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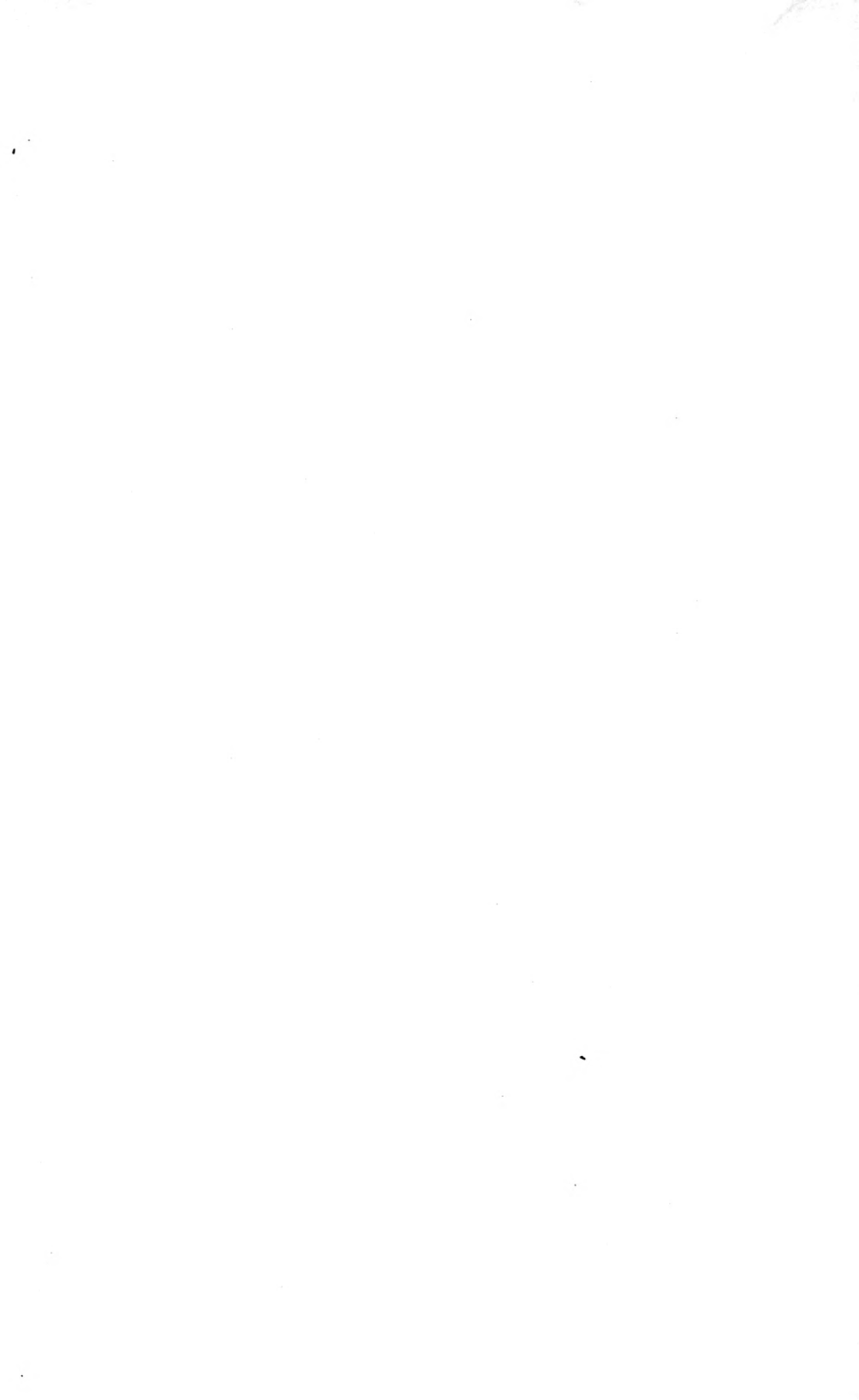
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CONTRIBUTIONS TO THE
FLORA OF SOUTH AMERICA

STUDIES ON ANDEAN COMPOSITAE—II
STUDIES IN SOUTH AMERICAN PLANTS—III

JOSÉ CUATRECASAS

1951

FIELDIANA: BOTANY

VOLUME 27, NUMBER 2

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INTRODUCTION

The second instalment of this series includes descriptions of new species and comments concerning the taxonomic status of Andean Senecioneae. The material used in this study represents collections found in the Herbarium of Chicago Natural History Museum, United States National Herbarium (Smithsonian Institution), New York Botanical Garden, and Gray Herbarium. I want to express my sincere thanks to the curators of these institutions for having given me the opportunity to study these interesting plants.

Some synonyms and new combinations presented in this paper are necessitated by the transfer of the species of *Culcitium* to *Senecio* proposed by me in the first part of this series (same vol. pages 43-51). Several new names published in that paper are herewith corrected.

In a first attempt to classify the Andean Senecios in natural subdivisions, it was necessary to create new sections for a better understanding of the genus as found in that area and to redefine three sections I had established previously. The new sections described below are: *Ledifolium*, *Abietoides*, *Vacinioides*, *Arbutoides*, *Ericoides*, *Triana*, *Granata*, *Macbrideus*, *Praegynoxys*, *Paragynoxys*, *Dendrophorbium*, *Hypsobates*, and *Culcitiopsis*. Sections *Reflexus* Cuatr., *Culcitium* (HBK) Cuatr., and *Latiflorus* Cuatr., are redefined.

The paper begins with descriptions of new species of *Gynoxys* (mostly Peruvian and Bolivian). These are followed by an account of *Senecio* in northern South America (mostly Colombia), by miscellaneous nomenclatural and taxonomical notes, and by new or noteworthy species of *Senecio* from Peru and Bolivia. The new sections are treated at the end. The arrangement of the species is according to their taxonomic affinities. This manuscript was finished in November 1950.

STUDIES ON ANDEAN COMPOSITAE-II

Gynoxys subamplectens Cuatr., sp. nov.

Frutex ramosus vel scandens. Ramuli tortuosi terminales tomentulosi demum glabrati.

Folia opposita coriacea breviter petiolata. Petiolus 2-4 mm. longus dense tomentosus. Lamina late lanceolata basi lata rotundata profunde emarginata apice acuta mucronata, margine subintegra, remote mucronato-dentata, 5-9 cm. longa, 1.3-3 cm. lata, supra glaberrima viridis subnitens, costa bene signata, nervis lateralibus ascendentibus cum nervulis venulisque elevatum reticulum formantibus; subtus adpresse tomento luteolo vel cinerascens obtecta, nervis mediano prominenti lateralibus 8 paribus ascendentibus et nervulis paulo conspicuis.

Inflorescentiae terminales basi foliosae cymoso-paniculatae floribundae. Ramuli dense hirtulo-tomentosi inferiores plus minusve curvati. Bractee lineares vel lanceolatae 10 mm. longae, sursum 4 mm. longae subtus tomentellae, supra glabratae. Pedicelli teneres usque ad 12 mm. longi, plus minusve flexuosi dense hirsuto-tomentosi apicem versus 1-2 bracteis apice 4-5 bracteolis anguste linearibus 1-2 mm. longis hirsutulis ad modum calyculum dispositis.

Capitula radiata (4-6 ligulis, 13-17 tubulis). Involucrum campanulatum saepe 8 bracteis 6 mm. longis, exterioribus elliptico-oblongis acutis 1.5 mm. latis extus tomentellis, interioribus ovato-ellipticis 3 mm. latis margine glabra late scariosa tantum dorso medio tomentello-puberulo omnibus apicem versus violaceo-rubescens glabratis.

Flores feminei ligulati lutei circa 11 mm. longi, tubo corollae 3-4.5 mm. longo apicem versus sparse piloso vel glabrato, lamina elliptica vel elliptico-oblonga circa 7 mm. longa 2-3 mm. lata 4 nerviis notatis, tridentata. Flores centrales hermaphroditi tubulosi lutei 7-8 mm. longi glabri, tubulo 2.5-3.5 mm. longo angusto, limbo tubuloso-campanulato apice profunde 5 dentato dentibus acutis; antheris 3.2 mm. longis; rami stigmatici apice conici caudato-penicillati. Ovarium glabrum. Pappus stramineus 7-8 mm. longus pilis sericeis hirtulo-scabridis.

Type: Peru, Depart. Cuzco: Paso de Tres Cruces, Cerro de Cusilluyoc 3800-3900 m. alt., bushy banks of paramo, collect. F. W. Pennell 13825. "Climbing shrub, flowers yellow." (F., US.) *Cotype*, same place: Pennell 13853. (F., US.)

Gynoxys subamplectens is easily distinguished by its almost sessile leaves which are emarginate and amplexicaul. The inflorescence is dense and large, the phyllaries are fairly tomentose, large and violaceous toward their tips. The ligules often bear a rudimentary superior lip.

Gynoxys Metcalfii Cuatr., sp. nov.

Suffrutex 1.4 m. alta, ramis plus minusve flexuosis, ramuli subtetragoni striati tomentosi vetustioribus gradatim glabratis.

Folia opposita subcoriacea petiolata. Petiolus circiter 12 mm. longus robustus curvatus supra sulcatus infra striatus tomentosus. Lamina ovato-oblonga basi profunde emarginato-cordata apice angustata obtusiuscula abrupte breviterque mucronulata; margine laevis vel obsolete repando-denticulata, 12.5 cm. longa, 5-6 cm. lata; supra viridis juventutis sparse pilis munita, demum nervo medio impresso hirsutulo excepto glabrata, nervis secundariis circa 12 utroque letere prominulis nervulis tertiis reticulatis conspicue elevatis; subtus ochraceo-viridula, crasso tomento laxo lanato induta, nervo medio elevato, secundariis plus minusve manifestis reliquis obsoletis.

Inflorescentia cymoso-paniculata terminalis tantum basi foliosa, foliis valde brevibus (ad 2-3.5 cm. longis). Ramuli angusti erecti vel parce flexuosi, crispo-hirsutulo-tomentosi, bracteis lanceolatis, superne anguste linearibus 3-5 mm. longis tomentellis flexuosis muniti. Pedicelli subteneres 7-18 mm. longi 2-4 bracteis munitis et apice 3-4 alteras bracteolas ad modum calyculum dispositas ferentes.

Capitula radiata plerumque 6 ligulis, 16 tubulis. Involucrum tubuloso-campanulatum 8 bracteis biseriatis 8 mm. longis, exterioribus oblongis acutiusculis 2 mm. latis laxe floccoso-hirtulo-tomentellis, interioribus elliptico-oblongis, 3 mm. latis tantum dorso tomentellis marginibus late scariosis glabris. Flores feminei flavi ligulati, 17-18 mm. longi, tubulo capillari 6 mm. longo glabro lamina elliptico-oblonga circa 12 mm. longa 4-4.2 mm. lata apice abrupte breviterque 3-dentata, 4 nervis conspicuis. Flores centrales hermaphroditi tubulosi lutei, corolla 9 mm. longa glabra, tubulo 4.5 mm. longo limbo tubuloso ampliato, dentibus lineari-triangularibus 1 mm. longis. Stylus exsertus stigmatibus conicis elongato-penicillatis. Ovaria glabra, pappis circa 10 mm. longis stramineis pilis sericeis hirtulo-scabridis.

Type: Peru: Dept. Puno, prov. Sandía: near Limbani, 3200-3450 m. alt., moist shaded places, rocky soil, much fog. On mountain-side, collect. R. D. Metcalf 30529. "Perennial herb 1.4 met. bracts yellow-green, brown at tips; ray and disc fls. yellow." (US.)

Gynoxys Metcalfii is characterized by its cordate, subamplexicaul leaves borne on short petioles. It differs from *G. subamplectens* by the softer and abundant tomentum on the lower surface of its leaves, by the longer hairs on its inflorescence, larger, oval leaves, longer petioles and pedicels, and larger involucre and flowers.

Gynoxys huasahuasis Cuatr., sp. nov.

Frutex scandens, ramis terminalibus flexuosis leviter striatis glabris vel subglabris.

Folia chartacea opposita petiolata. Petiolus 6-12 mm. longus, teneris pubescens vel glaber. Lamina ovata basi profunde cordata apice angustata acuta, marginibus crenato-dentata, 4-5.5 cm. longa,

2-3 cm. lata; utrinque viridis, supra nervo medio paulo impresso puberulo excepto, glabra, nervis lateralibus parce conspicuis nervulisque reticulum minutum depressum formantibus; subtus minutissime puberula, costa eminenti, nervis lateralibus 5-6 utroque latere prominulis, nervulis paulo prominulis reticulatis.

Inflorescentia pluriflora terminalis cymoso-paniculata, ramulis brachiatis pubescentibus. Bracteis linearibus angustis ciliatis 2-4 mm. longis. Pedicelli graciles 5-10 mm. longi puberuli, apice 5-6 bracteolis linearibus acutis 2-3 mm. longis ad modum calyculi. Capitula radiata. Involucrum 13 bracteis oblongis apice acutatis glabris viridibus in sicco pallescentibus, 5.5-6 mm. longis, 1.5 mm. latis. Flores marginales feminei ligulati circa 7, corolla lutea, tubulo 3.5 mm. longi, lamina 5-6 mm. longa, 2 mm. lata. Flores disci hermaphroditi circa 18, corolla lutea 7.5-8 mm. longa, tubulo 3 mm. limbo campanulato 5-dentato, dentibus papillosis 1 mm. longis. Antherae basi obtusae. Stigmata apice subtruncata. Ovarium glabrum. Pappus sordido-albidus.

Type: Peru: Dist. Huasahuasi, 2900 m. alt. Bushy plant growing in the ravine. Leaves middle-tone green. Fl. yellow. Does not seem to be common. Collect. 29-IV-1940 Felix Woytkowski 37. (F.)

Gynoxys huasahuasis is closely related to *G. Vargasi* Cabrera but differs by being glabrate and having shorter, ovate-acute, irregularly dentate leaves which have fewer nerves, shorter ligules, and longer pedicels. According to the original description, the branchlets and lower side of the leaves of *G. Vargasi* are ochraceous tomentose.

***Gynoxys Macfrancisci* Cuatr., sp. nov.**

Frutex ad 2 m. alt., ramis flexuosis terminalibus cinereo adpresseque tomentosus.

Folia opposita subcoriacea petiolata. Petiolus 2-4 cm. longus, erectus vel flexuosus striatus supra sulcatus, adpresse tomentosus. Lamina ovato-oblonga vel ovato lanceolata, basi truncata vel emarginato-rotundata asymmetrica, apice angustata acutiuscula, margine remote mucronato-dentata, 10-15 cm. longa, 25-55 cm. lata; supra nervo medio impresso puberulo reliqua glabra nervis secundariis patulis prominulis, nervulis venulisque in minutum reticulum argute elevatum anastomosantibus; subtus pallide viridi-cinerea tomento pilis crispo-lanatis densis adpressis omnino tecta, costa prominenti, nervis secundariis 10-14 utroque latere patulis marginem versus arcuatis anastomosatis plus minusve prominulis, reticulo nervulorum laxo paulo visibili vel inconspicuo.

Inflorescentiae cymoso-paniculatae compositae terminales valde floriferae plus minusve flexuosae basi foliatae, ramis adpresse tomentosus cinereis, erectis vel flexuosis. Bractae numerosae ovato-lanceolatae hirtulo-tomentosae 20-10 mm. longae 4-2.5 mm. latae. Pedicelli teneres tomentelli 8-14 mm. longi bracteolis linearibus 5-7 mm. longis extus tomentellis muniti, 3-4 superne ad modum calyculi

dispositis.

Capitula radiata involucre subcampanulato 8 bracteis tenuis 7 mm. longis, obtusiusculis exterioribus 2 mm. latis extus tomentellis, margine glabris, interioribus 3 mm. latis linea media tomentella reliquo scarioso glabro. Flores feminei ligulati lutei vulgo 5, 12-13 mm. longa tubulo capillari 5 mm. longo glabro, lamina oblonga circa 8 mm. longa, 2.5-3 mm. lata, 4-nervis, apice obtusiuscule 2-3 dentata. Flores centrales tubulosi lutei corolla 7 mm. longa glabra, apice 5-dentata dentibus anguste triangularibus acutis 1.2 mm. longis. Stylus glaber exsertus stigmatibus subtruncatis papilloso-pencillatis, plus minusve lateraliter caudatis. Ovarium glabrum. Papus circa 7 mm. longus stramineus hirtulo-scabridus.

Type: Peru: Yanano, about 6000 feet, collect. J. Francis Macbride 3747. "6 ft. shrub of sunny thickets." (US., F.)

Gynoxys Macfrancisci is distinguished by its large, subcoriaceous leaves which are borne on long petioles, delicate and prominently reticulate on the upper side and pulverulent-tomentose on the lower. The inflorescences are large and pendulous the pedicels thin and fairly long, the bracteoles are numerous on branchlets and peduncles, the involucre is scarcely tomentose or glabrate and the phyllaries have large subscariosae edges. Its relative, *G. macrophylla* Muschler, is a plant with alternate, usually larger and thicker leaves, short petioles, and glabrous involucre.

***Gynoxys compressissima* Cuatr., sp. nov.**

Frutex ramulis terminalibus tetragonis indumento sulphureo-albido valde compresso laevi subnitenti indutis.

Folia opposita subcoriacea petiolata. Petiolus 3-4.5 cm. longus supra sulcatus viridis subtus indumento albido indutus. Lamina ovato-lanceolata vel elliptico-lanceolata basi cuneata apice attenuata acutissima margine integra siccitate paulo revoluta, 9-18 cm. longa, 3-6 cm. lata; supra viridis, in sicco brunnescens laevis, nervo medio angusto impresso tomentuloso, reliqua glabra, nervis lateralibus et laxo reticulo paulo prominulis; subtus sulphureo-albida minutissimis pilis valde intricatis indumentum continuum compressissimum superficie membranam laevem subnitentem formantibus, nervo medio elevato, secundariis 7-8 utroque latere ascendentibus parce prominulis reliquis obsoletis.

Inflorescentia terminalis cymoso-paniculata basi foliosa, ramulis erectis vel flexuosis sulphureo-albidis, bracteolis lanceolatis folia similibus sed decrescentibus, superioribus linearibus, ad 8 mm. longis. Pedicelli 5-16 mm. longi apice aliquas bracteolas lineares flexuosas ad modum calyculi ferentes. Capitula radiata. Involucrum subcampanulatum 8 bracteis oblongis 7-8 mm. longis, exterioribus 3 mm., interioribus 4 mm. latis, margine scariosis glabris, dorso tenue tomento discontinuo compresso munitis. Flores exteriores feminei 5, corolla lutea ligulata 16-18 mm. longa tubulo 6-7 mm. longo, lamina elliptico-

oblonga 9-12 mm. longa, 3.5 mm. lata, apice minute tridentata. Flores centrales tubulosi circa 20 corolla lutea 10-11 mm. longa, limbo campanulato apice profunde dentato laciniis triangulari-linearibus ad 2 mm. longis. Stylus valde exsertus stigmatibus incrassatis subacutis valde caudato-penicillatis. Ovarium glabrum.

Type: Peru: Tambo de Vaca, about 12,000 feet, collected J. F. Macbride 4435. "Common clump-type shrub to 12 ft. high." (F.,US.)

G. compressissima is a striking plant because of its delicate, entangled and compressed hairs which form a whitish layer covering the terminal branchlets and under side of the leaves. The outer surface of the indument is half shining and has a tiny, transparent pelicule (film) formed by the concrescence of the hairs. This species has subcoriaceous, acute, long petiolated leaves and involucre with large, scarcely indute phyllaries.

Gynoxys vacana Cuatr., sp. nov.

Arbor parva ramuli tetragoni nodosi flexuosi minute adpresseque griseo-tomentosi, vel fuliginosi.

Folia opposita coriacea petiolata. Petiolus 10-15 mm. longus supra sulcatus, reliquis striatus, adpresse tomentosus. Lamina ovato-lanceolata basi rotundata vel obtusa, apicem versus acutata, margine levissime repandoque callosa-dentata, 4.5-9 cm. longa, 1.7-3 cm. lata; supra viridis excepto nervo medio subdepresso tomentuloso glabra, nervis secundariis ascendentibus cum nervulis in reticulo argute prominulo anastomosatis; subtus dense adpresseque albo-griseo tomentosa costa eminenti nervis lateralibus subpatulis minus prominulis, reticulo laxo obsoleto.

Inflorescentiae cymoso-paniculatae terminales basim foliatae ramulis griseis vel fuliginosis dense tomentosus, bracteolis ultimis late linearibus 5-7 mm. longis. Pedicelli breves 3-5 mm. longi crassiusculi tomentosi apice 3-5 bracteolis ad modum calyculi dispositis ferentes. Capitula radiata 5 ligulis 14-16 tubis. Involucrum subcampanulatum 8 bracteis elliptico-oblongis obtusiusculis 7 mm. longis, exterioribus dense tomentulosis cinereo-fuliginosis 2 mm. latis, interioribus 3-3.2 mm. latis margine latissime scariosae vitta dorsale tantum tomentosa. Flores feminei ligulati lutei, corolla 14 mm. longa lamina oblonga 8-9 mm. longa, 2-2.2 mm. lata. Flores centrales hermaphroditi corolla tubulosa 9-10 mm. longa glabra apice profunde 5-dentata laciniis 1.5 mm. longis. Ovarium glabrum. Stylus exsertus stigmatibus oblique truncatis acutatis penicillato-caudatis. Pappus stramineus circa 8 mm. longus breviter hirtulo-scabrosus.

Type: Peru: Tambo de Vaca, about 13,000 feet, collected J. F. Macbride 4391. "Open 12 ft. tree on steep well-drained 'point' Yellow. (F. US.)

G. vacana is similar to *G. caracensis* Muschler but has larger involucre with broader phyllaries, stronger pedicels and branchlets of the inflorescence, both being covered with thicker, grayish tomentum,

thicker, less densely reticulate leaves, the veins on the upper side being prominent whereas those on the lower side are covered by tomentum.

Gynoxys capituliparva Cuatr., sp. nov.

Arbor parva ramuli subtetragoni striolulati terminationibus cinereo-tomentosis, plus minusve flexuosi.

Folia opposita subcoriacea petiolata. Petiolus 11-15 mm. longus striatus cinereo-lanuginoso-tomentosus. Lamina lanceolata basi obtusa apice acuta margine integra paulo revoluta, 6-9.5 cm. longa, 15-30 mm. lata; supra viridis rugulosa nervo medio depresso paulo tomentuloso reliqua glabrata nervis secundariis nervulisque depressis paulo conspicuis; subtus lanuginoso-tomentosa cinerea tomento denso et laxo munito, costa eminenti nervis lateralibus 6-7 utroque latere prominentibus arcuato-ascendentibus, nervulis transversis laxe reticulatis paulo conspicuis.

Inflorescentiae cymoso-paniculatae terminales basi foliosae folia breviores ramulis angulatis adpresse griseo-tomentosis. Bracteolae superiores lanceolatae vel lineares 5-6 mm. longae. Pedicelli valde teneres 2-7 mm. longi tomentelli apice 3-4 bracteolis anguste linearibus 4 mm. longis ad modum calyculi ferentes. Capitula radiata subcampanulata parva. Bracteae involucri 8, 4-4.5 mm. longae, 1.5-2 mm. latae exteriores tomentellae interiores late margine scariosa glabra dorso tomentello. Flores feminei ligulati lutei corolla 8-9 mm. longa, lamina oblonga 1.5 mm. lata apice 3-denticulata. Flores centrales tubulosi corolla lutea 6 mm. longa. Stigmata extus papillosa apice obtusa penicillata. Pappus 5 mm. longus stramineus setis hirtuloscabrosis. Ovarium glabrum.

Type: Peru: Tambo de Vaca, about 12,000 feet, collected by J. F. Macbride 4434. "Common 15 ft. tree of uplands. Crown dense." (F.)

G. capituliparva is well characterized by its small, acute, lanceolate leaves which are rugulose on the upper side and grayish or cinereous-tomentose beneath; its tomentum is thick and soft, its inflorescences are small and shorter than its basal leaves, its pedicels are thin, and its heads and flowers are very small, as compared with other species of this genus.

Gynoxys infralanata Cuatr., sp. nov.

Arbor 7-10 met. alta ramulis terminalibus tetragonis striatis lanato-tomentosis albicantibus vel fuliginosis.

Folia opposita petiolata crasse coriacea. Petiolus robustus supra sulcatus lanato-tomentosus 2 cm. longus. Lamina ovata basi lata truncata apice acutata, margine integra angustissime revoluta, 8-10 cm. longa, 4.5-6 cm. lata; supra luteolo-viridis nervo medio impresso tomentoso, secundariis paulo prominulis tomentulosis, reliqua in juvenile statu puberula demum glabrata, nervulis venulisque laxe reticulatis prominulis; infra dense lanato-tomentosa albicans costa

valde elevata, nervis secundariis 12-13 utroque latere prominentibus patulis marginem versus furcatis. obsolete anastomosatis, nervulis minoribus vix inconspicuis.

Inflorescentia terminalis cymoso-paniculata basi foliosa floribunda ramis tetragonis dense albido-lanato-tomentosis. Bracteolae anguste lineares circa 5 mm. longae lanatae. Pedicelli 2-5 mm. longi subteneres lanato-tomentosi, apice 4-5 bracteolis linearibus 2-5 mm. longis calyculum formantibus. Capitula heterogama. Involucrum subcampanulatum 8 bracteis ellipticis vel oblongis 5-6 mm. longis, 3 mm. latis, crassiusculis, exterioribus lanato tomentosus, interioribus dorso crasso lanato, margine glabra late squamosa. Flores feminei ligulati 5-6, corolla 11 mm. longa, lamina oblonga 6 mm. longa 2 mm. lata apice brevissime tridenticulata. Flores centrales hermaphroditi, corolla tubulosa 6 mm. longa glabra tubo 2 mm. longo crassiusculo, limbo tubuloso-conico apice profunde 5-dentato. Rami stigmatici obtuse conici longe caudato-penicillati. Ovarium glabrum. Pappus stramineus 5-6 mm. longus setis hirtulo-scabrosis.

Type: Peru: Torontoy, Urubamba Valley, altitude about 3900 meters, collected by Edmund Heller 2181. "Chief timber-line tree, slender 20-30 ft." (US.)

Cotype: Heller 2178 (same locality). (US.)

G. infralanata can be distinguished by its medium sized, thickly coriaceous, oval acute leaves which are scarcely puberulent on the upper side and thickly tomentose-lanate beneath; its whitish inflorescence is also densely tomentose; its heads are rather small and its phyllaries thick and tomentose.

Gynoxys pillahuatensis Cuatr., sp. nov.

Arbor parva. Ramuli terminales flexuosi subtetragoni striati luteo-olivido-tomentosi.

Folia opposita petiolata coriacea. Petiolus 15-18 mm. longus dense tomentosus supra sulcatus basim dilatato vaginatus, subtus striolatus. Lamina ovato-lanceolata basi rotundata vel obtusa apicem attenuata, acuta margine plana remotis dentibus callosis munita vel laevis, 7-10 cm. longa 2.5-4 cm. lata; supra viridis nervo medio angusto depresso tomentello reliqua adulta glabra, nervis lateralibus filiformibus, nervulis angustis prominulis reticulatis; subtus dense ochraceo-tomentosa nervo medio valde eminenti striato nervis secundariis prominentibus ascendentibus marginem versus plus minusve ramificato-reticulatis, nervulis laxo reticulatis parum manifestis.

Inflorescentiae terminales cymoso-paniculatae latae floribundae flexuosae axi ramulisque striatis ochraceo-tomentosis, bracteolis superioribus anguste linearibus acutis flexuosis tomentosus 3-7 mm. longis. Pedicelli tenues striati 2-6 mm. longi apice 3-5 bracteolis linearibus ad modum calyculum. Capitula heterogama. Involucrum tubuloso-campanulatum 8-10 bracteis 6 mm. longis acutis exterioribus 1.8-2 mm. latis tomentellis, interioribus 3 mm. latis, dorso carinato-

tomentello margine late scariosa glabra. Flores feminei marginales 5 flavi ligulati, corolla 9-10 mm. longa lamina 6 mm. longa 2 mm. lata. Flores centrales hermaphroditi praecipue 12, corolla tubulosa lutea 7-8 mm. longa glabra. Ramuli stigmatici conici penicillato-caudati. Ovarium glabrum. Pappus stramineus circa 7 mm. longus.

Type: Peru: Department of Cuzco: "Pillahuata". Cerro de Cusilluyoc, 3000-3300 m. alt. collected May 1925 F. W. Pennell 14134. "Flowers lemon yellow. Tree." (F. US.)

G. pillahuatensis is closely related to *G. caracensis* Muschler and *C. cusilluyocana*. From the former it can be distinguished by its obtuse or rotund leaves, its less compressed tomentum, its slightly winged petioles with their enlarged bases, and its narrower heads containing fewer flowers. By comparison *C. cusilluyocana* has leaves which are strongly lanceolate at the base, more coriaceous and strongly reticulate on the upper side with a rugose appearance revolute margin; the inflorescences and heads are smaller and the tomentum is denser than in *G. pillahuatensis*. The latter is also close to *G. nitida* Muschler which has thicker and more elliptical leaves, more strongly reticulated on the upper side and more densely tomentose, thicker and broader, more tomentose phyllaries, and more robust branchlets of the inflorescence.

Gynoxys cusilluyocana Cuatr., sp. nov.

Frutex ramis subtetragonis striatis griseis terminationibus adpresse griseo vel cinereo-tomentosis.

Folia opposita petiolata coriacea. Petiolus 8-20 mm. longus dense cinereo-tomentosus supra sulcatus. Lamina ovato-lanceolata basi rotundata vel obtuse cuneata apice attenuata acuta, margine integra vel sparsissimis dentibus callosis munita siccitate revoluta, 5-8 cm. longa 1.6-3.2 cm. lata; supra viridis nervo medio depresso albo-tomentoso reliqua glabra, nervulis in reticulum densum prominulum anastomosantibus; subtus dense lanuginoso-tomentosa ochraceo pallida, costa elevata, nervis secundariis 8-10 paribus prominentibus vel prominulis ascendentibus marginem versus paulo ramificatis, reliquis nervulis obsoletis.

Inflorescentiae terminales cymoso-paniculatae tantum basi foliatis, folia adjacentia aequilongae vel breviores. Ramuli teneres subflexuosi dense tomentosi, bracteolis superioribus linearibus tomentosis 3-5 mm. longis. Pedicelli teneres 2-5 mm. longi tomentosi apice 3-5 bracteolis linearibus ad involucrem adpressis calyculum formantibus. Capitula heterogama involucre 8 bracteis crassiusculis 5 mm. longis, exterioribus 2 mm. latis elliptico-oblongis acutiusculis extus tomentosis, interioribus 3 mm. latis ovatis dorso carinato-tomentoso marginibus late scariosis glabris, apice omnibus violascentibus. Flores marginales feminei ligulati praecipue 8, corolla 7-8 mm. longa, flava, lamina 3.5 mm. longa 1.5 mm. lata apice tridentata. Flores centrales hermaphroditi circa 16, corolla tubulosa lutea 5.5 mm. longa tubulo

2 mm. longo, apice 5 dentata. Rami stigmatici acutiusculi caudato-penicillati. Ovarium glabrum. Pappus stramineus 6 mm. longus.

Type: Peru: Department of Cuzco: Paso de Tres Cruces, Cerro de Cusilluyoc, alt. 3500-3800 m. collect. May 3, 1925 F. W. Pennell 13900. "Rocky thicket, shrubzone below paramo. Flowers lemon chrome." (F. US.)

G. cusilluyocana is close to *G. infralanata*, but its tomentum is less thick, the upper side of its lanceolate leaves appears rugose, as its due to the elevated reticulate, and its inflorescences are slender. The same features distinguish it from *G. caracensis* Muschler.

***Gynoxys cuzcoensis* Cuatr., sp. nov.**

Arbor 4-6 met. alta. Ramuli terminales subtetragoni, striati ochraceo-tomentosi vel fuliginosi, praecipue in partibus juvenilibus pilis crispis brevibus dense intricato-tomentosis et pilis longis patulis muniti.

Folia opposita petiolata crasse coriacea. Petiolus 12-20 mm. longus dense ochraceo-tomentosus et hirtus supra late sulcatus basim versus ampliato-vaginato subtus striatus. Lamina ovata vel ovato-elliptica basi emarginata apice subite acutata margine integra parum incrassato-revoluta, 7.9-9 cm. longa 3.5-4 cm. lata; supra nitida viridis nervo medio depresso angusto tomentuloso excepto glabra, nervulis elevatis graciliter reticulatis; subtus denso tomento ochraceo induta nervo medio elevato, secundariis 10-12 utroque latere prominentibus ascendentibus inter eos nervulis laxo reticulum minus conspicuum formantibus.

Inflorescentiae terminales cymoso-paniculatae floribundae ramulis plus minusve flexuosis striolatis dense tomentosis, bracteolis linearibus copiosis 12-4 mm. longis breviter tomentellis et hirsutulis munitis. Pedicelli 10-15 mm. longi striolati teneres sed rigidi saepe erecti aliquis bracteis muniti apicem 2-3 bracteolis vix calyculum formantibus. Capitula heterogama mediocria. Involucrum campanulatum 8 bracteis elliptico-oblongis acutiusculis 7-7.5 mm. longis 2.2-3 mm. latis, exterioribus tomentosis, interioribus dorso tomentoso margine late glabra. Flores feminei marginales 6-8, corolla lutea 12-13 mm. longa tubulo capillare 6-7 mm. longa glabra, lamina elliptica circa 5-6 mm. longa 2.5 mm. lata apice tridenticulata. Corollae centrales praecipue 12, tubulosae luteae circa 10 mm. longae, glabrae tubulo angusto 5 mm. longo, limbo apice 5 dentato laciniis 1.5 mm. longis. Ramuli stigmatici conici penicillato-caudati. Ovarium glabrum. Pappus pallidus 8-9 mm. longus.

Type: Peru: Tres Cruces, Pancartambo, Department of Cuzco, 3600 m. alt. "bordes bosques de ceja de la montaña", collected Oct. 1, 1941 Cesar Vargas 2253. (NY.)

G. cuzcoensis is well characterized by its coriaceous, rigid, shiny leaves which are strongly reticulately veined on the upper side and densely tomentose beneath. The petioles, young branchlets and bracts have a double indumentum, a dense indumentum of short, curly hairs

and another of long spreading hairs.

Gynoxys yananoensis Cuatr., sp. nov.

Rami terminales striati dense tomentosi tomento crasso viridichraceo.

Folia opposita petiolata crasse coriacea. Petiolus 20-25 mm. longus robustus striatus supra sulcatus dense crasseque tomentosus. Lamina ovato-elliptica basi emarginata vel subcordata apice subite acutata, margine laevis anguste incrassato-revoluta, 7-10.5 cm. longa, 4.5 cm. lata; supra viridis subnitida, nervo medio depresso angusto tomentoso excepto glabra, nervulis elevatis graciliter reticulatis; subtus dense tomentosa, nervo medio elevato, secundariis 12-14 utroque latere prominentibus patulo-ascendentibus inter eos nervulis laxum reticulum formantibus.

Inflorescentiae axillari-subterminales cymoso-paniculatae ramis robustis striolatis dense crasseque tomentosis bracteolis numerosis linearibus tomentellis. Pedicelli 3-10 mm. longi tomentosi teneres bracteolati apice 4-5 angustis bracteolis flexuosis ad modum calyculum munitis. Capitula heterogama. Involucrum 8 bracteis elliptico-oblongis acutiusculis 6-7 mm. longis 2.5-3 mm. latis extus tomentosus, interioribus late scarioso-marginatis. Flores feminei marginales ligulati lutei, corolla 9 mm. longa tubulo 3 mm. longo, lamina oblonga 1 mm. lata. Flores centrales hermaphroditi, corolla tubulosa lutea 8 mm. longa glabra tubulo 3 mm. longo, limbo apice 5-dentato. Rami stigmatici conici penicillati appendiculati. Ovarium glabrum. Pappus 7-8 mm. stramineus.

Type: Peru: Yanano, about 6000 feet, common in shrubby canyons, fls. yellow, collected by J. F. Macbride 7931. (F.)

G. yananoensis is very similar to *G. cuzcoensis* in general aspect as well as in the form and structure of leaves. However, it differs in its thicker and longer tomentum, its smaller inflorescences, heads and flowers, and its shorter pedicels. Its ligules and florets are much shorter, as the tube of the corolla measures only 3 mm.

Gynoxys Rusbyi Cuatr., sp. nov.

Frutex ad 2 met. altus. Ramuli terminales subteretes striati griseobrunnei valde juniores tomentulosi.

Folia opposita coriacea petiolata. Petiolus 8-20 mm. longus praecipue flexuosus, tomentosus supra sulcatus. Lamina ovato-lanceolata basi rotundata apice valde acuta, margine plana repando dentata, dentibus mucronulatis abrupte patulis, 5-8 cm. longa 1.6-3.5 cm. lata; supra viridis glabra, nervo medio angusto depresso basim versus parce tomentuloso, nervis secundariis paulo prominulis, nervulis prominulis laxe reticulatis; subtus dense albicanti-tomentosa, costa eminenti striolulata, nervis secundariis arcuato-ascendentibus 6-7 utroque latere parte media furcatis, paulo conspicuis nervulis reticulatis obsolete.

Inflorescentia terminalis basi foliosa, cymoso-paniculata, confertiflorae ramulis erectis vel curvatis adpresse fuliginoso-tomentosi, bracteis inferioribus foliosis, superioribus lanceolatis et linearibus supra glabratis infra tomentellis, 6-8 mm. longis. Pedicelli 5-15 mm. longi teneres et rigidi adpresse tomentosi apice tantum 2 bracteolas anguste lineares 4-5 mm. longas ad modum calyculum ferentes. Capitula heterogama. Involucrum campanulatum praecipue 8 bracteis subcoriaceis elliptico-oblongis obtusiusculis 6.5 mm. longis, 2.5-3 mm. latis dorso breviter adpresseque tomentellis margine scariosa glabra. Flores feminei marginales 5-6 ligulatis, corolla lutea 10-11 mm. longa, tubulo capillari 3.5-4 mm. longo, lamina 2 mm. lata apice 2-3 dentata. Flores centrales hermaphroditi circa 20, corolla tubulosa lutea circa 8 mm. longa tubulo 3 mm. longo limbo tubuloso-campanulato 5 dentato dentibus lineari-triangularibus 1.5-1.8 mm. longis. Ramuli stigmatici conici penicillati-caudati. Ovarium glabrum. Pappus stramineus 6-7 mm. longus.

Type: Bolivia: Pongo de Quisne, 12,500 ft., Rocky hills, collected July 2, 1921 H. H. Rusby no. 3. (US., NY.)

S. Rusbyi is distinguished by its coriaceous, discolored, broadly lanceolate and remotely dentate leaves which are vividly green on the upper side and pale tomentose beneath. The phyllaries are broad with scarioso edges, tomentose on their backs and somewhat violaceous at the tip.

Gynoxys neovelutina Cuatr., sp. nov.

Arbuscula. Ramuli flexuosi tetragoni dense adpresseque tomentosi.

Folia opposita coriacea petiolata elongata. Petiolus 2-3 cm. longus robustus striatus supra sulcatus, dense adpresseque velutino-tomentosus. Lamina oblonga ovato-lanceolata basi lata cordata apicem versus angustata acuta, margine anguste incrassato-revoluta, minutissimis dentibus mucroniformibus repandis inferne revolutis, 12-15 cm. longa, 5.5 cm. lata; supra viridis nervo medio depresso tomentoso excepto glabra, nervis secundariis angustis impressis, nervulis venulisque minutum reticulum valde conspicuum elevatum vel impressum formantibus; subtus densissime tomento pallide ochraceo (in sicco) aspectu velutino induta, nervo medio valde elevato striato, secundariis 12-15 utroque latere patulis marginem versus ramificatis prominulis, reliquis nervulis laxo reticulatis cum tomento velatis.

Inflorescentia terminalis quam folia basilaria valde breviora, cymoso-paniculata, ramulis angulatis dense velutino-tomentosis, bracteis linearibus tomentosis 4-6 mm. longis. Pedicelli crassiusculi 4-8 mm. longi, apice 4-5 bracteolis linearibus angustis ad modum calyculum dispositis. Capitula heterogama. Involucrum bracteis subcoriaceis 7-8 mm. longis acutiusculis, exterioribus 2 mm. latis dense tomentosis, interioribus 3 mm. latis dorso tomentoso marginibus scariosis glabratis. Corollae exteriores 8-10 ligulatae (nondum adultae) 9 mm. longae, glabrae tubulo 4 mm. Corollae interiores tubulosae 8 mm. longae glabrae. Ovarium glabrum. Pappus stramineus 7 mm. longus.

Type: Bolivia: 3000 m. alt., 14 April 1892, collected Otto Kuntze. (NY.)

The leaves of *G. neovelutina* are similar to those of *G. pendula* Wedd., but they are thickly coriaceous, densely velvety tomentose beneath and markedly reticulate on the upper side; this reticulation is either prominent or depressed, in which case the surface is rugulose in appearance. The petioles are robust and striate, and the phyllaries thick and tomentose. The tomentum of the branchlets and pedicels is also velvety.

***Gynoxys sorataensis* Cuatr., sp. nov.**

Arbor parva. Ramuli terminales flexuosi tetragoni nodoso-articulati, internodiis 6-9 mm. longis, adpresse tomentosus.

Folia opposita petiolata crasse coriacea elongata. Petiolus 1.5-2.5 mm. longus striatus dense adpresseque tomentosus. Lamina sub-lanceolato-linear-oblonga basi rotundata vel obtusa apicem versus sine sensu paulum angustata acutiuscula, margine parum crassior, 8-13.5 cm. longa, 2-3.6 cm. lata; supra pallide viridis nitida laevis glaberrima, costa impressa nervis lateralibus parum conspicuis, nervulis venulisque obsoletis; subtus dense adpresseque tomentosovelutina subochracea, costa eminenti striata, nervis secundariis 9-13 utroque latere parce prominulis ascendentibus, reliquis nervulis reticulatis paulo visibilibus.

Inflorescentiae terminales cymoso-paniculatae confertiflorae basi foliosae quam folia breviores, ramulis robustis striatis dense velutino-tomentosis, bracteolis superne linearibus tomentosus flexuosis. Pedicelli 2-4 mm. longi crassiusculi apice 4-6 bracteolis anguste linearibus ad modum calyculum dispositis. Capitula heterogama. Involucrum 8 bracteis elliptico-oblongis obtusiusculis 7 mm. longis, exterioribus 2 mm. latis dense tomentosus interioribus 3 mm. latis dorso dense tomentoso margine scariosa glabra. Corollae exteriores ligulatae 5-7, 11-12 mm. longae, tubulo capillari 5 mm. longo, apice 2-3 denticulatae. Corollae centrales 14-16, tubulosae 8 mm. longae, glabrae, tubulo 2.5 mm. longo. Ramuli stigmatici floris hermaphroditi apice incrassati breviter conici longe penicillato-caudati. Ovarium glabrum. Pappus stramineus 8 mm. longus.

Type: Bolivia: Sorata, 10,000 ft., collected Feb., 1886, H. H. Rusby 1638. (NY. F.)

G. soratensis is related to *G. neovelutina* because of its long leaves which are velvety-tomentose beneath, but distinguishable by its narrower limb which is rotundate or obtuse at the base, completely glabrous and smooth on the upper side (lacking conspicuous venation). The ends of the branchlets are characterized by markedly articulate internodes.

***Gynoxys albifluminis* Cuatr., sp. nov.**

Frutex ad 2 met. altus, ramuli terminales flexuosi tetragoni articu-

lati internodiis 15-30 mm. longis dense adpresseque cinereo vel pallide ochraceo-tomentosi.

Folia opposita petiolata crasse coriacea elongata deflexa. Petiolus 2-3.5 cm. longus curvatus dense adpresseque tomentosus, supra sulcatus. Lamina elliptico-linearis (linguiformis), basi late rotundata vel truncata interdum paulo emarginata apice paulo angustata obtusiuscula, margine integra angustissime revoluta; supra viridis nitida prominule reticulato-nervosa glabra nervo medio excepto tomentuloso; subtus tomento denso adpressoque subvelutino ochraceo-cinereo tecta, nervo medio striolato elevato, secundariis et nervulis laxum reticulum cum indumento velatum formantibus.

Inflorescentiae cymoso-paniculatae terminales basi foliosae, ramulis striatis crasse tomentosus, bracteolis linearibus tomentosus. Pedicelli crassiusculi dense tomentosi 2-6 mm. longi apice 8-10 bracteolis crassiusculis 2-5 mm. longis ad modum calyculum ferentes. Capitula heterogama. Involucrum campanulatum, 10 bracteis subcoriaceis 6-7 mm. longis, exterioribus 2-2.5 mm. latis dense tomentosus interioribus 3-4 mm. latis dorso dense tomentosus margine scariosis glabris. Corollae exteriores 8-10 ligulatae luteae 12-14 mm. longae tubulo capillare 5 mm. longo. Corollae centrales circa 20 tubulosae luteae 10 mm. longae tubulo 4 mm. longo; ramis stigmaticis breviter conicis, penicillato-caudatis. Ovarium glabrum. Pappus stramineus 9 mm. longus.

Type: Peru: Río Blanco, about 15,000 ft. Stream-bank shrub, 4-5 ft. high. Collected, J. F. Macbride 3028. (F. US.)

Among long leaves species, *G. albifluminis* is characterized by its tongue-shaped leaves which are almost obtuse at the apex and subtruncate or rotundate at the base, marked reticulate on the upper side, whereas the lower side of leaves and branchlets is almost velvety, densely tomentose. On the other hand *G. neovelutina*, perhaps its most closely related species, has a more velvety tomentum, cordate and acute, lanceolate leaves which are more minutely reticulate on the upper side. The new species differs from *G. fuliginosa* HBK by its longer leaves and the structure of its indumentum.

Gynoxys visoensis Cuatr., sp. nov.

Arbor parva, ad 4 m. alta, ramulis paulo angulatis adpresse tomentosus.

Folia opposita coriacea elongata. Petiolus 1.5-3.5 cm. longus dense adpresseque tomentosus. Lamina elliptico-lanceolata basi truncata vel subrotundata apicem versus attenuata apice acutiuscula, margine integra parce incrassato-revoluta; supra viridis nervo medio impresso tomentoso reliqua glabra nervis nervulisque laxo reticulatis paulo prominulis; subtus dense subvelutino-tomentosa, costa striata eminenti nervis secundariis minus prominulis reliquis nervulis plus minusve velatis.

Inflorescentia cymoso-paniculata terminalis ramulis dense velutino-

tomentosis, bracteis linearibus tomentosis praeditis. Pedicelli 8-12 mm. longi graciles apice 4-6 bracteolis anguste linearibus 4-7 mm. longis tomentosis muniti. Capitula heterogama. Involucrum campanulatum 8-9 bracteis 9-10 mm. longis acutiusculis exterioribus 2.5 mm. latis tomentosis, interioribus 3.5 mm. latis dorso tomentosis margine scariosa apicibus plus minusve violaceis. Corollae marginales praecipue 6 luteae 16 mm. longae tubulo capillari 6 mm. longo. Flores hermaphroditi circiter 16 tubulosae, corolla 10-11 mm. longa tubulo angusto 3.6 mm. longo glabro; ramuli stigmatici conici longi caudato-penicillati. Ovarium glabrum. Pappus stramineus 10 mm. longus.

Type: Peru: Viso, about 9000 ft. Tree to 12 ft. in rock slides. Several trunks. Flowers light yellow. Collected by Macbride and Featherstone 580. (F. US.)

G. visoensis is related to *G. albifluminis* but differs in its more attenuate but less reticulate leaves, longer pedicels, fewer bracts per calycle which are longer and flexuose, and longer involucre formed by 8-9 densely tomentose phyllaries. In *G. albifluminis* the peduncles are shorter, heads congested, bracts per calycle more numerous (8-10), shorter and adpressed, and phyllaries shorter, thicker, and more densely tomentose.

Gynoxys ignaciana Cuatr., sp. nov.

Rami flexuosi terminationibus striatis lanato-tomentosis.

Folia opposita membranaceo-coriacea petiolata. Petiolus 2-2.5 cm. longus basi incrassatus valde tomentosus. Lamina ovato-oblonga basi rotundata vel emarginata apice paulo attenuata obtusiuscula, margine repando obtuseque sinuata anguste incrassato-revoluta, 7-9 cm. longa, 3.8-5 cm. lata, supra viridis nervo medio impresso angusto tomentuloso, reliqua glabra nervulis prominulis in reticulum anastomosantibus; subtus pulverulento-tomentosa in sicco ochracea, costa crassa eminenti 6-7 nervis utroque latere patulo-ascendentibus ramificatis ramulis anastomosatis cum nervulis reticulum laxum prominulum formantibus.

Inflorescentiae terminales floribundae cymoso-paniculatae basi foliosae, ramulis dense crasseque tomentosis, bracteolis ultimis linearibus teneribus flexuosis lanatis 6-8 mm. longis deciduis. Pedicelli erecti 10-18 mm. longi tomentoso-lanati, 3-4 bracteolis angustis 5-6 mm. longis muniti apice tantum una ad basim capituli disposita. Capitula heterogama. Involucrum tubuloso-campanulatum 8 bracteis acutiusculis crassiusculis 8 mm. longis 3 mm. latis extus dense tomentosis, interioribus margine scariosa. Flores feminei marginales 5, corolla ligulata 13-14 mm. longa, tubulo 5 mm. longo lamina 2-5 mm. lata. Flores centrales plerumque 20, corolla tubulosa 8-5 mm. longa, tubulo angusto 3 mm. longo, limbo tubuloso campanulato apice profunde 5-dentato dentibus 1.8 mm. longis; ramis stigmaticis apice conico-caudato-penicillato. Ovarium glabrum. Pappus stramineus 7 mm. longus.

Type: Ecuador: Pichincha region: San Ignacio 11,200 ft. Collect. Aug. 14-19, 1923, H. E. Anthony and G. H. H. Tate 127. (US.)

Related to *G. Hallii* Hieron., *G. ignaciana* differs from that species by its broader, ovate, leaves which are slender, rotundate or emarginate at the base, by its woolly-tomentose branchlets and involucre, and by its long pedicels provided with long, thin bracteoles which do not form a true calycle.

***Gynoxys Reinaldi* Cuatr., sp. nov.**

Arbuscula. Ramuli teretes grisei juveniles breviter puberuli mox glabrati.

Folia papiraceo-coriacea rigida opposita petiolata. Petiolus 6-12 mm. longus robustus adpresse tomentosus supra sulcatus subtus teres basi crassior vaginatus. Lamina ovata vel ovato-elliptica basi rotundata apice paulo angustata breviter acutiuscula mucronulata, margine integra sed 3-4 dentibus utroque latere minutissimis callosis, 3-5 cm. longa, 1.8-3.2 cm. lata, supra viridis nitida costa paulo impressa tomentella reliqua glaberrima nervulis venulisque minutum reticulum argute prominulum formantibus; subtus dense adpresseque tomentosa ochracea costa crassa prominenti nervis lateralibus patulis parce prominulis 8-10 utroque latere marginem versus obsolete ramificatis anastomosantibus, nervulis obsolete.

Inflorescentiae terminales cymoso-paniculatae confertiflorae folia superiora excedentes, ramulis fastigiatis dense adpresseque ochraceo-tomentosis, bracteis inferioribus anguste foliaceis superioribus lanceolatis vel linearibus erectis rigidis 5-2 mm. longis extus tomentosus. Pedicelli 5-10 mm. longi dense tomentosi erecti apice 3-4 bracteis minutis tomentosus ad basim involucri minutum calyculum formantibus. Capitula heterogama. Involucrum cylindricum glabrum 8 bracteis oblongis 7-7.5 mm. longis, exterioribus linearibus acutis 1.5 mm. latis, interioribus 2-5 mm. latis dorso carinato incrassato margine scariosa. Flores feminei 3 marginales, corolla lutea 9-10 mm. longa, tubulo 3 mm. longo, lamina elliptica 2-2.5 mm. lata. Flores hermaphroditi centrales 6-8, corolla tubulosa lutea 7 mm. longa, tubulo 3 mm. longo limbo campanulato apice profunde inciso dentibus 2 mm. longis. Rami stigmatici apice obtusi breviter papilloso-penicillati. Ovarium glabrum. Pappus stramineus nitidus 7 mm. longus.

Type: Ecuador: Loja: Cajamuna 2400 m. alt. collect 7-V-1946, Reinaldo Espinosa 312. (F.)

Cotype: Same locality, collected, Reinaldo Espinosa 347-a. (F.)

G. Reinaldi differs from the other species of this genus by the thin, but rigid leaves which are ovate and rather small, by the dense tomentum covering the branchlets of the inflorescence, bracts, calycle, and lower side of the leaves, and by the tubular, glabrous involucre which contains a small number of flowers.

Gynoxys cuicochensis Cuatr., sp. nov.

Ramuli flexuosi subteretes striolulati, minute dense adpresseque tomentosi.

Folia opposita coriacea. Petiolus 1-14 mm. longus, striatus adpresse tomentosus. Lamina ovata vel ovato-oblonga basi truncata vel rotundata apice breviter angustata vel acutiuscula, margine repando leviterque sinuata, 2.5-5.5 cm. longa 8-28 mm. lata; supra viridis laevis nervo medio tomentuloso excepto glabra, nervis secundariis paulo conspicuis depressis, nervulis venulisque reticulatis leviter prominulis; subtus dense adpresseque tomentoso-ochracea, nervo medio crasse prominenti, nervis secundariis 10-11 utroque latere perpendicularibus prominentibus marginem versus anastomosantibus, nervulis prominulis reticulatis.

Inflorescentia terminalis cymoso-paniculata, ramulis tomentosis, bracteolis ultimis lanceolatis acutis minutis 3-2 mm. longis tomentosis. Pedicelli 1-5 mm. longi apice 3-4 bracteolis ad modum calyculum. Capitula heterogama. Involucrum conico-campanulatum 7-8 bracteis 5.5 mm. longis exterioribus 2 mm. latis tomentosis, interioribus 2.8 mm. latis dorso tomentoso margine late scariosa glabra. Flores feminei marginales 3, corolla ligulata 7-8 mm. longa, tubulo 2 mm. Flores hermaphroditi 8-9, tubulosi corolla 7 mm. longa tubulo 2.2 mm., limbo campanulato profunde dentato. Rami stigmatici conici penicillati. Ovarium glabrum.

Type: Ecuador: Prov. Imbabura, Lake Cuicocha 3500 m. alt., collected C. W. Pendland & R. H. Summer 722. (F.)

G. cuicochensis is close to *G. Hallii* Hieron. and *G. ignaciana* but is distinguished by its dense, compressed tomentum, by the shape of its leaves, the rectangular secondary nerves, and by its tomentose bracteoles and involucre.

Gynoxys Apollinaris Cuatr., sp. nov.

Rami terminales striolulati dense adpresseque lanato-tomentosi.

Folia opposita coriacea. Petiolus crassiusculus 1-1.5 cm. longus, saepe curvatus supra sulcatus dense tomentosus. Lamina lanceolata basi rotundata vel cordata apicem versus sine sensu attenuata apice acuta, margine leviter repando sinuata revoluta, 7-12 cm. longa 1.2-3.5 cm. lata; supra in juvenilibus crispo-tomentosa in adultis nitida glaberrima, nervo medio impresso tomentuloso excepto, nervis secundariis patulis (90°) parce prominulis, nervulis venulisque in reticulo plus minusve conspicuo; subtus ochraceo-ferruginea, densissime crasseque lanato-tomentosa, indumento intricatissimo pagina uniforme omnino tecta.

Inflorescentia terminalis cymoso-paniculata pyramidalis ramulis lanato-tomentosis, bracteolis lineari-lanceolatis vel linearibus flexuosis 10-15 mm. longis munitis. Pedicelli 10-15 mm. longi lanato-tomentosi bracteolati, apice tantum 2-3 bracteolis calycularibus muniti.

Capitula heterogama. Involucrum 8 bracteis late oblongis acutiusculis 7-7.5 mm. longis, exterioribus 2.5 mm. latis lanatis, interioribus 3-3.2 mm. latis dorso lanatis margine scarioso-glabris. Ligulae 14-15 mm. longae apice argute 3 dentata tubulo 6 mm. longo. Corollae florum hermaphroditorum tubulosae 8 mm. longae, tubulo 2.5 mm. longo, limbo tubuloso-campanulato apice profunde dentato. Rami stigmatici conici penicillati. Ovarium glabrum. Pappus roseo-stramineus 8 mm. longus.

Type: Colombia: Caldas, San Félix, collected, Hno. Tomas Alberto, 1884. (F.)

G. Apollinaris is close to *G. Lindenii* but differs from that species by the very thick, woolly tomentum which uniformly covers the under side of its leaves. The leaves are narrowly lanceolate, coriaceous, whose edges are slightly sinuate and revolute; only the mid-rib can be seen under the thick indumentum.

Named in honor of the well known naturalist and friend, the late Brother Apolinar Maria.

GYNOXYS TRIANAE Hieron. var. *nemocona* Cuatr., nov. var.

Lamina foliorum robustior major (4-5.5 cm. longa, 15-22 mm. lata) elliptico-oblonga basi cordata vel emarginata, subtus ramique intense ochraceo-tomentosi. Capitula majora.

Type: Colombia, Dep. Cundinamarca: Nemocón, 2900-3000 m. alt. Shrub. Flowers yellow, collected Oct. 23, 1917, F. W. Pennell, 2619. (NY.)

Other specimen: Colombia, without locality: Mutis 5931 (US.)

GYNOXYS COLUMBIAN (Klatt) Hieron.

Liabum columbianum Klatt

Gynoxys puracensis Cuatr., Not. Fl. Colomb. VI: 32 (1944).

Specimens examined: Cuatr. & Pérez Arb. 5958 (type coll. of *G. puracensis*). Lehmann 3783 (Páramo de las Moras (fragment of isotype in the Ch. Nat. Hist. Mus.)). Photograph of the type.

Senecio tergolatanus Cuatr., sp. nov.

Herba ad 1 met. alta ramis floriferis erectis robustis striatis arachnoideo-lanuginosis satis foliosis.

Folia crassiuscule herbacea leviter bullata supra viridia sed sparse tomento arachnoideo plus minusve persistenti munita, subtus dense albo- vel cinereo-lanata, sessilia amplexicaulia, inferiora ovato-elliptica, vel oblonga, apice attenuata obtusa basi late rotundato-auriculata valde amplexicentia, margine irregulariter dentata vel incisa, 12 cm. longa, 4 cm. lata, superne subtriangularia oblongiora basi latissima apicem versus gradatim attenuata subacuta margine revoluta; nervo medio utrinque manifesto supra albo-lanato subtus prominenti, nervis secundariis patulis numerosis vix conspicuis.

Inflorescentia terminalis paniculata, ramulis striatis arachnoideolanatis, inferioribus foliorum superiorum axillaribus, bracteis ramorum triangularibus foliis similibus sed gradatim minoribus. Pedicelli tenues arachnoidei 5-10 mm. longi, saepe 1 bracteam linearem acutam longam ferentes. Capitula radiata. Calyculus 10-12 bracteis linearibus acutis valde angustis floccoso-arachnoideis 4-6 mm. longis conformatus. Involucrum campanulatum 23-24 bracteis lineari-lanceolatis, subuniseriatis, 8-9 mm. longis exterioribus 1-1.5 mm. latis, interioribus ad 2 mm. latis, dorso viridibus saepe leviter arachnoideis margine scariosis apice ciliatis. Receptaculum alveolatum 4 mm. diam. Flores marginales feminei ligulati 10-11, corolla lutea tubulo 4 mm. longo capillari puberulo, ligula 8-10 mm. longa 2.5-3 mm. lata, apice angustata, minutissime 3-dentata. Flores disci ultra 100, hermaphroditi tubulosi lutei glabri 7-9 mm. longi, tubulo 3-4 mm. longo subcapillari, limbo tubuloso 4-5 mm. longo dentibus 0.8 mm. longis. Antherae 3 mm. longae basi obtusae. Rami stigmatici truncati papilloso-penicillati. Setae pappi Albae tenues 7 mm. longae. Achaenia 2 mm. longa (inmatura) pubescentia.

Type: Colombia, Dep. Boyacá: Nevado del Cocuy, bajando al Cocuy en prados paramunos, 3600-3800 m. alt., collected 13-IX-1938, J. Cuatrecasas 1652. (F.)

S. tergolanus is a rare species living in the paramo-meadows, well characterized by being a herb with broadly auriculate, amplexicaul leaves which are woolly white beneath, and by its permanent white arachnoideous tomentum on the remainder of the plant.

Senecio supremus Cuatr., sp. nov.

Herba rhizomatosa, caule inclinato radicibus crassiusculis numerosis munito, extremo ramum simplicem foliosum fertilem producto.

Folia basilaria fasciculata crassiuscula, lineari-elliptica sublanceolata tertio inferiore in petiolum angustata basi late vaginata amplectentia apice subacuta, margine integra revoluta, 8-18 cm. longa, 5-10 mm. lata; supra viridis glabra costa plus minusve conspicua; subrus arachnoideo-lanigera, indumento aliquando deciduo nervo medio crasso, reliquis nervulis saepe inconspicuis, vagina longiuscule lanigera.

Scapus erectus 18-32 cm. longus striatus plus minusve lanuginosus vel glabratus, foliis alternis sessilibus lineari-lanceolatis basi rotundato-amplexentibus, margine valde revoluta integra vel breviter dentata, apice acutiusculis, supra lana arachnoidea decidua munitis denique glabris, subrus lanigeris, apicem versus gradatim minoribus et bracteosus commutatis. Capitula lata solitaria vel 2-3 ad apicem scapi, discoidea nutantia circa 3 cm. diam. Pedicelli teneres 2-3 cm. longi parce lanuginosi. Apex scapi densiuscule lanuginosus bracteas lineares acutas glabras numerosas usque 2 cm. longas, 2 mm. latas, erectas ad modum calyculum ad involucrum adpressas, ferens. Involucrum hemisphaericum, bracteis herbaceis biseriatis circa 28-30, 14 mm. longis, glabris vel basi parce arachnoideis, exterioribus

lanceolatis 3-3.5 mm. latis interioribus lanceolato-ovatis 4-6 mm. latis margine plus minusve erosis, basi breviter coalitis. Bracteae caliculares longitudinem involucri aequantes involucri multi seriatim simulantes.

Flores valde numerosi, ultra 300 in capitulo, isomorphi tubulosi, corolla tubulosa 9-10 mm. longa luteola-glabra, tubulo subcapillare 5 mm. longo basi abrupte bullato, limbo campanulato vel tubuloso campanulato 4.5-5 mm. longo 1.5-2 mm. diam., apice 5 dentato dentibus triangularibus 1 mm. longis. Antherae 2 mm. longae basi obtusae. Rami stigmatici apice truncati longe papilloso-penicillati. Ovarium glabrum. Pappus 9 mm. longus in sicco basim versus ferrugineus.

Crescit in supremas partes frigidas arenicolas vel saxicolae andium novogranatensium.

Type: Colombia, Dep. Boyacá: Nevado del Cocuy, alto valle de Las Lagunillas, pedregales-arenales abajo del glaciar, encima de Silla Larga, 4400-4300 m. alt., collect. 12-IX-1938 J. Cuatrecasas 1480. (F.)

Cotype: Id. id. Arenales junto al glaciar del Nevado del Cocuy (del Pulpito del Diablo), 4600 met. alt. 12-IX-1938, J. Cuatrecasas 1473. (F.)

S. supremus is a herbaceous plant with almost all its leaves basal, elongate, entire with revolute margin and lax, woolly tomentum; it is also characterized by its large, solitary, (or 2-3) discoid heads with broad involucrial bracts and pluriseriate calycle covering the involucre, simulating a pluiseriate involucre. Although related to *S. hypsobates* Wedd., it is distinguished from that species by its larger leaves and heads and by the woolliness. It can be differentiated from *S. chionogeton* Wedd. by its few heads and somewhat woolly arachnoideous appearance. On the other hand *S. summus* Cuatr., another related species, can be distinguished by the dense, white tomentum on the lower side of its leaves and by the large number of heads found in the ramified inflorescence.

Senecio pascuandinus Cuatr., sp. nov.

Herba rhizomatosa, caulibus foliosis terminalibus erectis 30 cm. altis crassis striatis sparse glanduloso-hirtis.

Folia herbacea alterna copiosa basilaria (in speciminibus nostris sicca corrugata) petiolata petiolus 3-4 cm. longus basi vagina latiora folia caulina inferiora late lanceolata basi in petiolum 2-3 cm. longum 5-6 mm. latum angustata apice attenuata acuta lamina 8 cm. longa 2-2.5 cm. lata, reliqua sessilia lanceolata, apicem versus breviora; margine minute dentata plana vel paulo revoluta, supra viridis sublaevis piloso-glandulosa et juvenilia plus minusve arachnoidea, tantum costa conspicua; subtus leviter arachnoideo-lanuginosa albicantia et pilis longis plus minusve strigosis munita, costa eminenti nervis lateralibus angustis ascendentibus paulo conspicuis reliquis nervulis in minuto reticulo obsoleto.

Inflorescentia terminalis multiflora paniculata 8-12 cm. longa et lata basi foliosa. Ramuli numerosi erecti glanduloso-hirsutuli et parce araneoso-floccosi 8-4 cm. longi, apice 1-3 capitula mediocria discoidea nutantia longe pedicellata ferentes. Ramuli vel pedicelli bracteis anguste linearibus acutis uninervis flexuosis 2-1 cm. longis plus minusve pubescentibus araneosisque, ad apicem copiosissimis glabratibus caliculum polyphyllum formantibus. Involucrum hemisphaericum 22 bracteis pallido-viridibus glabris biseriatis, exterioribus lineari-lanceolatis, 10-11 mm. longis 2 mm. latis apice ciliato-penicillatis, interioribus 3 mm. latis oblongis apice abrupte attenuato erosociliato. Flores omnes tubulosi hermaphroditi ultra 200 in capitulo. Corolla 7-8.5 mm. longa, glabra luteola tubulo capillari 3-3.5 mm. longo, limbo tubuloso apicem versus ampliato 4-5 mm. longo apice dentibus angustis 0.8 mm. longis. Antherae 2 mm. longae basi obtusae. Stigmata truncata papilloso-penicillata. Ovarium glabrum. Pappus albidus 8 mm. longus.

Type: Colombia, Dep. Boyacá; Nevado del Cocuy, páramos de Las Lagunillas, en El Tabloncillo, 4100-4200 m. alt., collected 13-IX-1938, J. Cuatrecasas 1599. (F., US.)

S. pascuandinus differs from all other herbaceous and discoid species by the particular shape and indumentum of its leaves, by its inflorescence, by the bracts on the peduncles and calycle, and structure of the heads. It is one of the species intermediate between *Senecio* and *Culcitium*.

Senecio adglacialis Cuatr., sp. nov.

Herba rhizomatosa, brevibus ramulis reptantibus foliosis in rosulas foliorum terminantibus vel scapiferis.

Folia rosularum herbacea viridia anguste elliptico-lanceolata basim versus in petiolum latum (3-4 mm. lat.) attenuata apice angustata acutiuscula margine breviter et repando serrata plana vel paulo revoluta, 6-12 cm. longa, 4-14 mm. lata, utrinque glabrata tantum sparsissimis pilis munita, nervo medio signato lateralibus paucis valde ascendentibus supra obsoletis subtus conspicuis.

Scapus erectus ad 50 cm. longus striatus puberulus et tenuiter araneosus foliis oblongo-lanceolatis sessilibus basi auriculato-amplexantibus, apice attenuatis, margine repando serratis breviter revolutis, numerosis alternis apicem versus gradatim minoribus.

Inflorescentia terminalis subcorymbosa oligocephala capitulis radiatis plus minusve nutantibus pedunculatis. Pedicelli flexuosi 5-10 mm. longi araneoso-lanuginosi axillares, bracteas ovato-lanceolatas excedentes. Calyculus longus 10-12 bracteis lineari-lanceolatis 18-10 mm. longis 1.5-2 mm. latis, dense glanduloso-hirsutis, ad involucrum paulo longiorem adpressis. Involucrum 20 bracteis uniseriatis lineari-lanceolatis glanduloso-hirsutulis 2-3 mm. latis 15 mm. longis, interioribus margine scariosis. Flores marginales feminei plerumque 24, ligulatae flavae corolla glabra tubulo 3-4 mm. longo ligula late

elliptica 12 mm. longa, 5-6 mm. lata apice subrotundata minute tridentata, 10 nervata. Flores centrales 170-180 hermaphroditi corolla tubulosa glabra, tubulo basi 3 mm. longo limbo 6-6.5 mm. longo tubuloso apice breviter 5-dentato. Antherae 3 mm. longae basi obtusiusculae. Stigmata truncata papilloso-penicillata. Ovarium glabrum vel parcissime puberulum. Pappus sericeo-stramineus.

Type: Colombia, Dep. Boyacá; Nevado del Cocuy, alto valle de Las Lagunillas, arenales en la base del glaciar 4400-4500 m. alt., 12-IX-1938 collected J. Cuatrecasas 1506. (F., US.)

S. adglacialis is characterized by its erect scape with few aggregated heads, by its glabrous leaves (the basal ones are oblong and attenuate toward the pseudo-petiole), by its glandular-hirsute involucre, by the calycle made up of numerous bracts nearly as long as the involucre, by its elliptical broad ligule, and by its glabrous ovary. It is closely related to *S. leucanthemoides* Cuatr. and *S. Funckii* but can be distinguished from these by the above mentioned characters.

Senecio Garcibarrigae Cuatr., var. **cataractarum** Cuatr., nov. var.

A species differt tota planta praecipue folia subtus et involucrem plus minusve pilosa, involucrem glanduloso-hirsutum bracteis latioribus. Ligulae latiores. Achaenia pubescentia.

Type: Colombia, Dep. Boyacá; Nevado del Cocuy, Chorreón de San Paulino, alt. 3950 m., collected 12-IX-1938, J. Cuatrecasas 1334. (F., US.)

Senecio Alberti-Smithii Cuatr., sp. nov.

Herba perennis rhizomate inclinato radicibus elongatis crassiusculis numerosis.

Caulis aereus erectus 30-40 cm. longus striatus glaber vel parcissime puberulus.

Folia caulina sessilia viridia valde tenuia, ovato-oblonga apice attenuata acutiuscula basi latiora rotundato-auriculata amplectentia, inferiora basi angustiora; margine crenato-dentata; 6-8 cm. longa, 2.5-3 cm. lata; supra glabra costa signata nervis lateralibus obsoletis, subtus sparse puberula costa prominula nervis lateralibus signatis ascendentibus circa 10 utroque latere marginem versus furcato-anastomosatis, venulis reticulatis obsoletis.

Inflorescentia in specimine unico 3 capitulis in corymbo terminale instructa, pedunculis erectis 6-10 cm. longis, parce puberulis. Capitula radiata nutantia. Calyculus 11-12 bracteis anguste lineari-acutis hispidulis adpressis, 6-9 mm. longis. Involucrem 20-22 bracteis subuniseriatis lineari-lanceolatis 12-13 mm. longis 1.5-2.5 mm. latis, parce puberulis apice ciliolatis. Flores marginales 18-20 feminei ligulati, corolla glabra tubulo 5-6 mm. longo, ligula 18-22 mm. longa, 5 mm. lata, apice obtusa minute tridentata, luteola 4 nerviis rubris percursa. Flores centrales hermaphroditi tubulosi circa 95, corolla lutea glabra 11 mm. longa, tubulo 3-3.5 mm. longo, limbo tubuloso 7-8

mm. longo, apice breviter 5-dentato. Antherae 3 mm. longae basi acutiusculae. Rami stigmatici longi curvati apice obtusi late papilloso-penicillati. Ovarium parce puberulum. Setis pappi sericeis deciduis 8-10 mm. longis.

Type: Colombia, Dep. Santander: Páramo de Santurban near Vetas, 3950-4160 m. alt., Jan. 17, 1927 collect. E. P. Killip & Albert C. Smith 17520. "Rays light yellow fading to pink, faintly red-striped, florets dark yellow." (US.)

S. Alberti-Smithii is very different from the other herbaceous species found in Colombian by being delicate and glabrous and having broad, amplexicaul leaves and erect stems supporting a few radiate heads. According to the collector's note, the ligules are somewhat pink. Basal leaves are missing in this specimen but they must be petiolate and elliptical like the young leaves of a sterile rosette. *S. Alberti-Smithii* has a surprising affinity with *S. helianthoides* Philippi from Chile, but differs by being glabrous and having larger involucre and flowers, and hispid achenes.

Senecio otophorus Wedd. var. **christophori** Cuatr., nov. var.

Herba robusta ramosa. Rami arachnoideo-lanati.

Folia crassiuscula firma, superne sessilia ovato-lanceolata oblonga basi rotundato-auriculata amplexicaulia, inferiora petiolata sed basi quoque auriculato-amplexicaulia, intermedia circa basim strangulata, margine argute dentata revolutaque, supra viridis indumento arachnoideo deciduo munita, infra dense lanato tomentosa albicantia, 4-8 cm. longa, 7-28 mm. lata.

Panicula terminalis plus minusve copiosa, ramulis pedunculisque dense lanatis. Involucrum plus minusve lanato-tomentosum bracteis lanceolatis 10-12 mm. longis margine scariosis. Calyculus polyphyllus imbricatus bracteis lanceolatis interioribus involucre dimidio brevioribus. Flosculus crebris (circa 100) 8 mm. longis tubulo capillari 4 mm. longo, limbo late campanulato 4 mm. apice argute deltoideo-dentato. Stigmata truncata longe caudato-penicillata.

Type: Colombia, Dep. Cundinamarca: Bogotá, San Cristóbal 3000-3300 m. alt. Bushy mountain valley. Fl. yellow. Collect. Sept. 1917, F. W. Pennell 2047 (NY.) (isotype US, F).

S. otophorus v. *christophori* is very different from *S. otophorus* by its larger and thicker leaves with abundant woolly tomentum on the lower surface and by the loose, arachnoid, woolly tomentum which covers its branchlets and involucre. The latter is longer and the heads are larger than in the typical form; the branchlets of the inflorescence are more robust. It represents an adaptation to the lower open bushes of the paramos. This plant could be regarded as a different species, were it not for intermediates with *S. otophorus* (like Pittier 1139, Huila and A. Joseph A500 Buitrago).

Senecio Guadalupe Cuatr., sp. nov.

Frutex (ad arbusculam?) ramis terminalibus robustis rigidis dense longeque hirsutis pilis subramentaceis.

Folia alterna simplicia petiolata rigide coriacea. Petiolus 12-16 mm. longus basim vaginato-dilatatus supra anguste sulcatus subterres densissime hirsutus. Lamina ovato-elliptica oblonga basi truncata, vel valde obtusa et asymmetrica, apice abrupte acutata vel obtusiuscula, margine repando dentata revoluta, 4-5 cm. longa, 14-24 cm. lata; supra in sicco brunnescens, nitida in juvenilibus araneosotomentella denique fere glabra, costa depressa tomentulosa nervis secundariis conspicuis tomentellis, venulis impressis plus minusve visibilibus; subtus densissime ochraceo-crispo-tomentosa, costa crassa elevata rubra hirsuta, nervis secundariis 6-8 patulis prominulis paulo conspicuis.

Inflorescentia terminalis erecta robusta paniculata basi foliosa 8-18 cm. expansa, conferte floribunda. Ramuli rubescenti robusti erecto-patenti dense ferrugineo-hirsuti pilis subramentaceis longis patulis flexuosisque. Capitula discoidea in ramulis terminalis 8-10 subcorymbosi disposita. Pedicelli 14-3 mm. longi dense hirsuti aliquis bracteis lineari-lanceolatis acutis 4-8 mm. longis muniti. Calyculus 8-10 bracteis lineari-acutis 4-6 mm. longis 1-1.2 mm. latis sub-biseriatis pagina subglabra in sicco rubescens marginibus hirsutulis. Involucrum tubuloso-campanulatum 9 bracteis 8-9 mm. longis, 5 exterioribus linearibus acutis 1.5 mm. latis, 4 interioribus oblongis acutiusculis 3 mm. latis glabris subnitidis in sicco rubescentibus tantum apice minute ciliolatis. Receptaculum fimbriiferum circa 2 mm. diam., squamis acutissimis plus 1 mm. longis. Flores omni tubulosi, hermaphroditi circa 34 in capitulo. Corollae luteae in sicco rubescentes 6-7.5 mm. longae glabrae tubulo 1.5-2 mm. longo, limbo 5-5.5 mm. longo, apice profunde dentatis. Antherae 2.5 mm. longae basi sagittatae. Stigmata obtusa penicillata. Ovarium glabrum. Pappus quam corolla balde brevior.

Type: Colombia, Dep. Cundinamarca, páramo southeast of Guadalupe, near Bogota, 3300-3400 m. alt. Shrub. Fl. yellow. Collect. Sept. 27, 1917 F. W. Pennell 2254 (NY) (isotype US), F(frag.)

S. Guadalupe is close to *S. colombianus* Cuatr. and can be easily distinguished by its hirsute indumentum (not arachnoid woolly) of the branchlets, inflorescence and the midrib of the leaves. Furthermore it has more rigid and coarser leaves and slightly larger heads.

Senecio frigidophilus Cuatr., sp. nov.

Frutex, ramis erectis subverticillate ramificatis, terminalibus glabris cum foliis imbricatis vel subimbricatis obtectis, vel inferne cicatricoso-squamatis vaginibus persistentibus foliorum delapsorum causa.

Folia alterna sessilia coriacea viridia subnitentia glabra, vel margine parce minuteque ciliolata; lamina elliptica vel suborbiculata

utrinque rotundata vel obtusa apice abrupte leviterque acutata 5-10 mm. longa, 4-7 mm. lata basi vagina lata amplectenti, tantum nervo medio conspicuo reliqua laevis.

Inflorescentiae terminales corymbosae 10-12 capitulis discoideis congestis. Pedicelli 3-8 mm. longi puberuli. Calyculus 6-7 bracteis imbricatis ovato-lanceolatis acutis 2-4 mm. longis 1.5-2 mm. latis crispo-pubescentibus. Involucrum campanulatum 8 bracteis oblongis acutiusculis 6 mm. longis 2-2.5 mm. latis, viridibus crispo-puberulis margine membranaceis ciliolulatis. Flores hermaphroditi tubulosi lutei. Corolla 5 mm. longa (non totale evoluta). Antherae basi caudiculatae. Rami stigmatici obtusi papilloso. Ovarium glabrum. Pappus 5 mm. longus albus setis apice incrassatis papilloso-clavatis.

Type: Colombia, Dep. Boyacá, Nevado del Cocuy, alto valle de Las Lagunillas, en la morrena Silla Larga, 4400-4500 m. alt., collect 12-IX-1938, J. Cuatrecasas 1498. (F).

S. frigidophilus, growing in the highest and coldest parts of the Nevado del Cocuy, is closely related to *S. flosfragans* Cuatr., but is distinguished by its pappus hairs the tips of which are thickened by numerous papillae present; in addition it has shorter, obtuse, sessile leaves, a less developed calyx which is pubescent like the involucre.

Senecio novolanatus Cuatr., sp. nov.

Frutex ramis congestis, ramulis lanuginosis vaginibus coriaceis foliorum delapsorum dense tectis.

Folia rigide coriacea alterna breviter petiolata, in ramulis terminalibus subfasciculatis conferta patula. Petiolus 2-3 mm. longus planus coriaceus basi in vaginam amplexicaulem persistentem subtus glabram ampliatus. Lamina elliptico-oblonga acuta basi subite in latum petiolum angustata, margine laevis, utrinque tomento crasso lanato albo vel cinereo obtecta, sed in foliis vetustis glabrescens vel glabrata paginis sublaevis tantum costa subtus paulo conspicua, 10-22 mm. longa 3-6 mm. lata.

Inflorescentiae terminales corymbosae 5-10 capitulis discoideis congestis, folia superiora vix superantibus. Pedicelli 10-4 mm. longi dense lanati aliquis bracteis linearibus acutis 3-6 mm. longis lanuginosis muniti, 3-5 superioribus ad modum caliculi dispositis. Involucrum campanulatum 12-13 bracteis oblongis acutis, 5-6.5 mm. longis, exterioribus 1.5, interioribus ad 3 mm. latis margine scariosis dorso arachnoideo-lanatis sub-apice glabratis apice ciliolatis basim magis lanatis. Flores tubulosi hermaphroditi 40-52 in capitulo, corolla lutea glabra 5-5.5 mm. longa, tubo 1.5 mm. Antherae basi breviter sagittatae. Stigmata truncata papillosa. Ovarium glabrum. Pappus setis, in sicco stramineis, pilosiusculis apice crassiuscule papillosis clavato-dilatatis.

Type: Colombia, Dep. Santander: Páramo de Santurbán, near Vetás, 3950-4160 m. alt., collect. Jan. 17, 1927 E. K. Killip & Albert C.

Smith 17505. "Low compact shrub, florets yellow, pappus light green." (US.) (fragment in F.).

Cotype: Killip & Smith 17463 same locality. (US).

S. novolanatus is close to *S. ledifolius* (HBK) DC. but differs from that species by its harder, more rigid, patulous leaves, which are arachnoid-woolly, woolly-tomentose (not sericeo-lanate) or sometimes floccose, its more coriaceous and persistent foliar sheets, the larger heads with longer and broader bracts and more numerous flowers, and by the pappus hairs the tips of which are enlarged by numerous hairy papillas. Careful study of the Killip and Smith plant suggests the possibility of its identity with *Cacalia lanata* HBK, of which I have seen only a photograph. In herbaria, *S. lanatus* DC. was formerly applied to a well represented and common species, *Cacalia ledifolia* HBK. I have identified many sheets of this species on the basis of typical material of *C. ledifolia* and treated *C. lanata* as a synonym of *C. ledifolia*. Since seeing the Killip and Smith specimens, I doubt again whether this synonymy is correct, although this does not affect the name of our species, as *Senecio lanatus* DC is a later homonym.

Senecio Ellsworthii Cuatr., sp. nov.

Herba robusta 0.60-3 m. alta, plus minusve ramosa, ramis fistulosis striatis glabris viridi-pallidis.

Folia alterna subcoriacea crassiuscula pallido-viridia glaberrima subsessilia. Petiolus 3-6 mm. longus glaber, basim versus latior vaginatus amplectens. Lamina ovata apice acuminata, basi cordata amplexicaulis, margine leviter revoluta argute serrata dentibus patentibus callosulis 3-8 mm. remotis, maxima vidi 18 cm. longa, 9 cm. lata in ramis superioribus minor; supra costa prominula, nervis secundariis 7-12, arcuato-ascendentibus leviter prominulis, venulis obsolete; subtus costa magis prominenti, nervis secundariis prominulis, venulis parum conspicuis.

Inflorescentia terminalis magna laxissime paniculata, ad 40 cm. expansa, axi ramulisque rubescentibus glabris brachiatis. Ramuli teneres sed rigidi bracteolas anguste lineares acutas 8-3 mm. longas gracilis ferentes. Pedicelli gracilliter capillares rubescentes recti vel paulo flexuosi, 8-5 bracteis angustissimis acutis circa 2 mm. longis muniti, 2.5-3.5 cm. longi, apice 2-4 bracteolis linearibus ad capitulum adpressis vix calyculum formantibus. Involucrum tubuloso-campanulatum, 8-9 bracteis lineari-oblongis acutis, 8 mm. longis, exterioribus 1.5 mm. lat. interioribus 2-2.2 mm. lat., purpurascens glabris, apice ciliolatis. Flores omnes hermaphroditi tubulosi, circa 16 in capitulo. Corollae viridi-pallidae 9-9.5 mm. longae, tubo 5 mm. longo, limbo campanulato profunde 5-dentato dentibus 1.5 mm. longis. Antherae 2.5 mm. longae basi breviter sagittatae viridulae. Rami stigmatici crassiusculi-conici breviter papillosi. Ovarium glabrum. Pappus albidus, 7-8 mm. longus.

Type: Colombia, Dep. Santander: Northern slope of Mesa de los Santos, alt. 1000-1500 m., collect. Dec. 1926, E. P. Killip et Albert C. Smith 15398. "Coarse herb, 4-10 feet; bracts purple-red; corolla grass-green styles grass-green; pappus white. In open." (US.) (fragment in F.).

Cotype: Colombia, Dep. Santander: Between El Roble and Tona, alt. 1500-1900 m. Woods, collect. Febr. 1927, Ellsworth P. Killip & A. C. Smith 19413. "Herb 2-6 ft.; florets greenish yellow."

S. Ellsworthii is one of the most peculiar species of *Senecio* in Colombia. It is especially striking on account of its large terminal panicles with slender, filiform, reddish, divaricate branchlets, and long capillary pedicels. The involucre is purplish and the corollas yellow-greenish. The leaves are large, thick, sessile and amplexicaul, serrate with acute, small teeth. The stigmas have an abrupt, conical prolongation at the top of the terminal enlargement.

Senecio diamantensis Cuatr., sp. nov.

Frutex scandens ramulis brunneis vel ferrugineis dense hirsutotomentosis, pilis conicis crassiusculis dense tectis acutis praecipue arcuatis.

Folia alterna membranacea petiolata. Petiolus 5-12 mm. longus puberulus vel tomentellus valde angustus. Lamina obovata vel subovata, apice rotundata vel obtusa, basi subite contracta, cuneata supra partem superiorem petioli decurrens, margine obtuse serrata dentibus muticis vel mucronatis, 2-4 cm. longa, 13-22 cm. lata; supra viridis vel atroviridis subnitens glabra vel minutissimis sparsissimis pilis munita nervo medio anguste impresso puberulo, reliquis nervis obsoletis; subtus pallidior subglabra costa prominenti puberula, nervis secundaris 8-9 utroque latere, parce prominulis patentibus marginem versus reticulato-evanescentibus venulis delicatulis in reticulo visibili, sparsissime puberula.

Inflorescentiae terminales et in ultimis axillis foliorum, paniculas plus minusve foliosas, plus minusve amplas formantes. Pedunculi ramusculique ferruginei hirsuto-tomentosi bracteis lineari-lanceolatis acutis tomentellis 5-2 mm. longis. Pedicelli 3-6 mm. longi teneres rigidi erecti tomentelli aliquis bracteolis lanceolatis ciliatis munitis apicem versus 4-5 circa 2 mm. longis ad modum calyculum formantibus. Capitula tubuloso-campanulata discoidea parva. Involucrum tubulosum 8 bracteis linearibus acutis 6 mm. longis 1-1.2 mm. latis pallidissime viridulus glabris margine scariosis apice brevissime ciliolulatis. Flores hermaphroditi tubulosi 12 in capitulo. Corollae albae glabrae 5-5.5 mm. longae, tubulo 2.5 mm. longo, limbo infundibuliformi profunde 5-dentato. Antherae basi obtusiusculi. Stigmata truncata papilloso-penicillata. Ovarium glabrum. Pappus albus 4 mm. longus.

Type: Colombia, Dep. Valle. Cordillera Occidental: Los Farallones, Quebrada de Las Nieves, páramos sobre la mina El Diamante, 3000-3120 m. alt., collect. 31-VII-1946 J. Cuatrecasas 21821. "Beju-

co. Hoja verde brillante oscuro haz, claro envés. Invólucro amarillo verdoso blanquecino. Corola blanca." (F).

Cotype: Id. id. Los Farallones, filo de la Cordillera, extremo N en cerro Alto del Buey, páramos 3500-3600 m. alt. collect. Oct. 1944 J. Cuatrecasas 17966. "Frútex bejucoso. Hoja semicoriácea, flexible, verde grisácea clara, algunas rojas o con nervios rojizos. Invólucro blanquecino verdoso. Corola blanca. Estigmas blanco amarillentos." (F).

S. diamantensis is related to *S. arboreus* (HBK) DC. and *S. weinmannifolius* Cuatr., but differs, among other characters, by its leaves which are not reticulate. It can be separated from *S. theaeifolius* Benth. by the shape of its leaves and its tomentose branchlets.

Senecio antioquensis Cuatr., sp. nov.

Frutex ramis scandentibus. Ramuli foliosi dense crasseque tomentosi badi vel ferruginei.

Folia alterna subcoriacea petiolata viridia, in sicco brunnescentia. Petiolus circa 5 mm. longus mediocriter robustus, tomentosus basi incrassatus. Lamina lanceolata basi late cuneata, apicem versus attenuata acuta, margine integra irregulariter revoluta; 3.5-7 cm. longa, 12-25 mm. lata; supra nervo medio impresso leviter puberulo, reliqua glabra nitens minute et prominule reticulato-venosa; subtus nervo medio crasso prominenti tomentosi, nervis lateralibus 8-12 utroque latere prominentibus patulis marginem versus furcatis evanescentibus tomentulosis, reliquis venulis in reticulum anastomosatis plus minusve tomentellis.

Inflorescentiae terminales et axillares foliorum superiorum paniculas foliosas elongatas formantes. Pedunculi ramuli pedicellique tomentosi. Capitula cylindrica discoidea. Pedicelli 0-2 mm. longi. Calyculus plerumque 5 bracteis lineari-lanceolatis 1-1.6 mm. longis acutis puberulo-ciliatis. Involucrum 8 bracteis lineari-oblongis subobtusis, glabris apice breviter ciliolatis, margine anguste scariosis, 4-4.5 mm. longis 1 mm. latis. Flores tubulosi hermaphroditi plerumque 10, praeanthesi involucro valde breviores. Corollae albae 3.5 mm. longae glabrae tubulo 1.3 mm., limbo infundibuliformi dentibus profundis 0.7 mm. longis apice papillosulis. Antherae basi obtusae. Stigmata truncata paulo papillosa. Ovarium glabrum. Pappus pilis scabridis.

Type: Colombia, Dep. Antioquia, San Pedro collect. Nov. 1937 Bro. Tomas Alberto 252. (US).

Cotypes: Antioquia: Jerico, collect. Dec. 1940, Hnos. Daniel & Tomas 2688. "Semivoluble, 2-3 m. long." (US)

Antioquia: San Pedro, collect. Dec. 1937, Hnos. Daniel & Tomas 1471. "Flexible, semi-shrub, flo. white." (US, F).

S. antioquensis is close to *S. tamaensis* Cuatr. but differs by having always a more or less dense tomentum on the lower side of the

leaves, bracts, and calycle. The indumentum on the branchlets of the inflorescence is thicker than in *S. tamaensis* which has glabrous leaves and calycle. Furthermore, *S. antioquiensis* has very short pedicels often with subsessile flowers and short, thick petioles; before anthesis, the flowers are much shorter than the involucre.

Senecio Archeri Cuatr., sp. nov.

Frutex scandens usque ad 10 met. longus. Rami terminales laeves glabri viridi-pallidi.

Folia alterna subcoriacea petiolata patentia glaberrima in sicco brunneo-olivacea. Petiolus 10-15 mm. longus, angustus rigidus, supra canaliculatus. Lamina elliptico-oblonga vel elliptico-lanceolata, basi obtuse cuneata apice acuminata valde acuta, margine paulo revoluta minute arguteque denticulata dentibus callosis, 6-9 cm. longa 2-4 cm. lata; supra costa depressa, nervis secundariis venulisque minute reticulatis paulo depressis vel elevato-reticulatis; subtus costa elevata, venulis graciliter reticulatis nervis secundariis ascendentibus 8-10 utroque latere paulo conspicioribus.

Inflorescentia terminalis panicula elongata basi foliosa. Axis ramulique (2 cm. longi) paulo tomentelli, bracteolis linearibus brevibus. Pedicelli puberuli 2-4 mm. longis aliquis bracteolis anguste linearibus apice vix caliculum formantibus. Capitula discoidea. Involucrum campanulatum 8 bracteis viridibus glabris ovatis apice acutis, 5 mm. longis 2-3 mm. latis, margine scariosis. Flores tubulosi hermaphroditi 20. Corolla 6 mm. longa, glabra tubulo 2.5 mm. apice dentata. Antherae basi caudatae. Stigmata obtusa truncata breviter papillosa. Ovarium glabrum striatum. Pappus albidus 5-6 mm. longus.

Type: Colombia, Dep. Antioquia: near Medellín, collect. Febr. 1931, W. A. Archer 1581. "Climbing 30 ft. Corolla pale green. Sepals shiny green, waxen." (US) (fragm.F). Other collection: Antioquia: Santa Elena, collect. 12-28-30 W. A. Archer 1165. "Vine 10-30 ft." (US).

S. Archeri is one of those vines which resemble *S. theaeifolius* Benth. and *S. tamaensis* Cuatr. but is distinguished by being glabrous, by its rigid, long petiolate, minutely dentate leaves, its broad campanulate involucre with broader bracts, and by its sagittate anthers.

Senecio supernitens Cuatr., sp. nov.

Frutex scandens ramis pallidis laevis glabris.

Folia alterna coriacea petiolata glaberrima utrinque valde nitida. Petiolus 5-10 mm. longus supra sulcatus basi paulo incrassatus in sicco nigrus. Lamina elliptico-oblonga utrinque attenuata, basi cuneata apice acuta, margine integerrima 7-9 cm. longa, 2.8-3.6 cm. lata, supra costa impressa, nervis lateralibus paulo elevatis venulis prominulis graciliter minuteque reticulatis; subtus costa crassa elevata in sicco nigrescenti, nervis secundariis prominulis 7-8 utroque latere,

ascendentibus arcuatis marginem versus anastomosantibus, venulis minute reticulatis conspicuis.

Inflorescentia terminalis robusta corymboso-paniculata 12 cm. lata axi ramulisque viridi-nigrescentibus breviter puberulis. Bractee lineari-lanceolatae 8-2 mm. longae sparse ciliato-puberulae. Pedicelli teneres 5-15 mm. longi erecti tomentelli 3-8 bracteolis parvis muniti apice 3-4 bracteolis 1.5-2 mm. longis ad basim capituli parvum calyculum formantibus. Capitula radiata. Involucrum tubuloso-campanulatum 13-14 bracteis linearibus 5-6 mm. longis 1-1.5 mm. latis glabris dorso viridibus margine scariosis apice acutiusculis ciliolulatis. Flores feminei marginales ligulati 8-10, corolla lutea 10 mm. longa, tubulo 3 mm., lamina oblonga minute tridentata, 6 mm. longa 2 mm. lata. Flores disci hermaphroditi tubulosi; corolla lutea glabra 6.5-7 mm. longa, tubulo 2.6 mm., limbo tubuloso-infundibuliforme, apice 5 dentato dentibus angustis 0.8 mm. longis; antherae basi sagittatae; stigmata truncata breviter penicillata. Ovarium glabrum. Pappus albus.

Type: Colombia, Dep. Antioquia: Medellín, estación experimental "Tulio Ospina", collect. 3-8-1931 W. A. Archer 1652. "Climbing 15 ft.; fl. yellow, lvs. leathery." (US), (fragm.F.)

S. supernitens is close to *S. caliensis* Cuatr., but differs from that and other Climbing species from Colombia by its coriaceous leaves which are finely reticulate and shiny on both sides. *S. supernitens* has a greater number of involucral bracts which are narrower than those of *S. caliensis*; the ligules are larger, the longer disc corollas have a shorter tube and a longer tubulose limb with shorter teeth.

Senecio haticoensis Cuatr., sp. nov.

Frutex scandens ramis divaricatis, extremis viridibus laevis nitidis glaberrimis.

Folia alterna membranacea, crassiuscula petiolata viridia glaberrima. Petiolus tenuis 5-10 mm. longis. Lamina ovoidea vel ovato-oblonga basi obtuse cuneata, apice angustata acuta, margine laevis, in sicco paulo revoluta utrinque laevis, supra nervo medio vix conspicuis, subtus costa prominula, nervis secundariis 4-5 utroque latere curvati-ascendentibus tantum in sicco paulo visibilibus, 3-6 cm. long. 15-28 mm. latis; in ramis inferioribus ad 11 x 4.5 cm.

Inflorescentiae paniculatae terminales usque 20 cm. expansae basi foliosae, ramis ascendentibus vel patulis glabris vel parce puberulis, bracteolis lineari-lanceolatis 10-3 mm. longis glabris superioribus angustissimis. Pedicelli 5-20 mm. longi, teneres rigidi vel paulo flexuosi parce puberuli. Capitula radiata erecta. Calyculus obsoletus, tantum 1-3 bracteolis minutis apice pedicelli praeditus. Involucrum cylindricum 6-7 mm. longum, 8 bracteis lineari-oblongis glabris vel parcissime puberulis, apice acutiusculis ciliatis, 1.2-1.8 mm. latis. Flores marginales 5 feminei ligulatae, corolla lutea 10 mm. longa, tubulo capillari 4 mm. longo, ligula elliptico-oblonga 6 mm.

longa 2 mm. lata apice minute bidentata. Flores centrales hermaphroditi 10-12, corolla 8 mm. longa, tubulo 4 mm. longo, limbo tubuloso apice 5 dentato dentibus linearibus 1 mm. longis; antherae basi sagittatae; stigmata truncata breviter penicillata. Ovarium glabrum. Pappus albidus.

Type: Colombia, Dep. Norte de Santander. Western of Páramo del Hatico en route from Toledo to Pamplona, alt. 2800-2900 m. edge of woods, collect. March 13, 1927 E. P. Killip & Albert C. Smith 20735. "Vine; rays yellow; florets orange." (US). (frag.F).

Cotypes: id. id.: Culaga Valley near Tapata (north of Toledo) 1500-2100 m., woods along stream, collect. E. P. Killip & A. C. Smith 20488. "Herbaceous vine; rays and florets yellow." (US)

Id. id.: Páramo del Hatico, collect. E. P. Killip & A. C. Smith 20581. (US).

Id. id.: Road from Pamplona to Toledo, crossing the divide between Rio La Teja and Rio Mesme, alt. 2800-3000 m.; dense woods; coll. E. P. Killip & A. C. Smith 19872. "Woody vine; rays and florets yellow". (US).

S. haticoensis is a very characteristic vine, the leaves of which are presumably fleshy when fresh and smooth without visible nerves coming off at an acute angle and scarcely perceptible when dry; the lamina is acute at the apex and attenuated into a narrow petiole at the base. The anthers are sagittate. Its smaller leaves and heads distinguish it from *S. nigellus* Badillo.

Senecio Tomasianus Cuatr., sp. nov.

Frutex circa 3 met. altus, ramis laevibus vel paulo striatis glabris vel parcissime minuteque puberulis.

Folia alterna membranacea petiolata glabra. Petiolus praecipue 15 mm. longus flexuosis supra sulcatus, basi paulo incrassatus. Lamina elliptico-oblonga utrinque attenuata basi obtuse cuneata apice acuta, margine integerrima in sicco paulo revoluta, 6.5-10 cm. longa, 2.6-3.5 cm. lata; supra tantum nervo medio signato reliqua levis; subtus costa crasse prominenti, nervis secundariis leviter prominulis 6-7 utroque latere ascendentibus marginem versus evanescenti-anastomosatis; reliquis nervulis reticulatis obsoletis.

Inflorescentia terminalis corymboso-paniculata circa 12 cm. lata, basi foliosa. Ramuli ascendenti striolati plus minusve tomentelli, bracteis linearibus acutis, 5-2 mm. longis. Capituli radiati cylindrici elongati. Pedicelli 1-6 mm. longi. Calyculus 34 bracteolis brevibus linearibus acutis 2-3 mm. longis parcissime puberulis. Involucrum cylindricum 8-10 bracteis oblongis 7-7.5 mm. longis 1.5-3 mm. latis dorso viridibus glabris basi puberulis margine scariosis apice acutiusculis. Flores feminei 6-8 marginales ligulati 8-9 mm. longi, tubulo filiformi 4.5 mm. longi, ligula elliptico-oblonga 3.5-4 mm. longa, 1 mm. lata. Flores centrales hermaphroditi tubulosi circa 14, corolla

7.5 mm. longa tubulo angusto filiformi 4-4.5 mm. longi, limbo infundibuliformi 5 dentibus oblongis 1.5-2 mm. longis; antherae basi sagittatae. Stigmata truncata penicillata. Ovarium glabrum. Pappus stramineus.

Type: Colombia, Dep. Antioquia: San Pedro, collect. Aug. 30, 1939 Bro. Tomás 595. "Shrub about 3 m. high, flowers yellow, wet places." (US).

S. Tomasianus is related to *S. breviligulatus* Hieron. but differs substantially from that and other related species by its very close bracts forming a long and tubular involucre which is somewhat contracted below the apex. Its flowers are also typical, as the lower part is long and filiform. The leaves are smooth on the upper side but show obsolete secondary nerves on the lower side and are presumably fleshy when fresh.

Senecio Danielis Cuatr., sp. nov.

Suffrutex 2 met. alta, ramis terminalibus pendulis vel erectis viridipallidis sublaevibus leviter striolatis glabris.

Folia alterna membranacea petiolata glabra. Petiolus 5-7 mm. longus plus minusve flexuosus supra sulcatus. Lamina elliptico-oblonga utrinque attenuata basi obtuse cuneata apice acutata, margine integra, in sicco paulo revoluta, 3.5-5.5 cm. longa, 13-25 cm. lata; supra costa impressa, reliqua laevis, nervulis obsoletis; subtus costa eminenti nervis lateralibus 6-7 utroque latere leviter conspicuis ascendentibus, nervulis obsoletis.

Panicula terminalis corymbosa vel subcorymbosa axis robustus glanduloso-puberulus, ramulis striatis glanduloso-tomentellis vel pubescentibus, bracteolis lanceolatis munitis. Pedicelli 6-20 mm. longi mediocri vel robusti, erecti pubescentes. Calyculus 2-3 bracteolas lineares angustas parvas reductus. Involucrum campanulatum 12 bracteis oblongo-lanceolatis 1.5-1.8 mm. latis 5 mm. longis, dorso viridibus puberulis vel glabratis, margine scariosis. Capitula radiata. Flores marginales feminei ligulati, corolla 12-14 mm. longa, tubulo filiformi 4 mm. longi, ligula anguste lineari 8-11 mm. longa 1.5 mm. lata apice minute 3-denticulata 4-nervata. Flores centrales hermaphroditi tubulosi, circa 40, corolla 6 mm. longa, tubulo 2.5 mm. longo, limbo infundibuliformi apice profunde dentato; antherae basi sagittatae; stigmata truncata penicillata. Ovarium glabrum striatum. Pappus stramineo-albidus.

Type: Colombia, Antioquia: Páramo de Sonsón, 2700-2850 m. collect. Jan. 26, 1945 Bro. Daniel 3418. "Mas menos 2 met. Flores amarillas." (US).

S. Danielis is close to *S. ellipticifolius* Hieron. and characterized by its long and narrow ligules, its thicker leaves with scarcely visible nerves, shorter and thicker petiole, and a larger number of involucral bracts (12-13, instead of 7-8).

Senecio Jahonii Cuatr., sp. nov.

Frutex scandens, ramis terminalibus paulo striatis glabris.

Folia alterna subcoriacea crassiuscula in sicco obscura fragile membranacea petiolata glabra. Petiolus tenuis plus minusve flexuosus 5-15 mm. longus. Lamina ovata basi rotundata vel obtusa apice acutata subacuminata, margine integerrima, 3.5-9 cm. longa, 2.5-5.5 cm. lata, supra costa et 2 nervis lateralibus paulo conspicuis subtus costa prominula 2 nervis lateralibus curvis ascendentibus cum margine parallelis conspicuis reliquis nervulis obliquis obsoletis.

Inflorescentiae singulis corymbis subterminalibus in paniculam subcorymbosam terminalem aggregatis. Capitula grandia radiata pedicello 7-15 mm. longo, filiformi parcissime puberuli 1-3 bracteolis linearibus secundum muniti. Calyculus 8-10 bracteolis linearibus glabris vel leviter puberulis 5-10 mm. longis, 0.5-1 mm. latis, flexuosis ad basim capitulum et subapicem pedicelli insertis conformatus. Involucrum tubulosum 8 bracteis oblongis apice acutis, 12-13 mm. longis 3 mm. latis, crassiusculis glabris dorso viridibus margine stramineis. Flores marginales feminei radiati circa 5, corolla lutea circa 20 mm. longa, tubulo angusto filiformi 10-11 mm. longo, ligula 9-10 mm. longa 2-2.5 mm. lata. Flores centrales 8-10 hermaphroditi corolla tubulosa 13 mm. longa basi abrupte dilatata apicem versus tubuloso-infundibuliformi sine sensu ampliata, dentibus acutis 1.5 mm. longis. Antherae basi muticae. Stigmata subtruncata penicillata. Ovarium glabrum. Pappus albidus 11 mm. longus.

Type: Venezuela: Rio Chico, Miranda, collect. May 30, 1923 Alfredo Jahn 1226. (US), (frag.F).

S. Jahonii is similar to *S. cobrensis* Cuatr. but differs from it by larger heads, longer ligules (the tube being 10 mm. long and the lamina comparatively narrow and long), larger and thicker disc corollas, and a calycle formed by a greater number of long and flexuose bracts. In *S. Jahonii* the petiole of the leaves is shorter and, on the under side of the lamina, two subbasal curved veins extend to the apex. Several less conspicuous, spreading veins are present in *S. cobrensis*. *S. Jahonii* has pubescent pedicels whereas *S. cobrensis* has glabrous ones.

Senecio mamancanacanus Cuatr., sp. nov.

Frutex ramis terminalis lanato-arachnoideis.

Folia alterna coriacea leviter petiolata. Petiolus 2-3 mm. longus. Lamina elliptica vel elliptico-oblonga, basi obtusa apice paulo attenuata subrotundata, margine integra paulo revoluta, 22-35 mm. longa 8-16 mm. lata; supra viridis in juvenilibus arachnoideo-lanuginosa denique glabra; subtus dense tomentosa albicans; tantum nervo medio utrinque conspicuis.

Inflorescentiae paniculatae terminales foliosae, singulis corymbis oligocephalis in axillis foliorum superiorum dispositis, ramuli pedun-

culi pedicellique crassiusculi flexuosi plus minusve albo sericeo-lanati. Pedicelli 5-12 mm. longi 1-2 bracteas lineares 4-6 mm. longas lanatas ferentes. Calyculus circa 14 bracteolis linearibus acutis albo-lanatis, 5-7 mm. longis 2-3 seriatus instructus. Involucrum 20 bracteis oblongis apice acutis, 9.5 mm. longis 1.8-2.2 mm. latis margine scariosis dorso herbaceo arachnoideo lanato albicanti. Capitula radiata. Receptaculum alveolatum 4 mm. diam. Flores marginales feminei 20, ligulatae, corolla 14 mm. longa, tubulo filiformi 4 mm. longo, lamina oblonga obtusa 9 mm. longa, 2.5 mm. lata apice minute 3-denticulata. Flores centrales hermaphroditi tubulosi 100 vel ultra in capitulo, corolla 6.5 mm. longa glabra, tubulo 2-6 mm. longo, limbo tubuloso-ampliato. Antherae basi muticae. Rami stigmatici truncati papillosuli. Ovarium glabrum. Pappus sericeus 6-7 mm. longus.

Type: Colombia, Sierra Nevada de Santa Marta, upper Mamancanaca Valley, south side of the major peaks, collect. March 1939 Cabot Expedition no. 6. (Gray Herb.) (frag.F).

S. mamancanacanus is related to the species of the Sect. *Reflexus* and close to *S. lingulatus* (Schr.) Cuatr., but strikingly different in view of its radiate heads.

Senecio Carrikeri Cuatr., sp. nov.

Frutex, ramis terminalibus erectis viridulis glabris nitidis.

Folia alterna coriacea subsessilia viridia glaberrima. Petiolus 1-3 mm. longus basi incrassatus. Lamina lineari-lanceolata utrinque angustata basi subcuneata apice subacuta mutica, margine integra in sicco curvato-revoluta, 4-6 cm. longa 6.5-10 mm. lata; costa supra impressa, subtus crassa eminenti; nervis lateralibus 8-10 utroque latere obsolete.

Capitula discoidea. Inflorescentiae terminales corymboso-paniculatae, breves, 3-7 cm. latae basi foliosae omnes glaberrimae. Ramuli teneres praecipue flexuosi breves, bracteolis linearibus acutis sparsis muniti. Pedicelli 5-10 mm. longi, 1-2 bracteati. Calyculus 3-4 bracteolis 2-3 mm. longis linearibus acutis instructus. Involucrum etiam glaberrimum 8-10 bracteis subcoriaceis, 5.5 cm. longis, 1.5-2.5 mm. latis, margine scariosis, dorso viridibus. Flores omnes tubulosi circa 28 hermaphroditi, corolla 7 mm. longa, tubulo circa 3 mm. longo. Antherae basi obtusae. Stigmata truncata penicillata. Ovarium glabrum. Pappus albus.

Type: Colombia, Sierra Nevada de Santa Marta; Rio Guatapuri ("Mitocua") alt. 10,500 ft., narrow, deep gulch running up mountain side, about a mile above river, collect. March 29, 1946 M. A. Carriker 56. (US), (frag.F).

S. Carrikeri is closely related to *S. pulchellus* DC. but differs in the shape of its leaves which are larger, subsessile and more attenuate toward the tip, larger involucre, glabrous inflorescence, smooth and more divaricate branchlets, and ascending leaves.

Senecio cachacoensis Cuatr., sp. nov.

Frutex ramulis erectis griseis tomentulosis terminalibus tomentoso-hirsutis.

Folia alterna subcoriacea petiolata copiosa. Petiolus circiter 5 mm. longus angustus hirsutulus. Lamina elliptico-oblonga oblanceolata, apice obtusiuscula vel acutiuscula, basim in petiolum angustata cuneata, margine repando crenato-dentata, in sicco plus minusve revoluta 3-3.5 cm. longa 9-19 mm. lata, utrinque viridis, supra glaberrima nitida sublaevis, nervo medio paulo conspicuo; subtus costa prominenti parce strigosa reliqua superficie glabra nervis lateralibus inconspicuis.

Inflorescentia terminalis corymbosa basi foliosa 8-10 capitulis longe pedicellatis, ramulis 1-3 floribus vel pedicellis, 1.5-2.5 cm. longis tenuibus strigoso-hirsutulis aliquis bracteolis linearibus acutis 2-4 mm. longis munitis. Capitula radiata erecta. Calyculus 1-3 bracteolis minutis. Involucrum campanulatum 13 bracteis 4.5 mm. longis, glabris, apice acutis ciliatis, viridibus, interioribus margine scariosis. Flores marginales feminei 8-12 ligulatae. Corolla lutea, tubulo angusto glabro 3 mm. longo, lamina late oblonga 8-9 mm. longa, 2.5-3 mm. lata 7-nervata apice obtusiuscula minute 3-dentata. Flores centrales hermaphroditi 16-18 tubulosi corolla lutea 6 mm. longa glabra tubulo 2 mm. longo, limbo infundibuliformi apice 5-dentato, antheris basi breviter caudatis, stigmatibus truncatis breviter penicillatis. Ovarium glabrum pappus stramineus.

Type: Venezuela; Trujillo: Páramo de Cachaco, 3400-3700 m. alt. collect. Nov. 7, 1927, Christ 85 (US).

S. cachacoensis, being shrubby and radiate, is characterized by its elongate, smooth leaves, its tomentose-hirsute branchlets and certain features of the heads and flowers. Because of the shape of the leaf and inflorescence it is related to *S. polymerus* Klatt but differs from that species by the indumentum and head structure. From *S. venezuelensis* Sandwith (= *S. mucuyanus* Cuatr.) it is easily separable by its smaller, narrower leaves with a midrib which is strigulose on the lower side, as well as the smaller and differently arranged head.

SENECIO FLORIBUNDUS Sch. Bip. ex Hieronymus, Engl. Bot. Jahrb. 29: 69 (1900)

This species is not synonymous with *Vernonia floribunda* as claimed by Hieronymus. The type must be the plant cited by Hieronymus at the end of its original description: Sodiro 59/19.

Field Museum photograph 15588 shows a sheet of the Willdenow Herbarium in Berlin with the following quotation: "Ex Herb. Kunth *Cacalia floribunda*. Ex Herb. Bonpl."; another sheet annotated by Hieronymus reads: "Senecio floribundus (Kunth) Sch. Bip. manuscr. in Herb. Willds. no. 15073 syn. *Vernonia floribunda* Kunth, Humb. Bonpl. Nov. Gen. et Sp. IV p. 38 (30).

Schultz Bipontinus and Hieronymus thought that this plant was the

type of *Vernonia floribunda* and therefore Hieronymus wrote: "Species a Kunthio errore generi *Vernoniae* associata et male descripta ..." (l.c.). Schultz B. made the transfer and Hieronymus published the new combination followed by a complete description based on Sodi-ro's specimens.

Field Museum photograph 37325 shows the type of *Vernonia floribunda* HBK from the Herbarium Bonpland preserved in Paris and proofs that Kunth was right in considering the plant a *Vernonia*. This species must be retained, whereas the plant from Berlin belongs to *Senecio floribundus*, a name which must be considered valid for a different species rather than used for the combination made by Hieronymus. Similar cases of confusion in taxonomy have resulted from having accepted plants from the Willdenow Herbarium as isotypes of Kunth without their being such. See *Culcitium ledifolium* in Fieldiana Bot. 27: 47.

SENECIO POLYMERUS Klatt, Abhandl. Natur. Gesell. Halle 15: 332 (1882).

S. sancti-sebastiani Sandwith, Kew Bull. 1941: 227 (1942).

Colombia: Funk 505 one leaf in Herb. Ch. Nat. Hist. Mus. (fragment from Herb. in Vienna) and Photo 33329 from the specimen in Vienna. It only has the annotation "Venezuela".

Cabot 2, Sierra Nevada de Santa Marta: Upper Mamancanaca Valley, south side of the major peaks, 9500 ft. Herb 10-14 inches tall (Gray Herb.). Cabot 3 (Id. id.) (Gray Herb.).

Apolinar Angel 653: Dept. Magdalena. Near rio Chinchina, between Pueblo Bello and San Sebastian, 2000 met. alt. (US.)

These specimens agree with the detailed description given by Sandwith except for minor differences in the measurements of heads and flowers and a certain amount of polymorphism. *S. polymerus* is well characterized by the arachnoid-membranaceous indument on its branchlets and leaves; this feature and the form of its leaves and inflorescence enabled me to identify these plants with Funk 505 which in the Vienna Herbarium bears the name of *S. polymerus* Klatt. However, the type of this species is Funk 297 ("Caracas") which I have not seen, but it may be supposed that whoever named the first number checked it with the type. Klatt's description is incomplete and the indument is described as "incano-tomentoso". However, the two Funk specimens must have been collected in the same region and not in "Caracas" (Venezuela) as stated in Klatt's publication. I have seen several specimens of Funk with numbers about 300 to 500 which were collected in Colombia, in the Sierra de Santa Marta. The error is due to a mistake in labelling many sheets of Funk and Schlim, on which one can read "Sierra Nevada de Sta. Marta, Caracas". (See for example Field Museum Photographs 28637, 28638 and 28639, *Diplostephium anactinotum*, *cyparissias*, and *microphyllum*, respectively.) Klatt who surely knew nothing about the Geography of northern South

America, gives as the locality for his *S. polymerus* "Caracas". This plant belongs to the flora of Colombia and must not be listed for that of Venezuela. The same error in labelling was apparently noticed by Mez in his discussion of *Stylogyne turbacensis* (Pflanzenreich IV. 236: 270), in which he questioned "Caracas" as the actual locality. I am convinced that the specimens Funk 297 and 505 belong to the series from the Sierra Nevada de Santa Marta labelled with the erroneous addition of "Caracas".

SENECIO CANESCENS (H. et B.) Cuatr., Fieldiana Bot. 27: 43

Culcitium canescens H. et B., Pl. Aeq. 2: 44

Culcitium rufescens H. et B., Pl. Aeq. 2: 41

Senecio rufescens Cuatr., no HBK, Fieldiana Bot. 27: 45

No specific differences exist between the plants described by Humboldt as *Culcitium rufescens* and *C. canescens* and by me as *C. boyacense*. However, several geographical varieties can be distinguished. The reddish color of the plant given by Humboldt and Bonpland as characteristic of their species is not very consistent; white plants can become reddish on drying, thus desiccation may influence color. In my opinion the following specimens belong to the typical form of this species:

Bonpland 3049: Peru (fragment from the Paris Herbar in F.)

Macbride & Featherstone: Peru, Huarapasca 16,500 feet (Us, F.)

Carriker: Peru, Libertad, Quirivilea (US, F.)

Killip & Smith 22062: Peru, Junín, near Huancayo 4700 m. (US).

SENECIO CANESCENS var. *boyacensis* (Cuatr.) Cuatr., nov. status

Culcitium boyacense Cuatr., Caldasia I: 5

Senecio boyacensis Cuatr., Fieldiana Bot. 27: 43

This variety includes all forms from the Oriental Cordillera of Colombia with soft, long leaves, rather large heads, and thick indumentum. Cuatr. 1372, Cuatr. & Garcia 1372 (Cocuy) (US, F, HNC), Cuatr. & Garcia (Almorzadero) (F, US, HNC), Cuatr. 13528 (Almorzadero) (F, US, HNC), Arist. Joseph B-73 (hacia Sumapaz) (US).

SENECIO CANESCENS var. *macrocephalus* Cuatr., nov. var.

Capitula magna, 6-8 cm. lata, receptaculo circa 4 cm. lato. Folia radicalia valde crassa late elliptico-lanceolata basi breviter attenuata, costa crassa robusta, 15-24 cm. longa, 3.5-6 cm. lata.

Type: Colombia, Dept. Caldas, Nevado de Santa Isabel arenales 4420 m. alt., collect. J. Cuatrecasas 23208 (F).

This variety is found in the Cordillera Central of Colombia on the paramos of Ruiz (Rovira 2, F.; Pennell 3030, NY, US; Dawe 767 NY, US; Chardon 5025, US; Daniel 2088, F; Pennell & Hazen 9893, NY, US; Cuatrecasas 9259, HNC, F), Puracé (Sneidern 1942, NY, F), Huila (Pittier 1012, 1015, 1016, US, F.).

SENECIO CANESCENS var. *elongatus* Cuatr., nov. var.

Folia longiora basim versus longe attenuata, nervis conspicuis. Inflorescentia ramosa. Capitula 4.5-5 cm. diam.

Type: Ecuador, Carchi: Páramo del Angel, 3300-3800 m. alt., collect. Acosta-Solis 10562 (F.)

This variety is limited to the paramos near the boundary between southern Colombia and northern Ecuador. Other specimens seen are: Garganta 421 (Lagune de Cumbal), Royo Gómez (Nevado del Cumbal); Ecuador: Mexía 7508 (Carchi, US), Hitchcock 20911 (Tulcan, US), Heinrich 659 (Páramo del Angel, NY).

SENECIO CANESCENS var. *ELONGATUS* fma. *magnificus* Cuatr., nov. fma.

Planta elata polycephala, capitulis magnis.

Type: Ecuador, Carchi, Páramo del Angel 12,000 ft., collect. Edward Balls 7337 (US).

SENECIO CANESCENS var. *ecuadoriensis* Cuatr., nov. var.

Folia radicalia elongato-elliptica utrinque angustata, crassa, nervis secundariis inconspicuis, capitulis solitariis vel paucis, mediocribus vel grandis, praecipue 5-6 cm. lat. Lana copiosa, in sicco rufescens.

Type: Ecuador, Monte Pichincha near Quito 4100-4500 m., collect. Hitchcock 21059 (US, NY).

Other specimens are: Pichincha (Mille 717, NY, US; Andre 176 and 3894, NY, F; Couthony, NY), Chimborazo (Hitchcock 21966, NY, US; Rimbach 93, US), Imbabura (Penland & Summers 796, F), Corazón (André 3780, NY), And. Quit. (Jameson 228, US, NY: USDA?, US; Herb. Gray, NY).

This variety of the central Andes of Ecuador is close to var. *macrocephalus* but differs by its smaller, narrower leaves with longer petioles but without the conspicuous nerves characteristic of the Colombian variety; the heads are smaller (receptacle 3 cm. broad or less).

SENECIO CANESCENS var. *monocephalus* (Wedd.) Cuatr., nov. status

Culcitium canescens var. *monocephalum* Weddell Chl. And. I: 138.

It is probable that this variety corresponds to a complex of Peruvian forms of *Culcitium rufescens* whose type is not clear to me and the descriptions of which (including the original one) may have been made from a mixture of Peruvian and Ecuadorian specimens.

Bolivia: Alaska Mine (Tate 66, NY), Larecaja vic. Sorata (Mandon 149, NY, F), Bang 1900 (NY, US). Peru: Paucartambo Valley (Herrera 1094, US, NY), Panticalla Pass (Cook & Gilbert 1884, US).

Senecio meridanus Cuatr., nom. nov.

Senecio Steyermarkii Cuatr., Fieldiana Bot. 27: 32 (June 1950), not *S. Steyermarkii* Greenman, Ceiba I: 124 (Apr. 1950).—*Gynoxis verrucosa* Badillo, Bol. Soc. Venez. Cien. Nat. 10: 312 (1946), not *Gynoxys verrucosa* Weddell, Chl. And. I: 77 (1855).

Senecio quitensis Cuatr., nom. nov.

Culcitium pichinchense Cuatr., An. Univ. Madrid 4: 215 (1935).
Senecio pichinchensis (Cuatr.) Cuatr., Fieldiana Bot. 27: 44 (1950).

The last name is a later homonym of *Senecio pichinchensis* Greenm. (1938), a valid name according to the latest rules of Nomenclature. Therefore my name for this species, *S. vulcanopichis*, is superfluous.

Senecio superandinus Cuatr., nom. nov.

Culcitium reflexum HBK., Nov. Gen. et Sp. Plant. IV: 171 (1820).

Senecio reflexus (HBK) Cuatr., Fieldiana Bot. 27: 44, no *Senecio reflexus* HBK (1820). *Culcitium ovatum* (Schlechter) Blake, *Lasiocephalus ovatus* Schlecht. *Culcitium uniflorum* Hieron.

I have seen many specimens of this high andean plant, which is well represented in the herbaria of USNM, NY Bot. Garden and Chicago Nat. Hist. Mus., chiefly from the volcanos Pichincha, Antisana and Chimborazo.

SENECIO REFLEXUS HBK., Nov. Gen. et Sp. Pl. IV: 182 (1820).

This is a valid name for a plant of which I have not seen type material. *Senecio semidentatus* Klatt and its varieties (like var. *Kluggii* Green.) must be very close to this species, and they are possibly synonymous. *Senecio reflexifolius* Cuatr. is a superfluous name for this species. *Senecio reflexus* (HBK) Cuatr., not HBK, (Fieldiana Bot. 27: 44) is illegitimate as a latter homonym.

SENECIO GILLIESII Hook & Arn., Journ. of Bot. III: 343 (1841).

Culcitium Poeppigii DC., *Cacalia candicans* Poepp. ex DC. pro synonym. *Senecio Poeppigii* (DC) Wedd., Chl. And. I: 118. *Senecio Poeppigii* (DC) Cuatr., Fieldiana Bot. 27: 44, not *S. Poeppigi* Hook et Arn. *Culcitium Gilliesii* (Hook. & Arn.) Spegazzini. *Culcitium dentatum* D., Don ex Hook. pro synonym.—The identification *Culcitium Poeppigii* DC. with *Senecio Gilliesii* Hook & Arn. was made by Cabrera (Lilloa 15: 50).

SENECIO POEPPIGII Hook & Arn., Journ. of Bot. III: 342 (1841).

Culcitium candidum Don. ex Hook. et Arn. pro synonym. *Senecio Doncandidus* Cuatr., Fieldiana Bot. 27: 44. The latter is superfluous. Not *S. Poeppigii* (DC) Wedd. and *S. Poeppigii* (DC) Cuatr., later illegitimate homonym.

SENECIO CANDIDANS DC., Prodr. VI.

Culcitium Gayanum Remy. *Senecio Culciremyi* Cuatr., Fieldiana Bot. 27: 43 (1950).

The following specimens were examined: Gregory Bay, Straits of Magulau (Leslie A. Lee 18-88); Tierra de Fuego, litoral near Rio Grande 2-4 m. alt. (Y. Mexia 7909); Punta Arenas, Patagonia (Feic. 1883); Sandy Point (Lechler 1247). Photograph of the type of *S. candidans* in Paris phot. of type of *Culcitium Gayanum* Remy in Paris; fragments from this type in Paris.

The synonymy of *C. Gayanum* with *Senecio candidans* DC., proposed by Weddell, was recently adopted by L. A. Cabrera, well known specialist in the genus (Lilloa 15: 52).

SENECIO CULCITENELLUS Cuatr., Fieldiana Bot. 27:43 (1950).

Culcitium tenellum Dusen, *Culcitium sessile* Speg., *Senecio neosessilis* Cuatr. Fieldiana Bot. 27:44. *Senecio santacruzensis* Cabrera, Notas del Museo de La Plata Bot. 75:103 (1950).

In my former publication I gave names in the genus *Senecio* to both *Culcitium tenellum* and *C. sessile*, but recently Cabrera stated that they are the same species.

SENECIO WEDGLACIALIS Cuatr., Fieldiana Bot. 27:45 (1950).

Senecio glacialis Wedd. is invalidated by the earlier homonym *S. glacialis* Sch. Bip., Flora 28:498 (1845) (*Doronicum glaciale* Nyman).

Senecio glacialis (Meyen & Walp) Cuatr., Fieldiana Bot. 27:44 is also a later homonym and therefore a superfluous name. I am not giving a new name to *Culcitium glaciale* Mayen & Walp, because it is possible that it has already a synonym in the genus *Senecio*. I have not seen the type material.

SENECIO SODIROI Hieron., Engl. Bot. Jahrb. 29:73 (1900).

This name is satisfactory for this species, eliminating *S. Sodirs candens* Cuatr. (Fieldiana Bot. 27:45). *Senecio Sodiroi* (Hieron.) Cuatr. (Fieldiana Bot. 27:45) given to *Culcitium Sodiroi* Hieron., is an invalid later homonym. I now regard *Culcitium Sodiroi* Hieron. as a simple form of *Senecio culciklatii* Cuatr. (*Culcitium peruvianum* Klatt).

SENECIO RUFESCENS DC. Prodr. VI:413 (1837).

A valid name, of which the later homonym *S. rufescens* (H. & B.) Cuatr., Fieldiana Bot. 27:45, must be rejected. For the same reason *S. austrorufescens* Cuatr. l.c. is also superfluous.

SENECIO VAGINAEFOLIUS Sch. Bip.

Culcitium dasyphyllum Gandoger, Bull. Soc. Bot. Fr. IX:27; *Senecio dasyphyllus* Cuatr., Fieldiana Bot. 27:43.

Cabrera proved that this form is identical with Gandoger's species.

Senecio leucophorbium Cuatr., sp. nov.

Herba rhizomatosa, rhizomate obliquo, caule fertili erectus 25 cm.

longus parce folioso, basi foliis radicalibus copiosis fasciculatis.

Folia radicalia crasse subcoriacea, lamina lineari valde elongata 20-25 cm. longa, 9-14 mm. lata, apice obtusa basim versus sine sensu paulum angustata, basi in longam vaginam scariosam 6 cm. longam 1.6 cm. latam ampliata, margine crassiusculo plano vel parce revoluta; supra albo-lanata tomento compressiusculo nervo medio albiori visibili; subtus dense crasseque albo-lanata costa crassa, nervis lateralibus prominulis ascendentibus subparallelis conspicuis.

Caulis floriferus dense albo-lanato-tomentosus folia basilaria aequilongus, aliquis foliis sessilibus radicalia similibus munita. Inflorescentia terminalis subcorymboso-paniculata polycephala circa 8-9 cm. ampla, basi bracteato-foliola, 13-14 capitulis discoideis breviter pedunculatis congestis. Pedunculi vel ramusculi 1-5 cm. longi. Calyculus pluribracteatus, bracteolis lineari-subulatis basi lanatis. Involucrum hemisphaericum circa 21 bracteis linearibus 12 mm. longis, 2 mm. latis subbiseriatis glabris vel tantum basi lanuginosis. Capitula homogama circa 2-2.5 cm. diam. ultra 400 floribus. Corolla 9 mm. longa, tubulo 4-4.5 mm. limbo tubuloso 5-dentato, dentibus 0.5 mm. profundis. Antherae basi obtusiusculae. Stigmata truncata papilloso-penicillata. Ovarium glabrum. Pappus 8 mm. longus ochraceus.

Type: Peru, prov. Pallasca, Dept. Ancash, Cordillera de Pelagos 4450 m. alt. collect. A. Weberbauer 7241 (F).

S. leucophorbium belongs to Sect. *Culcitium* and is close to *S. nivialis* (HBK) Cuatr., but differs from that species by being larger and having longer, thicker leaves with prominent veins on the lower side, stronger stalk which is shorter than the leaves, the multi-headed inflorescence, larger heads, fewer and broader involucral bracts, and poorer calycle. From *S. Haenkeanus* Cuatr. it differs particularly by its glabrous involucre.

Senecio mitonis Cuatr., sp. nov.

Herba caule basi reptante radiciferi tenui, parte foliosa subscaposa erecta.

Folia inferiora pauca subrosulata, petiolata. Lamina crassa ovata vel elliptica basi truncata vel obtusa apice deltoides margine crenatodentata revoluta, 2.5-4.5 cm. longa, 14-24 mm. lata, supra laevis pallido-viridis nervo medio depresso arachnoideo excepto glabra; subtus dense cinereo lanata tantum costa crassa eminenti conspicua. Petiolus 1.5-3 cm. longus rigidus supra sulcatus, arachnoideo tomentosus, basi longe lateque vaginatus, vagina petioloque postmortem fibrosis plus minusve persistentibus. Caulis gracilis erectus simplex 20-40 cm. longus araneoso-lanatus indumento plus minusve deciduo, basim versus 1-2 foliis sessilibus elliptico-lanceolatis, parte media superiorique tantum 1-3 foliolis bractaeiformibus linearibus praeditis, apice 2-3 capitulos discoideos nutantes ferens.

Involucrum hemisphaericum circa 22 bracteis lanceolatis 6 mm.

longis 1-2.2 mm. latis plus minusve violaceis parce arachnoideis vel glabris. Calyculus aliquis bracteis linearibus acutis valde minoribus conformatus. Flores omnes tubulosi hermaphroditi ultra 60 in capitulo. Corolla lutea glabra 6-7 mm. longa, tubulo 4 mm. longo basi valde dilatato excepto capillari, limbo tubuloso campanulato apice 5-dentato dentibus 0.5 mm. purpurascens. Antherae basi obtusiusculae. Stigmata truncata dense papilloso-penicillata. Stylus basi incrassato-bulbosus, bulbo 0.4 mm. longus pedicellatus pediculo 0.3 mm. longo. Achaenia glabra 2 mm. longa. Pappus pilis biseriatis sericeis quam corolla brevioribus.

Type: Peru: Mito, 9,000 ft. alt. Deep grasses of Western slopes, July-Aug. 1922, collect. Macbride & Featherstone 1807. (US).

S. mitonis is characterized by its petiolate, thick leaves which are crenate-dentate and densely tomentose on the lower side; it has few, small heads, a bulbous, pedicellate style, and a broad base of the corolla. These features differentiate it from *S. homognoides* Klatt and related species.

Senecio Featherstonei Cuatr., sp. nov.

Suffrutex caule rhizomatoso, ramis aereis erectis foliatis ad 20 cm. altis, dense floccoso-lanatis cinereis.

Folia alterna sessilia lineari-lanceolata apice acuta basi rotundato-auriculata amplectentia, margine integra revoluta, utrinque lanato-tomentosa supra cinerea subtus albida, 10-14 mm. longa, 2-2.5 mm. lata.

Capitula discoidea 4-5 in corymbos terminales disposita. Pedicelli erecti 8-18 mm. longi albo-cinereo-tomentosi. Calyculus plurimis bracteolis anguste linearibus acutis pluriseriatis imbricatis 3-4 mm. longis 0.5 mm. latis, extus lanatis sed apicem glabratis fusciscentibus. Involucrum conico-hemisphaericum circa 20 bracteis lineari-lanceolatis 6 mm. longis 1.5 mm. latis extus lanatis apicem violascentibus, apice ciliatis. Flores omnes hermaphroditi tubulosi circa 80 in capitulo. Corolla lutea 6.2 mm. longa, tubulo angustior 2 mm. longo limbo tubuloso-infundibuliformi dentibus papillois acutis 0.4 mm. longis. Antherae basi obtusae. Stylus basi hemisphaericobulbosus. Stigmata apice truncata incrassata breviter penicillata. Ovarium glabrum. Pappus albus sericeus 4-5 mm. longus.

Type: Peru: Mito 10,000 ft., grassland rock outcrop. Yellow, collect. Macbride & Featherstone 1903 (US.)

S. Featherstonei is easily distinguished from the other species of Sect. *Xero-senecio* Cabrera.

Senecio Weberbaueri Cuatr., sp. nov.

Frutex ramis fistulosis erectis striolatis, in sicco badiis, valde foliosis. Planta tota glabra.

Folia alterna copiosa suberecta, angustissime linearia aciculata,

rigida vel paulo flexuosa, 4-11 cm. longa, praecipue 1 mm. lata vel usque ad 2 mm. lata, basi paulo vaginato-ampliata, supra laevis teres, subtus nervo medio prominenti marginibus paulo revolutis.

Inflorescentia corymbiformi-paniculata terminalis multiflora, 8-15 cm. longa et lata. Ramuli tenues rigidi erecti 4-12 cm. longi, foliosi, foliis aciculari-linearibus tenuibus ad 1 cm. longis muniti, apicem plurimis pedicellis gracilibus rectis vel paulo flexuosis parce bracteolatis, 1-4 cm. longis, corymbiforme dispositis. Bracteolae anguste lineares acutae circa 2 mm. longae, apice pedicello 8-10 glomeratae calyculum formantes. Capitula erecta heterogama. Involucrum hemisphaericum 14-15 bracteis ad 5 mm. longis, exterioribus linearibus 1-1.2 mm. latis, interioribus lanceolatis ad 2 mm. latis, margine late scariosis dorso herbaceo in sicco fusco in omnibus apice acuto fusco. Flores marginales feminei ligulati 6-7, corolla lutea glabra tubulo 2.2 mm. longo, lamina elliptica 2.5 mm. longa 1.2 mm. lata apice tridentata. Flores disci hermaphroditi tubulosi 45-50, corolla 4-4.5 mm. longa glabra tubulo 1.5 mm. longo basi abrupte dilatato apice 5-dentati. Antherae basi obtusae; filamenta sub insertionem antherae incrassata. Stigmata truncata penicillata. Achaenia 2.2 mm. longa dense breviterque villosa. Pappus sordide albidus corollae longitudine. Receptaculum conicum.

Type: Peru: Río de Comas, 2300-2400 m. alt., collect. A. Weberbauer 6618 (F. type, US isotype).

S. Weberbaueri is related to *S. abietinus* (HBK) DC. and *S. Lindenii* Sch. Bip., both Colombian species, but can easily be distinguished from them by its longer, less rigid leaves, the structure of its involucre, its densely villose achenes, and its heterogamy.

***Senecio cano-purpureus* Cuatr., sp. nov.**

Suffrutex robusta ad 60 cm. alta rami robusti dichotomi ascendenti-divaricati cortice ruguloso-pallido arachnoideo lanato deinde glabrato.

Folia alterna sessilia linearia obtusa basi angustata, integra vel saepe tertio superiore dente triangulari utroque latere, margine revoluta 8-12 mm. longa, 1.5-3.5 mm. lata, valde juvenilia utrinque albolanata, adultiora supra viridia paulo arachnoidea subtus lanatomentosa.

Capitula homogama ramos hornotinos terminales rigidos patentes 3-7 cm. longos breviter foliosos solitaria desinentia. Calyculus 8-10 bracteis lineari-oblongis 2-4 mm. longis 1-1.5 mm. latis obtusis apice atropurpureis, reliquis albo-arachnoideo lanatis, plerumque biseriatis ad involucrum adpressis. Involucrum 13 bracteis oblongo-lanceolatis 6.5 mm. longis 2 mm. latis dorso lanatis margine scariosis apice plerumque purpureo maculatis. Flores omnes hermaphroditi ultra 42, corolla 6 mm. longa infra lutescens tubulo angustissimo 1.8 mm. longo sed basi abrupte dilatato, limbo sursum purpurascens tubuloso dentibus 0.5 mm. Antherae basi obtusiusculae. Stylus basi hemisphaericodilatatus, crasseque pedicellatus. Stigmata truncata papillosa.

Achaenia 2 mm. longa minute papilloso-pilosa. Pappus albus.

Type: Peru: Dept. Junin: near Huancayo, 3300-3500 m., open rocky hillside. Suffrutescent herb. up to 2 ft., florets purplish (withered). Collect. E. P. Killip & A. C. Smith 22131 (US).

S. cano-purpureus is a striking plant with its dichotomous, divaricate branchlets, the younger ones of which are white floccose like the leaves. Furthermore, the upper part of the corollas is purplish and the calycle is formed by two series of imbricate bracts the inner one of which is higher than the middle of the involucre. The involucre looks pluriseriate and the purple spots at the top of the phyllaries stand out against the white background of the head. This species belongs to Sect. *Sufrutecius* Cabr., possibly its subsect. *Candidi* Cabr.

Senecio incaicus Cuatr., sp. nov.

Frutex ad 69 cm. altus basi ramosus plus minusve intricatus ramis cicatricosis griseis puberulis squamoso-decorticantibus. Rami hornotini ascendentibus vel erectis lanato-arachnoideis denique glabratibus.

Folia alterna crassiuscula sessilia, anguste obovato-oblonga vel oblanceolata basim versus valde attenuata apice acuta, margine 1-2 dentibus utroque latere triangularibus acutis, plus minusve profundis, 10-20 mm. longa 1.5-5 mm. lata; margine revoluta; supra pallidoviridia glabra nervo medio impresso; subtus dense albo-lanato-tomentosa, nervo medio prominuli.

Capitula solitaria ramulos terminantia, erecta. Ramuli fertiles usque ad partem altam foliosi sed sursum denudati, tantum paucas bracteolas angustissime lineares ferentes. Alterae bracteolae 7-9 ad basim capitulum ad instar calyculum lanatum aggregatae. Involucrum cylindro-campanulatum praecipuae 13 bracteis elliptico-oblongis apice lanceolatis viridibus glabris margine scariosis apice puberulis. Flores marginales feminei ligulati 10-12, corolla lutea tubulo 5 mm. longo, angusto, lamina oblonga 5-nervata 10 mm. longa 2-2.5 mm. lata, apice obtusa 2-3 dentata. Flores centrales hermaphroditi numerosi, corolla lutea 6.5 mm. longa, tubulo 2.5 mm. Antherae basi obtusae. Stigmata truncata breviter penicillato-coronata et piloso caudata. *Achaenia* pubescentia 2.5 mm. longa. Pappus stramineus.

Type: Peru: Dept. Lima: Río Blanco, 3000-3500 m. alt. open hillside. Shrub 1-2 ft.; rays yellow, florets greenish yellow. Collect. E. P. Killip & A. C. Smith 21699 (US).

Cotype: Peru: Matucana, 8,000 ft. Rocky summit. Fls. yellow, collect. Macbride & Featherstone 418. (US.)

Other specimen: Peru: Río Blanco, 12,000 ft. Dense clumps or mats on decaying rock outcrops 4-12 in. high, collect. Macbride & Featherstone 691. (US.)

S. incaicus is distinguished from related species by being a low shrub with narrow, incised leaves which are glabrous on the upper-

side and tomentose on the lower, the filiform bracts of its calycle, and the structure and size of its heads which are solitary and radiate. It belongs to Sect. *Sufrutecius* Cabr., Subsect. *Subincani* Cabr.

Senecio chachaniensis Cuatr., sp. nov.

Suffrutex ramis basi repentes extremis erectis, pallide viridibus glabris dense foliosis.

Folia alterna sessilia glabra viridia anguste linearia crassiuscula basi paulo latiora apice acutissima pungentia, 8-14 mm. longa 1-1.5 mm. lata.

Capitula homogama in ramusculis lateralibus horizontalibus foliosis terminalia solitaria. Calyculus 3-4 bracteolis linearibus brevibus conformatus. Involucrum campanulatum 10-11 bracteis oblongis 6-7 mm. longis 1-2 mm. latis apice acutis ciliatis margine scariosis dorso glabris bursis resiniferis longitudinalibus praeditis. Flores circa 18 omnes hermaphroditi tubulosi, corolla lutea 8 mm. longa, tubulo 2 mm. longo, limbo tubuloso 5 dentibus 0.5 mm. profundis. Antherae basi obtusiusculae. Stigmata truncata penicillato-papillosa. Ovarium pubescente. Pappus sordidus.

Type: Peru: Dept. Arequipa, Nevado de Chachani, rocky slopes, alt. 3900-4100 m. Shrub 1 m. tall. Flowers yellow. Collect. Apr. 1925 F. W. Pennell 13285. (US.)

S. chachaniensis is related to *S. nutans* Sch. Bip. and *S. graveolens* Wedd. but differs from both by its linear, narrow, longer, and entire leaves. I think that *S. nutans* Sch. Bip. and *S. graveolens* probably belong to the same species.

Senecio neoglandulosus Cuatr., sp. nov.

Suffrutex 60-80 cm. alta ramis paulo striatis sub-erectis, dense hirsuto-glandulosis, valde adherentibus.

Folia alterna sessilia griseo-viridia, lineari-oblonga, basi auriculata amplectantia apice paulo attenuata obtusiuscula, margine integra revoluta, supra costa paulo conspicua subtus prominenti, utrinque hirsutulo-glandulosa, 2.5-5 cm. longa, 2-4 mm. lata.

Inflorescentiae corymboso-paniculatae terminales multiflorae, foliosae foliis sursum decrescentibus sine sensum in bracteas commutatas. Pedicelli erecti teneres sed rigidi 1-2 cm. longus glandulosi paulo bracteati bracteis anguste linearibus 3-5 mm. longis hirtoglandulosis. Calyculus 5-7 bracteolis instructus. Involucrum campanulatum 13 bracteis oblongis apice acutis, margine scariosis dorso viridi dense hirsutulo-glanduloso, 9 mm. longis, 1.5-2 mm. latis. Capitula radiata suberecta. Flores marginales feminei ligulati circa 12, corolla lutea tubulo angustissimo 4.5-5 mm. longo, lamina oblonga 5 mm. longa 1.8 mm. lata. Flores disci hermaphroditi circa 34, corolla anguste tubulosa lutea 6-7 mm. longa, tubulo filiformi 2-2.5 mm. longo, limbo angusto tubuloso apice 5-dentato. Antherae base breviter obtuseque appendiculatae. Stylus basi bulbosus. Stigmata trun-

cata papillosa. Achaenia 3 mm. longa, striata pubescentia.

Type: Peru: Chinchapalca (5 miles above Mito), 9500 ft. alt. Sunny grassy slopes. Very sticky. Fls. yellow. Collect. July 1922 Macbride & Featherstone 1597. (US.)

S. neoglandulosus is close to *S. saxicolus* Wedd. from which species it differs by its larger inflorescence, smaller heads, the presence of more glands, and entire, larger leaves.

Senecio Llewelynii Cuatr., sp. nov.

Frutex ramis erectis paulo angulosis, parce puberulis.

Folia alterna breviter petiolata (superne fertilia sessilia) crassiuscule membranacea utrinque glabra viridia. Petiolus 3-7 mm. longus, crassiusculus, supra planus vel sulcatus subtus teres basim ampliatio-vaginantus. Lamina elliptico-oblongo-lanceolata, apice angustata acutissima, basi paulo attenuata subcordata vel subtruncato-rotundata, margine serrata dentibus acutis mucronulatis callosis, 11-14 cm. longa, 2.5-4 cm. lata; supra costa conspicua nervis nervulisque fili-forme prominulis, subtus costa elevata nervis secundariis curvato-ascendentibus bene conspicuis 15-18 utroque latere, venulis in minutum prominulum reticulum anastomosantibus.

Inflorescentia terminalis floribunda paniculata corymbiformis, ramulis robustis ascendentibus paulo puberulis, duobus inferioribus ad axillas superiorum foliorum nascentibus, copiosa folia lanceolata breviora bracteiformia, sursum decrescentia ferentibus, 6-1 cm. longa, 20-2 mm. lata. Pedicelli angusti puberuli bracteolati 1-3 cm. longi. Calyculus praecipue 3 bracteolis linearibus angustissimis involucrium aequilongis. Involucrium 13 bracteis oblongis apice abrupte acutatis 6.5 mm. longis, 1-2 mm. latis margine scariosis dorso glabro viridi apice puberulo. Capitula erecta radiata. Flores marginales feminei ligulatae 10-12, tubulo angusto 10 mm. longo, lamina oblonga circa 9 mm. longa 2.5 mm. lata 4-nervata, lutea, subtus pallidior. Flores disci tubulosi hermaphroditi circa 30, corolla lutea 7 mm. longa tubulo angusto 2.8-3 mm. limbo infundibuliformi apice profunde dentato. Antherae basi rotundatae. Stigmata truncata paulo pilosa. Achaenia glabra. Pappus sordide albus 7 mm. longus.

Type: Peru: Central Cordilleras of the Andes, Dept. Amazonas. La Jalca, Chachapoyas, Mojabamba, collect. Jan. 1930, Llewelyn Williams 7589. (F)

S. Llewelynii is related to *S. castanaefolius* DC., but is distinguished from that species by its short petioles, the two superior leaves being sessile at the base of the inflorescence, and the rotundate or emarginate base of its leaves.

Senecio huanuconus Cuatr., sp. nov.

Frutex, ramulis robustis striatis dense ferrugineo-tomentosis.

Folia alterna coriacea petiolata. Petiolus 5-7 mm. longus crassius-

culus dense tomentosus. Lamina elliptico-ovata basi subcordata vel rotundata apice abrupte acutata mucronulata raro obtusiuscula, margine visu integra sed saepe dentibus minutis callosis repandis subtus conspicuis, 4.5-7 cm. longa, 2.5-3.8 cm. lata; supra adulta nervo medio tomentoso excepto glabra nitida nervis secundariis nervulisque reticulatis prominulis; subtus dense crasseque ferrugineo-tomentosa nervo medio crasso prominenti, lateralibus 5-7 utroque latere paulo conspicuis.

Inflorescentia terminalis paniculata basi foliosa, conferta folia paulo excedens. Ramuli dense ferrugineo-tomentosi; superne bracteolati bracteolis anguste linearibus brevibus tomentosis. Pedicelli 5-10 mm. longi. Calyculus 2-3 bracteolis filiformibus instructus. Involucrum 8 bracteis herbaceo-crassiusculis elliptico-oblongis apice paulo acutatis 6 mm. longis 1.3-3 mm. latis, margine scariosis dorso tomentosis. Capitula heterogama. Flores exteriores feminei plerumque 4, ligulatae, corolla lutea tubulo 4.5 mm. longo, lamina elliptico-oblonga 5 mm. longa 2 mm. lata. Flores disci 15-17, hermaphroditi, corolla 7-7.5 mm. longa tubulo 3 mm., dentibus linearibus 2 mm. profundis. Antherae basi rotundatae. Stigmata apice conoidea penicillato coronata centro longe piloso-caudata. Ovarium glabrum. Pappus pallido-ferrugineus circa 7 mm. long.

Type: Peru: Huanuco, ann. 1927, collect. M. Sawada 45 (F, US).

Senecio huanuconus var. ilicifolius Cuatr., nov. var.

A typo differt folia acutiora repando sinuato-dentata dentibus 3-4 utroque latere callosis acutis subpungentibus.

Type: Peru: Dep. Huanuco, puna, grass steppe, 4100 m. alt., collect. Woytkowski 34306 (F).

S. huanuconus is intermediate between *Senecio* and *Gynoxys*. The leaves and branchlets of the inflorescence are alternate but occasionally opposite. The stigmas resemble those of *Gynoxys*. It differs from *S. alternifolius* (Sch. Bip.) Greenm. by its shorter leaves and petioles, the denser tomentum, and the somewhat different heads.

Senecio Tuestae Cuatr., sp. nov.

Frutex ramulis robustis striatis dense tomentoso-hirsutis.

Folia alterna subcoriacea petiolata. Petiolus 4-4.5 cm. longus, erectus vel flexuosus striatus, supra sulcatus, dense tomentoso et hirsutus. Lamina elliptica vel ovato-elliptica oblonga utrinque attenuata basi obtusa apice acutata, margine repando sinuato-dentata dentibus mucroniformibus brevibus callosis acutis, 13-17 cm. longa, 5-7 cm. lata; supra viridis, in sicco brunnescens nervo medio angusto impresso tomentoso excepto glabra, nervulis minute reticulatis prominulis; subtus ferrugineo-ochracea dense crasseque tomentoso-velutina pilis stellatis valde intricatis tecta et aliquibus pilis simplicibus longioribus nervo medio munita, costa crassa elevata nervis secundariis 10-12 utroque latere bene conspicuis, nervulis obsoletis.

Inflorescentia terminalis ampla corymboso-paniculata, axi ramisque erectis breviter denseque tomentosis et copiose longeque hirsutis. Ramuli ultimi pedicellique filiformi hirsutuli aliquis bracteis linearibus angustissimis munitis. Pedicelli graciles 5-20 mm. longi, apicem 2-4 bracteolis filiformibus laxum calyculum formantibus. Capitula radiata. Involucrum 8 bracteis 8-8.5 mm. longis, lineari-oblongis exterioribus 1.2 mm. interioribus 2.5 mm. latis, glabratis. Flores exteriores feminei ligulati 2-3, corolla lutea tubulo angusto circa 5 mm. longo, lamina oblonga 8.5 mm. longa, 2 mm. lata. Flores centrales hermaphroditi 8.5-9 mm. longi, tubulo angusto 2.8-3 mm. longo, limbo tubuloso basi abrupte contracto apice in 5 dentibus linearibus 2 mm. longis inciso. Antherae basi subobtusae. Stigmata conica penicillato-caudata. Ovarium glabrum. Pappus 8.5 mm. long. brunneo-stramineus.

Type: Peru: Dep. Huanuco, Pillao, 2700 m. alt. open situations. Shrub 3-6 met., flowers yellow its center brownish, leaves very dark green underneath beige penetrating fragrance not pleasant. Collect. Diego Tuesta Díaz & Jorge Woytkowski 34095 (F).

S. Tuestae is closely related to *S. alternifolius* (Sch. B.) Greenm. but differs chiefly by the hirsute indumentum of the branchlets and inflorescence, formed by mixed stellate and simple divaricate hairs, by its longer pedicels, the larger involucre and flowers, and by the thicker, velvety tomentum on the lower side of the leaves.

Senecio Fortunatus Cuatr., sp. nov.

Frutex ramis terminalibus plus minusve flexuosis granulosis, extremis teretibus striatis plus minusve puberulis et lanato-araneosis.

Folia alterna membranacea petiolata viridia. Petiolus angustus 2.5-3 cm. longus puberulus basi incrassato-vaginat. Lamina lanceolata basi cuneata apice acuminatissima margine argute uniformiterque serrata, dentibus acutis 1.5 mm. altis 2-3 mm. distantibus; 20-24 cm. longa, 4-6 cm. lata; supra costa angusta conspicua tomentella reliqua glabra vel minutis sparsissimis pilis, nervis secundariis reticuloque paulo conspicuis; subtus viridis sparsissime vix conspicue araneosis costa prominenti parce arachnoideo-puberula nervis secundariis prominentibus circa 20 utroque latere ascendentibus, reliquis nervulis conspicuum gracilem minutum reticulum formantibus.

Inflorescentiae terminales ample paniculatae folia superiora non attingentibus, ad 20 cm. lata. Ramuli pubescenti et lanato-araneosi. Bractee lanceolatae, superiores angustissime lineares breviores. Pedicelli subcapillares 5-20 mm. longi erecti vel flexuosi puberuli 2-3 bracteolis filiformibus flexuosis muniti. Capitula radiata basi 5-6 bracteolis filiformibus 2-3 mm. longis calyculum formantibus. Involucrum hemisphaericum 13 bracteis ovato-apiculatis parce araneoso-puberulis 3.2 mm. longis 1.5-2 mm. latis apice fusco acuto ciliolato. Flores marginales feminei ligulati 10-12 corolla flava tubulo filiformi 3 mm. longo lamina elliptico-oblonga 5 mm. longa. Flores disci hermaphroditi, corolla lutea 5 mm. longa tubulo 1.7 mm. longo. Antherae

basi brevissime apiculatae. Stigmata truncata penicillata. Ovarium. Pappus stramineus.

Type: Peru: Dep. Cuzco, Urubamba Valley, Hacienda Fanccac 2760 m. alt., collect. Sept. 1928 Fortunato L. Herrera 2096. (US.)

Other specimen: Peru, Valle de Paucartambo, hacienda Pfyucalla, 3400 m. alt., collect. Jul. 1930 Fortunato L. Herrera 2983, n.v. "Puturputur".

S. Fortunatus is closely related to *S. multinervis* Sch. Bip. but distinguished by its glabrousness, its slender, petiolated leaves, which are smooth and glabrous on the upper side, and its smaller heads. From *S. castanaefolius* DC. it is distinguished by the thin indumentum, smaller heads and flowers, and the larger calycle, the linear, interior bracts of which are often as long as the involucre.

Senecio Cardenasii Cuatr., sp. nov.

Suffrutex valde robusta ad 2 met. alt. ramis terminalibus plus minusve flexuosis striolatis brunneo-tomentulosis copiosis pilis brevibus crassis resinosis fuscis tectis et tenuissimis flexuosis pilis albis araneosisque interspersis.

Folia alterna petiolata crassiuscule herbacea in sicco membranacea, laetiviridia. Petiolus praecipue 15 mm. longus erectus vel flexuosus tomentosus-araneosus basi incrassato-vaginat. Lamina plus minusve cochlearia sub-bullata marginibus deorsum recurvatis, ovato-oblonga basi asymmetrico cordata apice attenuata acutiuscula mucronata, margine repando-dentata dentibus callosis mucroniformibus, 9-11 cm. longa 3.5-5 cm. lata; supra subrugulosa in juvenilibus puberulis adultioribus glabra nervo medio angusto conspicuo tomentello, reliquis nervis paulo visibilibus; subtus puberulo-arachnoidea vel sparsissimis pilis munita, costa crassa, 8-10 nervis lateralibus utroque latere prominulis, nervulis prominule reticulatis.

Inflorescentiae terminales et ultimi-axillares magnam paniculam subpyramidatam subfoliosam formantes. Ramuli brachiati robusti dense tomentosi et arachnoidei. Bractae superiores ovato-lanceolatae amplectentes breves tomentellae. Pedicelli mediocriter robusti rigidi patuli praecipue curvati glanduloso-tomentello araneosique, 1-3 cm. longi, tantum sub apicem 2-3 bracteolis muniti et apice ad involucrem adpressis 5-7 bracteolis linearibus acutis 3-7 mm. longis subglabris ad modum calyculi dispositis. Involucreum campanulatum 14 bracteis obovato-oblongis 7 mm. longis 3 mm. latis crassis sed marginibus praecipue superiore parte late scariosis apice ciliatis acutis, dorso sparse glanduloso-puberulo. Capitula nutantia vel cernua radiata. Flores marginales feminei ligulatae 12-13, corolla lutea tubulo crassiusculo 3 mm. longo lamina 8 mm. longa 2-2.5 mm. lata, elliptico-oblonga. Flores disci hermaphroditi circa 30, corolla 7 mm. longa tubulo 2 mm. longo. Antherae basi minuscule apiculatae. Stigmata subtruncata papillosa. Ovarium glabrum. Pappus 6-7 mm. longus stramineus.

Type: Bolivia, near Chulumani way to Yungas of Tablas, Cochabamba, 2700 m. alt. on wet bushy slopes. Herb 2 met. flowers yellow. Collect. M. Cardenas 3988 (F, US.)

S. Cardenasii is a very well marked species differing from all similar species by the shape and texture of its leaves which are concave, and the structure of its inflorescence and heads. The two interior bracts of the calycle are as long as the involucre.

Senecio Woytkowskii Cuatr., sp. nov.

Frutex ad 2-3 met. alta.

Folia praesumptae alterna, coriacea petiolata. Petiolus 2 cm. longus robustus densissime ochraceo-tomentosus. Lamina obovato-elliptica oblonga basi subcuneata apice subite attenuata et cuspidata, margine plana serrata, dentibus callosis patentibus, 14-16 cm. longa, 4.5-5.5 cm. lata; supra viridis glabra nervo medio basim versus tomentosus excepto, nervis nervisque in reticulo paulo conspicuo; subtus densissime ochraceo-tomentosa, costa crassa prominenti nervis secundariis 12-14 utroque latere arcuato-ascendentibus prominulis, nervulis laxe reticulatis obsoletis.

Inflorescentiae terminales paniculata, ramulis tomentoso-pubescentibus, bracteis inferioribus ovato-lanceolatis mediis lanceolatis superioribus linearibus minoribus. Pedicelli 5-15 mm. longi crispo-pilosi. Calyculus 7-8 bracteolis linearibus subfiliformibus 3-5 mm. longis glabratis. Capitulum heterogamum. Involucrum circa 13 bracteis ellipticis apice acutatis 7.5-8 mm. longis 2-2.5 mm. latis glabris. Flores marginales feminei ligulati 12-13, corolla lutea tubulo 4 mm. longo, lamina oblonga 7 mm. longa, 2.5 mm. lata. Flores disci circa 36, hermaphroditi corolla 6-6.2 mm. long tubulo 2 mm. long., limbo tubuloso apice 5-dentato dentibus 1.3 mm. profundis. Antherae basi obtusae. Stigmata apice obtusa coronato-penicillata. Ovarium glabrum. Pappus stramineus.

Type: Peru: Huánuco, vicinity of Tambo de Vacas, 3500 m. alt. Tall shrub some 5-9 ft. high grows among the thicket, flowers bright yellow, collect. 4-XI-1937 Félix Woytkowski 145 (F).

S. Woytkowskii is distinguished from its related species by the texture and indumentum of its leaves and its conical stigma.

Senecio unduavianus Cuatr., sp. nov.

Suffrutex 2-3 met. alta, ramulis terminalibus angustis tomentoso-hirsutulis.

Folia alterna petiolata submembranacea ampla. Petiolus 3-5 cm. longus striatus puberulus vel tomentellus supra sulcatus basi abrupte dilatatus. Lamina oblongo-oblancoolata basin versus longiuscule angustata acute cuneata apice attenuato-lanceolata, margine argute dentata subserrata dentibus robustis acute mucronatis subuniformibus, media vel sterilia 40 cm. longa, 9 cm. lata, fertilia (superiora) 23-26 cm. longa 5.5-6.6 cm. lata; supra parce scabrido-pilosa viridis nervo

medio angusto tomentoso; subtus nervis plus minusve rufo-tomentosis reliqua saepe tenuiter lanato-arachnoidea, costa crassiuscula eminenti, nervis secundariis 23-30 utroque latere bene conspicuis patulis marginem versus curvato-anastomosatis, nervulis minute et conspicue reticulatis.

Inflorescentia terminalis foliosa subcorymboso-paniculata quam folia superiora brevior. Ramuli tomentelli et tenuiter araneosi, superne bracteolis lanceolatis vel linearibus acutis angustissimis muniti. Pedicelli 10-20 mm. longi filiformi erecti vel flexuosi. Capitula radiata subbasim 1-3 bracteolis parvis vix calyculum formantibus. Involucrum 12-13 bracteis ovatis apice apiculatis acutis, 4.5-5 mm. longis 2-2.5 mm. latis margine scariosis dorso parce puberulis araneosisque. Flores marginales femineae circa 10-12 ligulatae, corolla lutea tubulo 2.8-3 mm. longo, lamina elliptico-oblonga 5-nervata 6-7 mm. longa 2-2.5 mm. lata. Flores disci circa 40 hermaphroditi corolla lutea 7 mm. longa. Antherae basi obtusae. Stigmata truncata papillosa. Ovarium glabrum. Pappus stramineus 5-6 mm. longus.

Type: Bolivia: Unduavi, Nordyungas, 3300 m. alt. Strauch 2-3 met., Nov. 1910 collect. Otto Buchtien 3091. (US).

S. unduavianus is related to *S. multinervis* Sch. Bip. from which it differs chiefly by its long petiolated leaves.

Senecio ayopayensis Cuatr., sp. nov.

Frutex 2-3 met. alt. ramis terminalibus erectis medulosis striatis pilis glandulosis crassiusculis et pilis arachnoideo-lanuginosis tectis.

Folia alterna sessilia herbaceo-membranacea tantum superiora ramorum in specimine. Lamina grandis late lanceolata basim versus attenuata basi breviter rotundato-auriculata amplectens, apice angustata longe acuteque cuspidata, 38 cm. longa, 9.5 cm. lata; margine argute serratis, dentibus acutissimis minoribus 1 mm. longis cum majoribus triangularibus 3 mm. longis regulariter alternantibus; supra viridis puberula, pilis minutis crassiusculis prostratis et longioribus tenuioribusque arachnoideis munita, costa et nervis lateralibus plus minusve conspicuis tomentellisque; subtus pallido-viridis laxe arachnoideo-lanuginosa, costa rubescens prominenti nervis lateralibus copiosis prominentibus patulis 6-8 mm. inter eos distantibus, marginem versus reticulato anastomosantibus, nervulis venulisque minutum reticulum formantibus.

Inflorescentia corymboso-paniculata terminalis basi foliosa, folia superiora brevior. Rami angulati vel striati pubescenti et albo-arachnoidei. Bractee lanceolatae acutae sursum decrescentes. Pedicelli 5-20 mm. longi tenues lanuginoso-arachnoidei erecti vel flexuosi paulo bracteolati. Capitula radiata. Calyculus 4-5 bracteolis subfiliformibus involucrum aequilongis vel subaequilongis instructus. Involucrum hemisphaerico-campanulatum 12-13 bracteis ovatis acute apiculatis 4 mm. longis, 1.5-1.8 mm. latis margine scariosis apice ciliatis dorso lanuginoso-puberulis. Flores marginales femineae 10-12 ligulatae,

corolla lutea tubulo 3 mm. longo, lamina 6 mm. longa 2 mm. lata. Flores disci hermaphroditi 36-40, corolla lutea 5.5 mm. longa, tubulo 2 mm. Antherae basi brevissime appendiculatae. Stigmata truncata breviter papillosa. Ovarium glabrum. Pappus stramineus.

Type: Bolivia: Dep. Cochabamba, prov. Ayopaya: Sailapata, 2700 m. alt. Shrub 2-3 met. in wet soil, collect. M. Cardenas 3272 (US).

S. ayopayensis is related to *S. multinervis* Sch. Bip. ex Rusby but differs by its slender leaves which are not papillose on the upperside, its regularly doubly serrate margins (large triangular teeth alternate with minute ones), its smaller heads and flowers, and the acute, apiculate, arachnoideous, involucre bracts. From *S. biserrifolius* Kze, it differs by its larger leaves, truncate stigmas, and radiate heads. *S. yalusay* Cabrera belongs to this group and is distinguished chiefly by its petiolate leaves and larger involucre. As the plant at hand from Cochabamba has only superior leaves, the inferior ones are necessary for a complete understanding of this species.

Senecio longilinguae Cuatr., sp. nov.

Frutex ramis erectis medulosis argute angulatis viridibus glabris.

Folia alterna membranacea sessilia glabra valde approximata (internodiis superioribus valde brevibus). Lamina lineari-oblonga, elongato lingulata, apicem versus attenuata acuta, basi angusta rotundato-semiamplectens, costa superne notata inferne eminenti basim versus valde crassa acuteque carinata plus minusve decurrenti margine plus minusve profunde serrata dentibus acutis paulo revoluta; supra viridis vel atroviridis sublaevis nervis secundariis nervulisque paulo conspicuis, subtus valde pallida, nervis secundariis plus 30, rectangularis, marginem versus curvatis, prominulis, nervulis conspicuis minute reticulatis; 18-28 cm. longa, 3-4.5 cm. lata.

Inflorescentia terminalis paniculata, ramulis glabris vel parcissime puberulis, bracteolis lanceolatis 3-5 mm. longis, parce puberulis. Pedicelli 10-25 mm. longi parcissime puberuli 1-3 bracteolis muniti. Capitulum heterogamum. Calyculus 2-3 bracteolis brevibus subbasilaribus. Involucrum campanulatum viride glabrum, 8 bracteis late oblongis apice pubescenti fusco abrupte acutato, 7 mm. longis, 2-2.7 mm. latis. Flores marginales feminei ligulati lutei 4-5, corolla tubo 5 mm. longo, lamina 14 mm. longa 3-4 mm. lata. Flores centrales hermaphroditi 16-18, corolla 9 mm. longa, tubulo 4 mm., limbo apice 5 dentatis, dentibus 1 mm. profundis. Antherae basi obtusae. Stigmata truncata papillosa. Ovarium glabrum. Pappus albidus.

Type: Bolivia, collect. Miguel Bang 2495 (US).

S. longilinguae is striking by its narrow, elongate, sessile, glabrous leaves which are green on the upper side and pale on the lower, resembling those of *Nerium Oleander*.

Senecio Goodspeedii Cuatr., sp. nov.

Hierba robusta 2 met. alt.

Folia alterna chartacea petiolata. Petiolus 2-3 cm. longus robustus scabridus puberulus, supra planus, basi subite ampliato-amplexans. Lamina elliptico-oblonga utrinque attenuata basi cuneata apice acute acuminata vel caudata, margine minute uniformiterque denticulata dentibus callosis mucroniformibus 0.6 mm. longis 1-2 mm. inter se distantibus, 26-30 cm. longa 6-9 cm. lata; supra asperula atroviridis granulis conicis vel rotundatis plus minusve sparsis munita in juvenile puberulo-araneosa denique glabrata sed nervo medio angusto tomentello; subtus pubescenti araneosa, viridi-pallida costa crassa, nervis lateralibus prominentibus angustis circa 30 utroque latere patulis marginem versus reticulato-anastomosatis; nervulis venulisque in minutum reticulum connatis.

Inflorescentia terminalis ample paniculata basi foliosa, ramulis striolatis parce arachnoideis, paniculis parcialibus folia subtendentia aequilongis. Bracteolis superioribus minutis filiformibus flexuosis. Pedicelli longissimi, capillares flexuosi 1-4 cm. longi araneoso-puberuli. Capituli radiati basi 3-5 bracteolis brevibus angustissimis ad modum calyculi. Involucrum campanulatum 13 bracteis oblongis apice acutis 5 mm. longis, 1.5-2 mm. latis margine anguste scariosis dorso viridibus parce araneosis apice fuscis ciliatis. Flores feminei marginales circa 12 ligulatae, corolla lutea tubulo 3 mm., lamina lineari oblonga 10 mm. longa 2 mm. lata. Flores disci hermaphroditi 36-38 corolla aurantiaca 6.5 mm. longa. Antherae basi breviter appendiculatae. Stigmata truncata penicillata. Ovarium glabrum. Pappus albido-stramineus corolla brevior.

Type: Peru: Dept. Huanuco, Pillao 2700 m. alt., in open situations. Herb 2 met. Flower pale orange-yellow center more dark with black stamen tips. Stem very dark purple, leaves dark green. Stems and leaves very coarse, common name "pich-picha". Collect. by A. Tuesta Díaz & Félix Woytkowski 34097 as members of the "University of California Botanical Garden Expeditions to the Andes" under the direction of Prof. Thomas H. Goodspeed. (F)

Cotype: Same locality: Tuesta Díaz & Woytkowski 34096.

S. Goodspeedii is related to *S. multinervis* Sch. Bip., but is distinguished by the texture of its petioleated and minutely denticulate leaves, the extremely long and thin pedicels, and its relatively long ligules.

***Senecio sallapatensis* Cuatr., sp. nov.**

Frutex scandens ramis terminalibus flexuosis deflexis vel pendulis, minute striatis puberulo-floccoso-arachnoideis.

Folia alterna petiolata subcoriacea, viridia. Petiolus tenuis erectis laxe arachnoideo-lanuginosis 15-20 mm. longus, basi vaginato-dilatatus. Lamina elliptica, vel elliptico-oblonga basi rotundata vel obtusa apice attenuato-acuminata acutissima, margine repando-denticulata dentibus minutis acutis; 9-11 cm. longa, 3.5-5 cm. lata; supra glabra costa filiformi paulo impressa, nervis secundariis venulisque minute

reticulatis capillaribus impressis reliqua superficie inter eos minutissime bullato-rugosa; subtus levissime puberulo-arachnoidea, nervo medio eminenti, nervis lateralibus 12-13 utroque latere angustis graciliter prominulis subarcuato-ascendentibus marginem versus reticulato-evanescentibus, reliquis nervulis minutum reticulum formantibus.

Inflorescentia terminalis evoluta elongato-paniculata axi angulato-flexuoso, striato parce laxaque lanato-arachnoideo. Ramuli angulato-divaricati. Bractee lanceolatae vel lineares breves. Pedicelli brevissimi ad 1-2 mm. longi dense bracteolati. Capitula discoidea. Calyculus 3-4 bracteolis 1-2 mm. longis viridibus subglabris. Involucrum cylindraceum 8 bracteis lineari-oblongis apice acutis glabris pallido-viridibus, 5 mm. longis 1.5 mm. latis, margine scariosis. Flores omnes hermaphroditi 17-19 corolla tubulosa 4 mm. longa. Antherae basi caudatae. Stigmata obtusa papillosa. Ovarium glabrum.

Type: Bolivia, Dept. Cochabamba, Prov. Ayopaya: Sailapata 2700 m. alt. Vine flowers white, collect. X-1935 in wet forest by M. Cárdenas 3273, (US).

S. sailapatensis, related to *S. Brittonianus* Hieron. and *S. baccharidiflorus* Rusby, is distinguished by the glabrous appearance of the whole plant, which is provided only with a thin, floccose, arachnoid, largely deciduous tomentum, the glabrous involucre, and the fine reticulation of its rugose leaves which is depressed on the upper side and prominent on the lower.

Senecio Ramonii Cuatr., sp. nov.

Frutex ramis scandentibus flexuosis juventute laxe lanuginosis, adultis glabris nitidis leviter striatis.

Folia alterna petiolata coriacea. Petiolus angustus 8-10 mm. longus, paulo arachnoideus vel glaber supra sulcatus. Lamina lanceolato-elliptica, apice acuta mucronata basi obtusa, margine repando-denticulata dentibus mucroniformibus callosis acutis patulis, 5-8 cm. longa, 1.8-2.7 cm. lata; supra juvenilibus laxe arachnoidea demum glabra laevis nitida costa angustissima bene notata impressa, nervis secundariis obsolete impressis reliquis inconspicuis; subtus juvenile statu ochraceo-tomentella deinde parce puberula costa eminenti nervis lateralibus 9-10 utroque latere prominentibus patulis marginem versus arcuato-anastomosatis reliquis nervulis prominulis reticulatis.

Inflorescentia terminalis paniculata elongata basi foliosa pendula, axi angulato flexuoso ochraceo-lanuginoso, ramulis brevibus lanato-tomentellis reflexis 8-15 mm. longis, bracteis lanceolatis tomentellis. Capitula discoidea sessilia vel subsessilia. Calyculus 2-3 bracteolis minutissimis (1-1.5 mm.) tomentellis. Involucrum 8 bracteolis oblongis 4.5 mm. longis 1.5-2 mm. latis, margine scariosis dorso lanatis apice acutis ciliatis. Flores hermaphroditi tubulosi 10-12, corolla 5-5.2 mm. longi, tubo 2 mm. longo, limbo campanulato apice 5-dentatis dentibus oblongis 1.5 mm. profundis. Antherae basi acute caudatae. Stigmata truncata papillosa. Ovarium glabrum. Pappus albidus corolla paulo

longior. Raro 1-2 floribus marginalibus antheribus absentibus femineis sed corolla tubulosa regulari vel subregulari.

Type: Peru: Carpish, entre Huanuco y Tingo María, 2800-2900 m. alt. Flores blancas. Arbusto 1-1.5 met. Collect. Aug. 1947 Ramón Ferreyra 2310 (US).

S. Ramonii, related to *S. baccharidiflorus* Rusby and *S. cuzcoensis* Cabr., differs by its coriaceous leaves with obtuse base, which are neither reticulate on the upper side nor tomentose on the lower when adult, by its sessile, small heads bearing few flowers. *S. cuzcoensis* has marginal, filiform, female flowers. In a few heads of *S. Ramonii* I observed one or two female flowers which showed a corolla like the central flowers but lacked anthers.

Senecio Miguellii Cuatr., sp. nov.

Frutex scandens ramis flexuosis tenuissime arachnoideis.

Folia alterna petiolata subcoriacea pallide viridis utrinque glabra vel juvenilia sparse tenuissimo indumento arachnoideo. Petiolus 10-12 mm. longus erectus vel flexuosus. Lamina elliptico-lanceolata basi obtusa vel subrotundata apice attenuata acuminata, margine integra levissime revoluta, 6-11 cm. longa, 2.3-4 cm. lata; supra costa pallida visibili, nervis lateralibus filiformibus pallidis plus minusve conspicuis, nervulis reticulatis parce notatis; subtus costa prominenti nervis secundariis 8-9 utroque latere ascendentibus marginem versus arcuatis evanescentibus, nervulis reticulatis paulo prominulis.

Inflorescentia terminalis pyramidato-paniculata elongata dependens, 20 cm. longa, basi foliosa. Axi ramulique patuli leviter arachnoidei. Pedicelli 1-3 mm. longi paucis bracteolis parvis puberulis muniti, apice 3-4 ad modum calyculi. Capitula radiata glomerata. Involucrum campanulatum 12 bracteis linearibus 3.5 mm. longis 1 mm. latis apice acuto breviter ciliato margine scarioso dorso glabris. Flores marginales feminei 3-4, ligulatae corolla lutea tubuli capillari 2 mm. longi, lamina lineari 3.5 mm. longi 1 mm. lati. Flores disci 12-15, hermaphroditi tubulosi, corolla 4.5 mm. longa apice profunde 5-dentata, tubulo 1.5 mm. longo. Antherae basi caudatae. Stigmata truncata papillosa. Ovarium puberulum. Pappus albidus.

Type: Bolivia, collected Miguel Bang 2039 (F,US).

S. Miguellii is related to *S. psidifolius* Rusby but distinguished by its rather lanceolate leaves and its slender, longer pedicels.

Senecio huallaganus Cuatr., sp. nov.

Frutex scandens, ramis adpresse tomentosis, flexuosis deflexis.

Folia alterna subcoriacea petiolata. Petiolus angustus plus minusve flexuosus 10-12 mm. longus tomentosus supra planus. Lamina lanceolata basi obtusa vel subrotundata apicem versus angustata acuminatissima, margine integra, 8-10 cm. longa 25-32 mm. lata; supra glabra vel sparsissimis pilis munita costa angustissima depressa puberula

nervis lateralibus paulo conspicuis, nervulis venisque prominule reticulatis; subtus breviter sparseque tomentella costa prominenti, nervis secundariis 12-14 utroque latere prominentibus patulis marginem versus anastomosatis, nervulis reticulum prominulum anastomosatis.

Inflorescentia terminalis pyramidato-paniculata sub-foliola, elongata deflexa vel pendula, axi ramisque tomentosis. Capitula discoidea sessilia vel subsessilia glomerata secundum ramusculis spiciforme disposita. Calyculus plurimis bracteolis minutis circa 1 mm. longis tomentellis instructus. Involucrum campanulatum 13 bracteis anguste lanceolatis 3.5-4 mm. longis, 1 mm. latis apice ciliolatis margine leviter membranaceis dorso glabris. Receptaculum frimbiliferum. Flores omnes hermaphroditi circa 22, corolla 3.6 mm. longa, tubulo 1 mm., apice limbi 5-dentato dentibus 0.6 mm. longis. Antherae basi caudiculatae (sagittatae). Stigmata truncata papillosa. Ovarium glabrum. Pappus stramineus corollam aequantae.

Type: Peru: Huallaga: Hacienda Pampayacu 2100-2200 m. alt., collect. A. Weberbauer 6811 (F.)

S. huallaganus, related to *S. cuzcoensis* Cabr. and *S. baccharidiflorus* Rusby, differs by the short tomentum on the lower side of its lanceolate leaves, its smaller heads, and its lanceolate, subglabrous phyllaries (13 rather than 8).

Senecio Steinbachianus Cuatr., sp. nov.

Suffrutex vel frutex scandens. Rami virides glabri nitidi sublaeves.

Folia alterna petiolata membranacea in vivo crassa viridia. Petiolus 2-2.5 cm. longus gracilis rigidus glaber. Lamina elliptica basi cuneata apice attenuata acuminata, margine integerrima, 6.5-9 cm. longa, 3-4 cm. lata, utrinque laevis glabra; supra nervo medio tantum notato; subtus costa prominenti, nervis lateralibus 5-6 utroque latere ascendentibus arcuatis, paulo notatis, nervulis inconspicuis.

Inflorescentiae corymboso-paniculatae axillares, longe pedunculatae (pedunculo circa 10 cm. longo), circa 16 cm. latae. Ramuli ascendentes tenues rigidi parce breviterque tomentelli. Pedicelli 8-15 mm. longi subfiliformi, tomentelli plurimis bracteolis brevibus anguste linearibus 1.5-3 mm. longis muniti. Capitula radiata. Calyculus 3-6 minutis bracteolis. Involucrum cylindraceum 8 bracteis oblongis apice acutatis 7 mm. longis, 2-2.5 mm. latis margine scariosis dorso viridibus sparse pilosis vel glabris. Flores marginales feminei ligulati 5, corolla lutea tubulo angusto 6 mm. longo, lamina oblonga 7-8 mm. longa apice obtusa 3-denticulata. Flores disci hermaphroditi 16 tubulosi 9 mm. longi, tubulo angusto 5.5 mm. longo, limbo campanulato profunde 5-dentato. Antherae basi breviter caudatae. Stigmata apice incrassata subtruncata papillosa. Ovarium glabrum. Pappus pallide stramineus.

Type: Bolivia, Prov. Chapare, Dept. Cochabamba: Quebrada de Corani, 200 met. lat. "Wurzelt und rankt an Staemen". Coll. 21-VI-1929 Jose Steinbach 9876 (F).

S. Steinbachianus differs from *S. floccosus* Benth. by the absence of an indumentum and bracts so characteristic of the latter, by its slender, long pedicels with their small, narrow linear bracteoles, and the long tubule of the disc flowers. From *S. prunioides* Rusby it is distinguished also by being radiate, bearing a longer involucre and flowers, and the corymbose shape of the inflorescence, etc.

***Senecio lucidissimus* Cuatr., sp. nov.**

Frutex scandens, ramulis ultimis dense hirsutulo-tomentosis ferrugineis.

Folia alterna petiolata firme coriacea. Petiolus 10 mm. longus robustus ferrugineo-tomentosus supra sulcatus glaber. Lamina elliptico-oblonga vel elliptico-lanceolata basi subrotundata apice attenuata acute apiculata, margine integra levissime revoluta, 10-13 cm. longa, 4-5.5 cm. lata; supra glaberrima valde nitida viridis, in sicco viridirubescens, costa angustissima impressa nervis secundariis et nervulis laxe reticulatis prominulis; subtus nitidissima sed costa tomentella et sparsissimis pilis superficie munita, costa crassa elevata, nervis secundariis 7 utroque latere arcuato-ascendentibus marginem versus anastomosatis, nervulis paucis paulo conspicuis laxissime reticulatis.

Inflorescentiae racemosae-paniculatae axillares, (probabiliter etiam terminales) quam folia breviores vel subaequantes, axi ramulisque tomentosus. Pedicelli 2-6 mm. longi tomentelli vel puberuli. Bracteolae 1-3 valde minutae apicem pedicellum vix calyculum formantes. Capitula discoidea. Involucrum campanulatum 8-9 bracteis oblongo-lanceolatis 7 mm. longis 2 mm. latis, margine scariosis apice ciliatis basi pilosulis, dorso glabris. Flores hermaphroditi tubulosi circa 20, corolla 7-7.5 mm. longa, tubulo crassiusculo 4 mm. longo, limbo subcampanulato apice 5 dentatis, dentibus ovatis 1 mm. longis. Antherae basi caudatae. Stigmata apice subtruncata penicillata. Ovarium glabrum. Pappus albidus.

Type: Peru: Dept. Huanuco, Divisoria, in the forest 1600 m. alt. Vine 8 met. Fl. yellow, calyx green, stem woody pale brown. Leaves leathery very glassy. Collect. D. Tuesta Díaz & F. Woytkowski 34500 (F).

S. lucidissimus is easily distinguished among the climbing and discoid species of *Senecio* by its elliptic-elongated, acute, coriaceous, shiny leaves which have a tomentose dorsal rib; branchlets and inflorescences are also tomentose; the inflorescences are axillary compact and elongate.

***Senecio lorentensis* Cuatr., sp. nov.**

Frutex scandens. Rami terminales flexuosi striati tenuiter arachnoideo-puberuli, in sicco badii.

Folia alterna petiolata subcoriacea rigida. Petiolus 6-8 mm. longus

arachnoideo-pubescentis. Lamina elliptica utrinque attenuata basi acute cuneata apice subacuta mucronulata, margine integra, 4-6 cm. longa, 17-28 mm. lata, utrinque sparse arachnoidea vel glabra; supra nervo medio impresso, reliquis in minutum reticulum argute prominulum; subtrus costa eminenti, 5-6 nervis lateralibus notatis, reliquis nervulis minutum reticulum satis prominulum formantibus.

Inflorescentiae terminales paniculatae, panicula laxa pyramidalis elongata, ramulis erectis elongatis striatis parce arachnoideis. Capitula subdiscoidea sessilia vel subsessilia glomerata. Calyculus parvis bracteolis minutis. Involucrum campanulatum 8 bracteis 3.5 mm. longis 1.2 mm. latis apice acutis ciliolatis dorso glabris. Flores 10 in capitulo, 1-2 marginales feminei tubulosi corolla apice 5-dentata, dentibus profundis subregularibus. Flores disci hermaphroditi tubulosi, corolla 4.5 mm. longa, tubulo 2 mm. longo, dentibus 1 mm. Antherae 2 mm. longae basi caudatae. Stigmata truncatula penicillata. Ovarium glabrum. Pappus 5 mm. longus albus.

Type: Peru: Dept. Loreto: Pumayacu, between Balsapuerto and Moyobamba, alt. 600-1200 m. alt., forest. Collect. Sept. 1933 G. K. Klug 3191 (F, US).

S. lorentensis is close to the *S. arboreus* HBK complex and is somewhat related to *S. Brittonianus* Hieron. From the latter it is distinguished by its smaller and strongly reticulate, cuneate leaves. From *S. arboreus* HBK and *S. tamanus* Cuatr. it differs chiefly by the arachnoid indumentum of the branchlets and inflorescence and the longer, laxer inflorescence.

Senecio pentamerus Cuatr., sp. nov.

Frutex scandens glaberrimus ramis viridibus in sicco brunnescentibus, sublaevibus.

Folia alterna subcoriacea crassiuscula petiolata glaberrima utrinque viridis, in sicco subbrunnea. Petiolus angustus flexuosus 20-25 mm. longus. Lamina ovata basi rotundata apice attenuata et apiculata acuta, margine integerrima, praecipue 12 cm. longa x 7 cm. lata; supra nervis medio lateralibusque filiformis paulo conspicuis, subtrus costa prominenti nervis lateralibus 8-10 utroque latere parum prominulis arcuato ascendentibus marginem versus anastomosato-evanescentibus, reliquis nervulis in laxum reticulum vix conspicuum anastomosatis.

Inflorescentiae terminales paniculatae basi foliosae, ramis robustis patulis glabris, inferioribus ad 10 cm. longis, ramulis secundariis racemosis, tertiis (pedicellis) floriferis, 4-6 subcorymbosis. Pedicelli 2-6 mm. longi teneres, minute bracteati puberuli, bracteolis 5-6, minutis linearibus 1-1.5 mm. longis puberulis, 2-3 superioribus ad modum calyculi dispositis. Capitula discoidea homogama. Involucrum cylindricum 5 bracteis subelliptico-oblongis 9-10 mm. longis 3-3.5 mm. latis obtusiusculis subcoriaceis glabris in sicco pallido-brunneis rigidisque. Flores tantum vidi 5 per capitula, hermaphroditi. Corolla 10 mm. longa, tubulo 3.5 mm. longo, limbo tertio inferiore angustissime

tubuloso (2 mm. long.), reliqua parte laciniata, laciniis 4-4.5 mm. longis 0.1 mm. latis. Antherae basi apiculatae. Stigmata conica papillosa. Achaenia glabra 5 mm. longa. Pappus roseo-ochraceus circa 9 mm. longus.

Type: Bolivia, Dep. of La Paz, Prov. Larecaja: Copacabana (about 10 km. south of Mapiro, 850-950 m. alt., collect. Oct. Nov. 1939, B. A. Krukoff 11150 (NY).

S. pentamerus is striking in view of its habit and inflorescence. Its heads have only five subcoriaceous involucre bracts and five flowers. Its corolla is deeply incised, its anthers are apiculate at the base and its stigmas conical.

Senecio colaminus Cuatr., sp. nov.

Herba basi ramosa ramis erectis robustis viridibus striatis minute puberulis.

Folia alterna late lanceolata basim versus in pseudopetiolum brevem (10 mm. longum) attenuata basi vaginato-dilatata, apicem versus acutata, margine integra vel minute repando-dentata, 4.5-5 cm. longa, 8-12 mm. lata, superiora magis sessilia amplectentiaque basim non angustata; nervo medio supra notato subtus prominenti, nervis lateralibus ascendentibus subtus paulo conspicuis. Lamina viridis supra minute puberula, subtus glabrior.

Inflorescentia subcorymboso-paniculata ad apicem ramorum congesta pluriflora, foliis superioribus ovatis amplectentibus suffulta. Ramuli squamuloso-pubescenti. Capitula radiata ad extremum ramulorum subglomerata. Pedicelli 0-3 mm. valde squamulosi. Calyculis plurimis bracteolis lanceolatis acutis 2-4 mm. longis imbricatis apice scariosis dorso nigrescentibus. Involucrum campanulatum basi rotundatum 20-22 bracteis linearibus subulatis 6-7 mm. longis, 1-2 mm. latis apice longiuscule nigrescenti, dorso glabri viridi sed tenuibus squamis praeditis. Flores marginales feminei ligulati circa 14 tubulo 3 mm. longo, lamina 7-8 mm. longa 3 mm. lata. Flores disci hermaphroditi circa 58, corolla 7 mm. longa, tubulo 2 mm. limbo tubuloso breviter 5-dentato. Antherae basi obtusiusculae. Stigmata truncata penicillata. Ovarium glabrum. Pappus stramineus corolla satis brevior.

Type: Bolivia, Cochabamba: Colami 2900 m. alt. Dry hill sides, herb 10-70 cm. Fl. yellow, collect. M. Cárdenas 3654 (US).

S. colaminus is well characterized by its sunflower-like habit. Its heads are aggregated and possess a large number of phyllaries the tips of which are blackish; the calycle has many rather long, subimbricate bracteoles which are blackish on the inside. The ligules are long and broad. The superior leaves of the branchlets are broader, more ovate and amplexicaul.

Senecio lancidentatus Cuatr., sp. nov.

Suffrutex 40 cm.-1 m. ramis scandentibus badiis leviter striatis parcissime puberulis, ramulis teneribus flexuosis.

Folia alterna submembranacea petiolata. Petiolus tenellus 5-15 mm. longus basi abrupte in 2 auriculas ovatas, vel subrotundatas, lobatas (2-10 mm. latas) amplexicaules ampliatus. Lamina triangulari-lanceolata basi subite contracta vel truncata apice acuta, margine crenatodentata in sicco leviter revoluta, 2.5-4 cm. longa, 7-14 mm. lata; supra viridis glabra laevis, nervo medio paulo notato; subtus pallidior parcissime puberula, costa prominenti reliquis nervis nervulisque in laxum reticulum anastomosantibus.

Inflorescentiae terminales corymboso-paniculatae pauciflorae (6-8 capitulis) ramulis dichotomis filiformibus flexuosis subglabris, bracteolis filiformibus 2-6 mm. longis sparsis munitis. Pedicelli subglabri capillares 4-10 mm. longi flexuosi parce bracteolati, apice 3-5 bracteolis ad modum calyculi dispositi. Capitula discoidea deflexa. Involucrum subcampanulatum 13 bracteolis linearibus subulatis glabris tenuibus margine scariosis apice ciliolatis 8-9 mm. longis, 1 mm. latis. Flores omnes hermaphroditi circa 34, corolla 6.5-7 mm. longa, tubulo 2.8 mm. longo. Antherae basi obtusiusculae. Stigmata truncata papillosa. Ovarium glabrum. Pappus albidus.

Type: Peru: 6 miles south of Mito, 10,000 ft. in low canyon side shrubs, collect. Macbride & Featherstone 1826 (US).

S. lancidentatus is related to *S. Buchtienii* Greenm. which has a different indumentum and larger leaves and heads. From *S. sepium* Sch. Bip. it differs by its discoid, narrower heads which have a smaller number of flowers and phyllaries. The latter are longer and not spotted at the top; the calycle is rudimentary and the achenes are glabrous. I have compared it with an isotype of *S. Buchtienii* and a cotype of *S. sepium* (Mandon 133), which seems to be different from the type.

Senecio charaguensis Cuatr., sp. nov.

Herba elata vel suffrutex, ramis erectis striatis leviter araneosis.

Folia tenuiter membranacea alterna sessilia. Lamina lanceolata basin versus attenuata basi angustata apice acuta, margine saepe dimidia superiori parte dentato-sub serrata dentibus patulis acutis, vel subintegra, 8-18 cm. longa, 1-2.8 cm. lata; supra viridis in juvenilibus arachnoidea deinde glabra, nervo medio conspicuo reliquis obsoletis; subtus plus minusve persistente arachnoidea vel floccoso laxaque lanata, costa prominula nervis secundariis remotis ascendentibus parce conspicuis.

Inflorescentiae corymboso-paniculatae terminales laxae vel sublaxiflorae (10-25 capitulis) ramulis erectis striatis laxe lanuginosis vel arachnoideis. Bracteae lineares. Pedicelli tenues erecti 8-35 mm. longi, bracteolis anguste linearibus 5-10 mm. longis. Capitula radiata. Calyculus pluribracteatus bracteolis angustissimis subulatis acutis arachnoideis involucrum paulo brevioribus. Involucrum hemisphaericocampanulatum 22 bracteis subulatis acutis 8 mm. longis 1-1.6 mm. latis extus lanuginoso-arachnoideis, viridi-rubescens, vel viridibus. Flores marginales feminei circa 12 ligulatae, corolla lutea tubulo

4.5-5 mm. longo, lamina elliptico-oblonga 12 mm. longa, 2-2.5 mm. lata. Flores disci hermaphroditi ultra 80, corolla 7-7.5 mm. longa, tubulo angusto 4 mm. longo, apice dentibus 0.8 mm. Lobuli antheriferi basi mutici. Stigmata truncata coronato-penicillata. Achaenia 3 mm. longa costata costis pubescentibus. Pappus sericeus albidus.

Type: Bolivia: Santa Cruz, Reg. Charagua: Quebrada de Charagua, at sandy and dry soil (near river) 900 m. alt. Herb 60-80 cm. Flower yellow. Collect. M. Cárdenas 2825 (F).

S. charaguensis is close to *S. sinapoides* Rusby but differs by the arachnoid indumentum of the branchlets and involucre, its less developed inflorescences, and larger heads.

Senecio Krukoffii Cuatr., sp. nov.

Suffrutex elata caule prismatico-angulato robusto, viridi sed indumento albo arachnoideo-lanato plus minusve deciduo tecto.

Folia alterna petiolata subcoriacea rigida viridia, siccitate brunnescentia. Petiolus robustus 2-3 cm. longus erectus, supra sulcatus basi incrassatus lanato-albicanti. Lamina elliptico-vel obovato-elliptico-oblonga basi obtusata apice angustata apiculata acuta, margine paulo revoluta, serrata dentibus brevibus acutis, 12-22 cm. longa, 3.5-7.5 cm. lata; supra juvenile statu arachnoideo-lanata deinde glabra nitida nervo medio impresso lateralibus plus minusve impressis, reliquis obsolete; subtus indumento araneoso tenui persistenti, costa valde crassa elevata, nervis secundariis 14-15 utroque, latere prominentibus, ascendentibus (angulo acuto) ad marginem anastomosatis nervulis laxum reticulum prominulum formantibus.

Inflorescentia terminalis conferta paniculata exfoliata folia superiora caulis superans, circa 10 cm. longa et lata. Ramuli sulcati angulati indumento albicanti arachnoideo-lanato deciduo tecti. Bracteolae minutae lineares acutae sparse muniti. Pedicelli praecipue 5-10 mm. longi puberuli bracteolulati bracteolis filiformibus 1-2 mm. longis apice 3-4 vix calyculum formantibus. Capitula radiata erecta. Involucrum campanulatum 13 bracteis oblongis apice deltoideis 5-5.5 mm. longis 1.8 mm. latis, margine late scarioso dorso viridi glabro. Flores marginales feminei ligulati 12, corolla lutea tubulo filiformi 4 mm. longo, lamina elliptico-oblonga 5 mm. longa 1.5 mm. lata. Flores disci hermaphroditi circa 24, corolla tubulosa 7 mm. longa. Antherae basi caudatae. Stigmata subtruncata papillosula. Ovarium glabrum. Pappus stramineus.

Type: Bolivia: Dep. La Paz, Prov. of S Yungas, vicinity of Tajma (near Chulumani) 1500-1600 m., collect. B. A. Krukoff 10715 (NY, F).

S. Krukoffii, probably close to *S. myrianthus* Klatt., is characterized by its general habit, ascending branchlets covered with an arachnoid tomentum, shape of its inflorescence and structure of its heads (radiate, 13 phyllaries, etc.).

Senecio Cabrerae Cuatr., sp. nov.

Frutex ramis angulatis dense adpresseque tomentosis.

Folia alterna petiolata subchartacea. Petiolus 2.5-4 cm. longus, angustus rigidus adpresse tomentosus, supra sulcatus basi paulo incrassatus. Lamina elliptico-oblonga utrinque attenuata basi anguste cuneata apice acutato-cuspidata, margine argute serrata plus minusve revoluta, 13-23 cm. longa, 4-5.5 cm. lata; supra atroviridis in juvenilibus puberula, adulta glabrescens calloso-granulata, costa angusta tomentosa, nervis lateralibus patulis filiformibus tomentellis paulo conspicuis, nervulis obsoletis; subtus pallidior tomentella, nervo medio tomentoso crasso elevato, nervis secundariis numerosis 3-4 mm. inter se distantibus tomentosis venulis in minutum reticulum conspicuum anastomosantibus.

Inflorescentiae terminales et axillares, paniculas pyramidales subfoliosas ad extremos ramos formantes, ad 40 cm. longas. Ramuli crispo-tomentosi. Bracteolae lineares pubescentes. Pedicelli 3-10 mm. longi pubescentes. Capitula heterogama. Calyculus 4-6 bracteolis anguste linearibus puberulis vel glabratis brevibus. Involucrum subrotundato-campanulatum 8-9 bracteis elliptico-oblongis apice acutatis, 5-6 mm. longis, 1.5-2 mm. latis. Flores marginales feminei 7-9 ligulatae corolla lutea tubulo 4.5 mm. longo, lamina oblongo-elliptica 5 mm. longa 1.5 mm. lata. Flores disci hermaphroditi circa 20, corolla 7 mm. longa. Antherae basi caudiculatae. Stigmata obtusa apicem papillosa. Ovarium glabrum. Pappus albidus.

Type: Bolivia: Unduavi, Nordyungas, 3300 m. alt., collect. Otto Buchtien 3084 & 3085 (US).

S. Cabrerae belongs to the group of *S. semidentatus* Klatt and *S. Macbridei* Greenm. but differs completely from them by the dense tomentum of the branchlets and the soft tomentum on the underside of the leaves which are long petiolate. From *S. myrianthus* Klatt, known only from the original description and a photograph of the type, it is distinguished by its long petioles, the indumentum on the upper side of its leaves which are more acute and serrate, and by the much laxer inflorescence. *S. myrianthus* has rugose leaves, which are probably coriaceous. Named in honor of the well known botanist and friend Angel L. Cabrera.

Senecio pongoensis Cuatr., sp. nov.

Herba vel suffrutex, ramulis junioribus lanuginoso-arachnoideis denique glabratis.

Folia alterna sessilia oblongo-lanceolata inciso-lobata lobis triangularibus acutis apice acuta basim versus valde angustata sed basi subite in amplas auriculas ovato-lanceolatas amplectentes dilatata 5-6 cm. longa, 8-12 mm. lata; supra viridia et arachnoidea vel adulta glabra, subtus arachnoideo-lanata albo-cinerea; tantum nervo medio conspicuo, subtus prominenti, lateralibus ascendentibus obsoletis.

Inflorescentia corymboso-paniculata pauciflora terminalis, 6-12 capitulis. Ramuli cinereo-lanati indumento plus minusve deciduo. Pedicelli 0.8-3 cm. longi aliquis bracteolis filiformibus circa 5-7 mm. longis muniti. Capitula radiata. Calyculus plurimis bracteolis linearibus subfiliformibus 3-5 mm. longis imbricatis lanuginosis apice fuscis instructus. Involucrum campanulatum circa 20-22 bracteis linearibus subulatis 6 mm. longis 1-1.2 mm. latis, margine scariosis dorso viridi plus minusve lanuginoso denique glabrato apice ciliato fuscescenti-Flores marginales feminei 12 ligulati, corolla lutea, tubulo angusto 2.6 mm. longo, lamina lineari-oblonga 10 mm. longa, 2 mm. lata. Flores centrales hermaphroditi tubulosi, corolla 6 mm. longa, tubulo 1.5 mm. longo dentibus 0.7 mm. papillosis. Antherae basi obtusiusculae. Stigmata truncata penicillata. Achaenia linearia 3 mm. longa leviter striata glabra. Pappus sordidus setis deciduis.

Type: Bolivia: Pongo de Quisne 13,500 ft. alt., collect. July 13, 1921, H. H. Rusby 16 (NY).

Cotypes: Bolivia: Pongo, 11,500 ft., collect. H. H. Rusby 2. Pongo de Quisne, 11,500 ft., July 14, 1921, collect. O. E. White 186 and 176.

S. pongoensis, related to *S. sepium* Sch. Bip. and *S. sinapoides* Rusby, differs by its smaller and incised leaves which are lanate on the lower side, by its less developed inflorescence, and the structure of its heads.

***Senecio arequipensis* Cuatr., sp. nov.**

Fruticulus 20-40 cm. altus, caulibus tortuosus procumbentibus ramis basi tortuosis, ascendentibus pseudodichotomus divaricatis albo-tomentoso-lanatis.

Folia herbacea alterna supra cinereo subtus albo-lanato-tomentosa, in ramulis sterilibus petiolata in ramis evolutis sessilia. Prima lamina elliptica vel oblonga basi cuneata apice acuta mucronato-apiculata utroque latere tridentata dentibus patulis acutis 12-18 mm. longa 6-9 mm. lata, petiolo 5-6 mm. longo basi vix dilatato. Folia caulina superiora lamina obovato-elliptica vel oblonga sinuato-dentata vel incisa, 2-3 dentibus deltoideis mucronatis utroque latere, apice acuta mucronata basi rotundato-auriculata amplexicauli, mediana subpanduriformi vel in pseudopetiolum contracta, basi auriculato-dilatata amplectenti; 2-3 cm. longa, 6-13 mm. lata.

Capitula discoidea longe pedicellata solitaria vel 2-3 terminalia. Pedicelli 0.5-4 cm. longi subcapillares albo-lanati vel denique glabrati, apice 4-5 bracteolis anguste-linearibus 2 mm. longis basi lanatis ad modum calyculi dispositis. Involucrum tubuloso-campanulatum 9-10 bracteis viridi-lutescentibus glabris nitidis margine late scariosis, linearibus acutis 7-8 mm. longis 1.5-2 mm. latis biseriatis. Flores hermaphroditi 12-16 tubulosi. Corolla 6.5 mm. longa, tubulo 3 mm. longo, laciniis 1-2 mm. Antherae basi breviter caudatae. Rami stigmatici paulo complanati sublaeves, apice subrotundati papillosi.

Ovarium dense villosum. Achaenia 2.5 mm. longa breviter denseque villosa. Pappus uniseriatis stramineus corollae longitudinis.

Type: Peru: North of Arequipa. Southern slopes of Chachani Mountain, pampa at ca. 3000 m. alt., 12-15 inches tall. Collect. F. E. Hinkley 55 (US).

Cotype: Peru: Dept. Arequipa: Arequipa, rocky hillside, along stream course. Alt. 2600-2700 m. Flowers light yellow, collect. F. W. Pennell 13201 (F, US).

S. arequipensis is closely related to *S. Juanisernii* Cuatr., from which it differs by being a small shrub with more developed branches (the youngest ones being longer), by having more elongated leaves, of which only those of the very young ends are petiolated; the cauline leaves are sessile, the superior ones being oblong, the remaining ones being contracted in the lower third simulating a pseudo-petiole, broadly auriculate and amplexicaul. The involucre and flowers are longer and the phyllaries glabrous.

This species must belong to Sect. *Diclini* Cabrera and cannot be transferred to *Chersodoma* because of its glabrous stigmatic branchlets which are papillose only at the nearly rotundate tips; when young, the stigmas really are truncate. I think that the villous stigmatic branches represent an essential character of *Chersodoma*. *S. arequipensis*, like *S. Juanisernii*, has sagittate anthers, a seldom feature in Andean *Senecios*, and truly hermaphrodite flowers in the specimens examined.

SENECIO COMOSUS Sch. Bip. ex Wedd. var. *debilis* Cuatr., nov. var.

Folia herbacea subtus albo-cinerea, margine subintegra anguste revoluta, lamina oblongo-lanceolata 6-15 cm. longa 7-14 mm. lata, basi in petiolum angustissimum tenuiter flexuosum 7-10 cm. longum attenuata. Capitula pauca (3-5) brevius pedunculata, calyculo minus bracteato minus lanato.

Type: Peru: Huancayo: 3317 m. alt. Collect. Soukup 2740 (US).

SENECIO COMOSUS Sch. Bip. ex Wedd. var. *blancus* Cuatr., nov. var.

Folia late lineari-oblonga, lamina ad 30 cm. longa, 3.2 mm. lata, margine crenato-dentata dentibus acute mucronatis. Capitula grandia longe pedunculata involucreo circa 2 cm. diam. 6 (compressa), bracteis calycularibus arachnoideo-lanatis numerosis imbricatis involucreum attingentibus vel subattingentibus, involucreum pluriseriatum simulantibus.

Type: Peru: Rio Blanco 12,000 ft. In clumps, rocky brook edge. Fls. lemon-yellow. Collect. Macbride & Featherstone 712 (US).

Cotype: Peru: Rio Blanco (Dept. Lima) 3000-3500 m. open hillside. Coarse herb 3-4 ft. rays yellow, florets greenish yellow. Collect. E. P. Killip & A. C. Smith 21622 (US).

It is possible that these two varieties represent species different from *S. comosus*, typical material of which I have not seen. Ac-

ording to the original description, it has narrow, linear leaves like those in the photograph of the Lechler specimen but not like those of the Mandon 136 specimens included in the same negative (no. 15554). Anyway, the Bolivian plants, until now considered as belonging to the same species, are different from the varieties described above.

SENECIO JUANISERNII Cuatr. Trab. Mus. Nac. Cienc. Nat. Madrid Bot. 33: 144 (1936). *Senecio Isernii* Cuatr. Ann. Univers. Madr. (Ciencias) IV: 38, fig. 14, reprint Jun. 1935.

Folia caulina petiolata, petiolo gracili 4-8 mm. longo. Tantum folia superiora fertilia sessilia amplectentia. Flores polygami (vel dioica?), feminei antherae sed rudimentibus filamentorum, rami stigmatici subcomplanati glabri sublaeves apice subrotundato papilloso; hermaphroditi (vel masculi?) antheris basi caudatis, stylo stigmatique femineos similibus.

Peru: Matucana collect. Isern 420 (fragm. of type, F). Matucana 8000 ft., low mats on rock ledges of canyon wall. Fl. white, Macbride & Featherstone 232 (F, US).

Lima: Rio Blanco: 3000-3500 m. alt., open hillside Killip & Smith 21657 (US). Below Cuaytara 2300 m. alt. (Dept. Huancavelica prov. Castrovirreina) A. Weberbauer 5410 (F).

S. Juanisernii is a dioecious or polygamo-dioecious species. The type specimens are female as are those of Weberbauer. The female flowers possess filaments and sometimes rudimentary anthers. The apparently hermaphrodite flowers of the Macbride & Featherstone and Killips & Smith collections may contain sterile gynaecea. The stigmatic branches are compressed, nearly smooth, and free of hairs or papillas; the stigmas are rotundate and shortly papillose; the anthers are shortly sagittate. This plant and *S. arequipensis* resemble *Chersodoma*, but lack the important character of the stigmas.

Senecio Soukupii Cuatr., sp. nov.

Herba rhizomatosa folia elongata basi fasciculata, ramis fertilibus erectis foliosis.

Folia basilaria lamina late oblongo-lanceolata apice acuta basi in pseudopetiolum longe plicato-vaginantem attenuata 20-35 cm. longa 20-45 cm. lata, pseudopetiole plus vagina ad 15 cm. long., margine foliorum acute dentata, superficie laevi tantum nervo medio conspicuo subtus prominenti, utrinque viridia tenuissimi indumento lanato-arachnoideo floccoso plus minusve deciduo munita; caulina simillima sed sessilia amplectentia.

Rami fertiles foliosi erecti vel basi flexuosi striati, lanato-arachnoidei denique glabri. Inflorescentia terminalis corymboso-paniculata basi subfoliosa, bracteis late-lanceolatis sursum decrescentibus, ramulis 3-1 capitulis erectis inferiore axillari ad 12 cm. longi; pedunculis crassis 0.5-5 cm. longis apice plurimis bracteis calycularibus

lanceolatis ad capitulum imbricatis involucri attingentibus vel subaequantibus. Capitula radiata. Involucri campanulatum 15-17 bracteis oblongo-lanceolatis 11-12 mm. longis, 2 mm. latis margine scariosis dorso viridibus sparse floccoso-arachnoideo-lanuginosis. Flores marginales feminei 15-16 ligulatis, corolla lutea tubulo filiformi 6 mm. longi, lamina elliptico-oblonga 10-12 mm. longa 2.5-3 mm. lata. Flores disci hermaphroditi circa 100 tubulosi, lutei, corolla 8 mm. longa tubulo 2.5 mm. limbo tubuloso-infundibuliforme apice 5-dentato dentibus deltoideis 1 mm. longis. Antherae basi obtusae. Stigmata truncata papillosa penicillata. Ovarium glabrum. Pappus albidus 8 mm. longus.

Type: Peru: Dept. Cuzco, Yucay, 3000 m. alt. Dec. 26, 1937 collect. J. Soukup 710 (F).

Cotypes: Dept. Junin, Huancayo, 4100 m. alt. Acopalca, edge of mountain stream with roots in muck. Perennial herb 0.4-0.6 m. disc rays yellow. A strong, stocky brittle stem, collect. H. E. Stork 10921

Dep. Junin, Huancayo 4000 m., Acopalca canyon. Herb 1-2 ft. high. Rays yellow. Collect. Paul Ledig 22 (US). District Chateca, Alcumbrera, 3800 m. Paucartamba Valley, "Huirahuirah", collect. F. Herrera 1088 (US). Casapalca. In clumps on steep margin of spring. A light but bright yellow. 15,000 ft. Collect. Macbride & Featherstone 861 (US).

S. soukupii is closely related to *S. comosus* Sch. Bip. ex Wedd., but differs essentially by the glabrous stem and leaves which have a deciduous, floccose covering only when young.

***Senecio puna-sessilis* Cuatr., sp. nov.**

Herba rhizomatosa. Caulis fertilis subscaposus foliis evolutis basi congeste rosulatis.

Folia basilaria crassiuscula sessilia anguste elliptico-oblonga apice paulo attenuata vel acutiuscula supra basim parce angustata basi vaginata amplectentia, margine minute leviterque serrulata plana, 6-6.5 cm. longa 7-10 mm. lata; utrinque minute papilloso-puberula subvelutina costa notata sed non eminenti, 3-4 nervis lateralibus ascendentibus (subparallelinerviis) parum conspicuis.

Scapus circa 50 cm. longus erectus rigidus crassiusculus pallido-viridis striatus plus minusve arachnoideis vel glabratus, foliis bracteis alternis obtuse lanceolatis basi latis amplectentibus inferne 6 cm. longis 8 mm. latis sursum gradatim brevioribus. Capitula discoidea pedicellata cernua circa 10 ad extremo scapi subracemiforme disposita, pedicellis (ramulis) 5-2 cm. longis erectis teneribus arachnoideis bracteolatis, bracteolis lineari-lanceolatis, apice calyculum formantibus. Calyculum bracteis 4-7 mm. longis, 1 mm. latis glabris quam involucri brevioribus. Involucri hemisphaerico-campanulatum circa 21 bracteis oblongis acutis 10 mm. longis, 2 mm. latis herbaceis viridi-lutescentibus glabris sed apice ciliato-barbulatis. Flores numerosi omnes hermaphroditi tubulosi, corolla lutea 7-7.5 mm. longa, tubulo angusto 3 mm., limbo campanulato breviter 5-dentato. Antherae

basi obtusae. Stigmata apice dilatata truncata penicillata. Ovarium glabrum. Pappus sordide albidus.

Type: Peru, Dept. Huanaco, Torre-Huasi, 4100 met. alt. Lower stem and leaves purplish, leaves green with purple rim. Flower greenish yellow; stalk same color. Only two plants found flowering. 4 May 1946 collected D. Tuesta Díaz & Félix Woytkowski 34270 (F).

S. puna-sessilis is close to *S. subdecurrens* Sch. B. and *S. tephrosioides* Turcz. but differs from both (probably synonymous) by its sessile, basal leaves, its auriculate and entire upper leaves, and the minutely papillose and puberulent leaf surfaces.

***Senecio subculcitioides* Cuatr., sp. nov.**

Herba rhizomatosa, caule horizontali, rosulam foliorum terminaliam producto et ramo laterali emergenti fertili praedito.

Folia rosularia anguste linearia apicem versus angustata, acuta basim versus in tenuem pseudopetiolum attenuata basi ampliata vaginaria, margine revoluta integra, 20 cm. longa 5-7 mm. lata, supra viridia glabra laevia; subtus nervo medio eminenti subglabro excepto dense adpressequae albo-cinerea lanata. Folia basilaria in ramis fertilibus radicalia similia sed breviora. Rami floriferi scaposi tenues erecti leviter striati parce arachnoidei vel glabrati, tantum 2-3 parvis foliis bracteiformibus (10-20 mm. long, 2-3 mm. lat.) muniti.

Capitula discoidea globulosa cernua 2-3 extremis scapo disposita (12-14 mm. lat. compresso). Pedicelli tenui arachnoidei-lanuginosi circa 2 cm. longi apicem versus breves bracteolas lanceolatas acutas basi arachnoideas, ad capitulum instar involucrium dispositis. Involucrium campanulatum 20-21 bracteis ovato-lanceolatis 7.5-8 mm. longis 2 mm. latis apice acuto barbato, margine scariosis dorso glabro vel parce arachnoideo. Calyculus pluriphyllus, bracteis interioribus quam involucrio breviores. Flores omnes hermaphroditi tubulosi corolla 6.5 mm. longa, tubulo capillare 2 mm. basi subite inflato, limbo late campanulato breviter 5-dentato. Antherae 1.5 mm. longae basi obtusae. Stylus basi bulbosus. Stigmata truncata papilloso-penicillata. Ovarium glabrum. Pappus sordidus.

Type: Peru: Baños. Expedit. Capt. Wilkes (USNH-64711).

S. subculcitioides is related to *S. culcitioides* Klatt, but it is slender and has smaller leaves narrowed toward the base, thin exfoliate scapes which bear only one or two heads. These are smaller and in mature plants, the involucre is really shorter than the flowers.

***Senecio timidus* Cuatr., sp. nov.**

Herba rhizomatosa foliis basilaribus fasciculatis ramulis terminalibus solitariis subscaposis monocephalis.

Folia basilaria anguste linearia basim versus in pseudopetiolum angustatum basi longe vaginata amplectentia, margine minute vel obsolete denticulata, dentibus callosis, satis revoluta, 20-22 cm. longa,

5-8 cm. lata; utrinque pallido-viridia, supra glabra nervo medio parum depresso, subtus tenuissimi velo lanato-arachnoideo munita. Scapus simplex erectus leviter striatus parcissime arachnoideus demum glaber, folia basilaria valde superans 28-36 cm. longus, basim versus 2-3 foliis alternis basilaribus similibus sed brevioribus sessilibus basi amplectenti, sursum gradatim minoribus bracteosis; internodiis 3-7 cm. longis.

Capitula discoidea solitaria nutantia vel cernua 2 cm. lat. (statu compresso). Involucrum late campanulatum 21-22 bracteis elliptico-oblongis apice obtusis vel subacutis herbaceo chartaceis pallidis glabris, 15 mm. longis 3.5-4.5 mm. latis, biseriatis. Calyculus numerosis bracteis pluriseriatis imbricatis lineari-oblongis acutiusculis rubescentibus, glabris 10-13 mm. longis 1.5-2 mm. latis, involucre paulo brevioribus. Flores involucrum breviores omnes hermaphroditi tubulosi lutei, corolla 7.5 mm. longa, tubulo 3 mm. longo dentibus deltoideis 0.6 mm. Antherae basi obtusae. Stigmata truncata piloso-penicillata. Ovarium glabrum. Pappus albidus.

Type: Peru: Dept. Junin: Mount La Juntay, near Huancayo, alt. about 4700 m., puna. Bracts bright red, rays and florets yellow. Collect. E. P. Killip & A. C. Smith 22040 (US).

S. timidus is closely related to *S. hypsobates* Wedd., especially in regard to the structure of the heads. It differs from that species by the long, narrow leaves with revolute margins; these leaves, resembling those of *S. culcitoides*, lack the tomentum but have a slight arachnoid pubescence; moreover it differs from this species by being monocephalous and by having a different involucre with broader phyllaries which are longer than the flowers.

Senecio antaicochensis Cuatr., sp. nov.

Suffrutex ramis basi procumbens tortuosis extremis erectis, striolatis lanato tomentosis albidis.

Folia alterna sessilia crassiuscula obovato-oblonga in ramulis juvenilibus basim versus paulo attenuata in adultis ampliata-auriculata amplexicaulia, apice obtusa, margine integra revoluta, 12-22 mm. longa, 4-7 mm. lata; supra albo-cinerea dense crispo-lanato-tomentosa, subtus cinerea vel lutescente crispo tomentosa, tomento aliquando deciduo, nervo medio supra paulo conspicuo subtus prominenti.

Inflorescentia terminalis et subterminalis paniculata, circa 8 capitulis, ramulis tomentosis flexuosis axillaribus bracteis foliis similibus. Pedicelli 1-2 cm. longi, apice numerosis bracteis linearibus subulatis acutis dense lanato-tomentosis in calyculum imbricatis. Capitula radiata. Involucrum campanulatum circa 15 mm. latum (compressum) 21 bracteis lineari-subulatis 9-10 mm. longis 1.5-2 mm. latis, compressis crispo-lanato-tomentosis. Flores marginales feminei circa 21, ligulatae, corolla flava tubo 4 mm. longo, lamina oblonga 10-12 mm. longa, 3-3.5 mm. lata, apice breviter 3-dentata. Flores disci hermaphroditi circa 76, corolla lutea 7.5 mm. longa, tubulo 2 mm. limbo tubu-

loso-campanulato apice 5-dentato, dentibus 1 mm. Antherae basi muticae. Stigmata apice truncata papilloso-penicillata. Ovarium glabrum. Pappus stramineus.

Type: Peru: Dept. Lima, near Antaicocha, Cerro Colorado, East of Canta, open rocky cliff, 4000-4200 m. alt., shrub. Rays lemon chrome disk yellow, collect. F. W. Pennell 14687 (US).

S. antaicochensis is related to *S. sublutescens* but differs from that species by its lanate, dense tomentum, its rather obovate, oblong leaves, and its smaller heads. From *S. Hohenackeri* Sch. B. it differs in the shape of the involucre and calycle. From *S. Pavoni* (Wedd.) Cuatr. it is different by being radiate and having a different indumentum.

***Senecio sublutescens* Cuatr., sp. nov.**

Suffrutex ramis basi tortuosis procumbentibus extremis leviter striatis villosolanas cinereo-lutescens.

Folia alterna crassiuscula sessilia lineari-lanceolata vel lineari-elliptica apice obtusa vel obtusiuscula, basi dilatato-cordata amplexicaulia 1.8-4 cm. longa, 4-10 mm. lata, margine levissime revoluta integra, sed subtus minutissimis remotis dentibus obsolete; supra viridi grisea tenuiter villosolana, nervo medio anguste impresso; subtus dense villosolana cinerea vel luteolo-cinerea costa prominenti reliquis nervis inconspicuis; pilis sericeis.

Capitula radiata solitaria vel pauca (2-3) ad extremos ramorum longe pedunculata, pedunculis 3-7 cm. longis, crassiusculis flexuosis dense villosolanas lutescentibus. Calyculus 20-26 bracteis lineari-lanceolatis pluriseriatis circa 8-12 mm. longis, 1.5 mm. latis, extus densissime lanatis pilis sericeis in sicco lutescentibus, interioribus involucrum attingentibus velpaulobrevioribus. Involucrum late campanulatum (compressum 2-2.5 cm. lat.) circa 22 bracteis lineari-lanceolatis 13.5-14 mm. longis, 1.8-2.5 mm. latis extus crasse lanatis pilis sericeis lutescentibus. Flores marginales feminei ligulati numerosi (plus 22) exserti, corolla flava tubulo 5 mm. longo, lamina oblonga 17-20 mm. longa 4-5 mm. lata. Flores disci crebri tubulosi lutei, corolla 8-9 mm. longa, tubulo 2.5 mm., limbo apice 5-dentato, dentibus 1 mm. Antherae basi obtusiusculae. Stigmata apice incrassata truncata penicillata. Ovarium glabrum. Pappus albicans.

Type: Peru: Viso. In slide rock. Light yellow. 9000 ft. collect. Macbride & Featherstone 586 (US).

S. sublutescens is close to *S. Hohenackeri* Sch. Bip., but differs by the laxer, hispidulous, sericeous indumentum which is yellowish in the upper part of the plant, the linear-lanceolate phyllaries, and its adult leaves which are broader at the base. In the other hand, *S. Hohenackeri* has more ovate or elliptical phyllaries, broader and thicker calycular bracts and a thicker, more compact indumentum. Because of its indumentum it is similar to *S. Pavonii* (Wedd.) Cuatr., which has obovate, oblong leaves narrowed toward the base and is discoid.

Senecio minesinus Cuatr., sp. nov.

Frutex ramis erectis copiose cinereo-lanatis.

Folia alterna sessilia obovato-oblonga vel lineari-oblonga, supra basim parcissime attenuata apice acuta mucronulata basi ampliato-amplectentia, margine revoluta 2-3 dentibus mucroniformibus utroque latere, 16-28 mm. longa 5-6 mm. lata; supra griseo-lanuginosa, tomento crispo plus minusve deciduo, nervo medio excepto; subtus dense lanuginoso-tomentosa, cinerea vel lutescentia tantum costa visibili.

Inflorescentia corymboso-paniculata terminalis pauciflora vel multiflora basi subfoliosa. Ramuli erecti albicanti-lanati. Bractee ovato-lanceolatae oblongae basi late amplectentes, margine revolutae, lanatae. Pedicelli 10-20 mm. longi, crassiusculi flexuosi lanati. Capitula discoidea. Calyculus pluribracteatis bracteolis 2-pluriseriatis lanatis linearibus circa 8 mm. longis, interioribus involucro paulo brevioribus. Involucrum campanulatum 21 bracteis lanceolatis, 8 mm. longis 1.5-2 mm. latis extus griseo-lanatus, apice angustatis viridibus margine scariosis. Flores omnes hermaphroditi tubulosi circa 100, corolla 7-8 mm. longa tubulo 3 mm. limbo tubuloso apice breviter 5-dentato. Antherae basi obtusiusculae. Stigmata truncata papillosa. Ovarium glabrum. Pappus stramineus.

Type: Peru: San Carlos Mines, Est. 6 miles west of Huallanca 9000 ft. In crevices of rock outcrops. Woody below. Collect. Macbride & Featherstone 2470 (US).

Other specimen: Peru: 16 miles NE of Huanuco. Grassy wet hill-top 14,000 ft. Collect. Macbride & Featherstone 2169 (US).

S. minesinus belongs to Sect. *Reflexus* Cuatr. and is close to *S. Pavonii* (Wedd.) Cuatr. and *S. romeroides* Cuatr. From the former it is distinguished by being corymbose, having a different indumentum and leaves of different shape; from the latter species it differs chiefly by its broader leaves.

Senecio saxipunae Cuatr., sp. nov.

Fruticulus basi tortuosus ramulis terminalibus erectis vel flexuosis. Rami ramulique dense cinereo-lanato-tomentosi.

Folia alterna crassiuscula sessilia, ovata vel ovato-oblonga, apice obtusa vel obtusiuscula basi saepe cordato- vel subcordato-plexicaulia, vel in juvenilia attenuata, margine revoluta integra vel minutissimis dentibus mucroniformibus remotis munita, 18-28 mm. longa, 6-13 mm. lata; supra grisea tomento lanato albo tenui tecta denique deciduo, nervo medio depresso; subtus dense lanato-tomentosa albo-cinerea costa crassa 2-3 nervis lateralibus ascendentibus plus minus conspicuis.

Capitula radiata solitaria vel subsolitaria (2-4) ramos vel ramusculos terminantia. Pedicelli crassi flexuosi dense lanati. Calyculus 9-12 bracteolis subseriatis linearibus circa 4 mm. longis, 1 mm. latis dense lanatis albicantibus. Involucrum 19-21 bracteis lanceolatis 8.5

mm. longis 2-2.5 mm. latis apice acutis fusciscentibus, dorso densissime albicanti lanatis. Flores marginales feminei ligulatae involucri paulo excedentes, 8-10 corolla flava 6.5-7 mm. longa, tubulo 2.5 mm., lamina elliptica 4-4.5 mm. longa 2 mm. lata. Flores disci numerosi hermaphroditi, corolla lutea 7.5 mm. longa, tubulo 2.6 mm. limbo campanulato dentibus 1 mm. Antherae basi muticae. Stigmata apice truncata papillosa. Ovarium glabrum. Pappus albidus.

Type: Peru: Viso, 9000 ft. More or less pendant from crevices, vertical rock-cliffs. Woody below. Light yellow. Collected Macbride & Featherstone 587 (US).

Cotype: Peru: Dept. Cuzco: Cerro de Colquipata. Rocky cliff on puna, alt. 3900-4000 m. alt. Shrub. Rays lemon chrome, disc yellow. Collect. F. W. Pennell 13743 (F).

S. saxipunae is close to *S. Hohenackeri* Sch. Bip. and other related species from which it is distinguished by its short ligules, smaller heads and less developed calyx. The leaves are largely sessile and amplexicaul; the tomentum is very dense and white on the lower side, softer and transparent on the upper side. In its habit this species resembles closely species of Sect. *Reflexus* Cuatr., which includes old fruticose *Culcitia*.

SOME ANDEAN SECTIONS OF THE GENUS *SENECIO*

Sect. *Ledifolium* Cuatr., sect. nov.

Frutices vel arbusculae ramulis erectis rigidis lanato-tomentosis. Folia parviuscula coriacea sessilia vel breviter petiolata, lamina elliptico-oblonga vel lanceolata vel lineari margine integra, tomentosa vel supra denique glabra. Capitula discoidea in paniculis corymbosis terminalibus.

Typus Sectionis *Senecio ledifolius* (HBK) DC.

Other species: *S. Lehmannii* Hieron, *S. novolanatus* Cuatr.

Sect. *Abietoides* Cuatr., sect. nov.

Frutices vel suffrutices ramis rigidis elongatis glabris vel terminatiōe tomentosis. Folia coriacea angustissime linearia elongata aciculiformia glabra. Capitula discoidea vel radiata in panicula corymbosa terminali disposita.

Typus Sectionis *Senecio abietinus* Willd.

Subsect. *Discoidei* nov.—Capitula homogama, typus *Senecio abietinus* Willd. Other species: *S. aciculatus* Cuatr., *S. Lindenii* Sch. B., *S. teretifolius* DC., *S. elatoides* Wedd.

Subsect. *Radiati* nov.—Capitula heterogama, typus *Senecio Weberbauerii* Cuatr.

Sect. *Vaccinioides* Cuatr., sect. nov.

Arbusculae vel frutices glabrae vel pubescentes. Folia coriacea viridia oblonga sub lanceolata (0.5-5 cm. longa x 2-18 mm. lata) vel parva et elliptica, margine integra, petiolata vel subsessilia. Capitula discoidea involucre campanulato. Inflorescentiae corymbosae breves terminales.

Typus Sectionis: *Senecio vaccinioides* (HBK) Sch. Bip.

Other species: *S. pulchellus* (HBK) DC, *S. guantivanus* Cuatr., *S. Microchaete* (Benth.) Wedd., *S. pungens* (HBK) DC, *S. trichopus* (Benth.), *S. ramentosus* Cuatr., *S. Stuebelii* Hieron., *S. flos-fragens* Cuatr. *S. frigidophilus* Cuatr.

Sect. *Arbutoides* Cuatr., sect. nov.

Arbusculae vel frutices, glabrae vel glabrescentes. Folia coriacea parva viridia petiolata vel subsessilia, margine plus minusve dentata, ad 1 cm. longa. Capitula radiata involucre campanulato. Inflorescentia in brevibus paniculis corymbosis vel capitulis solitariis ad terminationem ramusculorum.

Typus sectionis *Senecio arbutifolius* HBK.

Other species: *S. ecuadoriensis* Hier., *S. Mutisii* Cuatr., *S. pichinchensis* Greenm., *S. myrsinites* Turcz., *S. flocculidens* Schultz Bip., *S. pachypus* Greenm.

Sect. *Ericoides* Cuatr., sect. nov.

Frutices ramis (praecipue juvenilibus) plus minusve tomentosis. Folia coriacea parviuscula anguste elliptico-oblonga vel linearia margine valde revoluta, subtus tomentosa. Capitula radiata pedunculata, axilaria subterminalia solitaria vel pseudocorymbos terminales formantia.

Typus sectionis *Senecio ericaefolius* Benth.

Other species: *S. apiculatus* Wedd.

Sect. *Triana* Cuatr., sect. nov.

Fruticosae scandentes ramulis flexuosis tomentosis vel glabris. Folia subcoriacea vel coriacea viridia plus minusve ovata mediocria petiolata, minute venulosa vel elevato-reticulata. Capitula discoidea parva in paniculis numerosis ramusculos terminantibus. Involucrum glabrum.

Typus sectionis *Senecio arboreus* HBK

Other species: *S. weinmannifolius* Cuatr., *S. Trianaei* Klatt, *S. tamaensis* Cuatr., *S. theaeifolius* Benth., *S. diamantensis* Cuatr., *S. antioquiensis* Cuatr., *S. Archeri* Cuatr., *S. lorentensis* Cuatr., *S. hachanus* Cuatr.

Sect. **Granata** Cuatr., sect. nov.

Arbusculae vel frutices. Folia alterna petiolata (vel sessilia) coriacea subtus tomentosa. Capitula discoidea involucri campanulato, bracteis crassiusculis. Panicula corymbosa terminalis.

Typus sectionis *Senecio colombianus* Cuatr.

Other species: *S. tolimensis* Sch. Bip. ex Wedd., *S. leiocladus* Cuatr., *S. Caroli-tertii* Cuatr., *S. andicola* Turcz., *S. Reissianus* Hier., *S. vernicosus* Sch. Bip., *S. nitidus* (HBK) DC, *S. sclerosus* Cuatr.

Sect. **Macbrideus** Cuatr., sect. nov.

Suffrutescentes robustae elataeque vel frutices ramis robustis elongatis foliosis glabris vel pubescentibus. Folia subcoriacea dentata. Capitula radiata involucri campanulato. Inflorescentia elata thyrsoido-paniculata axillari-terminalis.

Typus sectionis *Senecio Macbridei* Greenm.

Other species: *S. semidentatus* Klatt (= *aberrans* Greenm., *Kluggi* Greenm.), *S. reflexus* HBK, *S. Cabrerae* Cuatr., *S. Vargasii* Cabrera.

Sect. **Praegynoxys** Cuatr., sect. nov.

Arbusculae vel frutices. Folia subcoriacea alterna petiolata. Inflorescentia corymboso-paniculata terminalis. Capitula radiata. Stigmata conica.

Typus sectionis *Senecio alternifolius* (Sch. Bip. ex Rusby) Greenm.

Other species: *S. Tuestae* Cuatr., *S. huanuconus* Cuatr.

Sect. **Paragynoxys** Cuatr., sect. nov.

Arbusculae parce ramosae foliis grandis crasse coriaceis alternis. Inflorescentia terminalis paniculata. Calyculus valde reductus. Involucrum 5-6 phyllis. Corolla alba limbo usque ad basim laciniato. Capitula homogama, abortionem causa polygama vel dioica. Antherae basi caudatae. Stigma apice plus minusve incrassatum conicum penicillatum vel obtusum.

Typus sectionis *Senecio neodendroides* Cuatr.

Other species: *S. meridanus* Cuatr., *S. venezuelae* (Badillo) Cuatr.

Sect. **Dendrophorbium** Cuatr., sect. nov.

Arbusculae herbaceae vel suffrutescentes caule elato simplice vel paulo ramoso. Folia alterna grandia petiolata chartacea dentata nervis numerosis parallelis patulis. Inflorescentia terminalis corymboso-paniculata magna floribunda. Capitula radiata. Stigma truncatum vel obtusum. Involucrum breve, hemisphaerico-campanulatum.

Typus sectionis *Senecio Silvani* Cuatr.

Other species: *S. Arboluco* Cuatr., *S. moscopanus* Cuatr., *S. sibundoyensis* Cuatr., *S. tipocochensis* Domke, *S. Dielsii* Domke, *S. ingens*

Benoist, *S. balsapampae* Cuatr., *S. Pururu* Cuatr., *S. lloensis* Hier., *S. multinervis* Sch. Bip., *S. Goodspeedii* Cuatr., *S. unduavianus* Cuatr., *S. ayopayensis* Cuatr.

Sect. REFLEXUS Cuatr. Fieldiana, Bot. 27:51

Suffrutices vel fruticuli parvi, basi plerumque ramosi prostrati, ramis foliosis erectis foliis coriaceis alternis. Capitula discoidea. Calyculus plus minusve pluriseriatis, gradatim in involucrium pluriseriatum commutatus. Monocephala vel oligocephala.

Typus sectionis *Senecio superandinus* Cuatr., (*Culcitium reflexum* (HBK).

Other species: *S. gelidus* Wedd., *S. quitensis* Cuatr., *S. viridi-albus* Cuatr., *S. neoascendens* Cuatr., *S. guicanensis* Cuatr., *S. lingulatus* (Schlect.) Cuatr., *S. Gargantuanus* Cuatr., *S. puracensis* Cuatr., *S. Pavonii* (Wedd.) Cuatr., *Culcitium Sodiroi* Hieron., *S. Culcikliattii* Cuatr., *S. romeroides* Cuatr.

Sect. *Hypsobates* Cuatr., sect. nov.

Herbaceae glabrae vel puberulae. Folia elliptico-linearia, elongata, basilaria rosulata viridia. Rami fertiles scapiformes. Capitula discoidea solitaria vel pauca. Involucrium glabrum. Calyculus pluriseriatus plus minusve in involucrium commutatus.

Typus sectionis *Senecio hypsobates* Wedd.

Other species: *S. supremus* Cuatr., *S. tephrosioides* Turcz., *S. Chionogeton* Wedd., *S. subdecurrens* Sch. Bip., *S. serratifolius* (Meyen et Walp.) Cuatr., *S. timidus* Cuatr., *S. punasessilis* Cuatr.

Sect. CULCITIUM (H. & B.) Cuatr. Fieldiana Bot. 27:50

Herbaceae, foliis basilaribus plerumque linearibus vel elongatis, rosulatis subrosulatis vel fasciculatis, dense albo tomentoso-lanatis. Capitula discoidea. Calyculus multibracteatus gradatim in involucrium pluriseriatum commutatus. Bractee involucri calyculique angustae. Oligocephalae.

Typus sectionis *Senecio canescens* (H. & B.) Cuatr. (*Culcitium rufescens* H. et B. and *Culcitium canescens* H. et B.).

Other species: *S. canescens* (H. et B.) Cuatr., *S. cocuyanus* Cuatr., *S. santanderensis* Cuatr., *S. nivalis* (HBK) Cuatr., *S. Haenkeanus* Cuatr., *S. leucophorbium* Cuatr.

Sect. LATIFLORUS Cuatr. Fieldiana Bot. 27:51

Herbaceae foliis basilaribus elongato-ellipticis vel lanceolatis plus minusve rosulatis vel fasciculatis. Inflorescentia paniculata. Capitula radiata. Calyculus multibracteatus gradatim in involucrium pluriseriatum commutatus. Plantae adpresse albo-lanatae.

Typus sectionis *Senecio latiflorus* Wedd.

Other species: *S. niveo-aureus* Cuatr., *S. almorzaderonis*, Cuatr.

Sect. **Culcitiopsis** Cuatr., sect. nov.

Herbaceae foliis linearibus basilaribus fasciculatis vel rosulatis supra viridibus subtus albo-tomentosis. Capitula discoidea vel radiata paniculata. Involucrum glabrum vel subglabrum calyculo pluriseriati bracteis gradatim in involucrum commutatis.

Typus sectionis *Senecio summus* Cuatr.

Subsectio **Discoidei** Cuatr. nova; capitulis discoideis.

Typus subsectionis: *Senecio summus* Cuatr.

Other species: *S. culcitioides* Wedd., *S. subculcitioides* Cuatr.

Subsectio **Radiati** Cuatr. nova; capitulis discoideis.

Typus subsectionis: *Senecio comosus* Wedd.

Other species: *S. Soukuppii* Cuatr.

Sect. **BRACHYPAPPUS** (Sch. Bip.) Benth. & Hook.

Senecio magellanicus H. et A., *S. vaginaefolius* Sch. Bip. (*S. dasyphyllus* Cuatr., *Culcitium dasyphyllum* Gaüd.), *S. culcitenellus* Cuatr. (*Culcitium tenellum* Dusen, *C. sessile* Speg., *Senecio neosessilis* Cuatr.), *S. Gilliesii* Hook. (*C. Poeppigi* DC., *S. Poeppigii* Wedd.), *S. candidans* DC. (*C. Gayanum* Remy).

STUDIES IN SOUTH AMERICAN PLANTS—III

Previous parts of this series were published in *Lloydia*, Vol. XI: 185 and in *Fieldiana, Botany*, Vol. 27: 55. The drawings were made by Gustavo Rojas, while he collaborated with me as artist in the "Comisión Botánica del Valle (Cali, Colombia).

BRUNELLIACEAE

Brunellia velutina Cuatr., sp. nov.

Arbor grandis. Ramuli terminales robusti tetragoni dense velutino-tomentosi in sicco brunnescentes. Gemae et rami foliaque juveniles dense crasseque velutini. Stipulae crasse lineares arcuatae 3-4 mm. longae velutinae deciduae.

Folia opposita imparipinnata magna (40-80 cm. longa), 3-2 jugis stipulata. Petiolus robustus 14-22 cm. longus teres basi paulo in-crassatus, dense velutino-tomentosus sicut rhachis. Foliola coriacea opposita petiolulata stipulata petiolulo crasso lateralibus 3-6 mm. longo terminale 30-40 mm. longo. Lamina elliptica vel ovato-elliptica basi late rotundata vel subtruncata vel superne obtuse cuneata paulo asymmetrica, apice paulo angustata acutaque vel rotundata, margine dentato-serrata, 12-28 cm. longa 10-17 cm. lata; supra griseo-viridis nervis tomentosus reliqua pubescens; subtus ochraceo-viridis, in sicco pallido-badia, tomentosa, nervatura velutina, costa crassa eminenti, nervis lateralibus prominentibus 14-20 utroque latere patulis marginem versus paulo arcuatis, nervis tertiis transversis parallelis elevatis, reliquis nervulis minutum reticulum formantibus. Rhachis internodia 5-9 cm. longa.

Inflorescentiae axillares cymoso-paniculatae floribundae 14-26 cm. expansae, ramis principalibus dichasialis reliquis dichotomis, pedunculo robusto 4-6 cm. longo, subteres paulo striato dense tomentosovelutino, ramulis tomentosohirtis. Flores feminei pentameri subsessiles glomerati. Saepius quinque sepala triangularia 1.8-2 mm. longa villosotomentosa decem stamina sterilia quam sepala breviora et quinque carpella hirsutula ovalia 1.2 mm. longa dorso longe stylata. Aliquando tetramera vel tantum 4 carpella evoluta. Folliculi subrotundati paulo compressi tomentosi 2.2-2.5 mm. diam., stylo 1 mm. longo remanenti monospermi, saepe quinque uniformiter stellate dispositi. Semina subrotundata leviter compressa carinataque, 1.8 mm. lat. brunneo-rubra nitentia, maturitate exserta cum funiculo robusto.

Type: Colombia, Dept. Valle. Cordillera Occidental: Hoya del río Digua: río San Juan, 1300-1500 m. alt., abajo de Queremal ktos. 52-53, colect. 24-III-1947 J. Cuatrecasas 23953. "Gran árbol. Hoja subcoriácea, verde gris en el haz, verde ocrácea envés. Flores verdes.

Fruto pardusco. Semillas pardo rojizas, brillantes."

Brunellia velutina is characterized by its large leaves with tomentose, velvet rhachis and robust petioles, soft tomentose leaflets, velvety young organs, and small flowers and fruits.

Brunellia hygrothermica Cuatr., sp. nov.

Arbor 10-15 met. alta caule 20-25 cm. diam. ligno albo, ramulis fuscis glabris.

Folia opposita imparipinnata magna (50-100 cm. longa) 3-4 jugis, longe petiolata. Petiolus robustus 18-40 cm. longus teres sublaevis glaber sicut rhachis. Foliola coriacea opposita petiolulata, petiolulo in lateralibus 8-12 mm. longo in terminale 3-5.5 cm. longo. Lamina subelliptico-oblonga basi asymmetrica rotundata vel obtusa apice abrupte angustata breviter apiculata terminalis ovata basi cuneata symmetrica apice obtusa vel acutiuscula, margine grosse serrato-crenata, 17-28 cm. longa 7-13 cm. lata; supra viridis vel atroviridis laevis glabra nervo medio secundariisque impressis venulis reticulatis plus minusve conspicuis; subtus albo-cinerea minute tomentulosa, costa valde prominenti nervis lateralibus 15-18 utroque latere prominentibus paulo arcuato-ascendentibus, nervulis transversis cum venulis prominulis in reticulum anastomosatis.

Inflorescentiae axillares vel subterminales valde evolutae floribundae cymoso-paniculatae 30-60 cm. longae et latae, pedunculo valde robusto laevi glabro paulo compresso 10-20 cm. longo. Rami ramulique valde ramificati subdivaricati aurantiaco-viriduli extremos versus puberuli vel subglabri. Ramusculi ultimi tenues, pedicellis circa 1 mm. longis puberulis. Flores masculi (vel hermaphroditi) 5 sepalis valvatis deltoideis 2 mm. longis basi coalitis, luteolo-viridulis, extus parce minuteque puberulis intus sparse villosulis, 10 staminibus sepala aequilongis vel paulo excedentibus dimidia parte inferiore filamentorum villosa, antheris cordato-ellipticis 0.8 mm. longis dorso affixis. 5 carpellis liberis rudimentaribus ovario villosulo stylo elongato subulato glabro, aliquando bene evolutis 3 fertilibus monospermis vidi.

Type: Colombia, Dep. Valle; Costa del Pacífico, río Cajambre: Barco 80 met. alt., 26-IV-1944 colect. J. Cuatrecasas 17156. "Arbol 10 met. Tallo 20 cm. diam., corteza gris ocracea clara. Madera blanca. Inflorescencias axilares opuestas con ramitas verdoso anaranjadas. Perianto amarillo verdoso. Anteras id. Hoja semicoriacea, verde oscura brillante haz, blanco cencienta envés." (F.)

Cotype: Id. id. rio Cajambre: Quebrada de Ordóñez 5 met. alt., colect. 1-V-1944 J. Cuatrecasas 17278. "Arbol 15 met. Corteza pardo oscura. Madera blanca, ligera. Hoja imparipinada, verde haz, blanca envés. Flores, pedúnculo y perianto amarillo verdoso. Anteras parduscas." (F.)

Other specimen: Rio Dagua, Cordoba, Lehmann 2933 (US).

Brunellia hygrothermica is different from all other known species of the genus, but it can be related to *B. comocladifolia* H. et B. It is characterized by its large primate leaves which are glabrous on the upper side and shortly tomentose beneath, by its large inflorescences with less divaricate branchlets (angles of 45 or more acute), and the large number of small flowers with a barely puberulent perianth. The petioles and peduncles of the inflorescence are glabrous and the branchlets slightly pubescent. These features surely are a result of adaption of this species to its exceptional ecology. Unlike the other species of the genus which are Andean this *Brunellia* lives in the heart of a hygrothermic rain-forest.

***Brunellia ecuadoriensis* Cuatr., sp. nov.**

Ramuli terminales compressi striati minute tomentosi.

Folia opposita imparipinnata subcoriacea 25-40 cm. longa, 4-5 jugis. Petiolus 12-15 cm. longus subteres dense tomentosus. Foliola subsessilia elliptico-lanceolata apicem versus angustata acuminata basi obtusa asymmetrica margine dentato serrata, 8-13 cm. longa, 2-3 lata; supra subglabra costa angusta impressa nervis lateralibus conspicuis; subtus tomentosa costa eminenti nervis lateralibus 14-18 utroque latere prominentibus, nervulis venulisque reticulatis. Rhachis internodia 2-5 cm. longa dense tomentosa.

Inflorescentiae axillares cymoso-paniculatae ad 8 cm. latae in specimine, pedunculo robusto 3-7.5 cm. longo dense tomentoso, ramulis primariis secundariisque crassiusculis tomentosis, reliquis valde reductis hirsuto-tomentosis floribus sessilibus vel subsessilibus conglomeratis. Flores masculi 5 sepalis ovato-triangularibus 3.5 mm. longis tomentello-hirsutis, 10 staminibus quam sepalis longioribus filamentis basi dilatatis hirsutis superne glabris rudimentibus carpellarum hirsutis.

Type: Ecuador: W. Andes of Cuenca, collected Lehmann 5610 (F).

B. ecuadoriensis is closely related to *B. comocladifolia* H. & B. for which it has been mistaken. It differs from the latter by its narrower, acuminate leaflets and the structure of its inflorescences of which only the primary and secondary branchlets are elongated whereas the remaining ones are shorter and the flowers are therefore glomerated. The flowers are larger and the sepals tomentose-hirsute. These characters also differentiate this species from *B. dichapetaloides* Macbr. *B. sibundoya* Cuatr. is also closely related, but has larger, broader leaflets with a rotundate base, smaller sepals and a ramose-divaricate inflorescence.

VIOLACEAE

***Leonia triandra* Cuatr., sp. nov.**

Arbor grandis, cortice rugoso-brunnescenti sectione ochraceo, ligno luteolo-ochraceo. Ramuli pallido-brunnescentes plus minusve peri-

dermati glabri.

Folia alterna coriacea griseo-viridia vel atroviridia glabra. Pseudopetiolus 5-10 mm. longus basi incrassatus. Lamina lanceolato-elliptica vel obovato-elliptica basi anguste cuneata in ad modum petioli attenuata apice angustata acuta 14-24 cm. longa, 4.5-8 cm. lata margine integra; supra subnitens costa prominentis nervis lateralibus 14-16 utroque latere prominentibus arcuato-ascendentibus marginem versus anastomosatis nervulis bene prominulis reticulatis; subtus costa crassa nervis secundariis prominentibus reticulo venulorum prominulo.

Inflorescentiae axillares dichotomico-cymosae ramis tenuibus divaricatis ramulis teneribus brachiatis minute puberulis. Pedicelli 3-8 mm. longi. Calyx viridis subcupuliformis 1-1.2 mm. longus pubescens 5-lobatis lobulis rotundatis ciliatis. Petala 5 lutea libera quincuncialia crassa leviter inaequalia lineari-oblonga apice obtusa aliqua subcucullata, 2-3 mm. longa 1 mm. lata. Filamenta in tubum brevem cupuliformem dentatum membranaceum 0.4 mm. altum coalita. Antherae 3 liberae magnae bilobatae circa 0.8 mm. longae et latae, connectivo valde crasso apice saccos polliniferos transverse dehiscentes producto. Ovarium ovato-acuminatum 1-2 mm. longum extus 6-sulcatum. Stigma sessile anguste pyramidatum.

Fructus rotundus 5-6 cm. diam. pericarpio brunneo-viridi, maturitate ochraceo-aurantiaco carnosus 10 mm. crasso, endocarpio gelatinoso-succulento luteolo. Semina plura elliptico-polygonalia circa 18 mm. longa.

Type: Colombia: Dept. El Valle, Costa del Pacífico: río Cajambre, San Isidro 5-100 m. alt., colect. V-1944 J. Cuatrecasas 17351. "Arbol 8 met. Tallo 12 cm. diam. Corteza pardusca, rugulosa, sección ocrácea. Madera ocrácea. Hoja coriácea, flexible, verde grisáceo medio. Pedúnculo y cáliz verdes. Corola amarilla. Fruto ocráceo-anaranjado, 5.5-6 cm., pericarpo carnososuculento 10 mm. espesor. Semillas \pm 18 mm. long. poligonales envueltas en pulpa y gelatina amarillenta."

Cotype: Colombia: Dept. El Valle, Costa del Pacífico: río Cajambre: Silva, 80 m. alt., colect. J. Cuatrecasas 17373. "Arbol 20 met. Tallo 30 cm. diam. Corteza rugosa, pardo ocrácea claro, sección ocrácea, difícilmente separable en fragmentos. Madera astillosa de subido color amarillo ocráceo. Hoja coriácea, verde oscura haz, claro envés. Cáliz verde. Corola amarilla. Frutos 4.5 cm. diám. cubiertos de una capa densamente escamosa, sepia verdosa (inmaturos). Pericarpo carnosos. Endocarpio blando, amarillo." (F.)

Other specimens: Colombia, Dept. El Valle id. id. río Cajambre: Barco 80 m. alt., colect. IV-1944 J. Cuatrecasas 16999. "Arbol 20 met. Tallo 15 cm. diam. Hoja semicoriácea verde grisácea. Fruto 5 cm. diam. pericarpo verde pardusco de 8 mm. espesor endocarpio amarillo, semiblando, mantecoso, con varias semillas." (F.) Colombia, Dept. Caldas, Cordillera Occidental: Pueblo Rico, Santa Cecilia 1700-1900 m. alt., colect. 24-XI-1945 K. V. Sneidern 5166 (F.)

Leonia triandra differs considerably from the other *Leoniae* by having 3 stamens and a trimerous gynaecium. Each anther is a rotundate, elliptical, thick, bilobate body which bears the pollinia at the apex. The filaments form a short membranous, dentate tube at the interior margin of which the anthers are inserted. This species looks like *L. cymosa* Mart. but it has larger, more rigid leaves with more robust veins and larger fruits.

AQUIFOLIACEAE

Ilex farallonensis Cuatr., sp. nov.

Arbuscula ramulis pallido-viridibus, glaberrima.

Folia simplicia alterna crassa coriacea petiolata. Petiolus crassus 5 mm. longus, supra sulcatus. Lamina obovato-elliptica vel elliptica apice rotundata vel obtusissima basi obtuse cuneata margine levissime revoluta repando minutissimeque dentata (3-4 dentibus utroque latere), 3-4.5 cm. longa, 1.7-3 cm. lata; supra atroviridis, in sicco pallidior, costa 3-4 nervis lateralibusque paulo prominulis; subtus pallido-viridis fusco-punctata costa prominenti nervis lateralibus immersis leviter conspicuis.

Flores feminei in foliorum axillis fasciculati, 4-9, puncto insertionis tuberculato bracteolato. Bracteolae minutae crassiusculae triangulares vel lanceolatae 1 mm. longae. Pedicelli rigidi 4-6 mm. longi. Calyx pallido-viridis 4 lobulis obtusiusculis glabris, 1-1.2 mm. altus. Petala viridi-pallida 4 oblongo-elliptica obtusa 3 mm. longa, 1.4 mm. lata. Stamina 4 sterilia 1.2 mm. longa. Ovarium 2 mm. longum apice angustatum stigmate capitato.

Fructus ellipticus 5 mm. longus 4 mm. latus brevissime apiculatus.

Type: Colombia, Dep. Valle; Cordillera Occidental, Los Farallones de Cali: Quebrada del Ratón: Mina El Diamante 2950-3000 m. alt., colect. 30-VII-1946 J. Cuatrecasas 21775. "Arbolito ramas divaricadas. Hoja coriácea, rígida, verde oscura haz, verde envés. Perianto blanco verdoso." (F.)

Cotype: Same locality, Cuatr. 21766. "Arbusto. Hoja gruesa, coriácea rígida, verde mate haz, verde clara envés." Specimen with fruits. (F.)

I. farallonensis is related to *I. caniensis* Macbr. from which it differs by its thicker leaves with fewer and less marked veins, minute and more remote teeth, rotundate apex, and by being completely glabrous.

Ilex velutinulosa Cuatr., sp. nov.

Frutex ramulis terminalibus crassiusculis angulatis minute tomentosis.

Folia simplicia alterna petiolata crasse coriacea glabra. Petiolus crassus 5-10 cm. longus supra planus subtus carinatus basi incrassatus. Lamina obovato-elliptica vel oblongo-elliptica apice rotundata

basi obtuse cuneata, 3-5.5 cm. longa, 1.8-2.4 cm. lata, margine paulo incrassato revoluta vel plana crenato-serrata dentibus acutis parvis distantibus; supra tantum nervo medio paulo conspicuo superficie laevis minutissime papillosula aspectu velutino; subtus costa prominenti nervis lateralibus circa 5 utroque latere patulis vix conspicuis vel immersis, superficie laevis pallida epunctata.

Flores feminei in foliorum axillis fasciculati. Pedicelli (in specimine fructiferi) 5-7 mm. longi, rigidi crassiusculi minute hirsuti pilis crassiusculis acutis. Calyx 4-4.5 mm. diam., 4 lobatus lobis rotundatis, subglaber. Petala ovata acutiuscula 4 mm. longa, 3 mm. lata. Stamina sterilia angusta 1.8 mm. longa. Ovarium ellipticum tomentello-velutinum stigmatibus discoideo-capitato laeve glabro. Fructus ellipticus velutinus 7 mm. longus 5 mm. diam.

Type: Colombia, Dep. Santander: Mountains east of Las Vegas alt. 3000-3300 m., collect. Dec. 1926 E. P. Killip & A. C. Smith 15867. (US.)

I. velutinulosa is closely related to *I. gale* Triana, but differs from that species by its fasciculate flowers, tomentose pedicels, and its more elliptical, crenate-serrate leaves which have a papillose epidermis of velutinous appearance on the upper side.

Ilex flosparva Cuatr., sp. nov.

Arbor, ramulis terminalibus plus minusve flexuosis glabris pallido-viridibus.

Folia simplicia alterna subcoriacea rigidula breviter petiolata glabra. Petiolus 2-4 mm. longus crassiusculus rigidus. Lamina obovata apice rotundata sed abrupte apiculata, basi cuneata margine integra vel levissime obsoleteque crenata 8-12 cm. longa 4-7 cm. lata apiculo 5-15 mm. longo obtusiusculo, utrinque griseo viridis, in sicco griseo-pallida, supra nervo medio bene signato lateralibus impressis, subtus minute sparseque fusco punctata costa elevata nervis lateralibus 4-6 utroque latere prominentibus ascendentibus arcuatis prope marginem parce reticulato anastomosatis, parvis nervulis prominulis, saepe superficie leviter bullata.

Flores in cymulis brevibus caulinaribus vel axillaribus, solitariis vel fasciculatis dispositi, puncto insertione tuberculato bracteolato. Pedunculi tenues filiformes 2-5 mm. longi parce puberuli. Pedicelli teneres 1-2 mm. longi. Calyx explanatus 2 mm. diam., lobis rotundatus 1 mm. latis margine leviter lacerato-ciliatis. Petala 4, 1.5 mm. longa 1 mm. lata, glabra minute papillosula. Antherae ellipticae grosse bilobatae grandes. Ovarium sterile ovato-conicum.

Type: Colombia, Dep. Valle: Río Calima (región del Chocó): La Trojita 50 met. alt., 2-III-1944 colect. J. Cuatrecasas 16643. "Arbol. Hoja verde grisácea oscura, cartácea, rígida. Flores caulinares minúsculas. Tallo 30 cm. diám. Corteza pardo oscura. Madera blanquecina."

I. flosparva is characterized by its large and subcoriaceous, distant and prominent veins forming a slightly bullate surface, its minute flowers and cauline or axillary inflorescences which are commonly solitary.

Ilex fructiclipeata Cuatr., sp. nov.

Frutex glaberrimus ramulis erectis paulo angulatis fuscis.

Folia alterna simplicia crasse coriacea petiolata. Petiolus 7-10 mm. longus. Lamina oblongo-elliptica apice attenuata obtuse apiculata basi cuneata, margine leviter incrassato-revoluta subintegra obsolete remoteque crenulata, 7-9 cm. longa 2.8-3.7 cm. lata, supra costa conspicua ceteris laevis; subtus sparse fusco-punctata costa crassa eminenti nervis lateralibus immersis obsoletis.

Inflorescentiae paniculatae in foliorum axillis fasciculatae, racemiformes. Rhachis 1.5-3 cm. longis angulatis. Cymulae 1-3-florae sessiles vel brevissime pedunculatae (pedunculo ad 1.5 mm.). Pedicelli 1-2 mm. longi. Calyx fructiferus 2 mm. diam., 4-lobatus lobis rotundatus margine breviter ciliatis. Drupa violacea rotundata 3 mm. lata apice stigmate depresso discoideo-clipeato adpresso coronata. Nuculae 4, trigona 2-2.2 mm. longa 1.2 mm. lata.

Type: Colombia, Comisaría del Vaupés: Cerro de Chiribiquete a un lado del río Macaya, terreno muy pedregoso. Colect. 17-I-1944 G. Gutiérrez & R. E. Schultes 680. "Arbustico. Frutos morados." (Facultad Agronomía Medellín).

I. fructiclipeata is closely related to *I. laureola* Tr., *I. Martiniana* D. Don, and *I. affinis*, which differ very little from it. *I. fructiclipeata* is most similar to *I. laureola* Tr. because its leaves have only a prominent midrib. But my species seems to differ from the others by the stigma of the fruits which is thin, flat, disciform and completely attached to the depressed apex of the fruit like a flat shield. From *I. laureola* it differs also by its shorter, thicker pedicels and almost complete absence of secondary branchlets. From *I. affinis* it differs by the thicker pedicels and the leaves.

CELASTRACEAE

Celastrus colombianus Cuatr., nom. nov.

Ilex scandens Cuatr., Lloydia 11:214 (1948).

After examining unopened flowers, in better condition than those I studied previously, I can now say that they possess a well developed disc not seen previously. The original description must be corrected as follows:

Pedicelli florales 0-3 mm. longi. Sepala 5 ovata glabra margine eroso-ciliata obtusa vel subobtusa 1.2 mm. longa. Petala 5 suborbicularia praefloratione 1 mm. diam. margine minute erosa. Discus crasiusculus 5 lobatus. Ovarium ovato-conicum striatum, crasse stylato-

apiculatum apice trilobatum.

C. colombianus differs from *C. racemosus* (Reiss) Loes. by its coriaceous cuneate leaves which have ascendent veins, its shorter and simpler inflorescences with thicker and shorter pedicels, and its non verrucose-lenticellate branchlets.

Maytenus meridensis (Pittier) Cuatr., nov. comb.

Celastrus meridensis Pittier, Bol. Soc. Venez. Cien. Nat. 3:423. I think that my collections 1831 and 1813 from La Uvita (Boyaca, Colombia) belong to this species in spite of slight differences in the shape of the leaf which is more elliptical, thicker, and more crenate. But variations can be seen in my specimens as well as in the isotypes (Gehriger 298). The species was described in flowering condition whereas my specimens are in fruit. They bear elliptical, bright yellow seeds (about 1 cm. long.) surrounded by a red arillus. My specimens were obtained from trees, justifying their inclusion in the genus *Maytenus*.

In his "Catalogo de la Flora de Venezuela" 2:96 Pittier lists *M. meridensis* Pitt. without description and reference to it. This name is attributed to Gehriger 296, a collection which I have not seen. Thus Pittier's name is a *nomen nudum*; it cannot be referred to *Celastrus meridensis* Pittier, because the latter appears on the next page of the same "Catalogo".

SAPINDACEAE

Paullinia martinensis Cuatr., sp. nov.

Frutex ramis fuscis ramulis subteretibus viridi-griseis pubescentibus ligno simplici.

Folia 5-foliolato-pinnata 15-25 cm. longa, rhachi nuda (petiolo incluso) ad 12 cm. longa, pubescenti. Foliola petiolulata chartacea ovata vel oblongo-ovata vel terminalia subrhoemboidea, basi rotundata vel truncata vel obtusa terminalia cuneata, apice acuta, margine superiore parte 2-3 grosse dentata vel integra; supra nervis principalibus paulo conspicuis pubescentibus reliqua subglabra vix prominule reticulata; subtus hirsutulo-pubescentia costa eminenti nervis lateralibus 5-6 utroque latere prominentibus, nervulis minus conspicuis laxe reticulatis 4.5-8 cm. longa, 2.5-5 cm. lata. Petioluli 2-6 mm. longi, terminalis ad 12 mm. longus. Stipulae lineares pubescentes 5-10 mm. longae.

Inflorescentiae axillares thyrsis congeste glomeratis sessilibus 10-15 cm. latis rhachi ramulisque pubescentibus. Pedicelli 0.1-3 mm. longi pubescentes teneres. Calyx 5 sepalis, duobus exterioribus late ovatis obtusis pubescentibus 3 mm. longis, interioribus subrotundatis paulo longioribus puberulis. Petala 4 elliptico-oblonga obtusa glabra; squamae petala dimidia aequantes sed latiores appendice lingulato-rotundato deflexo leviter barbato superiores crista bilobata, inferiores

integra obliqua munitae. Discus tomentosus 2 glandulis oblongis crassiusculis 1 mm. longis inferne barbularis. Stamina filamentis compressis pilosis antheris ellipticis. Ovarium dense hispidum apice 3 stylos crassiusculos glabros ferente.

Typus: Peru, Dept. San Martin, Prov. San Martin, Tarapoto, alt. 830 m., collect. Febr. 24, 1947 Felix Woytkowski 35160. (F.)

Like in *P. alata* (R. & P.) Don., the inflorescences of *P. martinensis* are characterized by forming axillary glomerules. But in *P. martinensis* the branches are not winged and contain a simple wood system. It differs from other species by its narrow linear stipules and pubescent leaves, whose rachis lacks wings.

LECYTIDACEAE

Eschweilera cincta Cuatr., sp. nov.

Arbor grandis. Caulis 30 cm. diam. cortice brunneo-rubescenti plus minusve fissa, ligno luteo duro. Ramuli rugosi sparse lenticellati grisei.

Folia simplicia alterna petiolata coriacea subglabra apice ramulorum subfasciculato congesta. Petiolus robustus 2-4 cm. longus striolulatus supra subplanus minutissime sparse puberulus basi incrassatus et ampliatus. Lamina obovato-lanceolata basi obtuse cuneata apice acutata margine integra vel obsolete crenulato dentata; 13-29 cm. longa 4.5-11 cm. lata; supra siccitate griseo-viridis costa paulo prominula nervis lateralibus reticulo venulorum vix conspicuis; subtus brunneo-viridula costa elevata striata nervis lateralibus parallelis 17-20 utroque latere prominentibus patulis prope marginem abrupte arcuatis evanescentibusque anastomosatis, nervulis venulisque prominulis in minutum reticulum anastomosatis, glandulis puntiformibus fuscis valde sparsis, glabra sed costa basim versus minutissime puberula.

Inflorescentiae terminales racemosae simplices rhachi valde robusta (in statu fructifero tantum visa) tomentosa circa 6 cm. longa 5 mm. diam. striolulata 10-12 fructos longe pedicellatos parte media superiore ferenti. Pedicelli fructiferi robusti 3-4.5 cm. longi 3 mm. crassi ferrugineo-tomentosi. Fructi globoso-depressi maximi 8 cm. diametro, 5.5-6 cm. alti, basi subturbinati apice subrotundati umbonati, zona calycaris partem mediam fructum cingens margine libera coriacea 2-3 mm. lata, vitta interzonale 2-3 mm. lata, subtus tomentosum supra glabri; septi 2-5, semina plerumque 5 interdum 3-2. Pericarpium crassum lignosum. (Fig. 1)

Type: Colombia, Dep. Valle. Hoya del rio Sanquinini lado izquierdo: La Laguna bosques 1250-1400 m. alt. colect. 14-XII-1943 J. Cuatrecasas 15531. "Arbol. Tallo 30 cm. diam. Corteza pardo rojiza, escamoso agrietada. Madera dura, amarilla. Hoja coriacea. Frutos esferoidal aplanados con borde ecuatorial saliente. Pixidios inmaturos verdes con 2 o mas semillas."

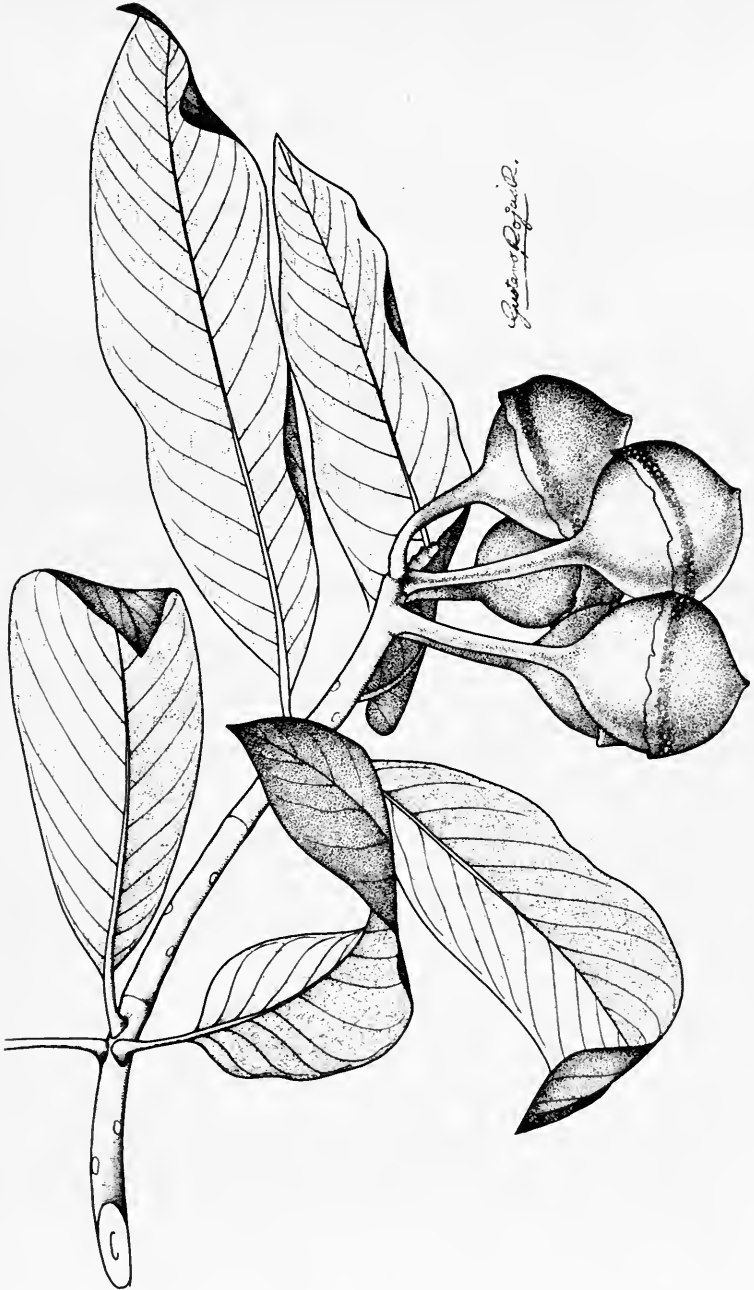


FIGURE 1. *Eschweilera cincta* (x 1/2)

Cotype: Id. id. id., colect. 19-XII-1943 J. Cuatrecasas 15645. "Arbol grande. Corteza pardo grisacea, semilisa, algo agrietada. Madera dura, ocre. Frutos 8 cm. lat. 5.5-6 cm. alt."

Eschweilera cicta is characterized by the structure of its long, nearly fascicular leaves and its depressed, rotundate fruits which show a narrow interzonal belt with a fairly broad, slightly lobate edge, derived from the calyx.

Eschweilera oligosperma Cuatr., sp. nov.

Arbor 10 met. alta. Caulis 10 cm. diam. Ramuli fusci vel grisei terminales penduli.

Folia simplicia alterna petiolata coriacea glabra pendula. Petiolus 8-12 mm. longus crassus subteres. Lamina elliptico-oblonga sublanceolata, basi lata obtusa apice angustato-cuspidata margine integra vel obsolete repando-dentata, 19-34 cm. longa 4-7.5 cm. lata, caudicula 12-25 mm. longa; supra in sicco viridula costa prominula nervis lateralibus nervisque obsolete prominulis; subtus siccitate cinereo-viridula costa valde eminenti nervis lateralibus principalibus 18-22 utroque latere 10-20 mm. inter eos remotis anguste prominentibus patulis marginem versus ascendentibus et evanescenti-anastomosatis, nervis venisque prominulis graciliter reticulatis glandulis punctiformibus fuscis copiosis sparsis munita.

Rhachi fructiferi caulinares teneres penduli vel flexuosi badi tuberculato-lenticellati pedicellis residualis parcis valde remotis (circa 3 cm. inter se distantibus). Pyxidium sphaeroideo-depressum basi depresso-rotundatum apice subplano-rotundatum, superficie rugosoverruculosa fusca 6-5 cm. diam., 5 cm. altum zona calycaris infra partem mediam, vitta interzonale latitudine variabili praecipue 8 mm. lata, pericarpio 3 mm. crasso spongioso-lignoso, loculo unico tantum rudimentum unicum septum (biloculari) visibile. Semina magna tantum 2 hemisphaerica vel 1 subglobosa in fructo evoluta. (Fig. 2)

Type: Colombia, Dep. Valle. Costa del Pacífico: río Yurumanguí: Veneral bosques 10-50 met. alt. 3-II-1944 colect. J. Cuatrecasas 15822. "Arbolito 10 met. Tallo 10 cm. diam. Frutos color pardo."

E. oligosperma is readily distinguished by its elongate, coriaceous, acuminate leaves and the rotundate, compressed fruits with a belt located slightly below the middle. The fruit has the singular feature of containing only one or two seeds and a very small rudimentary one.

Eschweilera lancifolia Cuatr., sp. nov.

Arbor. Ramuli penduli cortice fibroso fusco tuberculoso-lenticellati glabri.

Folia simplicia alterna crasse coriacea petiolata glabra. Petiolus subteres 7-10 mm. longus crassiusculus. Lamina lanceolata basi subrotundata vel obtusa apicem versus attenuata acutissima, margine integra leviter revoluta 11-20 cm. longa, 3-7 cm. lata; supra laevis tantum costa prominula reliquis nervis immersis obsoletis; subtus



Fig. 2. *Eschweilera oligosperma* Cuatr., in rain forest of Yurumanguí river.

costa crassa prominenti nervis lateralibus 8-10 utroque latere subascendentibus subimmersis vix conspicuis, nervulis venulisque subimmersis in reticulum parum visibilem anastomosatis, in sicco supra plumbagineo-viridula subtus pallidissima.

Inflorescentia terminalis subsimplex racemosa, rhachi subglabra circa 8 cm. longa basi 1-2 ramusculis tenuibus ad 10 mm. longis. Pedicelli 2-5 mm. inter eos remoti, glabri fusci circa 6 mm. longi erecti. Sepala 6 breviter coriacea ovata glabra plus minusve granulosa 2.5 mm. longa, 2 mm. lata. Receptaculum breve plano-conicum glabrum 4 mm. diam. Petala alba 14-18 mm. longa, 10 mm. lata subrotundata vel oblonga glabra. Androphorum lutescente circa 26 mm. longum annulo fertile 8 mm. diam. ligula ad 8-10 mm. lata, processibus staminiferis fertilibus apicem paulo incrassatis 2 mm. longis antheras breviter pedicellatas ferentibus, processibus galericulae lanceolatis

circa 4 mm. longis. Ovarium biloculare loculis 6-ovulatis.

Type: Colombia, Comisaría del Vaupés. Río Vaupés: bosque inundado en la Laguna de Urania, abajo de Mitú, 200 m. alt., 18-IX-1939 colect. J. Cuatrecasas 6891. "Arbol. Ramas colgantes. Flor amarilla y blanca, caídas flotan en el agua."

E. lancifolia is closely related to *E. paniculata* (Berg.) Miers but differs at first sight by its lanceolate leaves, the glabrous calyx (not ferrugineous-tomentose like the type of *E. paniculata*) with short sepals, and its glabrous pedicels.

Eschweilera inaequisepala Cuatr., sp. nov.

Arbor magna. Ramuli cortice fibroso obscure griseo tuberculati glabri.

Folia simplicia alterna coriacea petiolata glabra. Petiolus rigidus 6-12 mm. longus glaber supra sulcatus. Lamina elliptico-oblonga vel elliptico-lanceolata basi rotundata vel obtusissima apice plus minusve abrupte acuminata acuta vel cuspidata, margine minute crenulato-serrata parce revoluta; 10-20 cm. longa, 3-8.5 cm. lata; supra costa prominula nervis secundariis capillaribus venisque parum prominulis minute reticulatis; subtus costa crassa eminenti nervis secundariis 10-14 utroque latere angustis prominentibus patulis marginem versus curvato-ascendentibus extremis tenuioribus anastomosatis reliquis nervis venulisque parum prominulis in reticulum anastomosatis, punctis glandulosis fuscis satis copiosis praedita.

Inflorescentia terminalis racemosa simplex vel subsimplex rhachis ad 8 cm. longa angulata minute puberula cicatricibus pedicellorum 1-5 mm. inter eos distantibus. Pedicelli longi patuli minute pubescenti 8-16 mm. longi apice subite ampliati. Receptaculum breve conico-planum minute pubescenti, supra 5-5.5 mm. diam. Sepala 6, vel interdum 7, quator (vel 5) minora inaequalis 3-4 mm. longa, 3 mm. lata, ovalia, duo oblongiora 4.5-6 mm. longa, minutissime puberulenta. Petala alba glabra 6 ovata, 24-26 mm. longa 15-20 mm. lata. Androphorum 45 mm. longum, annulo fertile 10 mm. diam. ligula 11-12 mm. lata, processibus staminiferis fertilibus 2 mm. longis vix incrassatis antheribus subsessilibus, processibus galericulae 5 mm. longis. Ovarium biloculare subinferum loculis 8-9 ovulatis.

Type: Colombia, Comisaría del Vaupés: Márgenes del río Cuduyarí (afluente izquierda del río Vaupés, abajo de Mitú) 200 m. alt. 15-IX-1939 colect. J. Cuatrecasas 6820. "Gran arbol. Flor blanca."

E. inaequisepala is closely related to *E. odora* (Poepp.) Miers and *E. acuminatissima* (Berg.) Miers, but essentially different in that 2 sepals are longer than the others which are somewhat unequal in length; the lower side of the leaves are broadly reticulate and dotted with minute glands. The inflorescence is simple or has a short basal branchlet and its rhachis is minutely pulverulent like the petioles. The leaves of *E. acuminatissima* are more slender, lack glands and are more laxly and prominently reticulate on the upper side.

Eschweilera violacea Cuatr., sp. nov.

Arbor 15 met. alta. Caulis 15 cm. diam. cortice sublaevi sectione ochraceo ligno satis duro ochraceo. Ramuli terminali foliosi viridibrunnei leviter lenticellato-granulati.

Folia simplicia alterna membranaceo-coriacea rigida petiolata glauca glaberrima. Petiolus 8-14 mm. longus satis robustis supra planus in sicco sulcatus subtus teres. Lamina elliptica utrinque rotundata vel subrotundata apice abrupte breviterque acuminata, margine obsolete crenulato-serrata, 13-21 cm. longa 6-11.5 cm. lata acumine 5-6 mm. longo; siccitate pallido-viridula; supra costa paulo prominula nervis lateralibus reticuloque venulorum subprominulis; subtus costa crassa elevata nervis lateralibus 12 utroque latere angustis prominentibus arcuato ascendentibus ad marginem tenuioribus anastomosantibus, nervulis venulisque reticulatis prominulis, minutis punctis brunneis sparsis munita.

Inflorescentiae axillares breves simplices racemiformes confertiflorae, rhachi vulgo 2-4 cm. longa (interdum ad 5.5 cm. longa) crassiuscula (3 mm. crassa) angulato-rugosa glabra. Pedicelli crassi breves 1.5-3 mm. longi, 1.5-2 mm. crassi 0.5-3 mm. inter eos remoti. Calyx atroviridis glaber expansus 14-15 mm. diam. coriaceis dorso granulosis. Receptaculum extus granuloso-tuberculatum, intus 7 mm. diam. Petala 6 violacea glabra obovato-elliptica vel obovato-oblonga 25-30 mm. longa 14-18 mm. lata. Androphorum pallidum 4.5 cm. longum, basi fertile annulari circa 12-15 mm. diam. parte ligulae nuda 2 cm. longa 16 mm. lata, parte laciniata circa 2 cm. longa et lata. Processus galericuli steriles ad 7 mm. longi flavi, processus staminiferi fertiles clavati 2 mm. longi antheris 0.8 mm. subellipticis brevissime stipitatis. Stylus conicus crassus 2.5 mm. longus. Ovarium 2-loculare loculis 5-6 ovulatis.

Fructus circiter 12 cm. altus, 10 cm. latus pericarpio valde crasso lignoso apice obtuso, seminibus (specimen unicum fragmento vidi) 6 regulariter verticillatis dorso sphaericis intra angulatis duas facies planas 5-5.6 cm. altas habentibus. (Fig. 3)

Type: Colombia, Dep. Valle. Cordillera Occidental, monte La Guarida, filo de la cordillera sobre La Carbonera (entre Las Brisas y Albán) 1950-2000 m. alt. colect. 24-X-1946 J. Cuatrecasas 22501. "Arbol 15 met. alt. Tallo 15 cm. diám. Corteza sublisa, sección ocrácea. Hoja coriácea, delgada rígida, verde azuloso semimate. Cáliz verde oscuro. Pétalos violetas, ext. violado cárdenos. Lacinias estaminales blanco amarillentas. Capullos morados." (F.)

E. violacea is characterized by its medium sized, elliptic, rigid, and finely reticulate leaves, its short inflorescences with a rather thick rhachis and shortly pedicellate and crowded flowers, its thick ovate, obtuse green sepals, and its large violet petals. The fruit described was found on the ground in the vicinity of the tree. This species is similar to *E. coriacea* (DC.) Mart. and others of the Sec. *Chytroma*, but *E. violacea* is distinguished by being a *Euschweilera* and by the

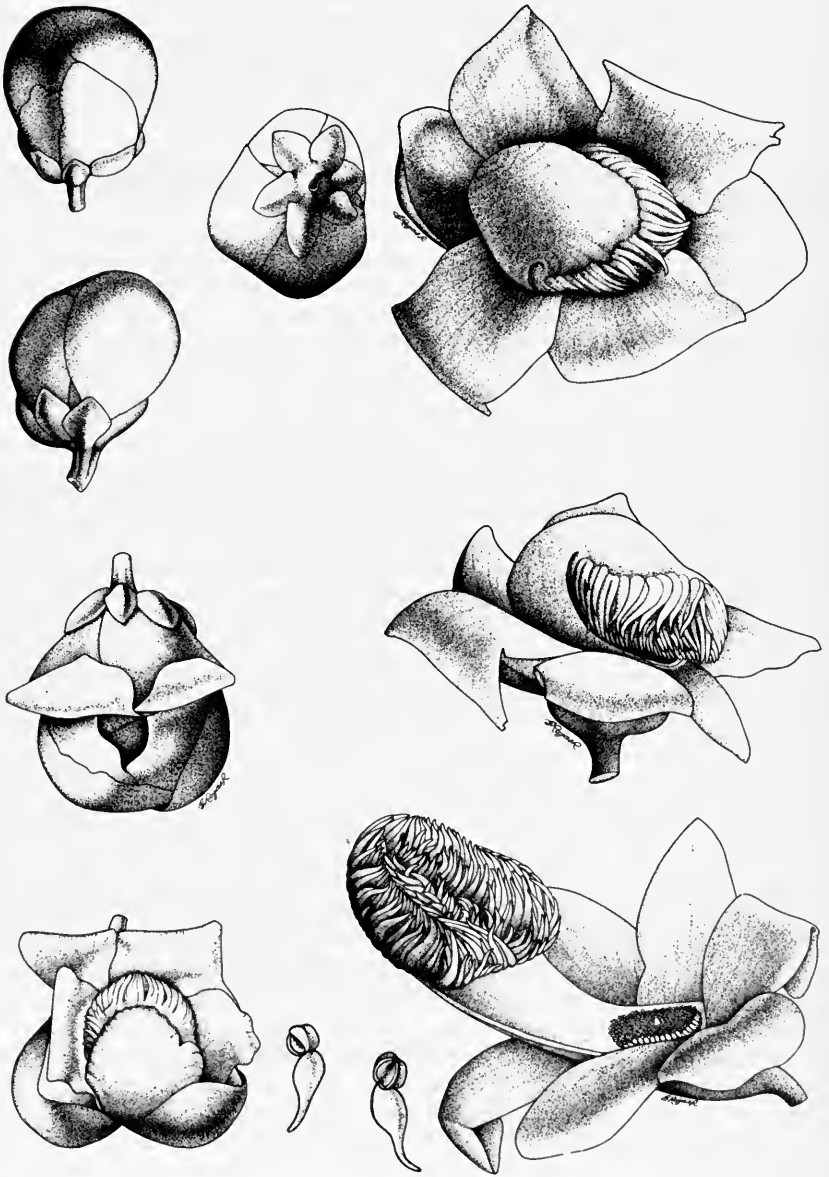


FIGURE 3. *Eschweilera violacea* Cuatr. (buds and flowers x $\cdot 1/3$, stamens x 6).

characters of its inflorescence. *E. Ciroana* Kunth has smaller leaves and slender inflorescences with longer pedicellate and scattered flowers.

Eschweilera montana Cuatr., sp. nov.

Arbor 20 met. alta. Caulis 50 cm. diam. cortice crasso extus rugoso-squamoso brunneo ligno duro. Ramuli fusci glabri plus minusve lenticellati.

Folia simplicia alterna rigide coriacea petiolata viridula glaberrima. Petiolus 12-20 mm. longus robustus 2.5-6 mm. latus supra planus subtus teres. Lamina elliptica interdum elliptico-oblonga, utrinque rotundata vel subrotundata apice abrupte acuteque apiculata basi levissime decurrens, margine obsolete crenato-dentata, 15-25 cm. longa, 7-14.5 cm. lata, acumine 3-6 mm. longo; supra costa prominula nervis lateralibus plus minusve depressis reticulo venulorum subprominulo conspicuo; subtus costa valida crassa nervis lateralibus anguste prominentibus 10-11 utroque latere ascendentibus marginem versus arcuatis evanescente anastomosantibus nervulis prominulis reticulatis, punctis glandulosis brunneis minutis sparse munita.

Inflorescentiae axillares paniculatae praecipue 3 ramis (2-5) confertiflorae 8-18 cm. longae et expansae. Pedunculi valde crassi 15 mm. longi 5-7 mm. crassi. Rhachis ramulique crassi angulati glabri dense lenticellati 2-4 mm. crassi, tuberculis cicatricialibus copiosis 2-3 mm. diam. circa 2 mm. inter se remotis. Pedicelli 2-4 mm. longi crassi atroviolacei, paulo granulosi. Calyx brunneo-violaceus glaber coriaceus granuloso-tuberculatus, expansus 20-26 mm. diam. lobis subrotundatis apice rotundatis 7-8 mm. longis et latis. Receptaculum extus plus minusve granuloso-tuberculatum intus disco ad 12 mm. diam. Petala 6 obovato-elliptica vel subrotundato-obovata 30-40 mm. longa 20-30 mm. lata glabra extus violacea intus roseo-violacea. Androphorum 55 cm. longum parte fertile basilari 15 mm. diam. parte ligulari nuda sterile crassa circa 20-25 mm. longa 22 mm. lata, galea (parte laciniata) 25-30 mm. longa et lata. Processus galericuli steriles usque ad 8 mm. longi. Processus staminiferi fertiles clavati 2 mm. longi, antheris breviter pedicellati. Stylus conicus crassus 5 mm. altus. Ovarium biloculare loculis 5-8 ovulatis.

Typé: Colombia, Dep. Valle. Cordillera Occidental, Hoya del río Dígua: Quebrada de San Juan, abajo de Queremal, 1350 m. alt., colect. 8-XI-1946 J. Cuatrecasas 22733. "Arbol 20 m. Tallo 50 cm. diám., corteza gruesa, ocráceo oscura, exteriormente parda, rugosa, escamosa. Madera dura ocráceo oscura. Hojas coriáceas, verde grisáceo semimate haz, verde mate envés.

Ramas terminales pardo rojizas. Pedúnculos violáceo oscuros. Cáliz pardo violáceo. Pétalos por fuera violetas, por dentro rosado violáceos. Lacinias del androceo ocráceas." (F.)

E. montana is similar to the former (*E. violacea*), but has robust, paniculate inflorescences; its leaves are thicker and larger with more

ascending nerves; its flowers are larger, its calyx lobules rotundate, and the style is thicker and larger. The calyx is colored, and the petals are of a lighter violate-pink color. *E. montana* is found in hygrophilous forests of the Cordillera below Queremal and is reminiscent of *E. coriacea* (DC.) Mart., *E. conduplicata* A. C. Sm., and *E. alutacea* A. C. Sm. but differs from these species by belonging to Sect. *Euschweilera*.

Eschweilera pachyderma Cuatr., sp. nov.

Arbor magna, vidi 35 met. alta. Caulis 60 cm. diam. cortice brunneo-fusco crasso, ligno albido-ochraceo. Rami cortice crasso rugoso granuloso. Ramuli terminales fuscescentes cortice granulato-lenticellati plus minusve lacerato-exfoliato.

Folia simplicia alterna rigide coriacea petiolata glabra. Petiolus robustissimus fuscus 15-20 mm. longus supra canaliculatus subtus teres. Lamina oblongo-elliptica utrinque rotundata vel obtusa apice abrupte breviterque acuminata, margine visu integra vel obsolete crenato-denticulata leviter revoluta, 15-32 cm. longa, 7-11 cm. lata, utrinque griseo-viridis; supra costa carinato-prominula nervis secundariis depressis venulis obsoletis; subtus costa crassa eminenti, nervis secundariis angustis eminentibus 16-18 utroque latere angulo obtuso marginem versus arcuato ascendentibus in nervo colectivo undulato submarginale anastomosatis, nervulis minoribus brevioribusque sparsis et laxe reticulatis visibilibus, venulis inconspicuis, punctis glandulosis minutis ad laminam et lineolis glanduliferis ad nervum copiose munita.

Inflorescentiae terminales et axillares paniculatae 6-14 cm. longae. Rachis ramulique angulatis lenticellati-granulosis, tuberculis cicatricialis 2-8 mm. inter se distantibus. Bractee ovatae obtusae circa 3 mm. long. deciduae. Alabastra circa 10 mm. diam. globosa sessilia atropurpurea. Sepala ovato-rotundata exteriora basi gibboso-incrassata receptaculum brevissimum obtusissimum 4-5 callosum concretescentia lobis 5 mm. longis. Ovarium biloculare loculis 6-ovulatis.

Type: Colombia, Dep. Valle. Costa del Pacífico, río Cajambre: Silva, 10-80 met. alt. 8-V-1944 colect. J. Cuatrecasas 17448. "Arbol 35 met. alt. Tallo 60 cm. diám. Hoja coriácea, verdoso grisácea. Capullos globosos, purpuráceo oscuros. Corteza pardo oscura, gruesa. Madera blanco ocrácea. Base con estribos tabulares."

E. pachyderma is characterized by its rigid, coriaceous leaves, the principal nerves of which are quite conspicuous, being depressed on the upper side and prominent beneath where they form a noticeable, undulate nerve near the margin; reticulation is absent on the upper side. The compound inflorescence has a strongly granulate rachis and branchlets. The flowers are sessile, and the very short receptacle has protuberances like decurrent bases of sepals. The bark of the stem and branches is very thick and fibrose, but on terminal branchlets it is granulate or tuberculate and can easily be removed.

Eschweillera sclerophylla Cuatr., sp. nov.

Arbor magna. Caulis 25 cm. diam. cortice fusco tenui adherente subsquamoso-rugoso. Ramuli brunnei rugosi lenticellati.

Folia simplicia alterna grandia firme coriacea petiolata glabra atroviridia. Petiolus 20-26 mm. longus valde robustus subteres supra sulcatus. Lamina elliptico-oblonga basi rotundata vel obtusa apice breviter angustata acuminatque, margine integra leviter revoluta, 27-56 cm. longa, 8-19 cm. lata; interdum minor; supra costa parum elevata, lata, nervis lateralibus depressis, venulis reticulatis subprominulis; subtus costa crassa valde elevata, nervis lateralibus eminentibus 14-18 utroque latere arcuato-ascendentibus prope marginem tenuioribus anastomosatis, nervulis prominulis laxo reticulatis, minutis punctis fuscis sparsis munita.

Inflorescentiae axillares racemosae confertiflorae 11-13 cm. longae. Rachis valde robusta subangulata granuloso-tuberculata glabra 5-6 cm. crassa cicatricibus pedicellorum 3-6 mm. remotis. Flores sessiles bibracteati. Bracteae chartaceae glabrae ovato-oblongae basi subcordatae amplectentes apice obtusae margine laeves dorso crassiuscule carinatae 8 mm. longae 6 mm. latae persistentes. Sepala 6 crassa glabra suborbicularia 12-14 mm. longa lataque exteriora basim plus minusve tuberculato-incrassata. Petala crassiuscula luteolo-pallida obovato-oblonga vel obovato-elliptica 30-38 mm. longa circa 20 mm. lata glabra. Androphorum luteolo-roseum 50 mm. longum parte fertile circa 25 mm. diam. processibus galericuli ad 10 mm. longi, processibus fertilibus circa 2 mm. longis clavatis, antheris rotundato-ellipticis subsessilibus. Receptaculum brevissimum extus obsoletum, intus disco circa 8 mm. diam. Ovarium semisuperum biloculare, loculia 6-9 ovulatis. Fructus valde juvenilis bracteis sepalisque persistentibus adnatis (no. 16879). Fructus maturitate rotundato-depressus 8 cm. latus 5 cm. altus apice obtuse umbonatus superficie granulosa badia cincto circa 1 cm. lato, pericarpo lignoso tenui, bilocularis septo tenui, 5-6 seminibus uniseriatis angulato-compressis munitus. (Fig. 4)

Type: Colombia, Dep. Valle. Rio Calima (región del Chocó): La Trojita, 10-50 met. alt., 27-II-1944 colect. J. Cuatrecasas 16517. "Gran árbol. Ejemplar 25 cm. diám., base casi recta. Corteza pardo oscura, muy delgada y adherida, rugoso escamosa. Madera ocrácea. Hoja coriácea, rígida, grande, verde oscura. Perianto y androceo ocráceo rosado claro."

Cotypes: Colombia, Intendencia del Chocó. Río San Juan: cercanías de Palestina, 5-50 met. alt., 12-III-1944 colect. J. Cuatrecasas 16879. "Árbol 20 met. Ramas horizontales, largas, divergentes. Hoja coriácea, flexuosa, verde oscura. Pétalos amarillo claros. Lámina estaminodial amarillo clara y rosada."

Colombia, Dep. Valle. Costa del Pacífico, río Yurumanguí: Veneral, bosques 10-50 met. alt., colect. 1-II-1944 J. Cuatrecasas 15859. "Árbolito 10 met. alt. Tallo 8 cm. diam. Grandes hojas terminales verde grisáceas, coriáceas. Frutos caulinares rubios, 8-10 cm. diam., 6 cm.

alt. con 5 grandes semillas, placentación basilar.”

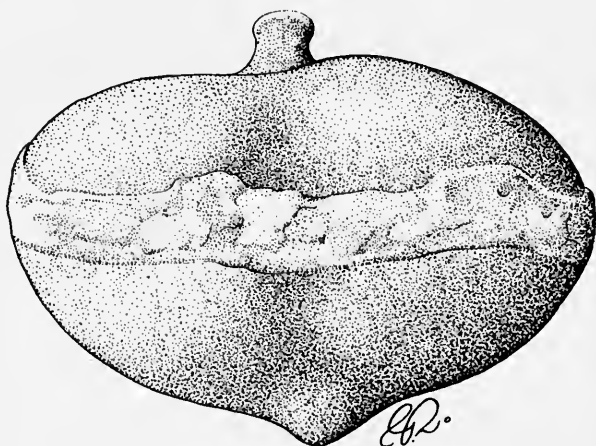


FIGURE 4. *Eschweilera sclerophylla*, fruit (natural size).

E. sclerophylla is closely related to *E. calyculata* Pittier the leaves of which might be mistaken for it, but our species has larger and sessile flowers that do not show the receptacle at their base; every flower bears two large, thick, persistent bracts, the petals are pale yellow and the top of the androphore is pink. The crowded and sessile flowers form a dense, showy inflorescence. The fruits are depressed, obtusely umbonate with a rather narrow, light brown, granulated belt in the middle. Such pyxidia of nearly discoid shape are not common in the family.

Gustavia magna Cuatr., sp. nov.

Arbor 15 met. alta caule 10 cm. diam. pauce ramosa, ramis apice folia magna fasciculata ferentibus.

Folia simplicia alterna firme coriacea petiolata. Petiolus robustissimus supra planiusculus subtus teres brunneus 9 cm. longus, basi 15 mm. lati. Lamina oblonga apice rotundata abrupte breviterque mucronata, basim versus sensim leviterque angustata basi obtuse cuneata, margine integra, 120 cm. longa parte tertia superiore 38 cm. lata; supra glabra costa prominenti nervis lateralibus prominulis subpatulis prope marginem arcuatis evanescentibus anastomosatis, nervulis transversis pallidioribus prominulisque remotis, venulis pallidis prominulis minute reticulatis conspicuis; subtus costa validissima nervis secundariis valde eminentibus 45-47 utroque latere 20-40 mm. inter eos distantibus prope marginem arcuatis anastomosatis, nervis transversis argute prominulis pallidis cum venulis prominulis in minutum reticulum satis conspicuum anastomosatis; costa nervisque subtus

minutissime puberulis; lamina inter nervos plus minusve bullata.

Inflorescentiae racemosae caulinares ad extremos ramorum. Rhachis robusta vulgo 6 cm. longa pluriflora bracteis late ovatis 3-5 mm. longis et latis. Pedicelli valde robusti 4-6.5 cm. longi tomentulosi sub partem mediam 2 bracteas suboppositas ovato-acutas tomentellas 2-3 mm. longas ferentes. Calycis limbus integer subtetragonus 1.5-2 mm. latus. Receptaculum turbinatum tomentulosum disco pubescenti 16-20 mm. diam. Petala 8 crassiuscula violaceo-rosea basi albida, elliptico-oblonga apice rotundata 8 cm. longa 4-4.5 cm. lata minutissime puberula. Androphorum urceolatum 4 cm. diam., basi connata annulo circa 15 mm. alto crasso albido; processus laciniis anguste linearibus 2-2.5 cm. longis violaceis. Antherae oblongae 3 mm. longae 1 mm. diam.

Type: Colombia, Comisaría del Putumayo. Selva higrofila entre la Quebrada de la Hormiga y San Antonio del Guamués, 330 m. alt., colect. 18-XII-1940 J. Cuatrecasas 11164. "Arbol de 15 met., 10 cm. diám. Hojas en penachos terminales. Flores en racimos caulinares debajo de las hojas. Pétalos rosado violáceos, en su base blanquecinos; estambres violáceos en su mitad superior." (F.)

G. magna is characterized by its large leaves and flowers. It is taller than *G. Tessmannii* Knuth, and has leaves longer than 1 meter, with a rotund apex and obtuse base abruptly separated from the robust petiole, with the principal nerves puberulent beneath. The inflorescences are robust and multiflorous (12-16 flowers), the thicker and tomentose pedicels bear two bracts (not decussate) on the lower half. The receptacle, petals and staminal process are twice the size of *G. Tessmannii*.

Gustavia occidentalis Cuatr., sp. nov.

Arbor mediocris. Ramuli terminales grisei glabri.

Folia simplicia alterna rigida coriacea petiolata glabra. Petiolus rigidus gracilis 4-6 mm. longus supra planiusculus subtus teres leviter striolatus basi abrupte dilatata. Lamina obovato-elliptica oblonga apice subrotundata subite cuspidata basi paulo angustata cuneata margine levissime ad petiolum decurrentis, margine integra 29-36 cm. longa, 12-15 cm. lata, acumine circa 15 mm. longo; supra costa subprominenti nervis secundariis filiformibus prominulis nervulis venulisque elevato-reticulatis; subtus costa crassa eminenti nervis lateralibus anguste arguteque prominentibus, 15-16 utroque latere 14-28 mm. inter eos distantibus, paulo ascendentibus marginem versus arcuatis tenuioribus anastomosantibus, nervulis venulisque prominulis reticulatis.

Inflorescentiae terminales racemosae pluriflorae subsessiles (8-12 floribus) rhachi robusto griseo-viridi glabro 3-4 cm. longo 5-7 mm. lato. Pedicelli graciles sed rigidi robustique 3.5-5.5 cm. longi, 2-3 mm. crassi, glabri duas bracteolas alternas deciduas cicatrices persistentes impressunt ferentes. Calycis limbus brevis integer 3 mm. longus, glaber. Receptaculum conoideum extus laeve glabrum inter disco in

sicco 14 mm. diam. pubescenti. Petala 8 obovato-elliptica apice rotundata 4-6 cm. longa 2-2.5 cm. lata crassa alba. Androphorum album 3.5 cm. diam. basi annulo 7-9 mm. alto, processus lacinis filiformibus pluriseriatis 10-16 mm. longis. Antherae 2.2 mm. longae luteae. (Fig.5)



FIGURE 5. *Gustavia occidentalis*

Type: Colombia, Dep. Valle. Río Calima (región del Chocó): La Trojita, 50 m. alt., colect. 2-III-1944 J. Cuatrecasas 16639. "Árbol Flor blanca. Anteras amarillas."

G. occidentalis is related to *G. speciosa* (HBK) DC., but differs primarily by its broader, nearly elliptical leaves which are slightly attenuate at the base, its longer petioles, glabrous pedicels, receptacle and calyx, the narrow calyx-limb (2-3 mm.), and the two small

bracts which leave two alternate scars at the top of the pedicel. In addition the androecium is white and the petals are larger.

Gustavia foliosa Cuatr., sp. nov.

Arbor grandis, 20 met. alta. Caulis 40 cm. diam. ramulis exfoliatis rugulosis griseis glabris.

Folia simplicia alterna rigide coriacea atroviridis nitida glabra petiolata apice ramulorum subfasciculata. Petiolus crassus 1.5-2.5 cm. longus supra subplanus subtus teres. Lamina obovato-oblonga vel obovata apice rotundata abrupte breviterque acuminata vel mutica, basim paulo attenuata cuneata, margine integra vel levissime sinuato-dentata, 15-40 cm. longa, 8-18 cm. lata; supra costa subplana notata nervis secundariis filiformibus conspicuis nervulis venulisque prominulis reticulatis; subtus costa crasse eminenti nervis lateralibus argute angusteque elevatis patulis circa 18 utroque latere 1-2.5 cm. remotis, prope marginem valde arcuatis et anastomosatis, nervulis venulisque prominulum minutum conspicuum reticulum formantibus.

Inflorescentia terminalis in ramulis hornotinis crassis viridibus foliosis cujusve, flores solitarii axillares vel extraaxillares cum foliis alternantes. Pedicelli graciles sed robusti erecti 3.5-9 cm. longi (inferiores longiores) 2-3 mm. crassi virides glabri apicem versus 2 bracteolas suboppositas vel remotas deciduas ferentes. Receptaculum conoideum extus leviter pruinose intus disco 15 mm. diam. puberulo. Calycis limbus subinteger 1.5-3 mm. longus. Petala matura late obovata apice rotundata vel subtruncata 5-6 cm. longa, 3-4.5 cm. lata, extus albo-rosea supra eburnea. Androphorum luteolo-album 3.5 cm. diam. basi annulo 12-13 mm. alto, processus laciniis filiformibus pluriseriatis 10-18 mm. longis. Antherae oblongae 3-4 mm. longae flavae.

Type: Colombia, Dep. Valle. Cordillera Occidental, vertiente occidental; hoyadel rio Anchicayá lado derecho, bosques entre Pavas y Miramar 350-450 m. alt., colect. 16-IV-1943 J. Cuatrecasas 14394. "Gran árbol, 20 m. alt. Tallo 40 cm. diám. Pétalos blanco rosados ext., por dentro blanco crema. Filamentos blanco amarillentos. Anteras amarillo claro."

G. foliosa is similar to *G. occidentalis*, but is distinguished because of its foliose inflorescence, the flowers appearing individually alternating with leaves at the tips of new branchlets (axillary or extra-axillary); the petioles are thicker and shorter, the petals larger, and the leaves more obovate.

Grias colombiana Cuatr., sp. nov.

Arbor circa 6 met. alta paulo ramosa, ramis terminalibus griseis glabris ad apicem folia subfasciculata ferentibus.

Folia simplicia alterna rigide coriacea sessilia glabra. Lamina obovato-oblonga basim versus attenuata basi angusta obtusa vel subtruncata paulo amplectens, apice subite angustata cuspidata, 24-53

cm. longa, 7.5-18 cm. lata, supra basim 10-15 mm. lata, utrinque viridis margine leviter obtuseque dentato-crenata; supra nervo medio laterali-
busque prominulis reliquis obsoletis; subtus costa valde eminenti basi
incrassata nervis lateralibus 18-25 utroque latere prominentibus
ascendentibus prope marginem subite arcuatis tenuioribus anastomo-
satis, in foliis maximis 15-22 mm. distantibus in minoribus 10-15 mm.
distantibus, nervulis transversis inconspicuis, punctis minutis rubes-
centibus et rarissimis pilis munita.

Inflorescentiae racemoso-contractae axillares foliorum inferiorum
vel caulinares in extremis ramorum, pedunculo valde brevi 1-6 mm.
longo glabro dense bracteato bracteis late ovatis acutis vel cuspidatis
glabris inferioribus 2 mm. longis superioribus oblongis ad 6 mm. longis.
Pedicelli 2-4 mm. longi glabri basi angusti sursum sensim incrassati,
saepe 2 bracteolis minutis acutis munita. Receptaculum conicum 3-5
mm. longum. Calycis limbus 4 lobatus lobis irregularibus plus minusve
obtusis 2-3 mm. altus, glaber. Petala 4 alba crassiuscula obovato-
elliptica apice rotundata glabra 16-20 mm. longa, 10 mm. lata. Pro-
cessi staminorum numerosissimi 7-10 mm. longi albi glabri. Antherae
rotundato-ellipticae 0.7 mm. longae. Ovarium turbinatum 4 loculare.
Fructus monospermus 5-6 cm. diam. maturitate luteus laevis, siccitate
obtusè 8-costatus apice truncatus margine obtusus 4 lobulis calycinis
parvi-triangularibus persistentibus.

Type: Colombia, Dep. Valle. Costa del Pacífico, río Yurumanguí:
Veneral, bosques 5-50 m. alt., colect. 3-II-1944 J. Cuatrecasas 15920.
"Arbolito, sumergido en la orilla del río, con numerosas varas verti-
cales. Perianto y androceo blancos. Frutos monospermos 5-6 cm.
diám., maduros amarillos." (F.)

Cotype: Id., Dep. Cauca. Costa del Pacífico, río Micay: brazo
Noanamito, orilla derecha; El Chachajo 2-5 m. alt., colect. 27-II-1943
J. Cuatrecasas 14267. "Palo de 6 m., poco ramificado con penachos
hojosos terminales. Flores caulinares en los extremos de las ramas."

Grias colombiana is closely related to *G. integrifolia* St. from Nica-
ragua but differs from the latter by its more or less obtuse, dentate
leaves which are shorter and have fewer, more ascendant veins. It
also differs by its pedunculate inflorescence, the longer and thicker
pedicels which are less differentiated from the conical receptacle,
the shorter calyx-lobes, and the larger number of stamens. *G. Haughtii*
Knuth from the Magdalena Valley has larger leaves (1 met. or more),
pedicels and flowers. *G. Fendleri* Seem. from Panama has petiolate
leaves, larger flowers, and 2 sepals.

Grias multinervia Cuatr., sp. nov.

Arbuscula simplex caule 4 met. alto apice foliis majusculis sub-
fasciculatis praedito.

Folia magna chartaceo-coriacea rigida simplicia alterna subglabra,
140 cm. longa, 35 cm. lata, elliptico-oblanceolata, apice breviter
acuminata acuta basim versus sensim angustata in brevem petiolum

valde robustum anguste alatum 3 cm. longum commutata, utrinque atroviridia in sicco viridia, margine subintegerrima, supra costa anguste elevata, nervis secundariis angustis prominentibus, transversalibus obsoletis; subtus costa crassissime eminenti striata. nervis secundariis elevatis firmis parallelis ascendentibus ad marginem abrupte curvatis anastomosatis nervum undulatum submarginalem vix continuum formantibus, utroque latere \pm 86, 15-25 mm. inter eos distantibus, sed basim versus magis confertis tantum 10-5 mm. remotis; nervulis transversis prominulis undulatis subparallelis, punctis numerosis sparsis minutis rubescentibus et copiosis sparsis tenuissimis pilis munita.

Fructi caulinares videtur solitarii pedunculo crasso longiusculo penduli elliptico-oblongi ad 10 cm. longi, 5 cm. lati, apice breviter 5-angulato coronati laeves, siccitate 8-costati, endocarpio lignoso 8-prismatico-costato. Semina solitaria oblonga obtusa in sicco 7.5 cm. longa, 28 mm. lata. (Fig. 6)

Type: Colombia, Dep. Cauca. Costa del Pacifico, río Micay, orilla derecha en Caliche 5-10 m. alt., colect. 26-II-1943 J. Cuatrecasas 14208. "Vara de 4 met. recta, simple con penachos de hojas terminales. Frutos caulinares."

G. multinervia apparently is the species of *Grias* with the largest leaves known. *G. grandifolia* Pilger and *G. Haughtii* Knuth also have very large leaves (120 x 20 cm. and 130 x 30 cm.), which taper toward the base for a greater length than in *G. multinervia* (*G. grandifolia* has long petioles); these leaves are completely glabrous, their lateral veins are more remote (3-4 cm.) and branch off at a wide angle. In *G. multinervia* the nerves are more approximated and numerous (86 on each side in the type specimen). The lower surface of the leaf in the type specimen is covered by copious diluted hairs, whereas the leaves of other species are glabrous. The fruits appear solitary on the peduncles indicating a very simple inflorescence.

LOGANIACEAE

Peltanthera costaricensis (Standl. & Steyer.) Cuatr., nov. status.

Valerioa costaricensis Standley & Steyermark Field Mus. Publ. Bot. 18:1099 (1938).

Having had the opportunity of studying a specimen of the Peruvian collection of Spruce 4940, which is the isotype of *Peltanthera floribunda* Benth., I compared this plant with the Costa Rican type of *Valerioa costaricensis* (referred to the Solanaceae). There is no doubt that they are almost identical. The plant from Costa Rica is slightly different from the Amazonian species, its leaves are coarsely dentate, the branchlets of the inflorescence and the pedicels are slender and longer, the corolla is thicker with broader and deeper lobules, and the stamens are longer. In *P. floribunda* the leaves are subentire and the corolla is narrow and more contracted below the shorter lobules. The fruit of these plants is still unknown; its know-



FIGURE 6. *Grias multinervia*, in rain forest of Micay River.

ledge would clear up the position of the genus and the separation of its two species, which have a remarkable geographical distribution.

CONNARACEAE

Connarus nervatus Cuatr., sp. nov.

Frutex validus scandens cortice succi rubescenti ramulis griseis lenticellato-granulosi glabri juvenilibus brevi-puberulis.

Folia alterna imparipinnata 5-7 foliolata petiolo 8-16 cm. longo robusto glabro basi valde vaginato-incrassato. Rhachis 9-14 cm. longa. Petioluli cylindrici crassi 5-7 mm. longi. Foliola crasse coriacea nitida oblongo-elliptica vel paulo ovato-elliptica basi rotundata vel obtusissima apice subrotundata vel obtusa abrupte breviterque acuminata margine integra 7-22 cm. longa, 3.8-10 cm. lata inferiora breviora terminali maximo; supra subglabra nervis medio secundariisque immersis paulo compressis visibilibus, nervulis transversis venulisque prominulis vel paulo conspicuis subtus subglabra sparsis vel sparsissimis pilis adpressis munita, costa valde eminenti nervis secundariis prominentibus 8-12 utroque latere ascendentibus ad marginem curvato-anastomosatis nervulis tertiis crebris elevatis cum venulis reticulum bene conspicuum formantibus.

Inflorescentiae fructiferae axillares paniculatae magnae pendulae, 30-40 cm. longae ad 20 cm. latae, axi robusto ramulisque patulis minute tuberculatis, sparse tomentulosis. Pedicelli crassi circa 2 mm. longi. Calyx persistens 5 sepalis oblongis 2.5-3 mm. longis basi coalitis puberulis. Folliculus longe stipitatus subhamatus linea dorsali subrecta sutura ventrali valde arcuata subsemicirculari apice valde oblique acuteque mucronato-rostrato, in vivo 3 cm. longus, 2 cm. latus lateraliter compressus pericarpo rigide coriaceo extus glaber rubescenti in sicco sclerenchymatico-striato endocarpo piloso; stipite 6-8 mm. longo. Semen (in vivo) album arillo luteo.

Type: Colombia, Dep. Valle, Costa del Pacífico; río Cajambre: Quebrada del Guapécito 5 met. alt., colect. 16-V-1944 J. Cuatrecasas 17713. "Gran bejuco. Hoja coriácea verde oscura haz. Frutos falciformes con pico lateral puntiagudo rojos o rojo amarillentos. Semilla blanca con arilo amarillo." (F.)

Cotype: Id. id. id. río Cajambre: San Isidro 5-100 m. alt., colect. 4-V-1944 J. Cuatrecasas 17349. "Gran bejuco. Corteza con zumo rojizo resinoso. Hoja semicoriácea verde grisácea. Frutos semilunares apiculados rojizos 3 cm. long. 2 cm. lat. comprimidos. Una semilla blanca con arilo amarillo." (F.) Id. id. id. Naya, brazo Ají, en Calle Larga 4 met. alt., colect. 28-II-1943 J. Cuatrecasas 14287. "Gran bejuco. Frutos rojizos." (F.)

Collection 21450 is in worse condition of preservation than former ones, but has flowers. In spite of small differences it seems to belong to the same species. It has paniculate inflorescences with tomentose

branchlets showing the following floral features: Sepala 5 oblonga acutiuscula crassiuscula 3 mm. longa extus hirsuto-tomentosa intus glabra. Petala 5 libera circa 4.4 mm. longa, oblongo-elliptica apice obtusa basi abrupte in unguem angustum attenuata extus tomentella intus dimidia superiore parte tomentella cetera glabra. Staminorum filamenta longiora sursum pilosa breviora glabra.

Colombia, Intendencia del Chocó: río San Juan, margen derecha Quebrada del Taparal, 20 met. alt., colect. 30-V-1946 J. Cuatrecasas 21450. "Gran bejuco. Hoja cartácea, verde oscura. Cáliz sepia por fuera. Sépalos int. y pétalos blanco verdosos." (F.)

This species belongs to the Subgenus *Connarellus* Schellen. and is fairly close to *C. Sprucei* Baker. But it has imparipinnate leaves, usually with 7 coriaceous, robust leaflets which are strongly nervate beneath. Furthermore, the leaflets of *C. nervatus* have a more or less conspicuous pubescence on the lower side of the midrib. When in the fruiting stage, the inflorescence is larger; the fruits too are larger, subfalcliform and borne on long stipes.

Connarus merizaldinus Cuatr., sp. nov.

Frutex scandens ramulis griseis lenticellato-verruculosis glabris.

Folia alterna trifoliolata petiolo 4-9 cm. longo rigido gracili glabro vel parce sparseque hirtulo, basi valde incrassato. Foliola subcoriacea glaberrima ovato-elliptica apice angustato-acuminata acuta basi rotundata margine laevis 7-14 cm. longa, 3.4-6 cm. lata; supra laevis costa depressa nervis lateralibus visibilibus, venulis fere inconspicuis; subtus costa elevata, nervis secundariis 5-6 utroque latere arcuato ascendentibus subprominulis marginem versus evanescentibus, reliquis nervulis tantum sub lente paulo visibilibus. Petioluli 4-5 mm. longi teretes crassi 4-5 mm. longi. Rhachis 10-30 mm. longa.

Inflorescentiae axillares et terminales laxiflorae, thyrsoidae vel paniculatae. Ramuli pseudoracemorum 5-14 cm. longi rigidi graciles striolulati breviter tomentelli. Ramuli cymorum 1-7 mm. longi. Pedicelli 0.4-1.5 mm. longi tomentulosi. Sepala 5 ovato-elliptica apice obtusiuscula 2.3 mm. longa 1.2 mm. lata basi coalita extus tomentulosa intus glabra, sparse punctata. Petala 5 libera ovata apice obtusa basi abrupte angustaeque unguiculata circa 3 mm. longa 1.4 mm. lata, alba glabra sparsissime punctata. Stamina 10 quinque epipetala breviora basi in tubum coalita, filamentis glabris vel parcissimis pilis glandulosis munitis. Ovarium hirsutum. Fructus ignotus.

Type: Colombia, Dep. Valle; Costa del Pacífico, río Naya: Puerto Merizalde, bosque 20 m. alt., collect. 22-II-1943 J. Cuatrecasas 14067. "Gran bejuco. Flor blanca." (F.)

Connarus merizaldinus is closely related to *C. lambertii* (DC.) Sagot, but it is distinguished by its smoother leaves (without prominent venation), its smaller flowers with small glabrous petals, which are ovate, and abruptly contracted at the base, and marked with scarce glandulose spots. The filaments are practically glabrous. *C. venezue-*

lanus Baill. has leaves that are puberulent beneath and larger flowers. *C. neglectus* Schellen and *C. laevis* Schellen. have larger and more glandulose petals and their sepals are tomentulous on both sides.

***Connarus silvanensis* Cuatr., sp. nov.**

Frutex validus scandens ramulis brunneis vel griseis lenticellato-tuberculatis.

Folia alterna trifoliolata petiolo 4.5-6 cm. longo glabro plus minusve granuloso-lenticellato. Rhachis 15-18 mm. longo. Petioluli teretes crassi 5-8 mm. longi. Foliola coriacea in sicco brunnea subelliptica basim versus paulo angustata basi obtuse cuneata apice subrotundata brevissime apiculata margine integra, 13-21 cm. longa, 6.2-11.5 cm. lata; supra glabra costa nervis lateralibus impressis, reticulo nervulorum submerso vix conspicuo; subtus glabra vel sparsis minutissimis pilis adpressis munita, costa valida nervis secundariis 8-9 utroque latere prominentibus ascendentibus marginem versus arcuato anastomosatis, nervulis prominulis cum venulis minus elevatis reticulum formantibus.

Inflorescentia statu fructifero brevis axillaris racemiformis rhachi robusta 5 cm. longa. Folliculus leguminaceus anguste oblongeque pyriformis oblicuus in 2 valvas dehiscens apice subrotundatus laterale breviter mucrato-apiculatus basi cuneatus haud stipitatus pericarpo lignoso extus rubro glabro sublaeve haud striato endocarpo intus nitido sparsissimis pilis munito, circa 3 cm. longus, 1.6 cm. latus. Semen unicum oblongo-ellipticum circa 2 cm. longum in vivo album nitidum arillo lutescenti.

Type: Colombia, Dep. Valle, Costa del Pacífico, río Cajambre; Silva, Loma de la Vigía, 80 met. alt., colect. 9-V-1944 J. Cuatrecasas 17454. "Gran bejuco. Hoja semicoriácea verde oscura. Frutos rojo vinosos, piriforme oblongos 3 cm. long., x 1.7 cm. lat. con semilla blanca con arilo amarillento." (F.)

C. silvanensis, of the Subgenus *Neoconnarus* Schellen., is related to *C. brachybotryosus* Donn. Smith, but can be distinguished by its more coriaceous and larger leaflets, its petioles which are much shorter than the leaflets, its smaller inflorescence, and larger fruits.

***Rourea granatensis* Cuatr., sp. nov.**

Frutex ramis brunnescentibus paulo granulosis glabris.

Folia alterna imparipinnata praecipue 5-foliolata glaberrima, petiolo 2-3 cm. longo rhachi 1.5-3 cm. longa gracili rigida, petiolulis incrassatis teretibus circa 4 mm. longis. Foliola coriacea oblongo-elliptica basi rotundata apice attenuata plus minusve cuspidata margine integra, inferiora breviora, 3-11.5 cm. longa 2-4.2 cm. lata; supra nitida costa impressa pallidior bene notata, nervis secundariis nervulis venulisque minutum reticulum elevatum formantibus; subtus costa crassa eminenti nervis secundariis prominulis patulis 7-8 utroque latere remote ad marginem arcuato anastomosatis, nervulis venulisque in prominulo

reticulo instructis.

Inflorescentiae axillares paniculatae laxiflorae 5-8 cm. longae, axi ramulisque patulis flexuosis gracilibus angulatis minute puberulis, bracteolis brevissimis. Pedicelli teneres recti patuli minute puberuli. Sepala 5 imbricata ovata apice obtusa vel subacuta, puberula, 3 mm. longa 2.5 mm. lata chartacea. Petala 5 elliptico-oblonga 3.5-4 mm. longa 1.2 mm. lata basi angustata. Stamina 10, filamentis glabris longioribus sepala paulo superantibus. Carpella 5 libera ovario supra hirsutissimo, stylo 2.5 mm. longo filiformi basi hirsuto, in flore tantum uno fertile.

Type: Colombia, Intendencia del Meta: Villavicencio hacia El Parrao, 500 m. alt. colect. 10-XI-1938 J. Cuatrecasas 4588. (F.)

R. granatensis belongs to section *Glabra* Schellen. and can readily be distinguished from *R. glabra* HBK by the short pubescence of its calyx and the branchlets of its inflorescence. From *R. puberula* Baker it can be differentiated by the prominent reticulate venation of its leaves.

***Rourea antioquiensis* Cuatr., sp. nov.**

Arbor mediocris ramulis terminalibus in sicco brunneis lenticellatis puberulis.

Folia alterna imparipinnata 5-foliolata, petiolo circa 3 cm. longo sicut rhachi 3-4 cm. longa breviter pubescenti, petioluli teretes crassiusculi 2.5-3 mm. longi. Foliola subcoriacea elliptica utrinque attenuata basi obtusa apice cuspidata margine integra, 4.5-10 cm. longa 2-4 cm. lata; supra glabra nitidula costa angusta impressa conspicua reticulo venulorum minutum elevatum nervis secundariis inter reticulum obsoletis; subtus costa crassa eminenti adpresse pubescenti nervis lateralibus circa 10 utroque latere patulis filiformibus prominulis marginem versus arcuato anastomosatis pubescentibus, reticulo paulo prominulo sicut ceteris sparse pubescentibus.

Inflorescentiae paniculatae axillares et subterminales ramis principalibus 8-14 cm. longis, ramulis secundariis tantum inferioribus longis reliquis brevibus patulisque 1-15 mm. longis, bracteolis minutis ad 1 mm. longis ovatis vel lanceolatis. Pedicelli graciles recti vel flexuosi circa 3 mm. longi dense pubescenti. Rami ramulique pubescenti. Sepala 5 imbricata suborbicularia basi subcordata apice deltoidea utronque pubescentia. Petala 5 obovato-elliptica apice rotundata basi anguste unguiculata glabra 3.2 mm. longa 1.6 mm. lata. Filamenta staminorum longiorum sepala excedentia breviorum subaequantia, omnia glabra basi in tubum coalita. Carpella 5 libera ovario dense hirsuto stylo 1 mm. longo apicem versus glabrato stigmate subdiscoideo-crasso.

Typus: Colombia, Dep. Antioquia; orillas del río Cauca en Puerto Valdivia, 240 m. alt., colect. 18-II-1942 R. Metcalf & J. Cuatrecasas 30045. "Gran árbol. Pétalos blancos. Cáliz blanco amarillento. Hoja semicoriacea, brillante, enves verde claro. Corteza parda." (F.)

R. antioquensis is related to *R. frutescens* Aubl., but can be distinguished by its more elliptical (not obovate), long cuspidate leaves with less prominent and more open secondary veins, pubescent branchlets, calyx and pedicels (not tomentose as in *R. frutescens*) and by its subrotundate and broader sepals.

***Pseudoconnarus agelaefolius* Cuatr., sp. nov.**

Frutex validus scandens ramulis flexuosis fuscis glabris.

Folia alterna trifoliolata glabra, petiolo rigido patulo 6-11 cm. longo basi incrassato, rhachi 1-3 cm. longo, petiolulis teretibus crassis 5-7 mm. longis. Foliola coriacea subtriplinervia late lanceolato-elliptica apice longe angustato-acuminata basi cuneata terminalia majora symmetrica 9-20 cm. longa 4-7.5 cm. lata lateralibus paulo asymmetrica minoraque 4.5-14 cm. longa 2-6.5 cm. lata margine integra; supra nitidula in sicco pallido-brunnescentia nervis principalibus paulo impressis pallidioribus notatis minuto reticulo venoso elevato conspicuo; subtus in sicco pallide badia valde opaca epidermo densissime minuteque papilloso, duobus nervis lateralibus basi cum nervo medio connatis bene eminentibus subrectis ascendentibus extremis marginem versus evanescentibus, sursum 1-3 nervis secundariis brevioribus plus minusve prominentibus notatis, nervulorum reticulo paulo prominulo plus minusve conspicuo.

Inflorescentiae paniculatae axillares et terminales laxiflorae, axillares 8-12 cm. longae terminales ad 20 cm. longae, ramulis patulis puberulis minutis pilis simplicibus vel furcatis munitis. Bracteolae minutissimae. Pedicelli erecti circa 3 mm. longi minute puberuli apice in receptaculum incrassatum producti. Sepala 5 imbricata subcoriacea ovata vel orbicularia apice subrotundato vel abrupte subacuto 2-2.2 mm. longa 2 mm. lata paulo acrescentia, margine ciliata cetera glabra. Petala decidua in meis speciminibus desiderata. Stamina 10 libera filamentis planis glabris, longioribus episepalis calycem aequilongis, brevioribus oppositipetalis et oppositicarpellis praesumpte sterilibus. Carpellis 5 liberis glabris ovario ovoideo 1 mm. longo apice in longum stylum crassiusculum 1.5 mm. longum productum, ovario uniloculari 2-ovulati. Folliculi plures fertiles sessiles oblongi sutura ventrali arcuata apice rotundata lateraliter breviter apiculata, calyce brevi basim persistenti.

Type: Colombia, Dep. Valle. Costa del Pacífico: río Cajambre: San Isidro loma con bosque en la Quebrada del Venenito \pm 80 m. alt., colect. 3-V-1944 J. Cuatrecasas 17334. "Gran bejuco. Hoja coriácea, flexible, verde brillante haz, cenicienta envés." (F.)

Pseudoconnarus agelaefolius is easily distinguished from all other species of the genus by the shape and texture of its leaves, its axillary as well as terminal inflorescences, and its free stamens. The leaves are almost identical with those of *Bernardinia agelaeoides* Schellen, a species of uncertain position regarded by Macbride as a *Rourea*; but its slender and elongate sepals as well as its venation differentiate it from this genus.

Regarding the genus *Pseudoconnarus*, I consider the triplinerved leaf with the three principal nerves united at the base for some distance as a fundamental character which I have never observed in *Rowea* or in *Connarus*. In the genus *Bernardinia* only *B. agelaoides* shows this pattern, that is so characteristic of the African genus *Agelaea*. A papillose epidermis of the lower side of the leaves and glabrous carpels, several of them mature in fruit, are typical of *Pseudoconnarus*.

ROSACEAE

Licania vaupesana Killip et Cuatr., sp. nov.

Arbor grandis ramulis terminalibus brunneo-viridibus minute puberulis, granuloso-lenticellatis.

Folia simplicia alterna coriacea petiolata. Petiolus 5-6 mm. longus subteres incrassatus supra pubescens reliquo puberulus. Lamina subovato-elliptica basi subrotundata vel obtusissima apice attenuata acute acuminata margine integra 7-12 cm. longa 3.7-5 cm. lata; supra in sicco brunnea subnitida costa angusta depressa tomentella reliqua glabra nervis secundariis reticuloque impressis; subtus nervis principalibus exceptis ochraceo-dealbata, dense adpresseque tomentosa costa eminenti fuscescenti glabra nervis secundariis circa 12 utroque latere prominulis angulo aperto subglabris marginem versus arcuatis evanescentibus, nervulis reticulatis obsolete. Stipulae subulatae pubescentes 5 mm. longae.

Paniculae terminales et subterminales ramoso-divaricatae circa 12 cm. longae, 6-7 cm. expansae axi ramulisque minute pubescentibus, bracteis linearibus ad 1 cm. longis sursum decrescentibus. Bracteolae floriferae deltoides tomentellae minutae. Flores subsessiles 1-5 in ramusculis 0.1-1.5 mm. longis glomeratis. Alabastra subglobosa 1.5 mm. diam. ochracea dense adpresseque tomentosa. Hypanthium crassiusculum turbinato-urceolatum 2 mm. altum 3 mm. latum extus tomentosum, intus hirsuto-tomentosum. Sepala 5 luteolo-albida crassiuscula ovata obtusiuscula 1.2 mm. longa 1.7-2 mm. lata tomentosa. Stamina 5-7 unilaterialia disposita filamentum brevissimo 0.3 mm. longo, anthera globosa 0.6 mm. diam. Ovarium 1 mm. diam. dense hispidum uniloculare biovulatum. Stylus gynobasicus 2 mm. longus.

Type: Colombia, Comisaría del Vaupés: río Cuduyarí afluente del río Vaupés, 200 m. alt. Colect. 15-IX-1939 J. Cuatrecasas 6837. "Árbol. Flor blanco amarillenta." (Herb. Nac. Colomb., Bogota.)

L. vaupesana is related to *L. Kunthiana* Hook. f. but distinguishable by its pedunculate glomerules, more slender secondary nerves, and the slightly different indument. It resembles *L. incana* Aubl., the hypanthium of which is lanate on the inside. *L. robusta* Sagot differs by its thick, coriaceous, stronger, nervate leaves.

***Licania pulchravenia* Killip et Cuatr., sp. nov.**

Arbor ramulis terminalibus glabris subnitidis sparse granulato-lenticellatis.

Folia simplicia alterna coriacea petiolata. Petiolus 6-10 mm. longus subtereti-compressus supra glaber subtus parce puberulus. Lamina elliptico-ovata vel paulo oblonga basi subrotundata sed margine cum petiolo cuneato-decurrenti, apice attenuata acutiuscula saepe breviter acuminata, margine integra 9-13 cm. longa, 4.5-6 cm. lata; supra pallide viridis opaca omnino glabra nervis medio secundariisque planis sordide conspicuis, nervulis transversis sordide visibilibus vel obsoletis; subtus ochracea pulcherrime discolori-nervata nervo medio lato sed paulo prominenti, nervis secundariis 6-7 utroque latere latiusculis paulo prominulis angulo acuto ascendentibus ad marginem curvatis subdecurrentibus, nervulis tertiis transversis venulisque depressis conspicuissime reticulatis, costa nervis reticuloque brunnescentibus glabris vel reticulo puberulo reliqua superficie densissime adpressisimeque ochraceo-tomentosa. Stipulae lanceolatae 5-6 mm. longae puberulae.

Paniculae terminales foliosae ad 8 cm. longae axi ramulisque minute pubescentibus, bracteis ovato-lanceolatis acutis circa 2 mm. longis pubescentibus. Flores sessiles subspicati. Alabastra subglobosa 2-2.5 mm. diam. sericei-tomentosa. Hypanthium hemisphaericum 2 mm. altum extus tomentosum intus hirsutum. Sepala 5 ovato-subrotundata 1 mm. longa crassiuscula viridi-pallida. Stamina 2-4 filamentis brevissimo anthera rotundata 0.4-0.5 mm. diam. Ovarium hirsutum 1 mm. uniloculare biovulatum. Stylus gynobasicus 1.5 mm. longus plus minusve villosus.

Type: Colombia, Comisaría del Vaupés: Bocas del Carurú, afluente del río Vaupés, orillas, 230 m. alt., colect. 27-IX-1939 J. Cuatrecasas 7054. "Árbol. Flor amarillento verdosa." (Herb. Nac. Colomb., Bogotá.)

L. pulchravenia, related to *L. Hostmannii* and *L. Kunthiana* Hook. f., can be distinguished by the smaller number of curved, ascending nerves which are broad, glabrous, brownish-reddish, and barely prominent, and by the very conspicuous, glabrous or subglabrous, depressed brownish-reddish reticulation as contrasted with the pale ochraceous, tomentose surface of the lower side of the leaf.

***Licania Caldasiana* Cuatr., sp. nov.**

Arbor ramulis terminalibus viridi-griseis minute tomentellis sparse lenticellatis.

Folia simplicia alterna coriacea petiolata. Petiolus 5-6 mm. longus crassiusculus tomentellus subtus supra planiusculus. Lamina elliptica vel oblongo-elliptica basi subrotundata vel obtusa apice rotundata vel interdum attenuata vel raro emarginata margine integerrima 6.5-10 cm. longa, 3.2-5 cm. lata; supra in sicco brunneo-nigra subopaca glaberrima venatione obsoleta; subtus siccitate cinerea dense ad-

pressequae tomento vestita sed costa crassa eminenti glabra vel puberula nigrescenti, nervis secundariis apertis 9-11 utroque latere tantum puberulis anguste prominentibus marginem versus curvatis pallidioribus, reticulo venulorum prominulo minus conspicuo.

Inflorescentiae terminales paniculatae brachiato-ramosae ad 14 cm. longae basi foliosae axi ramulisque viridi-cinereo-tomentosis, ramis secundariis pseudospicis valde patulis ad 7 cm. longis crassiusculis. Bracteae ovato-lanceolatae 1-2 mm. longae tomentosae flores sessiles glomeratos non superantes. Hypanthium crassum semiglobosum 1.5 mm. altum 2 mm. latum extus tomentosum intus tomentoso-hirsutum. Sepala 5 ovata obtusiuscula crassiuscula utrinque dense tomentosa 1-2 mm. longa. Stamina praecipue 4 filamenta glabra brevi anthera elliptica 0.4 mm. longa glabra. Ovarium 1 mm. villosissimum uniloculare biovulatum. Stylus gynobasicus 1 mm. longus basim versus longe villosus.

Type: Colombia: without locality, collected by J. C. Mutis no. 3868 (US). *Cotypes:* Mutis 1114 and 1130 (US).

L. Caldasiana is characterized by its robust inflorescences with spreading branches, and its sessile, spicate glomerules. The leaves are glabrous, smooth and dark on the upper side and densely cinereous, tomentose beneath. In texture its leaves are identical with those of *L. cymosa* Fritsch, but are completely flat.

This species is named in honor and memory of the famous scientist and Colombian patriot Francisco José de Caldas.

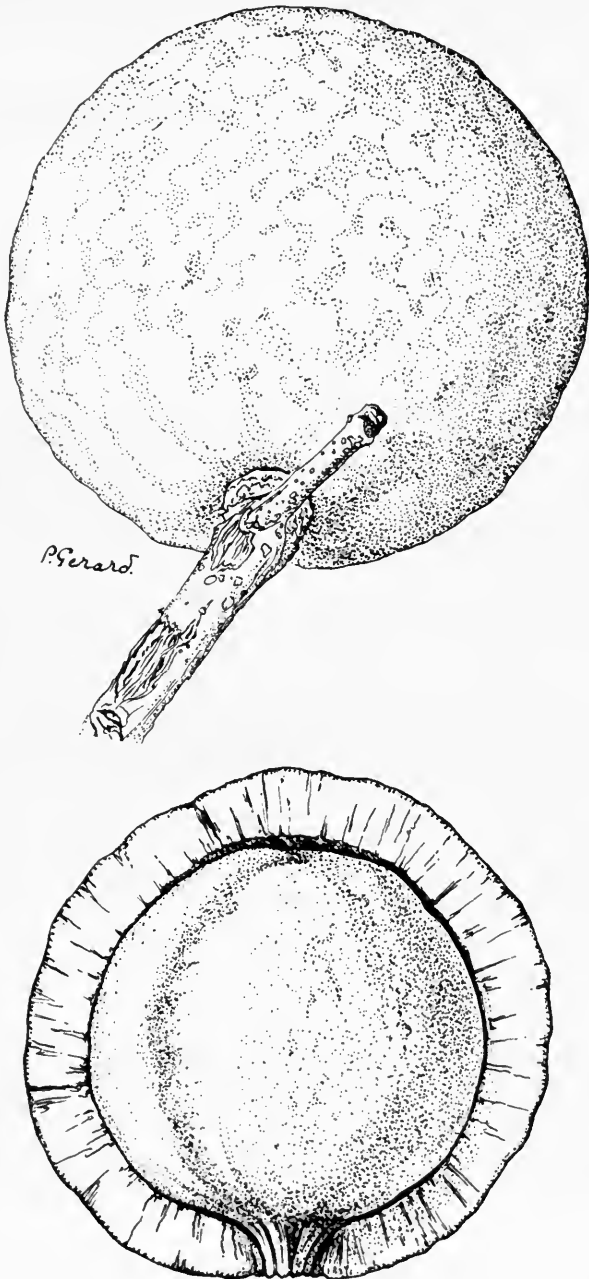
Licania macrocarpa Cuatr., sp. nov.

Arbor ramulis terminalibus villosis deinde glabratis badiis nitidis sparse granulato-lenticellatis.

Folia simplicia alterna rigide coriacea petiolata. Petiolus robustus subteres primum lanatus denique glabratus 15-20 mm. longus. Lamina elliptico-oblonga basi obtusissima vel subrotundata apice subrotundata abrupte breviterque cuspidata, margine integra, 20-28 cm. longa 6-10.5 cm. lata; supra glabra costa angusta elevata, nervis secundariis depressis, venulis obsoletis; subtus omnino dense indumento aracnoideo-lanato adpresso vestita, costa robusta elevata nervis secundariis valde eminentibus ascendentibus parallelis circa 18 utroque latere ad marginem subite arcuatis evanescentibusque, venulis minoribus transversis cum indumento velatis. Stipulae coriaceae vel subcoriaceae ovato-lanceolatae amplectentes margine scarioso reliquo dense villosotomentosae intraxillares.

Fructus sessilis globosus 8-9 cm. diam. pericarpo duro fibroso, 10 mm. crasso, extus leviter rugoso minute granuloso ochraceo-aurantiaco. Semen globosum 5.5-6.5 cm. diam. cotyledonibus magnis crassis hemisphaericis. (Fig. 7)

Type: Colombia, Dep. Valle, Costa del Pacífico: río Cajambre: Quebrada del Corosal, 0.5 met. alt., 17-V-1944 colect. J. Cuatrecasas

FIGURE 7. *Licania macrocarpa* (4/5)

17740. "Arbol. Hoja coriácea, rígida, verde amarillenta haz, ocráceo rosada envés. Grandes frutos redondos, 8-9 cm. diam., ocráceo anaranjados, superficie rugoso granulosa, duros." (F.)

L. macrocarpa is readily distinguished by its large coriaceous leaves with numerous ascendent, parallel nerves covered with a thick lanuginous coat on the lower side, by its large sericeous intra-axillary stipules, and chiefly by its large fruits.

Licania veneralensis Cuatr., sp. nov.

Arbor 10 met. alta caule 8 cm. diam. cortice griseo ramulis terminalibus badiis glabris.

Folia simplicia alterna petiolata coriacea. Petiolus teres crassus in sicco squamulosus 7-8 mm. longus. Lamina elliptico-oblonga basi rotundata apice breviter angustata acuminataque acuta, margine integra 12-18 cm. longa 4-6 cm. lata, supra viridis siccatate brunnescens glabra subnitida nervo medio angusto elevato, secundariis inconspicuis venulis minutissimum reticulum impressum formantibus; subtus ochracea nervo medio elevato glabro nervis secundariis 13-14 utroque latere prominentibus glabris paulo ascendentibus marginem versus arcuatis evanescentibus, nervulis tertiis transversis confertis levissime prominulis et sicut cetera superficie cum pellicula araneosa tenui valde compressa tectis.

Inflorescentia paniculata terminalis 10 cm. longa ramulis patulis crassiusculis ad 4 cm. longis sicut axi dense tomento ochraceo lanato tectis, bracteis chartaceis rigidis elliptico-oblongis navicularibus amplexicaulibus utrinque glabris vel leviter indumento lanato deciduo, infimis 12-14 mm. longis. Flores sessiles. Alabastra valde juvenilia globosa 1.5 mm. diam. dense lanato, petalis orbicularibus staminibus brevibus, hypanthio intus lanato.

Type: Colombia. Dep. Valle; Costa del Pacífico, río Yurumangú: Veneral, bosques 10-50 m. alt., colect. 30-I-1944 J. Cuatrecasas 15786. "Arbol 10 m. alt. Tallo 8 cm. diám. Corteza gris oscura. Madera amarillenta, dura." (F.)

L. veneralensis is distinguished by its coriaceous, elliptic-elongate, glabrous leaves with prominent midrib and depressed reticulation on the upper side, prominent glabrous nerves beneath and the apparently glabrous surface that is covered with a thin layer of arachnoid, compressed hairs. The inflorescence is lanate and the subcoriaceous bracts are glabrous.

Licania glauca Cuatr., sp. nov.

Arbor 12 met. alta, caule 15 cm. diam. ramulis terminalibus fuscis glabris parce lenticellatis.

Folia simplicia alterna breviter petiolata rigide coriacea. Petiolus circa 4 mm. longus crassus glaber. Lamina ovato-elliptica vel ovata basi rotundata sed anguste marginato-decurrente apice subite breviterque attenuato-apiculata, margine integra, 10-11.5 cm. longa, 5.5-6.5

cm. lata; supra glaberrima nitida pallido-viridis in sicco castanea, costa plana nervis lateralibus subdepresso-notatis venulis prominulis reticulatis; subtus viridi-glaucosa costa crassa eminenti nervis secundariis 5-6 utroque latere prominentibus arcuato-ascendentibus ad marginem decurrentibus evanescentibus ceteris nervulis venulisque argute prominuleque reticulatis, superficie minutissimo indumento tomentoso pulverulento plus minusve deciduo sed plus minusve permanenti induta.

Paniculae terminales et subterminales compositae. Axes ramulique minute adpresseque ferrugineo-tomentosi, bracteolis triangularibus acutis tomentosis 2-3 mm. longis. Alabastra ochraceo-ferruginea (in vivo viridia) 2-4 in glomerulis breviter pedunculatis, dense tomentosa, hypanthio intus tomentoso-hirsutulo, petalis nullis, staminibus tribus brevibus ovario tomentoso hirsuto.

Fructus depresso-globosus brunnescens 3 cm. longus 4 cm. latus.

Type: Colombia, Dep. Valle, dense forest along highway from Buenaventura to Cali, near sea level, collect. June 10, 1944. E. P. Killip & J. Cuatrecasas 39000. "Arbol 12 met., tallo 15 cm. diam. Hoja rígida, coriácea, verde amarillento brillante haz, verde glauco envés. Inflorescencia sepia. Frutos deprimidos sepia parduscos 3 x 4 cm. (vacíos)." (F.)

L. glauca is very well characterized by the minute, pulverulent, glaucous tomentum on the lower side of its leaves, the marked, venulose reticulation on both sides, its broadly obovate leaves, the small number of secondary nerves, short petioles, and the strong, angulate, tomentose branches of its inflorescences. Its flowers are glomerate on short branchlets. Although it apparently resembles *L. heteromorpha*, it differs from this species by being apetalous, by the toment of its leaves, and its stronger inflorescences.

Licania subarachnophylla Cuatr., sp. nov.

Arbor ad 20 met. alta ramulis terminalibus griseis gracilibus pubescentibus deinde glabratis squamulosisque.

Folia simplicia alterna petiolata chartacea. Petiolus 3-4 mm. longus crassiusculus tomentello-pubescentis. Lamina elliptica vel oblongo-elliptica basi obtusa apice subrotundata vel abrupte brevissimeque attenuato-mucronata margine integra, 4.5-6 cm. longa, 2-3 cm. lata; supra in sicco castanea opaca nervo medio prominulo tomentuloso, reliqua laevis venis obsoletis valde juniore araneosa mox glabra; subtus tenue tomento floccoso-araneoso cinereo tecta costa elevata rubescenti nervis secundariis filiformibus rubescentibus patulis parallelis circa 10 utroque latere marginem versus evanescentibus venulis inconspicuis. Stipulae deciduae.

Inflorescentiae axillares et terminales subsimplices, aspectu pseudo-spicatae, 4-15 cm. longae. Axis erectus subflexuosus gracilis ochraceo-lanato-tomentosus. Flores sessiles 1-7 in glomerulos sessiles secundum axem dispositos congeste aggregati. Bractee ovato-lanceolatae submembranaceae acute pubescentes glomerulos alabastro-

rum paulo excedentes. Alabastra globosa ochracea lanato-tomentosa circa 1.5 mm. lata. Hypanthium cupulare 1.5 mm. altum, 2 mm. diam. extus lanato-tomentosus intus lanatum. Sepala ovato-triangularia 1 mm. longa extus tomentosa intus basim versus glabrescens. Petala membranacea orbicularia abrupte unguiculata glabra ad basim parce araneosa excepto, 0.8 mm. diam. Stamina 15 basi in tubum continuum coalita filamentis sepala excedentia glabris maturitate 3 mm. longis. Ovarium tomentosum-lanatum. Stylus gynobasicus teneris hirtulo-lanatus apice glabro 3 mm. longus.

Type: Colombia, Dep. Boyacá: Los Llanos, Orocué 150 m. alt., 24-II-1939 collect. Oscar Haught 2629. "Tree \pm 20 m. with dense crown of slender branches very floriferous. Flowers white." (F.)

L. subarachnoidea belongs to Sect. *Moquilea* and is easily distinguished by its rather small, chartaceous, elliptical leaves which show no marked nerves on the upper side and are provided with a thin, arachnoid tomentum beneath, and by its long, slender, pseudo-spiciform inflorescences with sessile flowers aggregated in sessile, small glomerules. These characters differentiate this new species from *L. tomentosa* (Benth.) Fritsch, probably its most closely related species.

Licania salicifolia Cuatr., sp. nov.

Arbuscula 3-4 met. alta ramis terminalibus griseis pubescentibus minute lenticellati-tuberculatis, valde juvenilibus lanato-araneosis.

Folia simplicia alterna petiolata chartacea. Petiolus 4-5 mm. longus subteres crassiusculus pubescens. Lamina oblongo-lanceolata basi cuneata apice acuminata acutissima, margine paulo revoluta integerrima, 6-10 cm. longa 12-26 mm. lata; supra in sicco olivacea junioribus paulo araneosa mox glabra, costa prominula nervis secundariis parum visibilibus; subtus subcinerea araneoso-tomentella costa elevata nervis secundariis 10-14 utroque latere subfiliformibus prominulis ascendentibus marginem versus arcuatis evanescentibus nervulis transversis reticulatis cum indumento velatis postremo plus minusve prominulis. Stipulae angustissime lineares 4-8 mm. longae 0.1 mm. latae pubescentes deciduae.

Inflorescentiae terminales et subterminales ramoso-paniculatae ad 15 cm. longae ramis gracilibus ochraceo-viridibus tomentosis plus minusve flexuosis flores sessiles praecipue solitarios ferentibus. Alabastra depresso-globosa ochracea crasse lanato-tomentosa 2-3 mm. lata. Hypanthium cupulare 1.5 mm. altum intus lanatum. Sepala 1.5 mm. longa ovata extus marginibusque lanato-tomentosa intus glabra. Petala cordata acuta 1.5 mm. longa. Stamina circa 25 basi in tubum coalita.

Type: Colombia, Dep. Antioquia: Rio Negro, July 1934 collect. H. Daniel 477. (US)

The buds of our specimens cannot be fully analyzed, as they are infected by insects. However, being related to *L. tomentosa* (Benth.) Fritsch, *L. salicifolia* seems to belong to Sect. *Moquilea*. The narrower,

cuspidate leaves as well as the pseudospicate-paniculate, tomentose inflorescence bearing sessile flowers are striking features, permitting ready identification of *L. salicifolia*.

Correction: Pag. 65, line 9-10, change "Hypanthium turbinatum 9.7 mm. altum..." to "Hypanthium turbinatum 0.7 mm. altum....".

Hirtella Mutisii Killip & Cuatr., sp. nov.

Rami terminales brunnescentes dense hirsutuli pilis rigidiusculis patentibus ochraceis basi callosa muniti.

Folia simplicia alterna chartacea subsessilia. Petiolus 0.5-2 mm. longus crassiusculus hirsutus. Lamina oblongo-ovata basi subrotundata obtusissima interdum emarginata apice cuspidato-attenuata acuta margine plana laevis, 7.5-9.5 cm. longa 4-5 cm. lata; supra in sicco brunnea costa tomentoso-hirsutula bene notata nervis secundariis filiformibus paulo notatis pilis strigosis basi callosa secundum munitis reticulo fere inconspicuo reliqua superficie sparsis pilis strigosis praedita; subtus siccitate pallidiora viridi-brunnea costa eminenti densiuscula hirsuta nervis secundariis 7-8 utroque latere prominentibus marginem versus arcuato-anastomosatis nervis tertiis venulisque bene prominulis reticulatis, nervis secundariis reticuloque dense callosis copioseque strigosis. Stipulae lineares circa 5 mm. longae.

Inflorescentiae subsimplices terminales et subterminales in paniculam foliosam pseudoternalem aggregatae, singulae 4-9 cm. longae aspectu racemosae axi dense hirsuto bracteis linearibus circa 2-3 mm. longis, ramulis floriferis teneribus saepe unifloris interdum 2-3-floris 2-5 mm. longis bracteolis anguste linearibus brevibus circa 1-2 mm. longis. Pedicelli teneres recti vel flexuosi 3-5 mm. longi hirsuti. Hypanthium 5-6 mm. longum angustissime tubulosum apice cupulari-conico dense hirsutum tubo 0.6 mm. lato apice 2 mm. diam. intus glaber sed fauce annulo hirsutissimo munitum. Sepala elliptica apice attenuata utrinque villosa 3 mm. longa 2 mm. lata. Petala membranacea glabra tria elliptica 3 mm. longa et 2 mm. lata, duo angustiora asymmetrica. Stamina 3, filamentis glabris longissimis antheris ellipticis 0.7 mm. longis. Ovarium hirsutissimum. Stylus longus dimidia inferiore parte hirsuta superiore glabra, stigmatibus dilatato rotundato.

Type: Colombia, without definite locality collect. J. C. Mutis 3554. (US) *Cotype*: Mutis 23. (US)

H. Mutisii is closely related to *H. triandra* Sw but differs by its more densely hirsute and strigose hairs and chiefly by the conspicuous callosities at the base of the hairs which are contiguous along the lower side of the leaves. Moreover, in the inflorescence the secondary branchlets often have only one flower, seldom two or three, simulating flexuose racemes. On the contrary, in *H. triandra* the branchlets are longer and rigid with usually several flowers and many bracts and the pedicels are shorter. The hypanthium in *H. Mutisii* is longer, simulating a pedicel.

Licania minuscula Cuatr., nom. nov.

Licania minutiflora Cuatr., Fieldiana: Botany, Vol. 27: 64 (1950),
not *L. minutiflora* Fritsch (1889).

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