata*.

Leaves acute or subacuminate, 2 to 3 cm. long, about 1 cm. broad; calyx lobes lanceolate-triangular, 10 mm. across near base; stamens 10, 8 mm. and 10 mm. long, respectively; filaments connate in lower half..... 2. *L. minor*.

1. *Lysiclesia caudata* A. C. Smith, sp. nov.

Frutex subscandens, generis characteribus; laminis ovatis basi cuneatis apice caudato-acuminatis obscure 5-nerviis; staminibus 8.

Subscandent shrub; branchlets terete, slender, brownish, glabrous; petioles subterete, subrugose, glabrous, 4 to 7 mm. long; leaf blades ovate, 6 to 7 cm. long, 2 to 3 cm. broad, cuneate at base, caudate-acuminate at apex (acumen 15 mm. long, about 3 mm. across base), entire and slightly thickened at margins, glabrous, obscurely 5-nerved, the midnerve plane or slightly impressed above, raised beneath, the secondary nerves oriented from base, slightly raised on both surfaces, the veinlets reticulate, nearly plane; flowers solitary on leafless terminal branches; rachis subterete, slender, sparsely and deciduously pilose; pedicels terete, 18 to 22 mm. long, each subtended by a lanceolate-triangular bractlet 3 mm. long, bibracteolate near base with ovate-acuminate bractlets about 4 mm. long, swollen distally; calyx tube obscured by wings formed by the lobes, about 4 mm. long and 4 mm. in diameter, exclusive of wings; limb erect, 3-parted, the lobes ovate, short-acuminate, 26 to 27 mm. long, slightly projected at base beyond base of tube, about 12 mm. across at broadest part, membranous, copiously longitudinally veined, nearly completely covering the corolla; corolla submembranous, about 35 mm. long, 6 mm. in diameter, contracted distally, white-tomentose distally with lax hairs about 0.5 mm. long, 4-lobed, the lobes 1.5 mm. long; stamens 8, about 6 mm. and 8 mm. long, respectively; filaments castaneous, membranous, distinct or loosely coherent at base, sparsely and laxly pilose distally, about 2.5 mm. and 4.5 mm. long, respectively; anther sacs nearly smooth, about 2.5 mm. long; tubules erect, wide, about 2.5 mm. long.

Type in the herbarium of the New York Botanical Garden, collected in forest above Cascada Chorrón, south of Antizales, Department of Bolívar, Colombia, altitude 2,400 to 2,800 meters, February 25, 1918, by F. W. Pennell (no. 4389).

DISTRIBUTION: Known only from the type collection.

EXPLANATION OF PLATE 18.—*Lysiclesia caudata*, from photograph of type sheet. About one-half natural size.

2. *Lysiclesia minor* A. C. Smith, sp. nov.

Frutex gracilis, generis characteribus; laminis ovato-oblongis basi rotundatis apice apiculatis obscure 5-nerviis; staminibus 10.

Slender shrub; branchlets terete, slender, cinereous, deciduously pilose with stiff hairs about 0.2 mm. long; petioles subterete, essentially glabrous, 1 to 2 mm. long; leaf blades ovate-oblong, 3 to 3.5 cm. long, 1 to 1.5 cm. broad, rounded at base, apiculate at apex, entire at margins, glabrous, obscurely 5-nerved, the midnerve slightly impressed above, raised beneath, the secondary nerves oriented from base, slightly raised on both surfaces, the veinlets reticulate, slightly raised on both surfaces; flowers solitary on leafless terminal branches; pedicels striate, 12 to 15 mm. long, sparsely pilose, bibracteolate near base with triangular bractlets about 2 mm. long; calyx tube obscured by wings formed by bases of lobes, about 4 mm. long and 3 mm. in diameter exclusive of wings; limb erect, 3-parted, the lobes lanceolate-triangular, acuminate, about 32 mm. long, 10 mm. across at broadest part, slightly projected beyond base of tube, membranous, sparsely fimbriate and slightly thickened at margins, copiously reticulate-veined (veins elevated on both surfaces), nearly completely covering the corolla; corolla 28 to 35 mm. long, about 5 mm. in diameter, contracted distally, sparsely white-tomentose distally, the lobes 5 (?); stamens 10, about 8 mm. and 10 mm. long, respectively; filaments castaneous, membranous, slightly coherent, sparsely and laxly pilose distally with hairs up to 0.8 mm. long, about 4.5 mm. and 6.5 mm. long, respectively; anther sacs smooth, about 2 mm. long; tubules erect, wide, about 3 mm. long.

Type in the U. S. National Herbarium, no. 938,520, collected south of Amalfi, Department of Antioquia, Colombia, altitude 2,000 meters, September, 1884, by F. C. Lehmann (no. 4086).

DISTRIBUTION: Known only from the type collection.

20. SATYRIA Klotzsch, *Linnaea* 24:21. 1851

(*Riedelia* Meissn. in Mart. Fl. Bras. 7:172. 1863)

Calyx tube articulate with pedicel; limb subspreading, 5-lobed (rarely 3 or 4 lobed), the lobes ovate or triangular; corolla subcylindric, 5-lobed, the lobes triangular; stamens 10, alternately unequal, shorter than corolla (frequently about one-third as long); filaments firmly connate in a tube, submembranous, attached to the anther dorsally near its base, equal; anthers subcoriaceous, firm, alternately unequal, the sacs slightly granular, the tubules not clearly differentiated from sacs, flaring, opening by broad lateral clefts; style filiform, about as long as corolla.

Low shrubs, frequently epiphytic, with alternate, pinnately-veined or pinnate-veined, coriaceous, petioled leaves; inflorescence axillary or terminal, racemose or subfasciculate, few to many-flowered; flowers pedicelled, the pedicels bibracteolate.

DISTRIBUTION: Mountains from southern Mexico to Colombia, with a single species in Bolivia. Fourteen species are known.

This very distinct and unmistakable genus is marked by equal connate filaments and alternately unequal rigid anthers flaring at the apices. *S. warszewiczii* Klotzsch is the type species.

KEY TO THE SPECIES

- Inflorescence elongate (rachis 1.5 to 4 cm. long).
 Leaves elliptic-oblong, 3 to 6 cm. long, 1.2 to 1.8 cm. broad; base of anthers setose (Bolivia)----- 1. *S. neglecta*.
 Leaves ovate to oblong, at least 7 cm. long and 2.5 cm. broad; base of anthers glabrous or subpuberulous (Mexico to Peru).
 Leaf base narrowed and cuneate (Central America)----- 2. *S. elongata*.
 Leaf base subcordate or rounded.
 Calyx lobes 5, rarely 3 or 4 (South America)----- 3. *S. panurensis*.
 Calyx lobes 3 (Costa Rica)----- 4. *S. triloba*.
 Inflorescence short (flowers fascicled or short-racemose, the rachis rarely exceeding 1 cm. in length, sometimes up to 1.5 cm. long in no. 6).
 Calyx densely pubescent, the hairs pale, spreading, about 0.3 mm. long; filament tube pilose at upper margin with hairs about 0.5 mm. long; leaf base subcordate or truncate (northwestern Colombia)----- 5. *S. pilosa*.
 Calyx glabrous or minutely puberulous; filament tube glabrous or marginally short-pilose with hairs not more than 0.3 mm. long; leaf base cuneate.
 Leaves ovate to obovate, twice as long as broad, not more than 10 cm. long (Central America)----- 6. *S. ovata*.
 Leaves ovate to oblong, about 3 times as long as broad (except nos. 9 and 13), at least 10 cm. long.
 Corolla 20 mm. long or more at maturity (rarely 18 mm. long).
 Anthers subcoriaceous (Central America)----- 7. *S. warszewiczii*.
 Anthers stiffly coriaceous (Colombia).
 Leaves narrowly oblong, up to 20 cm. long and 7 cm. broad; filaments and anthers dorsally glabrous----- 8. *S. grandifolia*.
 Leaves broadly oblong, up to 35 cm. long and 15 cm. broad; filaments and anthers dorsally puberulous----- 9. *S. latifolia*.
 Corolla less than 17 mm. long at maturity.
 Calyx puberulous.
 Leaves 11 to 20 cm. long; corolla 10 to 12 mm. long (Guatemala).
 10. *S. meiantha*.
 Leaves 18 to 30 cm. long; corolla 12 to 14 mm. long (Venezuela).
 11. *S. nitida*.
 Calyx glabrous (Colombia).
 Flowers small (long anthers slightly more than 2 mm. long; corolla 7 to 8 mm. long)----- 12. *S. minutiflora*.
 Flowers larger (long anthers at least 4 mm. long; corolla more than 11 mm. long).
 Leaves about twice as long as broad; flowers ample (calyx tube 4 mm. in diameter; corolla 5 mm. in diameter at base).
 13. *S. toroi*.
 Leaves about 3 times as long as broad; flowers slender (calyx tube 2 to 3 mm. in diameter; corolla 3 to 4 mm. in diameter at base)----- 14. *S. breviflora*.

1. *Satyria neglecta* A. C. Smith, sp. nov.

Frutex; laminis oblongis vel elliptico-oblongis parvis basi cuneatis apice acutis pinnatinerviis; inflorescentia breviter racemosa glabra; calycis campanulati limbo tubum subaequante, lobis apiculatis; corolla subcylindrica; filamentis connatis aequalibus, antheris basi setosis alternatim inaequalibus, tubulis rimis latis dehiscentibus.

Shrub; branchlets subterete, striate, glabrous, brownish; petioles subrugose, glabrous, 2 to 4 mm. long, narrowly winged above; leaf blades coriaceous, oblong or elliptic-oblong, 3 to 6 cm. long, 1.2 to 1.8 cm. broad, cuneate or subattenuate at base, acute at apex, entire and slightly revolute at margins, pinnate-veined, the midvein slightly impressed above, prominent beneath, the secondary veins 2 or 3 to a side, ascending, plane above, raised beneath, the veinlets reticulate, nearly plane on both surfaces; inflorescence axillary, short-racemose, 10 to 20 flowered, glabrous in all parts; rachis subterete, 1 to 2.5 cm. long; pedicels striate, 6 to 12 mm. long, bibracteolate below middle with lanceolate fimbriate bractlets about 1 mm. long, sparsely puberulous or glabrous; calyx tube short-cylindric, about 1 mm. long and 2 mm. in diameter at anthesis; limb suberect, 1 to 1.5 mm. long including lobes, the lobes 5, apiculate, about 0.5 mm. long; corolla thin-carnose, slightly rugose, glabrous, about 6 mm. long and 2.5 mm. in diameter, contracted at throat, the lobes flaring, somewhat reflexed, obtuse, about 1 mm. long; stamens about 4.5 mm. and 5 mm. long, respectively; filaments castaneous, equal, about 2.5 mm. long, minutely brown-pilose without distally; anther sacs slightly granular, setose at base with hairs about 0.4 mm. long, about 1 mm. and 1.5 mm. long, respectively; tubules about 1.5 mm. long, opening by introrse oval clefts nearly as long; stigma truncate; young fruit subspherical, coriaceous, up to 4 mm. in diameter.

Type in the herbarium of the New York Botanical Garden, collected at Mapiri, Department of La Paz, Bolivia, altitude about 775 meters, May, 1886, by H. H. Rusby (no. 2219).

DISTRIBUTION: Known only from the type specimen.

This is the only species of *Satyria* known from Bolivia; that it is remarkably distinct from all other species in its small leaves and setose-based anthers is in keeping with its isolated geographic position.

2. *Satyria elongata* A. C. Smith, sp. nov.

Frutex gracilis epiphyticus; laminis lanceolato-oblongis basi cuneatis apice longe acuminatis 3 ad 5 pli-nerviis; inflorescentia racemosa comparate elongata glabra; calyce minute puberulento campanulato, limbo quam tubo brevior; corolla cylindrica; filamentis connatis, antheris basi productis superne dilatatis rimis ovalibus dehiscentibus.

Slender epiphytic shrub; branchlets glabrous or sparsely puberulous when young, brownish or cinereous; petioles subrugose, essentially glabrous, 4 to 5 mm. long; leaf blades lanceolate-oblong, 12 to 17 cm. long, 3 to 4 cm. broad, cuneate at base, long-acuminate at apex, entire and slightly revolute at margins, glabrous, thick-coriaceous, 3 to 5 pli-nerved, the midnerve slightly raised above, prominent beneath, pinnate-veined (veins inconspicuous, spreading, 5 to 9 to a side, joining the second and third nerves), the secondary nerves oriented from base, ascending near margins, slightly raised on both surfaces, the veinlets reticulate, slightly raised; inflorescence axillary near ends of branchlets, racemose, 7 to 15 flowered; rachis angled, essentially glabrous, 2.5 to 5 cm. long, deciduously minutely bracteate at base; pedicels striate, 12 to 22 mm. long, glabrous, each subtended by a subcoriaceous ovate acute bract about 2.5 mm. long, deciduously bibracteolate near base with lanceolate-ovate puberulous bractlets about 1.5 mm. long, swollen distally; calyx tube coriaceous, minutely puberulous with pale hairs about 0.1 mm. long, broadly campanulate, 2 to 2.5 mm. long, about 3 mm. in diameter at anthesis; limb spreading, thin-coriaceous, about 1.5 mm. long including lobes, the lobes 5, ovate, apiculate, about 1 mm. long, slightly thickened at margins; corolla minutely puberulous as the calyx, 20 to 30 mm. long, about 4 mm. in diameter, contracted at throat, the lobes oblong, subacute, about 3 mm. long; stamens 6.5 to 10 mm. and 7.5

to 11 mm. long, respectively; filaments dark castaneous, faintly puberulous distally, 4 to 6 mm. long; anthers nearly smooth, slender and slightly produced at base, 4 to 5 mm. and 5 to 6 mm. long respectively, opening by wide oval pores 1 to 1.5 mm. long; stigma truncate; young fruit coriaceous, subspherical, purplish, up to 7 mm. in diameter, surmounted by the persistent calyx limb.

Type in the U. S. National Herbarium, no. 941,221, collected at Cubilquitz, Department of Alta Verapaz, Guatemala, altitude 350 meters, July, 1900, by H. von Tuerckheim (no. 7633). Duplicates at G, Y.

DISTRIBUTION: Southern Mexico to Costa Rica, altitude 300 to 1,600 meters. MEXICO.

OAXACA: Montebello, *Reko* 4027 (N).

GUATEMALA.

ALTA VERAPAZ: Chamá, *Johnson* 510 (N).

COSTA RICA: Tucurrigue, *Tonduz* 13371 (N).

CARTAGO: Pejivalle, *Standley & Valerio* 46948 (N).

The specimens from Costa Rica appear conspecific with those from farther north, although the range thus indicated is unusual. Probably the species is more closely related to *S. warszewiczii* than is implied in the key, but it is nevertheless quite distinct on the basis of its elongate inflorescence.

3. *Satyria panurensis* (Benth.) Benth. & Hook. Gen. Pl. 2:568. 1876.

Thibaudia panurensis Benth.; Meissn. in Mart. Fl. Bras. 7:125. 1863.

Riedelia bahiensis Meissn. in Mart. Fl. Bras. 7:172. 1863.

Riedelia panurensis Kuntze, Rev. Gen. Pl. 2:384. 1891.

Satyria ulei Hoer. Verh. Bot. Ver. Brand. 50:93. 1909.

Shrub; branchlets terete, cinereous, glabrous; petioles rugose, glabrous, 4 to 6 mm. long; leaf blades oblong, 10 to 13 cm. long, 3 to 6 cm. broad, rounded or subcuneate or subcordate at base, acuminate at apex, entire at margins, glabrous, nitid, 3 to 5 pinnerved, the secondary nerves oriented from base, spreading near margins, with the midnerve slightly raised above, prominent beneath, the veinlets reticulate, slightly raised along the midnerve, otherwise obscure; inflorescence axillary, racemose, 8 to 20 flowered, glabrous in all parts; rachis subterete, 1.5 to 4 cm. long; pedicles subrugose, 8 to 11 mm. long, bibracteolate near base with triangular, sparsely fimbriate bractlets about 1 mm. long, slightly swollen distally; calyx tube subcylindric, sparsely puberulous when young, about 2 mm. long and 2 mm. in diameter at anthesis; limb spreading, 1 to 2 mm. long including lobes, the lobes ovate, apiculate, 0.5 to 1 mm. long; corolla thin-carnose, glabrous or sparsely farinose at apex when young, 16 to 31 mm. long, about 3 mm. in diameter, the lobes erect, oblong, subacute, about 1.5 mm. long; stamens 7.5 to 10 mm. and 8.5 to 11 mm. long, respectively; filaments nigrescent, 4 to 6 mm. long, glabrous, produced into slender connectives, these minutely pilose with hairs up to 0.2 mm. long; anthers slender, dark castaneous, produced at base, 5 to 7 mm. and 6 to 8 mm. long respectively, flaring distally, opening by large oval clefts 1.5 to 2 mm. long; stigma truncate.

TYPE LOCALITY: Near Panure, Rio Uaupes, State of Amazonas, Brazil. Type collected by Spruce (no. 2704).

DISTRIBUTION: Foothills of the Andes, upper Amazon basin; also in western British Guiana; altitude up to 1,300 meters.

BRITISH GUIANA: Below Kaletour Falls, Potaro River, *Jenman* 827 (K).

COLOMBIA.

CUNDINAMARCA: Pipiral to Susumuco, southeast of Quetamé, *Pennell* 1711 (N, Y).

PERU.

SAN MARTÍN: Cerro de Ponasa, *Ule* 6672 (B, type of *S. ulei*, Go).

LOBETO: Mouth of Río Santiago, *Tessmann* 4662 (B). Timbuchi, Río Nanay, *L. Williams* 934 (F, Y). Manfinfa, upper Río Nanay, *L. Williams* 1108 (F, Y).

BRAZIL.

AMAZONAS: Panure, Río Uaupes, *Spruce* 2704 (K, type, G). Río Japura, *Martius* (type collection of *Riedelia bahiensis*, K, Y).

The above-cited specimens, in spite of their widely separated stations, seem to me conspecific. The differences are very slight and appear purely individual; for instance, the leaves of the Guiana specimen are slightly the broadest and the corollas somewhat longer. The three types involved show no consequential differences. The distribution parallels that of *Psammisia guianensis* and of many other plants of the foothills at the edge of the Amazon basin, and the species is probably to be found at many other points in this sparsely collected region. The application of the specific name "*bahiensis*" by Meissner was apparently due to a mistake in labels, but fortunately the name does not have to be retained.

4. *Satyria triloba* A. C. Smith, sp. nov.

Frutex gracilis epiphyticus; laminis ovatis vel oblongo-ovatis basi rotundatis apice acuminatis 5-plex-nerviis; inflorescentia racemosa; calyce campanulato rugoso minute puberulento, limbo tubum subaequante 3-lobato, lobis ovatis; corolla cylindrica; filamentis connatis aequalibus, antheris basi productis superne dilatatis.

Slender epiphytic shrub; branchlets terete, cinereous, glabrous; petioles rugose, sparsely puberulous or glabrous, 3 to 5 mm. long; leaf blades ovate or oblong-ovate, 7 to 10 cm. long, 3.5 to 4.5 cm. broad, rounded at base, acuminate at apex, entire and slightly thickened at margins, 5-plex-nerved, the midnerve slightly impressed above, prominent beneath, the secondary veins oriented near base, ascending near margins, plane above, slightly raised beneath, the veinlets reticulate, slightly raised beneath; inflorescence axillary, short-racemose, 6 to 12 flowered; rachis striate, 1.5 to 3 cm. long, minutely puberulous, becoming glabrous, circumscribed at base by several imbricate ovate subcoriaceous bractlets up to 2 mm. long; pedicels rugose, 8 to 12 mm. long, bibracteolate below middle with ovate-lanceolate short-fimbriate bractlets up to 2 mm. long, slightly swollen distally; calyx tube rugose, minutely puberulous, campanulate, about 2 mm. long and 2 mm. in diameter at anthesis; limb spreading, about 2 mm. long including lobes, the lobes 3, frequently reflexed, ovate, acute, about 2 mm. long, 2 to 3 mm. across; corolla thin-carnose, about 25 mm. long, 2.5 to 3 mm. in diameter, minutely puberulous, 5-lobed, the lobes oblong, subacute, about 1 mm. long; stamens about 8 mm. and 9 mm. long, respectively; filaments dark castaneous or nigrescent, glabrous, about 4 mm. long, leading into slender connectives, these sparsely puberulous; anthers dark castaneous, produced at base, about 5 mm. and 6 mm. long, respectively, opening by oval clefts about 1 mm. long; stigma truncate.

Type in the U. S. National Herbarium, no. 941,207, collected at "Fougerales du General, vallée du Diquís," Costa Rica, altitude 700 meters, February 2, 1898, by H. Pittier (no. 12147).

DISTRIBUTION: Known only from the type specimen.

This species, which bears a strong superficial resemblance to the preceding, is distinct on the basis of its 3-lobed calyx, which here is a constant character.

5. *Satyria pilosa* A. C. Smith, sp. nov.

Frutex robustus; laminis oblongis vel obovato-oblongis basi truncatis vel leviter subcordatis apice acutis 7-plex-nerviis; inflorescentia subfasciculata ubique albo-pilosa; calycis rugosi campanulati limbo tubum subaequante, lobis apiculatis; corolla cylindrica; filamentis membranaceis connatis, antheris inaequalibus rimis ovalibus latis dehiscentibus.

Stout shrub; branchlets terete, cinereous, glabrous; petioles strongly rugose, glabrous, stout, up to 6 mm. long; leaf blades oblong or obovate-oblong, up to 18 cm. long and 7 cm. broad, truncate or slightly subcordate at base, acute at apex, entire and revolute at margins, glabrous, 7-plex-nerved, the secondary nerves oriented above base for a distance of 3 to 5 cm., sharply ascending, with the midnerve impressed above, strongly prominent beneath, the veinlets copiously reticulate, obscure above, nearly plane beneath; inflorescence axillary, subfasciculate; pedicels subterete, about 3 mm. long, pilose with spreading white hairs about 0.2 mm. long, bibracteolate near middle with ovate fimbriate bractlets about 1 mm. long, slightly swollen distally; calyx tube rugose, campanulate, densely white-pubescent with spreading hairs up to 0.3 mm. long, about 2.5 mm. long and 3 mm. in diameter at anthesis; limb erect, pubescent, 2 to 3 mm. long including lobes, the lobes 5, apiculate, about 0.5 mm. long; corolla laxly pilose, becoming glabrous proximally, 17 to 19 mm. long, 3 to 4 mm. in diameter, contracted distally, the lobes subacute, about 1.5 mm. long; stamens about 6 mm. and 6.5 mm. long, respectively; filaments castaneous, membranous, densely pilose at upper margins with hairs about 0.5 mm. long, about 3.5 mm. long; anthers dark castaneous, slightly incurved at base, about 3.7 mm. and 4.2 mm. long, respectively, opening by broad oval clefts about 1 mm. long.

Type in the herbarium of the New York Botanical Garden, collected in forest at Antizales, Department of Bolívar, Colombia, altitude 1,200 to 1,800 meters, February 25 or 26, 1918, by F. W. Pennell (no. 4421).

DISTRIBUTION: Known only from the type collection.

The present specimen is very imperfect, but is sufficiently complete to permit its recognition as a distinct species marked by the pubescent flowers and the marginally pubescent filament tube. Apparently the inflorescence is several flowered, the flowers spreading from a coriaceous peduncle on the larger branchlets.

6. *Satyria ovata* A. C. Smith, sp. nov.

Frutex epiphyticus; laminis ovatis basi cuneatis apice obtusis 3 ad 5-plex-nerviis; inflorescentia subfasciculata vel breviter racemosa; calycis rugosi campanulati limbo tubum subaequante 5-lobato, lobis apiculatis; corolla cylindrica; filamentis connatis, antheris inaequalibus rimis latis ovalibus dehiscentibus.

Epiphytic shrub about 1 meter high; branchlets terete, stout, cinereous, glabrous; petioles rugose, glabrous, 5 to 10 mm. long; leaf blades ovate, thick-coriaceous, 5 to 10 cm. long, 3 to 6 cm. broad, cuneate or subattenuate at base, obtuse at apex, entire and slightly thickened at margins, glabrous, 3 to 5 plex-nerved, the secondary nerves oriented near base, with the midnerve nearly plane above, raised beneath, the veinlets reticulate, plane above, plane or slightly raised beneath; inflorescence axillary, subfasciculate or short-racemose, 4 to 10 flowered; rachis angled, glabrous, 1 to 1.5 cm. long, deciduously minutely bracteate at base; pedicels rugose, glabrous, somewhat flexuose, 10 to 16 mm. long, each subtended by a subcoriaceous, ovate, sparsely fimbriate bract about

1.3 mm. long, deciduously bibracteolate below middle, slightly swollen distally; calyx tube rugose, glabrous or deciduously puberulous, campanulate, about 2 mm. long and 2.5 mm. in diameter at anthesis; limb spreading, about 1.5 mm. long including lobes, the lobes 5, triangular, apiculate, submembranous, less than 1 mm. long; corolla glabrous or minutely pilose when young, about 20 mm. long and 4 to 5 mm. in diameter, contracted distally, the lobes subacute, about 1.5 mm. long; stamens about 6.5 mm. and 7.5 mm. long, respectively; filaments dark castaneous, membranous, pilose at margins distally when young, becoming glabrous, about 3.5 mm. long; anthers about 3.5 mm. and 4.5 mm. long, respectively, opening by wide oval pores about 1.5 mm. long; stigma truncate.

Type in the U. S. National Herbarium, no. 44,897, collected in Nicaragua, 1853 to 1856, by C. Wright.

DISTRIBUTION: Guatemala to Costa Rica.

GUATEMALA: *Friedrichsthal* 3 (K).

COSTA RICA.

GUANACASTE: Quebrada Serena, southeast of Tilarán, *Standley & Valerio* 46262 (N).

The three specimens cited are certainly conspecific, the species being marked by the comparatively small broad leaves. The flower dimensions are taken from the type specimen. The Costa Rican specimen is identical in habit, but bears less mature flowers which are somewhat pubescent. The anthers are similar to those above described but the filaments are much shorter, forming a tube which is distinctly and regularly pilose at the apical margin.

7. *Satyria warszewiczii* Klotzsch, *Linnaea* 24:22. 1851.

Satyria clonantha Klotzsch, *Linnaea* 24:22. 1851.

Riedelia warszewiczii Kuntze, *Rev. Gen. Pl.* 2:384. 1891.

Riedelia clonantha Kuntze, *Rev. Gen. Pl.* 2:384. 1891.

Epiphytic shrub up to 4 meters high; branchlets subterete, stout, glabrous, brownish or cinereous; petioles rugose, dark brown, narrowly winged above, 8 to 16 mm. long; leaf blades oblong or ovate-oblong, 10 to 23 cm. long, 2 to 9 cm. broad, narrowly cuneate at base, acuminate at apex, entire and slightly revolute at margins, thick-coriaceous, glabrous (rarely pilose beneath with appressed brownish hairs about 0.25 mm. long), 3 to 5 pli-nerved, the secondary nerves oriented near base, with the midnerve slightly raised above, prominent beneath, the veinlets copiously reticulate, slightly raised on both surfaces or plane; inflorescence frequently copious, short-racemose, often borne in clusters on stout branchlets, deciduously bracteate at base, 8 to 30 flowered; rachis striate, glabrous, 5 to 10 mm. long; pedicels rugose, glabrous, 15 to 25 mm. long, each subtended by a submembranous oblong bractlet 3 to 4 mm. long, deciduously bibracteolate below base, swollen distally; calyx tube rugose, coriaceous, glabrous, broadly campanulate, sometimes apophysate, about 2 mm. long and 3 to 4 mm. in diameter at anthesis; limb thin-coriaceous, 2 to 3 mm. long, including lobes, the lobes triangular, apiculate, 1 mm. long or less; corolla thin-carnose, glabrous, 18 to 28 mm. long, 4 to 5 mm. in diameter, contracted at throat, the lobes subacute, about 1 mm. long; stamens 7 to 9 mm. and 8 to 11 mm. long, respectively; filaments castaneous, submembranous, 3 to 5 mm. long, free, distally and marginally pilose; anthers about 5 mm. and 6 mm. long respectively, opening by wide oval clefts 2 to 2.5 mm. long; stigma truncate; young fruit rugose, short-cylindric, up to 6 mm. in diameter.

TYPE LOCALITY: Volcán Barba, Costa Rica. Type collected by Warszewicz.

DISTRIBUTION: Southern Mexico to western Panama, altitude 1,000 to 2,400 meters.

The typical form, with consistently 3-nerved leaves, the blades oblong-lanceolate and 2 to 3 cm. broad, is represented by the following specimens:

COSTA RICA: Volcán Barba, *Warszewicz* (B, type). Cerro Jucosal, *Stork* 1111 (F).

HEREDIA: Yerba Buena, *Standley & Valerio* 49037 (N).

CARTAGO: Santa Clara de Cartago, *Maxon & Harvey* 8228 (N).

PANAMA: Veraguas, *Bridges*, in 1855 (K).

The common form, with 5 (sometimes 3) nerved leaves, the blades oblong and more than 3 cm. broad, is represented by the following specimens:

MEXICO.

CHIAPAS: Near Tumbala, *Nelson* 3328 (G, N).

GUATEMALA.

ALTA VERAPAZ: Finca Sepacuité, *Cook & Griggs* 475 (N).

COSTA RICA: *Endres* 232 (K). Cucaracha, *Lankester* 100 (K). Cañas Gordas, *Pittier* 11206 (N). San Jerónimo, *Wercklé* 11301 (N). Esmeralda, *Tonduz* 1881 (F, N). San Ramón, *Tonduz* 17836 (B, F, N). Agua Caliente, *Stork* 1050 (F).

ALAJUELA: Volcán Poás, *J. D. Smith* 6637 (N). Fraijanes, *Standley & Torres* 47431 (N), 47620 (N).

HEREDIA: Cerros de Zurquí, *Standley & Valerio* 50266 (N), 50648 (N).

SAN JOSÉ: La Palma, *Wercklé* 11605 (N); *Tonduz* 12438 (N); *Standley* 38108 (N). La Hondura, *Standley* 36201 (N), 37657 (N). El Copey, *Tonduz* 12232 (F, N, Y); *Standley* 42070 (N). Santa María de Dota, *Standley* 41647 (N), 42286 (N), 42978 (N); *Standley & Valerio* 43440 (N). Between Aserrí and Tarbaca, *Standley* 34194 (N). Las Nubes, *Standley* 38601 (N). Zurquí, *Standley & Valerio* 48148 (N).

CARTAGO: El Muñeco, south of Navarro, *Standley* 33496 (N). Pejivalle, *Standley & Valerio* 47120 (N). Carpintera, *Stork* 2064 (F).

PANAMA.

CHIRIQUÍ: El Boquete, *Seemann* 1172 (K); *Pittier* 3014 (F, N).

VERAGUAS: *Warszewicz* (B, type of *S. clonantha*).

In proposing the genus *Satyria*, Klotzsch describes two species, *warszewiczii* and *clonantha*, but comparison of his descriptions and study of a large series of material convinces me that the two specimens described are extremes of a very common and variable species. The name *warszewiczii* is here retained, although most specimens are closer to the type of *S. clonantha* than to that of *S. warszewiczii*. The above flower dimensions are near the average; frequently the anthers are up to 10 mm. in length. Local names are: "Colmillos," "muelas," "arrayán," "uva."

All the above-cited specimens are from Central America. Following are descriptions of two Colombian plants which I am not thoroughly convinced should be maintained as species distinct from *S. warszewiczii*. However, until further exploration of eastern Panama and northern Colombia gives us a more complete series of specimens, it seems best to recognize them.

8. *Satyria grandifolia* Hoer. Bot. Jahrb. Engler 42: 319. 1909.

Stout branching shrub; branchlets terete, brownish, glabrous; petioles rugose, subterete, stout, 9 to 12 mm. long; leaf blades oblong, 15 to 22 cm. long, 4.5 to 7 cm. broad, acute at base, subacute or short-acuminate at apex, entire and slightly revolute at margins, glabrous, thick-coriaceous, 5-plexi-nerved, the secondary nerves oriented slightly above base, with the midnerve slightly impressed above, prominent beneath, the veinlets reticulate, slightly raised on

both surfaces; inflorescence axillary, frequently on leafless branchlets, short-racemose, 6 to 10 flowered; rachises stout, 5 to 8 mm. long, solitary or in small clusters, glabrous; pedicels subrugose, glabrous, 10 to 16 mm. long, each subtended by a subcoriaceous, oblong, sparsely fimbriate bract about 3 mm. long, bibracteolate near base with smaller bractlets; calyx tube broadly campanulate, subrugose, glabrous, 1 to 1.5 mm. long, 3 mm. in diameter at anthesis; limb spreading, about 2 mm. long including lobes, the lobes broadly ovate, apiculate, about 1 mm. long and 3 to 4 mm. broad; corolla narrowly cylindrical, 25 to 30 mm. long, about 3 mm. in diameter at anthesis, contracted distally, the lobes small; stamens 8 mm. and 9 mm. long, respectively; filaments subnigrescent, sparsely pilose at distal margins, about 3 mm. long; anthers 7 mm. and 8 mm. long, respectively, opening by broad oval clefts about 3 mm. long; stigma truncate.

TYPE LOCALITY: Cienegueta, Cordillera del Chocó, Intendencia of El Chocó, Colombia, altitude 2,100 meters. Type collected by Triana (no. 2694).

DISTRIBUTION: Known only from the type collection.

COLOMBIA.

EL CHOCÓ: Cienegueta, *Triana* 2694 (B, type, K).

This species is distinct from *S. warszewiczii* on the basis of its unusually rigid anthers.

9. *Satyria latifolia* A. C. Smith, sp. nov.

Frutex robustus; laminis late ovato-oblongis basi late cuneatis glabris 5-pli-nerviis; floribus subglabris; calycis lati campanulati limbo tubum subaequante, lobis apiculatis; corolla cylindrica; filamentis nigrescentibus connatis superne pilosis, antheris granulatis rigide coriaceis dorsaliter puberulis superne dilatatis rimis latis ovalibus dehiscentibus.

Shrub; branchlets stout, terete, cinereous, glabrous; petioles subrugose, stout, up to 5 mm. in diameter, 9 to 12 mm. long; leaf blades broadly ovate-oblong, 25 to 35 cm. long, 11 to 15 cm. broad, broadly cuneate at base, entire and narrowly revolute at margins, glabrous, nitid above, thick-coriaceous, 5-pli-nerved, the secondary nerves oriented near base, with the midnerve slightly raised above, prominent beneath, the veinlets reticulate, slightly raised on both surfaces; inflorescence and pedicels lacking in our specimen; calyx tube glabrous, broadly campanulate or subspherical, about 2.5 mm. long and 4 mm. in diameter at anthesis; limb spreading, coriaceous, about 2.5 mm. long including lobes, the lobes 5, triangular, apiculate, about 1 mm. long; corolla subcoriaceous, glabrous, or minutely puberulous distally, about 25 mm. long and 5 to 6 mm. in diameter, contracted distally, the lobes subacute, about 2 mm. long; stamens about 7.5 mm. and 9.5 mm. long, respectively; filaments nigrescent, coriaceous, 3 to 3.5 mm. long, pilose dorsally near apex with minute brown hairs, marginally white-pubescent with pale hairs up to 0.15 mm. long; anthers granular, rigidly coriaceous, dorsally puberulous, produced at base, about 6.5 mm. and 8.5 mm. long, respectively, opening by wide oval clefts about 3 mm. long; stigma truncate.

Type in the herbarium of the New York Botanical Garden, collected in mossy forest, Boca Antizales, on Río Esmeralda, Department of Bolívar, Colombia, altitude 1,400 to 1,800 meters, February 26, 1918, by F. W. Pennell (no. 4484).

DISTRIBUTION: Known only from the type collection.

The specimen here described is very incomplete, but represents a distinct species on the basis of its large leaves and rigidly coriaceous puberulous anthers.

10. *Satyria melantha* Donn. Smith, Bot. Gaz. 47: 256. 1909.

Scandent shrub; branchlets stout, subterete, glabrous, cinereous; petioles rugose, glabrous, 2 to 4 mm. in diameter, 8 to 12 mm. long; leaf blades oblong or ovate-oblong, 12 to 18 cm. long, 4 to 9 cm. broad, cuneate at base, acuminate or long-acuminate at apex, entire and slightly revolute at margins, glabrous, thick-coriaceous, 5-plex-nerved, the secondary nerves oriented above base, with the midnerve nearly plane above, prominent beneath, the veinlets reticulate, slightly raised on both surfaces; inflorescence axillary, frequently on large leafless branches, short-racemose, 6 to 12 flowered; rachis striate, slender, glabrous, 5 to 10 mm. long, minutely and deciduously bracteate at base; pedicels rugose, glabrous or sparsely puberulous towards apex, slender, 6 to 10 mm. long, each subtended by an oblong, acute, subcoriaceous, sparsely fimbriate bract about 2 mm. long, bibracteolate near middle with similar, slightly smaller bractlets, swollen distally; calyx tube campanulate, subrugose, minutely puberulous, becoming glabrous, about 2 mm. long and 2 mm. in diameter at anthesis; limb about 1.5 mm. long including lobes, subcoriaceous, minutely puberulous, the lobes triangular, apiculate, about 0.5 mm. long; corolla subrugose, glabrous, 10 to 11 mm. long, about 2.5 mm. in diameter, contracted distally, the lobes subacute, about 1 mm. long; stamens about 5 mm. and 5.5 mm. long, respectively; filaments castaneous, glabrous or sparsely puberulous distally, about 3 mm. long; anthers about 3 mm. and 3.5 mm. long, respectively, opening by broad oval clefts 1 to 1.3 mm. long; stigma truncate.

TYPE LOCALITY: Cobán, Department of Alta Verapaz, Guatemala, altitude 1,600 meters. Type collected by von Tuerckheim (no. II. 2101).

DISTRIBUTION: Department of Alta Verapaz, Guatemala, altitude 1,400 to 1,600 meters.

GUATEMALA.

ALTA VERAPAZ: Cobán, *von Tuerckheim* II. 2101 (G, N, type, Y). Samac, *Johnson* 873 (N).

The small flowers, puberulous calyces, and medium-sized leaves distinguish this species.

11. *Satyria nitida* A. C. Smith, sp. nov.

Riedelia fendleriana Kuntze, Rev. Gen. Pl. 2: 384. 1891, nomen.

Frutex scandens; laminis oblongis basi cuneatis apice acuminatis supra nitidis 5-plex-nerviis; inflorescentia breviter racemosa ubique minute et decidue puberulento; calycis rugosi campanulati limbo tubum subaequante, lobis apiculatis; corolla cylindrica; filamentis connatis, antheris superne dilatatis rimis ovalibus dehiscentibus.

Scandent shrub; branchlets terete, glabrous, brownish; petioles rugose, stout, about 4 mm. in diameter, 6 to 10 mm. long, narrowly winged above; leaf blades oblong, 17 to 28 cm. long, 5 to 9 cm. broad, cuneate at base, acuminate or long-acuminate at apex, entire and narrowly revolute at margins, thick-coriaceous, glabrous and nitid above, glabrous beneath or sparsely pilose with scattered appressed brown hairs about 0.2 mm. long, 5-plex-nerved, the secondary nerves oriented slightly above base, ascending nearly to apex, with the midnerve slightly raised above, prominent beneath, the veinlets reticulate, plane or slightly raised on both surfaces; inflorescence axillary, frequently on stout leafless branchlets, 5 to 8 flowered, short-racemose; racemes 2 to 4 in a group, giving to the inflorescence a paniced appearance; rachis striate, minutely puberulous when young, 3 to 5 mm. long, deciduously and minutely bracteate at base; pedicels striate, minutely puberulous, each subtended by an ovate-oblong subcoriaceous fimbriate bract about 1 mm. long, minutely bibracteolate below middle, swollen distally; calyx tube rugose, minutely puberulous with

hairs about 0.1 mm. long, campanulate, about 2 mm. long and 2 mm. in diameter at anthesis; limb spreading, about 1.5 mm. long including lobes, the lobes 5, apiculate, about 0.5 mm. long; corolla minutely puberulous as the calyx, 12 to 14 mm. long, about 3.5 mm. in diameter, slightly contracted above, the lobes oblong, subacute, about 1.5 mm. long; stamens about 5.5 mm. and 6 mm. long, respectively; filaments nigrescent, about 2.5 mm. long, leading into slender, laterally pilose connectives; anthers slightly incurved and inconspicuously setose at base, about 3.5 mm. and 4 mm. long, respectively, opening by broad introrse clefts 1 to 2 mm. long; stigma truncate.

Type in the Gray Herbarium of Harvard University, collected between Maracai and Choroní, near Colonia Tovar, State of Aragua, Venezuela, altitude about 1,550 meters, January 29, 1857, by A. Fendler (no. 2013). Duplicate at K.

DISTRIBUTION: Known only from the type collection.

The present species of *Satyria*, which is the only one known as yet from Venezuela, differs from the preceding by its larger leaves and flowers. They have in common a minutely puberulous calyx.

12. *Satyria minutiflora* A. C. Smith, sp. nov.

Frutex; laminis oblongis vel ovato-oblongis basi cuneatis supra nitidis 5-plinerviis; inflorescentia subfasciculata glabra; floribus minutis; calyce coriaceo rugoso campanulato, limbo tubum subaequante, lobis apiculatis; corolla elongato-urceolata; filamentis connatis, antheris inaequalibus superne dilatatis poris obliquis latis dehiscentibus.

Shrub; branchlets stout, subterete, sparsely puberulous with pale spreading hairs or glabrous, cinereous; petioles subrugose, stout, about 4 mm. long, essentially glabrous, 8 to 10 mm. long; leaf blades oblong or ovate-oblong, 16 to 20 cm. long, 5 to 7 cm. broad, broadly cuneate at base, acute at apex (?), entire and slightly recurved at margins, thick-coriaceous, glabrous and nitid above, glabrous or sparsely pilose beneath with appressed brownish hairs up to 0.3 mm. long, 5-pli-nerved, the secondary nerves oriented above base, ascending nearly to apex, with the midnerve nearly plane above, prominent beneath, the veinlets obscurely reticulate; inflorescence subfasciculate, the peduncles stout, borne in clusters on leafless branchlets, the flowers 3 to 6 to a peduncle, glabrous in all parts; pedicels striate, slender, 6 to 8 mm. long, each subtended by an oblong, sparsely fimbriate bract about 1 mm. long, similarly bibracteolate below middle, swollen distally; calyx tube coriaceous, rugose, campanulate or subglobose, about 1.5 mm. long and 2 mm. in diameter at anthesis; limb subcoriaceous, 1 to 1.5 mm. long including lobes, the lobes 5, apiculate, about 0.5 mm. long; corolla subrugose, elongate-urceolate, 7 to 8 mm. long, about 2.5 mm. in diameter, contracted at throat, the lobes spreading, subacute, about 1 mm. long; stamens about 2.5 mm. and 2.8 mm. long, respectively; filaments castaneous, sparsely pubescent distally, 1 mm. long or slightly less; anthers pale castaneous, about 1.9 mm. and 2.2 mm. long, respectively, opening by broad oblique pores about 0.6 mm. long; stigma capitate.

Type in the herbarium of the New York Botanical Garden, collected in forest at La Cumbre, Western Cordillera, Department of El Valle, Colombia, altitude 1,700 to 2,100 meters, September 9, 1922, by E. P. Killip and T. E. Hazen (no. 12138).

DISTRIBUTION: Known only from the type collection.

The small flowers and minute anthers easily distinguish this species. The extraordinarily stout branchlets, which bear flowers on the old woody portions, also are characteristic.

EXPLANATION OF PLATE 19.—*Satyria minutiflora*, from photograph of type sheet. About one-half natural size.

13. *Satyria toroi* A. C. Smith, sp. nov.

Frutex; laminis late ovato-oblongis basi cuneatis glabris 5-plex-nerviis; inflorescentia breviter racemosa; calycis tubo late campanulato rugoso glabro limbum subaequante, lobis ovato-apiculatis; corolla subcylindrica; filamentis connatis, antheris superne dilatatis rimis ovalibus latis dehiscentibus.

Shrub; branchlets stout, subterete, glabrous, cinereous; petioles subrugose, stout, 3 to 5 mm. in diameter, glabrous, 7 to 10 mm. long; leaf blades broadly ovate-oblong, 15 to 20 cm. long, 8 to 10 cm. broad, cuneate at base, apex (?), entire at margins, thick-coriaceous, glabrous, 5-plex-nerved, the secondary nerves oriented slightly above base, ascending near margins, with the midnerve nearly plane above, prominent beneath, the veinlets reticulate, slightly raised on both surfaces; inflorescence short-racemose, the racemes borne in clusters of 2 or 3 on stout leafless branchlets, deciduously bracteate at base, 5 to 10 flowered; rachis striate, 3 to 6 mm. long, glabrous; pedicels rugose, glabrous, 15 to 25 mm. long, each subtended by an oblong subcoriaceous fimbriate bract 3 to 4 mm. long, bibracteolate below middle with bractlets about 1.5 mm. long, swollen distally; calyx tube coriaceous, rugose, broadly campanulate, about 2 mm. long and 4 mm. in diameter at anthesis, glabrous; limb spreading, thin-coriaceous, about 3 mm. long including lobes, the lobes 5, ovate, apiculate, about 1.5 mm. long, thick-margined except at apex; corolla thin-carnose, minutely puberulous, becoming glabrous, subcylindric or elongate-urceolate, 15 to 17 mm. long, 4 to 5 mm. in diameter, contracted at throat, the lobes subacute, about 1.5 mm. long; stamens about 7 mm. and 8 mm. long respectively; filaments castaneous, about 2.5 mm. long, free distally and here puberulous; anthers castaneous, incurved at base, about 5.5 mm. and 6.5 mm. long, respectively, opening by wide oval clefts about 2.5 mm. long; stigma truncate.

Type in the herbarium of the New York Botanical Garden, collected at Dauro, Intendencia of El Chocó, Columbia, April 6, 1928, by R. A. Toro (no. 1131).

DISTRIBUTION: Known only from the type collection.

Distinguished by its broad leaves and ample soft-carnose flowers.

14. *Satyria breviflora* Hoer. Bot. Jahrb. Engler 42:319. 1909.

Shrub; branchlets stout, terete, glabrous, brownish or cinereous; petioles rugose, glabrous, stout, 3 to 4 mm. in diameter, narrowly winged above, 6 to 8 mm. long; leaf blades thick-coriaceous, ovate-oblong, 15 to 18 cm. long, 4 to 7 cm. broad, cuneate at base, acute at apex, entire and slightly revolute at margins, glabrous, 5-plex-nerved, the secondary nerves oriented slightly above base, with the midnerve impressed above, prominent beneath, the veinlets reticulate, plane or slightly raised; inflorescence short-racemose, the racemes solitary or clustered on stout leafless branchlets, deciduously minutely bracteate at base, 8 to 20 flowered; rachis stout, glabrous, 4 to 10 mm. long; pedicels rugose, glabrous, 20 to 25 mm. long, each subtended by a submembranous oblong acute fimbriate bract about 2.5 mm. long, bibracteolate below middle with bractlets about 1.5 mm. long, swollen distally; calyx tube coriaceous, rugose, campanulate, about 2 mm. long and 3 mm. in diameter at anthesis, glabrous; limb thin-coriaceous, about 2.5 mm. long including lobes, the lobes ovate, apiculate, about 1.5 mm. long, slightly thickened at margins except at apex; corolla thin-carnose, minutely puberulous when young, 11 to 16 mm. long, about 4 mm. in diameter, contracted at throat, the lobes subacute, less than 1 mm. long; stamens about 7.5 mm. and 8 mm. long, respectively; filaments dark castaneous, about 3 mm. long, pilose at margins distally with hairs about 0.2 mm. long;

anthers about 5.5 mm. and 6 mm. long, respectively, opening by wide clefts about 2 mm. long; stigma truncate.

TYPE LOCALITY: Quindío Region, Colombia (Department of Tolima?). Type collected by Triana (no. 253).

DISTRIBUTION: Andes of Central Colombia, altitude 2,000 to 2,300 meters.

COLOMBIA.

CUNDINAMARCA: Above Sibaté, *Holton*, in December, 1852 (Y).

TOLIMA: Quindío Region, *Triana* 253 (B, type). *Murillo*, *Pennell* 3191 (Y).

ANTIOQUIA: Medellín, *Archer* 1508 (N, Y).

CALDAS: Buenos Aires, north of Supía, *Pennell* 10725 (Y).

The above dimensions are average; the anthers of the *Holton* specimen are somewhat smaller, but it is apparently conspecific with material from the Central Cordillera.

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 9467. *Macleania nitida*.
 9520. *Cavendishia montana*.
 12138. *Satyria minutiflora*.
 12144. *Cavendishia scabriuscula*.

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

15049. *Psammisia penduliflora*.
 15124. *Cavendishia killipii*.
 15465. *Cavendishia pubescens*.
 15722. *Macleania nitida*.
 15794. *Themistoclesia vegasana*.
 15803. *Cavendishia scabriuscula*.
 15806. *Macleania nitida*.
 15820. *Thibaudia floribunda*.
 15871. *Cavendishia gracilis*.
 15880. *Themistoclesia vegasana*.

15918. *Cavendishia pubescens*.
 15978. *Cavendishia splendens*.
 15980. *Cavendishia splendens*.
 15987. *Orthaea cavendishioides*.
 15997. *Cavendishia gracilis*.
 16090. *Cavendishia splendens*.
 16100. *Cavendishia scabriuscula*.
 16621. *Psammisia penduliflora*.
 16764. *Cavendishia splendens*.
 16777. *Psammisia penduliflora*.
 17174. *Psammisia falcata*.
 17280. *Macleania nitida*.
 17281. *Macleania nitida*.
 17336. *Macleania nitida*.
 17586. *Macleania nitida*.
 17698. *Macleania nitida*.
 17744. *Macleania nitida*.
 17857. *Cavendishia scabriuscula*.
 17873. *Psammisia penduliflora*.
 17994. *Macleania nitida*.
 18013. *Psammisia penduliflora*.
 18087. *Thibaudia floribunda*.
 18222. *Macleania nitida*.
 18370. *Psammisia falcata*.
 18606. *Macleania nitida*.
 18784. *Cavendishia scabriuscula*.
 18791. *Thibaudia floribunda*.
 18794. *Psammisia falcata*.
 18868. *Psammisia penduliflora*.
 18872. *Psammisia penduliflora*.
 18875. *Cavendishia cordifolia*.
 18883. *Cavendishia pubescens*.
 18888. *Cavendishia scabriuscula*.
 18950. *Cavendishia splendens*.
 19039. *Cavendishia pubescens*.
 19091. *Cavendishia pubescens*.
 19099. *Psammisia penduliflora*.
 19308. *Cavendishia pubescens*.
 19312. *Cavendishia scabriuscula*.
 19435. *Cavendishia pubescens*.
 19460. *Cavendishia pubescens*.
 19631. *Macleania nitida*.
 19738. *Macleania nitida*.
 19781. *Cavendishia scabriuscula*.
 19914. *Macleania nitida*.
 19936. *Themistoclesia hirsuta*.
 20051. *Psammisia penduliflora*.
 20055. *Cavendishia pubescens*.
 20108. *Psammisia penduliflora*.
 20481. *Psammisia penduliflora*.
 20587. *Psammisia penduliflora*.
 20588. *Cavendishia splendens*.
 20663. *Ceratostema coronarium*.

20674. *Cavendishia splendens*.
 20676. *Cavendishia splendens*.
 20731. *Cavendishia scabriuscula*.
 21172. *Macleania nitida*.
 21218. *Cavendishia cordifolia*.
 22199. *Cavendishia paniculata*.
 22297. *Cavendishia beckmanniana*.
 22387. *Cavendishia beckmanniana*.
 22432. *Cavendishia paniculata*.
 22489. *Cavendishia beckmanniana*.
 23141. *Cavendishia beckmanniana*.
 23209. *Cavendishia beckmanniana*.
 24138. *Psammisia coarctata*.
 24244. *Thibaudia ovata*.
 24256. *Cavendishia punctatifolia*.
 24269. *Cavendishia beckmanniana*.
 24353. *Thibaudia ovata*.
 24473. *Cavendishia punctatifolia*.
 24489. *Cavendishia pubescens*.
 24868. *Psammisia globosa*.
 24882. *Cavendishia pubescens*.
 25677. *Cavendishia acuminata*.
 25686. *Thibaudia biflora*.
 25850. *Semiramisia weberbaueri*.
 25938. *Cavendishia pubescens*.
 25946. *Cavendishia ulbrichiana*.

KLUG, G.

1678. *Psammisia guyanensis*.

KUNTZE, O.

1572. *Cavendishia pubescens*.
 1636. *Psammisia hookeriana*.
 2346, in part. *Cavendishia smithii*.
 2346, in part. *Macleania glabra*.

LANKESTER, C. H.

100. *Satyria warszewiczii*.
 107. *Cavendishia veraguensis*.
 109. *Psammisia ramiflora*.
 K79. *Macleania ovata*.
 K247. *Psammisia ramiflora*.

LECHLER, W.

1875. *Cavendishia beckmanniana*.
 1924a. *Cavendishia pubescens*.
 2053. *Siphonandra pilosa*.
 2198. *Cavendishia beckmanniana*.
 2276. *Siphonandra elliptica*.
 2386. *Psammisia pauciflora*.
 2585. *Ceratostema graebnerianum*.
 2693. *Ceratostema graebnerianum*.

LEHMANN, F. C.

160. *Cavendishia acuminata*.
 2954. *Cavendishia quereme*.
 4086. *Lysiclesia minor*.
 4452. *Psammisia columbiensis*.
 4763. *Cavendishia divaricata*.
 4961. *Psammisia lehmannii*.
 5437. *Macleania stricta*.
 5438. *Psammisia breviflora*.
 5439. *Psammisia sodirol*.
 5620. *Themistoclesia dependens*.
 6299. *Cavendishia cordifolia*.
 7447. *Cavendishia gracilis*.
 7525. *Cavendishia lindauiana*.
 7527. *Cavendishia guatapéensis*.
 7535. *Thibaudia rigidiflora*.
 7895. *Cavendishia lehmannii*.
 8232. *Thibaudia lehmannii*.
 8417. *Psammisia macrophylla*.
 8418. *Cavendishia miconioides*.
 BT439. *Psammisia macrophylla*.
 BT639. *Psammisia macrophylla*.
 BT949. *Anthopterus bracteatus*.
 BT965. *Psammisia macrophylla*.
 K168. *Cavendishia adenophora*.
 K169. *Cavendishia adenophora*.
 K172. *Ceratostema rigidum*.
 K173. *Psammisia ferruginea*.
 K174. *Psammisia ecuadorensis*.
 K176. *Thibaudia paniculata*.
 K179. *Anthopterus wardii*.
 K180. *Psammisia macrophylla*.
 CCXXX. *Cavendishia lehmannii*.

LEIBOLD, F. E.

23. *Macleania insignis*.

LIEBMANN, F. M.

8643. *Macleania insignis*.
 8645. *Macleania insignis*.

LINDEN, J. J.

26. *Psammisia hookeriana*.
 50. *Cavendishia splendens*.
 283. *Psammisia penduliflora*.
 355. *Cavendishia splendens*.
 918. *Ceratostema pubiflorum*.
 949. *Cavendishia macrocephala*.
 951. *Psammisia grandiflora*.
 1304. *Cavendishia cordifolia*.

LLOYD, F. E.

302. *Gonocalyx smilacifolius*.

LOBB, W.

1. *Thibaudia ovata*.
 2. *Ceratostema buxifolium*.
 3. *Ceratostema grandiflorum*.
 79. *Periclesia flexuosa*.
 80. *Englerodoxa alata*.
 81. *Macleania stricta*.
 89. *Psammisia ferruginea*.
 161. *Englerodoxa alata*.
 224. *Cavendishia cordifolia*.
 252. *Ceratostema lobbii*.

MACBRIDE, J. F.

3361. *Ceratostema grandiflorum*.
 3544. *Ceratostema coccineum*.
 3558. *Cavendishia acuminata*.
 3632. *Cavendishia punctatifolia*.
 3664. *Macleania benthamiana*.
 4376. *Ceratostema coccineum*.
 4792. *Psammisia guyanensis*.
 4851. *Psammisia ulbrichiana*.
 4874. *Thibaudia floribunda*.
 4964. *Themistoclesia peruviana*.
 5626. *Psammisia coarctata*.
 5754. *Psammisia globosa*.

MACBRIDE, J. F., and FEATHERSTONE, W.

1402. *Thibaudia melliflora*.
 2163. *Ceratostema coccineum*.
 2227. *Cavendishia acuminata*.

MANDON, G.

548. *Ceratostema mandoni*.
 549. *Siphonandra pilosa*.
 550. *Cavendishia acuminata*.

MATHEWS, A.

- 883*. *Thibaudia ovalifolia*.
 884. *Siphonandra elliptica*.
 1442. *Macleania floribunda*.
 1443. *Thibaudia angustifolia*.
 1444. *Cavendishia acuminata*.
 2077. *Psammisia globosa*.
 2078, in part. *Cavendishia nobilis*.
 2078, in part. *Psammisia coarctata*.
 3041, in part. *Thibaudia moricandi*.
 3041, in part. *Thibaudia phyllireaefolia*.

MAXON, W. R.

5446. *Cavendishia wercklei*.

MAXON, W. R., and HARVEY, A. D.

7912. *Cavendishia endresii*.
 7913. *Cavendishia smithii*.
 7914. *Cavendishia smithii*.
 8018. *Cavendishia endresii*.
 8197. *Cavendishia melastomoides*.
 8228. *Satyria warszewiczii*.

MAXON, W. R., HARVEY, A. D., and
VALENTINE, A. T.

7768. *Cavendishia smithii*.

MORITZ, J.

479. *Psammisia hookeriana*.
 772. *Psammisia hookeriana*.
 1340. *Themistoclesia pendula*.
 1346. *Cavendishia pubescens*.
 1347. *Psammisia penduliflora*.
 1347b. *Psammisia penduliflora*.
 1348. *Cavendishia cordifolia*.
 1349. *Macleania nitida*.
 1662. *Themistoclesia pendula*.
 1663. *Cavendishia splendens*.

NELSON, E. W.

778. *Cavendishia crassifolia*.
 3328. *Satyria warszewiczii*.
 3350. *Cavendishia laurifolia*.
 3362. *Cavendishia laurifolia*.

NIEMEYER, E.

141a. *Cavendishia cordifolia*.
 143. *Cavendishia cordifolia*.

OERSTED, A.

8569. *Cavendishia veraguensis*.
 8572. *Cavendishia smithii*.
 8574. *Macleania glabra*.
 8648. *Macleania glabra*.

PACHANO, A.

179. *Macleania euryphylla*.
 223. *Cavendishia hartwegiana*.

PEARCE, R.

126. *Thibaudia melliflora*.
 236. *Psammisia ulbrichiana*.
 731. *Orthaea boliviensis*.
 790. *Siphonandra elliptica*.
 814. *Orthaea constans*.

PENNELL, F. W.

1711. *Satyria panurensis*.
 1769. *Cavendishia cordifolia*.
 1770. *Cavendishia cordifolia*.
 1782. *Cavendishia cordifolia*.
 1924. *Thibaudia floribunda*.
 1968. *Cavendishia cordifolia*.
 2420. *Psammisia graebneriana*.
 2447. *Cavendishia cordifolia*.
 2572. *Cavendishia obtusa*.
 2643. *Macleania hirtiflora*.
 2646. *Macleania hirtiflora*.
 2659. *Themistoclesia compacta*.
 2695. *Cavendishia pubescens*.
 2705. *Psammisia lanceolata*.
 3116. *Macleania nitida*.
 3178. *Cavendishia durifolia*.
 3179. *Thibaudia pennellii*.
 3191. *Satyria breviflora*.
 3192. *Cavendishia pubescens*.
 3193. *Cavendishia guatapeensis*.
 3405. *Macleania nervosa*.
 4299. *Cavendishia subamplexicaulis*.
 4300. *Cavendishia guatapeensis*.
 4301. *Cavendishia glandulosa*.
 4307. *Cavendishia guatapeensis*.
 4332. *Cavendishia guatapeensis*.
 4375. *Cavendishia axillaris*.
 4377. *Cavendishia sessiliflora*.
 4389. *Lysiclesia caudata*.
 4406. *Psammisia breviflora*.
 4421. *Satyria pilosa*.
 4441. *Cavendishia caudata*.
 4484. *Satyria latifolia*.
 4488. *Cavendishia compacta*.
 4780. *Cavendishia sessiliflora*.
 6953. *Psammisia graebneriana*.
 7023. *Ceratostema rigidum*.
 7465. *Macleania crassa*.
 7557. *Cavendishia divaricata*.
 7566. *Macleania pubiflora*.
 7628. *Psammisia pennellii*.
 7629. *Psammisia breviflora*.
 8267. *Psammisia macrophylla*.
 9303. *Cavendishia obtusa*.
 9304. *Psammisia pennellii*.
 9305. *Cavendishia montana*.
 10308. *Psammisia macrophylla*.
 10314. *Cavendishia acuminata*.
 10315. *Psammisia macrophylla*.
 10401. *Cavendishia adenophora*.
 10402. *Cavendishia bomareoides*.
 10403. *Psammisia grandiflora*.

10458. *Psammisia grandiflora*.
 10459. *Psammisia grandiflora*.
 10460. *Thibaudia floribunda*.
 10509. *Cavendishia acuminata*.
 10538. *Cavendishia acuminata*.
 10539. *Cavendishia scabriuscula*.
 10722. *Cavendishia pubescens*.
 10744. *Cavendishia pubescens*.
 10933. *Cavendishia pubescens*.
 13857. *Siphonandra elliptica*.
 13962. *Cavendishia paniculata*.
 13972. *Orthaea breviflora*.
 14009. *Cavendishia weberbaueri*.
 14015. *Cavendishia weberbaueri*.
 14028. *Psammisia ulbrichiana*.
 14096. *Ceratostema graebnerianum*.

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

10076. *Ceratostema pubiflorum*.
 10115. *Cavendishia scabriuscula*.

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

5750. *Psammisia pennellii*.
 5751. *Psammisia macrophylla*.
 5796. *Cavendishia adenophora*.
 5801. *Cavendishia spicata*.
 5802. *Thibaudia rigidiflora*.
 6324. *Psammisia killipii*.
 6369. *Psammisia macrophylla*.
 6397. *Cavendishia miconioides*.
 6519. *Psammisia graebneriana*.
 6524. *Thibaudia floribunda*.
 7290. *Psammisia pennellii*.
 7304. *Thibaudia floribunda*.
 7384. *Cavendishia divaricata*.
 8130. *Psammisia macrophylla*.
 8275. *Psammisia macrophylla*.
 8305. *Psammisia macrophylla*.
 8862. *Cavendishia scabriuscula*.

PEREZ, A. E.

1060. *Macleania nitida*.

PITTIER, E.

81. *Cavendishia pubescens*.
 129. *Psammisia hookeriana*.

PITTIER, H.

588. *Macleania pentaptera*.
 770. *Macleania antioquiæ*.
 1071. *Cavendishia acuminata*.
 1073. *Thibaudia floribunda*.

1180. *Themistoclesia dependens*.
 1226. *Cavendishia miconioides*.
 3014. *Satyria warszewiczii*.
 3036. *Cavendishia endresii*.
 3206. *Cavendishia wercklei*.
 3234. *Lateropora ovata*.
 5647. *Cavendishia splachnoides*.
 5651. *Cavendishia bomareoides*.
 5659. *Cavendishia splachnoides*.
 5872. *Cavendishia pubescens*.
 9175. *Cavendishia pubescens*.
 9263. *Cavendishia splendens*.
 9916. *Psammisia hookeriana*.
 9994. *Themistoclesia pendula*.
 11377. *Psammisia urichiana*.
 12874, in part. *Psammisia penduliflora*.
 12874, in part. *Cavendishia cordifolia*.

PITTIER, H.

(In J. D. Smith or Inst. Fis.-Geogr.
 Costa Rica series)

340. *Cavendishia callista*.
 2033, in part. *Cavendishia veraguensis*.
 2033, in part. *Macleania glabra*.
 3102. *Macleania glabra*.
 7546. *Macleania glabra*.
 7547. *Cavendishia veraguensis*.
 10170. *Cavendishia complectens*.
 11206. *Satyria warszewiczii*.
 12147. *Satyria triloba*.
 13047. *Macleania glabra*.
 14030. *Cavendishia quercina*.
 14031. *Cavendishia pterocarpa*.
 16609. *Cavendishia veraguensis*.
 16610. *Cavendishia quereme*.

POEPPIG, E. F.

1350. *Thibaudia biflora*.

POPENOE, W.

927. *Macleania insignis*.
 1017. *Macleania glabra*.
 1170. *Cavendishia cordifolia*.
 1292. *Englerodoxa alata*.
 1315. *Cavendishia hartwegiana*.
 1328. *Cavendishia acuminata*.
 1329. *Macleania poortmanni*.
 1330. *Macleania benthamiana*.
 1340. *Macleania loeseneriana*.

PRINGLE, C. G.

7870. *Macleania compacta*.

PURDIE, W.

103. *Orthaea apophysata*.

PURPUS, C. A.

288. *Macleania insignis*.
6313. *Macleania insignis*.
7342. *Cavendishia chiapensis*.
10410. *Cavendishia crassifolia*.

REKO, B. P.

4027. *Satyria elongata*.
4096. *Cavendishia crassifolia*.

ROSE, J. N.

22378. *Cavendishia acuminata*.
23169. *Cavendishia acuminata*.
23777. *Cavendishia acuminata*.
23914. *Macleania nitida*.

ROWLEE, W. W., and ROWLEE, H. E.

255. *Cavendishia complectens*.

RUSBY, H. H.

2033. *Cavendishia pubescens*.
2034. *Thibaudia boliviensis*.
2035. *Thibaudia macrocalyx*.
2036. *Siphonandra elliptica*.
2037. *Psammisia pauciflora*.
2038. *Psammisia guyanensis*.
2219. *Satyria neglecta*.
2403. *Cavendishia paniculata*.
2632. *Ceratostema mandoni*.
2692. *Rusbya taxifolia*.

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

563. *Cavendishia pubescens*.
567. *Cavendishia cordifolia*.
567A, in part. *Cavendishia cordifolia*.
567A, in part. *Cavendishia miconioides*.
599. *Psammisia lanceolata*.
676. *Cavendishia obtusa*.
750. *Psammisia lehmannii*.
751. *Psammisia lehmannii*.
847. *Cavendishia miconioides*.
865. *Psammisia falcata*.
875. *Psammisia lanceolata*.
939. *Cavendishia pubescens*.
982. *Thibaudia rigidiflora*.

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983. *Thibaudia rigidiflora*.
989. *Cavendishia cordifolia*.
990. *Cavendishia miconioides*.
991. *Cavendishia cordifolia*.
1290A. *Thibaudia rigidiflora*.

SAWADA, M.

P36. *Psammisia coarctata*.
P43. *Thibaudia floribunda*.

SCHAFFNER, J. G.

538. *Macleania insignis*.

SCHLIM, L.

1095. *Cavendishia splendens*.

SCHOMBURGK, RICHARD

35. *Orthaea hispida*.
566, in part. *Thibaudia nutans*.
566, in part. *Notopora schomburgkii*.
567/873. *Thibaudia nutans*.
867. *Notopora schomburgkii*.
873. *Thibaudia nutans*.
924. *Thibaudia nutans*.
974. *Psammisia guyanensis*.
1018. *Cavendishia duidae*.
1040. *Thibaudia formosa*.

SCHULTZE, A.

15. *Cavendishia cordifolia*.
54. *Macleania nitida*.
70. *Psammisia falcata*.

SEEMANN, B. C.

1079. *Macleania pentaptera*.
1172. *Satyria warszewiczii*.

SELER, E.

3107. *Cavendishia guatemalensis*.

SHAFER, J. A.

3641. *Gonocalyx portoricensis*.

SINTENIS, P.

1363. *Gonocalyx portoricensis*.

SMITH, H. H.

1554. *Psammisia elegans*.
1722. *Macleania robusta*.
1964. *Macleania hirtiflora*.
2789. *Macleania robusta*.

SMITH, J. D.

4876. *Cavendishia smithii*.
 6636. *Cavendishia smithii*.
 6637. *Satyria warszewiczii*.

SODIRO, L.

- 92/1. *Macleania rotundifolia*.
 92/2. *Macleania pentaptera*.
 92/2b. *Macleania longiflora*.
 92/2C. *Macleania ecuadorensis*.
 92/2c. *Macleania loeseneriana*.
 92/2D. *Macleania ecuadorensis*.
 92/3. *Macleania loeseneriana*.
 92/3b. *Psammisia graebneriana*.
 92/4. *Psammisia ulbrichiana*.
 92/4b. *Psammisia sodiroi*.
 92/4c. *Englerodoxa alata*.
 92/5. *Psammisia ulbrichiana*.
 92/6. *Psammisia ecuadorensis*.
 92/7. *Psammisia ecuadorensis*.
 92/9. *Psammisia ecuadorensis*.
 92/11. *Macleania nitida*.
 92/11b, in part. *Thibaudia floribunda*.
 92/11b, in part. *Macleania pilgeriana*.
 92/12. *Psammisia sodiroi*.
 92/14. *Psammisia graebneriana*.
 92/15. *Thibaudia floribunda*.
 92/16. *Cavendishia acuminata*.
 92/17. *Cavendishia acuminata*.
 92/18. *Cavendishia acuminata*.
 92/18c, in part. *Cavendishia acuminata*.
 92/18c, in part. *Cavendishia gilgiana*.
 92/18c, in part. *Cavendishia grandifolia*.
 92/19, in part. *Cavendishia engleriana*.
 92/19, in part. *Cavendishia gilgiana*.
 92/20. *Cavendishia venosa*.
 92/35. *Themistoclesia dependens*.
 92/36. *Cavendishia complectens*.

SPRUCE, R.

2465. *Psammisia guyanensis*.
 2704. *Satyria panurensis*.
 2705. *Psammisia guyanensis*.
 4302. *Cavendishia tarapotana*.
 4357. *Psammisia guyanensis*.
 4430. *Thibaudia biflora*.
 4999. *Macleania nitida*.
 5036. *Psammisia guyanensis*.
 5074. *Cavendishia tarapotana*.
 5094. *Englerodoxa calycina*.
 5095. *Cavendishia hartwegiana*.

5550. *Macleania hirtiflora*.
 5842. *Macleania reducta*.
 6088. *Thibaudia biflora*.
 6168. *Macleania cordifolia*.
 6169. *Psammisia ecuadorensis*.

STANDLEY, P. C.

32918. *Cavendishia complectens*.
 32950. *Cavendishia complectens*.
 32954. *Cavendishia smithii*.
 32987. *Cavendishia smithii*.
 32999. *Cavendishia smithii*.
 33002. *Thibaudia costaricensis*.
 33071. *Cavendishia smithii*.
 33088. *Cavendishia smithii*.
 33089. *Cavendishia longiflora*.
 33205. *Cavendishia complectens*.
 33496. *Satyria warszewiczii*.
 33507. *Cavendishia capitulata*.
 33618. *Cavendishia quereme*.
 33906. *Cavendishia complectens*.
 34145. *Cavendishia quercina*.
 34194. *Satyria warszewiczii*.
 34325. *Macleania glabra*.
 34329. *Cavendishia costaricensis*.
 34334. *Cavendishia costaricensis*.
 34467. *Cavendishia costaricensis*.
 34878. *Cavendishia smithii*.
 34975a. *Macleania glabra*.
 35257. *Macleania glabra*.
 35698. *Cavendishia smithii*.
 36130. *Cavendishia quereme*.
 36201. *Satyria warszewiczii*.
 36223. *Cavendishia quereme*.
 36258. *Cavendishia smithii*.
 36360. *Cavendishia capitulata*.
 36395. *Cavendishia capitulata*.
 36552. *Cavendishia quereme*.
 37593. *Cavendishia quereme*.
 37622. *Cavendishia eudresii*.
 37633. *Cavendishia quereme*.
 37657. *Satyria warszewiczii*.
 37664. *Cavendishia capitulata*.
 37807. *Cavendishia quereme*.
 37862. *Cavendishia capitulata*.
 38053. *Thibaudia costaricensis*.
 38072. *Thibaudia costaricensis*.
 38108. *Satyria warszewiczii*.
 38121. *Cavendishia complectens*.
 38134. *Cavendishia complectens*.
 38211. *Psammisia ramiflora*.
 38508. *Cavendishia melastomoides*.
 38601. *Satyria warszewiczii*.

38631. *Cavendishia smithii*.
 38741. *Cavendishia melastomoides*.
 38853. *Cavendishia smithii*.
 39162. *Cavendishia complectens*.
 39275. *Psammisia ramiflora*.
 39375. *Cavendishia capitulata*.
 39418. *Cavendishia capitulata*.
 39469. *Cavendishia costaricensis*.
 39538. *Cavendishia capitulata*.
 39581. *Cavendishia capitulata*.
 39634. *Cavendishia capitulata*.
 39814. *Cavendishia complectens*.
 39832. *Cavendishia quereme*.
 39852. *Cavendishia capitulata*.
 41647. *Satyria warszewiczii*.
 42070. *Satyria warszewiczii*.
 42190. *Cavendishia costaricensis*.
 42205. *Cavendishia quercina*.
 42286. *Satyria warszewiczii*.
 42287. *Cavendishia smithii*.
 42325. *Macleania glabra*.
 42578. *Cavendishia quercina*.
 42650. *Cavendishia costaricensis*.
 42657. *Macleania glabra*.
 42677. *Cavendishia quercina*.
 42683. *Macleania glabra*.
 42722. *Macleania glabra*.
 42772. *Cavendishia quercina*.
 42792. *Cavendishia quercina*.
 42978. *Satyria warszewiczii*.
 43048. *Macleania glabra*.

STANDLEY, P. C., and TORRES, R.

47431. *Satyria warszewiczii*.
 47623. *Cavendishia capitulata*.
 50883. *Macleania ovata*.
 51279. *Cavendishia bullata*.
 51292. *Thibaudia costaricensis*.
 51376. *Thibaudia costaricensis*.
 51400. *Cavendishia quereme*.
 51738. *Cavendishia complectens*.
 51772. *Cavendishia complectens*.

STANDLEY, P. C., and VALERIO, J.

43440. *Satyria warszewiczii*.
 43720. *Macleania glabra*.
 43907. *Macleania glabra*.
 44005. *Macleania glabra*.
 44022. *Macleania glabra*.
 44734. *Cavendishia capitulata*.
 44822. *Cavendishia capitulata*.
 45381. *Cavendishia capitulata*.
 45434. *Cavendishia capitulata*.

45623. *Cavendishia capitulata*.
 46262. *Satyria warszewiczii*.
 46948. *Satyria elongata*.
 47120. *Satyria warszewiczii*.
 48023. *Cavendishia quercina*.
 48122. *Cavendishia quercina*.
 48148. *Satyria warszewiczii*.
 49037. *Satyria warszewiczii*.
 49091. *Cavendishia smithii*.
 49837. *Cavendishia pterocarpa*.
 50189. *Cavendishia costaricensis*.
 50266. *Satyria warszewiczii*.
 50415. *Cavendishia costaricensis*.
 50648. *Satyria warszewiczii*.
 50752. *Cavendishia costaricensis*.
 50822. *Cavendishia pterocarpa*.
 51589. *Cavendishia costaricensis*.
 51919. *Cavendishia quereme*.
 51928. *Cavendishia complectens*.
 52038. *Cavendishia costaricensis*.
 52276. *Cavendishia costaricensis*.
 52311. *Cavendishia costaricensis*.
 52342. *Cavendishia costaricensis*.

STEINBACH, J.

8860. *Cavendishia beckmanniana*.
 9023. *Cavendishia pubescens*.
 9529. *Siphonandra elliptica*.

STEVENS, F. L.

75. *Cavendishia costaricensis*.

STOBK, H. E.

363. *Cavendishia capitulata*.
 390. *Cavendishia costaricensis*.
 429. *Cavendishia endresii*.
 1050. *Satyria warszewiczii*.
 1111. *Satyria warszewiczii*.
 1115. *Cavendishia costaricensis*.
 1161. *Cavendishia smithii*.
 1264. *Cavendishia smithii*.
 1313. *Psammisia ramiflora*.
 1316. *Cavendishia costaricensis*.
 1789. *Cavendishia bullata*.
 2064. *Satyria warszewiczii*.
 2070. *Macleania glabra*.
 2567. *Cavendishia costaricensis*.
 2569. *Cavendishia melastomoides*.

STUEBEL, A.

- 120b. *Cavendishia cordifolia*.
 149a. *Cavendishia obtusa*.

- 150b. *Macleania nitida*.
 164a. *Thibaudia floribunda*.
 271a. *Ceratostema rigidum*.
 317a. *Cavendishia quereme*.
 340a. *Cavendishia quereme*.

TATE, G. H. II.

200. *Thibaudia macrocalyx*.
 214. *Themistoclesia pendula*.
 215. *Themistoclesia pendula*.
 284. *Thibaudia nutans*.
 312. *Ceratostema mandoni*.
 370. *Ceratostema mandoni*.
 371. *Siphonandra elliptica*.
 372. *Thibaudia axillaris*.
 402. *Thibaudia nutans*.
 409. *Thibaudia glandulifera*.
 457. *Thibaudia glandulifera*.
 525. *Thibaudia glandulifera*.
 602. *Thibaudia truncata*.
 603. *Mycerinus sclerophyllus*.
 629. *Cavendishia hartwegiana*.
 670. *Cavendishia tarapotana*.
 694. *Thibaudia glandulifera*.
 703. *Cavendishia duidae*.
 729. *Thibaudia formosa*.
 862. *Siphonandra elliptica*.
 903. *Thibaudia formosa*.
 1048 (Venezuela). *Cavendishia duidae*.
 1048 (Bolivia). *Cavendishia paniculata*.

TESSMANN, G.

3954. *Psammisia guyanensis*.
 4662. *Satyria panurensis*.

THURN, E. IM

- 49, in part. *Psammisia guyanensis*.
 49, in part. *Thibaudia roraimae*.
 56. *Thibaudia nutans*.
 109. *Notopora schomburgkii*.

TONDUZ, A.

(Distributed in Inst. Fis.-Geogr. Costa Rica series)

1881. *Satyria warszewiczii*.
 7391. *Cavendishia longiflora*.
 7404. *Cavendishia complectens*.
 7462. *Cavendishia smithii*.
 10781. *Cavendishia smithii*.

12232. *Satyria warszewiczii*.
 12251. *Macleania glabra*.
 12351. *Cavendishia smithii*.
 12438. *Satyria warszewiczii*.
 12657. *Cavendishia smithii*.
 13371. *Satyria elongata*.
 17836. *Satyria warszewiczii*.

TORO, R. A.

191. *Cavendishia pubescens*.
 468. *Cavendishia guatapeensis*.
 1131. *Satyria torol*.
 1172. *Cavendishia bomareoides*.

TRACEY, MRS. I. A.

14. *Cavendishia cordifolia*.
 20. *Psammisia graebneriana*.
 269. *Cavendishia obtusa*.
 270. *Psammisia lehmannii*.
 335. *Cavendishia rigidifolia*.
 336. *Cavendishia pubescens*.

TRIANA, J.

36. *Macleania nitida*.
 37. *Psammisia grandiflora*.
 253. *Satyria breviflora*.
 345. *Psammisia penduliflora*.
 2668. *Cavendishia pubescens*.
 2669. *Psammisia macrophylla*.
 2670. *Psammisia graebneriana*.
 2671. *Cavendishia quereme*.
 2672. *Macleania pubiflora*.
 2674. *Psammisia macrophylla*.
 2675. *Cavendishia oligantha*.
 2677. *Cavendishia cordifolia*.
 2681. *Psammisia ferruginea*.
 2685. *Psammisia falcata*.
 2686. *Psammisia falcata*.
 2689. *Thibaudia pachyantha*.
 2694. *Satyria grandifolia*.
 2699. *Cavendishia compacta*.
 2703. *Macleania nitida*.
 2708. *Macleania macrantha*.
 2709. *Cavendishia hispida*.
 2712. *Macleania pentaptera*.
 2716. *Anthopterus wardii*.
 2718. *Anthopterus cuneatus*.
 4333. *Macleania nitida*.
 4333/19. *Psammisia lanceolata*.

TUERCKHEIM, H. VON

64. *Cavendishia laurifolia*.
 941. *Cavendishia callista*.

1190. *Macleania insignis*.
 1332. *Macleania linearifolia*.
 4119. *Cavendishia callista*.
 7633. *Satyria elongata*.
 7916. *Cavendishia callista*.
 II. 1626. *Cavendishia laurifolia*.
 II. 1661. *Macleania insignis*.
 II. 1795. *Cavendishia callista*.
 II. 2101. *Satyria melantha*.
 II. 2153. *Macleania insignis*.

ULE, E.

- 52p. *Semiramisia weberbaueri*.
 6340. *Psammisia guyanensis*.
 6672. *Satyria panurensis*.
 6789. *Cavendishia ulei*.
 6790. *Thibaudia biflora*.
 8669. *Notopora schomburgkii*.
 8714. *Psammisia urichiana*.
 8715. *Thibaudia roraimae*.
 8719. *Thibaudia nutans*.
 br. 40. *Thibaudia nutans*.

WEBERBAUER, A.

594. *Cavendishia pubescens*.
 636. *Cavendishia beckmanniana*.
 684. *Orthaea weberbaueri*.
 740. *Siphonandra elliptica*.
 742. *Ceratostema graebnerianum*.
 742a. *Ceratostema mandoni*.
 889. *Ceratostema mandoni*.
 1081. *Cavendishia peruviana*.
 1081a. *Cavendishia pubescens* var. *microphylla*.
 1159. *Psammisia coarctata*.
 1770. *Cavendishia bracteata*.
 1972. *Cavendishia punctatifolia*.
 2055. *Thibaudia engleriana*.
 2071. *Thibaudia apophysata*.
 2075. *Ceratostema buxifolium*.
 2151. *Psammisia coarctata*.
 2202. *Ceratostema grandiflorum*.
 2436. *Thibaudia ovata*.
 2505. *Ceratostema coccineum*.
 3374. *Ceratostema harmsianum*.
 3510. *Psammisia coarctata*.
 3518. *Cavendishia urbaniana*.
 3542. *Thibaudia harmsiana*.
 4182. *Macleania nitida*.
 4339. *Thibaudia angustifolia*.
 4374. *Thibaudia tomentosa*.
 4449. *Thibaudia urbaniana*.

4455. *Semiramisia weberbaueri*.
 4739. *Cavendishia weberbaueri*.
 4753. *Orthaea engleriana*.
 4974. *Ceratostema microphyllum*.
 5009. *Cavendishia paniculata*.
 5861. *Siphonandra elliptica*.
 6041. *Macleania nitida*.
 6120. *Macleania farinosa*.
 6122. *Cavendishia ulei*.
 6644. *Ceratostema spectabile*.
 6704. *Macleania benthamiana*.
 6925. *Orthaea pinnatinervia*.
 6928. *Ceratostema microphyllum*.
 6929. *Siphonandra elliptica*.
 7154. *Thibaudia obovata*.
 7532. *Thibaudia laxa*.
 7790. *Ceratostema microphyllum*.
 7814. *Orthaea pinnatinervia*.
 7816. *Cavendishia weberbaueri*.

WERCKLÉ, C.

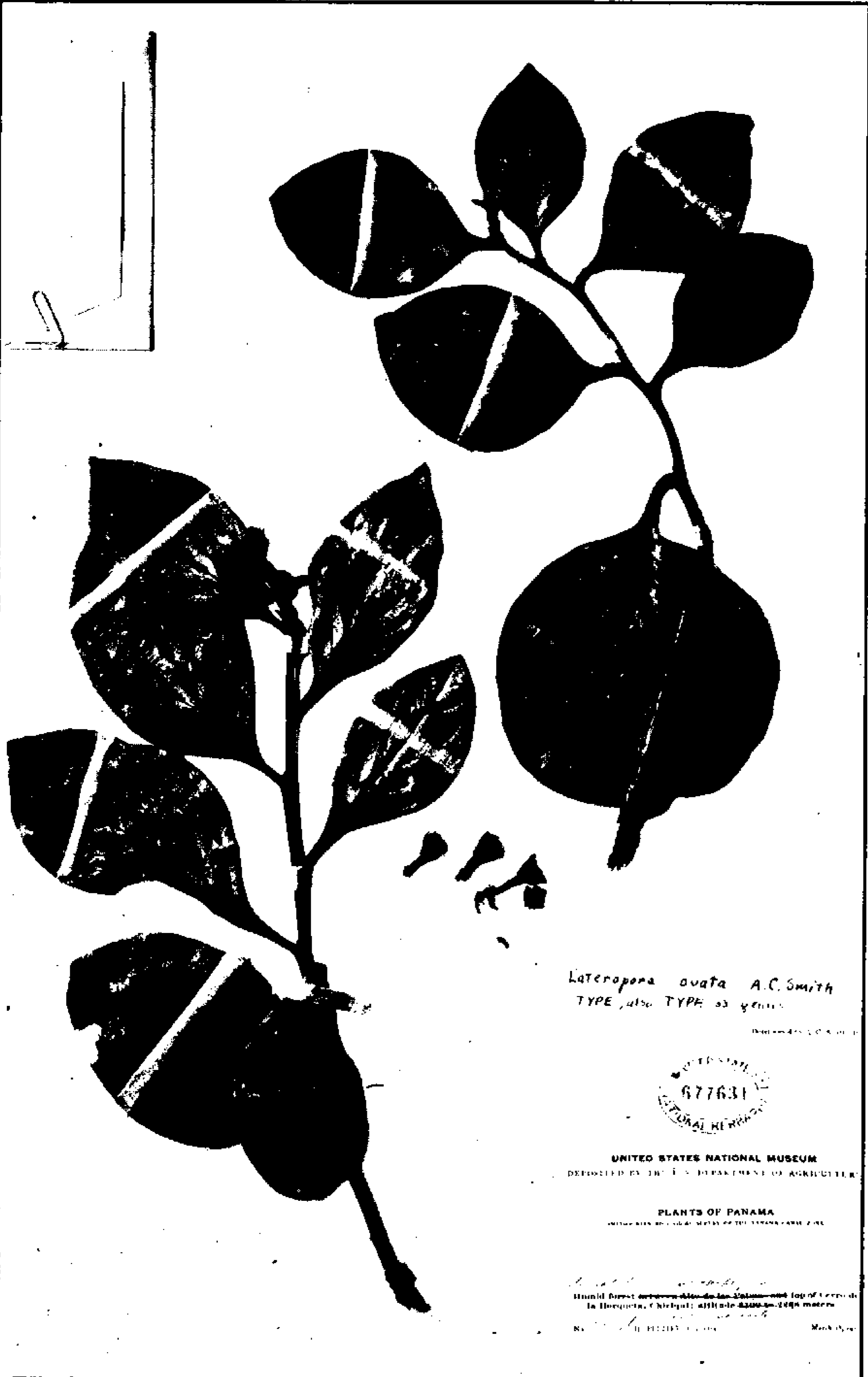
19. *Cavendishia endresii*.
 20. *Thibaudia costaricensis*.
 26. *Psammisia ramiflora*.
 29. *Cavendishia melastomoides*.
 50. *Cavendishia endresii*.
 52. *Thibaudia costaricensis*.
 53. *Cavendishia wercklei*.
 54. *Cavendishia costaricensis*.
 11301. *Satyria warszewiczii*.
 11565. *Cavendishia capitulata*.
 11567. *Cavendishia quereme*.
 11597. *Cavendishia smithii*.
 11598. *Cavendishia complectens*.
 11605. *Satyria warszewiczii*.
 11606. *Psammisia ramiflora*.
 16588. *Macleania glabra*.
 16650. *Macleania ovata*.
 16684. *Cavendishia smithii*.
 17413. *Cavendishia smithii*.

WILLIAMS, L.

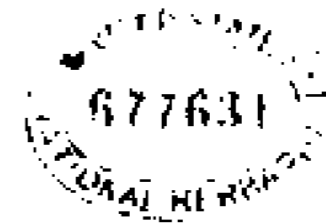
934. *Satyria panurensis*.
 1108. *Satyria panurensis*.
 7343. *Psammisia guyanensis*.
 7597. *Psammisia ulbrichiana*.
 7712. *Psammisia guyanensis*.

WILLIAMS, R. S.

1581. *Thibaudia boliviensis*.
 2487. *Psammisia elliptica*.



Lateropora ovata A.C. Smith
 TYPE, also TYPE 33 years



UNITED STATES NATIONAL MUSEUM
 DEPARTMENT OF THE INTERIOR, BUREAU OF PLANT INDUSTRY

PLANTS OF PANAMA
 COLLECTED BY A. C. SMITH AND OTHERS

Collected by A. C. Smith, 1931
 Humid forest, between Alto de las Animas and top of Cerro de
 la Horqueta, Chiriquí; altitude 2200-2400 meters
 No. 877631
 Mark 15/31

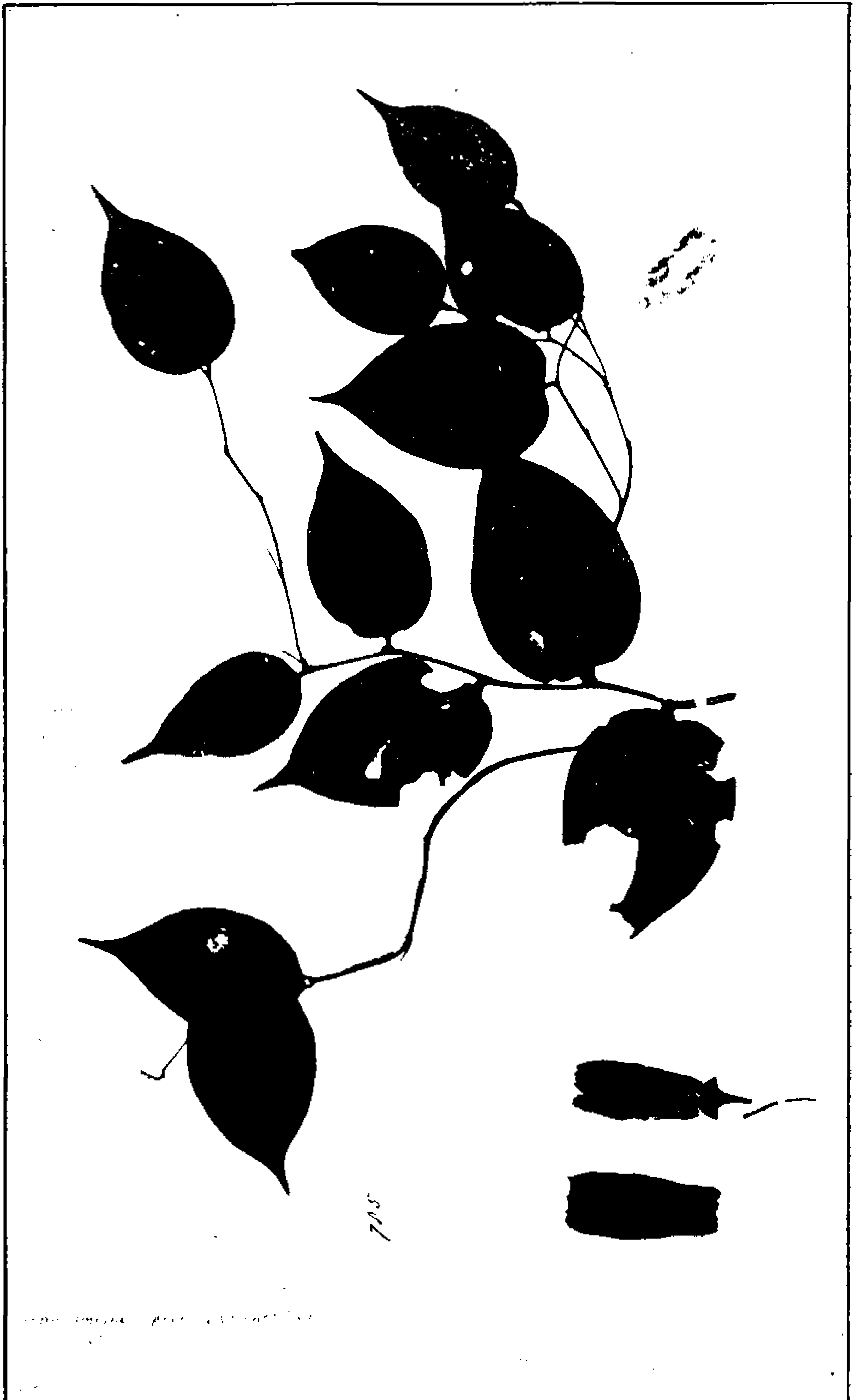
LATEROPORA OVATA A. C. SMITH



CERATOSTEMA LOBBILII A. C. SMITH



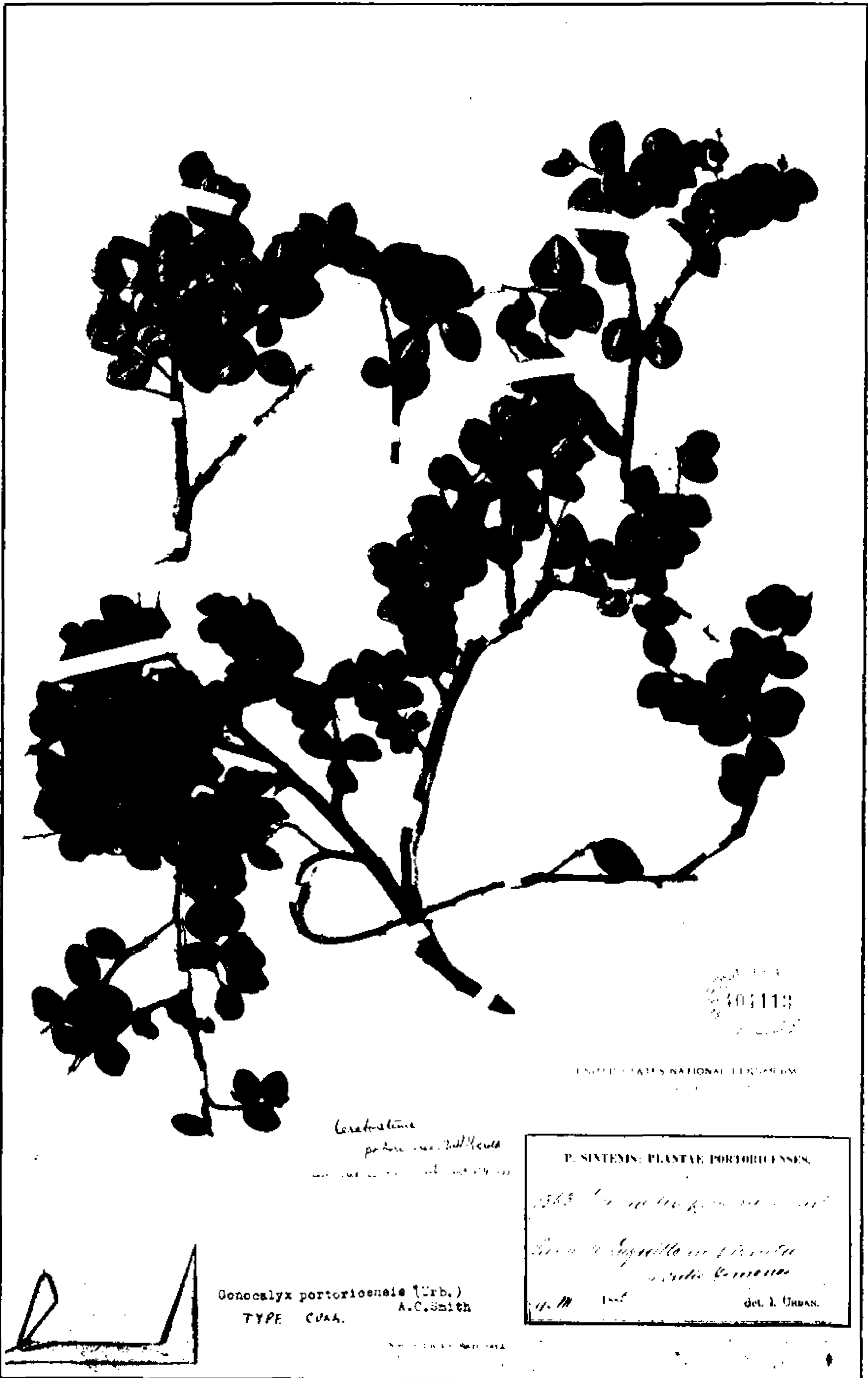
CERATOSTEMA SPECTABILE RUSBY



SEMIRAMISIA SPECIOSA (BENTH.) KLOTZSCH



ENGLERODOXA CALYCINA (BENTH. & HOOK.) A. C. SMITH



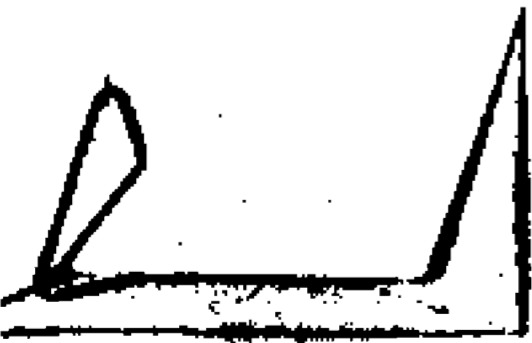
30113

UNITED STATES NATIONAL HERBARIUM

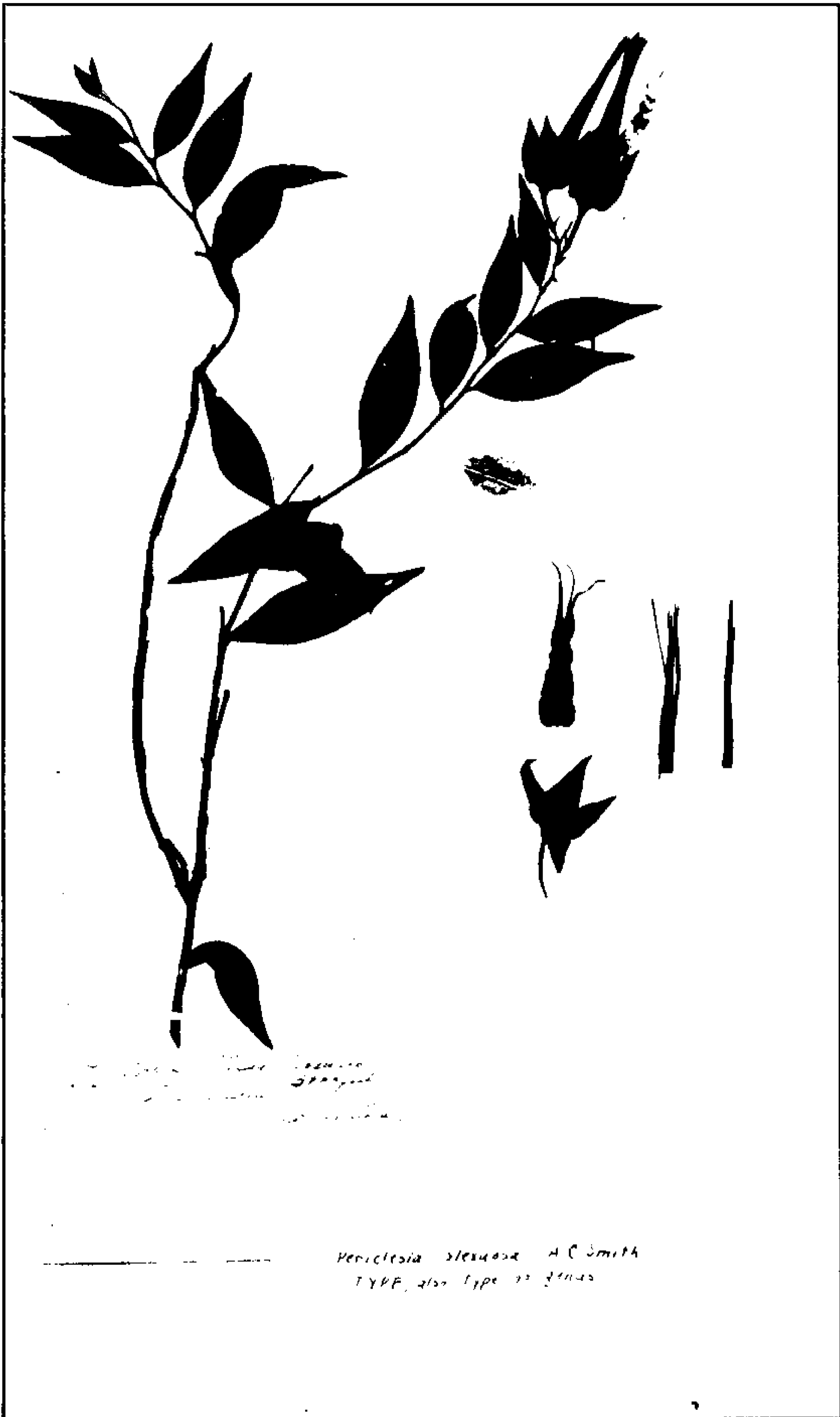
Cerastium
portoricensis Urban
 A.C. Smith

D. SIXTENS: PLANTAE PORTORICENSIS
Gonocalyx portoricensis Urban
 A.C. Smith
 1911
 det. J. Urban.

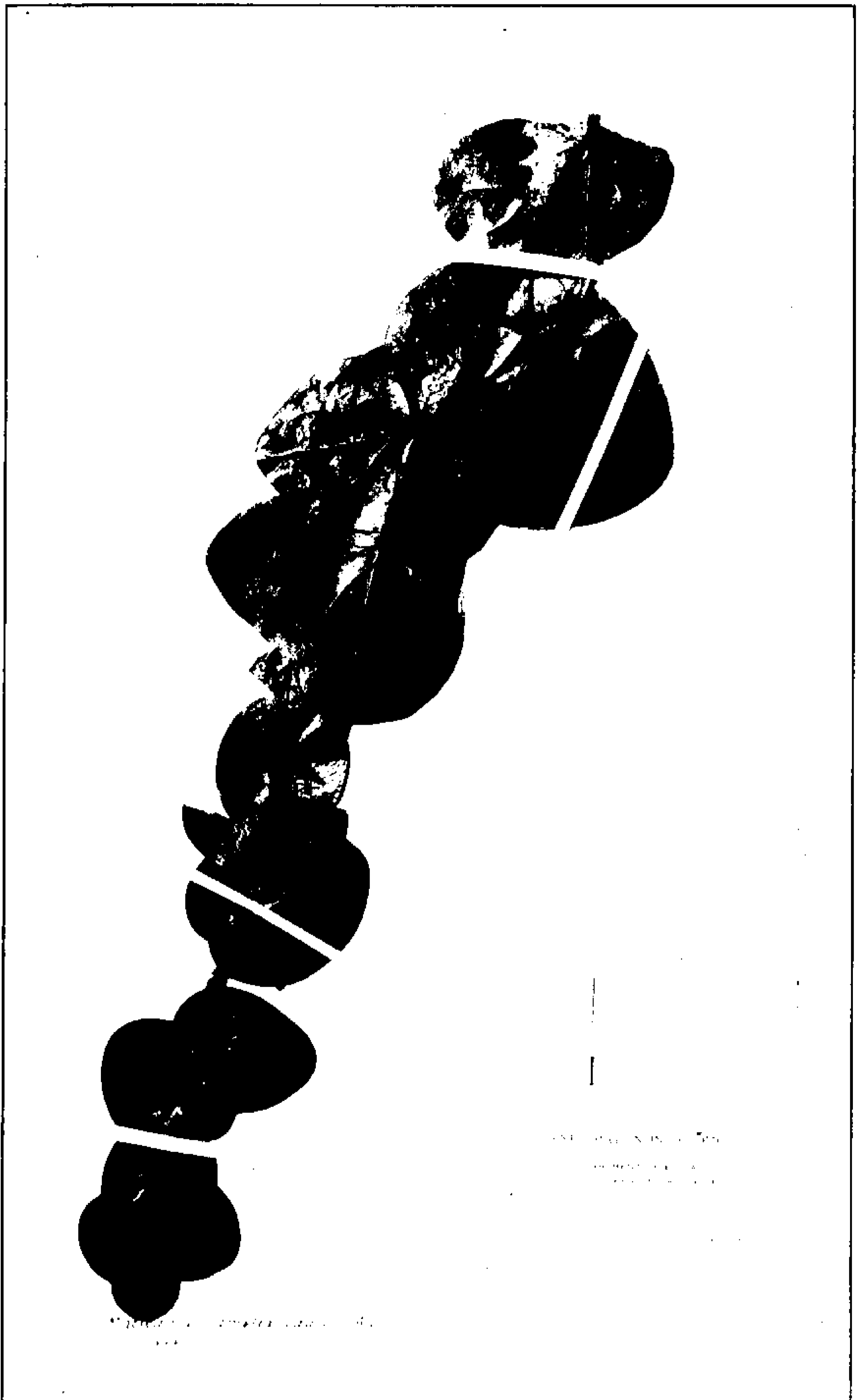
Gonocalyx portoricensis (Urban)
 TYPE COA. A.C. Smith



GONOCALYX PORTORICENSIS (URBAN) A. C. SMITH



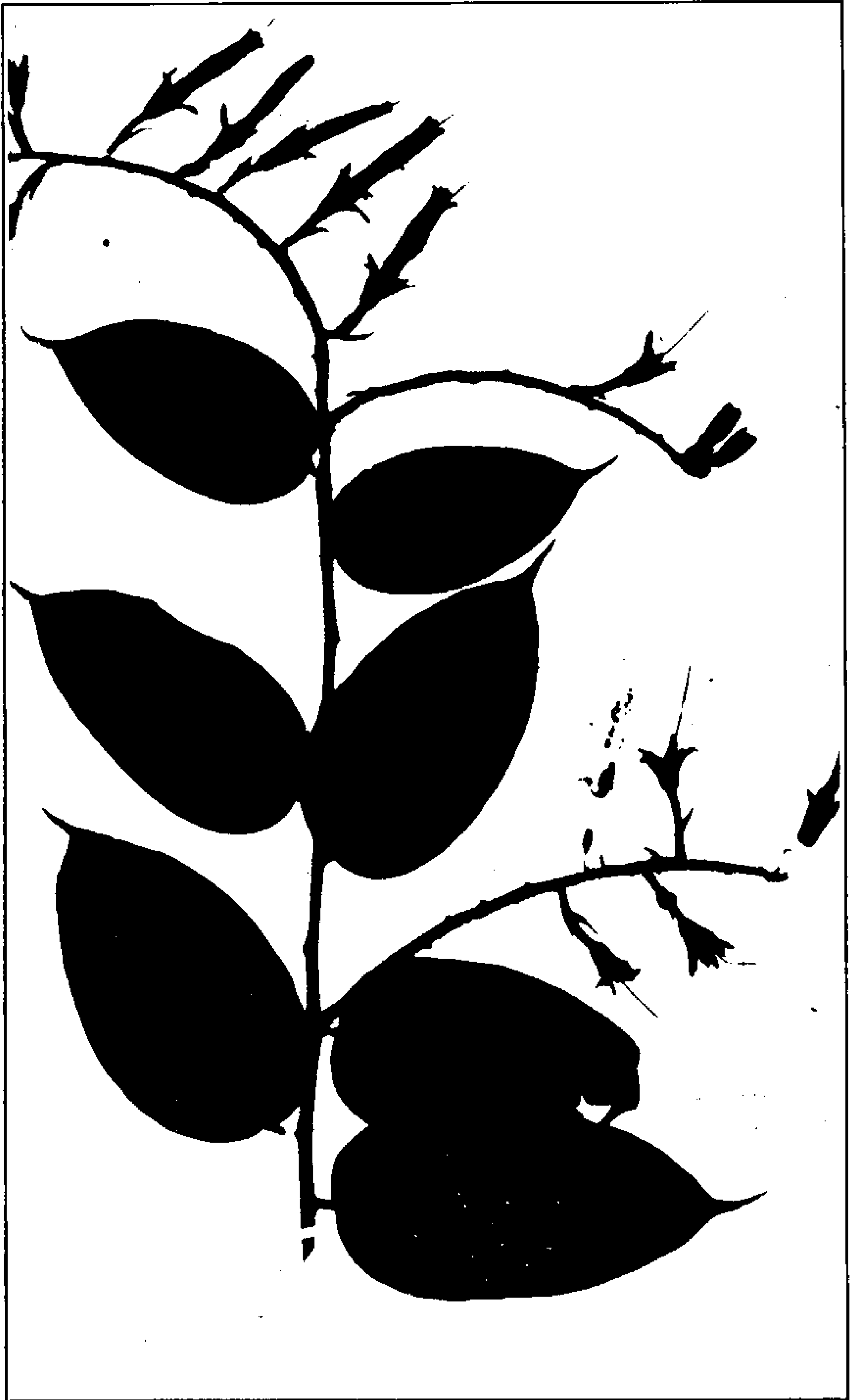
PERICLESIA FLEXUOSA A. C. SMITH



MACLEANIA AMPLEXICAULIS A. C. SMITH



PSAMMISIA GLOBOSA A. C. SMITH



PSAMMISIA FERRUGINEA A. C. SMITH

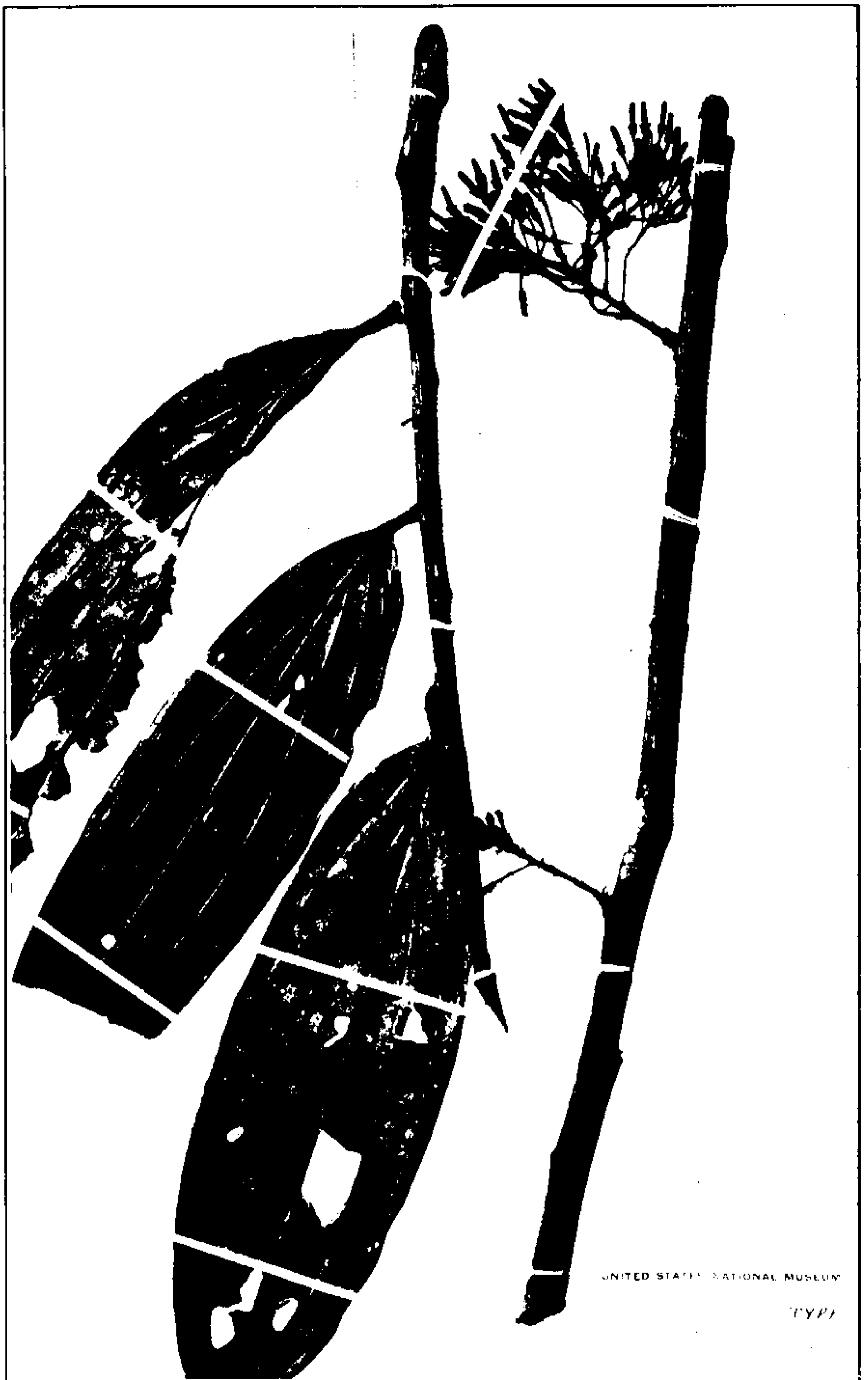


HERBARIUM LEHMANNIANUM COLOMBIANUM.

N. A. Smith

Anthopterus bracteatus

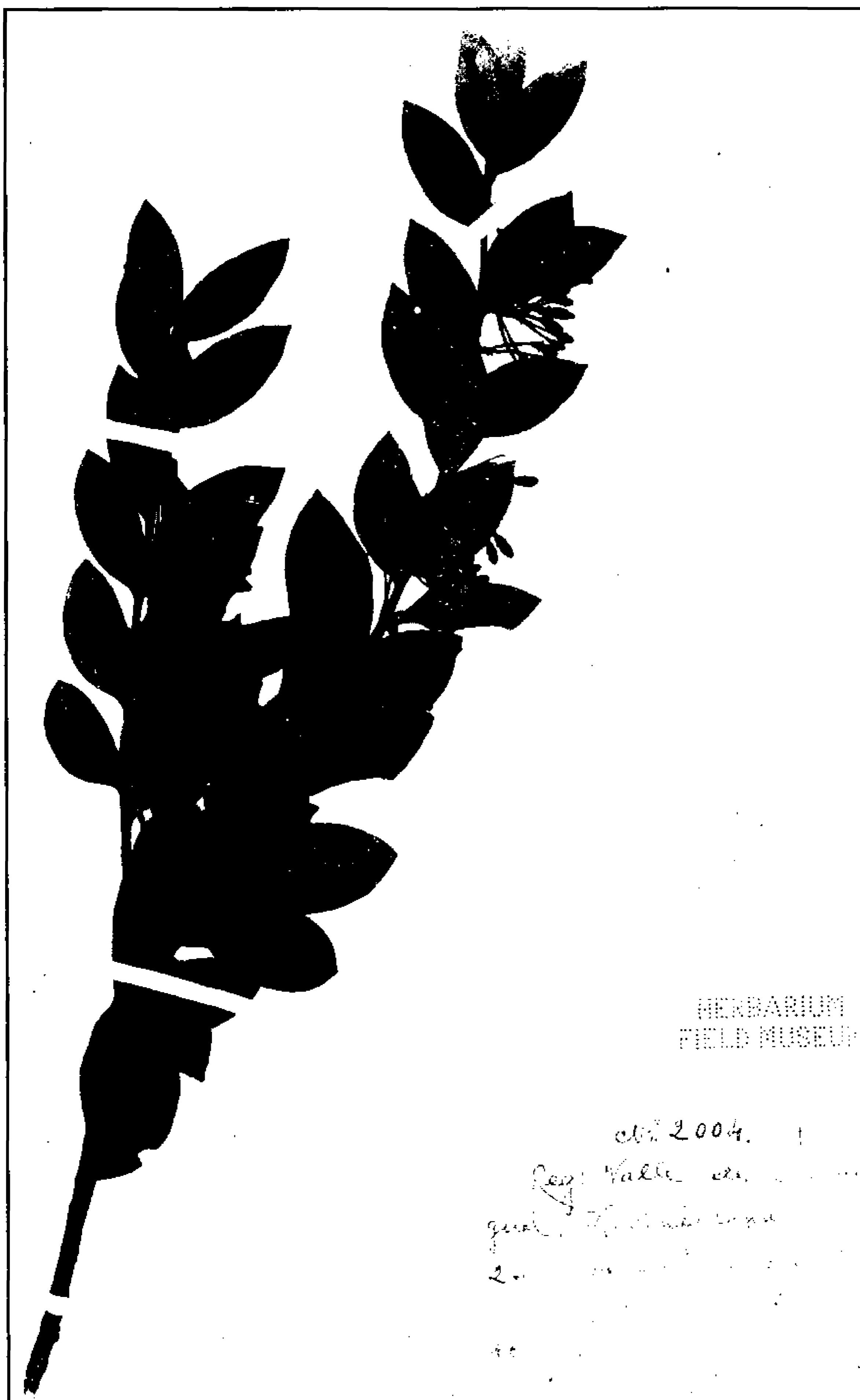
ANTHOPTERUS BRACTEATUS A. C. SMITH



UNITED STATES NATIONAL MUSEUM

TYPE

THIBAUDIA ARCHERI A. C. SMITH



HERBARIUM
FIELD MUSEUM

Oct. 2004.
Gen: Valle
Thibaudia regularis
2004

THIBAUDIA REGULARIS A. C. SMITH



UNITED STATES NATIONAL MUSEUM

EXPLORATION IN COLOMBIA
EASTERN COLOMBIA

Tree 10-15 ft; branches dependent.
Corolla red. Fruits.

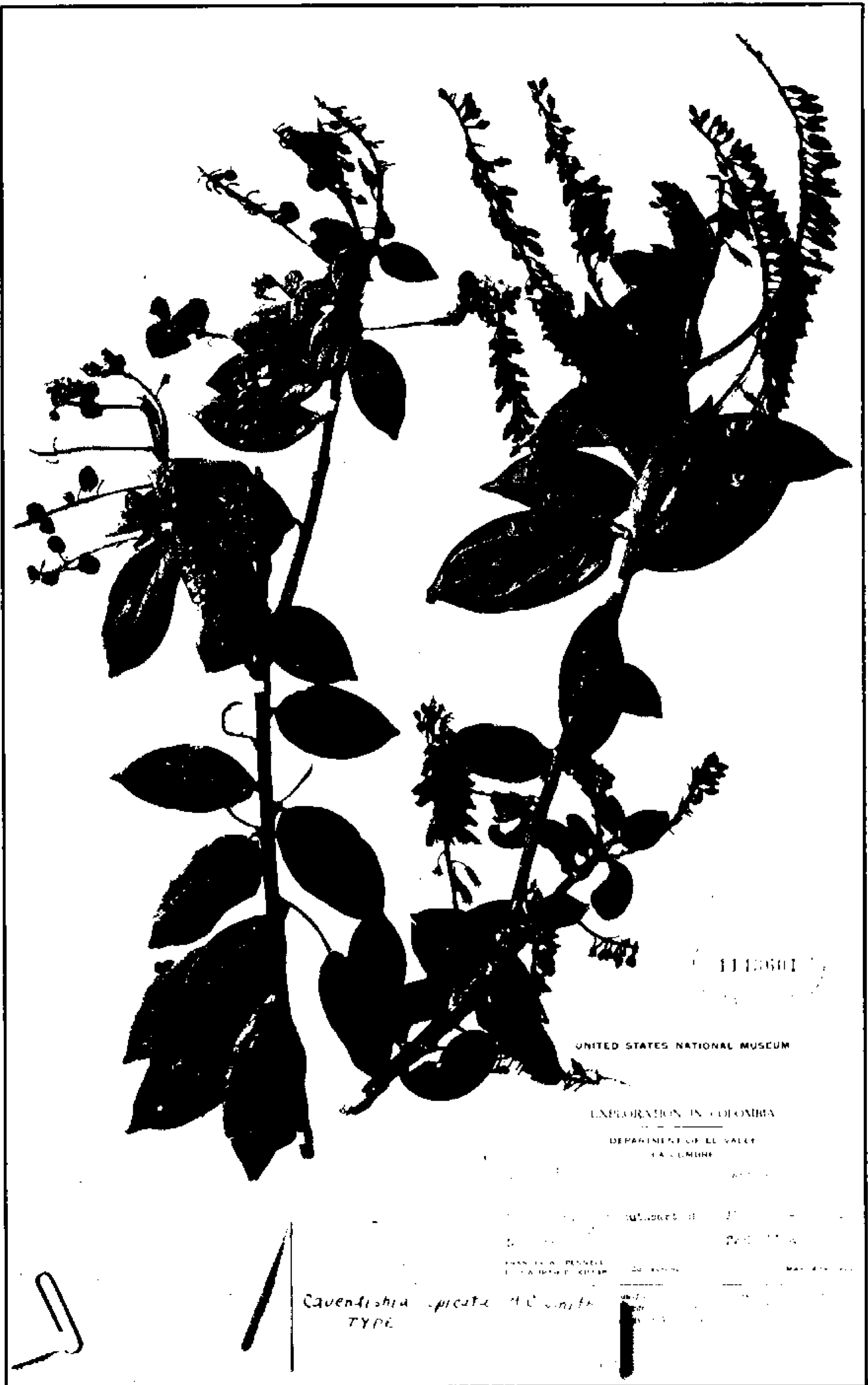
Dept. Santander, Mountains east of San Vito; alt. 2000-2500
meters.

No. 1794 E. F. Kuhn, } Collectors
Alonso C. Smith } Dec. 21, 1928

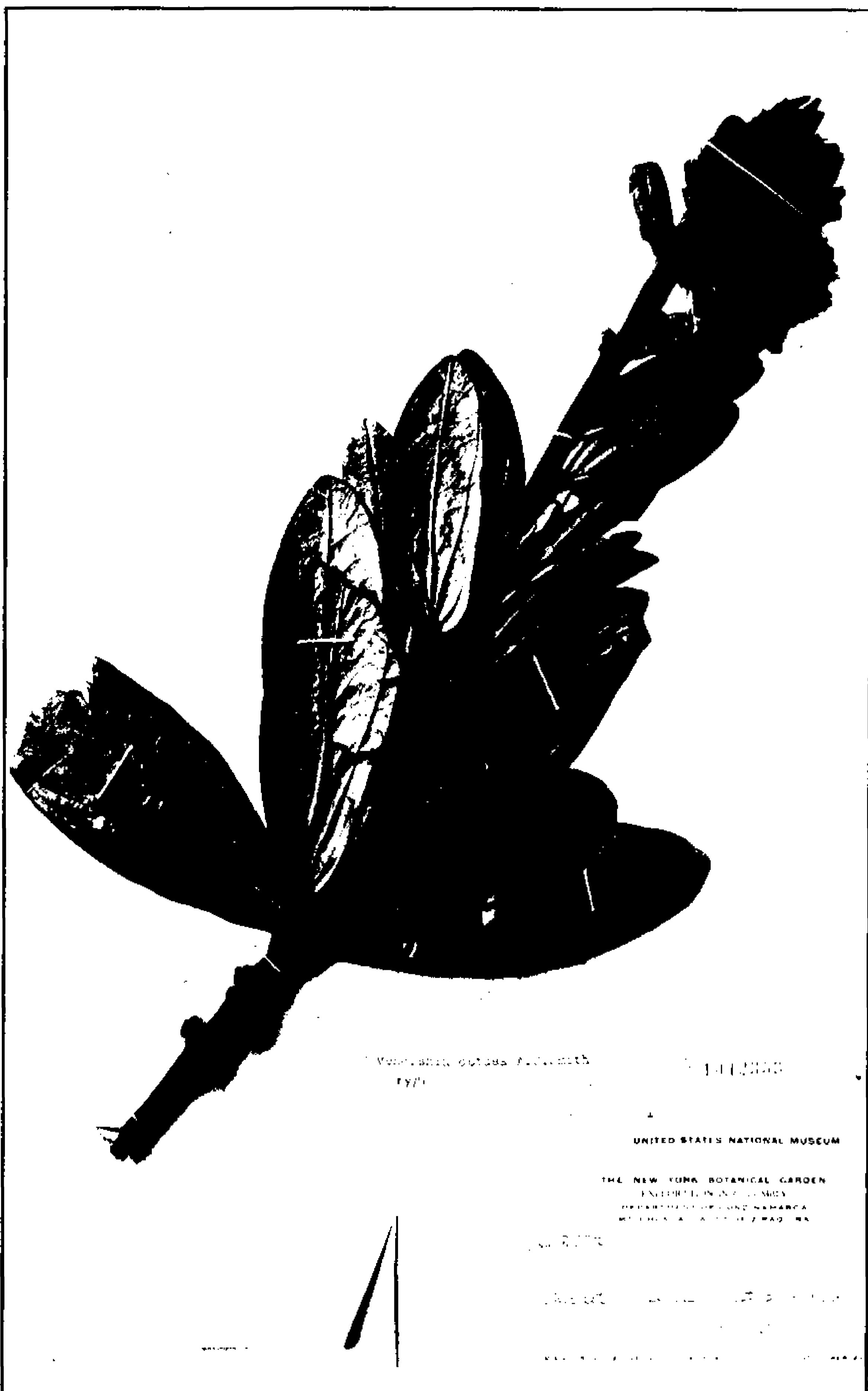
Collected under the auspices of the New York Botanical Garden,
its Herbarium, Harvard University, United States
National Museum, and the Field Columbian

Themistoclesia vegasana A. C. Smith
TYPE

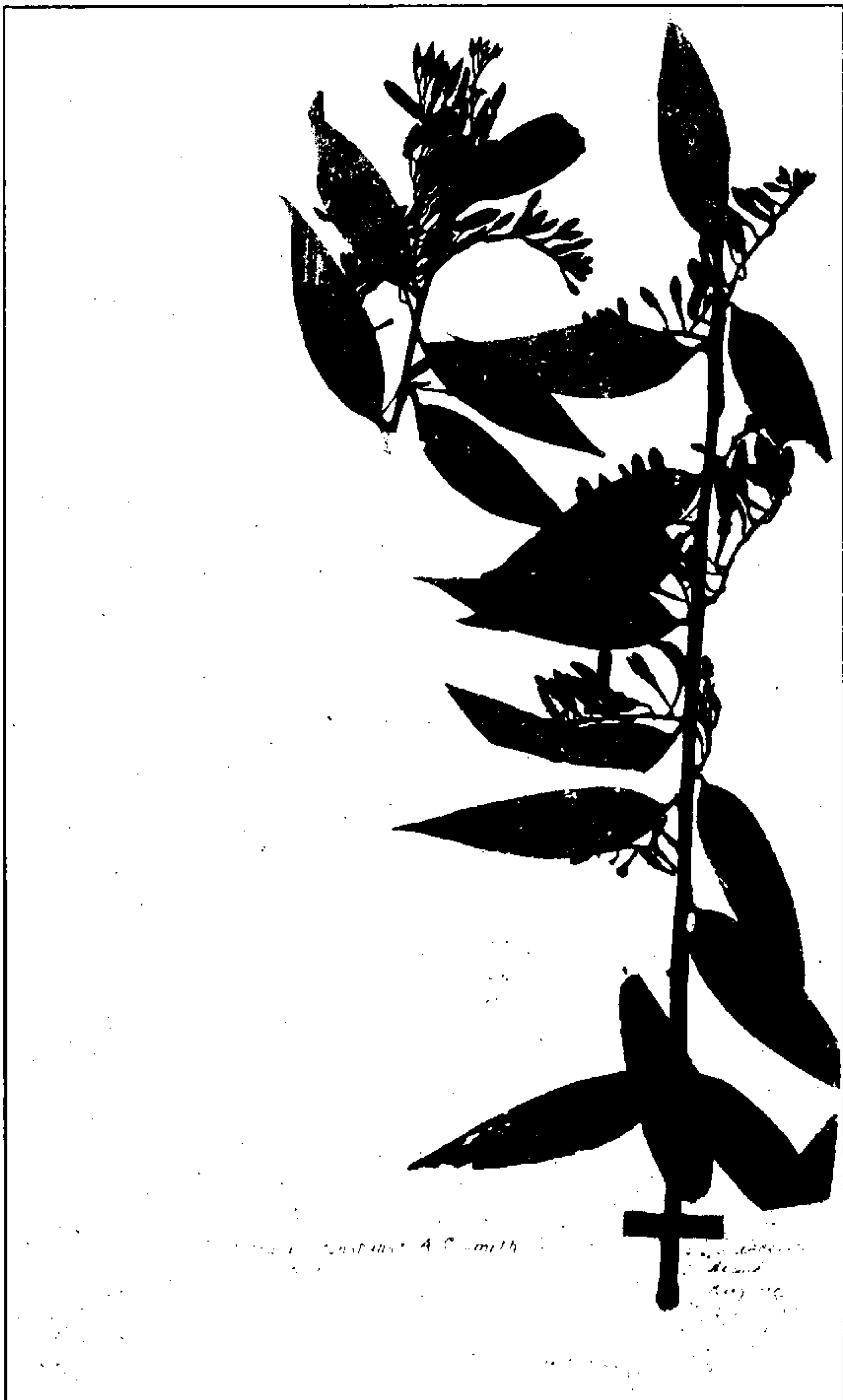
THEMISTOCLESIA VEGASANA A. C. SMITH



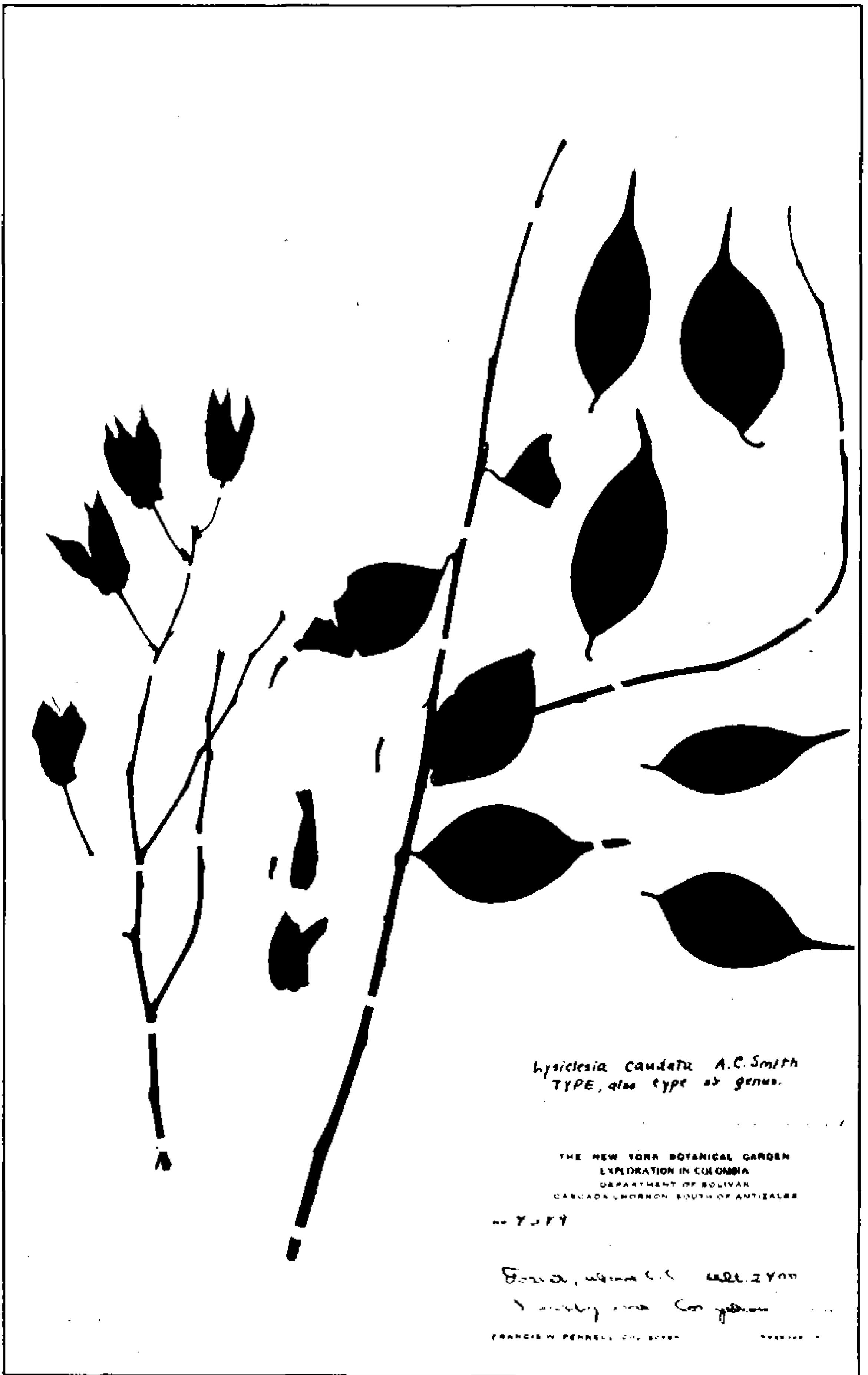
CAVENDISHIA SPICATA A. C. SMITH



CAVENDISHIA OBTUSA A. C. SMITH



ORTHAEA CONSTANS A. C. SMITH



LYSICLESIA CAUDATA A. C. SMITH



SATYRIA MINUTIFLORA A. C. SMITH