

NOTES ON NEOTROPICAL EUPHORBIACEAE

3. Synopsis of Caribbean *Sapium*

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When working on the Euphorbiaceae of the Guayana Highland I frequently had to extend my studies over the whole of South America. Here I encountered great difficulties with the genus *Sapium*. The variability of characters, coupled with a lack of morphological discontinuity between the species, made the impression of a high plasticity of subgeneric taxa and a free flow of genes, probably also combined with a great deal of introgression.

Extending my studies subsequently to the Caribbean area I was pleasantly surprised by the decrease of difficulties and the sharpness of morphological boundaries between the species, especially in the West Indies. Although the differences between the individual species remain small and the variability great, the specific limits are better defined and the flow of genes less free.

It is interesting to follow *Sapium jamaicense* from West to East through Cuba, Jamaica, Hispaniola to Porto Rico, where its distribution ends sharply; but before it ends completely it gives rise to a closely related, well defined local species *S. laurocerasus*. This is not the case when tracing *S. jamaicense* westward into Central America and southern Mexico. Here *S. pleiostachys* appears on the scene as a local, closely related species, connected with transitional forms and only acceptable as a separate entity because of the complete lack of this form in the east.

It is true that the collections are much more complete in the West Indies than in southern Mexico and Central America, which makes the geographical comparisons less reliable.

An interesting feature is the close relationship of the group *cuneatum* - *leucogynum* - *haitiense* - *adenodon* - *maestrense* - *cubense* - *moaense* - *parvifolium* and *erythrospermum*. All endemics concentrated in a small area between Jamaica, Cuba Oriente, and the western tip of Haiti, they are characterized by cuneate leaf form, unpronounced submerged lateral nervature and lack of petiolar glands. Although these forms are all closely related, their specific limit is sharp and definite.

Sapium is confined to the tropics. It hardly crosses the geodetical limits of the Tropics of Cancer and Capricorn. The southern limit is reached only by xerophytic types, and Dr.

Howard Irwin informs me that this line corresponds to the Frost Line. The northern limit is in the Sonoran Desert and is reached by two species: S. pedicellatum and S. lateriflorum.

As defined today, Sapium is restricted to the neotropics and its place in the paleotropics is taken by Excoecaria. The two genera are no doubt closely related, but differ sharply in the male calyx which is synsepal and bifid in Sapium with wide lobes, and gamosepal and divided into 2-3 free sepals in Excoecaria. In addition, Excoecaria never has any petiolar glands and its seeds are not arillate or carunculate, but completely enclosed in the epidermis, and the bracts are not conspicuously biglandular at the base, as in Sapium.

Leonard has questioned recently the validity of this distinction (Bull. Jardin de l'Etat 29: 133-146. 1959). More knowledge of African Excoecaria will be necessary on my part to enable me to discuss Leonard's objections.

The name Sapium first appeared in the literature in Patrick Browne: The civil and natural history of Jamaica 1756, where he described it as Sapium I, without a specific epithet. In all probability it represented what we call today S. jamaicense Sw. 1829.

Jacquin gave a generic description in Enum. Plant. Carib. 9. 1760 of Sapium and provided it with a specific epithet aucuparium without specific description, so the epithet remained invalid.

The nomenclatural vicissitudes of Sapium, however, goes back to the first and second editions of Species Plantarum where Linnaeus described Hippomane glandulosa in the first edition which he corrected in the second edition to biglandulosa. This binominal is so broadly conceived that it could include the entire genus Sapium without its eglandular species. Linnaeus acquired Browne's herbarium in 1758, but there is no indication in the second edition that he changed his mind in regard to the broadness of his concept.

In 1866 DC. Prodr. 15,2 and in Mart. Fl. Bras., Muller transferred Sapium to Excoecaria, whereas Baillon (Etude General des Euphorbiacees. 1858) included it in his broadly circumscribed Stillingia.

Pax retransferred the neotropical portion of Muller's Excoecaria back to Sapium, and in the following we accept Pax's interpretation.

In my Synopsis of South American Sapium I distinguished 58 species. To this we now have to add 27 Caribbean species, bringing the total to 85.

It is well to keep in mind that the number of binominals will have to be reduced when more material becomes available. The binominals: harrisii, bourgeaui and nitidum also may become synonyms of cuneatum, oligoneurum and lateriflorum.

The key presented below refers to Caribbean species only. A key to comprise the entire genus Sapium with its 85 species will yet have to be constructed at a future date.

Clavis Specierum Caribaeo-Americanarum

1. Patentinervia. Costae secundariae numerosae, densae fili-formes, rectae, sub marginem tantum adscendentes vel dictyodromae. Folia praecipue majora 11-14 (35) cm longa, 4-6 cm lata, ovata vel late ovato-lanceolata, apice rotundata cum acumine parvo, plana nunquam cucullata vel unguiformia, basi late cuneata vel rotundata. Spicae apice ramulorum plures in fasciculas confertae. Glandulae petiolares obsoletae vel inconspicuae. Petioli longi.
2. Costae secundariae angulo 70°-80° insidentes, sub marginem tantum arcuato adscendentes.
3. Glandulae petiolares obsoletae (Jamaica, Cuba, Hispaniola, Porto Rico, Honduras, Guatemala, Chiapas) 1. jamaicense
3. Glandulae petiolares parvae, sed distinctae (Guatemala, Costa Rica, Panama) 2. pleiostachys
2. Costae secundariae angulo 80°-90° progredientes, sub marginem dictyodromae; glandulae petiolares distinctae. Folia vulgo minora 7-14 cm longa rotundata, apice rotundata vel obtuse acuminata (Porto Rico) 3. laurocerasus
1. Costae secundariae paucae, laxae, arcuato adscendentes vel rectae. Ramuli spicas singulas terminales gerentes.
4. Glandulae petiolares distinctae.
5. Lamina apice cucullato-introflexa vel unguiformia.
6. Centro Americana. Folia vel rotundata vel lanceolata et longiora quam 10 cm.
7. Folia lanceolata praecipue longiora quam 10 cm.
8. Capsula sessilis. Costae secundariae rectae vel subrectae. Folia basi obtusa vel acuta margine praecipue serrata (Colombia, Panama) 4. aucuparium
8. Capsula distincte stipitata. Costae secundariae arcuato adscendentes, fere prominulae.
9. Folia margine integra 5. thelocarpum
9. Folia margine leviter crenulata. Capsula ignota; folia lanceolata, 13 cm longa, 4 cm lata 6. bourgeaui
7. Folia rotundato-elliptica, 8 cm longa, 4 cm lata, apice variabile cucullata

- vel unguiformia. Costae secundariae paucijugae, subtus crebre prominulae. Capsula sessilis vel stipitata. . . 7. oligoneurum
6. Occidentali Indiana. Folia lanceolata et mimis quam 10 cm longa.
10. Glandulae petiolares anguste cylindricae frequenter sub marginem laminae inflexae.
11. Folia leviter cucullata, 6-9 cm longa. Costae secundariae rectae, non prominulae sub marginem occultae (Cuba, Oriente). 8. daphnoides
11. Folia crebre cucullata lanceolata vel elliptica. Costae secundariae arcuatae prominentes (British Guiana, Trinidad, Tobago, Barbados). . . 9. hippomane
10. Glandulae petiolares hemisphaericae. Folia lineari vel elliptico-lanceolata, 3.5-4.5 cm longae, 1.2-1.6 cm lata, cucullata, sed cucullae parvae. Costae secundariae rectae patentes non prominulae. Ovarium biloculare. . . 10. buchii
5. Lamina apice plana.
12. Folia alterna.
13. Folia papyracea, evenia elliptico-lanceolata 7-14 cm longa, 3-6 cm lata (N. Antilles). 11. caribaenum
13. Folia coriacea, costae fere prominulae (Am. Centr., Mexico).
14. Glandulae petiolares elongatae cylindricae vel conicae divaricatae.
15. Capsula majuscula 2 cm longa et lata. Costae secundariae subrectae non prominulae. Folia lanceolata utrinque acuta subtus pallidiora. 12. macrocarpum
15. Capsula minora. Costae arcuato adscendentes. Folia majuscula late elliptica utrinque olivacea.
16. Capsulae sessiles. Spicae crassiusculae terminales. Folia majora 8-21 cm longa, 4-7 cm lata basi praecipue rotundata. Glandulae petiolares conicae. 13. pachystachys
16. Capsulae distincte stipitatae. Spicae tenues. Glandulae petiolares tenues circinales. Ramuli spicigeri laterales. Folia latiuscula. 14. pedicellatum
14. Glandulae petiolares adpressae vel hemisphaericae.
17. Ramuli spicigeri laterales. Folia majuscula 18-20 cm longa, 5 cm lata. 15. lateriflorum

17. Ramuli spicigeri terminales. Folia
minora 16. nitidum
12. Folia subopposita, minora 3-6 cm longa, 2-4
cm lata, orbiculari-elliptica margine ir-
regulariter pauci-glandulosa. Speciei
photogr. tantum vidi ("Nueva Espana"). 17. ruizii
4. Glandulae petiolares nullae.
18. Glandulae basiliares nullae (nec petiolares,
nec laminae adnatae).
19. Folia basi anguste cuneata.
20. Folia majuscula (10-17 cm longa) coriacea
(Jamaica).
21. Ovarium sessile 18. cuneatum
21. Ovarium stipitatum 19. harrisii
20. Folia minora (7-10 cm longa, 3.5-4.3 cm
lata) membranacea.
22. Folia margine tenuissime dentata.
23. Spicae axillares. Styli liberi.
Stipulae minusculae. Folia
margine eglandulosa (Cuba Occid.) . . .
. 20. leucogynum
23. Spicae terminales. Styli connati
ad 2/3 longitudine. Stipulae 2
mm longae. Folia supra basin
margine utrinque glandulis 1-2
sessilibus parvulis instructa
(Haiti) 21. haitiense
22. Folia margine grosse dentata (Cuba
Oriente) 22. adenodon
19. Folia basi late cuneata vel rotundata.
24. Folia majuscula (4-10 cm longa, 2 cm
lata).
25. Folia apice cuneata.
26. Folia apice acuta et cucullata,
margine tenuissime dentata.
Spicae masculae 1 cm longae
(Cuba Oriente, regio Maestra)
. 23. maestrense
26. Folia apice obtusa nec cucullata,
margine grosse dentata. Spicae
masculae 3 cm longae. Folia 8
cm longa, 3 cm lata (Cuba
Oriente, regio Moe, Nipe et
Maestra) 24. cubense
25. Folia apice rotundata vel emarginata
coriacea, supra nitidula, (Cuba
Oriente, regio Moe) 25. moaense
24. Folia minora, elliptica 2.4 cm longa,
1 cm lata, subtus brunnea (Cuba
Oriente, regio Moe, Nipe, Baracoa)
. 26. parvifolium
18. Glandulae basilares, (non petiolares) parvae,
interdum obsoletae, si adsint laminae adnatae.

27. Folia minora, minus quam 5 cm longa, (3-4.5 cm longa, 1.1-1.2 cm lata), coriacea, pallida. Glandulae ad laminam adnatae hemisphaericae. Denticulae marginis foliorum dorso bulboso incrassatae (Cuba Oriente). . . 27. erythrospermum
27. Folia plus quam 5 cm longa.
28. Folia orbiculari-elliptica (7 cm longa, 4-5 cm lata), margine integra. Glandulae temes interdum sub laminam occultae (Costa Rica). 28. pittieri
28. Folia lanceolata 6-8 cm longa, 3-4 cm lata, margine crebre glanduloso-ciliata. Costae secundariae 10-jugae. Specimen non visum mihi tantum ex photogr. notum ("Nueva Espana"). . . 29. simile

1. SAPIUM JAMAICENSE Swartz

Adnot. Bot. 62. 1829; Urban, Symb. Antill. 3: 308. 1902; Huber in Bull. Herb. Boiss. Ser. 2,6: 347, f. 2. 1906; Hemsley in Hook. Ic. Pl. 29, tab. 2889. 1909; Pax et K. Hoffm., Pflanzr. 52: 205. 1912; Fawcett et Rendle, Fl. of Jamaica 325. 1920; Bro. Alain, Fl. de Cuba 3: 113. 1953. Sapium I Patr. Browne, Civ. Nat. Hist. Jamaica 1756.

Arboreum foliis ellipticis glabris, petiolis biglandulosis, floribus spicatis.

Sapium laurifolium Griseb., Fl. Brit. West Ind. Isl. 49. 1859.

Sapium laurocerasus var. ellipticum Mull. Arg., Linn. 32: 116. 1863.

Sapium laurocerasus var. laurifolium Mull. Arg., Linn. 32: 116. 1863.

Stillingia laurifolia Richards in Sagra Hist. Fis. Cuba 11: 201, tab. 69. 1850.

Excoecaria laurocerasus var. elliptica et var. laurifolia Mull. Arg. in DC. Prodr. 15,2: 1203. 1866.

Sapium aucuparium Croizat, Jour. Arn. Arb. 24: 174. 1943 non Jacquin.

Sapium anadenum K. Schuman & Pittier in Contrib. U.S. Nat. Herb. 12: 164. 1908 pro parte, quoad specimina costaricensia.

Typus: Habitat in campis montium Jamaicae, (BM) n.v.

Distribution: Jamaica, Cuba, Hispaniola, Porto Rico, Chiapas, Guatemala and Honduras.

Specimens Examined:

JAMAICA:

Lapland, near Catadupa, El. 1200 ft., Harris 9165 (NY, US, A, A).

Castleton, Castleton, Harris 9194 (NY).

Golden Valley, near Castleton, El. 600 ft., Harris 9195 (US).

- Road to Guava Ridge, El. 2200 ft., Harris 9562 (A, NY, US).
- Stanmore Hill, El. 2200 ft., Harris 9971 (sterile US, NY).
- Bachelor's Hall, Harris & Britton 10713 (NY, US).
- Rio Minho Valley, El. 1000 ft., Harris 10882, 10883 (US, NY, GH).
- Windsor Trelawny parish, El. 100-150 m, Miller 1538 (US).
- Chepstow, El. 250 ft., Proctor 8528 (GH).
- Ecclesdown, El. 1000 ft., Howard, Proctor, Wagenknecht 20525 (NY).
- One mile southeast of Millbank, El. 700-800 ft., Proctor 20656 (A).
- Island View Hill, Wilson Valley district, 1.5 miles N of Warsop, Proctor 21848 (NY).
- CUBA:
- Pinar del Rio: Rangel, Sierra del Rosario, El. 500 m, Bro. Alain 6516 (GH).
- Isle of Pines: San Juan, Britton, Britton, Wilson 15473 (NY, US).
- Matanzas: ad fl. St. John, Rugel 256 (Meisner Herb) (NY)
- Las Villas: San Blas, El. 800, Rehder 1134 (A, A, US, NY).
- Trinidad Mt., Jinblito San Blas, Conzales 586 (NY, A).
- Trinidad Mt. near Guanabana, El. 260, Britton, Earle, Wilson 4767 (NY).
- Trinidad Mt., San Blas-Buenos Aires, Howard 5385 (NY, GH).
- Vegas, east of Cienfuegos, Bro. Leon 13957 (NY).
- Harvard Tropical Garden, Soledad, Cienfuegos, J.G. Jack 4265 (US), 5244 (US, NY), 8524 (A).
- San Mateo, Jack 8524 (NY, US, A).
- San Blas, Jack 5748 (NY, US).
- Colonia Limones, Ingenierio Soledad, near Cienfuegos, Pringle 104 (NY, US, GH).
- Mino Carlota, SE of Cumanayagua, Sierra de San Juan, El. 300-400 m, Senn 310 (NY, US, GH), R.A. Howard 5620 (NY, GH).
- Hoyo de Manicaragua, Britton, Britton, Wilson 4700 (NY, NY).
- Lomas de Banao, Luna 564 (NY).
- Gavilanes, Banao Mts., Bros. Leon, M. Roco 8010 (NY).
- Bernaó Mt., Luna 654 (NY).
- Camaguey: Loma del Jaguey, Eggers 4909 (NY, A, US).
- Oriente: Puerto Padre, Curbelo 5673 (Hb Roig) (NY).
- Bayate, Monte Oscuro (Nipi), Ekman 4618 (NY).
- Moa Region, Bro. Leon 21277 (NY).
- Baracoa, Canete, Roig 123 (NY).
- Baracoa, Valley of Rio Macaguanigua,

- Ekman 4306 (NY).
 Maisi Plain, Bro. Leon 18290 (NY).
 Southern Baracoa Region, Janco-Assiba, Bro.
Leon 11813 (NY).
 Gran Piedra, Mt. Santiago, Bro. Clemente 6554
 (GH).
 Road to Olimpo, Gran Piedra, Bro. Clemente
7149 (GH, NY).
 Ensenada de Mora River Valley, Britton,
 Cowell, Shafer 12939 (NY, US).
 "Cuba Orientae", Wright 578 (Torrey Herb.)
 (NY, US, GH).

HAITI:

- Vicinity of Basse Terre, Tortae Isl., Leonard, Leonard
12426 (NY, GH, A); 13990 (NY, US, A).
 Massif de Nord, Port Margot at Riv. Limon, Ekman NH
2920 (US).
 Vicinity of St. Michel da Atalaye, Dpt. de Nord, El.
 350 m, Leonard 7275 (NY, US); GH.
 Massif des Mateux, Mirabalais, below Morne Saint d'Eau
 and Montagne Terrible, El. 400 m, Ekman NH 5512
 (A, US).
 Massif de la Selle, Port-au-Prince, near Monfleury,
 El. 150 m, Ekman 10883 (NY).
 Massif de la Selle, Leogane, Fond-de-Boudin, El. 400
 m, Ekman NH 2391 (US).
 Examined by Bro. Alain (personal inf.):
 Pétionville, Ekman 2192 (S).
 Montfleury, Ekman 10883 (S).
 Trouin, Ekman 2391 (S).

DOMINICAN REPUBLIC:

- Cordillera Septentrional, prov. Santiago, Las Lagunas
 El Penon, El. 300 m, Ekman 16211 (US).
 Lopez, prov. Santiago, Jimenez 457 (US).
 Jovenó near sea level, Abbott s.n. (US).
 Trujillo City, Schiffino 128 (GH).
 Daguilla, Schiffino 14 (US).
 Llano Costero, prov. Santo Domingo, El Manielito,
 woods beyond Rio Isabel, Ekman 17323 (US).
 Paradis prope Barahona, El. 250 m, Turckheim 2827 (US).
 Barahona, Padre Fuertes 826 (US, GH, A, A).
 El Manielito, Ekman 11323 (S). Pers. Inf. Bro. Alain.

PORTO RICO:

- Tabeiba, Holdridge 211 (NY).
 Luguillo Mountain, Holdridge 518 (NY).

MEXICO:

- Chiapas: Mt. Ovando, El. 800 m, Escuintla, Matuda
16371 (US).

GUATEMALA:

- San Felipe, Dpt. Retalhuelu, El. 700 m, J.D. Smith
2607 (US, NY).
 Finca Moca, Guatalon, Ruehl 1046 (US).
 Finca Sepacuite, Alta Vera Paz, Cook & Griggs 250 (US).

HONDURAS:

Lancetilla Valley, near Tela, Dpt. Atlantide, El. 20-600 m, Standley 55608 (US, A).

2. SAPIUM PLEIOSTACHYS Schuman & Pittier

In Contrib. U.S. Nat. Herb. 12: 164. 1908.

Sapium anadenum Pittier in Contrib. U.S. Nat. Herb. 12: 164. 1908.

Typus: Forests of Golfito de Osa, close to seashore, H. Pittier 9906 (7121) (US, US 578902), Comarca de Puntarenas, Costa Rica (GH isotypus)!

Sapium pleiostachys is closely related to Sapium jamaicense and differs from it by the regular presence of well developed petiolar glands. The morphological discontinuity is often obscured by the variability of the glands.

Typical S. jamaicense however, as found in the West Indies, does not show this variation. The transition is encountered only in Central America.

Specimens Examined:

PANAMA:

Dpt. Chiriqui, Cooper & Slater 197 (NY).

COSTA RICA:

Forested hills near Golfito de Golfo Dulce, prov.

Puntarenas, Allen 5991 (US, GH).

In climax forest, region between Rio Esquinas and

Palmar Sur de Osa, Allen 5773 (GH).

Vicinity of El General, prov. San Jose, El. 670 m,

Skutch 4235 (NY, US, A).

Basin of El General, prov. San Jose, El. 675-900 m,

Skutch 4821 (US, NY, A), 4932 (US, NY, A).

Hacienda Valverde a Orosi, El. 1200 m, photo of type

Pittier (Inst. fis. geog. Costa Rica 16366) (type of S. anadenum).

Suese, canton San Carlos, prov. Alajuela, El. 975 m,

Austin Smith 1666 (GH).

Jimenez - Santa Clara, Cooper 10201 (US, US).

Vicinity of Tilaran, prov. Guanacaste, El. 500-650 m,

Standley & Valerio 44931 (US).

Quebrada Serena, southeast of Tilaran, prov. Guana-

caste, El. 700 m, Standley & Valerio 46236 (US).

GUATEMALA:

Entre Rios, Kuyler 8891 (US).

Finca Porvenir, on Portrero Matasan along Rio Cabus,

Volcan Tajumulco, El. 1000-1300 m, Steyermark 37644 (A).

CHIAPAS:

Turquia, Escuintla, Matuda s.n. (GH).

3. SAPIUM LAURO CERASUS Desfontaines

Catalogus Plantarum Horti Regii Parisiensis, Ed. 3, 411.

- 1829; Urban, Symb. Antill. 3: 307. 1902; 4: 351. 1905;
 Huber in Bull. Herb. Boiss. 2, 6: 347, f. 1. 1906;
 Hemsley in Hook. Icon. Pl. 29, tab. 2888. 1909; Pax et
 K. Hoffm., Pflanzr. 52: 205. 1912.
Sapium laurocerasus var. genuinum Mull. Arg. in Linnaea
 32: 116. 1863.
Excoecaria laurocerasus var. genuina Mull. Arg. in DC.
 Prodr. 15, 2: 1202. 1866.
Stillingia laurocerasus Baill., Etud. gen. Euphorb. 513,
 tab. 6, f. 1-9. 1858.

Typus: Hortus Parisiensi Caldario, n.v.

Distribution: Endemic to Porto Rico.

The nervature poorly depicted in Hemsley's illustration.
 Huber's is more correct.

Specimens Examined:

PORTO RICO:

- Adjuntas, in Monte Guilarte, Sintenis 4554 (US, NY,
 GH).
 Between Arecibo and Utuado, Britton & Cowell 2061
 (US, NY).
 Mun. de Villalba, Toro Negro forest, El. 950-970 m,
Webster, Ellis, Miller 8740 (US).
 Coanzo to Caguas, Britton & Cowell 1399 (NY, US).
 Roadside near Caguas, Britton & Cowell 1399 (US).
 Sierra de Yabucoa, in Monte Cerro Gordo, Sintenis
2574 (US).
 Sierra de Naguabo, Rio Icaco and adjacent hills, El.
 465-720 m, Shafer 3493 (US, NY).
 Sierra de Naguabo, Barrio de Mairales, Britton &
Shafer 2138 (US, NY).
 Catalina-Yunque Trail, Luquillo Mt., Britton & Bruner
7558 (NY).
 El Yunque, Sargent 338 (US).
 Bosque Nacional del Caribe, Luquillo Forest, El. 500-
 600 m, Webster, Purcell 8677 (US).
 Sierra de Luquillo, Eggers 977 (W), 1213 (US).
 Sierra de Luquillo, in Monte Jimenez, Sintenis 1659
 (US).
 Los Tres Picachos, El. 1000 m, Sargent 3064 (US).
 Cultiv. Hortus Schonbrunnensis, Hb. Jacquin, Hb.
Fenzel, Hb. Endlicher, Hb. Radlkofer (W), Horn 83
 (NY).
 Luquillo Mts., Holdridge 211 (A).
 Sierra de Luquillo, in Monte Jimenez, Urban 1659
 (GH, US).
 Luquillo Forest, Schubert & Winters 405 (GH).
 Near Cerro Punta Toro Negro, El. 3500 ft., Little
13674 (A).
 Adjuntas in Monte Guilarte, Urban 2574 (GH, US),
Urban 4554 (US, GH, NY).

4. SAPIUM AUCUPARIUM Jacquin

Select. Amer. Hist. 249, pl. 158. 1763 excl. syn., et excl. Jacq. Enum. 1760; Swartz, Adnot. Bot. 63. 1829; Huber in Bull. Herb. Boiss. 2,6: 358, f. 19. 1906; Hemsley in Hook. Icon. Pl. 29, tab. 2895. 1909 non Hemsley in Hook. Icon. Pl. Vol. 27, tab. 2650. 1900 quoad est S. hemsleyanum Huber; Pax & K. Hoffm., Pflanzr. 52: 230. 1912 excl. syn. Jacq. Enum. 1760.

Sapium salicifolium H.B.K. Nov. Gen. & Sp. 2: 52. 1817.

Sapium moritzianum Kl. in Seeman. Bot. Voy. Herald 100. 1852.

Sapium giganteum Pittier, Contrib. U.S. Nat. Herb. 20: 128. 1918.

Sapium aucuparium moritzianum Pittier, l.c.

Sapium caudatum Pittier, l.c. 127.

Sapium biglandulosum var. moritzianum Mull. Arg. in Linnaea 32: 119. 1863.

Sapium biglandulosum Croiz. in Jour. Arn. Arb. 24: 175. 1943 non (L.) Mull. Arg.

Excoecaria biglandulosa var. moritziana Mull. Arg. in DC. Prodr. 15,2: 1206. 1865.

Stillingia haematantha Standl., Ann. Mo. Bot. Gdn. 27: 314. 1940.

Typus: Pl. 158 in Select. Amer. Hist. 249. 1763, growing near Cartagena in Colombia: "inque ipso suburbio Xiximani ante macellum."

Distribution: Colombia: Magdalena Valley; Panama, Honduras.

Specimens Examined:

PANAMA:

Vicinity of El Llano, Ducke 5838 (GH).

Fato (Nombro de Dios), prov. Colon, at sea level,

Pittier 4441 (US) type of S. giganteum.

Around Gamboa, Canal Zone, Pittier 3713 (US) type of

S. caudatum, El. 20-100 m, Pittier 2603 (GH, NY).

Ft. Sherman, area west of Limon Bay, Gatun Locks & Gatun Lake, Johnston 1575 (A, A).

Prov. Cocle, north rim of El Valle, Allen 1915 (US) type of Stillingia haematantha Standl.

Prov. Cocle, Aguadulce, Pittier 4951 (NY).

Prov. Los Santos, Las Takulas, Dwyer 2495 (US).

Pena Prieta, Pittier 4070 (GH, NY).

Canal Zone, one mile below Chilibi, growing on finca of Manuel Hill, Seibert 1514 (NY).

Vicinity of Concepcion, El. 100 m, Chirique, Allen 3475 (GH, NY).

HONDURAS:

Rio Lizapa, betw. Galeras and Lizapa Grande, Dpt.

El Paraizo, El. 1000 m, Molina 189 (GH).

Rio de la Orilla; Cerra Majicoran, Dpt. Morazan,

El. 850 m, Louis O. Williams 18855 (US).

Along Chorrera River drainage of Rio Yeguas 87°14',

Dpt. Morazan, El. 2600 ft., Glassman 1816 (NY).

Remarks on Nomenclature:

The name S. aucuparium published in Select. Amer. Hist. 249, pl. 158. 1763, is accompanied by a detailed description, by a good illustration and by an exact statement of occurrence at Carthagena, Colombia. The plant Jacquin described in 1763 was a living plant he saw with his own eyes.

One must, however, ignore the four synonyms: Browne. jam. 1 p. 338; Limn. sp. pl. 2 p. 1191; Plum. Ic. 171. f. 2; Pluk. alm. 369. t. 229. f. 8. Each of these represent a different species in modern sense. But Jacquin followed Linnaeus in his excessive liberality in ascribing synonyms. Sapium aucuparium Jacquin 1763 is narrowly defined and well circumscribed and leaves little chance for confusion.

The confusion began when some authors eager to follow strict priority tried to revive Jacquin's earlier (1760) publication of the epithet. The protologue of this earlier publication is inadequate for typification or identification. It lacks description, illustration or geographic reference. As a matter of fact the entire protologue consists of nothing but two synonyms: "Plum. Ic. 171. f. 2" and "Browne Jam. p. 338." They both are quite clear and adequate in themselves but definitely represent two entirely different species. Browne Jam. p. 338 probably represents S. jamaicense Sw. (1829), but the illustration Plum. Ic. 171. f. 2 with its single terminal spike, camptodrom widely spaced nervature, and conspicuous petiolar glands, excludes all possibility of identifying it with S. jamaicense, which is characterized by clustered spikes, obsolete or missing petiolar glands, and dense almost rectangular nervature.

Jacquin's loose quotation of these contradictory synonyms have no value for identification and his 1760 publication must be considered invalid.

I do not agree with Croizat (Jour. Arn. Arb. 24: 274. 1943) that Jacquin's 1763 and 1760 publications applied to two "very different plants". Nobody is in a position to know what plant - if any - Jacquin had seen or had in mind when preparing his Caribbean catalog in 1760. The difference is not in the plants he saw in 1763 and did not see in 1760, but in the validity of the two publications.

The concept of Jacquin's species was correctly interpreted by Swartz as early as 1829 ("descriptio Jacquini optima"). All botanists treating Sapium monographically accepted this interpretation: Muller Argoviensis (1863), Huber (1906), Hemsley (1908), Pax & K. Hoffman (1912), Bro. Alain (1953).

My search in Jacquin's herbarium in Vienna revealed no specimen collected by him in Carthagena, and S. aucuparium Jacquin 1763 for the time being must be typified by his illustration (tab. 158).

5. SAPIUM THELOCARPUM Schuman & Pittier

In Contrib. U.S. Nat. Herb. 12: 166, tab. 13. 1908.

Typus: Hedges at La Verbená near San José, El. 1100 m, Costa Rica, Tonduz 8857 (US, US)!

Specimens Examined:

COSTA RICA:

Along R. Ciruelas on the southern slope of Barba Volcano, El. 1800 m, Tonduz 2219 (NY).

Hacienda Tourmon, San Francisco de Guadalupe, El. 1200 m, Pittier 3669 (US, US).

Potrero, San Francisco Guadalupe, Jimenez 12 (US).

Dans une cafeerie pres de la station de San Juan, Tonduz 17558 (US).

Au bord du río Nizilla pres San Juan, Tonduz 17559 (US).

Vicinity Palmar Sur de Osa, prov. Puntarenas, Allen 5567 (US).

Environ de Nicoya, Tonduz 1900 (US).

HONDURAS:

Edge of Lake Yojoa, Howard, Briggs, Kamb, Lane, Ritland 623 (NY).

NICARAGUA:

Casa Colorada and vicinity, south of Managua, El. about 850 m, Maxon, Harvey, Valentine 7460 (US).

6. SAPIUM BOURGEOUI Croiz.

In Jour. Arn. Arb. 24: 172. 1943.

Typus: Santa Ana near Orizaba, Vera Cruz, Mexico, M. Bourgeau 3010 (A). Type.

Based on a sterile specimen. Without flowers and some doubtful loose capsules, it was impossible to distinguish it definitely from S. aucuparium or S. thelocarpum. Hemsley reported a duplicate of the same collection in the notes under S. mexicanum in Hook. Ic. Vol. 27, pl. 2680. 1901, but he abstained from describing it because of the inadequate specimen.

Another inadequate specimen is found in the Vienna herbarium: Mexico, prov. Mirador, Vera Cruz, El. 3000-3800 ft., Hohenacker s.n., with shorter leaves (9 cm long, 3-5 cm wide), otherwise undistinguishable from Bourgeau 3020.

7. SAPIUM OLIGONEURUM Schuman & Pittier

In Contrib. U.S. Nat. Herb. 12: 168, tab. 17. 1908; Pax et K. Hoffm., Pflanzr. 52: 231. 1912.

Sapium sulciferum Pittier, l.c. 169; Hemsley, Hook: Icon. Pl. 29, tab. 2892. 1909.

Sapium schippii Croiz., Am. Midl. Natur. 29: 477. 1943.

Sapium biglandulosum var. Klotzschianum Mull. Arg. in Linn. 32: 117. 1863.

Sapium biglandulosum var. oligoneurum Monachino in Bull. Torrey Bot. Club 67: 772. 1940.

Sapium biglandulosum var. sulciferum Monachino l.c.

Typus: Costa Rica: Along upper road going from the railroad station at Cartago to Cot, near San Rafael, El. 1500 m, H.

Pittier (Inst. fis. geog. Costa Rica, no. 13403; U.S. Nat. Herb. no. 578903). Type.

Distribution: Costa Rica, Panama, Nicaragua, Honduras, El Salvador, Br. Honduras, Guatemala, Mexico (Chiapas).

Specimens Examined:

COSTA RICA:

- La Hondura (San Jose), El. 1300-1700 m, Standley 37623 (US).
 La Palma, Bord de la route de la Palma, Tonduz 12428 (US), El. 1550 m. Typus of S. sulciferum. (Holotype NY).
 La Palma, au pied des troncs a la Palma, Tonduz 12428 (US), El. 1459 m.
 Road above San Isidrio de Coronado, Allen 542 (A), El. 1400-1600 m.
 San Francisco Guadalupe, Jimenez 639 (US).
 San Francisco de Guadalupe, El. 1200 m, Pittier 3670 (US, US).
 Los Cuadros near Guadalupe, El. 1200 m, Pittier 3690 (legit Jimenez) (US).
 La Palma de San Ramon, Brenes 5525 (NY).
 Rio Maria Aquilar near San Jose, El. 1200 m, Standley 38938 (US).
 La Carpintera, El. 1400-1500 m, pr. Cartago, Pittier 3668 (US).
 Cartago, El. 4500, Cooper 5940, 265 (US).
 Along River Reventado, north of Cartago, Standley & Valerio 49418, 49542 (US, US).
 Cartago vicinity, Stork 335 (US).
 San Rafael de Cartago, El. 1500 m, Pittier 13403 (US).
 Typus of S. oligoneurum.
 Alajuela, Canton Alfaio Ruiz, El Selaneaia, El. 1400 m, Austin Smith P 2294 (A).
 Regione Pacifica, peninsula Osa, and Golfo Dulce circa Puerto Jimenez, ad vias arbor 8 m, Cufodontis s.n. (Oesterr Costa Rica Exped. 1930 unter leitung Prof. Porsch (W)).

PANAMA:

Boguelli, prov. Chiriqui, El. 4000 ft., Davidson 852 (A).

HONDURAS:

- In forested lower slopes of Mt. Cangregal vicinity of La Ceiba, Dpt. Atlantido, Yuncker, Koepper, Wagner 8511 (US, NY, GH).
 Zamorano, Dpt. Morozan, El. 800 m, Williams, Molina 12687 (GH).

BR. HONDURAS:

"Forest Home". Punta Gorda, El. 250 ft., W. A. Schipp 1049 (A, NY, GH). Typus of S. schippii Croiz.

GUATEMALA:

Arroyo (Rio) Petexbatum, south of Sayaxche, El. 50 m,

Steyermark 46185 (US, A).

San Jose, Frederichstal 1315 (W, A).

Huehuetenango, Cafetal of Finca Soledad, 5 miles southeast of Barillas, Sierra de los Cuchumatanes, El. 1150 m, Steyermark 49527 (A).

CHIAPAS

En Canada hacia el Aguacate al N de La Chacoma hacia 800 m de alt., Faustino Miranda 6444 (US).

NICARAGUA:

Mombacho Volcano, El. 750-900 m, Maxon, Harvey, Valentine 7806 (US, GH).

EL SALVADOR:

Laguna de las Ranas, on hill west of Cerro del Aguila, lat. 13°54' N. Long. 88 44 W, El. 1680 m, Dpt. St. Ana, Tucker 1244 (NY, US).

A comparatively large collection is available from Costa Rica from the vicinity of San Jose. These specimens (15 of them) show a great variation of the apex of the leaves from strong cucullate to unguiform and plane. The leaf is, however, quite constantly elliptic and short and the fruit is slightly stalked.

Specimens collected at a greater distance from San Jose show often a departure from this leaf shape, which often gets more lanceolate.

The specimen collected by Steyermark at Petexbatum, Guatemala is very distinct with its large leaves and is very possibly a new species, but lack of flower and fruit does not permit a description. The specimen from Chiapas is also sterile and shows a peculiar double anastomosing venation.

8. SAPIUM DAPHNOIDES Griseb.

In Nachr. Gesellsch. Gottingen 176. 1865; Huber in Bull.

Herb. Boiss. 2,6: 349, f. 4. 1906; Pax et K. Hoffm.,

Pflanzr. 52: 205. 1912; Bro. Alain, Fl. de Cuba 3: 113. 1958.

Excoecaria biglandulosa var. daphnoides Mull. Arg. in DC. Prodr. 15,2: 1205. 1866.

Typus: Cuba, Wright 2001 (Isotype in US)!

Distribution: Endemic to Cuba.

Specimens Examined:

CUBA:

Pinar del Rio: On hill Soroa, Candelaria, Bro. Alain 2446 (NY, GH).

Las Villas: Sto. Tomas, Cienaga de Zapota, Acuna 4344 (NY).

Las Villas: Sta. Clara, Lomas de Banao, Luna 111 (NY).

Oriente: Stjago de Cuba, Roig 6825 (NY).

Oriente: Sierra Maestra, Ekman 14420 (US, NY).

Oriente: Slope of main peak of Pico Turquino, Rucher

85 (NY).

Oriente: Pico Turquino, Bro. Leon 10797 (NY).

9. SAPIUM HIPPOMANE G.F.W. Meyer

Prim. Fl. Esseq. 275. 1818; Urb. Symb. Antill. 3: 305.

1902; Pax et K. Hoffm., Pflanzr. 52: 251. 1912.

Sapium suberosum Mull. Arg. in Linnaea 34: 217. 1865.Sapium fendleri Hemsley in Hook. Icon. Pl. 29, tab.
2888. 1909.Sapium biglandulosum var. meyerianum Mull. Arg. in
Linnaea 32: 116. 1863.Excoecaria biglandulosa var. hippomane Mull. Arg. in DC.
Prodr. 1204. 1865.Sapium glandulosum Croizat in Jour. Arn. Arb. 24: 176.
1943. non MorongTypus: British Guiana: In humidis insulae Arowabish,
Hostmann 311 (vidi in hb. Vindob).Distribution: British Guiana, Suriname, Barbados, Trinidad,
Tobago.

Specimens Examined:

TRINIDAD:

Collector's name(?) 2467 (US, NY). Broadway 5203 (NY).

TOBAGO:

Louis d'Or near the river, Broadway 4527 (GH, US).Roxborough - Bloody Bay Road, El. 1000 ft., Purse-
glove 6326 (US).

BARBADOS:

Forster Hall Wood, Eggers 7238 (NY, A, US).Turner's Hall Wood, El. 200 m, Beard & Hauschell 623
(A).Newcastle Wood, St. John, Lash 187 (US, NY).Dodds, Bovell 187 (NY).St. John, St. Margaret's Woods, Gooding 427b (NY).Meyer has compared this species with Sapium jamaicense,
stating: "A Sapiro jamaicensi diversum. Foliis apice rostro
parvo subcartilagineo crasso introrsum flexo auctis."We can distinguish two forms of S. hippomane, one with
lanceolate leaves found in Trinidad and Tobago, and another
with elliptic broad leaves in Barbados.

10. SAPIUM BUCHII Urban

Arkiv. Bot. 20A, 15: 65. 1926.

Sebastiana buchii Urb. Nbl. B. G. Berlin 7: 497. 1921.Typus: Montagne noire in partibus montosis, El. 1800 m,
Buch 1673 n.v.

Distribution: Endemic to Hispaniola.

Specimens Examined:

HAITI:

Massif de Bahos, gr. Las Cahobas, Belladere, Morne Lagoune-Ibere, laterite on limestone, El. 1200 m, Ekman H 5605 (US).

Massif de la Selle, Petionville, M. Tranchant, El. 1675 m, Ekman H 1185 (US, NY).

Massif du Nord, Port de Paix, Haut Piton, El. 1100 m, Ekman H 9820 (US, A).

Baranā, Petite Source, Morne des Commissaires, El. 1520 m, Holdridge 1934 (US, GH, NY).

SANTO DOMINGO:

Cordillera Septentrional, prov. Santiago, Loma Diego de Ocampo, El. 900 m, Ekman H 16299 (US).

The majority of collections are characterized by elliptic leaves (4.5-6 x 2 cm). Two collections: Holdridge 1934 and Ekman H 5605 differ from the rest by narrow lanceolate leaves (7-9 x 1-1.5 cm).

Specimens examined by Bro. Alain (personal inf.):

HAITI:

Petit Goave, Ekman 6584 (S).

Las Cahobas, Ekman 5605 (S).

Perodin, Ekman 3455 (S).

St. Michel de Atalāye, Ekman 8377 (S), 8367 (S).

Montagnes Noires (typus) Buch 1673 (S).

Morne Tranchant, Ekman 1185 (S).

Port de Paix, Ekman 9820 (S).

Morne des Commissaires, Holdridge 1934 (S).

SANTO DOMINGO:

Diego de Ocampo, Cape Samana, Ekman 14899 (S).

Very narrow leaves.

11. SAPIUM CARIBAEUM Urban

Symb. Antill. 3: 308. 1902; Huber in Bull. Herb. Boiss. 2,6: 349, f. 3. 1906.

Sapium glandulosum Croizat, Jour. Arn. Arb. 24: 176. 1943, non Morong.

Excoecaria biglandulosa var. leptadenia Glaziou in Bull. Soc. Bot. France 59 Mem. 3g. 635. 1912.

Hippomane glandulosa L., Spec. ed. 1: 1191. 1753 (quoad syn. Plum).

Hippomane biglandulosa L., Spec. ed. 2: 1431. 1763 (quoad. syn. Plum).

Typus: In Guadalupe in regione inferiore et media usque ad 1000 m alt. e. gr. in sylvis Bains Jaunes Trois Rivieres, Duss 2932 (syntype in NY).

Distribution: Lesser Antilles.

Specimens Examined:

ST. JAN:

Cinnamon Bay Gut, Eggers s.n. (GH).

ST. KITTS:

Lambert Estate, Britton & Cowell 645 (US, NY).

ANTIGUA:

Christian Valley, Harold E. Box 1181 (US, NY, A).

GUADALUPE:

In silvis Bains-Jaunes, Duss 2932 (NY, US, GH, NY).

Saut du Constantin, Questel 5108 (US).

Matouba, Questel 2087 (US).

Basse-Terre, la Soufriere, above St. Claude foret de

Bains-Jaunes, El. 800-1000 m, Webster, Ellis,

Miller 9102 (US).

DOMINICA:

Carib trail from Salybia to Hutton Garden, Hodge 3362 (GH).

Height above Magua (near Bellevue), Douglas Taylor 133 (GH).

MARTINIQUE:

Grand bois de Fond St. Denis, de Champflore de 1'

Ajoupa Bouillon, Pere Duss 29 (NY, NY, US).

Bois de Sainte Luce, Hahn 882 (US, V).

STA. LUCIA:

En bas saut, tran masse-river, El. 300 m, John S. Beard 504 (A, NY).

En bas saut, Pamela Beard 1092 (GH, US).

M. Deux Boltes (Canaries), Harold E. Box 1882 (NY).

ST. VINCENT:

Umdwas and Lennard, El. 1500-2000 ft., G.H. Smith 492 (GH, NY).

12. SAPIUM MACROCARPUM Mull. Arg.

In Linnaea 32: 119. 1863; Huber in Bull. Herb. Boiss. 2,6: 352, f. 8. 1906; Pax et K. Hoffm., Pflanzr. 52: 204. 1912.

Sapium mexicanum Hemsley in Hooker Ic. Pl. Vol. 27, tab. 2680. 1901.

Excoecaria macrocarpa Mull. Arg. in DC. Prodr. 152: 1207. 1861.

Typus: Hb. Pavon in Hb. Boissier, NE (Nueva Espana).

A Mull. Arg. sphalmate perperam ex Peruvia notatus.

Distribution: Mexico (Morelos, Colima, Chiapas) and Guatemala.

Specimens Examined:

COLIMA:

16 miles W-NW of Santiago, road to Cihuatla, El.

30 m, McVaugh 14984 (US).

MORELOS:

- Cuernavaca, El. 5000 ft., Pringle 6336 (A, GH, NY, US, W). Type of S. mexicanum Hemsley.
 Cuernavaca, El. 5000 ft., Pringle 13195 (US).
 Cuernavaca, Knechtal 674 (W).
 Cuernavaca, Holway 3517 (GH).
 Cuernavaca, Orcutt 3893 (US).
 Cuernavaca, Schmitz 1122 (W, W).

CHIAPAS:

- ACD de Tonalá, en el camino a Arrioga, Miranda 7279 (US).

GUATEMALA:

- Jutiapa, Louis D. Williams 14207 (GH).

13. SAPIUM PACHYSTACHYS Schuman & Pittier

- In Contrib. U.S. Nat. Herb. 12: 168, tab. 16, 1908; Pax et K. Hoffm., Pflanzr. 52: 231. 1912.

Typus: Costa Rica: El Copey, Dota Mt., El. 1800 m, Ad. Tonduz 11875 (US, US, NY)!

Distribution: Costa Rica, Nicaragua, Panama.

Specimens Examined:

NICARAGUA:

- Ameyá, Dpt. Chinandega, near sea level, Maxon, Harvey, Valentine 7186 (US).

COSTA RICA:

- Vara Blanca de Sarapiquí, north slope of Central Cordillera, between Poas and Barba Volcano, El. 1740 m, Skutch 3384 (A, US, NY).
 La Palma, Prov. of San José, El. 1600 m, Standley 38012 (US).
 Quebradillas, 7 km N of Santa María de Dota, Prov. San José, El. 1800 m, Standley 42936 (US).
 Near summit of Cerros de Escazu, about 10 km SW of San José, El. 7100 ft., Little 6042 (US).
 La Palma, Jimenez 959 (US).

PANAMA:

- Chiriquí, slopes of Volcan Baru, near town of Cerro Punta, El. 6300 ft., Stern & Chambers 97 (US).

14. SAPIUM PEDICELLATUM Huber

- In Bull. Herb. Boiss., Ser. 2,6: 352, f. 9. 1906;
 Pittier in Contrib. U.S. Nat. Herb. 12: 166, tab. 11. 1908; Hemsley in Hook. Icon. Pl. 29, tab. 2893. 1909;
 Pax et K. Hoffm., Pflanzr. 52: 253. 1912.

Typus: Stillingia arborea Pavon in Sched. Vidi in hb. Boiss.

- Syn.: S. biglandulosum var. klotzschianum f. oblongatum Mull. Arg. in Linnaea 32: 117. 1863.

S. biglandulosum var. hamatum f. pavonianum Mull.
Arg. l.c. Perperam ex Peruvia citatum. Vidi in
hb. Pavon in hb. Boiss.

Distribution: Disjunct, Pacific slopes of Mexico between the Tropic of Cancer and Guerrero, and also in El Salvador and Honduras, with a big gap betw. Guerrero and El Salvador.

Specimens Examined:

Photograph made in Br. Mus. (coll. Sesse & Mocino) Stillingia arborea Ruiz & Pavon "N.E." (NY).

SINALOÁ:

La Ramada, Ortega 4492 (US).
Culiacan, Yuale, Palmer 1451 (GH, GH, US, US).
San Juan, Ortega 4025 (US).
Near Colomos, foothills of S. Madre, Rose 1783
(US).
Labradas, Ferris & Mexia 5263 (A).

NAYARIT:

Vicinity of San Blas, Ferris 5372 (US), 5468
(US).
Puga-Tepic, Ferris 5802 (US, A).
Tepic, Collino, Kempton 74 (US), 25 (US).
Acaponeta, Rose 1473 (US, GH).
Acaponeta, Rose, Standley, Russell 14434 (NY).

JALISCO:

Puerto Vallarta, Howell 10313 (A).
Dry arroyo 3 miles west of Autlan c. 3200 ft.
alt., Wilbur, Wilbur 1653 (US).
Trail between Chaute and Mamatlan about 15
miles south-southeast of Autlan, Wilbur
2109 (US).

COLIMA:

Near Colima, Palmer 92 (US, US, US, US, US,
GH).
Extreme western end of Bahia de Santiago,
opposite Santiago, between the gravelly
ocean beach and coastal lagoon, McVaugh
15870 (US).

GUERRERO:

Distr. Galeana, Atoyac 25-100 m, edge of
arroyo, Hinton 15448 (NY), 14548 (GH, US,
W).

EL SALVADOR:

San Martin, Calderon 708 (NY, US).
Finca San Nicolas, Choussy 1580 (US, NY, GH).
Vicinity Apopa, Dpt. San Salvador, Allen &
Armour 6849 (US).
Laguna del Jocotal, Dpt. San Miguel, Allen &
Severin 6888 (NY, US).
Vicinity of San Salvador, El. 650-850 m,

Standley 22436 (NY, US, GH).
 Vicinity of La Union, Dpt. La Union, El. 150
 m or less, Standley 20819 (US, GH).
 Vicinity of San Vicente, Dpt. San Vicente,
 El. 350-500 m, Standley 21721 (US).

HONDURAS:

Vicinity of Tela, Dpt. Atlantida at sea level,
Standley 54221 (A, US).

15. SAPIUM LATERIFLORUM Hemsl.

In Hook. Icon. Pl. Vol. 27, tab. 2680. 1901.

Typus: Primeval forest of Famulte, Tabasco, Mexico,
Rovirosa 769 (K), isotype (US!).

Distribution: Mexico (Sinaloa, Nayarit, Colima, Oaxaca,
 Vera Cruz, Tabasco, Chiapas), Br. Honduras, Guatemala, Honduras,
 Costa Rica.

Specimens Examined:

SINALOA:

Pueblo de San Juan, San Ignacio, El. 300 m, Montes,
 Salazar 360 (sterile US).

NAYARIT:

Vicinity of Acajoneta, dry hills, Rosa, Standley,
 Russell 14434 (sterile US).

COLIMA:

Palmer 1186 (sterile US).

OAXACA:

Cerro Espino, El. 600 m, Cafetal Concordia, B.P.
 Reko 3595 (with frts. US).

VERA CRUZ:

Misantla, Purpus 5967 (US, GH, NY).

Entre Yecuatla y Colipa, El Caobal a 3 km el ono de
 Colonia Deesa, Martinez 50-4 (A).

3 km de Martinez de la Torre rumbo a Misantla,
Gomez Pompa 904 (A).

Vera Cruz, Fred Muller 34 (NY, NY).

Coacacoalcos, Fortuno, Williams 8717 (US).

TABASCO:

Forest of Famulte, Rovirosa 769 (type).

CHIAPAS:

Cerca de Ocosingo, El. 850 m, Miranda 7206 (US).

GUATEMALA:

Dept. Alta Verapaz, Tucuru, El. 350 m, Turckheim
 2229 (NY, US).

Dept. Alta Verapaz, Cerro de Agua Tortuga (Sahaoc)
 vicinity of Cubilguitz, El. 350-450 m, Steyer-
 mark 44633 (A).

Dept. Guatemala, along slopes of Lago de Amatitlan
 below Moran, El. 1300 m, Steyermark 52446 (A).

Dept. Isabel, vicinity of Quirigua, El. 75-225 m, Standley 24608 (US, NY, GH).

BR. HONDURAS:

El Cayo district, camp 6, Gentle 2590 (A).

Honey Camp, Orange Walk, Lundell s.n.

(sterile NY, US, US, US, A).

HONDURAS:

Lancetilla Valley, near Tela, Dept.

Atlantida, El. 20-600 m, Standley 55288 (A).

COSTA RICA:

Hacienda Tournon, San Francisco de Guadalupe,

Pittier 3670 (US).

Specimens collected on the Mexican west coast may represent a new species with larger leaves (13-24 cm) and more pronounced petiolar glands, but the material is poor.

16. SAPIUM NITIDUM (Monachino) Lundell

Am. Midl. Nat. 29: 477. 1943.

Sapium biglandulosum var. nitidum Monachino, Bull. Torr.

Bot. Club 67: 771. 1920.

Typus: British Honduras, on deep river-alluvium, Santa Rosa pasture, 2 miles from El Cayo, El. 65 m, J.B. Kinloch 340 (typus in NY, US).

Monachino thought that treating this plant as a variety instead of species is a more "modest" procedure. However, it creates the impression that one is able to precisely measure the degree of relationship, which is very far from the truth, especially in this difficult genus. Besides, I cannot distinguish S. nitidum from S. lateriflorum except by the number of locules of the capsules. Since very few specimens of S. lateriflorum have complete material, it is difficult at this time to be sure if there are two species or only one.

17. SAPIUM RUIZII Hemsley

In Hook. Icon. Pl. 29, tab. 2894. 1909.

Typus: "Nova Hispania" (Mexico vel America Centralis).

Ruiz & Pavon s.n. (BM).

Species mihi tantum ex photogr. nota.

18. SAPIUM CUNEATUM Griseb.

Fl. British West Ind. Isl. 49. 1864; Pax et K. Hoffm.,

Pflanzr. 52: 235. 1912.

Excoecaria cuneata Mull. Arg. in DC. Prodr. 15,2: 1208.

1865.

Typus: "Jamaica 1850, R. C. Alexander" (vidi syntype in NY). Fide Pax: St. Ann parish: Moneague.

Distribution: Endemic to Jamaica.

Specimens Examined:

JAMAICA:

- Trelawny parish, Cockpit country, c. 3 miles N of Troy woods on limestone, El. 1500-1780 ft., Webster, Ellis, Miller 8400 (fem. US).
 Potsdam Woodlands, Santa Cruz Mts., El. 2600 ft., Harris 9817 (male US, sterile NY).
 Manchester parish, collector? (GH).
 Manchester parish, upper slopes and summit of Herons Hill (Shooler or Martin Hill), El. 3000-3100 ft., Proctor 17476 (A) frt.
 Manchester parish, 2 miles from Mandeville on old road to Spur Tree, Howard & Proctor 14567 (A).
 Clarendon parish, Crofts Mountain, El. 2500 ft., Harris 11214 (NY, US).
 Dolphin Head and vicinity, El. 450 m, Britton 2290 (sterile NY).
 Clarendon parish, 10 miles southwest of Priestmans River, El. 1500-2500 ft., Proctor 5254 (A).

19. SAPIUM HARRISII Pax et K. Hoffm.
 In Pflanzr. 52: 236. 1912.

Typus: Jamaica, Hardware Gap, El. 4000 ft., Harris 10117 (isotypes NY, US, GH).

Distribution: Known only from the type locality, Hardware Gap, Portland parish, Jamaica.

Specimens Examined:

JAMAICA:

- Vicinity of New Castle, Hardware Gap, Britton, Hollick 1794 (fem. NY).
 Along the waterfall track north of Hardware Gap, El. 3900-4000 ft., Proctor 22072 (GH), 24649 (GH).
 Jamaica, March 1819. Collector(?) (GH).

Hardly different from S. cuneatum. The difference is supposed to be in the longer styler column. The available material is not enough to evaluate this character.

20. SAPIUM LEUCOGYNUM Wright ex Grisebach

In Nachr. Ges. Wiss. Göttingen 176. 1865; Urban, Symb. Antill. 3: 310. 1902; Huber in Bull. Herb. Boiss. 2, 6: 350, f. 5. 1906; Pax et K. Hoffm., Pflanzr. 52: 218. 1912; Bro. Alain, Fl. de Cuba 3: 114. 1953.
Sapium leucospermum Griseb. in Nachr. Ges. Wiss. Göttingen 177. 1865.
Excoecaria leucogyna Mull. Arg. in DC. Prodr. 15, 2: 1208. 1866.
Excoecaria leucosperma Mull. Arg. in DC. Prodr. 15, 2: 1209. 1866.

Typus: Cuba: Pinar del Rio, Retiro, Wright 2000 (isotypes GH, NY, US).

Distribution: Endemic in western Cuba on limestone hills.

Specimens Examined:

CUBA:

Pinar del Rio: Retiro, Wright 2000 (GH, NY, US).
Limestone hills, vicinity of Sumidero,
Shafer 13460 (NY, NY), 13728 (NY,
NY).

Sierra Guayaba, south of Sumidero,
Shafer 13859 (US, NY, NY).

Rangel, limestone cliffs, Bro. Alain
1174 (NY).

Rangel, Loma del Sabicu, Bro. Leon
12624 (NY).

Banos San Vicente, Britton, Britton,
Gager 7455 (NY, US).

San Cristobal, Loma del Pimiento,
Ekman 11530 (NY).

Rangel, on lst. rocks, El. 500 m,
Bro. Alain 612 (GH), 114085 (GH).

Sierra de Anafe, Bro. Leon 11476 (NY),
11546 (NY, NY).

Sierra de Anafe, lst. rocks, shady
places, Bro. Alain 5309 (GH).

Las Villas: Trinidad Mts., Pico Portrerillo, El.
1000 m, Bro. Alain 6342 (US, GH).

Trinidad Mts., La Guira, Tope de
Collantes, El. 900 m, Bro. Alain
6480 (GH).

21. SAPIUM HAITIENSE Urban

In Arkiv. for Botanik 17,7: 39. 1921.

Typus: Haiti, "Morne de la Hotte in declivibus sept.-orient. in sylvis montanis satis frequens, ca 800 m alt."
Ekman 207 n.v.

Distribution: Endemic in massif de la Hotte of Haiti.

Specimens Examined:

Massif de la Hotte, western group, Les Roseaux,
virgin forest near Quilland, mountain top ca 1500 m,
Ekman 10140 (US, NY),

Specimens examined by Bro. Alain (personal inf.):

HAITI:

Morne la Hotte (typus) Ekman H 207 (S).

Ma Blanche, Ekman 624 (S).

Les Roseaux, Ekman 10140 (S).

Torbec, Ekman 5321 (S).

22. SAPIUM ADENODON Griseb.

In Mem. Amer. Acad. 2 ser. 8: 160. 1860; Pax et K. Hoffm., Pflanzr. 52: 236. 1912; Alain, Fl. de Cuba 3: 115. 1953.

Excoecaria eglandulosa Mull. Arg. in DC. Prodr. 15,2: 1209. 1866.

Bonania adenodon Benth. in Benth. & Hook. f. Gen. 3: 335. 1880.

Typus: "Cuba Orientali, prope villam Monte Verde dictam," C. Wright 1428 (isotypes: GH, A, NY).

Distribution: Endemic Cuba Oriente.

Specimens Examined:

CUBA:

Monte Verde, C. Wright 1428.

Pinelands, Peña Prieta, Toa, El. 600 m, Bro. Alain 3203 (GH).

Baracoa Region, mesa de Prada, Ianco, El. 350 m, Bro. Leon 11849 (NY).

Sierra de Nipe, Loma de Estrella, Ekman 5801 (NY).

Sierra de Nipe, Woodfred, El. 500 m, Ekman 9079 (NY).

Sierra de Nipe, Manacales at Rio Pilato, El. 350 m, Ekman 6722 (NY).

Sierra de Nipe, Manacales at Loma Mensura, Ekman 9923 (US).

23. SAPIUM MAESTRENSE Urban

Fedde, Rep. Nov. Spec. 28: 230. 1930; Alain, Fl. de Cuba 3: 115. 1953.

Typus: Cuba Oriente, Sierra Maestra in the northern spur of Pico Turquino, steep rocks of Loma Regino, Ekman 14480 (NY). Seen photo only.

Distribution: Endemic in Sierra Maestra of Cuba Oriente.

Specimens Examined:

CUBA:

Along Rio Paladero, below Aseradero, San Antonio de los Cumbres, crest of Sierra Maestra, El. 1300 m, C.V. Morton 9560 (US).

Loma del Gato, El. 1000 m, Bro. Leon 10420 (GH).

24. SAPIUM CUBENSE Britton & Wilson

In Mem. Torrey Bot. Club 16: 77. 1920; Alain, Fl. de Cuba 3: 115. 1953.

Typus: "Type from near woodfred, Sierra Nipe," Cuba

Oriente, Shafer 3607 (US).

Distribution: Cuba Oriente: northern Oriente and eastern Sierra Maestra.

Specimens Examined:

CUBA:

No detailed locality given. Probably near Aseradero, Sierra Maestra, Wright 1428a (US, NY).

Sierra Nipe: Near Woodfred, El. 450-550 m, Shafer 3025 (NY, US).

Sierra Nipe: Near Woodfred, El. 450-550 m, Shafer 3607 (holotypus NY, isotypus US).

Sierra Nipe: Near Woodfred, El. 450-550 m, Shafer 3609 (GH, NY).

Sierra Nipe: Near Woodfred, El. 450-550 m, Shafer 3611 (NY, GH).

Sierra Nipe: Lumber Camp, El. 600-700 m, Morton, Acuna 3203 (US).

Sierra Nipe: Loma La Bondera, Carabia 3820 (NY).

Sierra de Cristal: Valley of Lebisa River, Alain & Figueiras 4599 (GH), 4601 (GH).

Camp La Gloria, S. of Sierra Moa, Shafer 8168 (NY), 8291 (NY, US).

Moa Bay, East of Rio Moa, Shafer 8361 (NY, US).

Alluvial Valley of Rio Yamanigüey, Shafer 4216 (NY, GH, US).

Mesa de Prada, Jauco, Southern Baracoa region, Leon 11849 (GH).

Sierra Maestra: Loma del Gato, Leon, Clemente, Roca 10420 (NY).

Sierra Maestra: Loma del Gato, La Finca de los Hermanos, El. 750 m, Ekman 15683 (NY).

25. SAPIUM MOAENSE Alain

Rev. Soc. Cubano Bot. 1027. 1953; Alain, Fl. de Cuba 3: 115. 1953.

Typus: La Brena woods, Moa Region, Cuba Oriente, Bros. Leon & Clemente 23297 (NY, GH).

Distribution: Endemic to Moa Region, Cuba Oriente.

Specimens Examined:

CUBA:

Cayo Coco, vicinity of Moa, Julian Acuna 12510 (US).

26. SAPIUM PARVIFOLIUM Alain

In Contribuciones Ocasionales del Museo de Historia Natural del Colegio "De La Salle" 11: 10. 1952; Alain, Fl. de Cuba 3: 115. 1953.

Typus: Mina Cayoguan, Moa Region, Cuba Orientae, Leon &

Clemente 23163 (holotype in La Salle, Habana; isotype in NY, GH).

Distribution: Endemic to serpentine barrens of Cuba Oriente.

Specimens Examined:

CUBA:

Moa Region: Mina Cayoguan, Leon & Clemente 23163 (NY, GH).

Moa Region: Cayo Coco, Acuna 12508 (US), 12509 (US).

Moa Region: Monte La Brena, Acuna 13162 (GH).

Baracoa Region: 19 km S of Baracoa, Via Azul, Alain & Morton 5137 (US, GH).

Baracoa Region: On the Via Azul betw. Sabanilla and Cajabobo at 7 km from Sabanilla, El. 600 m, Morton & Alain 9002 (US), 9003 (US).

Sierra de Cristal: Valley of Lebissa River, Alain & Figueiras 4574 (GH), 4612 (GH).

Sierra Nipe: South of lumber camp, El. 600-700 m, Morton & Acuna 3067 (US).

27. SAPIUM ERYTHROSPERMUM (Griseb.) Mull. Arg.

In Linnaea 32: 119. 1863; Pax et K. Hoffm., Pflanzr. 52: 218. 1912; Alain, Fl. de Cuba 3: 114. 1953.

Excoecaria erythrosperma Griseb., in Mem. Amer. Acad. 2, 8: 161. 1861; Mull. Arg. in DC. Prodr. 15, 2: 1208. 1866.

Bonania erythrosperma Benth. et Hook. f. Gen. 3: 335. 1880.

Typus: La Guinea, Wright 1673 (W, GH, NY).

Distribution: Endemic to southern Cuba Oriente.

Specimens Examined:

CUBA:

La Guinea (SE Sierra Maestra), Wright 1673 (W, GH, NY).

Since flowers were not seen it was difficult to establish exact systematic position, but character of glands at the base of lamina suggests Sebastiania rather than Sapium.

28. SAPIUM PITTIERI Huber

In Bull. Herb. Boiss. 2, 6: 350, f. 7. 1906; Pittier in Contrib. U.S. Nat. Herb. 12: 167, f. 9 & f. 15. 1908; Pax et K. Hoffm., Pflanzr. 52: 208. 1912.

Sapium laurocerasus Pax in Anal. fis. geogr. nation 8: 4. 1895.

Typus: Costa Rica, western slope of La Carpintiera, between Tres Rios and Cartago at an altitude of about 1700 m,

Pittier & Tonduz 4344 (isotype US).

The nervature on f. 9 of Pittier is poorly represented. The retroflex laminal glands are strikingly similar to those of the Brazilian S. sellowianum and microdentatum.

29. SAPIUM SIMILE Hemsl.

In Hook. Icon. Pl. 29, tab. 2894. 1909.

Sapium sessile Pax nomen sphalmate false scriptum
(Pflanzr. 68: 61. 1919).

Typus: "N.E. Ruiz & Pavon" (Centr. Am. or Mexico) n.v.
Vidi tantum photo.

Note: According to Hemsley it is similar to S. ciliatum Pax, and he describes it as "folia, per totum ambitum crebre glanduloso ciliata".

30. SAPIUM SP. NOV. aff. DAPHNOIDES

Leaves elliptical, rounded on tip, plane and not cuculate, rusty brown below. Secondary nerves almost straight.

Specimens Examined:

PANAMA:

Chiriqui, slopes of Volcan Baru near town of Cerro Punta, El. 6000 ft., (sterile) W.L. Stern & K.L. Chambers 85 (A, US).

COSTA RICA:

Viento Fresco, prov. de Alajuela, El. 1600-1700 m, Paul C. Standley, Ruben Torres R. 47896 (US).

No doubt a good species, but both collections incomplete for naming and description. Also similar to S. moaense Alain of Cuba Oriente.

Nomina Confusa Atque Rejicienda

In his Species Plantarum ed. 1: 1191. 1753, Linnaeus published Hippomane glandulosa with the differential phrase name: "foliis ovato-oblongis serratis glandulosis" and included two synonyms: Plum. gen. 50 and Pluk. alm. 369. t. 229. f. 8.

These synonyms, both well illustrated, can easily be identified with two distinct species of modern usage: Sapium aucuparium Jacq. 1763 and S. caribaeum Urb. 1902, but they both also can be well absorbed into the broad Linnaean concept.

In the second edition of Species Plantarum in 1763, Linnaeus, while correcting the epithet "glandulosum" to "biglandulosum", maintained the broad concept, repeating almost unchanged the differential phrase name and adding two more synonyms: Sapium arboreum Browne jam. 338 and Sapium aucuparium Jacq. amer. 31. t. 158. The first one represents S. jamaicense Sw. of modern usage. The inclusion of the second one was not surprising either, it was well within the broad concept of

Linnaean species, which was so broad that it could easily absorb 45-50 of our modern Sapium species.

In 1863 Muller Argoviensis transferred the major portion of Hippomane biglandulosa L. to Sapium, creating Sapium biglandulosum (L.) Mull. Arg. in Linnaea 32: 116. 1863, but he also added 8 new and retained a few newly described West Indian binominals in addition to S. biglandulosum.

Realizing the heterogeneity of the old Linnaean concept Mueller began to split it up, first into 13, then into 17 in 1865, and finally into 26 in 1874, ending up with a block of 26 trinominals, 11 quadrimominals, and a few quinquenominals, all poorly defined and many of them based on one meager specimen only. The hierarchy thus created made the false impression of a perfect taxonomic coordination, which in reality was unusable for identification and left the binominal Sapium biglandulosum itself neither well defined nor clearly circumscribed.

Huber in 1906 attacked this untenable situation which he called "lutter avec le terrible bloc du Sapium biglandulosum" une agglomeration specific vaste "une especes collective sans delimitation exacte".

Adhering to a clear and simple binominal approach, and accompanied by a number of illustrations, he achieved a great deal of clarification. All authors after Huber: Hemsley (1908), Pax & Hoffm. (1912), Lanjouw (1931), Bro. Alain (1953) treating Sapium monographically followed Huber's ideas and have dropped the name Sapium biglandulosum (L.) Muller as a nomen confusum.

In 1893 Morong, disregarding Muller's action, revived the long dead Hippomane glandulosa L. (1753) and transferred it to Sapium, (see Britton and Morong in Ann. N.Y. Acad. Sci. 7: 227. 1893) putting Hippomane biglandulosa and Sapium biglandulosum into synonymy. Apparently he did not accept the correction made by Linnaeus in 1763 and considered biglandulosum illegitimate. At the same time he committed the error of applying this new name combination to a plant growing near Asuncion, Paraguay, which at that time was known as Sapium biglandulosum var. serratum f. longifolium Mull. Arg. and which we now call S. longifolium (Mull.) Huber.

When Linnaeus in the second edition of his Species Plantarum 1763 changed the epithet glandulosa to biglandulosa it was clearly a correction and not a creation of a new species. It is immaterial whether it was only a correction of a misprint, or if it also involved some correction of his previous judgment. H. biglandulosa was not intended to be a new species, otherwise he would not have dropped H. glandulosa at the same time.

As well known, the first edition of Species Plantarum abounds in errors and misprints and it was a frequent habit of Linnaeus to correct these in the second edition (see Stearn, Introduction to Sp. Plantarum 135. 1957).

It is hard to understand for what purpose Croizat (Jour. Arn. Arb. 24: 175. 1943) made two binominals, one based on the uncorrected and another based on the corrected version of the same Linnaean concept, and then use these to kill two perfectly clear and legitimate binominals: Sapium aucuparium Jacq. 1763 and Sapium hippomane G.F.W. Mey. 1818.

In view of the above discussion, the following binominals are rejected:

Sapium aucuparium Jacquin, Enum. Pl. Carib. 31. 1760 as not validly published.

Sapium biglandulosum (L.) Mull. Arg. in Linnaea 32: 116. 1863 as a nomen confusum in the sense of Art. 69.

Sapium biglandulosum Croizat in Jour. Arn. Arb. 24: 175 non Muller Arg. as a mis-application of an undefinable nomen confusum to a well defined and legitimate name Sapium aucuparium Jacq., Select. Amer. Hist. 249, pl. 158. 1763.

Sapium glandulosum (L.) Morong in Ann. N.Y. Acad. Sci. 7: 227. 1893 as a misapplication of a misprint. The plant to which this name is applied is now well covered by the new name S. longifolium (Mull.) Huber 1906.

Sapium glandulosum Croizat in Jour. Arn. Arb. 24: 176. 1943 non Morong 1893 by misapplication of a misprint to the legitimate name of S. hippomane G.F.W. Mey., Prin. Esseq. 275. 1818.

Sapium aucuparium Croizat in Jour. Arn. Arb. 24: 174. 1943 non Jacq. (1760) by misapplication of an invalid name to the valid and legitimate name of Sapium jamaicense Sw., Adnot. Bot. 62. 1829.

Sapium Cultivated in Caribbean and North America

Sapium jenmanii Hems1.

Cultivated in Trinidad, and brought from Br. Guiana, Broadway s.n. (GH, GH, NY, US).

Sapium longifolium (Mull. Arg.) Huber

Florida: Pensacola, Curtiss 6859 (GH, NY). This collection was distributed as S. biglandulosum var. lanceolatum Mull. Arg. by Curtiss, who remarks that the seeds evidently came in ballast from South America.

Sapium obtusilobum Mull. Arg.

Cultivated at Hope Garden, Jamaica, from seeds brought from Cinchona by the late M. Patin, Harris s.n. (US).

Sapium sebiferum (L.) Roxb.

Cuba: Tropical Garden, Soledad, Cienfuegos, Jack 5303 (US, NY).

Martinique: Jardin Botanique, Duss s.n. (NY).

Porto Rico: Cultiv. Mayaque, Britton & Britton 8032 (NY).

Porto Rico: Bayamon, Stevenson 3677 (US).

Texas: Cameron Co., Brownsville, Lundell & Lundell 8710 (GH).

Texas: Harris Co., 5720 Palmatto St., Bellaire, backyard of Barker, Traverse 91 (GH).

Texas: Brownsville, Rose & Russell 24198 (A).

Texas: Galveston Co., 1/2 mile SE of Arcadia, Cory 51030 (GH).

Louisiana: Jefferson Davis parish, 3.2 miles east of Eltorr, Shinners 24202 (GH).

Louisiana: Calcasieu parish, 1 mile east of Lake Charles, Correll 9630 (GH).

Louisiana: Bayou Nezipique WG Basile, La., Nyland & Rogers 8727 (A).

Louisiana: Lake Charles, Calcasieu parish, Palmer 7643 (A), 8526 (A).

Louisiana: New Orleans, Dr. Torrey 1839 (GH).

Georgia: Chatam Co., Savannah National Wildlife Refuge, Mellinger s.n. (GH).

South Carolina: Savannah National Wildlife Refuge, Mellinger s.n. (GH).

South Carolina: Colleton Co., abund. natur. along causeway Combabee River, Godfrey 50936 (GH).

Sapium tolimense Jumelle

Cultivated at Cinchona, El. 4900 ft., Public Gardens, Jamaica, Harris s.n. (US, US, US). See Contrib. U.S. Nat. Herb. 18, 2: 72-73. 1914.

Sapium utile Preuss

Cultivated at Hope Gardens, Jamaica. Received from M. Chas. Patin, Medellin, Colombia, Harris s.n. (US).

Excludendae

Sapium appendiculatum (Mull. Arg.) Pax et K. Hoffm. - Mexico. Glandulae basi laminae = Sebastiania appendiculata.

Sapium biloculare (Wats) Pax - Northern Mexico, Arizona.

Folia linearia, ovarium biloculare = Sebastiania bilocularis.

Sapium biloculare var. amplum I.M. Johnston, Proc. Cal. Acad. Sci. ser. 4, 12: 1077. 1924. Lower California = Sebastiania ampla (I.M. Johnston) Jabl. comb. nov.

Sapium turckheimianum Pax et K. Hoffm., Pflanzr. 68, Addit: 61. 1919. Guatemala: Alta Vera Paz. Folia ima basi supra glandulis patellaribus obsita, apice plana = Sebastiania sp.

Sapium zelayense (HBK) Mull. Arg. - Guatemala, Panama, Mexico. = Stillingia zelayensis Rogers.

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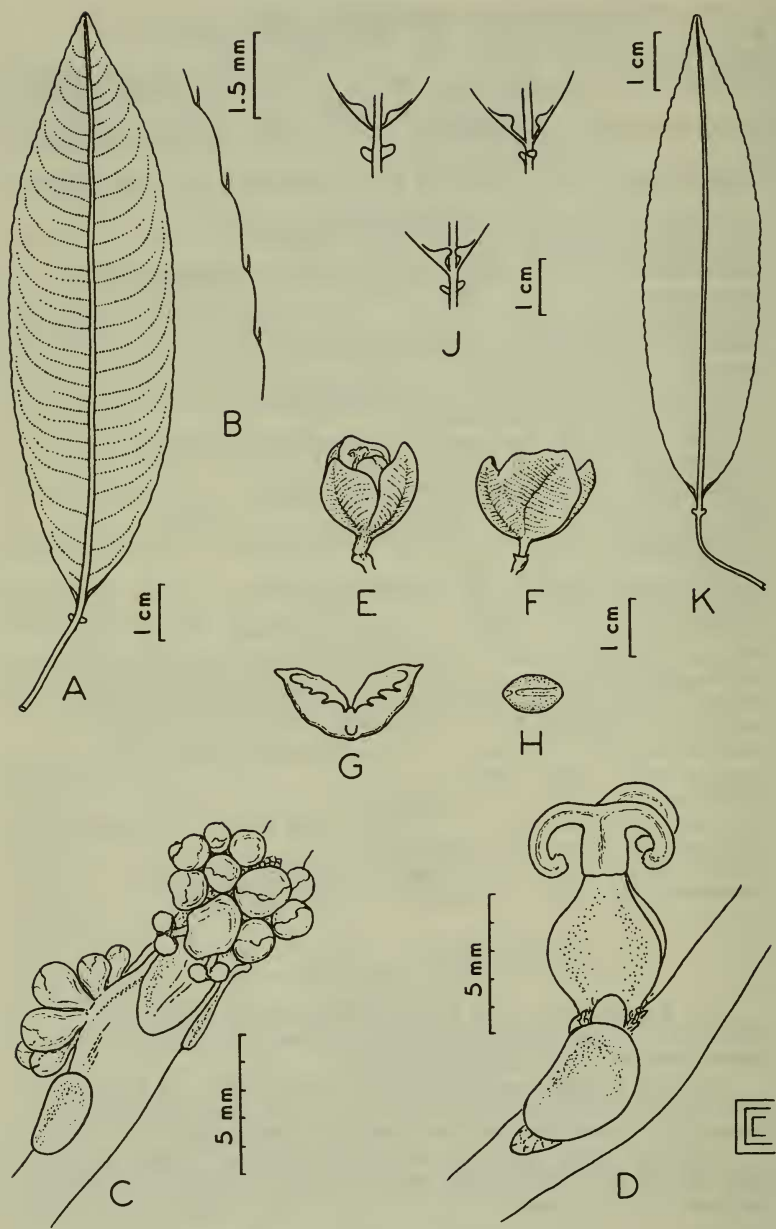
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zelayense HBK. 1817 - Stillingia zelayensis Rogers

Acknowledgments

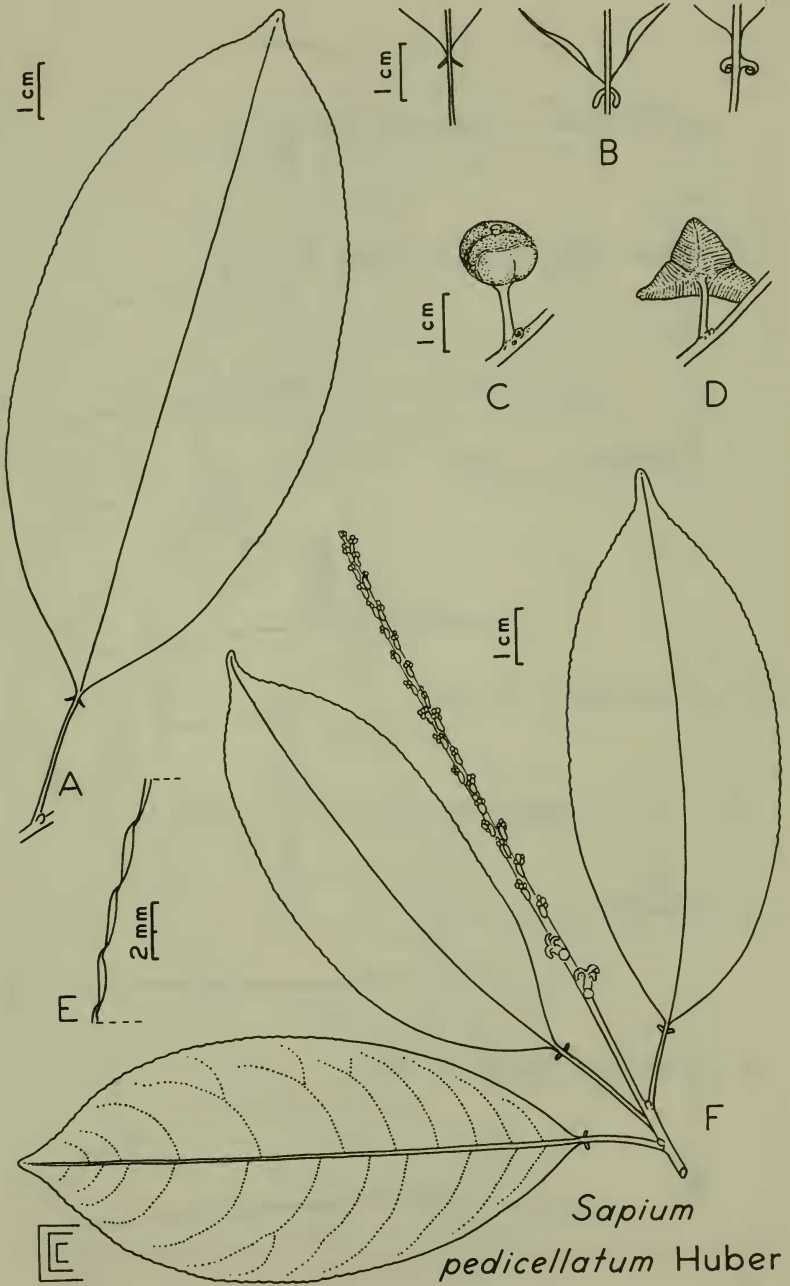
In conclusion, it is my pleasant duty to express my gratitude to the following people, without whom I would have never been able to finish this work:

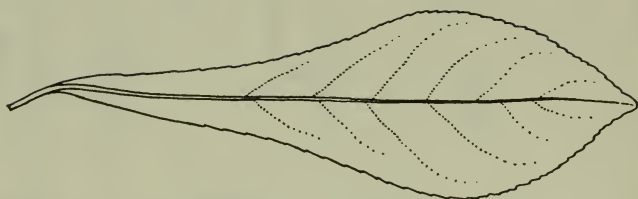
Rupert Barneby, who has helped, encouraged and supported my work and has unselfishly extended to me his storehouse of scientific knowledge and wide taxonomic experience.

Brother Alain Liogier, whose many years of field experience in the West Indies was an invaluable help to me in many geobotanical problems.

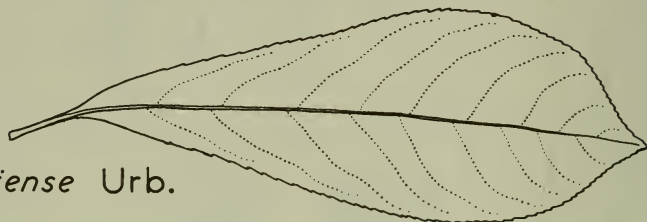


Sapium macrocarpum Müll. Arg.

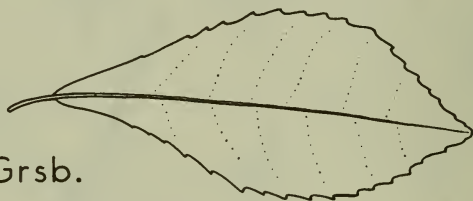




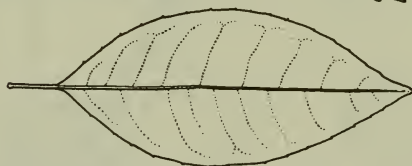
Sapium leucogynum Wr. & Grsb.



S. haitiense Urb.

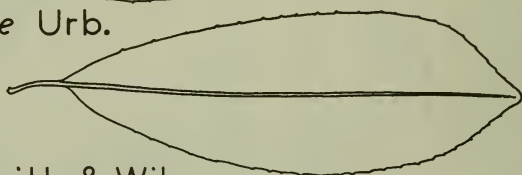


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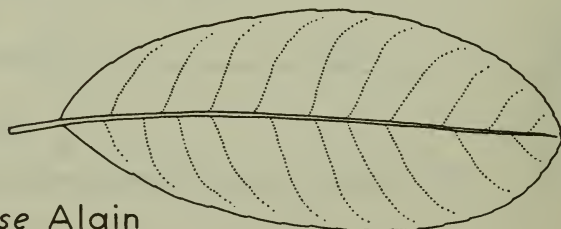


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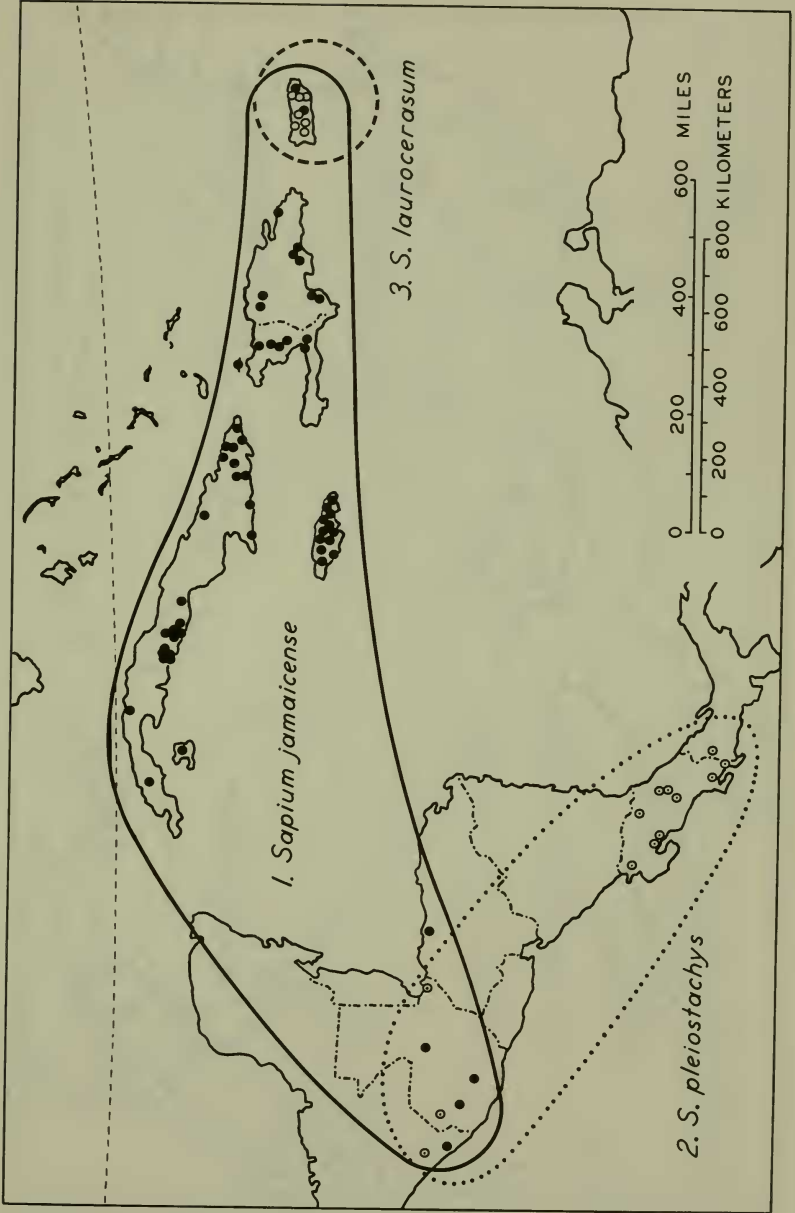
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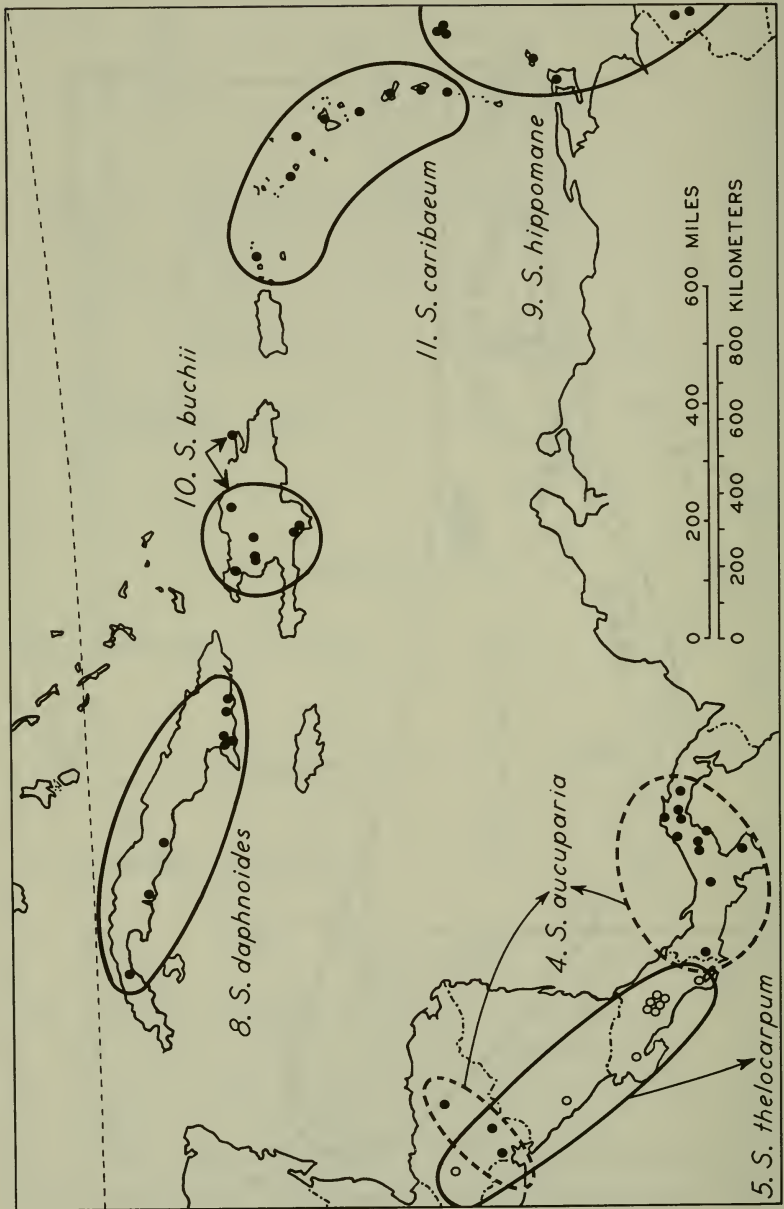


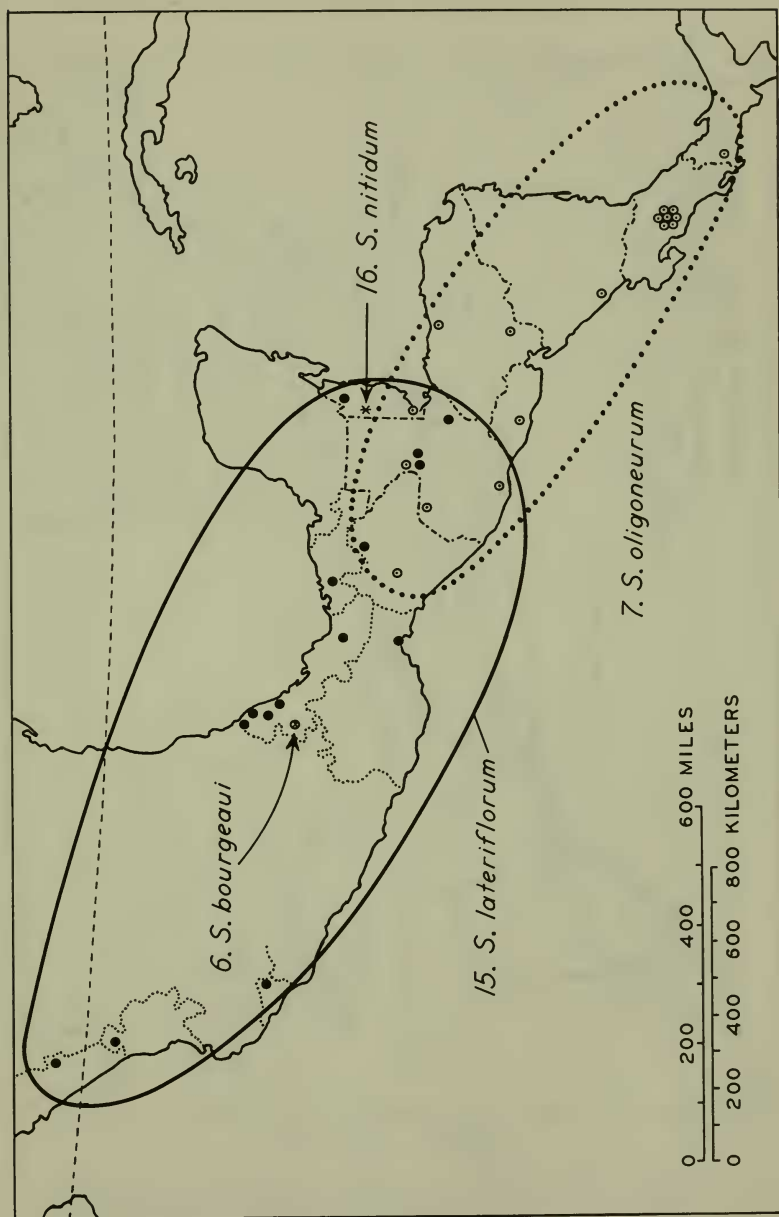
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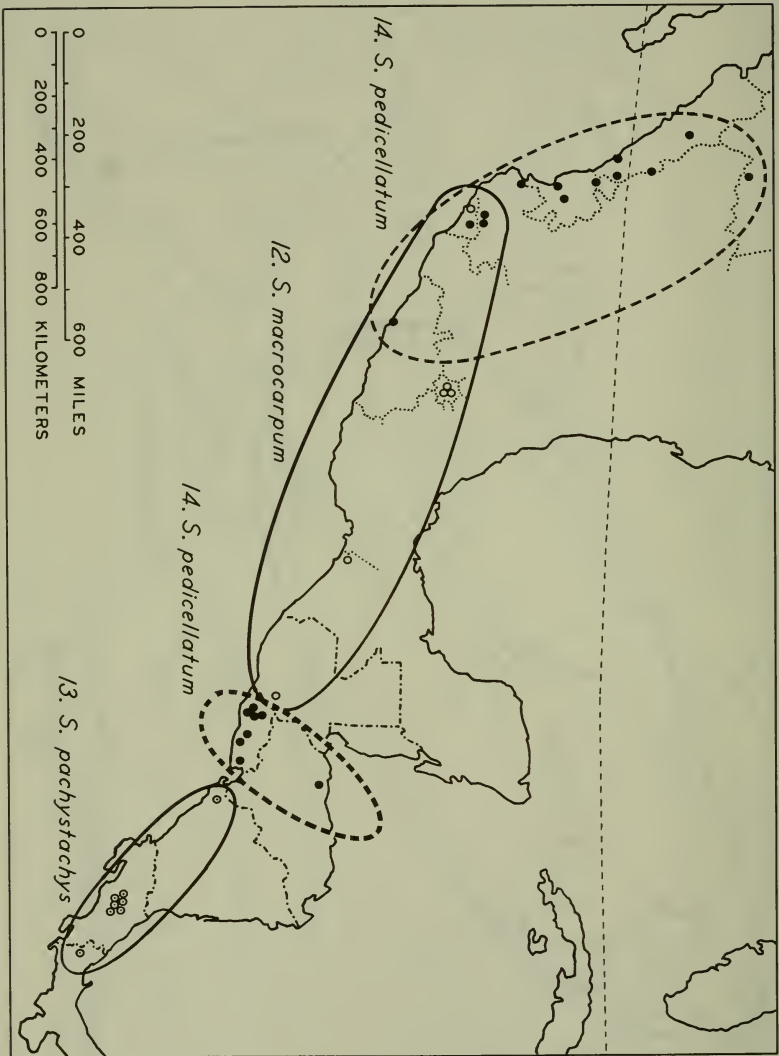


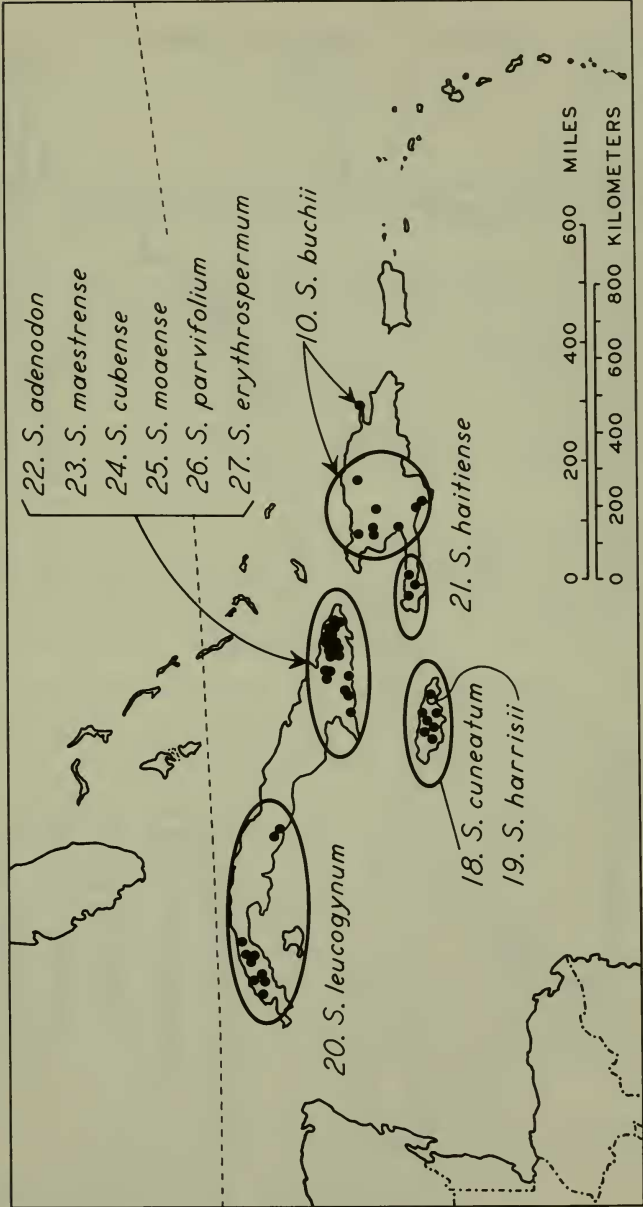
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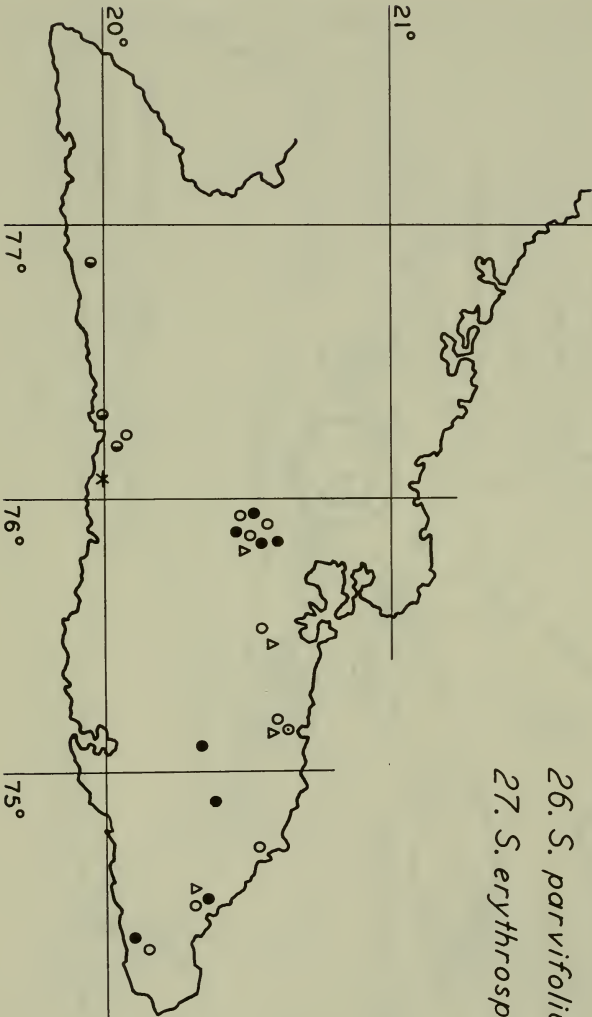












0 32 64 120 128
 0 40 80 120 KILOMETERS
 0 32 64 128 MILES

22. *S. adenodon* ●
 23. *S. maestrense* ○
 24. *S. cubense* ○
 25. *S. moaense* ○
 26. *S. parvifolium* △
 27. *S. erythrospermum* *