

MISCELLANEOUS NOTES ON NEOTROPICAL FLORA

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These notes are taxonomic transfers, new species proposals, and observations relating to some members of the Moraceae, Bombacaceae and Compositae. They have resulted from the preliminary studies for the preparation of revisionary treatments of the genera involved (Cecropia, Matisia, Quararibea, Phragmothea, Patinoea, Espeletia and Senecio). The work has been partially sponsored by the National Science Foundation.

CECROPLA POLYANDROPHORA Cuatr. sp. nov.

Arbor circa 15 m alta basi radicibus hypogeis, trunco 20 cm diametenti, ramis terminationibus viridi-brunneis internodiis 1-2 cm longis valde asperis pilis acutis patulis basi tuberculatis dense obtectis.

Folia magna coriacea peltata robuste petiolata. Lamina palmata in 8 lobis profunde ( $\frac{4}{5}$ ) fissa, lobis majoribus oblongo-ovatis ad apicem attenuatis subacutis, maximo ab insertione petioli usque ad apicem 56-64 cm longo 21-25 cm lato lobis minoribus ovato-rotundatis obtusiusculis vel obtusis minimo 22-33 cm longo 8.5-16 cm lato, parte centrali concrescenti radio 9-12 cm inter lobis majores 12-15 cm inter minores, margine leviter sinuata; supra in vivo subatroviridis nitida in sicco pallide brunnescenti fere laevis tantum juvenilissima statu paulo araneosa sparseque pilosa adulta glabra, costis valde notatis nervis secundariis filiformibus prominentibusque tertiis paulo apparentibus; subtus nervis primariis secundariisque plus minusve rubescentibus exceptis cinerea, pilis albis tenuibus flexuosisque indumentum arachnoideo-lanosum subdensum areolis tegentum formantibus, costis valde robustis striatis nervis secundariis prominentibus 25-26 utroque latere (in lobis majoribus) sicut costis pilis brevibus crassiusculis flexuosis brunneis et parvis pilis tenuibus araneosis albis munitis, costis prope centrum magis minute brunneotomentosis et cum pilis acutis rectis subpatulis hyalinis 0.5 mm longis plus-minusve copiosis praeditis, nervis tertiis pallidis 2-3 mm distantibus parallelis tenuibus prominulis parce minuteque albido araneosis, venulis minoribus reticulum prominulum plus minusve albo-araneosis formantibus. Petiolus robustus 50-75 cm longus 1-1.5 cm crassus striatus valde juvenilis adpresse arachnoideo-lanatus demum glabratus sparsis vel sparsissimis pilis araneosis; pulvinus basilaris eminens badius pilis brevibus crassiusculis flexuosis patulis densissimis et pilis albidis rigidulis acutis magis dilutis instructum.

Stipulae terminales roseo-violaceae oblongae angustate acuminatae 25-30 cm longae extus dilute villosae pilis minutis flexuosis badiis et pilis ascendentibus acutis albis 0.5-0.8 mm longis subadpressis munitae, intus albido-sericeae pilis albis rectis acutis circa 1 mm longis dense tectae.

Inflorescentiae masculae axillares geminatae pedunculo 3-5 cm longo 6-7 mm crasso (in sicco) tomentuloso pilis brevibus badiis flexuosis et pilis albis acutis patulis vel ascendentibus ad 0.8 mm longis tecto. Spathae 12-14 cm longae subcoriaceae roseo-violaceae ovato-lanceolatae acuminatissimae intus glabrae extus tomentoso-villosae pilis brevibus flexuosis et pilis longioribus albis acutis ascendentibus vel subadpressis. Amenta mascula pedicellata 22-26 valde inaequalia linearia angulata acuta gracilia flexibilia, minora 3 cm longa altera ad 14 cm longa, 3 mm diametentia (in sicco); perianthium 1-1.2 mm longum ad basim attenuatum lateraliter sericeum; stamina duo inaequilonga filamentis laminaribus antheris ellipsoideis 0.3-0.4 mm longis. Receptaculum parvis brevibus setis munitum. Pedicelli teneri glabri nitidique 10-20 mm longi 1.5-2 mm crassi.

Inflorescentiae feminae axillares geminatae pedunculo circa 4 cm longo 5-6 mm crasso in sicco, in statu fructifero ad 7.5 cm longi, tomentuloso. Spathae subcoriaceae roseo-violaceae oblongae subite acuminatae 10-12 cm longae intus glabrae extus minute tomentosae et subadpresse albo-villosae. Amenta feminea breviter pedicellata 2-4 cylindracea statu florifero lutescentia 9-10 cm longa et 6-7 mm diametentia (in sicco), statu fructifero 13-20 cm longa 10-13 mm crassa; perianthium 2 mm longus apice incrassatum polygonale granulosum lateraliter parte media lanuginosum; ovarium oblongum laeve 1 mm longum; stylus flexuosus 0.8 mm; stigma fasciculatum; achaenia 2-2.2 mm longa 1-1.1 mm lata ellipsoideo-oblonga paulo compressa basi rotundata apice attenuata faciebus tuberculato-granulata. Pedicelli feminei glabri 2-5 mm longi 2-3 mm crassi. Receptaculum glabrum.

Typus: Colombia, Antioquia: Hoya del río León o Bacubá entre Villa Arteaga y Chigorodó: río Porroso: La Pradera, 90 m alt, ♂ Arbol 14 m 20 cm diam, base zancuda; hoja tierna rosado cárdena, adulta coriácea, crassiúscula, rígida, verde más bien oscura con nervios rojos de joven en la haz, cenicienta envés; amentos ♂ x 20-25 amarillo pálidos estípulas y espatas rosado cárdenas; 3-X-61, J. Cuatrecasas & L. Willard 26187; holotypus US; isotypus, COL. Idéntica localidad; ♀ árbol 16 m, 20 cm diam, zancudo; hoja tierna rosada en la haz, adulta 1.2 m long, coriácea, rígida, verde oscura haz, cenicienta envés; pecíolo 75 cm long; estípulas rosado cárdenas hasta 35 cm de largo; espatas rosado cárdenas, amentos ♀ amarillentos x 2-4, maduros hasta 14 mm diámetro; 3-X-61, J. Cuatrecasas & L. Willard 26186, paratypi US, COL (typus ♀).

*Cecropia polyandrophora* is closely related to *C. eximia* Cuatr. The main difference is in the male inflorescences which bear more than 20 slender and flexible amenta, their length varying from 3 to 14 cm, in the same bunch; the pedicels are thin, from 1-2 cm long. In contrast, the inflorescences of *C. eximia* have only 5-7 thick (1 cm) and rigid amenta supported by thick pedicels. The female inflorescences have 4-7 amenta in *C. eximia* and 2 or 3 (rarely 4) in *C. polyandrophora*. Specimens with only foliage or also with female parts will be difficult to distinguish from *C. eximia*. Many species of *Cecropia* apparently

differ only in the characters of one of the sexes; for this reason, the botanists should collect male and female specimens at the same place, in order to obtain a reliable collection for identification. *Cecropia eximia* was first described on the basis of a female collection (Rev. Acad. Colomb. Cienc. 6: 287, 1945); its knowledge was supplemented later with the help of new male and female specimens collected together from the same population (Rev. Acad. Colomb. Cienc. 9:326-327, 1956). Woodson in his Flora of Panama (Ann. Mo. Bot. Gard. 47: 214, 1960) described the male inflorescences of *C. eximia* based on specimens from Costa Rica. I am skeptical about the identity of the latter specimens which I have not seen.

#### QUARARIBEA AND MATISIA

The genus *Matisia* proposed by Humboldt and Bonpland, has been subsequently accepted by many botanists such as Planchon, Triana, Karsten, Schumann, Poeppig, Endlicher, Huber, Ducke, Sprague, etc. I have myself followed the same line for several years, except for a short time when I adhered to the viewpoint of Vischer (Bull. Soc. Bot. Geneve. 11:199, 1919) in joining *Matisia* to *Quararibea*.

The two concepts are clear cut making it easy to differentiate the two genera, both in flower and in fruit. I explained this in 1954 (Rev. Acad. Colomb. Cienc. 9:175, 1954), also listing all the published species for each of the genera at that time. The fact that one species, *Quararibea funebris* (Llave) Vischer, shows somewhat intermediate characters does not alter the concepts of the two genera. Recent examination of herbarium material of this species indicates ovaries with two biovulate cells, alternating with two lysigenous cavities. Other specimens obtained from the market in Oaxaca, Mexico, by V. V. Patiño, show variations in the structure of the ovary which often has four biovular, carpelar cavities; these cavities being usually irregular in size and also irregular in the development of the ovules. In some cases I found three ovary cells, also alternating, symmetrically, with 3 lysigenous cavities. The stigmas are lobulate according to the number of ovular cells. Probably, these variations in *Q. funebris* are due to the fact that the trees might be cultivated, the flowers being a popular spice sold in the markets.

Like myself other contemporary botanists, such as Pittier, Gleason, Benoist, Dugand and Little have been accepting the genus *Matisia*. The pollen grains of a few studied species (Erdtman, Pollen Morph. & Pl. Taxon. 76, 1966), indicate substantial differences which might add new characters to both genera when all the species are worked out.

MATISIA SOEGENGII Cuatr. sp. nov.

Arbor 20 m alta trunco circa 40 cm diametro, florifero. Ramusculi terminales dense brunnescenti tomentosi pilis stellatis multiradiatis radiis inaequilongis 0.2-1 mm longis fasciculatis instructi. Stipulae terminales lanceolatae crassiusculae dense tomentosae deciduae, circa 15 mm longae 4-5 mm latae.

Folia ampla firme membranacea viridia palmatinervia longe petiolata. Petiolus stellato-tomentulosus gracillis sed rigidus sursum triangulatus deorsum teretiusculus basi incrassatus, 25-37 cm longus. Lamina 42-46 x 32-40 cm ambitu late ovato-rotundata leviter inciso-trilobata, basi profunde cordata leviter asymmetrica sinu angusto 7-10 cm profundo, auriculis late rotundatis paulo inaequalibus, apice triangulata acuta saepe cuspidata margine lobis uno utroque latere triangulatis circa 2 cm longis latisque reliqua integra; nervis primariis 9 supra prominulis subtus valde prominentibus mediali robustiore nervis secundariis 4-5 utroque latere arcuato-ascendentibus subtus prominentibus, tertiis transversalibus parallelis supra filiformibus subtus prominentibus, nervulis minoribus perpendicularibus reticulum laxum formantibus; superficie supra nervis majoribus breviter pilosis basim versus tomentellis cetera subglabra, subtus dilute stellato-hirtula pilis gracilibus ad 1 mm longis sed nervis principalibus dense hirtulis seu tomentosis.

Flores fasciculati ex tuberculis trunci orientes. Pedicelli teretes crassi 1.5-2.5 cm longi 3-4 mm diametro dense minuteque viridi-brunneo-tomentosi ebracteati. Calyx tubulosus 30 cm longus 10-12 mm diametens 2 mm crassus intus dense adpresseque strigoso-sericeus extus minute denseque viridi-brunnescente tomentosus, apice trilobatus lobis 3-4 mm longis obtusis. Petala 5 prefloratione contorta, crassa fragilia lutescentia spatulata apice rotundata integra vel emarginata basim versus cum costa incrassata in ungem angustata, intus tantum sursum adpresse sericeo-villosa ungue glabro extus minute stellato-pilosa, 40-45 mm longa, subapicem 15-18 mm lata. Staminorum columna valde robusta sursum teres circa 3 mm crassa basim versus 5-sulcata 4 mm diametens densiuscule stellato-pubescentis, apice in 5 laciniis antheriferas producta; laciniis linearibus subteretibus robustis 20-22 mm longis, secundum abaxiali facie 12-14 loculos pollinigeros 1.5-2.5 mm longos ferentibus, inter eos cum pilis crassiusculis vermicularibus subflexuosis acutis 2 mm longis ornatis. Stylus exsertus robustus 5-angulatus dense stellato-tomentellus. Stigma rotundato-capitatum obsolete 5-lobatum. Ovarium in calyce inclusum sursum stellato-tomentosum 5 sulcatum, 5 loculatum loculis biovulatis. Fructus immaturus extus dense minuteque brunneo-stellato-tomentosus, oblongo-obovoideus utrinque attenuatus subapiculatus, circa 8.5 x 4.5 cm, exocarpio crasso fibroso denique indurato, endocarpio maturitate in 5 nuculas lignosas 3.5-1.7 cm monospermas amygdaliformes scisso. Semen 28 x 13 x 9 mm testa membranacea. Cotyledones cordato-orbiculares contortuplicatae bullato-corrugatae. Calyx fructifer cupularis coriaceus integer 3.5 cm diam 1.5-2 cm altus. Pedunculus fructifer robustus 3 cm longus 4-5 mm crassus. Fig.1.

Typus: Ecuador, Esmeraldas, Rio Mira between Guadual and Piguambi, "tree 20 m tall, diameter  $\pm$  40 cm, small buttresses, cauliflorous, calyx pale yellowish, corolla yellow, stamens and style creamy, fruit immature velvety brown, white inside, fairly common here, younger trees have much larger leaves than shown in the specimen; flowers in flash"; collected 6 Sept. 1961 by Wertit Soeeng s.n. Holotypus US.

This interesting species belongs to the section *Eumatisia* Tr. & Pl. being closely related to *M. stenopetala* St. & Cuatr, which resembles very much on account of foliage and indumentum. It differs from this one and the other species of the section by its larger flowers with long, coriaceous, tubular calyx, robust staminal column and style, the structure of the antheriferous laciniae and shape and size of the fruit. The thin, membranaceous leaves of this species is neither found in any other species of this group.

The following mentioned specimens collected at Santo Domingo de los Colorados about 300 m. high, probably belong to this species. They have somewhat thicker leaves with more abundant indumentum and they lack the two indentations described for the type. No flowers or fruits seen of these collections.

Ecuador, Pichincha: Santo Domingo de Los Colorados, 1000 feet, seasonal forest, 20 feet tall riverside tree, D.B.H. 8", wood soft, leaves crowded at branch tips, corolla cream, fruit in spirit, 24 Oct. 1961 collect. Cazalet & Pennington 5141 (US, sterile). Ibidem, soft wooded tree to 20 feet, D.B.H. 8", rami-florous, fruit 5-10 c. enclosed in persistent and swollen K, 1 Nov. 1961, collect. Cazalet & Pennington 5229 (US, leaf and section of a young fruit). Ibidem, tree 27 feet, D.B.H. 6 inches, 40 cm long cordate leaves, 4 Apr. 1943 collect. E. Little 6161 (US, sterile).

*MATISIA ARTEAGENSIS* Cuatr. sp. nov.

Arbor 8 m alta caule simplici 10-12 cm diametro, florigero. Stipulae subcoriaceae lanceolato-subulatae dense minuteque stellato-tomentosae 2.5-3.5 cm longae basi circa 8 mm latae.

Folia magna tenuiter coriacea rigidaque longe petiolata subpalmatinervia. Petiolus robustus argute striatus ad apicem longe pulvinatus basi incrassatus breviterque pulvinatus tomentulosus cum minutis pilis stellatis densiusculis tectus, maturitate circa 46 cm longus. Lamina ovato-oblonga vel elliptica symmetrica ad 80 cm longa 50 cm lata basi profundissime cordata lobis rotundatis conniventibus 12-13 cm longis apice paulo attenuata subobtusata vel obtusata subite breviterque acuminata margine integra, basi 9-11-nervata; supra viridis subglabra tantum nervis parum pilosis, nervis principalibus paulo notatis ceteris obsoletis; subtus pallido-viridis pubescens pilis stellatis patulis copiose munita, costa prominentissima ceteris nervis primariis prominentibus, nervis secundariis circa 6 paribus in parte media distantibus bene prominentibus, nervis tertiis perpendicularibus, parallelis 1-1.5 cm distantibus, nervis minoribus prominulis laxum reticulum formantibus.



Flores fasciculati ex tuberculis trunci prodeuntes, in specimine dessunt. Pedunculi subfructiferi 1.5-3 cm longi robusti sparse stellato-pilosi. Calyx fructiferus (prematuratione) cupularis vel subpatelliformis 15-16 mm diametro, intus sericeus extus atroviridis sparse stellato-pilosus. Fructus incipiens ovato-oblongis obtuse apiculatus (obpyriformibus) ochraceus dense stellato-tomentosus.

Typus: Colombia, Antioquia: Hoya del río León o Bacubá, Villa Arteaga, Las Caucheras, rain forests around Villa Agraria, about 95 m alt, "palo de 8 m, 10-12 cm diám, simple, pecíolo 50 cm, limbo coriáceo rígido, 80 x 50 cm, verde oscuro brillante haz, claro mate envés" "sapote", 2 Oct. 1961, coll. J. Cuatrecasas & L. Willard 26175. Holotypus, US: isotypus COL.

*Matisia arteagensis* is closely related to *M. stenopetala* and *M. soegengii*. From both it differs in the more oblong outline of the leaves. Furthermore *M. stenopetala* has tomentose leaves and calyces. *M. soegengii* has much larger flowers with a long, tubular carnose, tomentose calyx.

*MATISIA CALIMANA* Cuatr. sp. nov.

Arbor medialis ramis terminalibus pallide viridibus juvenilibus pubescentibus deinde glabris. Stipulae breves tomentellae mox deciduae.

Folia firme membranacea griseo viridia simplicia. Petiolus 1.8-3 cm longus stellato-tomentosus apice basique pulvinato-dilatatus. Lamina obovato-elliptica vel subelliptica basin versus angustata cuneataque apice plus minusve attenuata subobtusa et subite acuteque acuminata margine integra 21-32 cm longa 11.5-16 cm lata, basi trinervis; supra nervis principalibus discoloribus filiformibus stellato-pubescentibus cetera sparse pilosula, subtus dilute pilosula pilis stellatis radiis teneris patulis, nervis principalibus pallidis conspicuissimis: costa, duobus nervis basilaribus acute ascendentibus et 4-5 nervis secundariis utroque latere arcuato-ascendentibus prominentibus, nervis tertiis transversis parallelis et nervis minoribus perpendicularibus reticulum laxum prominulum conspicuumque formantibus.

Pedunculi fructiferi oppositifolii robusti stellato-tomentosi 3-4 cm longi. Calyx fructifer cupullato-patelliformis rigide coriaceus circa 4 cm diametro extus minute tuberculatus et densissime velutino-tomentosus, intus crasse tomentoso-velutinus pilis pubescentibus stellatis brevibus densissimis et pilis longis albis sericeis instructus. Fructus globosus leviter depressus apice umbilicatus basi attenuatus aequatore prominenti, minute granulatus densissime indumento rufescenti stellato-tomentoso velutinoque tectus, 4-4.5 cm longus latusque, 5-septatus, epicarpio coriaceo duro 3-4 mm crasso, mesocarpio fibroso-carnoso tenui, endocarpio in 5 nuculis lignosis amygdaliformibus basi acutis intus nitidis extus leviter rugulosis 22 x 12 mm, pariete 0.8 mm crasso maturitate solutis. Semina ellipsoidea circa 2 x 1 cm, testa brunnescenti tenuiterque membranacea.

Typus: Colombia, Valle: Pacific Cost, Rio Calima region: Quebrada de La Brea, 30-50 m alt, 25 Sept 1961, coll. J. Cuatre-

casas & L. Willard 26086. Holotypus, US: isotypus, COL.

*Matisia calimana* is characterized by its membranaceous, sparsely stellate-pubescent leaves combined with the rather rounded, reddish, velvety-tomentose fruits. These hard drupaceous fruits are accompanied by the persistent, coriaceous, disk-shaped calyx.

*MATISIA DOLICHOPODA* (A. Robyns) Cuatr. comb. nov.

*Quararibea dolichopoda* A. Robyns, Ann. Mo. Bot. Gard. 54: 185, 1967.

*MATISIA LONGITUBULOSA* (A. Robyns) Cuatr. comb. nov.

*Quararibea longitubulosa* A. Robyns, Ann. Mo. Bot. Gard. 55: 56, 1968.

*MATISIA SANBLASENSIS* (A. Robyns) Cuatr. comb. nov.

*Quararibea sanblasensis* A. Robyns, Ann. Mo. Bot. Gard. 55: 57, 1968.

This species, described from Panama has also been found in the Chococo region of Colombia. It seems to be represented by the following collection: Colombia, Antioquia: Hoya del río León o Bacubá, Villa Arteaga, Las Caucheras, rain forests at Villa Agraria, 95 m alt, "tree 15 m, leaves chartaceous, flexible," 2 Oct. 1961 collect. J. Cuatrecasas & L. Willard 26171 (US, COL).

*MATISIA WURDACKII* (A. Robyns) Cuatr. comb. nov.

*Quararibea wurdackii* A. Robyns, Ann. Mo. Bot. Gard. 55:58, 1968.

*PATINOA PARAENSIS* (Huber) Cuatr. comb. nov.

*Matisia paraensis* Huber, Bol. Mus. Paraense 3:430, 1902.

One of the main reasons for my trip to Belem do Para in 1962, was to try to collect fruiting material of *Matisia paraensis* Huber which I suspected to belong to *Patinoa*. I was fortunate to find fruiting trees with the invaluable help of the Instituto Agronomico do Norte, and especially of Mrs. Dagmar Albuquerque, Curator of the herbarium. The fruits which were collected were 16-17 cm long and 11-12 cm broad, and agree perfectly with those which are typical of the genus *Patinoa* (Cuatrecasas, Rev. Intern. Appl. Agr. Trop. 33:306, 1953). Unfortunately, the plants were not in flower at that time, but, some months later, Mr. Paulo B. Cavalcante sent me flowering specimens (n<sup>o</sup> 16847) from another tree, which was marked with the number 212. I was able to use these materials for my study and for the illustrations, which will be included in a forthcoming synopsis of the genus *Patinoa*.

Brasil, Pará: Furo Mucujubino, "cupuassú-rana", 30-VII-1901, Guedes 2207 (MG, holotypus). Belém, Murutucú, mata de varzea do Guamá, arbore pequena, flor verde, "cupuassú-rana", 14-XII-41, Ducke 842 (MG, NY, US). Vicinity of Belem, "cupuassú-rana", Pires 51846 (US). Antonio Lemos, varzea do Rio Tajapurú, arbore de folhas grandes e reluzientes (verde escuro), flor

branca, "cumpussurana", 21-VII-48, Black 48-3030 (NY). Belém, horto Museu Goeldi, arvore 212, flores 20-4-1963, Cavalcante MG-16847 (US). Horto Botanico Pará (Furos de Breves, Pará), "cupu-assú-rana", XII-1917, Ducke 16847 (MG, US). Belém, grounds of the Instituto Agronomico do Norte. Igarapé de Murutucú, 20 m alt, tree 10 m, leaves rather dark, yellowish green above, pale green beneath, fruits 16-17 x 11-12 cm, 7-XI-1962, Cuatrecasas 26647 (US). Horto Bot. Rio de Janeiro, culta (from prov. Breves, Pará), arbor parva, floribus viridibus, "cupu-rana". 20-XII-1928, Ducke 21047 (US). Amazonas, Esperança, boca do Javari, mata de terra firme, lugar humido, 7-XII-1945, Ducke 1780 (A, IAN, NY, US). Fig. 2.

PHRAGMOTHECA FUCHSII Cuatr. sp.nov.

Arbor. Rami terminales juveniles ochraceo-virides dense adpresseque lepidoti denique glabrati. Stipulae tomentosae lancoelatae circa 1 cm longae deciduae.

Folia alterna crassiuscule membranacea simplicia bene petiolata. Petiolus 5-8 cm longus subteres dense lepidotus ad apicem et basim dilatatus. Lamina 22-30 cm longa 9-13.5 cm lata obovato-elliptica oblongata basi obtusa vel rotundata apice paulo attenuata vel obtusa cuspidata margine integra basi quinquenervia costa supra stricte impressa subtus valde prominenti, nervis secundariis 6-7 utroque latere valde ascendentibus supra filiformibus subtus prominentibus, nervis tertiis notatis subtus prominentibus, nervulis minoribus reticulum laxum subtus prominulum formantibus; superficie supra leviter asperula viridula subtus ochraceo-viridi fere nitidula utrinque copiose lepidota.

Pedunculus fructifer oppositifolius robustus 3.5 cm longus lenticellatus et dense lepidotus. Calyx fructifer patelliformis 5 cm diametro in specimine dense ochraceo-lepidotus intus densissime adpresseque villosus-subsericeus.

Drupa circa 8 cm alta 10 cm diametro depresso globosa apiculata basi umbilicata ochracea dense lepidota et stellato-tomentosa epicarpio coriaceo rigidoque sed tenui (0.8 mm crasso), mesocarpio fibroso-carnoso circa 5 mm crasso, endocarpio 5 nuculis lignosis monospermis subellipsoideis compressis sulcatis valde duris 7 x 4.8 x 3 cm instructo. Parietis ligno duro latere 7-10 mm dorso 14 mm crasso. Semen amygdaliforme circa 30 x 17 x 8 mm epispermo membranaceo rubescenti cotyledonibus crassis albis plano-convexis plumula basali. Fig. 3.

Typus: Colombia, dep. Chocó: area of Baudó, near the Bocana of Río Baudó on left bank of the river near the headwaters of Estero del Medio, coll. Ferb. 1967, H.P. Fuchs & L. Zanella 21944. Holotypus, US.

This is the second record for a collection of *Phragmoechea* and the first in fruiting condition, the fruit of this genus being unknown to the present. The identification of the genus is based in the typical stellate-scaled trichomes spread throughout the branchlets, leaves, pedicels, calyces and epicarps.

*Phragmoechea fuchsii* differs from *P. siderosa* Cuatr. (Rev. Acad. Colomb. Cienc. 7:49, 1946) in having thinner membranaceous



and more oblong leaves which are green above and slightly ochraceous below, with sparsely distributed scales on both surfaces. *P. siderosa* has rather ovate or elliptic-ovate, coriaceous leaves covered by a ferruginous indumentum of densely distributed scales. The scales in *P. siderosa* are more deeply divided having longer rays. Only further collecting will provide the necessary elements to enable an actual comparison of flowers and fruits from both species.

*ESPELETTIA CURIALENSIS* Cuatr. sp. nov.

Caulirosula, caudice simplice usque ad 10 m. alto vaginis foliorum vetustorum spisse oblecto, tantum ad apicem folia crebra rosulata producto.

Folia lata coriacea flexibilia quando vetusta rigidula, griseo-viridia vel cinereo-viridia sessilia, lanceolata apice acuta basim versus attenuata in vaginam longam ad caudem adpressa producta. Lamina 44-52 cm longa 7-9 cm lata basim 1.4-2 cm angusta margine aspectu integra sed minusculis dentibus callosis recurvis remotis inconspicuisque munita; supra costa dense albo-sericea lanuginoso-villosa conspicua reliqua molliter tenuiterque lanuginosa, nervis secundariis plus minusve conspicuis; subtus costa valde prominenti densiuscule albo-lanata et subsericeo-villosa, nervis secundariis bene conspicuis elevatis, angulo 50°-60° divergentibus, 1-1.5 cm inter se distantibus, lanuginoso-sericeis, nervulis in reticulo plano vel parce prominulo obsoleto cum indumento lanugineo molli fere velato vagina subtus longe dense adpressequae albo-vel cinereo-barbata. Folia juvenilia mollia dense crasseque villosa-sericea alba vel cinerea in sicco albo-grisea.

Inflorescentiae axillares numerosae circa 80-90 cm longae, cymoso-paniculatae corymbiformes, capitulis latiusculis radiatis copiosis. Axis robustus 70-80 cm longus supra basim usque ad 2 cm diametenti albo-vellereus, dimidia parte inferiore 4-5 paribus foliis oppositis subcoriaceis sublanceolatis vel oblongo-lanceolatis basim versus plus minusve angustatis ad basim amplectente vaginatis, vaginis membranaceis oppositis connatis ad 2-3 cm longis, lamina 20-30 cm longa 2.5-4 cm lata, nervatione indumentoque foliorum rosulae similibus; dimidia parte superiori ramosi, 5-6 paribus ramorum oppositorum, bracteis subtendentibus foliosis sessilibus inferioribus oblongis vel lanceolato-oblongis basi amplectentibus breviterque connatis, usque ad 23 x 3 cm, sursum gradatim minoribus, superne lance-ovatis vel ovatis acutisque 4-2 cm longis 3-1.5 cm latis, semper quam ramo brevioribus et lanato-villosis. Rami elongati sursum 3-2-fissi vel simplices, inferiores valde longiores (usque ad 40 cm) magis robusti alteris gradatim minores omnes verticem paniculae altitudine attingentes vel subattingentes, ramulis oppositis gracilibus lanato-albicantibus, sursum 3-1-plo ramosis, extremo saepe capitulis tribus pedunculatis vel singulo instructis. Pedunculi maturitate 2-8 cm longi viridi-ochracei et albo-lanati.

Capitula expansa 35-40 cm diametentia disco centrali 20-24 mm diametro, 174-209 flores ferentia. Involucrum semiglobosum

basi rotundatum ad marginem circa 30 mm amplum, phyllariis sterilibus 3-seriatis 11-12, exterioribus plerumque tribus herbaceis crassiusculis violaceo-viridibus lanato-villosis, ovatis acutis 15-17 mm longis 10-12 mm latis, subexterioribus tribus ovatis vel oblongo-ovatis 14-18 x 9-11 mm, alteris tenuioribus 17-13 x 10-9 mm, omnibus nervis parallelis numerosis filiformibus intus concipuis; phyllariis interioribus fertilibus cum sterilibus similibus planis extus lanatis, 12-14 x 6-7 mm. Receptaculum convexum 10-12 mm diametro glabrum. Paleae exteriores feminei oblongis vel obovato-oblongis acutis subamplectentibus hyalinis, dorso crassiore, margine tenui, apice extus hirsuto, 10.5-10 x 3.5-4 mm. Paleae disci obovatae valde amplectentes hyalinae multinervatae apice obtusissimae barbataeque, circa 8 mm longae 4 mm latae.

Flores radii feminei ligulati exserti 3-seriati 42-53 in capitulo. Corolla lutea interdum vetusta rubescenti 11-15 mm longa; tubo crassiusculo 2.5-3 mm longo pilis pluricellularibus crassiusculis patulis brevibus copiosis et parcis glandulis minutis pediculatis munito; lamina 3.5-4 mm lata crassiuscula obovato-oblonga obtusa 2-3-dentata 5-7-nervata duobus nervis magis notatis, inferne subtus parce pilosula. Stylus 6-8 mm longus ramis lanceolato-subulatis 2-2.8 mm longis. Ovaria in serie exteriori obovata facie abaxiali plano-convexa, adaxiali costa prominente circa 4 x 2.5 mm, altera oblongiora 4.2-4.4 x 2 mm, dorso subangulato, omnia basi acuta et ad nervos calloso-marginata.

Flores disci masculi 126-156 in capitulo. Corolla lutea 8.5-9.8 mm longa glabra vel sparsissimis pilis minutis glandulosis; tubulo 3-3.5 mm longo angusto (0.6 mm diam); limbo sursum paulo ampliato (campanulato-tubuloso) 5.5-6.3 mm longo 1.8-2 mm lato, commisurale nervato, dentibus triangularibus subaequilateralis 1.2-1.5 mm longis marginibus minute papillosis. Antherae 3-3.2 mm longae basi subacutae, appendice apicali ovato-elliptica subacuta 0.5 mm longa. Stylus 9-13 mm longus basin versus angustatus apice conico breviter emmarginatus minute papillosus subapicem piloso-papillosis, postanthesim valde exsertus. Ovarium minimum sterile. Nectarium tubulosum crassiusculum breviter obtuseque 5 dentatum.

Typus: Colombia, Boyacá, páramo entre Chita y Sácama, vertiente oriental (tributaria del río Casanare), Quebrada del Curial, lugar llamado La Porquera, 3350 m alt; "tronco simple 6 m, 12 inflorescencias 80 cm long, con abundantes capítulos hojas coriáceas bastante rígidas cuando viejas, involucro verdoso-violáceo o verdoso purpúreo, lígulas amarillas al envejecer vinosas, corolas del disco amarillas", 15 Sept. 1969 collect. José Cuatrecasas & Laureano Rodríguez, 27740. Holotypus, US; isotypus, COL.

*Espeletia curialensis* is closely related to *E. uribei* Cuatr. from the paramos near Bogota. It may be distinguished by the less rigid or softer leaves which are less narrowed at the base and lack the prominent venation typical of *E. uribei*. Furthermore in *E. curialensis* the inflorescences surpass the length of the leaves, being stouter and having more leaves and flowers; the

heads, as well as the rays are larger, the tube of the ray corollas is much longer and the disc corollas are subglabrous.

*ESPELETTIA FIGUEIRASII* Cuatr. sp. nov.

Caulis brevis vel brevissimus circa 5 cm diametro ad 10 cm longus ad basim paucè ramosus vel gemmiferus, superne rosulato-foliatus, inter folia densissime longissimeque fulvo-barbatus.

Folia basilaria linearia dense rosulata. Lamina 25-30 cm longa 1-1.6 cm lata, coriacea flexibilis stricte lanceolato-linearis margine anguste revoluta apice acutissimo mucronulato (mucro 1.5 mm longo), basim versus angustata et in vaginam ampliatam producta; supra viridis costa minute pilosa deorsum dense argenteo-arachnoidea reliqua glabra; subtus albo-cinerea densissime minuteque lanuginosa et longissime villosa-sericea. Vagina 4.5-5.5 cm longa basi usque ad 2 cm lata faciebus glabris sed marginibus longissime densissimeque fulvo-barbatis.

Inflorescentia centralis axe robusto ad 1.5-2 m alto prope basim 4 cm diametro, fistuloso striato purpurascenti cum velo sericeo pilis albis longissimis adpressis plus minusve vestito  $\frac{2}{3}$  superioribus ramoso ramis ramulisque ascendentibus paniculam thyrsoideam ad 50 cm amplam extremo subcorymbosam formantibus. Rami patuli ascendentes purpuracei albido-pilosi seu floccoso-arachnoidei. Pedunculi 1-10 cm longi angusti erecti recti vel paucè curvati dense hirsutuli, pilis flexuosis 1-3 cm longis semiascendentibus plus minusve intricatis tectis. Folia caulinarum inferiora ad 30 cm longa 1.6 cm lata linearia acuta radicalia similia; superne gradatim breviora. Bracteae subtendentes 3-1 cm longae 2-1 mm latae subulatae flexuosae supra glabrae subtus villosae et resinoso-granulatae.

Capitula semiglobosa vel subglobosa 12-18 mm diametro 9-12 mm alta atropurpurea. Involucrum 9-12 phyllariis sterilibus biseriatis crassiusculis rigidulis ovato-oblongis vel lanceolato-oblongis acutato-acuminatis 7-12 mm longis 2-3 mm latis, 3-5 nervatis purpureo-viridibus vel atropurpureis extus pubescentibus pilis longiusculis ascendentibus rigidulis basim strictis acutiusculis sursum obtusiusculis; phyllariis interioribus fertilibus 6.5-7.5 x 2.3 mm ovato-oblongis acuminatis planis crassiusculis basim versus incrassatis cum costa eminenti 2-4 nervis laterilibus conspicuis, extus pilosis pilis ascendentibus 1-3 mm longis obtusiusculis (longioribus acutis), sursum sparsis pilis pistilatis. Receptaculum plano-convexum glabrum 7-9 mm diam. Paleae radii 2-3 seriatae femineae 5-6 x 2.3-1.8 mm, incrassatae rigidulae oblongae vel obovato-oblongae subite acutatae amplectentes naviculares extus praecipue sursum densiuscule hirtulo-atropiliosae, interiores angustae sursum pilis pistilatis (0.3-0.4 mm). Paleae disci amplectentes obovato-oblongae 5-6.5 x 2 mm apice subite acutato-acuminatae marginibus hyalinae dorso sursum hirtulae pilis crassiusculis pistilatis brunnescentibus 0.3-0.4 mm longis, acumine nudo.

Flores marginales feminei 68-92 in capitulo 3-4 seriati. Corolla tubulo brevi 0.8-1.5 mm longo crassiusculo apice integro, rarissime cum appendiculo adaxiali lineari stricto (ad 1 mm

longo) ornato, densissime patulo-pilosi pilis crassiusculis pistilatis 0.2-0.3 mm longis, reducta. Stylus 2.2-2.5 mm longus ramis exsertis luteolis oblongis margine revoluta 1-1.2 mm longis. Ovarium oblongum basim angustatum triquetrum plusminusve arquatum faciebus laevibus.

Flores disci pseudohermaphroditi 68-92 in capitulo. Corola 5-6 mm longa carnosula enervata vel nervis commisuralibus tantum visibilibus, tubulo stricto 2.5-3 mm longo sparse piloso pilis hyalinis obtusis vel pistilatis 0.2-0.3 mm longis, limbo bene ampliato deorsum sparsis pilis, dentibus oblongo-triangularibus 1.5 mm longis marginibus crassioribus minutissime papillosis dorso sursum dense atro-pistilato-pilosis sed apice nudo; antherae 2 mm longae basi acute auriculatae appendice apicale ovata acuta circa 0.4-0.5 mm longa. Stylus crassus 5 mm, apice conico-capitato breviter fisso minute papilloso subapicem moderate pilosus. Nectarium tubulosus basim crassior apice 5-dentatus 1.2 mm longus.

Achaenia nigra 3.2-3.6 mm longa oblonga basim versus angustata acuta triangulata basi acuta paulo curvata vel corniculata, faciebus laevibus.

Typus: Venezuela, Mérida: Sierra Nevada de Santo Domingo: Páramo de Los Granates, Loma de Paja - Las Escaleras, 3240 m alt, tronco corto con ramificación basilar a ras de suelo, hoja verde haz, blanquecina envés, eje de la inflorescencia 1.8-2 m, purpúrea con pelos blancos; capítulos 1-2 cm diam, purpúreos, muy oscuros, estilos amarillos, nom. vulg. "frailejón maguei", collect. 11 Oct. 1969, J. Cuatrecasas, L. Ruiz-Terán & M. López Figueiras 28068. Holotypus, US; isotypus MERRF.

The relationships of this species will be discussed in the forthcoming monograph. However, it may be mentioned here that *Espeletia figueirasii* resembles in habit *E. viridis* Aristeg., from which it may readily be distinguished by the discoid nature of the heads and the whitish villose-lanate indumentum of the underside of the leaves.

#### ESPELETIA MARCANA Cuatr. sp. nov.

Acaulirosula albicans. Folia coriacea crassa rigidula breviter petiolata. Lamina 26-31 cm longa 6-8 cm lata, late lanceolata utrinque attenuata apice acuta margine integra basi in brevem petiolum (circa 1 cm longum) angustata; supra albo-viridis aspectu laevis dense tomentoso-lanata pilis patulis crispis congestis oblecta, costa latiuscula densissime albo-lanuginoso-sericea notata, ceteris nervis obsoletis; subtus dense tomentoso-lanata plus costa nervisque albo villosa-lanatis, costa crassa eminentique, nervis secundariis numerosis prominentibus 45-50 utroque latere angulo 60°-70° divergentibus, nervulis minoribus venulisque minutum reticulum prominentem cum indumento velatum formantibus. Petiolus brevis cum latitudine costa reductus circa 1 cm longus dense lanato-villosus. Vagina coriacea nervato-striata adaxiali facie glabra abaxiali longe dense adpressequestrineo-villosa.

Inflorescentiae recemosae axillares numerosas folia valde excedentes, 90-100 cm longae habitu albedo-lanatae. Axis robustus 1.5 cm diametro dense albo-lanatus et vellereus inferne 3-4 foliis alternis sessilibus linearibus lanatis, inferiore supra basim 14-16 cm longa 1.3-2 cm lata vagina 2.5-3.5 cm longa, duobus tertiis superioribus racemosus. Pedunculi robustiusculi crasse albo-lanati ascendenti-erecti sursum gradatim minoribus 12-2.5 cm longis monocephalis; bracteis subtendentibus linearibus dense lanatis sursum decrescentibus 8-2 cm longis 1-0.4 cm latis.

Capitula radiata hemisphaerica 18-22 mm diametentia circa 10 mm alta. Involucrum patellatum 18-22 mm diametro, phyllariis exterioribus 8-9 oblongo-lanceolatis acuminatis dense albo lanatis 9-11 x 3 mm, discum excedentibus, phyllariis alteris sterilibus 16-18 plus minusve biseriatis tenuioribus 9-7 x 3 mm, phyllariis interioribus fertilibus teneris ovatis vel subobovatis apice subite attenuatis acuminatisque sursum lanuginoso-villosis 5.5-6 x 2.2-2.8 mm. Receptaculum plano-convexum 10-10.5 mm diametro. Paleae radii hyalinae 4.5-5 x 1.5-2 mm oblongae basim versus paulo angustatae apice triangulares acuminatae ad apicem extus barbellatae. Paleae disci hyalinae 5 x 2 mm, late oblongae apice triangulares acuminataeque sursum barbulatae.

Flores radii feminei 110-120 in capitulo triseriati. Corolla lutea 3-3.5 mm longa, tubo 1 mm longo dense piloso pilis flexuosis intricatis ad 0.8 mm longis, lamina 2-2.5 mm longa 1.6-2 mm lata subovata obtusa 3-2-dentata dentibus usque ad 1 mm longis obtusis, 3-2-nervata nervis medialis loborum, supra glabra subtus sursum sparsis pilis acutis, ad apicem tubi labio adaxiali denticiformi ovato obtuso 0.3-0.5 mm longo (cum indumento tubi velato) instructa.

Flores disci pseudohermaphroditi 260-290 in capitulo. Corolla lutea circa 5 mm longa, tubulo 2 mm longo crassiusculo praecipue sursum sparse piloso pilis usque ad 1 mm longis, limbo tubuloso deorsum sparse pilosum, dentibus triangularibus acutis 0.5 mm longis marginato-papillois dorso pilosis pilis acutis 0.2-0.5 mm longis. Antherae 1.8 mm basi breviter sagittatae appendicibus apicalis oblongo-ovatis 0.3 mm longis. Stylus 5.5 mm longus apice dilatato-conico minute papilloso subapicem longiuscule papillosus. Nectarium tubulosum crassum 0.6 mm altum obtuse quinqueangulatum.

Typus: Venezuela, Táchira: Páramo del Colorado, continuación del Páramo del Zumbador 3100-3200 m alt., 1 Oct. 1969 collect. J. Cuatrecasas, M. López-Figueiras & Luis Marceno 27993. Holotypus, US; isotypus MERR.

*Espeletia marcana* is related to *E. thyriformis* A. C. Smith from which it differs mainly by the larger, broad-lanceolate leaves (with the shape of those of *E. grandifolia*), by the racemose inflorescence, by the larger heads and flowers and the smaller rays which possess longer tube.

SENECIO RUITERANII Cuatr. sp. nov.

Frutex erectus usque 1 m altus vel plus minusve sarmentosus,



divaricato-ramosus, caule 1 cm diametro cortice badia suberosa fissurato-striata rugosaque. Rami terminales plerumque erecti striati viridi-ochracei dense tomentosi, pilis malpighiaceis furcis tectis.

Folia alterna petiolata coriacea prope terminationem ramulorum copiosa. Petiolus 4-7 mm longus supra sulcatus basi dilatatus, dense tomentoso-lanuginosus. Lamina 1.5-5 cm longa 0.6-2.2 cm lata. obovato-elliptica vel obovata vel elliptica saepe elongata basi cuneata apice subotusa vel subite acutata vel rotundata saepe sursum 5-3-dentata dentibus triangularibus acutis brevibus interdum integerrima, margine revoluta; supra viridis vel griseo-viridis, juvenili statu adpresse pilosa denique glabrata minutissimeque tuberculata, costa parum conspicua alteris nervis obsoletis; subtus dense crasseque-vel cinereo-tomentosa pilis brachiatis et furcis flexuosis intricatis adpressis obtecta, costa et duobus vel tribus nervis utroque latere satis curvato-ascendentibus prominentibus, alteris nervulis nullis.

Inflorescentia terminalis corymbosa brevis plerumque folia non attingens, axe brevi angulato ochraceo-tomentoso 5-10-ramis monocephalis teneris ochraceo-tomentosis angulatis 0.5-3 cm longis, bracteolis 2-4 mm longis parvis linearibus strictis acutis instructis ad apicem interdum tantum 1-3 ad modum calyculi. Capitula radiata. Involucrum cylindraceum circa 7-7.5 mm longum lanuginoso-ochraceum phyllariis 8-9 crassiusculis rigidulis externis linearibus acutis circa 7 x 1.5 mm, interioribus oblongis acutis 7 x 2.5-2.8 mm marginibus hyalinis. Flores feminei radiati 5-8 in capitulo; corolla lutea ligulata crassiuscula glabra 7.5-8.5 mm longa tubo 2.8-3 mm longo lamina lineari minute tridentata enervia 1.5 mm lata; stylus 5 mm longus ramis strictis 1.5 mm longis; ovarium glabrum 10-nervatum 2-2.4 mm longum; pappus albus sericeus 5 mm longus. Flores disci hermaphroditi 13-21 in capitulo; corolla lutea 7-7.5 mm longa glabra tubo amplo circa 2.8 mm longo limbo sursum sine ampliato laevi lobis triangulari-oblongis acutis 1.5-1.6 mm longis. Antherae 3.2 mm basi minute auriculatae. Stylus 6 mm, ramis 1.4 mm truncatis. Ovarium oblongum 2-2.5 mm longum 10-nervatum. Pappus albus 6 mm longus.

Typus: Venezuela, Lara: Páramo del Jabón, 3100-3400 m alt. Frútex 1 m con ramas torcidas o bejucoso, hojas coriáceas, verdes o verde-grisáceas haz, cenicientas u ocráceas envés, involucro ocráceo claro, lígulas amarillas, 2 Nov. 1969, J. Cuatrecasas, L. Ruiz Terán & López Figueiras 28204. Holotypus, US; isotypus. MERF.

*Senecio ruiternii* is a very distinct species, whose relationships are to be found with *Senecio greenmannianus* Hieron. a tree or large bush typical of the timberline of Venezuelan paramos.

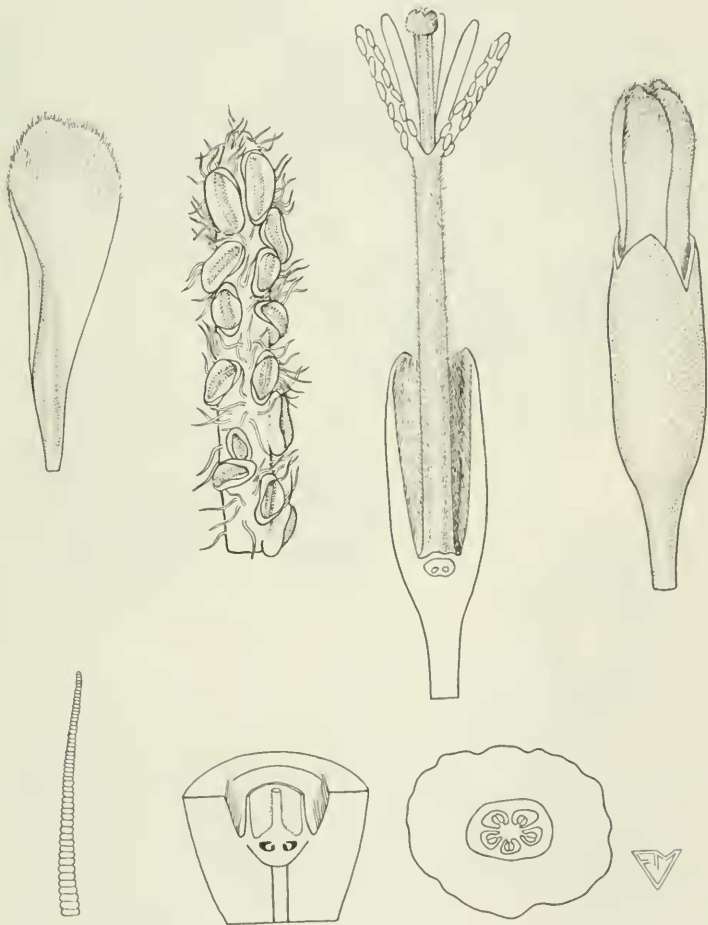


Fig. 1. *Matisia soegengii* Cuatr.: Petal, x 1; staminal lacinia, x 3; mature flowers, the petals removed, x 1; flower, x 1; hair of the anthers, x 20; vertical section of the ovary, x 2; transection of the ovary, x 3.

From *Soegeng s.n.*

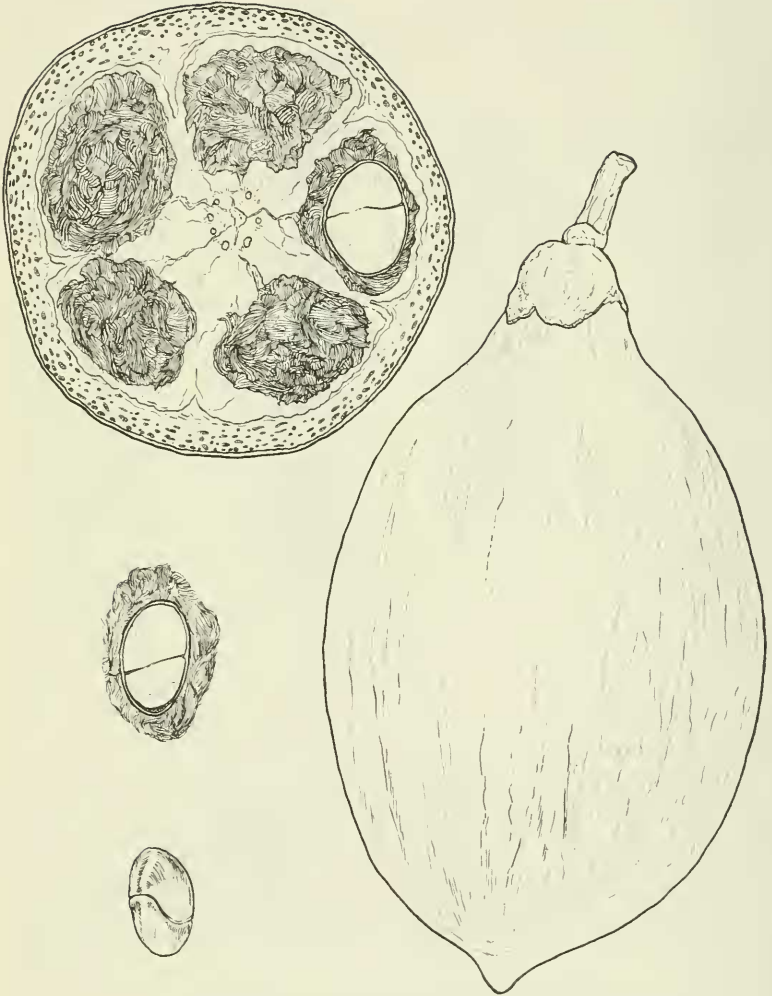


Fig. 2. *Patinoa paraensis* (Huber) Cuatr.: Transection of fruit, mature fruit, seed and cotyledons  $\times \frac{1}{2}$ . From Cuatrecasas 26647.

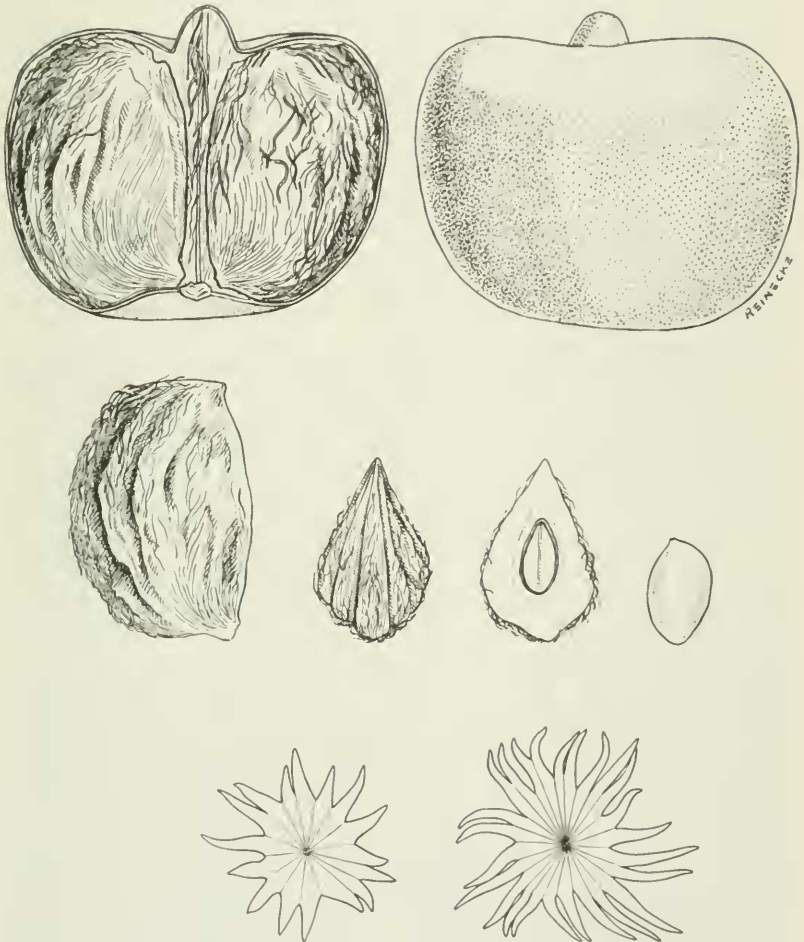


Fig. 3. *Phragmotheca fuchsii* Cuatr.: Fruit in section; fruit entire; nucule, lateral view, apical view, transection, seed, all  $\times \frac{1}{2}$ ; lower left, leaf scale of *P. fuchsii* from Fuchs & Zanella 21944; lower right, leaf scale of *P. siderosa* from Cuatr. 16558,  $\times 100$ .