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NOMENCLATURAL AND TAXONOMIC NOTES ON THE PTERIDOPHYTES OF COSTA RICA, PANAMA, AND COLOMBIA, I.

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The purpose of this paper and the one which will follow it is to publish lectotypes, new combinations, and new species of pteridophytes that will be included in my forthcoming "Ferns and Fern-allies of Costa Rica, Panama, and the Chocó."

Throughout this paper in the citation of type specimens, the word "photo" followed by a number refers to the numbered series of photographs taken by C. V. Morton and distributed from the U.S. National Museum. Photographs by others are identified by the name (and number, if any) of the person or institution who took them.

The papers also include some new combinations and new species necessary for the correct naming of specimens that de la Sota and I collected in Colombia outside the Chocó region, and which may be based on types collected in countries other than Colombia.

The principal entries are in alphabetical order for easy reference. In those cases where the principal entries are taxonomic or nomenclatural synonyms, the disposition of these names is given as I understand it at present.

Adiantum deflectens var. *tremulum* Hieron.
Bot. Jahrb. Engler 34:487. 1904.

Lectotype: To fix the application of this name, I choose from among the syntypes cited by Hieronymus: Near Colonia Tovar, Edo. Aragua, Venezuela, *Fendler 81* (US).

Discussion: This variety intergrades with var. *deflectens* Mart., and does not seem worthy of distinction. It is characterized by having lobed

pinnae with incisions between the sori and large, sterile teeth along the margins of the pinnae adjacent to the sori.

Adiantum glaucophyllum Hooker, Sp. Fil. 2:40. 1851.

Lectotype: To fix the application of this name, I choose: Boquete, Varaguas [now Pcia. Chiriquí], Panama, Feb 1849, *Seemann* (K not seen Kew photo). This is the specimen that later was illustrated by Hooker (Icon. Plant. 10: t. 961. 1854), and so is the logical lectotype. *Adiantum glaucophyllum* is a synonym of *A. andicola* Liebm.

Adiantum lucidum var. *pinnatum* Fourn. Mex. Pl. 129. 1872.

Lectotype: To fix the application of this name I choose: Teapa, Edo. Tabasco, Mexico, *Linden* (P not seen photo 2605). The other syntypes are: Oaxaca, Mexico, *Galeotti 6487* and *6492* (both P neither seen). *Adiantum lucidum* var. *pinnatum* is a synonym of *A. petiolatum* Desv.

Adiantum tetraphyllum Humb. & Bonpl. ex Willd.
Sp. Pl. ed. 4, 5:441. 1810.

Adiantum prionophyllum H.B.K. Nov. Gen. Sp. Pl. Prodr. 1:20 (fol. 16). 1815, nom. superfl. *Type*: A renaming of *A. tetraphyllum* Humb. & Bonpl. ex Willd., and so based on the lectotype of that name.

Lectotype: To fix the application of this name, I choose: Near Guanaguana and Caripe, Edo. Monagas, Venezuela, *Humboldt & Bonpland* (B-Hb. Willd. 20082-2 not seen Tryon photo). The other syntype is: West Indies, *Vahl* (B-Hb. Willd. 20082-1 not seen Tryon photo).

Adiantum tetraphyllum var. *majus* Fourn. Mex. Pl. 129. 1872.

Discussion: Because Fournier cites only Mexican specimens and a single valid species (*A. fructuosum* Kunze ex Spreng.) in synonymy, but gives no description, it is mandatory to base the variety on the cited synonym, the type of which is Cuba, *Poeppig* in 1822 (LZ destroyed; isotypes B not seen fragm US, L not seen photo 259). At least one of the cited specimens (*Galeotti 6490*) is *A. pulverulentum*, and several others are *A. tetraphyllum*. Possibly none of the cited specimens are *A. fructuosum*.

Adiantum trapeziforme L. Sp. Pl. 2:1097. 1753.

Lectotype: To fix the application of this name, I choose: Plate 59 of Sloane's "Voyage," which Linnaeus called "bona." Linnaeus' description "pinnis rhombeis" agrees better with this plate than it does with the specimen labelled "Adiantum 14 trapeziforme" in the hand of

Linnaeus (LINN 1252.13 not seen microfiche S.I. Library). This specimen, although it was in the Linnaean herbarium in 1753, represents the species long known as *A. tenerum* Swartz, and so is not a suitable lectotype.

Aspidium eurylobum Christ in Bomm. & Christ,
Bull. Soc. Bot. Belg. 35:206. 1896.

Lectotype: To fix the application of this name, I choose: Puerto Viejo, confluent with the Río Sarapiquí, Pcia. Heredia, Costa Rica, *Pittier 6934* (BR not seen photo 19793; isolectotypes CR, US). The other syntypes are: *Pittier 7473* (BR not seen photo 19792; isosyntypes CR, US) from the same locality; and Tsâki, Talamanca, Pcia. Limón, Costa Rica, 200 m alt, *Pittier 9445* (BR not seen photo 19797; isosyntype CR). The latter also is a syntype of *Aspidium myriosorum* Christ under the number 9995. *Aspidium eurylobum* is a synonym of *Tectaria nicotianifolia* (Baker) C. Chr.

Aspidium myriosorum Christ, Bull. Herb. Boiss. II, 5:256. 1905.

Lectotype: To fix the application of this name, I choose: Santa Clara, Las Delicias, Pcia. Limón, Costa Rica, 500 m alt, *Biolley 10684* (US; isolectotype P not seen). The other syntypes are: Río Hondo, Madre de Dios, Pcia. Limón, Costa Rica, 200 m alt, *Pittier 10348* (P not seen; isosyntype US) and Tsâki, Talamanca, Pcia. Limón, Costa Rica, *Tonduz 9995* (P not seen; isosyntype CR). The latter also is a syntype of *Aspidium eurylobum* Christ. *Aspidium myriosorum* is a synonym of *Tectaria draconoptera* (D. C. Eaton) Copel.

Discussion: The Colombian material of this species is a little more glossy than the Central American, but I can find no substantial character to separate the two.

Aspidium rivale Mett. ex Kuhn, Linnaea 36:120. 1869.

Lectotype: To fix the application of this name, I choose: Bay of Utria, Depto. Chocó, Colombia, *Seemann* (US; isolectotype B not seen). The other syntype, Chagres, Canal Zone, Panama, *Fendler 406* (B not seen Killip photo), is *Tectaria rheosora* (Baker) C. Chr. *Aspidium rivale* is a synonym of *Tectaria rivalis* (Mett. ex Kuhn) C. Chr.

Asplenium auritum f. *diversifolium* Rosenst.
Hedwigia 46:104. 1906.

Lectotype: To fix the application of this name, I choose: Lages, Est. Sta. Catarina, Brazil, *Spannagel (Rosenst. Fil. Austrobras. Exs. 361)* (S not seen; isolectotypes L not seen photo 486, P not seen photo 4144). *Asplenium auritum* f. *diversifolium* clearly is a synonym of *A.*

cuspidatum var. *foeniculaceum* (H.B.K.) Morton & Lellinger, which is known from Costa Rica, Colombia to Bolivia, and southern Brazil.

Asplenium bradeorum Hieron. Hedwigia 60:217. 1918.

Lectotype: To fix the application of this name, I choose Tablazo, Pcia. S. José, Costa Rica, 1900 m alt, *A. & A. C. Brade (Rosenst. Fil. Costar. Exs. 11)* (B not seen; isotypes UC, fragm US). The other syntype, Mt. Tolima, Depto. Tolima, Colombia, *Lehmann 2295* (B not seen), presumably is not *A. miradorense*, which is a Central American species. *Asplenium bradeorum* is a synonym of *A. miradorense* Liebm.

Asplenium conquisitum Underw. & Maxon ex Christ, Bull. Herb. Boiss. II, 7:270. 1907.

Lectotype: To fix the application of this name, I choose: Mabess River, Jamaica, 3000 ft alt, *Maxon 1558* (US), which is the sheet Maxon designated as holotype for the species which he and Underwood never published. Although both Maxon and Christ thought *A. conquisitum* was a distinct species, it has proved to be a synonym of *A. rutaceum* (Willd.) Mett.

Asplenium erectum var. *lagesianum* Rosenst. Hedwigia 46:98. 1906.

Lectotype: To fix the application of this name, I choose: Lages, Est. Sta. Catherina, Brazil, *Spannagel 4 (Rosenst. Fil. Austrobras. Exs. 390)* (US; isolectotype S not seen). *Asplenium erectum* var. *lagesianum* is a synonym of *A. harpeodes* Kunze.

Asplenium harpeodes var. *incisum* Hieron. Hedwigia 60:238. 1919.

Lectotype: To fix the application of this name, I choose: Unduavi, North Yungas, Depto. La Paz, Bolivia, 3200 m alt, *Buchtien 101* (US; isolectotypes B not seen, P not seen photo 4167). *Asplenium harpeodes* var. *incisum* is a synonym of *A. harpeodes* Kunze.

Asplenium induratum Christ, Bull. Soc. Roy. Bot. Belg. 35: Mém. 201. 1896.

Diplazium induratum Diels, Nat. Pflanz. 1(4):226. 1899. *Type*: Based on *A. induratum* Christ, non Hooker, 1861, nom. illeg., and so based on the type of that name.

Lectotype: To fix the application of this name, I choose: Tsâki Cordillera de Talamanca, Pcia. Limón, Costa Rica, 200 m alt, *Tonduz 9438* (US; isolectotype BR not seen). The other two syntypes are from the same locality, *Tonduz 9465* (BR not seen; isosyntype US) and

9466 (BR not seen; isosyntype US). *Asplenium induratum* is a synonym of *Diplazium lindbergii* (Mett.) Christ.

Asplenium lindbergii Mett. Ann. Sci. Nat., Paris V, 2:236. 1864.

Lectotype: To fix the application of this name, I choose: Caldes, Brazil, *Lindberg 543* (B not seen), examined by D. E. Meyer (in litt. 28 June 1976). The other syntypes are from Colombia, Venezuela, and Mexico. *Asplenium lindbergii* is a synonym of *Diplazium lindbergii* (Mett.) Christ.

Discussion: The Andean material may represent a different species, *D. subnudum* (Karst.) Alston. Alston (J. Washington Acad. Sci. 48: 432. 1958) thought that "the Andean specimens are more deeply lobed than the typical . . . of Brazil." Such specimens in the U.S. National Herbarium seem to me to have wider and more persistent indusia, thus confirming Alston's opinion.

Asplenium radicans var. *uniseriale* (Raddi) Lellinger, comb. nov.

Asplenium uniseriale Raddi, Opusc. Sci. Bologna 3:291. 1819. *Type*: Brazil, *Raddi* (FI not seen).

Discussion: This variety intergrades a little with var. *partitum* (Klotzsch) Hieron. and, apparently, with var. *tripinnatum* Mett.

Asplenium sodiroi Christ in Pitt. Prim. Fl. Costar. 3(1):26. 1901.

Asplenium ebeneum sensu Sodiro, Anal. Univ. Quito 8(58):271 (repr. 146). 1893.

Lectotype: To fix the application of this name, I choose: Andes of Quito, Pcia. Pichincha, Ecuador, *Sodiro* (P-Hb. Christ not seen photo 4250). The other syntype cited by Christ is: Santa Rosa du Copey, Pcia. S. José, Costa Rica, *Tonduz 12333* (CR or P not seen fragm US), and is *A. sessilifolium* Desv. *Asplenium sodiroi* may be a valid species, or it may prove to be a form or variety of *A. sessilifolium*.

Asplenium trianae Mett. Ann. Sci. Nat. Paris V, 2:233. 1864.

Lectotype: To fix the application of this name, I choose: Prov. de Barbacoas, via de Túquerres, Depto. Nariño, Colombia, 900 m alt, *Triana* in 1853 (BM not seen photo 7049; isolectotype B? not seen). The other syntype is: Ingara, Depto. Chocó, Colombia, *Triana 157* (B? not seen; isosyntype P not seen photo 4129). *Asplenium trianae* is a synonym of *Diplazium trianae* (Mett.) C. Chr.

Athyrium palmense (Christ) Lellinger, comb. nov.

Cystopteris fragilis var. *palmensis* Christ, Bull. Herb. Boiss. II, 7:264. 1907. *Type*: La Palma, Pcia. S. José, Costa Rica, 1500 m alt, *Wercklé 17054* (P).

Discussion: This species resembles *A. skinneri* (Baker) Moore, especially in pinnule architecture, but differs in the usually alternate pinnae and subflexuous rachises and in the 2–3-pinnate-pinnatifid, not pinnate-pinnatifid or 2-pinnate frond division. The subflexuous rachises are more evident in the specimens from El Salvador and Mexico than they are in most of the specimens from Costa Rica.

Athyrium reductum Christ, Bull. Herb. Boiss. II, 4:966. 1904.

Lectotype: To fix the application of this name, I choose: Alajuelita, Pcia. S. José, Costa Rica, *Alfaro 16472* (US; isolectotypes GH, P not seen). The other syntype is: Ecuador, *Sodiro* (P? not seen), which presumably is a specimen of *A. dombeyi* Desv., a species that resembles *A. reductum*. Christ also cited the holotype of *A. ordinatum* Christ, *Wercklé 60* (P not seen photo 4041, US); this is an obvious error. The holotype bears only the name "Athyrium ordinatum Chr." because it is the holotype of that species, which appears on the page following the description of *A. reductum*. The two species differ primarily in the insubstantial character of size, and clearly are taxonomic synonyms. I cannot find any work which synonymizes either of these species under the other one. I adopt *A. ordinatum* because it is more clearly typified, and so make *Athyrium reductum* a synonym of *A. ordinatum*.

Campyloneurum falcoideum (Kuhn ex Hieron.) M. Meyer ex Lellinger, comb. nov.

Polypodium falcoideum Kuhn ex Hieron. Bot. Jahrb. Engler 34:533. 1904. *Syntypes*: Río Sucio, Costa Rica, 800 m alt, *Lehmann 1741* (B not seen; isosyntype US); and Near Desengaño, Pcia. Heredia?, Costa Rica, *Wendland 876* (B not seen).

Discussion: Myriam Meyer is the author of an unpublished Ph.D. dissertation from Southern Illinois University, Carbondale, in 1964. Her conclusion that this species, which had been put in *Polypodium* sect. *Goniophlebium*, belongs in *Campyloneurum* is correct.

Campyloneurum multipunctatum (Christ) Lellinger, comb. nov.

Polypodium phyllitidis f. *multipunctatum* Christ, Bull. Herb. Boiss. II, 5:7. 1905. *Type*: Costa Rica, *Wercklé 174* (P not seen).

Polypodium phyllitidis var. *elongatum* Hieron. Bot. Jahrb. Engler 34: 534. 1904, as "*elongata.*" *Syntypes*: Río Paez, Depto. Tolima, Colombia, 800–1300 m alt, *Lehmann 5721* (B not seen; isosyntype US);

and Cerro Yanghuan near Pindilic, Cordillera Oriental de Cuenca, Pcia. Azuay, Ecuador, 2500–2800 m alt, *Lehmann 7679* (B not seen; isosyntype US).

Discussion: This species is very distinct from typical *C. phyllitidis* (L.) Presl. by its narrow, linear, dark green, extremely dull fronds.

Campyloneurum occultum (Christ) M. Meyer ex Lellinger, comb. nov.

Polypodium occultum Christ, Bull. Herb. Boiss. II, 5:7. 1905. *Type*: Río de Las Vueltas, Tucurrique, Pcia. Cartago, Costa Rica, 364 m alt, *Tonduz 12756* (P? not seen). *Tonduz 12752* (US) is also this species from the same locality, and may actually be the type number if the published number is in error.

Ctenitis equestris var. *mutica* (Christ) Lellinger, comb. nov.

Aspidium effusum var. *muticum* Christ in Pitt. Prim. Fl. Costar. 3(1): 32. 1901. *Type*: Headwaters of the Río Bkís, Diquís basin, Pcia. Puntarenas, Costa Rica, 1500 m alt, *Pittier 10597* (BR not seen; isotype US).

Dryopteris equestris var. *heterolepis* C. Chr. K. Danske Vidensk. Selsk. Skr. VIII, 6:56. 1920. *Type*: Vicinity of Boquete, Pcia. Chiriquí, Panama, *Maxon 4951* (US; isotype C not seen).

Ctenitis hirsuto-setosa (Hieron.) Lellinger, comb. nov.

Dryopteris hirsuto-setosa Hieron. Hedwigia 46:343, t. 6, f. 16. 1907. *Type*: Above Allpayacu between Baños and Jivaría de Pintuc, Pcia. Tungurahua?, Ecuador, *Stuebel 903* (B not seen).

Discussion: This species is a member of sect. *Subincisae*.

Ctenitis lunensis (Christ) Lellinger, comb. nov.

Aspidium lunense Christ, Bull. Herb. Boiss. II, 6:55. 1906. *Syntypes*: Pont du Río Navarro, Pcia. Cartago, Costa Rica, *Wercklé* (P not seen); and Luna, quebrada orientale, Pcia. S. José?, Costa Rica, *Wercklé* (P not seen; presumable isosyntype US).

Discussion: This species is closely related to *C. pansamalensis* (C. Chr.) Ching, and has exactly the same broad, flaccid scales on the axes, but has fewer, shorter, laxer hairs on the lamina undersurface, axes, and veins.

Ctenitis palmensis (Rosenst.) Lellinger, comb. nov.

Dryopteris subincisa var. *palmensis* Rosenst. Repert. Sp. Nov. Fedde 22:11. 1925. *Syntypes*: La Palma, Pcia. Heredia, Costa Rica, 1400 m

alt, *A. & A. C. Brade 215a* (S not seen), 1450 m alt, 17 Mar 1910 *A. & A. C. Brade* (S not seen).

Discussion: This species is unusual in sect. *Hirtae* in having broad, lanceate scales on the axes, rather than the hairlike ones that are typical of the section.

Ctenitis subdryopteris (Christ) Lellinger, comb. nov.

Phegopteris subdryopteris Christ in Pitt. Prim. Fl. Costar. 3(1):36. 1901. *Type*: Edge of the Río Pedregoso, Copey, Pcia. S. José, Costa Rica, 1800 m alt, *Tonduz 11852* (BR not seen; isotype US).

Ctenitis submarginalis f. *caripensis* (Willd.) Lellinger, comb. nov.

Polypodium caripense Humb. & Bonpl. ex Willd. Sp. Pl. ed. 4, 5:202. 1810. *Type*: Near Caripe, Edo. Monagas, Venezuela, *Humboldt 428* (B-Hb. Willd. 19700-1 and 2 not seen Tryon photos).

Discussion: This name applies to material from Florida, Hispaniola, and Mexico through Venezuela, Colombia, and Ecuador. Other forms and varieties of the species exist in the Andes, Brazil, and southern South America, according to Christensen (K. Danske Vidensk. Selsk. Skr. VIII, 10:95–98. 1913).

Danaea humilis Moore, Ind. Fil. 286. 1861.

Lectotype: To fix the application of this name, I choose: Tarapoto, Depto. S. Martín, Peru, *Spruce 4769* (K not seen; isotype L not seen photo 841), which has a terminal pinna, and thus is the only syntype that agrees with the original description. The other syntypes are: Cabo Corrientes, Depto. Chocó, Colombia, *Seemann 996* (K? not seen); and "Panama" [probably Depto. Chocó, Colombia], *Fendler 389* (K? not seen). Both are odd-pinnate, proliferous or potentially so, and clearly are specimens of *D. wendlandii* Reichenb.

Dicranoglossum panamense (C. Chr.) Lellinger, comb. nov.

Eschatogramme panamensis C. Chr. Dansk Bot. Ark. 6(3):37. 1929. *Type*: Around the Agua Clara Reservoir near Gatun, Canal Zone, Panama, *Maxon 4642* (US).

Diplazium crenulatum Liebmann, K. Vidensk. Selsk. Skr. V, 1:254 (repr. 102). 1849.

Lectotype: To fix the application of this name, I choose: Between Colipa and Misantla, Edo. Veracruz, Mexico, *Liebmann* (US; isolectotype C not seen photo 5609). The other syntypes are: Barranca de Jovo, Edo. Veracruz, Mexico, *Liebmann* (C not seen photo 5607); and Hacienda de Mirador, Edo. Veracruz, Mexico, *Liebmann* (C not seen

photo 5608). *Diplazium crenulatum* is a synonym of *D. striatum* (L.) Presl.

Diplazium grandifolium var. *submarginatum* Rosenst.
Repert Sp. Nov. Fedde 22:9. 1925.

Lectotype: To fix the application of this name, I choose: Llanuras de S. Carlos, Pcia. Alajuela, Costa Rica, 200 m alt, *A. & A. C. Brade 453* (S not seen photo 6280; isolectotype NY). The other syntype is from the same locality, *A. & A. C. Brade 381a* (S not seen). *Diplazium grandifolium* var. *submarginatum* is a synonym of *D. seemannii* Moore.

Diplazium ingens Christ, Bull. Herb. Boiss. II, 4:970. 1904.

Lectotype: To fix the application of this name, I choose: Tsâki, Talamanca, Pcia. Limón, Costa Rica, 200 m alt, *Tonduz 9443* (US; isolectotype P not seen). The other syntypes are: Jiménez, Pcia. Limón, Costa Rica, 200 m, *Alfaro 16506* (P not seen; isosyntype US); Costa Rica, *Wercklé 239* (P not seen); and Zent, Pcia. Limón, Costa Rica, 31 m alt, *Tonduz 14566* (P not seen photo 4047).

Discussion: This collection is also the type of *Asplenium radicans* var. *costaricense* Christ (Bull. Soc. Roy. Bot. Belg. 35: Mém. 202. 1896).

Diplazium obscurum Christ, Bull. Herb. Boiss. II, 7:269. 1907.

Lectotype: To fix the application of this name, I choose: Tablazo, Pcia. S. José, Costa Rica, 1900 m alt, *Biolley 60* (US; isotype P not seen). The other syntypes are: Navarro, Pcia. Cartago, Costa Rica, *Wercklé* in 1905 (P not seen); and S. Lorenzo de Dota, Pcia. S. José, Costa Rica, *Pittier 2239* (P not seen; isosyntype US).

Diplazium pactile Lellinger, sp. nov.
Figure 1

Planta terrestris. Rhizoma erectum ca. 2 cm diam. squamatum; paleis lineari-lanceolatis usque ad 7 mm longis 1 mm latis bicoloribus, parte centrali brunneolis fibrosis, marginibus castaneis rigidis dentatis dentibus bifidis. Stipites ca. 80 cm longi 8–10 mm lati cinnamomei carnosi profunde sulcati omnino sparse squamati; paleis eis rhizomatis similibus praediti. Rhachides cinnamomeae vel stramineae non profunde sulcatae non alatae sparse squamatae et dense pilosulae; pilis brunneis contortis catenatis usque ad 0.5 mm longis. Laminae 60–75(90?) cm longae 30–45 cm latae papyraceae lineari-lanceolatae pinnatae vel pinnato-pinnatifidae basin versus, ad basin obtusae, ad apicem acutae vel acuminatae infra pinnatifidae, supra lobatae; pinnis basalibus sessilibus vel petiolulatis (usque ad 4 mm) oppositis vel suboppositis usque ad 25 cm longis 6–8 cm latis; pinnis superioribus sessilibus vel adnatis, 4–6 paribus sub-

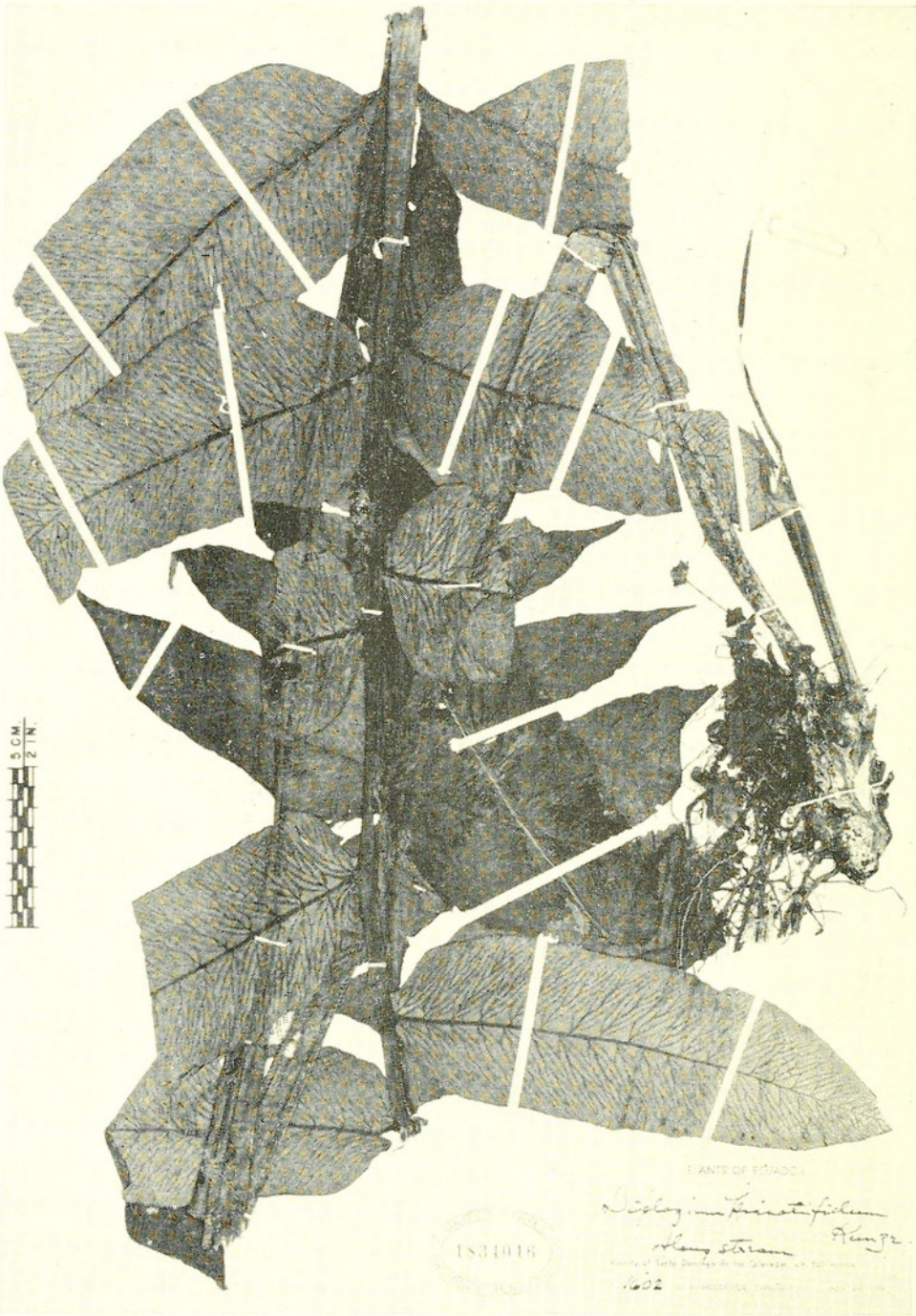

FIG. 1. Holotype of *Diplazium pactile* Lellinger, *Holdridge 1602* (US).

oppositis vel alternis 15–22 cm longis 4.5–6.5 cm latis; apice 20–30 cm longis 20–25 cm latis, lobis connatis et adnatis, infimis acutis, supernis rotundatis, areolis demissis secus rhachim praeditis; pinnis linearibus vel lanceolatis aequilateralibus integris irregulariter crenatis vel pinnatifidis (1/3 ad costam), costis usque ad 2 mm diam. infra cinnamomeis, paleis

et pilis eis rhachidis praeditis, supra stramineis glabris leviter sulcatis, in pinnis pinnatifidis costulis rectis, usque ad 25 paribus suboppositis vel alternis, venulis 1-furcatis anastomosantibus in 1 vel 2 seriebus, in pinnis integris costulis basin versus rectis, marginem versus subdichotomis 3–4-furcatis anastomosantibus in 3–5 seriebus; paginis supra glabris, venulis prominulis; paginis infra sparse pilosulis, pilis eis rachidis praeditis, venulis prominulis. Sori lineares. Indusia continua ca. 0.2 mm lata membranacea integra demum erosa.

Type: Vicinity of Santo Domingo de los Colorados, Pcia. Pichincha, Ecuador, 500 m alt, *Holdridge 1602* (US).

Paratypes: Near the Finca Sepacuite, Depto. Alta Verapaz, Guatemala, *Cook & Griggs 54* (US); Tsâki, Talamanca, Pcia. Limón, Costa Rica, ca. 200 m alt, *Tonduz 9446* (US); Vicinity of Guápiles, Pcia. Limón, Costa Rica, 300–500 m alt, *Standley 37237* (US).

Discussion: This species of subg. *Anisogonium* resembles *D. wallisii* Baker in texture, division, and venation. It is a little like *D. pinnatifidum* Kunze, but that species is smaller, more glabrous, and much more coriaceous.

Diplazium sanctae-rosae Christ, Bull. Herb. Boiss. II, 7:268. 1907.

Lectotype: To fix the application of this name, I choose: Sta. Rosa de Copey, Pcia. San José, Costa Rica, 1800 m alt, *Tonduz 12187* (US; isolectotype P not seen). The other syntype is: Costa Rica, *Wercklé 83* (P not seen).

Diplazium subsilvaticum Christ in Pitt. Prim. Fl. Costar. 3(1):28. 1901.

Lectotype: To fix the application of this name, I choose: Cañas Gordas, Pcia. Puntarenas, Costa Rica, 1100 m alt, *Pittier 10982* (US; isolectotype P not seen). The other syntype is: Achiote, Volcán Poás, Pcia. Alajuela, Costa Rica, 2200 m, *Tonduz 10728* (P not seen).

Diplazium tomentellum (Rosenst.) Lellinger, comb. nov.

Diplazium hians var. *tomentellum* Rosenst. Repert. Sp. Nov. Fedde 22:9. 1925. *Type*: Tablazo, Pcia. S. José, Costa Rica, 1900 m alt, *A. & A. C. Brade 803* (S not seen fragm US).

Gleichenia brevipubis Christ, Bull. Herb. Boiss. II, 6:280. 1906.

Lectotype: To fix the application of this name, I choose: Valley of the Río Navarro, Pcia. Cartago, Costa Rica, 1400 m alt, *Wercklé* in 1905 (P not seen photo 4478; isolectotype US). The other syntype is: Meseta Central de S. José, Pcia. S. José, Costa Rica, 2000 m alt, *Alfaro 16871* (P not seen photo 4479). The lectotype is a better developed and more typical specimen.

Gleichenia maritima Hieron. Bot. Jahrb. Engler 34:562. 1905.

Lectotype: To fix the application of this name, I choose: Near Buenaventura, Depto. El Valle, Colombia, *Lehmann 4432* (B not seen photo 10337; isotype US). The other syntype is: Above Cordova on the Río Dagua, Depto. El Valle, Colombia, *Lehmann 742* (B not seen photo 10338).

Gleichenia pectinata var. *sublinearis* Christ,
Bull. Herb. Boiss. II, 6:282. 1906.

Lectotype: To fix the application of this name, I choose: Navarro, Pcia. Cartago, Costa Rica, 3500 ft alt, *J. D. Smith 4994* (US; isolectotype P not seen). The other syntypes are: Navarro, Pcia. Cartago, Costa Rica, *Wercklé* (P not seen); Helechales du General, vallée du Diquís, Pcia. Puntarenas, Costa Rica, 700 m alt, *Pittier 12063* [not *1263*] (P not seen; isosyntype US); Boruca, Pcia. Puntarenas, Costa Rica, *Pittier 4437* (P not seen; isosyntype US); and Santiago, Costa Rica, 900 m alt, *Wercklé 16912* (P not seen). *Gleichenia pectinata* var. *sublinearis* is a synonym of *Dicranopteris pectinata* (Willd.) Underw.

Grammitis dolorensis (Hieron.) Lellinger, comb. nov.

Polypodium dolorense Hieron. Bot. Jahrb. Engler 34:512. 1904. *Type*: Santa Rosa, Depto. Antioquia, Colombia, 1700–2200 m alt, *Lehmann 7380* (B? not seen; isotype US).

Discussion: This species is like *G. chrysleri* (Copel.) Proctor, but has many stiff setae on the laminae beneath.

Grammitis epiphytica (Copel.) Lellinger, comb. nov.

Ctenopteris epiphytica Copel. Phillip. J. Sci. 84:436. 1956. *Type*: La Trojita, Río Calima, Depto. Valle, Colombia, 5–50 m alt, *Cuatrecasas 16723* (US).

Discussion: This species, which is closely related to *G. isidrensis* (Copel.) Seymour, is known only from the type.

Grammitis hombersleyi (Maxon) Lellinger, comb. nov.

Polypodium hombersleyi Maxon, Amer. Fern J. 20:1. 1930. *Type*: Gulley at mile 10.25 of the Blanchisseuse Road, Trinidad, epiphytic in moss at 2200 ft, *Hombersley 331* (US).

Discussion: This species is distinctive in its diminutive size, crenate margins, and few, pale, short trichomes on the stipe and rachis.

Grammitis limula (Christ) Lellinger, comb. nov.

Polypodium limulum Christ, Bull. Soc. Bot. Genève II, 1:218. 1909.

Lectotype: To fix the application of this name, I choose: La Palma,

Pcia. Heredia, Costa Rica, 1459 m alt, *Tonduz 12595* (US; isolectotype P not seen). The other syntypes are: La Palma, Pcia. San José, Costa Rica, *Pittier 708*, *Brade 79*, and *Wercklé* in 1903 (all P none seen).

Grammitis nigrolimbata (Jenm.) Lellinger, comb. nov.

Polypodium nigrolimbatum Jenm. Bull. Dept. Agr. Jamaica 4:69. 1897. *Type*: Near Tarapoto, Depto. S. Martín, Peru, *Spruce 4643* (K not seen); see Hooker (Sp. Fil. 4:164. 1864).

Grammitis pearcei (Bak. in Hook. & Bak.) Lellinger, comb. nov.

Polypodium pearcei Bak. in Hook. & Bak. Syn. Fil. 508. 1874. *Type*: Quichara, Peru or Bolivia?, 6000–7000 ft alt, *Pearce* (K not seen).

Discussion: Copeland (Phillip. J. Sci. 84:467. 1956) included this as a synonym of the Brazilian species *Grammitis albidula* (Baker) Morton (as *Ctenopteris*), but the holotype, *Glaziou 3579* (BR not seen photo 4971) shows that *G. albidula* has long stipes. *Grammitis pearcei* is slightly farinose beneath and has superficial sori. It is related to *G. curvata* (Swartz) Ching, which is not farinose and has slightly sunken sori.

Grammitis rosulata (Christ) Lellinger, comb. nov.

Polypodium rosulatum Christ, Bull. Herb. Boiss. 4:662. 1896. *Type*: Río Naranjo, Costa Rica, *Pittier 7953* (BR not seen photo 5027).

Grammitis semihirsuta var. *fuscosetosa* (Hieron.) Lellinger, comb. nov.

Polypodium semihirsutum var. *fuscosetosum* Hieron. Bot. Jahrb. Engler 34:515. 1904, as "*fuscosetosa.*" *Syntypes*: Río Dagua, Depto. Cauca, Colombia, 1500 m alt, *Lehmann 2982 p. p.* (B not seen); Mt. Tolima, Depto. Tolima, Colombia, Mar 1882, *Schmidtchen* (B not seen); Near Tatanera, Depto. Puno, Peru, *Lechler 2551* (B not seen), *2570* (B not seen); and Near S. Miguel Uspantan, Depto. Quiché, Guatemala, 2100–2200 m alt, *Heyde & Lux (J. D. Smith 3256)* (B not seen; isosyntype US).

Discussion: This variety has reddish brown to pale setae ca. 1 mm long scattered between the veins beneath, in contrast to var. *semihirsuta*, which is glabrous between the veins beneath, and to *G. alsopteris* Morton, which has dark setae mostly ca. 0.25 mm long abundant between the veins beneath. The Guatemalan syntype seems to be var. *semihirsuta*, and since I have seen none of the other syntypes, I do not wish to choose a lectotype.

Grammitis staheliana (Posth.) Lellinger, comb. nov.

Polypodium stahelianum Posth. Rec. Trav. Bot. Neerl., Leiden 23:401. 1927. *Type*: Emmaketen, Suriname, 700 m alt, *Gonggrijp & Stahel 5765* (U not seen photo 23).

Discussion: This rarely collected species, thought by Kramer (Amer. Fern J. 64:114. 1974) to be endemic to Suriname, is now known also from Nicaragua, Venezuela, and Colombia.

Hymenophyllum ceratophylloides Christ,
Bull. Herb. Boiss. II, 4:942. 1904.

Lectotype: To fix the application of this name, I choose: Costa Rica, *Wercklé 280* (P not seen). Morton has written on a description of this species (US), "The CR type in P is a Sphaerocionium . . . the Ecuador is Euhymenophyllum." The other syntype is: Quito, Pcia. Pichincha, Ecuador, *Sodiro* (P not seen). In all probability, *H. ceratophylloides* is a synonym of *H. lineare* (Swartz) Swartz.

Hymenophyllum siliquosum Christ,
Bull. Herb. Boiss. II, 4:938. 1904.

Lectotype: To fix the application of this name, I choose: Costa Rica, *Wercklé 289* (P not seen). The other syntype, Costa Rica, *Wercklé 307* (P not seen; isotype CR), is *H. (Sphaerocionium) lineare* (Swartz) Swartz. *Hymenophyllum siliquosum* is a member of subg. *Mecodium*.

Hypolepis pulcherrima Underw. & Maxon,
Proc. Biol. Soc. Washington 43:84. 1930.

Hypolepis purdieana sensu Jenm. Bull. Bot. Dept. Jamaica 36:10. 1892, non *H. purdieana* Hooker, 1852.

Lectotype: In publishing their name, Underwood and Maxon considered Jenman's name to be a validly published later homonym, rather than a sensu name. But this is not the case, and since sensu names are not validly published and have no types, a lectotype must be chosen from among the specimens cited by Underwood and Lloyd, whose name must be considered a new species with a description provided by Jenman. I choose: Blue Mountain Peak, Jamaica, *Maxon 9912* (US).

Lastreopsis chontalensis (Fourn.) Lellinger, comb. nov.

Aspidium chontalense Fourn. Bull. Soc. Bot. France 19:254. 1872. *Type*: Chontales, Depto. Chontales, Nicaragua, 600 m alt, *Lévy 516* (P not seen photo 4657; isotype fragm US).

Nephrodium guatemalense Bak. in Hook. & Bak. Syn. Fil., ed. 2. 498. 1874.

Lectotype: Choctum, Guatemala, *Salvin & Godman* (K not seen), chosen by Christensen (K. Danske Vidensk. Selsk. Skr. VIII, 6:96. 1920).

Discussion: This species differs from *L. exculta* (Mett.) Tindale in its narrower laminae and more closely set median pinnae.

Lycopodium attenuatum Spring, Monogr. Lyc. 2:8. 1850.

Lectotype: To fix the application of this name, I choose: Mt. Pichincha, Pcia. Pichincha, Ecuador, 11500 ft alt, *Hartweg 1470* (US; isolectotype LG? not seen). The other syntype is: Andes of Quito, Pcia. Pichincha, Ecuador, 11000–11500 ft alt, *Jameson* (K not seen).

Lycopodium pensum Lellinger & Mickel, sp. nov.
Figure 2

Planta terrestris. Rhizoma ignotum. Caulis primarius erectus teres 1 m longus usque ad 4(6?) mm latus ad basin sparse hirsutus foliaceus; foliis adpressis distantibus sublanceolatis late affixis ad basin acuminatis vel subaristatis ad apicem 6–8 mm longis 1 mm latis irregulariter et breviter ciliatis, ciliis unicellularibus rigidis. Caules secundarii horizontales subopposite vel fere verticillati usque ad 30 cm longi 2 mm lati hirsuti foliacei; foliis adpressis similibus illis caulis primarii 5–7 mm longis 0.8–1 mm latis subimbricatis. Caules tertiarii alterni 1–3.5(6.5) cm distantes cernui hirsuti 3–5-plo dichotomi usque ad 15 cm longi; ramulis ca. 1.5 mm diam. hirsutis foliaceis, foliis subadpressis similibus illis caulibus secondariis 3–4 mm longis 0.4–0.75 mm latis imbricatis. Strobili sessiles usque ad 18 mm longi 5 mm lati. Sporophylla late lanceolata usque ad 3 mm longa 1 mm lata patentia, marginibus ciliatis albidis; sporangiis subsphaericis ca. 0.8 mm in diam.

Type: 6 mi. from S. Rafael de Heredia on slopes of Volcán Barba [Cerro Chompipe]; swampy cloud forest at the end of the road, Pcia. Heredia, Costa Rica, *McAlpin 216* (DUKE; fragm GH).

Paratypes: Atlantic slope of Volcán Barba, Pcia. Heredia, Costa Rica, ca. 2000 m alt 14 Aug. 1964, *R. E. Woodruff* (FLAS, US); 12.3 mi. below Villa Mills on Interamerican Highway, Pcia. S. José, Costa Rica, *McAlpin 2377* (US).

Discussion: This species is a member of the *L. cernuum* group and is related to *L. trianae* Hieron. in having hirsute stems and ciliate leaves. Among the *L. cernuum* group, it is more treelike in its habit than most, and can be distinguished by its long, drooping tertiary branches.

Lycopodium pflanzii (Nessel) Lellinger, comb. nov.

Urostachys pflanzii Nessel, Repert. Sp. Nov. Fedde 36:181, t. 171. 1934. *Syntypes*: Near Corocoro, Depto. La Paz, Bolivia, *Pflanz* in 1920 (Hb. Nessel not seen; isotype fragm US); and San Benito,

FIG. 2. Holotype of *Lycopodium pensum* Lellinger & Mickel, *McAlpin 216* (DUKE).

Sacaba, Depto. Cochabamba, Bolivia, 3000–4000 m alt, 14 Nov 1921, *Steinbach* (B not seen).

Discussion: This species is a member of the *L. saururus* group and is notable for its broad, widely flaring leaves with distinct keel and

wide band of specialized marginal cells. It is known from one locality, Cerro de la Muerte, in Costa Rica (*Tryon & Tryon 7055*, GH).

Lycopodium trianae Hieron. Bot. Jahrb. Engler 34:574. 1905.

Lectotype: To fix the application of this name, I choose: Acostadero [Arrostradero, t. Hieron.], Depto. Chocó, Colombia, 2500 m alt, *Triana 234* (US; isolectotype B not seen). The other syntype is: Near Buenaventura, Depto. Valle, Colombia, *Lehmann 8910* (B not seen; isosyntype US).

Lycopodium verticillatum var. *parvifolium*
(Wercklé ex Nessel) Lellinger, comb. nov.

Urostachys verticillatus var. *parvifolius* Wercklé ex Nessel, Rev. Sudamer. Bot. 6:163, f. 43. 1940. *Type*: Volcán Barba, Pcia. Heredia, Costa Rica, 2100 m alt, *A. & A. C. Brade 283* (HB not seen).

Discussion: This variety is slightly distinct from typical material from Réunion in its shorter, more spreading sterile leaves.

Oleandra zapatana Lellinger, sp. nov.
Figure 3

Planta epiphytica. Rhizoma scandens 2–3.5 mm diam. squamatum ramosum; ramis sub angulo 90° abeuntibus et inter se 1–4 cm distantibus; paleis lineari-lanceolatis peltatis 4–7 mm longis 0.5–0.8 mm latis concoloribus (puncto insertionis excepto) pallide brunneis sublaxis, marginibus sparse ciliolatis, apice subcontortis. Phyllopodia 1–2 cm longa ca. 1 mm lata castanea vel brunnea nitida. Stipites sicut costae sulcati, subtus brunnei, supra obscure castanei. Stipites (2.5)5–7 cm longi (0.75)1–1.5 mm diam. nitidi glabri vel sparse pilosi; pilis 0.25–0.5 mm longis laxis subglandulosis. Costae pilosae; pilis 0.5–2 mm longis laxis. Laminae membranaceae lineari-lanceolatae, ad basin acutae, ad apicem abrupte acuto- vel acuminato-caudatae, 18–28 cm longae 4–7 cm latae simplices; marginibus integris glabris vel sparse pilosulis prope costam; venis 9–15 per cm simplicibus vel 1-furcatis. Sori indusiati plusminusve mediales pauci sparsi; indusiis circularibus ca. 0.8 mm diam. debilibus pilosis.

Type: Trail along ridge from the confluence of the forks of the Río Mutatá above the Río Dos Bocas to the top of Alto del Buey, Depto. Chocó, Colombia, ca. 1450–1750 m alt, *Lellinger & de la Sota 300* (US; isotypes COL, LP).

Paratype: Hillside above the Río Mutatá ca. 3 km above its junction with the Río El Valle near the base of Alto del Buey, Depto. Chocó, Colombia, ca. 850 m alt, *Lellinger & de la Sota 195* (US; isoparatype LP).

FIG. 3. Holotype of *Oleandra zapatana* Lellinger, *Lellinger & de la Sota 300* (US).

Discussion: This species is most closely related to *O. nodosa* (Willd.) Presl [syn. *O. articulata* (Swartz) Presl], from which it differs in its rather densely pilose stipe apex and midrib. The lamina surface near the midrib is also often short-pilose.

Phegopteris refulgens Mett. in Tr. & Planch.
Ann. Sci. Nat. Paris V, 2:240. 1864.

Lectotype: To fix the application of this name, I choose: Mouth of the Río Nercua, Depto. Chocó, Colombia, *Schott 7* (US; presumable isolectotype B not seen). The other syntypes are: Mt. Tolima, Depto. Tolima, Colombia, *Linden 1011* (B not seen); Magdalena, Colombia, 100 m alt, *Lindig 382* (B not seen); and Guyana, *Schomburgk 1183* (B not seen).

Pityrogramma dukei Lellinger, sp. nov.
Figure 4

Planta terrestris. Rhizoma erectum vel ascendens 2–3 mm diam. squamatum; paleis lanceatis usque ad 1 mm longis 0.33 mm latis concoloribus rufobrunneis nitidis rigidis, cellulis tumidis, marginibus carinatis. Stipites 14–31(34) cm longi 1–1.5 mm lati atropurpurei profunde sulcati nitidi, ad basin sparse squamati; paleis eis rhizomatis similibus praediti. Rachides atropurpureae sulcatae non alatae, in sulco flavoceraceae aliter glabrae. Laminae 15–21 cm longae (7)11–20 cm latae papyraceae lanceolatae vel deltoideo-lanceolatae, ad basin obtusae, apice acuminatae, quadripinnatae interdum quadripinnato-pinnatifidae, sursum tripinnatae, apice pinnato-pinnatifidae; pinnis basalibus petiolulatis (usque ad 10 mm) oppositis vel suboppositis usque ad 11 cm longis 6 cm latis; pinnis superioribus petiolulatis (1–8 mm) 10–16 paribus alternis vel suboppositis usque ad 7 cm longis 4 cm latis; pinnis lanceolatis aequilateralibus anadromis, ad basin inferiorem excavatis, costis usque ad 0.75 mm diam. atropurpureis leviter sulcatis alatis (0.2–0.3 mm), pinnulis inaequilateralibus usque ad 11 mm longis 6 mm latis lanceolatis anadromis, ad basin inferiorem excavatis, usque ad 12(16)-jugis 2–5(15) mm distantibus, costulis usque ad 0.1 mm diam. atropurpureis leviter sulcatis alatis (0.1 mm), segmentis ultimis pinnato-lobatis plusminusve oblancelolatis et apice bifidis vel angustis et integris, venulis pinnatis in lobis terminantibus, paginis infra ceraceis aliter glabris, supra nitidis striatis glabris, margine integris et leviter revolutis. Sori dorsales supra venulas ultimas exindusiati, sporangiis subsessilibus. Sporae triletae, atrobrunneae.

Type: Near the Río Truando, 3–5 km above the airport at La Teresita, Depto. Chocó, Colombia, *Duke 11200* (US; isotype NY).

Paratype: Quebrada with stream along the road to El Valle 8 km from Bahía Solano, Depto. Chocó, Colombia, ca. 50 m alt, *Lellinger & de la Sota 97* (US; isoparatypes COL, LP).

Discussion: This species is most closely related to *P. pearcei* (Moore) Domin, from Costa Rica, Colombia, and Peru, but differs in having yellow wax and rather broader ultimate segments with 1, 2, or sometimes 3 veins, rather than lacking wax and the narrow ultimate segments with always a single vein.

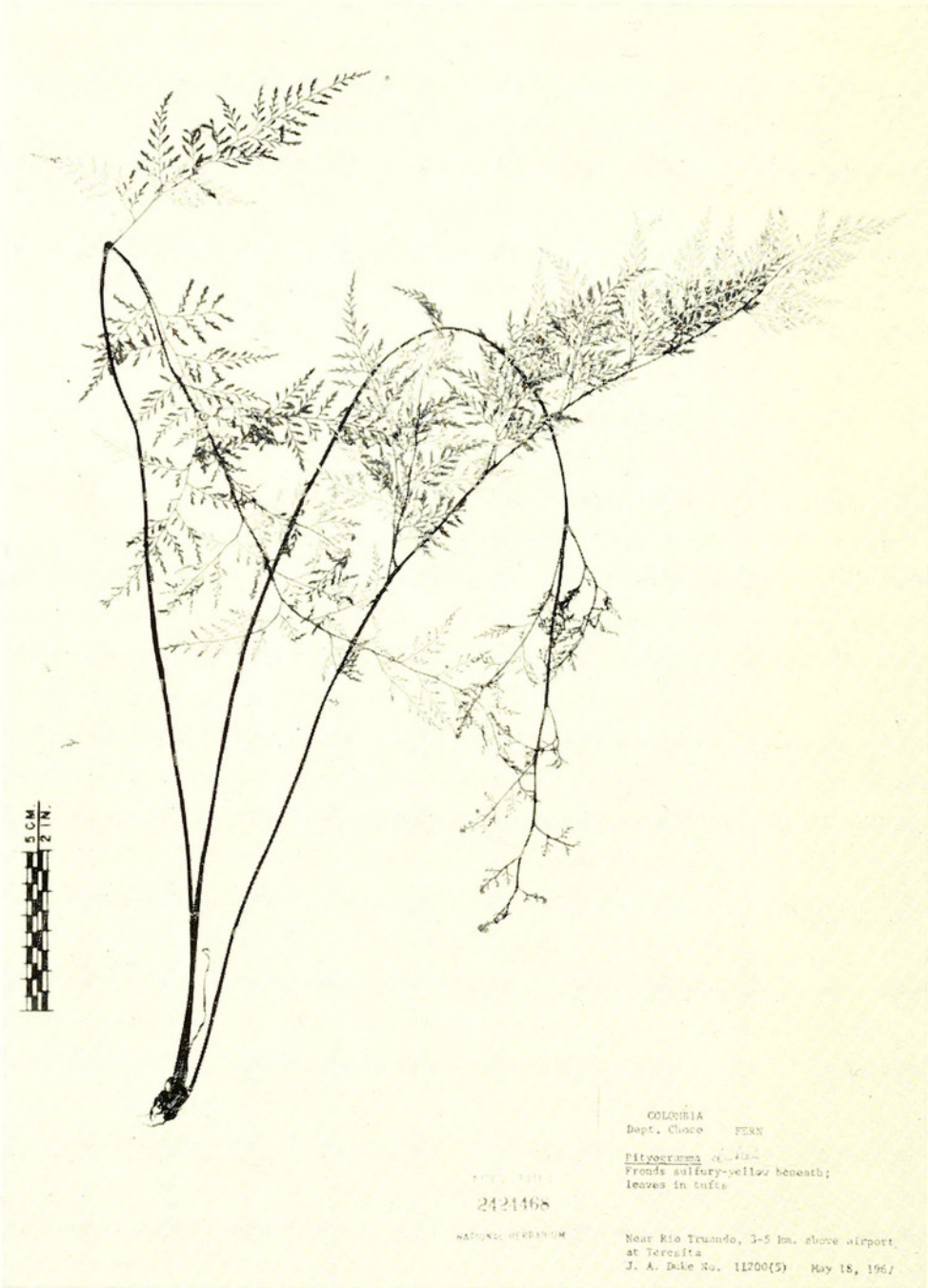

FIG. 4. Holotype of *Pityrogramma dukei* Lellinger, *Duke 11200* (US).

Pleopeltis fructuosa (Maxon & Weath. in Weath.) Lellinger, comb. nov.

Polypodium fructuosum Maxon & Weath. in Weath. Contr. Gray Herb. 65:12. 1922. *Type*: Upper Caldera River, Holcomb's trail above Boquete, Pcia. Chiriquí, Panama, 1450–1650 m alt, *Maxon 5689* (US).

Pleopeltis macrocarpa var. *complanata* (Weath.) Lellinger, comb. nov.

Polypodium lanceolatum var. *complanatum* Weath. Contr. Gray Herb. 65:8. 1922. *Type*: Juan Viñas, Pcia. Cartago, Costa Rica, *Pittier 1855* (US).

Discussion: This variety is distinguished from var. *macrocarpa* by its flattened stipes and usually longer rhizome scales.

Pleopeltis wiesbaurii (Sodiro) Lellinger, comb. nov.

Drymoglossum wiesbaurii Sodiro, Anal. Univ. Quito 11(75):312. Aug. 1894. *Type*: Río Chimbo, Pcia. Guayas, Ecuador, 300–500 m alt, *Sodiro* (Hb. Sodiro not seen).

Polybotrya lourteigiana Lellinger, sp. nov.
Figure 5

Planta hemiepiphytica. Rhizoma scandens (0.5)1–1.5 cm diam. dense squamatum; paleis linearibus ca. 1–1.25 cm longis 1–1.5 mm latis leviter bicoloribus, parte centrali crassissima obscure brunnea, marginibus subtiliter ciliatis stramineis demum omnino erosis. Stipites (12)18–28 cm longi (2)2.5–6 mm diam. straminei profunde sulcati sparse pilosi primum, basi sparse squamati; paleis eis rhizomatis similibus sed marginibus stramineis latioribus praediti. Rhachides stramineae sulcatae hirtae praesertim in sulco; pilis ca. 0.5 mm longis ferrugineis. Laminae steriles coriaceae punctatae lanceolatae vel triangulares, ad basin truncatae vel obtusae, ad apicem acuminatae, 35–90 cm longae 22–60 cm latae tripinnato-pinnatifidae (bipinnato-pinnatifidae juventute) ad basin, sursum bipinnatae, ad apicem pinnato-pinnatifidae pinnatae vel pinnatifidae; pinnis 15–22 paribus alternis vel suboppositis; pinnis inferioribus petiolulatis bipinnatis, ad basin subaequilateralibus, usque ad 30 cm longis 12.5 cm latis; pinnulis ca. 10–13 paribus liberis, ad basin subaequilateralibus usque ad 7 cm longis 2 cm latis, costulis ca. 12-jugis, venis 4(5)-jugis; pinnis superioribus sessilibus vel adnatis lineari-lanceolatis, ad basin fere aequilateralibus, 2–12 cm longis 0.7–3 cm latis pinnatis pinnatifidis vel crenato-lobatis, marginibus crenatis vel integris, costis sulcatis, subtus glabris sed costis et venis hirtis, costulis usque ad 10-jugis, venis 1–3-furcatis. Laminae fertiles subtriangulares, ad basin obtusae, ad apicem acuminatae, ca. 50–75 cm longae 25–50 cm latae quadripinnatae; pinnis ca. 20 paribus alternis vel suboppositis lanceatis vel linearibus usque ad 29 cm longis 9 cm latis, costis sulcatis, hirtis, segmentis minutis.

Type: Trail along ridge from the confluence of the forks of the Río Mutatá above the Río Dos Bocas to the top of Alto del Buey, Depto. Chocó, Colombia, ca. 1450–1750 m alt. *Lellinger & de la Sota 251* (US; isotypes COL, LP).

FIG. 5. Apical portion of the sterile frond of the holotype of *Polybotrya lourteigiana* Lellinger, *Lellinger & de la Sota 251* (US).

Paratypes: Same locality as above, *Lellinger & de la Sota 285* (US; isoparatypes COL, LP). Hillsides and base of the sheer, rock mountains, Mojarras de Tadó, 8.5 km E of Istmina, Depto. Chocó, Colombia, 150–250 m alt. *Lellinger & de la Sota 387* (US; isoparatypes COL, CR, HUA, LP).

Discussion: The sterile laminae of this species resemble those of *P. villosula* Christ, but the much shorter and less stiff hairs that are particularly abundant on the rhachises and costae are unlike those of *P. villosula*. *Polybotrya lourteigiana* also resembles some phases of *P. lechleriana* Mett., but has in general larger segments and lacks the generally stiff hairs found on the veins beneath in that species.

Polybotrya pittieri Lellinger, sp. nov.
Figure 6

Planta hemiepiphytica. Rhizoma scandens (4)5–8 mm diam. dense squamatum; paleis linearibus ca. 8 mm longis 0.6 mm latis concoloribus vel leviter bicoloribus, parte centrali obscure brunneis, marginibus ciliatis ferrugineis demum omnino erosis. Stipites (18)27–45 cm longi 3–6 mm diam. straminei sulcati pilosi primum, ad basin squamati; paleis eis rhizomatis similibus praediti. Rhachides stramineae sulcatae pilosae; pilis ca. 0.15–0.70 mm longis stramineis. Laminae steriles coriaceae triangulares, ad basin abruptae, ad apicem acutae vel acuminatae, 45–60 cm longae 32–52 cm latae, ad basin bipinnato-pinnatifidae vel tripinnatae, sursum bipinnatae, ad apicem pinnato-pinnatifidae pinnatae vel pinnatifidae; pinnis ca. 20 paribus alternis vel suboppositis; pinnis inferioribus petiolulatis pinnato-pinnatifidis vel bipinnatis, ad basin aequilateralibus, 16–28(48) cm longis 6–8(19) cm latis, pinnulis ca. 12–16 paribus liberis, ad basin subaequilateralibus, usque ad 4.5(11) cm longis 2(3) cm latis, pinnulis abaxialibus pinnulas adaxiales superantibus, costulis ca. 8–12(16)-jugis, venis 3–6-jugis; pinnis superioribus petiolulatis vel sessilibus lineari-lanceatis, ad basin subaequilateralibus, 2–18 cm longis 0.6–5 cm latis, pinnato-pinnatifidis pinnatis pinnatifidis vel crenatis-lobis, marginibus integris, subtus glabris sed costis pilosis, costis sulcatis, costulis usque ad 12-jugis, venis 1–3-furcatis. Laminae fertiles triangulares, ad basin abruptae, apice acuminatae, usque ad 40(?) cm longae tripinnato-pinnatifidae; pinnis ca. 20(?) paribus alternis vel suboppositis lanceatis vel linearibus usque ad 17 cm longis 6 cm latis, costis sulcatis pilosis, segmentis minutis.

Type: Córdoba, Dagua Valley, Pacific Coastal Zone of the Depto. Cauca, Colombia, 30–100 m alt. *Pittier* 587 (US).

Paratypes: On both sides of the ridge of the Serranía de Los Paraguas, along the trail from El Cairo to Río Blanco, ca. 8 km SW of El Cairo, Depto. Chocó–El Valle, Colombia, 2200–2250 m alt. *Lellinger & de la Sota* 843 (US). 0.3 km E of the road across the suspension bridge at ca. Km. 141 of the Ciudad Bolívar–Quibdó road, Depto. Chocó, Colombia, 750 m alt. *Lellinger & de la Sota* 899 (US; isoparatype LP). On both sides of the ridge W of La Mansa, Depto. Chocó–El Valle, Colombia, 2100–2200 m alt. *Lellinger & de la Sota* 948 (US).

Discussion: This species resembles most closely *P. osmundacea* Humb. & Bonpl. ex Willd., especially in the pilose axes, but differs from that

FIG. 6. Sterile frond of the holotype of *Polybotrya pittieri* Lellinger, *Pittier* 587 (US).

species in having the larger pinnules subequilateral at the base, and not strongly excavate at the lower base. Although it is like *P. lourteigiana* Lellinger in this character, it differs from that species in its rather stiffly pilose indument on the rhachis and costae, rather than a lax, hirtous indument.

Polypodium ambiguum Mett. ex Kuhn,
Linnaea 36:134. 1869, non Desv., 1827.

Lectotype: To fix the application of this name, I choose: Near Colonia Tovar, Edo. Aragua, Venezuela, *Fendler 254* (US; isolectotype B not seen). *Polypodium ambiguum* Mett. ex Kuhn, a nom. illeg., is a synonym of *P. ursipes* Moritz ex C. Chr.

Polypodium laxifrons var. *lividum* Kuhn ex Krug & Urban,
Bot. Jahrb. Engler 24:126. 1897.

Lectotype: To fix the application of this name, I choose: Mt. Guaraguao, Adjuntas, Puerto Rico, *Sintenis 4328* (US). *Polypodium laxifrons* var. *lividum* is a synonym of *Grammitis asplenifolia* (L.) Proctor.

Polypodium loriceum f. *duplisorum* Domin, Pterid. Dominica 130. 1929.

Lectotype: To fix the application of this name, I choose: Heights of Aripo, Trinidad, *Broadway 9957a* (NY; isolectotype US). The other syntypes are: Grenada, Sherring in 1890–91 (K? not seen); Mount Tocuche, Trinidad, *Britton, Hazen & Mendelson 1324* (NY; isosyntype US); Trinidad, *Fendler 83* in 1877–80 (US); and Trinidad, *Hart 6771* (NY? not seen).

Discussion: This form probably does not deserve recognition, but should be considered a synonym of *P. loriceum* L.

Polypodium nicotianifolium Baker, Syn. Fil. 455. 1868.

Lectotype: To fix the application of this name, I choose: Mt. Chimborazo, Pcia. Chimborazo, Ecuador, *Spruce 5723* (K not seen Tryon photo). The other syntype is: Chontales, Depto. Chontales, Nicaragua, *Seemann 230* (K not seen Tryon photo); judging by the photograph, it may be a specimen of *Tectaria draconoptera* (D. C. Eaton) Copel.

Discussion: *Polypodium nicotianifolium* is a synonym of *Tectaria nicotianifolia* (Baker) C. Chr. The lectotype has the wavy, not or only slightly prominulous main lateral veins that are characteristic of that species.

Polypodium tablazianum Rosenst. Repert. Sp. Nov. Fedde 22:14. 1925.

Lectotype: To fix the application of this name, I choose: Cerro Carpintera, Pcia. Cartago, Costa Rica, 1500 m alt, *A. & A. C. Brade 149* (S not seen photo 6080; isolectotypes UC, US). The other syntypes are: Cerro Tablazo, Pcia. S. José, Costa Rica, 1900 m alt, *A. & A. C. Brade 696* (S not seen; isosyntype NY not seen) and 1800 m alt, *A. & A. C. Brade 14a* (S not seen photo 6081). *Polypodium tablazianum* is a synonym of *P. alfredii* Rosenst.

Pteris longipetiolulata Lellinger, sp. nov.
Figure 7

Planta terrestris. Rhizoma breviter repens ca. 2 cm diam. squamatum; paleis lineari-lanceolatis ca. 3–5 mm longis 0.5–0.75 mm latis bicoloribus,

FIG. 7. Apical portion of the frond of the holotype of *Pteris longipetiolulata* Lellinger, *Lellinger & de la Sota 739* (US).

parte centrali brunneo nitido rigido, parte marginali pallidiori laxo, marginibus erosis et irregulariter ciliatis. Stipites (0.5)1–3 m longi 3–5 mm diam. sulcati, ad basin atropurpurei, sursum fere straminei glabri, squamati; paleis eis rhizomatis similibus praediti. Rhachides stramineae non profunde sulcatae aculeatae, ad apicem squamatae; squamis lanceolatis

brunneis minutis et saepe similibus pilis deciduis. Laminae papyraceae vel coriaceae triangulari-deltoideae, ad basin truncatae vel obtusae, ad apicem acutae, 0.3–1 m longae 0.3–1.25 m latae tripinnato-pinnatifidae, sursum bipinnato-pinnatifidae, ad apicem pinnatifidem decrescens; costis aculeatis squamatis, paleis eis rhachidis similibus praeditis; pinnis basalibus 0.15–0.5 m longis 0.25–0.65 m latis petiolulatis (usque ad 9 cm) lanceatis, ad basin parum inaequilateralibus, sursum aequilateralibus, ad apicem pinnatifidis caudatis, pinnulis 7–14 paribus suboppositis vel rare alternis, apice caudatis; pinnis suprabasalibus 5–25 cm longis 1.5–15 cm latis petiolulatis (usque ad 1.5 cm) vel subsessilibus lineari-lanceatis aequilateralibus, pinnulis vel segmentis 8–24 paribus oppositis vel suboppositis, ad apicem pinnatifidis caudatis, segmentis 5–20 mm longis 2–5 mm latis usque ad 7 mm distantibus, ad basin decurrentibus, ad apicem acutis vel mucronulatis, venulis usque ad 13-jugis 1–2 mm distantibus 0–2-furcatis liberis (venulis commisuralibus exceptis). Sori elongati indusiati; indusiis ca. 0.25 mm latis integris membranaceis pallidis.

Type: Principal ridge and slope 2 km E of San José del Palmar, Depto. Chocó, Colombia, 1550–1650 m alt, *Lellinger & de la Sota 739* (US; isotypes COL, CR, HUA, LP).

Paratypes: "Canaan," Mt. Purace, Depto. Cauca, Colombia, 3100–3300 m alt, *Pennell & Killip 6623* (US). Páramos on the road from Bogotá to Calera, Depto. Cundinamarca, Colombia, *Woronov & Juzepczuk 5142* (US).

Discussion: This species is related to *Pteris muricata* Hooker from which it differs in its larger size and much longer petiolules, especially on the basal pinnae. It is also much less pedate, with the basal pinnules of the basal pinnae subequal. Additional specimens of *P. longipetiolulata* in the U. S. National Herbarium are from other departments in Columbia (Magdalena, Santander, and Antioquia); all specimens of this species known to me have been found in the various ranges of the Andes from 2300 to 3500 m, with the exception of the type, which is also by far the largest specimen.

Selaginella estrellensis Hieron. Hedwigia 41:200. 1902.

Lectotype: Estrella, Pcia. Cartago, Costa Rica, 4400 ft alt, *J. J. Cooper 6062* (US; isolectotype B not seen), chosen by Alston (Bull. Brit. Mus. Nat. Hist. 1:249. 1955). Other syntype is: Near La Carpintera, Pcia. Cartago, Costa Rica, *Pittier & Tonduz 48* (B not seen; presumable isosyntype "*Pittier 118*" US).

Selaginella wendlandii Hieron. in Engl. & Prantl, Nat. Pflanzenfam. 1(4):683. 1901.

Lectotype: The original publication mentioned no types. Several syntypes are cited in a later paper by Hieronymus (Hedwigia 41:186. 1902). From among these I choose: Near San Miguel, Costa Rica,

Wendland 771 (B not seen). The other syntypes are from Guatemala: Near Pansamalá, Depto. Alta Verapaz, 1300–1400 m alt, *von Tuerckheim 679* (B not seen; isosyntype US); and between Santa Cruz Almor and Ixcan, Depto. Huehuetenango, Sept 1876, *Bernoulli* (B not seen). *Selaginella wendlandii* is a synonym of *S. oaxacana* Spring.

Stigmatopteris clypeata (Maxon & Morton) Lellinger, comb. nov.

Dryopteris clypeata Maxon & Morton, Bull. Torrey Bot. Club 66:52. 1939. *Type*: Hills back of Puerto Obaldía, Com. S. Blas, Panama, 50–200 m alt, *Pittier 4309* (US).

Discussion: This species is known only from the type.

Stigmatopteris killipiana Lellinger, sp. nov.
Figure 8

Planta terrestris. Rhizoma breviter repens 0.5–1 cm diam. squamatum; paleis lineari-lanceolatis ca. 3–5 mm longis 1–1.5 mm latis concoloribus rufobrunneis vel castaneis nitidis rigidis, marginibus integris. Stipites ca. 50 cm longi 3–5 mm diam. sulcati sparse squamati, subtus atropurpurei vel brunnei, supra fere straminei; paleis in dimidio inferioris stipitum eis rhizomatis similibus praediti; paleis in dimidio superioris stipitum eis rhachidis similibus praediti. Rhachides stramineae vel brunneae, supra sulcatae, in sulco pilosae, squamatae; paleis linearibus usque ad 5 mm longis 0.5 mm latis stramineis. Laminae papyraceae triangulares, ad basin truncatae vel obtusae, ad apicem acutae, 38–53 cm longae 24–31 cm latae pinnatae sursum pinnatifidae, ad apicem pinnatifidae vel lobatae; pinnis et lobis ascendentibus, marginibus crenatis vel integris, ad basin obtusis basi inferiore excavatis, ad apicem crenatis subcaudatis, glabris; pinnis inferioribus petiolulatis (usque ad 4 mm) 3–5 paribus oppositis vel subopppositis 10–15 cm longis 2.5–4.5 cm latis lineari-lanceolatis vel rare ovato-lanceolatis, costulis 18–25(30)-jugis 4–7 mm distantibus, venis usque ad 7 paribus anastomosantibus, venulis liberis excurrentibus 1 vel 2; pinnis superioribus adnatis 2–4 paribus subopppositis vel alternis 7–12.5 cm longis 1.25–2.5 cm latis lineari-lanceolatis vel subquadratis, costulis 16–20(22)-jugis 2.5–3.5 mm distantibus, venis usque ad 5(6) paribus anastomosantibus, venulis liberis excurrentibus 1 vel 2. Sori exindusiati usque ad 8 singulariter vel in paribus inter costulas rotundati leviter elongati vel interdum confluentes, receptaculo non elevato.

Type: Hillside above the Río Mutatá ca. 3 km above its junction with the Río El Valle, near Alto del Buey, Depto. Chocó, Colombia, ca. 850 m alt, *Lellinger & de la Sota 194* (US; isotypes COL, CR, HUA, LP).

Paratypes: Trail along ridge from the confluence of the forks of the Río Mutatá above the Río Dos Bocas toward the top of Alto del Buey, Depto. Chocó, Colombia, ca. 950–1450 m alt, *Lellinger & de la Sota 221* (US; isoparatypes COL, LP). Deep ravine near Frijoles, Canal Zone,

FIG. 8. Holotype of *Stigmatopteris killipiana* Lellinger, *Lellinger & de la Sota 194* (US).

Panama, *Killip 2919* (US). Between Frijoles and Monte Lirio, Canal Zone, Panama, 30 m alt, *Killip 12147* (US).

Discussion: This species differs from *S. alloeoptera* (Kunze) C. Chr. in having pinnae that are exavate at the lower base and slightly decur-

rent, rather than not excavate and strongly decurrent and from S. *opaca* (Baker) C. Chr. (syn. *Dryopteris christii* C. Chr.) in having usually discrete rather than meniscioid sori.

Trichomanes eximium var. *crispulum* Rosenst.
Repert. Sp. Nov. Fedde 20:89. 1924.

Lectotype: To fix the application of this name, I choose: Organ Mountains, Est. Rio de Janeiro, Brazil, *Luetzelburg 6196* (US; isolectotype M not seen). Rosenstock cited six other syntypes from the area, all Luetzelburg collections and all deposited at M. *Trichomanes eximium* var. *crispulum* is a synonym of *T. diaphanum* H.B.K.