

NEW SPECIES OF PLANTS OF THE LADEW

EXPEDITION TO BOLIVIA. (a)

Henry Hurd Rusby

In 1926, through the generosity of Mr. Harvey S. Ladew, the American Museum of Natural History was able to send a small biological expedition to Bolivia. The territory to be explored was the Amazonian slopes of the Cordillera Real, the principal objectives being the assemblage of representative collections of the mammals, birds, and plants of the region. The botanical collections were made by Mr. G. H. H. Tate and included 1275 numbers, of which the following are new to science. The types of these new species are deposited in the herbarium of The New York Botanical Garden. Excellent collector's notes accompany all specimens, and it is to be regretted that want of space forbids the publication of the entire list, as well as Mr. Tate's interesting sketch of the journey.

Mr. Tate has compiled the following table showing the geographical distribution of the collections:

First trip to Yungas, Bolivia

La Cumbre	15,000 ft.	1-48
Alaska Mine	13,500 ft.	49-102
Pongo	12,000 ft.	103-273

(numerous mosses also, but unnumbered).

Mapiri-Tipuani trip, Bolivia

Altiplano between La Paz and Sorata	14,000 - 15,000 ft.	998-1003
Sorata	8,000 ft.	767-779
Cocopunco	10,000 ft.	274-385
Road from Cocopunco to Pararani (Pararani about 5,000 ft.)		386-392
Road from Pararani to Mapiri		393-399
Mapiri	2,000 ft.	400-498
Rio Chimate	1,900 ft.	499-552, 593-613
Guanay	1,800 ft.	553-592
Road from Guanay to Carahuarani		1213-1215
Chuquini		1115-1195
Ticunhuaya	4,800 ft.	1051-1114
Simacu	5,800 ft.	No numbers
La Joya	5,900 ft.	1004-1050
Okara	7,500 ft.	890-997

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Road from Okara to Ancoma		836-889
Tipuani trail, from top of divide, 17,000 ft., down to Sorata		780-835
Second trip to Yungas, Bolivia		
Pitiguaya		721-766
Nequejahuira	8,000 ft.	614-689
Rio Aceramarca	11,500 ft.	690-720
Peru		
Arequipa	7,550 ft.	1196-1212

COMMELINA REFLEXA Rusby, sp. nov. Caules vix ramosi erecti crassi glabri vel glabrati; laminae quam vaginis 3-4-plo longiores acuminatae et acutae; spatha valde reflexa ad angulam 90° a pedunculo; ramulus floriferus spatham aequans densiflorus; capsula ovalis 5 mm. longa 3 mm. diametro.

Nearly glabrous, or the upper stem portion more or less puberulent; stems stout, erect, sparsely branched, the branches erect; leaves few; sheaths a fourth to a third as long as the blades, thick and rigid, about 10-ribbed; leaf-blade to 12 cm. by 2.5 cm., lanceolate, long-acuminate and acute, the upper ones erect, the lower spreading; peduncles elongated, stout, erect; spathe turned at a right angle to its peduncle, in fruit 3.5 by 2.5 cm. in the folded state, scarcely acuminate, acute or obtusish, about 15-nerved, the nerves slender, sharp, connected by numerous fine straight veins; lower branch of the cyme about 13 mm. long, naked, rigid, the floriferous branch about two-thirds of the length of the spathe, in its incurved position, but about equaling it when straightened, densely flowered, the flowers not seen; pods 5 mm. long, 3 mm. broad, oval.

First collected by O. E. White at Pongo de Quime, Bolivia, alt. 11,500 ft., in July, 1921 (Mulford No. 172). "Growing in full sunshine, about 12 inches high, the flowers blue." Collected by G. H. H. Tate on the road from Okara to Ancoma, alt. 11,000 ft., April 29, 1926 (No. 847).

COSTUS LONGIFOLIUS Rusby, sp. nov. Caules debiles internodiis 2-3 cm. longis 6-7 mm. crassis; vaginae apice breviter pilosae et ciliatae; petioli breves torti pubescentes; laminae lanceolatae utrinque acuminatae acutae tenues; spica late ovoidea squamis patulis late ovatis acutis crassis; calyx infundibuliformis dentibus late triangularibus mucronatis.

Stem rather slender, weak, its height unknown; internodes 2 or 3 cm. long, 6 or 7 mm. thick, the sheaths light brown, the summit slightly oblique, sparsely short-pilose and short-ciliate; petioles 1 cm. long, light brown, twisted, pubescent, nerved; blades to 25 by 4 cm., lanceolate to oblanceolate, acuminate at both ends, acute, very thin, bright

green, glabrous above, softly pubescent beneath, but becoming nearly glabrous with age; spike broadly ovoid, 8 cm. long by 9 cm. broad (in my specimen), the scales spreading, to 5 by 2.5 cm., ovate, with broad base and acute summit, very thick and coriaceous, finely puberulent; bractlets 2.5 cm. long, lanceolate, retuse at the summit, strongly complanate, about half enclosing the fruit, many-nerved; calyx 1.5 cm. long, 8 mm. broad at the mouth (as pressed), many-nerved, regularly infundibular, the teeth 3 mm. long, broadly triangular, tipped by a dark-colored mucro; summit of ovary and base of calyx sparsely short-pilose; fruit obovoid, 1.5 by 1 cm.; seeds 3.5 mm. long, 2 mm. broad, obovoid, truncate, black, tuberculate, mostly enclosed in the thin, white, hyaline aril, which is longer than the seed on one side.

Collected by G. H. H. Tate at Mapiiri, Bolivia, alt. 2,000 ft., March 30 to April 6, 1926 (No. 442).

COSTUS TATEI Rusby, sp. nov. Caulis debilis puberulus; ligula auriculata pilosa; lamina obovata mucronulata ciliata; spica ellipsoidea squamis adpressis subrotundis; calyx 4 mm. longus campanulatus dentibus brevissimis.

Pubescent or puberulent, the leaves ciliate; stem weak, its height unknown; internodes 4 or 5 cm. long, the sheaths 4 to 10 mm. broad, minutely puberulent, the summit slightly oblique, the ligule shortly auriculate above the base of the leaf, its margin more or less pilose; leaf thickish, sessile, to 17 by 7 cm., obovate, with acutish base and acutely mucronate summit, the margin strongly ciliate with hairs similar to those which clothe the upper surface of the midrib, the upper surface otherwise glabrous, the lower surface puberulent or pubescent, the transverse lines exceedingly numerous, almost as wide as the spaces between them; spike ellipsoid, 8 by 3.5 cm. (in my specimen), the scales puberulent and closely appressed, 2 cm. long and broad, subrotund, obtuse; bractlet 1 cm. long, oblong, acutish, complanate, not enclosing the flower; immature fruit 5 mm. long, 2 mm. broad at the truncate summit, tuberculate; calyx 4 mm. long, broadly campanulate-turbinate, subtruncate, the teeth extremely short; remainder of flower not seen.

Collected by G. H. H. Tate at Rio Chimate, Bolivia, alt. 1900 ft., April 1 to 14, 1926 (No. 523, the type). No. 441, from Mapiiri, alt. 12,000 ft., March 30 to April 9, is the same species. This specimen exhibits a cylindrical spike 9 by 3 cm. Its leaves reach 25 by 10 cm. No. 647, of the Mulford collection, from the Bopi River, alt. 2200 ft., August 8, 1921, collected by O. E. White, is the same species, as is also No. 1808, from Rurrenabaque, November 25. These latter specimens are much more pubescent than the

Tate plant. The species is well distinguished by the ciliate margins and midribs of the leaves.

MYRIOCARPA TATEI Rusby, sp. nov. Asperime densaeque pubescens; caules crassi atque debiles; petioli albido-setosi; laminae tenues ovatae abrupte acuminatae acutae basi obtusae serratae; spicae numerosae elongatae saepissime simplices densiflorae floribus divaricatis albido-pilosis; ovarium late ovoideum stylum subaequans.

Densely and shortly rough-hairy throughout; branchlets stout, but weak and crooked, reddish-brown and gray-hairy, the hairs matted together; stipules early deciduous, 1 cm. long, ovate, acuminate and acute; petioles (only the upper leaves seen) to 3 cm. long, slender, white setose-hairy, the hairs divaricate; blades to 10 by 6 cm., ovate, with blunt or rounded base and abruptly short-acuminate and acute summit, finely and regularly serrate, the teeth ovate, broader than long, acute with a whitish tip, the sinuses acute, very thin, 3-nerved from a little above the base, the upper surface densely and shortly rough-hairy, dark green, the lower surface grayish-green, more densely hairy but less rough, the venation finely reticulate, not prominent; spikes very numerous, simple or branching near the base, 15 to 20 cm. long, 5 mm. broad, densely flowered, the flowers divaricate, all the parts pilose with spreading white hairs; bractlets 2 and linear, slightly longer than the slender stipe, which is half the length of the broadly ovoid ovary, the style about equaling the ovary, the stigma mostly recurved.

Collected by G. H. H. Tate at Nequejahuira, Bolivia, alt. 8000 ft., May 15 to 24, 1926 (No. 645).

PHENAX BULLATUS Rusby, sp. nov. Rami elongati graciles adscendentes subglabrati; folia lanceolato-ovata acuminata acuta ad basin rotundata, dentibus mucronulatis, pagina superiore bullata saepe nitente; bractee ovaes obtusae concavae; pistillum sessile ovoideum, stylo elongato.

Subglabrous; branches elongate, very slender, erect or strongly ascending, light red, terete, very leafy; stipules 3 mm. long, triangular-acuminate, scarious, reddish; petioles to 1 cm. long, very slender, minutely scurfy; blades to 3.5 by 1.5 cm., lance-ovate, with rounded base and acuminate and acute summit, serrate with mucronulate teeth, deep-green, the upper surface mostly bullate, often shining, with the venation impressed, very minutely puberulent, the lower surface mostly brown or reddish, densely papillose, the venation lightly prominent, the three ribs originating in the petiole, connected by slender crooked secondaries; heads spherical, nearly 1 cm. broad, reddish or rich-brown; bracts brown, scarious, 1.5 to 2 mm. long and more than half as broad, oval, obtuse, concave; staminate flower very shortly

stipitate, the calyx parted below the middle, the lobes 2 mm. long, faintly 3-nerved, broadly oval, the summit rounded and mucronate; stamens 4, longer than the calyx; rudimentary ovary minute, free from the stamens; pistillate flower sessile, the ovary less than 1 mm. long, ovoid, the style more than 3 mm. long, very slender.

Collected by O. Buchtien at Cotana, Bolivia, alt. 2700 m., in November, 1911 (No. 3158). "A shrub about 2 meters high." Also collected by G. H. H. Tate at Nequejahuira, alt. 8000 ft., May 15 to 24, 1926 (No. 649). The species is very near P. ballotaefolius Wedd.

PHENAX FLAVIFOLIUS Rusby, sp. nov. Rami elongati graciles setosi; stipulae ovatae acuminatae acutaeque scariosae caducae; folia lanceolata acuminata acutaeque basi acuta serrata flavo-brunnea; pistillum oblanceolatum stipitatum pubescens.

Setose-hairy and slightly hispid; branches elongated, slender, reddish-brown, terete, narrowly sulcate, very leafy, the hairs white and widely spreading or divaricate; stipules caducous, 4 or 5 mm. long, ovate, acuminate and acute, brown, scarious, pilose; petioles to 2 cm. long, slender, red, setose, deeply channeled above; blades to 15 by 4 cm., lanceolate with a short-acuminate and acute base and a long-acuminate and acute summit, finely serrate with short acute teeth and sinuses; heads to 8 or 10 mm. broad, dense, brown; bractlets minute, hyaline; pistil short-stipitate, the ovary 1.5 mm. long, oblanceolate, the base tapering into the stipe, pubescent, obtuse, the style stout, tapering, pubescent, 2.5 mm. long; staminate flower not found.

Collected by G. H. H. Tate at Pitiguaya, Unduavi, Bolivia, alt. 5800 ft., May 7 to 15, 1926 (No. 726).

ALSINE YUNGASENSIS Rusby, sp. nov. Caules elongati debiles graciles glabri flavi nitentes; folia late sessilia ovata acuta apiculata tenuia; flores pauci solitarii penduli aut recurvi; sepala late ovata acuta; petala quam sepalis staminibusque paulo longiora; stamina stylos aequantia.

Glabrous; the stems elongated, weak and slender; branches elongated, ascending, yellow, shining; leaves sessile by a broad base, 2 to 3.5 cm. long, 1 to nearly 2 cm. broad, ovate, acute, minutely apiculate or mucronulate, light green, drying yellowish, very thin, the venation slender, crooked, ascending and meeting to form a conspicuous line close to the margin; flowers few, axillary, solitary, mostly recurved or pendulous on long peduncles; sepals 6 mm. long, broadly ovate, acute, thin, pale green, veiny; petals 8 mm. long, bifid, the divisions narrow; stamens shorter than the petals, about equalling the styles; ovary 2 mm.

long, obovoid, the styles 3, shorter than the ovary, the upper part somewhat recurved, the summits slightly thickened.

Collected by H. H. Rusby in Yungas, Bolivia, alt. 6,000 ft., in 1885 (Parke, Davis & Co. No. 1185, the type), distributed as "*S. cuspidata* Willd.?" Also collected by G. H. H. Tate at Pongo, alt. 12,000 ft., February 17 to March 1, 1926 (No. 159).

CERASTIUM BREVICARPICUM Rusby, sp. nov. Dense breviter-que pilosum; caules crassiusculi ex basi dense ramosi; folia crassa, basalia lanceolato-oblonga obtusa inferne angustata in basin longum petioloideum, caulina deinceps minora et brevis petiolata; sepala oblanceolata obtusa petala parum excedentia; stamina quam petalis $1/3$ breviora pistillum subaequantia.

Densely pilose or subtomentose throughout, with stout hairs; stems mostly 3 to 5 cm. long, densely branching from the base, thickish; leaves thickish, the radical ones 3 cm. long, 8 mm. wide, the lower half being a long petiole-like base, the limb lance-oblong, obtuse, densely hairy and ciliate, the cauline leaves successively smaller and with shorter basal portions; principal veins strongly ascending, the venation coarsely reticulate; sepals thickish, 1 cm. long, oblanceolate, obtuse, tomentose; petals a little shorter than the sepals, shortly 2-lobed, the lobes obtuse; stamens two-thirds the length of the petals; ovary brown, 5 mm. long and more than half as broad, with rounded summit, 10-ribbed and finely many-nerved; styles 5, half as long as the ovary; mature pod not seen, but it opens by 10 equal, short, obtuse teeth.

Collected by G. H. H. Tate at the top of the Tipuani-Ancona-Sorata trail, alt. 16,500 ft., April 30, 1926 (No. 785). Nos. 21 and 820 represent the same species.

DRYMARIA LADEWII Rusby, sp. nov. In juventute minute puberulum; caules ramique gracillimi patuli; stipulae albidae lacerae; petioli filiformes; laminae ovatae obtusae mucronulatae basi truncatae vel subcordatae; flores pauci pedicellis filiformibus; sepala lanceolato-ovata rigida acuminata et acuta staminibus petalisque longiora; capsula globosa seminibus magnis.

Younger portions and inflorescence very minutely puberulent; stems elongated, very slender, the branches similar, divaricate or widely spreading; stipules whitish, irregularly lacerate, the divisions filiform; petioles of the largest leaves to 5 mm. long, filiform; blades very unequal, successively smaller upward, the largest 3 cm. long and nearly as broad, ovate, very obtuse, but minutely mucronate, with a truncate or shallowly cordate base, very thin, pale green,

glabrous, 3-nerved from the base, the venation slender, sparse; inflorescence cymose, very lax and few-flowered, the flowers on filiform pedicels; sepals 3 mm. long, rigid, pale green with whitish margins, lance-ovate, acuminate and acute; petals two-thirds as long as the sepals, white, very delicate, bifid, the divisions linear; stamens and pistil about equalling the petals; ovary globose, the style 3-fid about half-way; capsule splitting into 3 valves, the seeds large, brown.

Collected by G. H. H. Tate at Nequejahuira, Bolivia, alt. 8,000 ft., May 15 to 24, 1926 (No. 652, the type), and at Okara, alt. 7,500 ft., April 26 to 29 (No. 982). The species is very near D. pauciflora Bartl., but is not at all pilose like that species.

DRYMARIA STRICTA Rusby, sp. nov. Breviter pubescens; caules ramique elongati graciles erecti; stipulae setaceae; petioli breves lati; folia ovata latioria quam longa basi subtruncata apice breviter acuminata et acuta; sepala et stamina a petalis excessa; capsula sepala aequans.

Pubescent with short spreading hairs; stems to 3 dm. tall, slender and erect, like the branches; stipules very small, setaceous; petioles 1 or 2 mm. long, broad; blades to 12 mm. long, broader than long, ovate with a subtruncate base and an abruptly short-acuminate and acute summit, thin, drying yellowish, 5-nerved from the base; inflorescence, with its filiform erect branches and pedicels, pilose with divaricate hairs like the calyx; sepals 3 mm. long, oval, obtuse, pale green, rigid; petals exceeding the sepals, bifid, white, narrowed to the base; stamens about equalling the calyx; style trifid half-way down; capsule equalling the calyx.

Collected by G. H. H. Tate at Pongo de Quime, Bolivia, alt. 12,000 ft., February 17 to March 1, 1926 (No. 160). The species is very near to D. glandulosa Presl.

GUATTERIA SETOSA Rusby, sp. nov. Setoso-pilosa et scabra; folia subsessilia oblonga acuminata et attenuata superne glabra; flores solitarii axillares, pedunculo calyceque setosis; petala exteriora sepala paullo excedentia, interiora longiora margine ad apicem excavata, omnia obtusa.

More or less setose-hairy; branchlets much elongated, slender, harshly pilose or scabrous; leaves nearly sessile, the petiole about as broad as long, the blades to 14 by 3.5 cm., oblong with an obtuse base, the summit acuminate and ending in an attenuate point about 5 mm. long, glabrous above, sparsely pilose below with stiff appressed hairs, the venation lightly prominent beneath, the secondaries 15 to 18 on a side, widely spreading, the ends strongly upcurved and connecting near the margin; flowers axillary, solitary, the

peduncles 2 cm. long, setose like the sepals; calyx apparently valvate, coriaceous, the sepals 1 cm. long, broadly ovate, obtusish; petals coriaceous, the outer slightly larger than the sepals, short-pubescent or tomentose, probably valvate, obtuse, the inner longer and much broader than the outer, very obtuse, the margins slightly excavated near the summit, as though inclined to be 3-lobed, somewhat connivent; stamens densely massed, but not coherent, 1.5 mm. long, broadened upward, with a truncate summit; carpels forming a dense head 3 mm. broad.

Collected by G. H. H. Tate at Chuquini, Bolivia, alt. 3,000 ft., February 17 to March 1, 1926 (No. 1138).

DIOCLEA ORNITHORYNCHA Rusby, sp. nov. Pubescens pilis divaricatis vel retrorsis; petiolus brevissimus; foliola ovales apice in rostrum longum abrupte contracta; calycis tubus late campanulatus ferrugineo-hirsutus, dentes longi falcati adscendentes.

Pubescent with divaricate or somewhat retrorse hairs; stems rather stout, costate or strongly nerved; stipules not seen; petioles 7 or 8 cm. long, slender, narrowly channeled above; rachis 2 or 3 cm. long; petiolules 5 mm. long; terminal leaflet 15 by 8 cm., oval with a rounded base and a summit abruptly contracted into a curved beak-like acumination which is 2 cm. or more long, entire, very thin, the very slender midrib and secondaries lightly prominent beneath, the secondaries 5 or 6 on each side, strongly ascending, lightly curved, connected by a loose reticulation, the upper surface sparsely, the lower more densely pubescent, the veins pilose with stiff divergent hairs; lateral leaflets about equal, similar but inequilateral; peduncle and rachis each about 2 dm. long, the latter black-nodose from the fallen flowers. A single detached flower is present on my specimen. This has the pedicel 7 mm. long, slender; calyx-tube campanulate, 5 mm. long, 8 mm. broad, 5-ribbed, hirsute and ferruginous, the long calyx-tooth nearly 1 cm. long, falcate-ascending; corolla-bud beginning to open, 1 cm. long and a little broader; dissection material wanting.

Collected by G. H. H. Tate at Mapiiri, Bolivia, alt. 2000 ft., March 3 to April 9, 1921 (No. 479). The species is near to *D. rufescens* Benth., but the latter is wanting in the stiff divergent hairs on the veins of the lower leaf surface and has different flowers.

LUPINUS BUCHTIENII Rusby, sp. nov. Puberulus; caules ex basi numerosi prostrati vel adscendentes, ramosi et foliosi; stipulae lanceolatae abrupte attenuatae brumeae; foliola oblanceolata basi cuneata apice obtusa vel rotundata; racemi elongati simplices pedunculati; bractae lanceolatae

acuminatae quam pedicellis filiformibus duplo longiores; calycis labia subaequalia, labio inferiore 3-denticulato; corolla subcaerulea.

Closely and finely puberulent; stems numerous from the summit of a long tap-root, prostrate or ascending, freely branching, 5 to 10 cm. long, slender, leafy, angled and nerved; stipules to 5 mm. long, lanceolate, abruptly contracted into an attenuate summit, thin, brown, erect; petioles very unequal, to 1 cm. long, filiform; leaflets mostly 7 or 9, sessile, the lower smaller, to 3 mm. long and 1 mm. wide or less, oblanceolate with cuneate base and blunt or rounded summit, entire, gray-puberulent, the venation obscure; racemes terminating the branches, long and slenderly peduncled, simple, mostly 5- to 10-flowered, the pedicels about half as long as the lanceolate acute bracts; lower lip of calyx 3 mm. long and about as broad, ovate, 5-nerved, minutely 3-dentate, the upper lip about as long, ovate, acuminate and acute, entire; corolla light blue, 7 mm. long; stamens 5 mm. long, the filaments united more than half-way; ovary 2.5 mm. long, lanceolate, the style exceeding the stamens, lightly curved; pod 1 cm. long, 5 mm. wide, oval, compressed, one margin thickened, tomentose, mucronate, 3-seeded.

Collected by Otto Buchtien at Unduavi, Bolivia, alt. 3500 meters, in November, 1910 (No. 2869, the type). Distributed as L. prostratus Ag., which it closely resembles. Also collected by G. H. H. Tate at Pongo, alt. 12,000 ft., February 17 to March 1, 1926 (No. 174).

LUPINUS TATEI Rusby, sp. nov. Cinereo-sericeus; caules alti crassi ramis ascendentibus; stipulae varie subulatae attenuataeque; foliola oblanceolata acuta basi acuminata; bractearum pars basalis late ovata, pars superior setacea; lobus calycis major ovatus acuminatus alii angusti acuminati et acuti.

Densely gray-sericeous throughout; only the upper branches seen, these 2 or 3 dm. long, ascending, rather stout, floriferous at the summit; stipules more than 1 cm. long, narrowly subulate and long-attenuate; petioles to 5 cm. long, slender, narrowly grooved above; leaflets apparently 7, sub-petiolulate, the outer successively smaller, the central to 6 by 1 or 1.2 cm., oblanceolate, acute with an acuminate base, entire, thin, densely sericeous on both surfaces; flowers loosely racemed, mostly 2 together; bracts in two parts, the basal broadly ovate, about 5 mm. long, the upper longer and setaceous; pedicels about 1 cm. long, slender; calyx-tube 3 mm. long, 5 mm. wide, obtusely 10-costate, the larger lobe 8 mm. long, ovate, long-acuminate and acute, the others narrower, 7 mm. long, acuminate and acute; vexillum orbicular, 1.5 cm. long and even broad-

er; alae obovate, equally long; keel 13 mm. long, finely many-nerved, ovate, obtusish, the summit darker; stamens about as long as the keel, connate two-thirds of their length, the anthers lanceolate, 2 mm. long; style 2 mm. longer than the stamens, the stigma bearded; pod 3 or 4 cm. long, 1 cm. broad, oblanceolate, compressed, hirsute, the edges thickened, mostly 5-seeded.

Collected by G. H. H. Tate on the road from Okara to Ancona, Bolivia, alt. 11,000 ft., April 29, 1926 (No. 855). The species is very near L. paniculatus Benth. and L. sorataensis Rusby.

MEIBOMIA ADHAERENS Rusby, sp. nov. Dense albo-hispida; caules validi flexuosi erecti; stipulae late ovatae abrupte attenuatae longe pilosae quam petiolis longiores; foliola consimilia ovata obtusa minute apiculata; paniculae axillares et terminales laxiflorae; pedicelli recurvi; calycis labium superius quam inferiore fere duplo longius; legumen sub-7-articulatum suturis utriusque invaginatis.

Densely hispid with slender white, shining, divergent hairs which are mostly hooked at the tip; stems herbaceous, rather stout, flexuous, yellowish, apparently erect; stipules about 7 mm. long, broadly ovate, abruptly contracted into an attenuation that is nearly as long as the body, thin, brown, nerved, long-pilose; petiole to 5 cm. long, slender, spreading, nerved, grooved on the upper surface, pilose, the rachis similar, 1 cm. long, the stipellae 4 mm. long, lance-linear, attenuate; leaflets 3, the petiolules shorter than the stipellae; leaflets alike, the lateral somewhat smaller, to 4.5 by 3 cm., ovate with a broad base and summit, the latter minutely apiculate, thin, pale green, sparsely pilose, the slender venation not prominent, the secondaries 5 or 6 on each side, at an angle of about 45°, little curved except at the ends, the venation coarsely reticulate; panicles axillary and terminal, elongated, little branched and very loosely flowered; pedicels filiform, recurved, 4 to 7 mm. long in flower, later slightly elongating; upper lip of calyx nearly twice the length of the lower, which is 3-lobed more than half-way, the lobes triangular, acute; vexillum 1 cm. long and broad, the claw short and very broad, cuneate; wings and keel shorter than the vexillum; filaments united for most of their length; only one immature pod seen, this 7-jointed, both margins indented but not equally, strongly hispid, the joints small, inequilaterally oval, a little longer than broad.

Collected by G. H. H. Tate at Sorata, Bolivia, alt. 10,000 ft., May 1, 1926 (No. 769).

MEIBOMIA ADPRESSA Rusby, sp. nov. Minute puberula; caules basi radicantes atque ascendentes, ramis gracilibus e-

longatis, dense foliosis; stipulae adpressae ovatae longe attenuatae; petioli basi dilatati; stipellae minutae subulatae; foliola ovalia obovata vel orbicularia; racemi terminales stricti pauciflori; legumina pauci-articulata, sutura ventrali paullo incisa dorsali alte sulcata.

Very minutely and closely puberulent; stems rooting at the base, then ascending, branching from below, the branches long and slender, ascending, densely leafy; stipules 4 mm. long, appressed, ovate, with a long-attenuate summit; petiole to 1 cm. long, stout, mostly erect, dilated at the base, the rachis a fourth its length; stipellae subulate, very small; leaflets 3, the petiolules 1 mm. long, broad; blades varying from orbicular to broadly oval or somewhat obovate, with a rounded summit and base, the lateral ones about two-thirds the size of the terminal, all deep green, thin but rigid, the margin thinly revolute, grayish-puberulent beneath, the venation prominent beneath, secondaries crooked, the finer venation strongly anastomosing; racemes terminal, long-peduncled, slender and strict, few-flowered; pedicels filiform, about 8 mm. long, erect and incurved; longer lip of calyx 4 mm. long and nearly equalling the stamens, ovate with a long-acuminate summit, the other three lobes similar and only a little smaller; perfect pods not seen, apparently 3-jointed, the ventral suture slightly and sharply notched, the dorsal deeply and widely intruded, the joints about 3 mm. long, 1.5 mm. wide, about twice as broad near the summit as near the base.

Collected by G. H. H. Tate at Mapiri, Bolivia, alt. 2000 ft., March 20 to April 9, 1926 (No. 468). The species is characteristic in its numerous subimbricated leaves, erect petioles and pedicels, and appressed stipules.

MEIBOMIA NUMMULARIA Rusby, sp. nov. Dense pilosa; caules ex basi lignosa ramosi gracillimi; stipulae divaricatae late ovatae attenuatae; petiolus quam rhachide triplo longior; stipellae setaceae; foliola subrotundae supra strigosa subtus molliter pilosa; racemi axillares minimi pauciflori.

Densely pilose with soft white divergent hairs; stems branching from a woody base, in my specimen to 5 dm. long but probably growing much longer, the branches elongated, very slender; stipules 5 to 7 mm. long, divaricate, thin, brown, broadly ovate and attenuate, pilose, finely many-nerved; petioles to 3 cm. long, slender, thrice the length of the rachis; stipellae 3 or 4 mm. long, setaceous; leaflets 3, the petiolules less than 1 mm. long; leaflets very irregular in size, from 5 by 5 mm. to 2.5 by 2.5 cm., the terminal one a little larger and relatively broader than the lateral ones, all subrotund, thin, bright green, the upper surface bearing appressed hairs with enlarged base, the lower surface densely soft-pilose; secondaries 4 on each

side, strongly ascending, nearly straight; racemes axillary, very small and few-flowered, the flowers not yet developed in my specimen.

Collected by G. H. H. Tate at La Joya, Bolivia, alt. 5900 ft., April 25 to 26, 1926 (No. 1021).

MEIBOMIA SIMPLICIFLORA Rusby, sp. nov. Pubescens; rami graciles elongati; stipulae ovatae acuminatae et acutae patulae vel recurvae; petiolus quam rhachide triplo longior; foliola ovata obtusa vel apiculata pubescentia, pilis adpressis basi bulbosis; racemi elongati simplices vel subsimplices laxiflori; calycis dentes ovati acuminati; legumen sutura una alte altera paullo invaginatum.

Pubescent with short, fine, white hairs; stems slender, terete, reddish, the branches elongated and slender; stipules 5 mm. long, broadly ovate, abruptly long-acuminate and acute, brown, spreading or recurved; petiole 2 to 4 cm. long and thrice the length of the rachis, slender, the stipellae similar to the stipules, but half as large; leaflets 3, the terminal one from 4 by 2 cm. to 6 by 3 cm., ovate with a rounded base and acute or obtusish and minutely apiculate summit, thin, deep-green, sparingly pubescent on both surfaces, the hairs appressed, with bulbous bases, the secondaries 6 to 8 on each side, strongly ascending, lightly curved; lateral leaflets similar and about two-thirds as large, on petiolules about 1 mm. long; raceme terminal, elongated, simple or nearly so, loosely flowered; longer lip of calyx 3 mm. long, ovate, attenuate, the other teeth similar, about half as long, less attenuate; corolla absent; stamens 6 mm. long; pod mostly 5- or 6-seeded, nearly straight, 2 to 2.5 cm. long, 2 mm. wide, shortly stipitate; ventral sinus not at all or very little intruded, the dorsal sinus deeply so, the joints triangulate, hispid, very small.

Collected by G. H. H. Tate at Okara, Bolivia, alt. 7,500 ft., April 26 to 29, 1926 (No. 988).

MEIBOMIA TETRASPERMA Rusby, sp. nov. Hispidulum et pilosum; rami elongati graciles patuli; stipulae subulatae attenuatae 5-7-nervae; foliola ovata obtusa apiculata; paniculae magnae late patulae laxiflorae; pedicelli divergentes vel reflexi; calycis dentes acuminati et acuti; filamenta fere ad apicem conjuncta; legumen reflexum saepe 4-articulatum, sutura ventrali paullo, dorsali alte invaginata.

Minutely and sparsely hispidulous with very short, recurved hairs and a few long straight slender ones; stem herbaceous, very slender, apparently very long, with elongated and widely spreading branches; stipules 3 or 4 mm. long, subulate and attenuate, sharply 5- or 7-nerved; petiole to 3 cm. long, nearly filiform, the rachis more than half as long as the petiole; stipellae very small, the petiolules 2 or 3

mm. long, thick, pilose; blades very thin, pale-green, the terminal to 6 by 3.5 cm., rhomboidally ovate, blunt, minutely apiculate, the lateral ones considerably smaller, ovate, sparsely pilose with appressed hairs, the venation inconspicuous, the secondaries about 6 on each side, strongly falcate-ascending, rather crooked; panicles large, widely and sparsely branching, the branches filiform, loosely-flowered; pedicels 1 to 1.5 cm. long in flower, 2 cm. long in fruit, divergent or lightly reflexed; upper lip of calyx 1.5 mm. long, deeply 2-toothed, the teeth triangular-lanceolate, the lower 3-toothed, the lateral teeth much like the upper, the middle tooth a half larger, all acuminate and acute; vexillum nearly 1 cm. long, rose-colored, the claw very short, the keel and wings about two-thirds as long and nearly as long as the stamens, which are united nearly to the summit, shorter than the pistil; stigma capitate, flat; pod reflexed on the pedicel, mostly 4-jointed, the ventral suture slightly, the dorsal suture deeply intruded and almost meeting, the joints very much flattened, with thickened densely ciliate margins, the joints nearly 1 cm. long and half as wide, reticulately veined, the seed attached at the middle, the long axis of the seed parallel with that of the pod.

Collected by G. H. H. Tate at Okara, Bolivia, alt. 7500 ft., April 26 to 29, 1926 (No. 987).

OXALIS DENSISSIMA Rusby, sp. nov. Pubescens; caules dense caespitiosi; stipulae brunneae tenues ovatae obtusae inferne ad petiolulum adnatae superne divaricatae; petioli albo-pilosi; foliola sessilia basi cuneata subtiliter obcordata; pedunculi erecti uniflori medio bibracteolati; calyx corollaque concolorea.

Finely pubescent; stems caespitose, very short, growing in dense masses with mosses; stipules 1.5 to 2 mm. long, ovate, obtuse, adnate to the base of the petiole, divaricate, brown, thin and hyaline; petioles to 1.5 cm. long, slender, white-pilose; leaflets 3, sessile, equal, 2 mm. long, 3 mm. wide, cuneate at the base, shallowly obcordate, pilose, rather thin; peduncles filiform, pilose, erect, 3 or 4 cm. long, 2-bracted about the middle, one-flowered, the bracts lance-linear, acuminate; sepals colored like the corolla, 5 mm. long, oblong, with rounded summit, finely nerved; corolla 14 mm. long, purple; stamens monadelphous, very unequal, the longest reaching to the middle of the corolla, the filaments short-pilose; ovary oval, about 2 mm. long; styles 4, as long as the ovary, distinct, slender; stigma capitate.

Collected on the Ladew Expedition by G. H. H. Tate at Copunco, Bolivia, alt. 10,000 ft., in March, 1926 (No. 383). Nos. 383 and 323 grow together and are badly mixed in the

specimens. No. 383 is well distinguished by its longer petioles, larger and thinner leaflets, smaller and thinner stipules of different form, and its non-thickening petiole base.

Oxalis Tatei Rusby, sp. nov. Molliter pubescens, pilis purpureo-brunneis vel ferrugineis; caules caespitosi erecti uniflori inferne stipulis crassis brunneis ovatis imbricatis dense obtectis, his cum basi adnata petioli post lapsum foliorum persistentibus, petiolo deinde in corpusculum durum inter stipularum bases accrescente; corolla calyxque purpurati.

Softly pubescent, the indumentum somewhat ferruginous or brownish-purple; stems gregarious, one or more cm. tall, the lower portions densely imbricated by persistent stipules, one-flowered; stipules 2 mm. long, ovate, acute, brown, thick and somewhat coriaceous, adnate to the base of the petiole, which eventually disarticulates at the point of union, the stipules and base of the petiole persisting, the latter enlarging and thickening to form a hard body between the stipules; free portion of petiole 3 mm. long; leaflets 3, sessile, the terminal one a little larger, 2 mm. long, 3 mm. wide, triangular-obcordate with a shallow sinus, thick and somewhat fleshy, deep-green; peduncles about 2 cm. long, filiform, pilose, two-bracted about the middle; sepals 3 to 3.5 mm. long, lance-ovate, obtuse, somewhat unequal, colored like the corolla; corolla 13 mm. long, apparently purple; stamens monadelphous at the dilated bases, 5 of them 4 mm. long, the others 6 mm. long and pilose, those of either set sometimes unequal among themselves; pistil 2 mm. long, the oval ovary two-thirds of the length; styles 4, distinct, rather stout, spreading; stigmas capitate.

Collected on the Ladew Expedition by G. H. H. Tate at Cocopunco, Bolivia, alt. 10,000 ft., March 24 to 29, 1926 (No. 323). The peculiar origin of the scales clothing the stem-bases sheds light on the relationship of the species of "*Oxalis*" with scaly rhizomes and scaly bulbs. Perhaps this species and *O. densissima* represent a genus not as yet segregated.

Oxalis virgata Rusby, sp. nov. Puberula et parce ferruginea; caules lignosi erecti crassi foliosissimi; stipulae erectae lanceolatae acuminatae et acutae scariosae brunneae; petioli graciles subtus ad apicem glandula magna ornati; foliola 3 consimilia triangulari-obovata simu brevi lato lobis rotundatis ad apicem costae glandula magna notatis; pedunculi in axillis superioribus solitarii saepissime uniflori; sepala viridia; petala flava.

Puberulent and somewhat ferruginous; stems woody, stout, terete, erect, very leafy; stipules 2 or 3 mm. long, erect, brown, thin and scarious, lanceolate, acuminate and acute;

petioles about 1 cm. long, slender, erect or somewhat spreading, puberulent, with a large gland at the summit on the lower side; leaflets 3, often reflexed, sessile or nearly so, equal or the terminal one a little larger, 7 mm. long (to the summit of the midrib), 6 mm. broad, triangular-ovate, the terminal sinus broad and shallow. the summit of the lobes rounded, with a large round brown gland at the summit of the midrib on the lower surface, the upper surface deep-green, puberulent with few minute whitish hairs, the venation slightly prominent beneath, ferruginous and pubescent, the midrib very stout, the secondaries 3 or 4 on each side, ascending at about 45° ; peduncles few, solitary in the upper axils, mostly 1-flowered, occasionally 2- or 3-flowered, filiform, to 3 cm. or more long, bearing linear-attenuate brown scarious bracts; sepals 3 mm. long, thin, green, lanceolate, with an attenuate summit, the midrib strong; corolla yellow, 12 mm. long; stamens very unequal, the longest ones half the length of the corolla; dissection material and fruit wanting.

Collected on the Ladew Expedition by G. H. H. Tate at Cocopunco, Bolivia, alt. 10,000 ft., March 24 to 29, 1926 (No. 282). The species is very characteristic because of its tall, stout, woody stems, densely clothed with leaves on short erect petioles.

ALCHORNEA MEGALOSTYLIS Rusby, sp. nov. Breviter albo-pubescentis; caules petiolique rubri; folia crassa ovali-ovata, basi rotundata, apice abrupte breviter et obtuse acuminata, obscure sinuato-dentata; spicae foemineae axillares solitariae breves graciles pauciflorae; styli 2 rubri crassi pubescentes complanati valde recurvi quam ovario multo longiores; spicae masculae graciles laxae ramosae.

Pubescent with short white hairs; stem terete, reddish; stipules not seen; petioles to 5 cm. long, stout, reddish, nerved; blades to 15 by 8 cm., ovate or oval, with rounded or blunt base and very abrupt, short, obtuse acumination, shallowly sinuate-dentate, thickish and rigid, pale-green, above very shortly and sparsely pubescent on the veins, which are slightly prominent, more pubescent beneath, with the red venation very stout and prominent, 3-nerved, the secondaries 4 or 5 on each side, strongly ascending and lightly falcate, connected by numerous straightish tertiaries and strongly looped together near the margin, the finer venation strongly anastomosing; pistillate spikes axillary, shorter than their leaves, simple, slender, very loosely flowered; calyx white, tomentose, deeply 4-parted, about one-third the length of the white tomentose ovary, which is broadly ovoid, about 1 mm. long; styles 2, thick and fleshy, red, pubescent, flattened, strongly recurved, much longer than the ovary; staminate plant more pubescent

and the leaves ciliate, the spikes loosely branched, very slender, the flowers glomerate at the nodes; calyx 2-parted; stamens 4 or 5, not united.

Pistillate plant collected by M. Bang near Coroico, Bolivia, August 6, 1894 (No. 2375, the type). Staminate plant collected by G. H. H. Tate at Nequejahuira, alt. 8000 ft., May 15 to 24, 1926 (No. 646).

PAULLINIA TATEI Rusby, sp. nov. Glabra; ramuli graciles rubelli 3-angulati; petioli graciles 3-angulati; foliola ovali-ovata basi in petiolum breviter producta apice obtusa remote sinuato-dentata; racemi axillares simplices, pedunculis elongatis recurvatis apice cirrhiferis; capsula obtuse triangularis parce lobata.

Glabrous throughout; branches elongated, slender, reddish brown, triangular; leaves trifoliolate, the petioles 4 cm. long, slender, triangular; lateral petiolules 2 or 3 mm. long, the terminal a little longer; lateral leaflets 7 by 4 cm., oval or slightly ovate, with very slightly produced base and obtuse summit, sinuately dentate with few very short blunt teeth, slightly shining, the venation impressed above, prominent beneath, the secondaries about 7 on each side; terminal leaflet somewhat larger, lightly obovate; racemes axillary, mostly simple, on elongated, slender, recurved peduncles, tendril-bearing at the summit, the rachis densely fruited or nodose from the fallen fruits; capsule obtusely triangular and lightly 3-lobed, with a broad flat summit and a short thecaphore at the base, 11 or 12 mm. broad and not quite so long, red; seed 8 mm. long, obovoid with a rounded summit, deep purple, shining, the aril light brown, papillose, cup-shaped, the margin truncated and sometimes irregularly ruptured, about half the length of the seed.

Fruiting specimen collected by G. H. H. Tate at Guanai, Bolivia, alt. 1800 ft., April 14 to 16, 1926 (No. 553).

SERJANIA LYRATA Rusby, sp. nov. Breviter ferrugineo-tomentosa; rami graciles 6-costati; laminae foliorum quam petiolis sub-6-plo longiores bipinnatae; foliola lanceolata-oblonga basi breviter acuminata apice subacuta argute serrata utrinque ferrugineo-tomentosa; paniculae graciles; carpellae maturae tenues parce puberulae.

Shortly ferruginous-tomentose; branches rather slender, reddish-brown, 6-costate, unarmed; petioles about one-seventh the total length of the leaf, about 15 mm. long; blade bipinnate, 10 or 12 cm. long and nearly as broad at the base, the lower pinnae on short slender petiolules, their lateral pinnules 2 to 2.5 cm. long and half as broad, the lower on short petiolules, lance-oblong with an abruptly short-acuminate base and acutish summit, serrate with a-

cute teeth, occasionally the lowest pinnule pinnate, the terminal pinnule ovate with abruptly acuminate base, much larger than the lateral ones; upper pinnae sessile, occasionally with a single basal pinnule, similar to the terminal pinnules of the lower pinnae; terminal pinna lance-ovate, long-acuminate, variously incised, serrate, or pinnatifid; leaves thin, ferruginous-tomentose on both sides, the venation slender, abundant; panicles narrow, short-peduncled, the peduncles angular; fruiting pedicels 4 mm. long, slender, the carpels nearly 2.5 cm. long, 9 mm. broad, with a rounded base, light-green, thin, slightly puberulent, the veins horizontal or somewhat depressed, the summit rounded, the seed small, near the summit.

Fruiting specimen collected by G. H. H. Tate at Okara, Bolivia, alt. 7500 ft., April 26, 1926 (No. 991).

WALTHERIA LADEWI Rusby, sp. nov. Dense et molliter cinereo-stellato-tomentella; caules graciles erecti subsimplices; stipulae angustae basi paullo dilatatae; folia ovata crenato-dentata basi rotundata apice obtusa vel mucronulata; racemi breves secundi recurvati; calycis dentes a basi acuminati.

Densely, closely, and softly gray-stellate-tomentellous throughout; stems to 6 dm. high, slender, erect, simple or little branched, the branches erect, terete; stipules not seen; petioles 3 to 5 mm. long, slender, slightly dilated at the base; blades to 30 by 13 mm., ovate with a broadly rounded base and a blunt, minutely mucronulate summit, finely crenate-dentate with short broad mucronulate teeth, the upper surface gray-green, very densely tomentellous, the venation finely channeled, the lower surface gray, with the slender midrib and secondaries sharply prominent, the secondaries 5 or 6 on each side; flowers secundly racemose in the axils, the racemes much shorter than their leaves, shortly and slenderly peduncled and recurved; bracts 4 or 5 mm. long, imbricated, lanceolate, acuminate, hirsute, ciliate, thickish; calyx turbinate, 5 mm. long, toothed nearly half-way, the tube 10-nerved, the teeth acuminate from the base; petals 2 mm. longer than the calyx; filaments 1 mm. long, completely coherent, the anthers 1 mm. long, minutely mucronate; style pilose, 1 mm. longer than the stamens, plumose at the summit.

Collected by G. H. H. Tate at Mapiiri, Bolivia, alt. 2000 ft., March 30 to April 9, 1926 (No. 470). The species is near *W. americana* L.

CAOPIA PARVIFOLIA Rusby, sp. nov. Puberula, in inflorescentia glandulosa; folia lanceolata in petiolum brevissimum abrupte contracta breviter acuminata et acuta supra glabra subtus parce ferruginea; pedicelli fructiferi grac-

iles; sepala reflexa lanceolata acuminata et subacuta; fructus insigniter glandulosi.

Sparsely puberulent, the inflorescence glandular; branches very slender, angled; petioles very short, margined; blades to 5 by 2 cm., lanceolate, very abruptly contracted into a short petiole-like base and an abruptly short-acuminate and acute summit, thin, yellowish-green, above glabrous, beneath finely puberulent with appressed hairs and somewhat ferruginous, the venation slender, lightly prominent beneath, the secondaries 6 or 8 on each side; panicles terminating the branches, small and loosely fruited, the pedicels slender, 2 or 3 mm. long; sepals reflexed in fruit, 1.5 to 2 mm. long, lanceolate, acuminate, acutish; fruit 7 mm. long, mostly broader than long, strongly glandular, mostly bearing the short and slender recurved styles; the remains of a flower show a yellow petal, 7 mm. long, densely covered with red-brown glands.

Fruiting specimen collected by G. H. H. Tate at Chuquini, Bolivia, alt. 3000 ft., April 17 to 19, 1926 (No. 1128).

PASSIFLORA TATEI Killip & Rusby, sp. nov. Pilosula; caules trigoni; stipulae lineari-falcatae purpurascens; petioli eglandulosi; laminae oblongae et latiores apice truncato obsolete 2-3-lobato; pedunculis solitarii vel geminati graciles; bractae setaceae 2-3-fidae; flores circa 3 cm. lati; petala anguste linearia alba; corona biseriata exterior ligulata interior filiformis.

Herbaceous vine; stem trigonous, densely pilosulous; stipules narrowly linear-falcate, 7 to 10 mm. long, 0.5 mm. wide, purplish; petioles 1 to 2.5 cm. long, glandless, pilosulous; leaves oblong or suborbicular in general outline, 3.5 to 10 cm. long, 3 to 7 cm. wide, obsoletely 2- or 3-lobed at the truncate apex, rounded or shallowly cordate at base, entire, 3-nerved, subcoriaceous, lustrous and minutely puberulous above, dull red, densely pilosulous on the nerves and veins beneath; peduncles solitary or in pairs, 3.5 to 4 cm. long, slender; bracts dissitate, 6 to 9 mm. long, setaceous, deeply 2- or 3-cleft, purplish; flowers 2.5 to 3.5 cm. wide; calyx-tube broadly campanulate, 7 to 10 mm. wide at base; sepals linear or lanceolate, about 1.5 cm. long, 0.4 cm. wide, obtuse, greenish-white; petals narrowly linear, 7 to 9 mm. long, 1.5 mm. wide, obtuse, white; corona in two series, the outer narrowly liguliform, about 8 mm. long, the inner filiform, 2 to 3 mm. long; operculum closely plicate, about 1.5 mm. high, denticulate, incurved; nectary ring annular; limen cupuliform, about 2 mm. high; ovary globose, densely lanate-villose; fruit globose, seeds ovate-orbicular, transversely sulcate.

Type collected at Nequajahuira, Cordillera Real, Bolivia, alt. 2500 meters, May 15 to 24, 1926, by G. H. H. Tate (No.

654). This species has the general appearance of *P. bauginifolia* H.B.K., a species known only from the mountains of central Ecuador, and the two are obviously closely related. In *P. tatei* the bracts are deeply cleft; in *P. bauginifolia* entire; the calyx-tube is much broader in *P. tatei*, and the petals are narrowly linear, rather than ovate-lanceolate.

CAIOPHORA MACROPHYLLA Rusby, sp. nov. Breviter setosa pilis saepissime reflexis; caules volubiles cinereo-pubescentes; petioli basi abrupte dilatati et inter se connati; laminae ovatae cordatae pinnatifidae lobis utrinque circa 4; pedunculi volubiles; sepala pinnatifida quam petalis subtriplo brevioribus; stamina inaequalia.

Setose with short and weak, mostly reflexed prickly hairs; stems rather stout, twining, terete, gray-hairy; petioles (only the upper ones seen) 3 or 4 cm. long, the bases abruptly dilated and connecting, the upper surface narrowly and deeply channeled; blades to 14 by 9 cm., ovate, cordate, pinnatifid, the lobes about 4 on each side, ovate, acutish, irregularly and shallowly dentate, the sinuses obtuse or the upper acute, very thin, bright-green on both surfaces, sparsely setose on both surfaces, the setae very unequal, the veins beneath densely setose-pilose, the venation weak, coarsely reticulate; peduncle terminal, to 3 dm. long, stout, twining, retrorsely setose; sepals 1 cm. long, lanceolate, incisely pinnatifid, some of the teeth gland-tipped, bright-green, setose-pilose; corolla light-scarlet, setose-pilose, the petals 3.5 cm. long, broadly oval, very veiny; stamens numerous, unequal, some of them two-thirds the length of the petals, the filaments filiform, the anthers elliptic, about 1 mm. long; pistil not seen.

Collected by G. H. H. Tate at Pongo de Quime, Bolivia, alt. 12,000 ft., February 17 to March 1, 1926 (No. 185). The species is notable for its ample bright-green leaves and large handsome flowers.

BEGONIA SUBRECTANGULA Rusby, sp. nov. Caules cinerei papilloso; stipulae obtusae ovatae ex basi lata; folia tenuia late ovata abrupte et brevissime acutata, minute serrulata supra glabra subtus dense lepidota, costa a petiolo fere ad angulam rectam divergente, lobo basali rotundato in latitudine laminam propriam fere aequante.

Stems coarsely angled, gray, papillose; stipules sessile by a broad base, to 2 cm. long, 1 cm. wide, ovate, obtuse, entire, spreading or reflexed, thin and membranaceous, brown and veiny; petiole to 3 cm. long, slender, gray, nerved, lightly papillose; total length of blade 6 to 12 cm. by 3 to 6 cm. wide, the midrib nearly at right angles to the petiole and 4 to 8 cm. long, the main body of the leaf broadly ovate, very abruptly contracted into a short and acute point,

the basal lobe rounded, nearly as wide as the main portion, the sinus deep, broad, acute, the margin finely serrulate, the leaf thin, deep-green, glabrous, but densely lepidote on the lower surface, the venation slender, sharply prominent on both sides, the basal nerves about 9, one or two secondaries from the lower half of the midrib, strongly ascending, nearly straight; pedicels filiform, nearly 3 cm. long; staminate flower with sepals 2, subequal, broadly ovate, cordate, nearly 1 cm. broad, thin and petaloid, about 20-nerved, the nerves faint; petals none; stamens numerous, distinct or barely united at the base, the filaments filiform, scarcely 1 mm. long, the anthers linear-oblong, 2 mm. long, obtuse. The plant is apparently dioecious, no pistillate flowers being found.

Collected on the Ladew Expedition by G. H. H. Tate, May 15 to 24, at Nequejahuira, Bolivia, alt. 8000 ft. (No. 656). The species seems to be near B. sanguinea Raddi.

BEGONIA UNILATERALIA Rusby, sp. nov. Furfuraceo-tomentosa et ferruginea; stipulae lanceolatae acuminatae in caudam longum filiformem; folia oblique ovata, abrupte breviterque acuminata, margine irregulariter leviterque crenato-dentato, sinu basilari fere obsolete, costa a petiolo sub angulo circa 135° ; pedicelli elongati filiformes; petala exteriora sepala fere aequantia et valde simulantia, ovata et obtusa.

Scurfy-tomentose with short, thick, ferruginous hairs; stems very flexuous, coarsely angled, light-brown; stipules brown, thin and scarious, unequal, the longest about 12 mm. long, lanceolate from a broad base, acuminate and bearing a terminal filiform appendage, finely nerved; petiole slender, 3 or 4 cm. long, scurfy-tomentose; blades to 7 by 3 cm., the midrib 6 cm. long, meeting the petiole at an angle of about 135° , the blade obliquely ovate, the basal lobe rounded, the sinus almost wanting, the summit abruptly short-acuminate and acute, the margin irregularly and shallowly crenate-dentate, the teeth mostly acute, the leaf thin, sparsely scurfy on the veins above, scurfy-tomentose on the veins beneath, finely lepidote, the nerves about 9, from the base, with 2 or 3 secondaries ascending strongly from the midrib; inflorescence (only pistillate flowers seen) scanty and lax, the flowers on long filiform pedicels, the 2 outer sepals subequal, obliquely ovate, 1 cm. long, 6 mm. wide, obtuse, serrate, thin, nerved; petals of similar texture, unequal, the outer ones nearly equalling the sepals and much like them, the inner 3 lance-ovate, obtuse, entire or slightly serrate; ovary and its 2 larger wings ferruginous-tomentose, ovoid, 8 mm. long and nearly as broad, the largest wing 8 mm. long and broad, its upper margin nearly straight and almost horizontal with the surface of the ovary, obtuse at the end, whence it curves regularly to a point slightly be-

low the base of the ovary, the margin lightly dentate, the second wing 3 mm. wide at the summit, whence it narrows gradually and slightly, its lower end meeting the primary, along its inner margin is a narrow, brown, thickened line, the third wing is thin and hyaline, irregular and incomplete; styles 3, slightly united at the base, 5 mm. long, 2- or 3-cleft nearly to the base, the branches again cleft or variously branched, the branches nearly smooth, tortuous or sinuous, flattened, stout and tough, thickened upward, obtuse.

Collected on the Ladew Expedition by G. H. H. Tate at Nequajhuira, Bolivia, alt. 8000 ft., May 15 to 24, 1926 (No. 657).

PARSONSIA SATUREIODES Rusby, sp. nov. Glanduloso-pubes-cens, pilis patulis; rami graciles foliosi; folia opposita sessilia linearia acuta basi angustata integra glabra; pedicelli axillares solitarii graciles erecti, floribus reflexis; calyx infundibulariformis 6-costatus hispidus calcare brevi rotundato, dentibus 6 triangularibus.

Glandular-hairy; densely branched, the branches erect or ascending, slender, 5 to 10 cm. long, shortly and coarsely glandular-hairy, the hairs spreading or divaricate; leaves numerous, opposite, sessile, to 2 cm. long and 3 mm. wide, linear, acute, narrowed to the base, entire, glabrous, thickish, the midrib stout on the lower side, the venation obscure; pedicels solitary in the axils, slender, erect, about two-thirds the length of their leaves, slightly thickened upward; flowers more or less reflexed on the summit of the pedicel; calyx (in flower) about 5 mm. long, about 1 mm. wide at the summit, nearly straight, infundibular, about 6-ribbed, hispid, the basal sac very short and rounded, the teeth six, about one-sixth of the total length, triangular, acute, with acute sinuses, two teeth a little longer and each with a smaller tooth at the side; petals 6, red, subequal, 2 mm. longer than the calyx, adnate to its summit, oblanceolate, obtuse, the claw rather broad, the basal glands very small; stamens somewhat unequal, reaching to the base of the calyx-lobes, the anthers oval; seeds 6, 1.5 mm. long, irregularly oval, flattened.

Collected by G. H. H. Tate at Rio Chimate, Bolivia, alt. 1900 ft., April 10 to 14, 1926 (No. 541).

BRACHYOTUM BARBIFERUM Rusby, sp. nov. Scabrum et leviter strigosum; rami rubelli anguste 4-alati alis hispidis; ramuli infra nodos saepe setas glomeratas gerentes; folia lenceolato-oblonga apice obtusiuscula vel saepius apiculata.

Scabrous and somewhat short-strigose; branches red-purple, quadrangular, the angles narrowly winged, the wings hispid with short ascending hairs; branchlets bearing, on

the internodes or usually just below the petioles, occasional pairs of tufts or fascicles of coarse unequal setae; petioles of the pair often unequal, to 1.5 cm. long, slender, scabrous with short stout appressed hairs; blades to 6 by 2 cm., or narrower, lance-oblong with obtuse or acutish base and obtusish minutely apiculate summit, entire, thickish and rigid, 3-ribbed from the summit of the petiole, with a pair of secondary ribs from near the base of the outer ones, the ribs narrowly channeled on the upper surface, which is hispid in four bands between the ribs and near the margins, with five glabrous bands at and beside the ribs; ribs and secondaries prominent on the lower surface, the secondaries about 40, with smaller intermediate ones, widely spreading and strongly falcate to meet in a sinuous line between the ribs; panicles terminating short branchlets, very slenderly peduncled, their branches and branchlets strictly opposite, the rachis dilated at the point of branching; young buds ovoid, acute, the calyx-teeth acute; flowers not seen.

Collected by G. H. H. Tate at Copunco, Bolivia, alt. 10,000 ft., March 24 to 29, 1926 (No. 362, the type); also, without inflorescence, at the same time and place, No. 331.

PERNETTYA DENSA Rusby, sp. nov. Caules lignosi ramosissimi juventute leviter pilosi; folia sessilia basi angustata, coriacea oblonga obtusa crenulato-dentata; pedicelli fructiferi graciles divaricati; sepala rubella rigida quam fructu 5-lobato dimidio breviora.

Young stems sparsely short-pilose; stems woody, diffusely branched, the branchlets mostly 2 to 4 cm. long, densely crowded, very leafy, reddish; leaves sessile but with a narrowed petiole-like base, coriaceous, thick and rigid, oblong and obtuse, to 7 by 2 mm., pale-green above, reddish or ferruginous beneath and on the shallowly crenulate-dentate margins, the midrib very stout and prominent beneath, the secondaries erect or strongly ascending, crooked; flowers not seen; fruiting pedicels 2 to 4 mm. long, slender, spreading or mostly recurved, reddish; sepals puberulent, reddish, thick and rigid, about half the length of the fruit, ovate, acute; fruit above 4 mm. broad and shorter than its breadth, 5-lobed, glabrous or puberulent when young, the stout persistent style less than half the length of the fruit.

Collected by G. H. H. Tate at Copunco, Bolivia, alt. 10,000 ft., March 24 to 29, 1926 (No. 283). The species is apparently a shrub less than a foot high.

PERNETTYA SCHIZOSTIGMA Rusby, sp. nov. Rami numerosi erecti aut adscendentes nigrescentes breviter setosi; folia oblonga obtusa breviter obtuseque serrata; flores in axillis superioribus solitarii; stylus brevis superne incrassatus stigmate 5-lobato.

Much-branched, the branches short, slender, erect or ascending, somewhat crowded, blackish, sparsely clothed with short, stout bristles; leaves sessile, but having a very short petiole-like base, about 15 mm. long by 3.5 to 4 mm. wide, oblong, obtuse, the recurved margin serrate with short obtuse teeth, thick and rigid, pale-green, glabrous, the midrib and sometimes the veins impressed above, very strong and prominent beneath, the secondaries 3 or 4 on each side, erect or strongly ascending, very crooked, irregularly and sparsely anastomosing, sometimes with several bristly hairs on the midrib; flowers solitary in the upper axils, the peduncles about half as long as the leaves, angled, subulate-bracted, bristly; sepals 2 mm. long, ovate, spreading, thick and veiny, mucronate and acute; corolla white, 4 or 5 mm. long, two-thirds as wide, the teeth short, obtuse, recurved; filaments 2 mm. long, abruptly dilated and concave at the base, tapering upward, attached below the middle of the anther, which is less than 1 mm. long, broadly ovoid with a rounded base, slenderly 4-awned at the summit, the pores looking upward and slightly inward; ovary 2.5 mm. long and broad, green, the style a little larger, stout, thickened upward, the stigma shortly 5-lobed, the lobes spreading; fruit red, papillose, 1 cm. broad and not so long.

Collected by G. H. H. Tate, on the Ladew Expedition, at Pongo, Bolivia, alt. 12,000 ft., February 17 to March 1, 1926 (No. 198).

"Gaultheria martaensis Rusby" proves, on re-examination, to be a species of Pernettya, perhaps a form of P. Pentlandii DC.

VACCINIUM TATEI Rusby, sp. nov. In partibus juvenilibus minute puberulum; rami dense ramosi, ramulis adscendentibus rubellis; laminae quam petiolis recurvis vel tortis 5-plo longiores ovaes obtusae coriaceae subtus ferrugineae; pedicelli crassi quam fructu dimidio breviores.

Young portions minutely downy; stems densely branched, the branchlets ascending, slender, ferruginous or reddish, mostly 3 to 6 cm. long, densely leafy; petioles about 1.5 mm. long, mostly recurved or twisted, stout; blades 8 by 5 mm., oval, obtuse, coriaceous, shallowly sinuate-dentate (or entire toward the base), pale-green above, ferruginous beneath, the venation faintly impressed above, stout and prominent beneath, the secondaries 3 to 5 on each side, crooked, uniting to form a line near the margin; fruits few at the summit of the branchlets, purple, the pedicels stout, crooked, less than half the length of the fruit, which, in the dried state, is 3 or 4 mm. in diameter, globose; calyx-teeth short and broad, acute.

Collected by G. H. H. Tate at Pongo, Bolivia, alt. 12,000 ft., February 17 to March 1, 1926 (No. 199). The species is

apparently a low, much-branched shrub.

RAPANEA DENTICULATA Rusby, sp. nov. Subglabra; ramuli cicatricibus foliorum asperati; folia sessilia oblonga vel oblanceolata margine revoluta et prope basin denticulata, glabra rugulosa; sepala quam fructu dimidio breviora triangulari-ovata adpressa.

Subglabrous; branchlets short, stout, coarsely and irregularly angled, roughened with sharply projecting leaf-scars; leaves sessile, but with narrower petiole-like bases, from 7 by 3 cm. to 10 by 4 cm., oblong or mostly slightly oblanceolate, acute, the margin sharply revolute, minutely denticulate, increasingly so toward and upon the petiole-like base, thick and rigid, sometimes slightly scurfy on the midrib above, otherwise glabrous, but the extremely fine wrinkles resembling trichomes or papillae; midrib slightly impressed above, prominent beneath, the rest of the venation lightly prominent above, the secondaries about 15 on each side, slender, crooked; bracte triangular-subulate, thick and rigid; flowers not seen; fruiting-calyx closely appressed, the sepals thick and rigid, keeled, nearly half the length of the fruit, triangular-ovate, acute; fruit sessile, about 5 in a cluster, mostly 5 mm. long and 4 mm. wide, oval, tipped with the strong style-base, brown, faintly nerved, finely wrinkled-papillose.

Collected by G. H. H. Tate, on the Ladew Expedition, at Rio Aceromarco, Bolivia, alt. 10,800 ft., May 24 to 28, 1926 (No. 706). The species is peculiar in its denticulate leaf-bases. It is near *R. latifolia* (R. & P.) Mez, but the fruit characters and the denticulation of the leaf are very different.

GENTIANA TATEI Rusby, sp. nov. Glabra; caules graciles erecti simplices foliosi; folia basalia oblanceolata basi angustata obtusa, caulina a basi amplexente sensim ad apicem angustata; cymae sessiles pauciflora vel multiflora, pedicellis brevibus confertis anguste 4-alatis; calyx quam corolla dimidio brevior, lobis quam tubo duplo longioribus; corollae tubus quam lobis latis rotundatis duplo longior.

Glabrous; stems slender, erect or ascending, simple, 15 to 30 cm. long, leafy; root-leaves 2 cm. or more long, 3 or 4 mm. wide, oblanceolate, obtuse, tapering gradually to the base, the stem-leaves sessile with clasping base, from which they taper gradually and regularly to the summit, which is either acute or obtuse, mostly about 2 cm. long, narrowly linear, very thin, finely 7- to 9-nerved, those at the base of the cymes being relatively broader; cymes simple or corymbose, several- to many-flowered, sessile, the pedicels 8 to 12 mm. long, slender, slightly thickened upward, 4-angled, the angles bearing narrow membranous hyaline marg-

ins; flowers 13 to 17 mm. long, about 1 cm. broad at the mouth; calyx a little more than half the length of the corolla, divided two-thirds of the way, the tube broadly campanulate, 8-nerved, the sinuses broad and obtuse or rounded, the lobes triangular and tapering regularly from the base to the acute summit, apparently pale-green; corolla campanulate, apparently white, pink, or possibly yellowish, lobed a third of the length, the lobes very broad and rounded, entire, minutely apiculate, without folds in the sinuses; stamens nearly equalling the corolla, attached at its base, distinct, the filaments stout, broad and flattened, attached broadly to the lower half of the blackish anther, which is 1 mm. long, ovate, and obtuse; pistil equalling the corolla, the ovary lanceolate, the style very short, the stigmas small, strongly recurved.

Collected by G. H. H. Tate at Alaska Mine, Bolivia, alt. 13,700 ft., March 1 to 4, 1926 (No. 65).

DURANTA RECURVISTACHYS Rusby, sp. nov. Partes juveniles pubescentes; ramuli divaricati aut recurvi, racemi vel paniculae terminales recurvi; folia ovalia vel ovata, abrupte acuteque angustata, in basin petioloideum abrupte contracta, serrata; pedicelli brevissimi reflexi vel torti; corollae tubus quam calyce duplo longior.

Inflorescence, younger portions, etc., pubescent; branches stout, terete, the branchlets divaricate and somewhat recurved, the supra-axillary spines very short, stout, straight, pungent; stem-leaves to 8 by 5 or 6 cm., oval or ovate, very abruptly, shortly, and acutely pointed at the summit and very abruptly contracted into a petiole-like base about 1 cm. long, coarsely serrate with short and broad mucronate teeth, rather thick, deep-green and sparsely and obscurely pubescent above, where the slender venation is very lightly impressed, the lower surface yellowish-green, pubescent on the veins, which are yellowish, slender, and prominent, the secondaries about 5 on each side, falcate and somewhat crooked; leaves of the branchlets mostly 5 by 2 cm., oval, abruptly short-acuminate at both ends, acute, entire or with a few obscure teeth, otherwise like the stem-leaves, but more pubescent; inflorescence either simple, slender, loosely flowered, recurved racemes or panicles terminating the branchlets, their branches similarly racemose, nodose where the flowers or fruits have fallen, some of the flowers subtended by very small lance-linear acute bracts; pedicels very short, mostly reflexed or twisted; calyx about 6 mm. long, the teeth about 1 mm. long, erect, subulate; corolla-tube twice the length of the calyx, the exerted portion strongly recurved, the limb abrupt, 8 to 10 mm. broad, the lobes reflexed; fruit 1 cm. long and nearly as broad, ovoid, mucronate, brown, somewhat shining.

Collected by M. Bang in Bolivia, probably near Cochabamba (No. 1798) and distributed as *D. Plumieri* Jacq., but certainly not that species. Buchtien's No. 314, collected in South Yungas, at an altitude of about 7000 ft., June 12, 1906, "a shrub of 4 or 5 meters", is probably of this species. Specimens collected by G. H. H. Tate at Okara, alt. 7500 ft., April 26 to 29, 1926 (No. 910), apparently represent a distinct and undescribed species, but flowers are wanting. The branch-leaves have slender petioles 1 to 1.5 cm. long, the young growth is ferruginous-tomentellous, the pedicels are slender, and the fruits are as broad or broader than long and more strongly and stoutly beaked.

LANTANA TENUIFOLIA Rusby, sp. nov. Strigosa; aculei parvi graciles acuti recurvi; rami graciles adscendentes; folia petiolata ovata acuta, utrinque breviter acuminata, pilis albidis adpressis ex basibus bulbosis viridibus vestita; pedunculi elongati graciles erecti; capitula lata densiflora arcte involucreta; flores strigosi.

Armed with small, slender, recurved, pungent prickles and more or less strigose throughout; stems elongated, irregularly angled or sulcate above, the branches elongated, strongly ascending; petioles to 2 cm. long, grooved above; blades (which turn black in drying) to 10 or 12 by 5 cm., ovate, very abruptly short-acuminate at both ends, acute, irregularly and finely crenate-dentate, the teeth short, obtuse or acutish, the sinuses narrow and acute, thin, deep-green, strigose with stiff, appressed, white hairs, each from a large bulbous green base, the venation lightly prominent beneath, the secondaries about 8 on each side, ascending at about 45°, little curved; peduncles to 15 cm. long, erect or strongly ascending, very slender; heads to 2 or 3 cm. broad, densely flowered, strongly involucreta by a circle of closely appressed reduced leaves; flowers strigose, about 1 cm. long, the tube contracted to about half its diameter near the limb.

Collected by H. H. Rusby in the Bopi River valley, Bolivia, alt. 3000 ft., September 11, 1921 (Mulford No. 653, the type) and by G. H. H. Tate at Mapiri, alt. 2000 ft., March 30 to April 9, 1926 (No. 469). The species is very near *L. tiliaefolia* Cham.

HEDEOMA ADSCENDENS Rusby, sp. nov. Cinereo-puberula et asperula, pilis crassis albidis; caules graciles decumbentes, ramis numerosis erectis; folia ovata obtusa obtuse dentata basi rotundata; pedicelli brevissimi; calyx longe pilosus.

Gray-puberulent and roughish, with short, stout, white, divaricate hairs; stem slender, more or less decumbent, diffusely branched, the branches erect, 3 to 5 m. long, the

internodes mostly longer than the leaves; petioles 1 to 1.5 mm. long; blades to 4 by 3 mm., ovate, with rounded base and blunt summit, thickish, shallowly and obtusely dentate, the venation coarse and stout, the secondaries about 3 on each side; flowers mostly solitary in the axils of the upper leaves, some of these reduced to bracts; inflorescence white-pilose with rigid hairs; pedicels about 1 mm. long; calyx-tube 2.5 mm. long, infundibular, the lower half turgid, strongly ribbed, the limb divided nearly to the base, the teeth long-pilose, subulate and very acute, subequal, the lower somewhat longer; flowers not seen.

Collected by G. H. H. Tate on the Tipuani-Ancona-Sorata trail, alt. 13,000 ft., April 30, 1926 (No. 783).

SOLANUM TENUISPINUM Rusby, sp. nov. Aculeatus setosum et glanduloso-pilosum; aculei flavescentes elongati graciles acutissimi infra medium glanduloso-pubescentes; setae albiae graciles; petioli elongati; laminae late ovatae obtusae vel subacutae, dentibus magnis vel lobis utroque latere 2 vel 3, basi truncata vel subcordata; calyx setosus.

Branches, petioles, peduncles, and pedicels spiny, bristly and glandular-hairy; spines yellowish or light-brown, elongated, slender and very pungent, mostly divaricate, mostly a little compressed laterally at the base, and bearing, especially below the middle, short-glandular hairs, which are also borne on the stem and elsewhere; bristles whitish, slender; branches slender, very flexuous, green, irregularly angled; petioles to 8 cm. long, widely spreading, green-sulcate or angular; blades to 14 cm. long and nearly as wide, ovate, the blade somewhat oblique and truncate or subcordate, obtuse or acutish, with 2 or 3 large triangular teeth or lobes on each side, which are obtuse or acutish, the sinuses obtuse or rounded, the margin ciliate, very thin, deep-green above, bright-green beneath, the veins on both surfaces sparingly spiny, both surfaces more or less bristly and minutely and sparsely stellate-hairy among the bristles, the venation slender, prominent beneath, the secondaries 5 or 6 on each side, the finer venation coarsely reticulate; cymes umbelliform, few-fruited, the peduncle shorter than the pedicels, opposite and below the petiole, all the stems long-hispid and glandular, the pedicels regularly thickened upward; calyx bristly, parted nearly to the base, the lobes about 5 mm. long, narrowly lanceolate, acuminate and acute, subcarinate; fruit spherical, glabrous, light-brown, 1 cm. in diameter.

Collected by G. H. H. Tate, on the Ladew Expedition, at Nequejahuira, Bolivia, alt. 8000 ft., May 15 to 24, 1926 (No. 662). The species is near *S. atropurpureum* Schrenk.

BARTSIA ALTISSIMA Rusby, sp. nov. Albido-hispida; caulis

altus crassus sed debilis rubellus, ramis numerosis brevibus; folia amplectentia divaricata oblongo-lanceolata obtusa crassa crenato-dentata, ad basin latissima; flores in axillis superioribus sessiles; calycis tubus late campanulatus lobis triangulari-ovatis obtusis.

Hispid with short, stout, white, glistening hairs, many of which are branched at the base, or 2 or 3 from the same base; stem (of my specimen) nearly 7 dm. long, stout, but weak, reddish, strongly sulcate and obtusely angular, the branches numerous, short; leaves sessile and clasping, divaricate or somewhat deflexed, to 2 cm. long, broadest at the base, which is sometimes nearly half the length, lance-oblong, obtuse, gray-green, densely hispid, thickish, crenate-dentate with short obtuse teeth and acute sinuses, the midrib and secondaries very strong and keel-like on the lower surface, the secondaries 4 or 5 on each side, strongly ascending; flowers few, solitary and sessile in the upper axils, unexpanded in my specimen, the calyx broadly campanulate, the tube 4 mm. long and broad, the lobes triangular-ovate, obtuse, the longer about 2 mm. long; dissection material wanting.

Collected by G. H. H. Tate, on the Ladew Expedition, at Pongo, Bolivia, alt. 12,000 ft., February 17 to March 1, 1926 (No. 222). The species is very near *B. mutica* Benth. and *B. hispida* Benth., but is much more hispid than either and the hairs are different.

BARTSIA GUGGENHEIMIANA Rusby, sp. nov. Cinereo-hispidula; caules caespitosi ex caudice crasso foliosissimi; folia sessilia valde revoluta oblonga obtusa leviter crenata, basi angustata; pedicelli brevissimi graciles; calycis tubus cupulatus, dentibus rotundatis carnosoincrassatis; corolla recta pubescens, tubo gracili.

Minutely grayish-hispidulose; stems caespitose, branching from a short and stout caudex, the branches 3 or 4 cm. long, stout, ascending, very densely leafy; leaves sessile, 5 or 6 mm. long, about 2 mm. wide when flattened out, but revolute and appearing narrower, oblong, obtuse with a narrowed base, the margin revolute, shallowly crenate, deep-green; pedicels very short, slender; calyx-tube cupulate, 4 mm. long, 2.5 mm. wide, the 2 longer lobes 1 mm. long and broad, the 2 smaller ones about two-thirds as large, all rounded, of a deeper green than the tube, fleshy-thickened; corolla straight, pink (?), pubescent, the tube slender, 4 mm. long, the limb slightly shorter, its longer lip more than twice the length of the shorter and several times larger; stamens at length slightly exerted, the summit recurved, the anthers broadly oval, the thecae mucronate at the base; style filiform, about twice the length of the calyx, sigmoid-curved, the stigma oval, obtuse, somewhat ob-

lique; capsule (immature) broadly ovoid, with a rounded summit.

Collected on the Ladew Expedition by G. H. H. Tate at Alaska Mine, Pongo, Bolivia, alt. 13,500 ft., March 1 to 4, 1926 (No. 64).

CALCEOLARIA CRYPTANTHA Rusby, sp. nov. Ubique tomentosa; rami graciles recurvi; petioli breves graciles; laminae ovatae acutae basi truncatae crenato-dentatae dentibus mucronulatis, supra puberulae, subtus cinereo-tomentellae; calyx latus sepalibus fere distinctis et aequalibus subtrinervis; corolla tomentella labio parviore poculiforme.

Habit unknown, apparently herbaceous and erect, with slender recurved branches; shortly tomentose throughout; branches strongly, irregularly, and obtusely angled; petiole to 5 mm. long, slender; blades to 3 by 2 cm., ovate with a truncate or lightly cordate base, acute, crenate-dentate with acute or mucronulate teeth, thin, deep-green and puberulent above, gray-tomentellous beneath, with the slender venation prominent, lightly falcate-ascending; inflorescence somewhat crowded at the ends of the short branchlets, the pedicels slender, at length 1.5 to 2 cm. long; calyx nearly 2 cm. broad, the sepals nearly distinct, broadly oval, mucronate, veiny, sub-trinerved; corolla yellow, tomentellous, the larger lip 13 mm. long and broad, nearly circular (as pressed), the claw very short, the smaller lip 3 mm. long and 4 mm. broad, cup-shaped, the stamens partially concealed in it; anthers 3.5 mm. broad, the thecae short and broad, divaricate from a broad base, confluent; style stout, equaling the anthers.

Collected on the Ladew Expedition by G. H. H. Tate at the top of the pass Tipuani to Sorata, alt. 14,000 ft., April 30, 1926 (No. 819).

CALCEOLARIA LECHIOIDES Rusby, sp. nov. Ubique cinereo-tomentello; caules lignosi rubelli ramosissimi, ramis adscendentibus foliosis; petioli breves crassi; laminae crassiusculae ovatae obtusae crenato-dentatae basi rotundatae; pedicelli brevissimi; calyx 1 cm. latus lobis late ovatis obtusis quam tubo duplo longioribus.

Gray-tomentellous throughout; stems woody, erect or ascending, reddish, much-branched, the branches short, ascending, very leafy; petioles nearly 1 mm. long, rather stout, the blades to 6 or 7 mm. long, 3 mm. wide, ovate, with a rounded base and obtusish summit, strongly crenate-dentate, with 4 or 5 teeth on each side, thickish, the venation impressed on the upper surface, stout and prominent underneath, the upper surface gray, the lower somewhat ferruginous; flowers racemose at the summit, the pedicels very short; calyx 1 cm. broad, divided two-thirds to the base,

the lobes broadly ovate, obtusish, thick, one distinctly broader than the others; corolla tomentose, yellow, 12 mm. long, 1 cm. broad, unopened in my flower; dissection material wanting.

Collected on the Ladew Expedition by G. H. H. Tate at Pongo, Bolivia, alt. 12,000 ft., February 17 to March 1, 1926 (No. 220).

CALCEOLARIA RIBESIAEFOLIA Rusby, sp. nov. Albido-pubescent; rami angulati et sulcati valde adscendentes; petioli suberecti; laminae triangulari-ovatae acutae paullo trilobatae grosse dentatae, basi subcordatae; pedicelli filiformes; sepala fere aequalia fere 1 cm. longa, ovata, acuta, quam corolla dimidio brevior.

Pubescent, with short white divergent hairs, the upper leaf-surfaces strigillose; stems and branches erect or strongly ascending, strongly angled and sulcate, my specimen 8 dm. high; leaves opposite, the petioles nearly erect, slender, to 5 cm. long, slightly dilated at the base, channeled above; blades 6 or 7 cm. long and broad, triangular-ovate, with a broadly truncate or subcordate base and an acute summit, sub-3-lobed, coarsely and unequally dentate with triangular acute teeth and acute or obtuse sinuses, very thin, the upper surface deep-green and rather sparsely short-strigose, the hairs stout, white, and glistening, the lower surface pale-green, grayish-pubescent, 5- to 7-nerved from the base or near it, the venation weak and not conspicuous; flowers few, loosely corymbose at the summit, the pedicels filiform; sepals sub-equal, the largest nearly 1 cm. long, broadly ovate, acute, densely pubescent; large lip of corolla 2 cm. long, the claw 3 mm., the sac 1 cm. broad; smaller lip of corolla 5 mm. long and broad; anther cells oval, turgid, 2 mm. long, 1.5 mm. wide, contiguous, nearly horizontal, confluent.

Collected on the Ladew Expedition by G. H. H. Tate at Pongo, Bolivia, alt. 12,000 ft., February 17 to March 1, 1926 (No. 219).

ARCYTHOPHYLLUM NODOSUM Rusby, sp. nov. Subglabrum; caules crassi; rami numerosi erecti graciles, nodis incrassatis et e foliis delapsis alte foveolatis; stipulae scariosae adpressae triangulares apice 2-3-setosae; folia demum recurva acuta breviaristata ex basi rotundata lanceolata.

Nearly glabrous; stems stout, erect, much-branched, the branches erect, slender, swollen at the nodes, which are deeply pitted where the leaves have disarticulated, the branchlets light-brown, sharply angled and clothed with the stipules; stipules scarious, strongly appressed, distinct or nearly so, triangular, 2 to 2.5 mm. long and mostly a little broader, bearing 2 or 3 slender terminal setae about of

their own length; leaves sessile, densely crowded, spreading and at length recurved, deep-green and shining above, apparently evergreen, at length turning brownish before falling, to 9 by 3 mm., lanceolate with a rounded base and an acute short-aristate summit, the middle portion much thickened, the margin somewhat thickened and deep-green against the yellowish lower surface; flowers few in the upper axils, subsessile, the calyx 5 mm. long, parted nearly to the base, the calyx-lobes closely resembling the leaves; corolla-tube 7 or 8 mm. long, 1.5 mm. wide, the lobes 3 mm. long, broadly ovate, acute, the corolla somewhat coriaceous; stamens attached near the summit of the tube, the filament slender, the anther 1 mm. long, oblong, slightly exerted; ovary very small, the style very short.

Collected by G. H. H. Tate at Cocopunco, Bolivia, alt. 10,000 ft., March 24 to 29, 1926 (No. 367). The species is very near to *A. flavescens*, but is well characterized by its swollen pitted nodes and its stipules, as well as by the crowded foliage and the leaf-characters.

EVEA RADIATA Rusby, sp. nov. Glabra; ramuli graciles nigrescentes, nodis incrassatis persistentes imbricatas truncatas gerentibus; petioli graciles; laminae oblongae vel oblanceolatae, basi subacutae, apice breviter acuminatae et acutae; cyma terminalis, pedunculo gracili nigrescente, ramuli cymae bracteis 4 parvis ovatis acutis subtenti.

Glabrous; branchlets slender, blackish, the internodes short, the nodes swollen and bearing the persistent stipules, which are interpetiolar, distinct but mostly imbricate at the base, 4 mm. long and broader, thick, truncate and sometimes bearing one or more short awns; petioles about 1 cm. long, slender, somewhat dilated at the base; blades to 15 by 6 cm., oblong or oblanceolate with an acutish base and an abruptly short-acuminate or mucronate acute summit, rather thin but coriaceous, the slender venation lightly prominent beneath, the midrib narrowly margined on the lower side, the secondaries very numerous, the alternate ones smaller, divaricate and the outer portions falcate to meet in a strictly marginal line, loosely connected by the tertiaries; cyme terminal, long and slenderly peduncled, the peduncle blackish, angled, the branches subtended by four small ovate acute bracts, the branches (4 in my specimen) about a third as long as the peduncle, slender, spreading, each terminating in a small head of 2 to several flowers, bracted like the cyme; fruits sessile or subsessile, about 1 cm. long and nearly as broad, ovoid, blackish, the persistent calyx-limb light-colored, 2 or 3 mm. long and about as broad, truncate or obscurely toothed, the summit a little broader; flowers not seen.

Collected by G. H. H. Tate at Ticunhuaya, Bolivia, alt.

5000 ft., April 20 to 24, 1926 (No. 1103). The foliage is closely similar to that of E. pectinata, but is thinner, and the species is well distinguished by its long peduncle and branches of the eyeme.

GALIUM CHAROIDES Rusby, sp. nov. Ubique scabrum pilis conicis, verisimiliter annuum; caules graciles adscendentes ex basi ramosi 4-angulati vel anguste alati foliosi; folia 8 in quoque verticillo sessilia inaequalia linearia acute albidomucronata, margine dense scabra; flores parvi axillares solitarii; fructus hispidus.

Scabrous throughout, with short, conical, divaricate or ascending trichomes; apparently annual, the stems slender, to 30 cm. tall, much branched at the base, ascending, 4-angled or very narrowly winged, very leafy; verticils mostly 8-leaved, the leaves sessile, very unequal, the longest to 15 mm. long, spreading or often recurved, linear and the uppers ones somewhat broader, acutely mucronate with a white point, obscurely 3-nerved, the margins densely scabrous with the white trichomes above described; flowers few, very small and solitary in the axils, the fruiting pedicels at length to 1 cm. long; fruit 1 mm. long and nearly 2 mm. broad, emarginate at the base and summit, the carpels nearly rotund, hispid, the hairs more slender than the others on the plant.

Collected by G. H. H. Tate, on the Ladew Expedition (No. 234), at Pongo, Bolivia, alt. 12,000 ft. The species is near G. pseudoaparine Griseb.

(a) A limited number of reprints of this article are available, and will be sent postpaid on receipt of fifty cents each. To those ordering copies of my "Three Hundred Species of South American Plants", at \$2.50, the present contribution will be sent without charge.