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MORE ADDITIONS TO THE FLORA OF JAMAICA

GEORGE R. PROCTOR

THE PUBLICATION of C. D. Adams's *Flowering Plants of Jamaica* in 1972 was an important milestone in the history of Jamaican botany. Among its useful contributions to knowledge was the enumeration and description of some 2888 species of flowering plants either indigenous to Jamaica or considered to be fully naturalized. It was stated in the Introduction (p. 22) that 784 (27%) of these "are in the state of our present knowledge thought to be endemic to the island." It was further stated (p. 24) that "some additions to the flora are inevitable in the future," but that "the main phase of exploration is virtually closed." While this may be generally true (and unusually so for a tropical country), the local distribution of native plants is so remarkably complex, and often so narrowly localized, that until virtually every wooded hilltop, cliff-face, mossy woodland, boggy wetland, dry thornscrub, or other special habitat has been thoroughly examined at different seasons of the year, our knowledge of the Jamaican flora will be incomplete. Further, anyone who makes really thorough collections in any more or less undisturbed or uncollected habitat, particularly at favorable seasons (which may not occur every year!), is likely to turn up new records and even species new to science. In this context, we still do not have a complete inventory of the Jamaican vegetation, and we do not yet have adequate knowledge of the local distribution of many individual species. It is surprising how many species are recorded on the basis of but one collection. For these reasons I have continued to investigate new localities, to revisit old ones, and to collect fresh material for the Institute of Jamaica Herbarium. The present publication arises from this work and summarizes a portion of the new information that has accumulated since 1972; it also includes a few overlooked or unpublished older records. It can be considered an informal supplement to Adams's volume.

A few of the new species proposed herein were included without names (for example, as "sp. A" or "sp. B") under various genera in *Flowering*

Plants of Jamaica. Their publication is long overdue. However, not all the taxa in this category can be dealt with at the present time.

This paper, as its title suggests, is a sequel to one that I published in 1967, and it has a somewhat similar format. The sequence of families, however, has been altered to conform with that of *Flowering Plants of Jamaica* (Adams, 1972). All specimens cited are deposited in the Institute of Jamaica Herbarium (U), unless indicated otherwise. Duplicates of most of these, and several cited holotypes, can be found in the Harvard University Herbaria (A and GH).

As a matter of statistical interest, this paper adds 2 families, 14 genera, 115 species, and 6 varieties to the known Jamaican flora growing outside of cultivation. Of these, 44 species and 5 varieties are new to science. Added to the figure cited by Adams (see above), the flowering plants of Jamaica now total 3003 species.

ORDER OF FAMILIES

MONOCOTS	Viscaceae	Thymelaeaceae
Calyciferae	Rafflesiaceae	Flacourtiaceae
Hydrocharitaceae	Polygonaceae	Turneraceae
Commelinaceae	Chenopodiaceae	Passifloraceae
Bromeliaceae	Amaranthaceae	Begoniaceae
Marantaceae	Nyctaginaceae	Lythraceae
	Phytolaccaceae	Myrtaceae
	Portulacaceae	Onagraceae
	Caryophyllaceae	Haloragidaceae
Corolliferae	Cactaceae	
Araceae	Lauraceae	Sympetalae
Lemnaceae	Nymphaeaceae	Primulaceae
Hypoxidaceae	Ceratophyllaceae	Sapotaceae
Orchidaceae	Theaceae	Oleaceae
	Guttiferae	Gentianaceae
Glumiflorae	Droseraceae	Apocynaceae
Cyperaceae	Sarraceniaceae	Asclepiadaceae
Gramineae	Leguminosae	Convolvulaceae
	Rutaceae	Boraginaceae
	Burseraceae	Solanaceae
DICOTS	Malpighiaceae	Scrophulariaceae
Polypetalae	Polygalaceae	Bignoniaceae
Piperaceae	Euphorbiaceae	Lentibulariaceae
Moraceae	Celastraceae	Acanthaceae
Olacaceae	Staphyleaceae	Rubiaceae
	Malvaceae	Compositae

HYDROCHARITACEAE

Hydrilla L. C. Rich.

Hydrilla verticillata (L. f.) Royle, Illus. Bot. Nat. Hist. Himalayan Mts. 376. 1839.

Genus and species new to Jamaica. **St. Andrew:**¹ 0.5 mi² due E of Newcastle in small artificial pool, ca. 3700 ft, *Proctor 38141*, May 1, 1979. **St. Catherine:** near head of Fresh R., ca. 1.3 mi due WNW of Caymanas Factory, near sea level, *Proctor 38203*, June 19, 1979; Rio Cobre just S of Central Village, ca. 10 ft, *Proctor 36808*, April 30, 1977, *Proctor 37221*, Sept. 4, 1977.

It is possible that Adams's (1972) record of *Elodea* in Jamaica was based in part on misidentified material of *Hydrilla*, the existence of which in Jamaica was not suspected at that time.

This rampant aquatic species, widely distributed in the warmer parts of the Old World, particularly in tropical Asia and Indonesia, has become naturalized in several widely separated New World localities and can be expected to increase in range. It was collected in Aruba, Netherlands Antilles, in October, 1969 (*Arnoldo-Broeder 3815-b*, GH), and was recorded from central and southern Florida by Long and Lakela (1971), from Panama by Croat (1978), and from various southern states by Godfrey and Wooten (1979). Croat was incorrect in stating that his collections were the first from the Americas.

Hydrilla is closely related to *Egeria* and *Elodea*, and all of them might reasonably be united in a single genus. *Hydrilla* is, however, usually distinguished without difficulty from the other two by its more prominently toothed leaf margins, and especially by the toothlike projections of the midribs on the under-surfaces of its leaves. From *Egeria* it is also differentiated by its smaller leaves (less than 2 cm long, averaging ca. 1.5 cm, vs. 2–3 cm). Floral differences are distinctive but seldom observable.

COMMELINACEAE

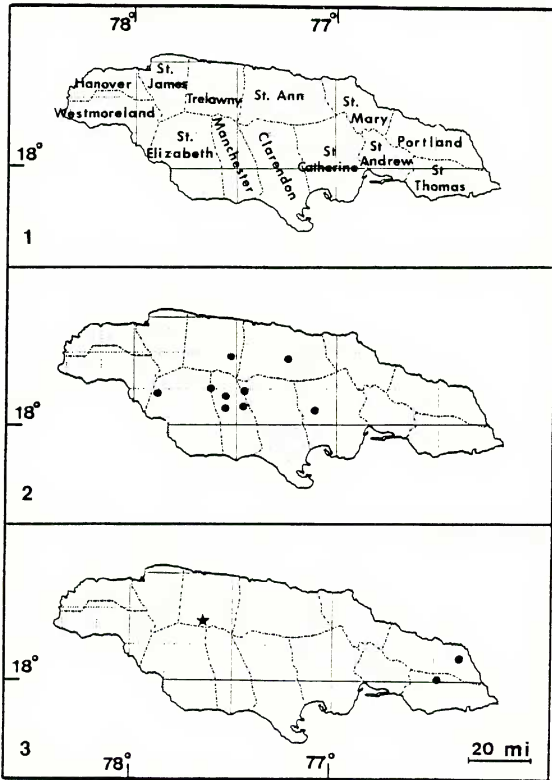
Callisia Loefl.

Callisia fragrans (Lindley) Woodson, Ann. Missouri Bot. Gard. **29**: 154. 1942. MAP 2.

New to Jamaica. **St. Catherine:** Browns Town distr., 1 mi N of Watermount P.O., ca. 1500 ft, *Proctor 37646*, Feb. 9, 1978. **Clarendon:** ca. 1 mi due ESE of Spaldings, ca. 2800 ft, *Proctor 37472*, Dec. 4, 1977. **Manchester:** Keynsham distr., ca. 1 mi by road N of St. Paul's, ca. 1100 ft, *Proctor 37677*, Feb. 19, 1978; Mike Town distr., ca. 3 mi NW of Mandeville, ca. 2200 ft, *Proctor 37587*, Jan. 17, 1978; Marshalls Pen, ca. 2.25 mi due NW of Mandeville, ca. 2100 ft, *Proctor 38636*, March 5, 1980; along road between Bellefield and Banana Ground, ca. 2000 ft, *Proctor 37591*, Jan. 18, 1978; 0.5 mi due NW of Grove Place, ca. 1700 ft, *Proctor 38548*, Jan. 19, 1980. **St. Elizabeth:** 1.5 mi by road SE of Newmarket, ca. 1200 ft, *Proctor 37625*, Feb. 5, 1978. **Trelawny:** Alps distr., ca. 2 mi NNE of Ulster

¹Specimens are cited according to parishes (see MAP 1); these are the basic political divisions of Jamaica.

²Elevations and local map distances are expressed in feet and miles because these are the official units of measurement used on Jamaican maps.



MAPS 1-3. 1, Jamaica, showing location of parishes (specimens are cited according to parishes where collected). 2, 3, distributions: 2, *Callisia fragrans*; 3, *Aechmea decurva* (dots), *Tillandsia trelawniensis* (star).

Springs, ca. 1400 ft, *Proctor 37584*, Jan. 9, 1978. **St. Ann:** vic. of Albion, ca. 2000 ft, *Proctor 37693*, Feb. 25, 1978.

As can be seen from these citations, the Mexican species *Callisia fragrans* has become widely and extensively naturalized in Jamaica.

BROMELIACEAE

Aechmea Ruiz & Pavon

Aechmea decurva Proctor, sp. nov.

MAP 3.

Aechmea paniculigera affinis, sed in foliis spinis brevioribus angustioribusque, scapo decurvato, paniculis brevioribus indumento tomentoso melius evoluto, sepalis brevioribus indumento tomentoso praeditis marginibus ciliatis, et petalis purpureis brevioribus, differt.

Solitary epiphyte. Leaves to 80 cm long and 7 cm broad above expanded base, minutely lepidote, the margins with sharp, narrowly deltate, straight or upcurved spines to 2.5 mm long and 1 mm wide at base. Scape densely arachnoid-tomentose, decurved and projecting below leaves, bearing along upper part several bright pink, reflexed, narrowly lanceolate bracts up to 17 by 2.5 cm; panicle ascending, 15–20 cm long, whitish-tomentose throughout, densely flowered. Branches of panicle in clusters of 2 or 3, each 3- to 5-flowered, flowers sessile. Sepals whitish-tomentose, with spiny-ciliate margins, 3.5–4 mm long excluding apical spines, the spines 1.5–2 mm long, oblique or bent horizontally, tomentose at base; petals purple, ca. 8 mm long at anthesis; ovary ca. 6 mm long, densely whitish-tomentose. Fruits not seen.

Portland: John Crow Mts., ca. 6 mi by road S of Sherwood Forest, 1200–1500 ft, *Proctor 37294*, Sept. 25, 1977 (holotype, A). **St. Thomas:** along E arm of Morant R. SE of Macungo Hill, ca. 1500 ft, *Proctor 28642*, May 14, 1968.

This species is confined to the mountain rainforests at the eastern end of Jamaica, where it is rare. It is always an epiphyte, unlike *Aechmea paniculigera* (Sw.) Griseb., its only Jamaican congener, which most often grows on shaded rocks although it is occasionally an epiphyte. *Aechmea decurva* is obviously related to *A. paniculigera* of central and western Jamaica but differs in its shorter and narrower leaf-spines; its invariably decurved (vs. erect) scapes; its narrower scape bracts; its shorter (15–20 vs. 30–50 cm), much more pubescent panicles; its shorter (3.5–4 vs. 4.5–6.5 mm, excluding the spines), whitish-tomentose sepals with spiny-ciliate instead of entire margins; its oblique to horizontally bent calyx spines, these tomentose at base instead of glabrous; and its purple (vs. pink, mauve, or light blue) corolla ca. 8 (vs. 10) mm long at anthesis.

Tillandsia L.**Tillandsia adamsii** R. W. Read, *Phytologia* **28**: 21. *pl. 1*. 1974.

This species related to *Tillandsia canescens* Sw. was recognized as new too late to be included in *Flowering Plants of Jamaica* (Adams, 1972). It has been recorded from the parishes of St. James and Trelawny.

Tillandsia trelawniensis Proctor, *sp. nov.*

MAP 3.

Herba epiphytica sessilis a *Tillandsia polystachia* in foliis circa 55 (versus 17) omnis plantis; vaginis basalibus foliarum atrobrunneis (haud pallidis ferrugineis); laminis pallida lepidotis, squamis densis minutis peltatis marginibus elevatis; bracteis basibus ovatis; et bracteis floralibus hebetibus roseo-purpureis, haud viridibus, differt.

Plant stemless, rather massive. Leaves numerous (40 to 70, averaging 55), 20–32 cm long, straight to slightly recurved, forming dense, erect to subspreading rosette, very densely pale-lepidote throughout, peltate scales completely concealing epidermis; sheaths flat, broadly oblong or ovate-oblong, up to 4 cm broad, dark brown; blades narrowly triangular-attenuate, nearly filiform toward apex, 1–1.5 cm broad near base, more or less involute. Inflorescence shorter than or exceeding leaves, 15–35 cm long; scape erect; scape bracts foliaceous, densely grayish lepidote, with loosely imbricate or slightly separated ovate sheaths, terminated by erect, attenuate-acuminate blades; primary bracts ovate-attenuate, much shorter than spikes; spikes 6 to 12, erect, short-stipitate, rather densely subdigitate at apex of scape, mostly 5–10 cm long, complanate, linear-oblancoolate, ca. 1 cm broad above middle; floral bracts dull rosy purple, red-marginate, coriaceous, erect, more or less imbricate, ovate, acute and mucronate, 15–20 mm long, glabrous, smooth or very faintly striate, subcarinate toward apex. Flowers at anthesis and mature fruits not seen.

Trelawny: near Crown Lands road extension 4.5–5 mi NW of Troy, ca. 2000 ft, Proctor 34713, Jan. 26, 1975 (holotype).

This species superficially resembles *Tillandsia polystachia* (L.) L. in the size, shape, and arrangement of the spikes. However, it differs markedly from that species in its much more massive growth: *T. trelawniensis* averages 55 leaves per plant, whereas *T. polystachia* averages 17, with a range of 12 to 24. Further, the basal sheaths of this new species are dark brown instead of "pale-ferruginous" as in *T. polystachia*, and the leaves are densely pale-lepidote throughout, the minute peltate scales having raised margins (the punctate scales of *T. polystachia* are so minute that the leaf surface superficially appears smooth and glabrous). *Tillandsia trelawniensis* also differs in the ovate bases of its scape bracts and primary bracts, and in the dull rosy purple (instead of green) color of the floral bracts.

MARANTACEAE

Calathea G. F. W. Meyer

Calathea lutea (Aublet) G. F. W. Meyer, Prim. Fl. Esseq. 10. 1818.

Portland: between Millbank and Bowden Pen, 500–1000 ft, *Proctor 28629*, April 21, 1968. **St. Thomas:** Spring Bank distr., ca. 1200 ft, *Proctor 27842*, March 20, 1967.

Adams (1972, p. 60) briefly mentioned *Calathea lutea* ("native of Guyana") as "naturalized" in the parish of St. Thomas. This species, although originally described from Guyana, has a circum-Caribbean range, occurring on the continent from southern Mexico southward throughout Central America, and from Puerto Rico through the Lesser Antilles to Trinidad. In South America it is recorded from as far south as Peru. This distribution is consistent with its occurrence in Jamaica being natural. There is no evidence of its introduction to Jamaica by humans, at least in modern times. On the other hand, the widespread use in Central America of the leaf blades of *C. lutea* for wrapping food suggests the possibility of aboriginal introduction by Mayan sea-traders, who are known to have visited Jamaica in pre-Columbian times. It is doubtful, however, that any evidence exists for this hypothesis. The occurrence of this species in Jamaica on wet slopes and in open riverine marshes of the upper Rio Grande valley, and at isolated sites on the southern side of the same watershed, suggests that it has grown here for a long time. Certainly this species should be included as part of the present noncultivated flora of Jamaica.

The large leaves of *Calathea lutea* bear on their underside a white, flaky material called "cauassú wax," which is said to have considerable commercial value for high-quality polishes. Because of ease of propagation in wet, swampy soils and relatively high yield (one hectare will potentially grow 75,000 plants, which will yield 800 kg of wax per year after the second year), this species should be investigated as an agricultural crop for suitable Jamaican localities.

ARACEAE

Alocasia Schott

Alocasia macrorhiza (L.) Schott, Österr. Bot. Wochenbl. 4: 409. 1854; Prodr. 146. 1860. FIGURE 1.

Genus and species new to Jamaica. **St. Catherine:** vic. of Spanish Town, *N. L. Britton 3107*, Aug. 30–Sept. 3, 1908 (sterile) (det. D. H. Nicolson) (NY). **Portland:** Sherwood Forest, ca. 700 ft, *Proctor 38498*, Dec. 27, 1979 (sterile).

This species is one of the commonest and most widespread of its family



FIGURE 1. *Alocasia macrorrhiza* at Sherwood Forest, Jamaica.

in Jamaica and probably occurs in all parishes. Although its total absence from the literature on the Jamaican flora is therefore astonishing, it can perhaps be accounted for by the fact that plants of this species apparently never flower in Jamaica. Botanical collectors tend to neglect the Araceae in any case, and it seems that scarcely anyone ever bothers to gather large, unwieldy leaves of sterile plants, especially if their sap is irritating to the skin! There is no mention of this species by Adams (1972). Britton's collection at New York remained unidentified until 1962 and has not been cited until now. Britton and Wilson (1926, p. 335) reported this species from Puerto Rico and stated that "we have been unable to find it flowering . . ." although it was abundantly naturalized in moist ground. It would be interesting to

ascertain if *Alocasia macrorrhiza* ever flowers under West Indian conditions. The species occurs in Cuba and Hispaniola as well as in Puerto Rico.

Alocasia macrorrhiza is indigenous to tropical Asia; the circumstances and date of its introduction to Jamaica do not seem to be known. It is locally called "scratch-coco," and the large, starchy rhizomes are often fed to pigs.

Anthurium Schott

Anthurium cubense Engler, Bot. Jahrb. **25**: 364. 1898.

New to Jamaica. **St. Andrew**: Salt Hill, ca. 3000 ft, *Proctor 32760*.

This plant was found on a wooded rocky mountainside by Mrs. Vernon James some time prior to 1965. She brought it into cultivation at her Pine Grove Hotel, where I saw it in 1970. At that time, Mrs. James gave me an offshoot of her plant, which has since been growing in a pot at my home. A leaf and inflorescence taken from this plant have been placed in the Institute of Jamaica Herbarium as *Proctor 32760*. This species has heretofore been considered endemic to Cuba; its identity and natural occurrence in Jamaica require further confirmation.

Anthurium gracile (Rudge) Lindley, Bot. Register **19**: 1635. 1833, *excl. fig.*

New to Jamaica. **Portland**: along the Buff Bay-Hardwar Gap road above Cedar Valley, ca. 2000 ft, *Proctor 23033*.

A wild population of this species was found at the above site by Dr. G. E. Valentine prior to 1960; this station was subsequently destroyed by road-widening. However, Dr. Valentine had taken a number of the plants into cultivation and has distributed a few of these to friends interested in horticulture. I obtained two leaves and an inflorescence of this population from Mr. L. Hendrickson on Dec. 9, 1962, and these were deposited in the Institute of Jamaica Herbarium as *Proctor 23033*.

Anthurium gracile has a wide continental distribution from Belize southward into South America and has also been found in Hispaniola, so its natural occurrence in Jamaica is not surprising.

LEMNACEAE

In treating this family, Adams (1972) recognized two genera: *Lemna* L., with two species; and *Wolffia* Horkel ex Schleiden, with one. Subsequent collecting, as well as a reappraisal of available material, indicates that at least three more species occur in Jamaica, one of which represents a previously unreported genus. Although Adams followed the practice of most British authors in not recognizing *Spirodela* as a genus separate from *Lemna*, all monographers of the family have taken a contrary view. If *Spirodela* is accepted as valid, then Jamaica must be credited with a total of four genera

in this family. These can be keyed out as follows, using the classification presented by den Hartog and van der Plas (1970):

- A. Roots present; flowers enclosed by a spathe; anthers bilocular; tissue containing raphides.
 - B. Each thallus with several roots, a dorsal and a ventral scale, and 5 or more nerves. *Spirodela*.
 - B. Each thallus with 1 root, no dorsal or ventral scale, and 0, 1, or 3 nerves. *Lemna*.
- A. Roots absent; flowers not enclosed by a spathe; anthers unilocular; tissue without raphides.
 - C. Plant body a flat, recurved thallus 5–6 mm long; inflorescences 2 per thallus. *Wolffiella*.
 - C. Plant body globular to ellipsoid, 0.5–1 mm long; inflorescence 1 per thallus. *Wolffia*.

Spirodela Schleiden

Spirodela polyrhiza (L.) Schleiden, *Linnaea* **13**: 392. 1839.

Lemna polyrhiza L. *Sp. Pl.* **2**: 970. 1753; Adams, 1972.

Lemna L.

Three species are now known to occur in Jamaica. Adams (1972) listed only *Lemna perpusilla* Torrey (excluding *L. polyrhiza*, now separated in *Spirodela*), although Daubs (1965) had cited a Jamaican collection of *L. valdiviana* (Harris 10837, us). Recent studies by Dr. E. Landolt have shown that the plants called *L. perpusilla* by Adams should instead be known as *L. aequinoctialis* Welw., and examination of Harris 10837 at us has revealed that it was misidentified by Daubs and also represents *L. aequinoctialis*. Thus my collections of authentic *L. valdiviana* are in fact a new record for Jamaica. The Jamaican species can be keyed as follows:

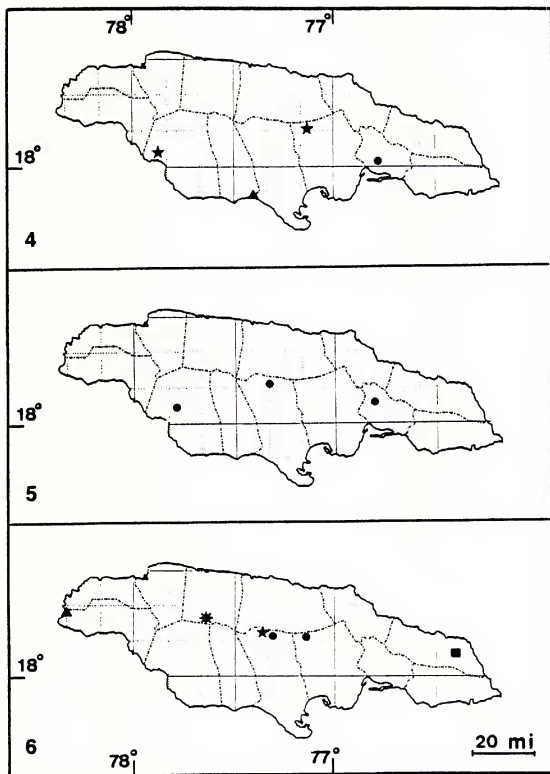
- A. Thallus 3-nerved, broadly oblong, obovate, or suborbicular, not much longer than broad. *L. aequinoctialis*.
- A. Thallus obscurely 1-nerved or apparently nerveless, narrowly oblong, usually at least twice as long as broad when mature.
 - B. Thallus 2.5–4.5 mm long, inequilateral and often subfalcate, submerged; epidermis without evident cystoliths. *L. valdiviana*.
 - B. Thallus 1–1.5 mm long, equilateral, floating; epidermis with minute, linear, whitish cystoliths. *L. minuscula*.

Lemna aequinoctialis Welw. *Añaes Conselho Ultramar.* **55**: 543. 1858.

Lemna perpusilla of Adams, *Fl. Pl. Jamaica*, 71. 1972, not Torrey, 1843.

Lemna minuscula Herter, *Revista Sudam. Bot.* **9**: 185. 1954. MAP 4.

New to Jamaica. **St. Andrew**: garden pool on Clieveden Ave., ca. 400 ft, *Proctor 37942-a*, Dec. 17, 1978.



MAPS 4-6. Distributions: 4, *Lemna minuscula* (dot), *L. valdiviana* (triangle), *Woffiella welwitschii* (stars); 5, *Curculigo scorzonrifolia*; 6, *Epidendrum blancheanum* (dots), *E. scalpelligerum* (star), *Liparis adamsii* and *Stelis scabrada* together (asterisk), *S. scabrada* alone (square), *Zeuxine strateumatica* (triangle).

These minute plants were associated with scattered groups of *Salvinia* and may have been introduced with them. This species is known chiefly from the southwestern United States (especially California), Guatemala, and several countries in South America; so far as can be ascertained, it has not previously been reported from the West Indies.

Lemna valdiviana Phil. *Linnaea* **33**: 239. 1864.

MAP 4.

New to Jamaica. **Manchester**: Alligator Hole R., sea level, *Proctor* 35373, Oct. 22, 1975, *Proctor* 38198, June 17, 1979 (coll. and det. R. M. Lowden).

This species is widely distributed in temperate and tropical America. The constantly submerged growth-habit that it maintains in Jamaica is not mentioned in any literature I have seen and apparently does not occur in populations elsewhere.

Wolffiella Hegelm.

Wolffiella welwitschii (Hegelm.) Monod, *Mém. Soc. Hist. Nat. Afrique N.*, hors-sér. **2**: 229, 242. 1949.

MAP 4.

Wolffia welwitschii Hegelm. *Jour. Bot. London* **3**: 114. 1865.

Wolffiopsis welwitschii (Hegelm.) den Hartog & van der Plas, *Blumea* **18**: 366. 1970.

Genus and species new to Jamaica. **St. Catherine**: Charlton, shallow weedy lake 1 mi W of Ewarton, ca. 1000 ft, *Proctor* 37943, Dec. 20, 1978. **St. Elizabeth**: weed-filled seasonal pond in pasture ca. 1 mi N of Black River, near sea level, *Proctor* 35444, Nov. 8, 1975 (det. R. M. Lowden).

This species was first described from tropical west Africa; its sporadic tropical American distribution includes the West Indian islands of Cuba, Jamaica, Hispaniola, and Guadeloupe, and the continental countries of Guatemala, Suriname, Venezuela, Colombia, and Ecuador.

Wolffia Horkel ex Schleiden

Wolffia brasiliensis Weddell, *Ann. Sci. Nat.* III. **12**: 170. 1849.

Wolffia punctata Griseb. *Fl. Brit. W. Indian Is.* 512. 1864; Adams, 1972.

The earlier Weddell name is here taken up for the Jamaican species following the recent publication of Landolt (1980).

HYPOXIDACEAE

Curculigo Gaertner

Curculigo scorzonrifolia (Lam.) Baker, *Jour. Linn. Soc. Bot.* **17**: 124. 1878.

MAP 5.

This species was listed by Adams (1972, p. 82) as "very rare (St. Andr.), in grassy places on heavy clay soil; 800–1000 ft. . . ." Subsequent collections have considerably extended the known local range and altitudinal span, but *Curculigo scorzonrifolia* must still be considered very rare. However, this is a plant unlikely to be noticed except when it is flowering, and the flowering season is very short.

St. Andrew: (*vide* Adams). **Clarendon:** Bunkers Hill Savanna, ca. 2000 ft, *Proctor 36843*, May 8, 1977. **St. Elizabeth:** Slipe distr., sea level, *Proctor 38180*, June 16, 1979.

ORCHIDACEAE

Epidendrum L.

Epidendrum blancheanum Urban, *Ark. Bot.* **17**(7): 21. 1922. MAP 6

Epidendrum acuñae Dressler, *Am. Orchid Soc. Bull.* **28**: 358. 1959.

New to Jamaica. **St. Catherine:** Blue Mountain distr., S slope of Mt. Diablo, epiphytic on wooded limestone hillside, 2600–2700 ft, *Proctor 27901* (with R. W. Read), May 13, 1967 (originally det. as *E. acuñae* by L. A. Garay). **Clarendon:** stream gully 0.9 mi by road E of Reckford, epiphytic on tree branch overhanging stream, ca. 2000 ft, *Proctor 38151*, May 2, 1979.

This species is otherwise known from Cuba, Hispaniola, Mexico, Guatemala, Honduras, and Panama. It can be distinguished from the superficially similar *Epidendrum ramosum* Jacq. and its relatives by its pendent unbranched foliage stems with short lateral flowering shoots, each initially bearing one flower, but later by renewed growth producing another flower, and so on, eventually becoming somewhat elongate.

Epidendrum scalpelligerum Reichenb. f. *Flora* **48**: 278. 1865. MAP 6.

New to Jamaica. **St. Ann:** Greenock distr., 0.8 mi due SE of Cave Valley Square, epiphytic on citrus trees, ca. 1850 ft, *A. L. Gloudon s.n. (IJ 69180)*.

I discovered this rare and little-known species on March 30, 1975, only in sterile or juvenile condition; no herbarium specimen was collected. Later, at my suggestion, Mr. Gloudon searched the same locality and collected a number of live plants for cultivation, one of which flowered in his garden. This plant was pressed in August, 1978, and is the specimen recorded above.

Epidendrum scalpelligerum was originally described on the basis of a Wright specimen (3339) from eastern Cuba; to the best of my knowledge, it has never been found again until the present Jamaican discovery. Our specimen was identified by L. A. Garay in September, 1978. The species was listed by León (1947) as *Pleuranthium scalpelligerum* (Reichenb. f.) Cogn. Its growth form is unusual for an *Epidendrum*, consisting of a small, fan-shaped vertical rosette of overlapping leaves very similar in appearance to that of *Oncidium pusillum*. The inflorescence is a small raceme that is merely

an extension and narrowing of this rosette, bearing a few inconspicuous greenish flowers.

Liparis L. C. Rich.

Liparis adamsii Proctor, sp. nov.

MAP 6.

Affinis *Liparis harrisii*, sed pseudobulbis minoribus, foliis in ambitu differentibus minoribusque, sepalis brevioribus angustioribusque, labello valde diverso, et columna sine spissescensibus sub apice et ad basin ample differt.

Pseudobulbs of flowering scape ca. 10 by 4–6 mm, enlarging to ca. 15 by 9 mm. Leaves 2, flat, broadly ovate, acute at apex, subcordate at base; blade of upper leaf 2–2.5 by 1.5–2 cm, of lower leaf 5–6 by 3.2–4.8 cm. Peduncle 10–13 cm long, quadrangular, very narrowly 4-winged; raceme 3.5–6 cm long, bearing 6 to 10 or more flowers, the bracts linear-lanceolate, 4–7 mm long; pedicels 9–12 mm long. Sepals pale green, lanceolate, 6–7 mm long, ca. 1.5 mm wide near base; petals filiform, greenish, 7–11 mm long, usually exceeding sepals; lip broadly obovate or nearly rotund, 12–15 mm long, 8–12 mm wide above middle, abruptly and minutely acuminate at apex, cordate at base, translucent dull purple with very faint darker veins; column greenish, 3.5 mm long, curved near apex, diameter uniform throughout. Capsules not seen.

Trelawny: near Crown Lands road extension 4.5–5 mi NW of Troy, in humus on shaded limestone ledges, ca. 2000 ft, *Proctor 34165*, Sept. 7, 1974 (holotype).

This beautiful species seems clearly related to *Liparis harrisii* Fawcett & Rendle, from which it differs in having smaller pseudobulbs, smaller leaves of a different shape, shorter and narrower sepals exceeded by the filiform petals, a differently shaped lip (obovate and minutely acuminate vs. oblong and obtuse) of a translucent purple color, and a shorter column of uniform diameter. It is named for Dr. C. D. Adams in recognition of his important contributions to Jamaican botany.

Stelis Sw.

Three species of this genus are now known to occur in Jamaica, although Adams (1972) listed but two definitely, one of these under an incorrect name. The Jamaican species can be designated as follows:

Stelis micrantha (Sw.) Sw. Jour. Bot. Schrader **1799**(2): 240. 1800.

Stelis scabrída Lindley, Ann. Nat. Hist. **5**: 115. 1840. TYPE: Dominica.
MAP 6.

New to Jamaica. **Portland:** NW slope of Joe Hill, 1000–2250 ft, *Proctor 15836*, Dec. 2, 1956. **Trelawny:** 5.5 mi NW of Troy, 2000 ft, *Adams 12833*, May 8, 1966. (Both specimens det. L. A. Garay.)

Until now this species was believed to be endemic to the Lesser Antilles, where the flowers are cited as being "yellow-green." The flowers of both Jamaican specimens are purple but are morphologically indistinguishable from those of the Lesser Antilles.

Stelis trigoniflora (Sw.) Garay, Bot. Mus. Leaflet. **26**(1): 25. 1978, based on *Epidendrum trigoniflorum* Sw., 1788, excl. syn.

This species has been widely but incorrectly known as *Stelis ophioglossoides* (Jacq.) Sw.

Zeuxine Lindley

Zeuxine strateumatica (L.) Schlecht. Feddes Repert. Beih. **1**: 77. 1911. MAP 6.

Westmoreland: near milepost 23, 2.5 mi NE of Negril, sea level, *Proctor 34694* (with Lester Dinnall), Jan. 15, 1975; near Middle R., 2.3 mi NE of Negril, sea level, *Proctor 34728*, Jan. 29, 1975.

First reported from Jamaica by Proctor (1975). It has been suggested that this diminutive annual species might have been accidentally introduced from Florida on the feet of tourists. This is an interesting variation of the theory of plant distribution by birds.

CYPERACEAE

It is probably not a matter of chance that this family has produced more new Jamaican records than any other except the Myrtaceae; the somewhat drab, grasslike appearance of these plants and their lack of economic importance have tended to deflect critical interest in the group.

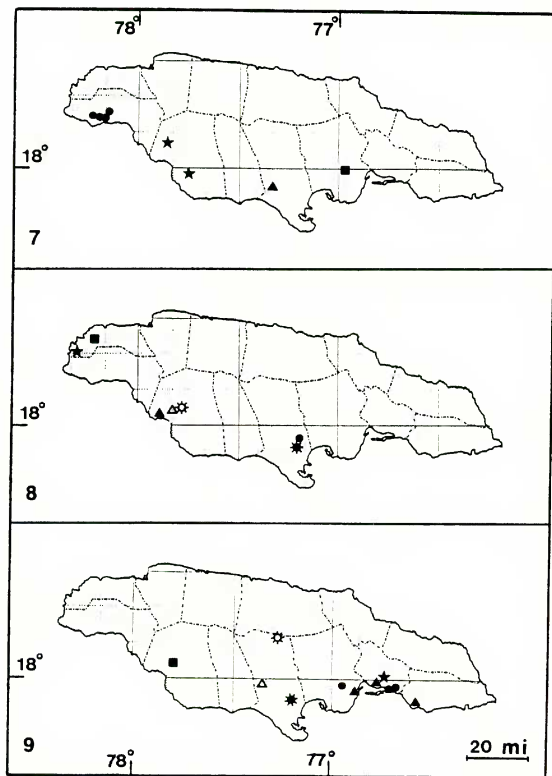
Cyperus L.

Some recent authors have treated the major subdivisions of this taxon as genera, but I prefer to view them as subgenera.

Cyperus cyperoides (L.) Kuntze, Rev. Gen. Pl. **3**(2): 333. 1898. MAP 7.

New to Jamaica. **St. Catherine:** Belle Vue near Spanish Town, in wet hollows in pasture, *Harris 12045*, May 24, 1915 (NY).

First reported from Jamaica by Koyama (in Howard, Fl. Lesser Antilles **3**: 277. 1979) as *Mariscus sumatrensis* (Retz.) J. Raynal, without data. This report was probably based on the above specimen. *Cyperus cyperoides* is indigenous to tropical Asia and Africa; in the New World it is recorded as an adventive in Grenada and Trinidad, as well as in Jamaica. It resembles the common *C. tenuis* Sw. but can easily be distinguished by the shorter spikelets (3–5 mm long vs. 7–10 mm for *C. tenuis*).



MAPS 7-9. Distributions: 7, *Cyperus cyperoides* (square), *C. floridanus* (stars), *C. iria* (triangle), *C. procerus* var. *lasiorrhachis* (dots); 8, *Eleocharis nigrescens* (dot), *Fimbristylis autumnalis* (solid triangle), *Rhynchospora tracyi* (star), *Scleria macrophylla* (hollow triangle), *S. reticularis* var. *pubescens* (square), *S. setuloso-ciliata* (hollow asterisk) (solid asterisk marks location of Harris Savanna); 9, *Paspalum botteri* (star), *Panicum exiguiflorum*, additional site (hollow triangle), *Reynaudia filiformis* (square), *Sacciolepis indica* (hollow asterisk), *Tragus berteronianus* (solid triangles), *T. racemosus* (dots) (solid asterisk marks location of Harris Savanna).

Cyperus floridanus Britton in Small, Fl. SE. U. S. 170, 1327. 1903.

MAP 7.

C. filiformis Sw. var. *densiceps* Kükenthal, Repert. Sp. Nov. 23: 190. 1926.
C. kingsii Adams ex Proctor, Sloanea 1: 1. 1977.

New to Jamaica. **St. Elizabeth:** Mt. Charles Estate, ca. 1 mi due SW of Giddy Hall P.O., 750–1000 ft, *Proctor 36399*, Oct. 2, 1976; 0.8 mile N of Mountainside, near sea level, *Proctor 37957*, Jan. 3, 1979.

Otherwise known from the Florida Keys, Bahamas, Cuba, and the Cayman Islands. This species belongs in subgenus *Torulinium* and is closely related to *Cyperus filiformis*, but it is definitely not conspecific with that entity.

Cyperus iria L. Sp. Pl. 1: 45. 1753.

MAP 7.

New to Jamaica. **Clarendon:** Ramble Pen, 1 mi NE of Pridees, in wet roadside ditch, 10–50 ft, *Proctor 32942*, Oct. 11, 1972.

This is a widespread species of the Old World tropics and subtropics, already well known as a naturalized plant in the southeastern United States, Cuba, and Hispaniola.

Cyperus procerus Rottb. var. *lasiorrhachis* C. B. Clarke in Hooker, Fl. Brit. India 6: 610. 1893; Kern, Fl. Males. 1. 7(3): 611. fig. 51. 1974.

MAP 7.

New to Jamaica. **Westmoreland:** near New Hope, sea level, *Proctor 33069*, Dec. 3, 1972; vic. of Big Bridge, WNW of Savanna-la-Mar, sea level, *Proctor 35340*, Oct. 7, 1975; near Little Bridge road crossing of Styx R., 2.5 mi ESE of Little London, sea level, *Proctor 33548*, Sept. 28, 1973; ca. 1.6 mi due SW of Georges Plain House, near sea level, *Proctor 37949*, Jan. 1, 1979.

This robust sedge of tropical Asia and Malesia has accidentally been introduced into Jamaica as a weed in rice-fields and is now thoroughly naturalized. So far as can be discovered, this species has not previously been recorded from anywhere in the Western Hemisphere.

Eleocharis R. Br.

Eleocharis atropurpurea (Retz.) Kunth, Enum. Pl. 2: 151. 1837.

New to Jamaica. **Clarendon:** Harris Savanna, in wet muddy ground among other sedges, 350 ft, *Proctor 34275*, Nov. 13, 1974, *Proctor 34312*, Nov. 15, 1974.

This is a pantropical species of somewhat sporadic distribution, apparently very rare in the West Indies. It occurs at a number of scattered localities in temperate North America. As an ephemeral annual, *Eleocharis atropurpurea* is probably often overlooked or only apparently absent; the achenes seem

able to live in a dormant state for a long time until growing conditions are favorable.

Eleocharis nigrescens (Nees) Steudel, Synopsis Pl. Glum. 2: 77. 1855.

MAP 8.

E. minutiflora Böck. Bot. Jahrb. 7: 274. 1886.

E. nigrescens var. *minutiflora* (Böck.) Svensen, Rhodora 39: 226. 1937.

New to Jamaica. **Clarendon:** Lancewood Valley, in moist depression beside main highway, 50–200 ft, *Proctor 36521*, Nov. 11, 1976.

Like the previous species, this has a sporadic pantropical distribution; in North America it has been found as far north as South Carolina, where it is presumed to be introduced. *Eleocharis nigrescens* is very small and easily overlooked.

Eleocharis oligantha C. B. Clarke in Urban, Symb. Antill. 2: 69. 1900.

New to Jamaica. **Clarendon:** Harris Savanna, on mud beside seasonal rain-pool, ca. 350 ft, *Proctor 34363*, Nov. 26, 1974, *Proctor 38029*, Feb. 10, 1979.

This species was previously known only from Cuba.

All three of the *Eleocharis* species newly reported from Jamaica would key out to the second half of Adams's (1972) key, in which *E. atropurpurea* is said to occur in the Cayman Islands. This section of the key can be rewritten as follows:

- (1. Spikelets less than 5 mm long, more or less ovoid. . . .)
 7. Achenes flattened; style 2-cleft; bristles conspicuous (8, 8; 9, 9; as in Adams's key).
 7. Achenes trigonous; style 3-cleft; bristles inconspicuous, much shorter than achene or absent.
 10. Achenes 1–1.2 mm long.
 11. Culms 0.2–0.4 mm in diameter; glumes mostly pale or greenish, at least along keel. *E. retroflexa*.
 11. Culms ca. 0.1 mm in diameter; glumes mostly purple-brown throughout. *E. oligantha*.
 10. Achenes 0.5–0.6 mm long.
 12. Bristles 3 to 5; spikelet subtended by linear bract more than half as long as spikelet; achenes grayish white, with rounded angles. *E. microcarpa*.
 12. Bristles lacking; spikelet subtended by bract similar to glumes; achenes yellowish brown, with ribbed angles. *E. nigrescens*.

Fimbristylis Vahl

Fimbristylis autumnalis (L.) Roemer & Schultes in L. Syst. Veg. 2: 97. 1817.

MAP 8.

New to Jamaica. **St. Elizabeth:** Police Rifle Range, 3.5 mi NW of Black River, in wet silica sand, near sea level, *Proctor 18447*, Dec. 11, 1958.

It was associated at this locality with another rare species, *Bacopa sessiliflora* (Bentham) Edwall of the Scrophulariaceae.

The record of this small annual species was overlooked and omitted by Adams (1972). *Fimbristylis autumnalis* also occurs in the Bahamas and Cuba, and it has a wide range in continental North America, as well as in the Old World tropics. This plant would key out in Adam's treatment to *F. complanata*, but it differs markedly from that species in its smaller stature (culms 10–20 vs. 20–60 cm tall), narrower leaves (0.8–1.5 vs. 2–3 mm wide), and smaller spikelets (2–5 vs. 5–10 mm long). The achenes of *F. autumnalis* are translucent and smooth or very faintly reticulate, whereas those of *F. complanata* are opaque and minutely papillose.

***Fimbristylis capillaris* (L.) A. Gray, Man. Bot. ed. 5. 567. 1848.**

Bulbostylis capillaris (L.) Kunth ex C. B. Clarke in Hooker f. Fl. Brit. India 6: 652. 1893.

New to Jamaica. **Clarendon:** Harris Savanna, ca. 350 ft, *Proctor 34279*, Nov. 13, 1974.

Of widespread occurrence in the United States, this species has also been recorded from Mexico, Belize, Honduras, Panama, and Cuba. *Fimbristylis arenaria*, a very similar species differing chiefly in its much darker achenes, has been recorded from pine forests in Cuba, Hispaniola, and Belize.

Fimbristylis capillaris, together with *F. papillosa* (Kükenthal) Alain (see Adams, 1972), belong to subg. BULBOSTYLIS, which is distinguished from subg. FIMBRISTYLIS by the persistent, caplike style-bases on the apex of the achenes, and also frequently by the finely wiry or filiform texture of the culms. These two species, however, are very different from each other in details. *Fimbristylis capillaris* is a small, soft-filiform, tufted annual with culms 5–20 cm tall; its spikelets are 2–7 mm long, and its transversely rugulose achenes are 0.75–0.9 mm long. *Fimbristylis papillosa*, on the other hand, is a perennial with a hard, often slightly bulbous base and filiform but rather wiry culms up to 60 cm or more tall; its spikelets are 7–12 mm long, and its densely papillose achenes are 1–1.1 mm long.

Rhynchospora Vahl

***Rhynchospora tracyi* Britton, Trans. N. Y. Acad. Sci. 11: 84. 1892.**

MAP 8.

New to Jamaica. **Hanover:** in Great Morass ca. 1.9 mi due SW of Logwood, open, wet, fresh-water "quaking" marsh (underlain with semiliquid peat), sea level, *Proctor 37135*, July 19, 1977, *Proctor 37517*, Dec. 20, 1977.

This species resembles *Rhynchospora cyperoides* (Sw.) Martius but differs from that taxon in its more slender and wiry culms, its fewer, larger heads,

and its much larger achenes (2.5 mm vs. 1 mm long).

Rhynchospora tracyi is otherwise known from the Bahamas, Cuba, Hispaniola, Belize, and along the coastal plain of southeastern United States from South Carolina to Florida and Mississippi.

Scleria Berg.

Scleria macrophylla C. Presl, Reliq. Haenk. **1**: 200. 1838. MAP 8.

New to Jamaica. **St. Elizabeth**: in Black R. Morass near junction of Y.S. and Black rivers, sea level, *Proctor 24517*, Jan. 25, 1964 (det. John E. Fairey, III, too late to be included in Adams's *Flowering Plants of Jamaica* (1972)).

This species has a wide continental range from southern Mexico to Panama, Brazil, and Bolivia, but it has not previously been found in the West Indies. It is easily distinguished from all other *Scleria* species in Jamaica by its very broad leaves, which reach 4.5 cm in width.

Scleria reticularis Michaux var. **pubescens** Britton, Ann. N. Y. Acad. Sci. **3**: 232. 1884. MAP 8.

New to Jamaica. **Hanover**: near Hog R., 1.7 mi due NW of Kingsvale P.O., ca. 500 ft, *Proctor 33577*, Oct. 31, 1973.

The variety has previously been known from southeastern United States, Cuba, and Haiti.

Scleria setuloso-ciliata Böck. Flora **65**: 30. 1882. MAP 8.

New to Jamaica. **St. Elizabeth**: Slipe distr., sea level, *Proctor 33455*, July 22, 1973.

Originally described from Guatemala, this species is recorded from Cuba, scattered Central American localities, and Brazil.

GRAMINEAE

Panicum L.

Panicum exiguiflorum Griseb. Catal. Pl. Cubens. 234. 1866. MAP 9.

New to Jamaica. **Clarendon**: Harris Savanna, among sedges in open marshy ground, ca. 350 ft, *Proctor 34350*, Nov. 26, 1974; 0.8 mi by road E of Toll Gate, ca. 50 ft, *Proctor 37804*, May 5, 1978.

Otherwise known from the Bahamas, Cuba, and Haiti. This species is distinctive in its growth habit, the culms of well-developed plants becoming lax

and trailing. Unlike that in other species of this genus in Jamaica, the palea at maturity becomes much enlarged and of subcoriaceous texture, by its development forcing the spikelet open.

Paspalum L.

Paspalum botteri (Fourn.) Chase, Jour. Wash. Acad. Sci. **13**: 436. 1923. MAP 9.

New to Jamaica. **St. Andrew**: campus of Univ. West Indies near Botany Dept., in open waste ground, ca. 600 ft, *C. D. Adams 13269*, Oct. 5, 1972 (u, ucw).

This perennial weed has somehow been introduced into Jamaica and is persisting; it will probably become naturalized. Its natural range is southern Mexico and Central America to Costa Rica.

Paspalum clavuliferum C. Wright, Anal. Acad. Ci. Habana **8**: 203. 1871.

New to Jamaica. **Clarendon**: Harris Savanna, in open ground among scattered sedges, ca. 350 ft, *Proctor 34432*, Dec. 10, 1974.

Otherwise known from Cuba, Hispaniola, and Puerto Rico; this species also has a wide range in continental tropical America from Mexico to South America.

Paspalum pleostachyum Döll in Martius, Fl. Brasil. **2**(2): 58. 1877.

New to Jamaica. **Clarendon**: Harris Savanna, among sedges and grasses in seasonally moist open ground, ca. 350 ft, *Proctor 35365*, Oct. 20, 1975.

Recorded by Hitchcock (1936) from Cuba, Haiti, and Grenada; also in South America south to Brazil.

Paspalum rupestre Trin. Linnaea **10**: 293. 1836.

New to Jamaica. **Clarendon**: Harris Savanna, in open ground among scattered sedges, ca. 350 ft, *Proctor 34400*, Dec. 7, 1974, *Proctor 34411* and *34411-a*, Dec. 10, 1974.

Otherwise known from Cuba, Hispaniola, and Puerto Rico. Some of the Harris Savanna plants were unusually robust for this species, but all show the characteristic slender, recumbent culms lying on the ground.

The addition of four more species of *Paspalum* to the 30 recorded by Adams (1972) hardly justifies rewriting his key. Interested persons are referred to Hitchcock (1936) for aid in identification.

Reynaudia Kunth**Reynaudia filiformis** Kunth, Révis. Gram. 195. 1830.

MAP 9.

This rare grass, not recorded from Jamaica since Wullschlaegel collected it in the parish of Manchester in 1849, has now been rediscovered growing rather abundantly in a moist, savannalike pasture, where it was associated with a number of other rare species (see a partial listing of these under *Schultesia guianensis*).

St. Elizabeth: Slipe distr., sea level, *Proctor 33566*, Oct. 26, 1973.

Sacciolepis Nash**Sacciolepis indica** (L.) Chase, Proc. Biol. Soc. Washington **21**: 8. 1908.

MAP 9.

New to Jamaica. **Clarendon:** Mason River Field Sta., ca. 2.75 mi due NW of Kellit's P.O., ca. 2300 ft, *Proctor 37853*, June 18, 1978, *Proctor 38209*, June 22, 1979 (duplicates of these numbers det. H. B. Correll).

In the West Indies this species has also been found in Guadeloupe (Gould, 1979). Its natural range is from tropical Asia through Malaysia to Australia and Polynesia, and its appearance in the Western Hemisphere has been comparatively recent. The earliest report I have seen is from Georgia (Hitchcock, 1935, p. 688): *Sacciolepis indica* is stated to have been "introduced in a Government pecan orchard, Thomasville." It has also been reported from Texas (Gould, 1975), Florida to North Carolina (Godfrey & Wooten, 1979), and North Carolina (Radford, Ahles, & Bell, 1968). The latter record is particularly interesting because it was based on two collections from Sampson County. It is probably more than a coincidence that the *Dionaea muscipula* plants now naturalized at the Jamaican locality of *S. indica* also originated from Sampson County, from where they were introduced in 1968. It seems reasonable to suppose that seeds of *S. indica* were accidentally introduced among the roots of the *Dionaea*.

Sacciolepis indica is easily distinguished from *S. striata*, the only other Jamaican species of this genus, by the very much smaller size of all its parts; *S. striata* also occurs only at very much lower elevations (below 400 ft).

Tragus Haller

Jamaica has always been credited with but one species of this genus, *Tragus berteronianus*; in fact, Hitchcock (1936) recorded no other species from the West Indies. It was therefore rather a surprise when a specimen of supposed *T. berteronianus*, sent with exchange material to Texas, was reported back by Dr. M. C. Johnston as *T. racemosus*. A close examination of the specimens of *Tragus* in the Institute of Jamaica Herbarium has subsequently

revealed several sheets of both species. These plants can be differentiated as follows:

- A. Spikelets 2–3 mm long, the apex blunt, scarcely projecting beyond spines, the bur nearly sessile. *T. berteronianus*.
 A. Spikelets 4–4.5 mm long, the apex acuminate, projecting beyond spines, the bur pedicellate. *T. racemosus*.

Tragus berteronianus Schultes, Mant. Syst. Veg. 2: 205. 1824. MAP 9.

Kingston: N end of Race Course [now National Heroes Circle], ca. 150 ft, *Proctor* 9358, Oct. 24, 1954. **St. Catherine:** Port Henderson Hill, *Miss P. B. Caws s.n.* (JJ 4352), Sept. 25, 1953. **St. Thomas:** near mouth of Yallahs R., ca. 50 ft, *Proctor* 9415, Oct. 31, 1954.

Tragus racemosus (L.) All. Fl. Pedem. 2: 241. 1785. MAP 9.

New to Jamaica. **St. Andrew:** near mouth of Hope R., 0–20 ft, *Proctor* 9288, Aug. 23, 1954 (cited by Adams (1972) as *T. berteronianus*); E of Cane R. above coastal highway bridge, ca. 20 ft, *Proctor* 25595, Oct. 25, 1964. **St. Catherine:** along Rio Cobre just S of Central Village, 10–40 ft, *Proctor* 36867, May 14, 1977.

This species occurs as an introduced, naturalized plant in the northeastern and southwestern United States. Its natural range extends from southern Europe eastward through Asia Minor to Iran and Afghanistan.

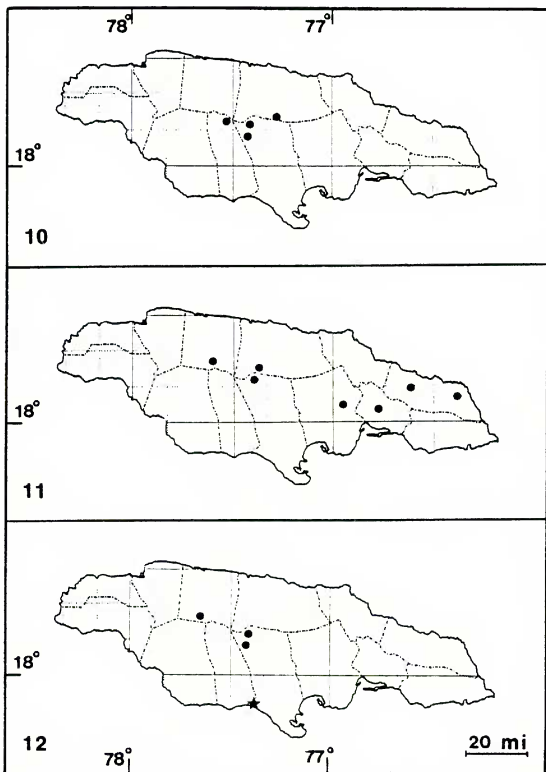
PIPERACEAE

Peperomia Ruiz & Pavon

Peperomia abdita Proctor, nom. et stat. nov. MAP 10.

Peperomia barbata C. DC. var. *puberula* Yuncker, Bull. Inst. Jamaica Sci. 11: 36. 1960; Adams, 1972, p. 206.

In describing this plant and assigning varietal status to it, Yuncker differentiated it solely by its minute, puberulous indument (vs. the dense villous hairs of typical *Peperomia barbata*). Working no doubt with insufficient material, he failed to note several other distinctive differences: the fruits of "var. *puberula*" are smaller (0.6 vs. 0.8 mm in diameter), are densely papillose-glandular (instead of smooth), have a symmetrical instead of a sub-oblique apex, and at maturity are exerted on a short, conical stalk instead of remaining sessile. Further, except at the type locality, "var. *puberula*" is consistently smaller in stature and leaf size. The two populations are only partly sympatric, and each may occur alone or somewhat near the other. Both occur in crevices on the sheltered sides of limestone cliffs, but "var. *puberula*" appears to require deeper shade and usually grows in the darkest, most hidden recesses of moist, rocky limestone hilltops. There appear to be



MAPS 10-12. Distributions: 10, *Peperomia abdita*; 11, *Pseudolmedia spuria*; 12, *Schoepfia harrisii* (dots), *S. obovata* (star).

no intermediate forms; therefore it is here proposed that Yuncker's "var. *puberula*" be raised to the rank of species. For this, a new name is required. The name *abdita*, which means "hidden" or "concealed," seems appropriate.

Clarendon: Peckham Woods, ca. 2500 ft, *Proctor 8218 p.p.*, March 10, 1954, 8419 *p.p.* (type); Glenwood Springs, along road between Balcarres and Sunbury, ca. 3100 ft, *Proctor 33636*, Nov. 30, 1973. **Manchester:** 1 mi SE of Pike, ca. 3100 ft, *Proctor 18316*, Oct. 25, 1958. **St. Ann:** Douglas Castle distr., ca. 2300 ft, *Proctor 26821*, Jan. 22, 1966.

Peperomia barbata var. *barbata* has been collected at some of the above localities, and also at others in the parishes of Trelawny and St. Catherine. *Peperomia abdita* has so far not been found in the latter two parishes.

Peperomia tetraphylla (G. Forster) Hooker & Arnott, Bot. Beechey Voy. 97. 1841.

Peperomia reflexa (L. f.) A. Dietr. in L. Sp. Pl. ed. 6. 1: 180. 1831, not Kunth in H.B.K., 1815.

The specific epithet *reflexa* as used by Yuncker (1960), Adams (1972), and most other authors of floristic works of the Antillean-Central American region is illegitimate. The name *tetraphylla* is the next available one.

MORACEAE

***Pseudolmedia* Trécul**

Pseudolmedia spuria (Sw.) Griseb. Fl. Brit. W. Indian Is. 152. 1860. MAP 11.

Adams (1972, p. 224) stated that this species is "rare and not recently collected." However, data now available suggest that it is in fact widely distributed and not uncommon. The Institute of Jamaica Herbarium has specimens from six parishes.

In the John Crow Mountains area this tree is known locally as "red breadnut."

St. Andrew: along Hermitage road above Red Gal Ring, 1000-1200 ft, *Proctor 31548*, Dec. 11, 1970 (sterile). **St. Catherine:** 1.5 mi due SE of Sligoville, 1800-1900 ft, *Proctor 31729* (♂), *Proctor 31730* (♀), both April 16, 1971. **Clarendon:** Broom Hall hills, 1.2 mi due SW of Cave Valley Square, 1800-2000 ft, *Proctor 36722*, Jan. 8, 1977 (sterile). **Trelawny:** Tyre distr., 2 mi N of Troy, ca. 1750 ft, *Proctor 9937*, March 14, 1955 (♂) (det. C. C. Berg). **St. Ann:** Cedar Valley distr., ca. 1.5 mi NE of Cave Valley Square, ca. 2000 ft, *Proctor 36699*, Dec. 18, 1976 (♀). *Goodfriend s.n.*, June 2, 1977 (♀). **Portland:** ca. 1 mi S of Chepstow, ca. 500 ft, *Proctor 36745*, March 20, 1977 (sterile); John Crow Mts. ca. 6 mi by road S of Sherwood Forest, 1200-1500 ft, *Proctor 38457*, Dec. 6, 1979 (sterile).

OLACACEAE

Schoepfia Schreber

Schoepfia obovata C. Wright ex Sauv. An. Acad. Ci. Habana 5: 289.
1868. MAP 12.

New to Jamaica. **Clarendon:** N slope of Round Hill, 500–1100 ft, *Proctor 9497*, Nov. 22, 1955, *Proctor 38257*, July 26, 1979.

The first of these two collections was cited by Adams (1972) as *Schoepfia harrisii*, but a reappraisal of this material shows that it is not the same as that species. *Schoepfia harrisii* is a straggling or even scrambling shrub confined to moist, wooded limestone crags at scattered localities around the perimeter of the Central Inlier (see MAP 12) at elevations of 2000–3000 ft. It has lanceolate, narrowly elliptic, or lance-ovate leaves up to 11.5 cm long and mostly 2–4 cm broad; they tend to be variable in shape, sometimes being inequilateral or bluntly acuminate, with petioles up to 8 mm long. The plant is cauliflorous along older stems (or with flowers occasionally originating from leaf axils), with floral peduncles 10–15 mm long, and its fruits are bright red. It is a rare and localized Jamaican endemic.

Schoepfia obovata, on the other hand, is an erect, sturdy shrub or tree up to 10 m tall that grows in dry limestone woodlands at much lower elevations. It has obovate, oblong, or elliptic leaves mostly 2–4 by 1.5–2 cm; they are quite regular in shape and always rounded or blunt at the apex, with very short petioles 1–3 mm long. Its flowers, on peduncles 2–8 mm long, always originate from leaf axils, and its fruits are yellow or dull red. This species has a broad West Indian range, being found in the Bahamas, Cuba, Hispaniola, and Puerto Rico. Its presence in suitable Jamaican habitats is therefore not surprising.

VISCACEAE

Following the proposals of Barlow (1964) and more particularly the careful analysis by Kuijt (1969), the genera *Dendrophthora* and *Phoradendron* are here considered members of the family Viscaceae instead of Loranthaceae. Adams (1972) treated all the mistletoes under Loranthaceae.

Dendrophthora Eichler

The publication of Kuijt's monograph of *Dendrophthora* (1961) made it possible for the first time to identify members of this genus with some degree of confidence. It is to be hoped that he (or someone as meticulous) will go on to bring order out of the chaos of *Phoradendron*.

Because Kuijt did not examine the material in the Institute of Jamaica Herbarium, he did not realize that the nearly complete personal collection of W. Buch from Haiti is now preserved there; he assumed that since the

holotype of *Dendrophthora brachystachys* Urban at Berlin "is probably no more extant" (p. 37), it was necessary to designate a neotype. However, the Buch collection in question (no. 811) is represented at U and should be designated lectotype of this species.

Recent field work in Jamaica has revealed the presence of an undescribed species of *Dendrophthora* that is related to *D. flagelliformis* (Lam.) Krug & Urban of Cuba, Hispaniola, and Puerto Rico. Dr. Kuijt has kindly examined this material and has confirmed that it is distinct; I am indebted to him for providing some helpful notes on these specimens.

***Dendrophthora nuda* Proctor, sp. nov.**

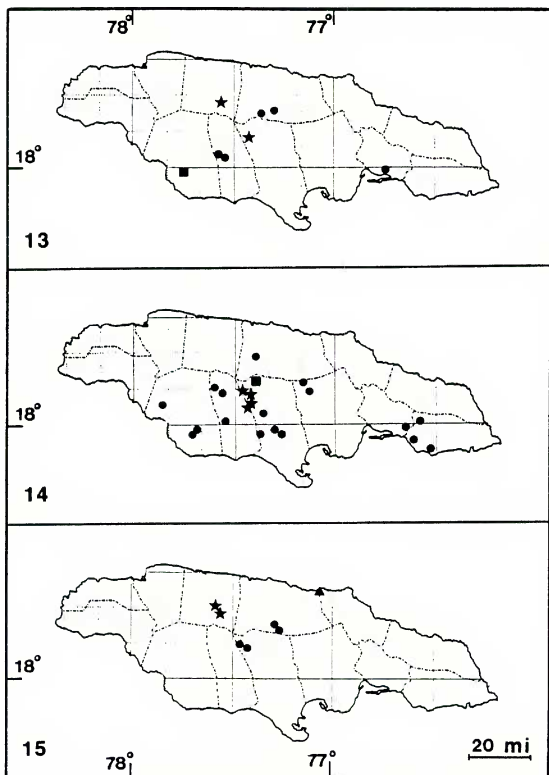
FIGURE 2, MAP 13.

Frutex aphyllus dioecius parasitatur in *Tabebuia angustata*, a speciebus aliis *Dendrophthora Jamaicensis* et a *D. flagelliformis* in ramulis elongatis teretibus et inflorescentiis compositis, inflorescentiis staminatis internodiis quadrangularibus et floribus numerosis congestus, inflorescentiis pistillatis floribus 2 vel 4 uterque nodo praeditis, differt.

Leafless dioecious shrub parasitic on *Tabebuia angustata* Britton; stems terete, glabrous, pendulous but firm, up to 1 m long, with numerous branches; cataphylls absent; basal appendages minute, transverse. Spikes elongate and apparently of indeterminate growth, curved, arranged in loose compound inflorescences with axes similar in appearance to ordinary stems except for nodal scales. Fertile staminate internodes up to 11 per division, each internode 5-18 by 0.8-1.7 mm, flattened-quadrangular in cross section,



FIGURE 2. *Dendrophthora nuda*, pistillate inflorescence with fruits.



MAPS 13–15. Distributions: 13, *Dendrophthora nuda* (square), *Phoradendron berterianum* (stars), *P. campbellii* (dots); 14, *P. crenulatum* (dots), *P. solandrae* (stars), *Pilostyles globosa* (square); 15, *Cocoloba priorii* (dots), *C. longifolia* × *C. tenuifolia* (stars), *C. uvifera* × *C. longifolia* (triangle).

with 5 to 15 crowded flowers borne in straight row on both narrow sides of each internode; staminate flowers ca. 0.7 mm in diameter. Fertile pistillate internodes up to 8 per division, each internode 5–18 by 0.7–2 mm, terete, with 1 or 2 pairs of flowers per internode (if 2, these widely separated); pistillate flowers ca. 1.5 mm in diameter. Fruits pale orange, oblong, 4–4.5 by 2–2.3 mm.

St. Elizabeth: 0.8 mi N of Mountainside, sea level, *Proctor 38034*, Feb. 17, 1979 (♀) (holotype), *Proctor 37959* (♂), *Proctor 37960* (♀), both Jan. 3, 1979.

Dendrophthora nuda is easily distinguished from the two other Jamaican species by its elongate terete stems and its compound unisexual inflorescences, of which the staminate have flattened-quadrangular internodes with numerous small, crowded flowers, and the pistillate have only 1 or 2 pairs of flowers per internode. These characters also separate it from *D. flagelliformis* of Cuba and Hispaniola, seemingly its closest relative elsewhere. *Dendrophthora nuda* is the only Jamaican mistletoe to have been found parasitic on *Tabebuia*; it is also unusual in its genus for occurring at sea level.

Phoradendron Nutt.

The mistletoes have generally been neglected by collectors, and there is still much to be learned about the Jamaican species. The present contribution adds a new record and a new species to the local roster and presents augmented locality data on two others that have been little known.

Phoradendron berterianum (DC.) Nutt. Jour. Acad. Nat. Sci. Philadelphia **1**: 185. 1847. MAP 13.

P. dichotomum (Bert.) Krug & Urban, Bot. Jahrb. **24**: 48. 1897.

New to Jamaica. **Clarendon:** Glenwood Springs, along road between Balcarres and Sunbury, ca. 3100 ft, on *Ateramnus integer*, *Proctor 33646*, Nov. 30, 1973, *Proctor 36352*, July 21, 1976. **Trelawny:** Mango Tree Hill, along road between Burnt Hill and Spring Garden, ca. 1800 ft, on *Trichilia reticulata*, *Proctor 35666*, April 1, 1976.

This species is otherwise known from Cuba, Hispaniola, and Puerto Rico. It is distinguished from all but two of the other Jamaican species in having cataphylls (scale sheaths) at the base of all internodes. It differs from *Phoradendron piperoides* (Kunth) Trelease in having the leaves basinerved instead of pinnately nerved, and from *P. flavens* (Sw.) Griseb. in having its flowers in four rows instead of six; it differs from both of these species in its dichotomous branching.

Phoradendron campbellii Krug & Urban, Bot. Jahrb. **24**: 40. 1897.

MAP 13.

Adams (1972, p. 243) stated that *Phoradendron campbellii* is "apparently rare and local (St. Andr.). . . . This obscure species has not been seen since

the original collections." However, recent attention paid to mistletoes has revealed that this species is fairly widespread in the interior of the island; it is now known from two more parishes in addition to the original one.

Manchester: Marshalls Pen, ca. 2.25 mi due NW of Mandeville, ca. 2100 ft, on *Nectandra coriacea*, Proctor 28887, July 28, 1968; Top Lincoln, 1.2 mi NNW of Lincoln P.A., ca. 2850 ft, on *Nectandra coriacea*, Proctor 37903, July 20, 1978. **St. Ann:** Cedar Valley distr., ca. 1.5 mi NE of Cave Valley Square, ca. 2000 ft, on *Licaria triandra*, Proctor 37276, Sept. 23, 1977, Proctor 37317, Oct. 7, 1977, on *Guapira fragrans*, Proctor 37391, Nov. 4, 1977; 1.6 mi by road SSE of Stepney, ca. 2300 ft, on *Nectandra antillana*, Proctor 36322, July 3, 1976.

Phoradendron crenulatum Urban, Symb. Antill. 5: 332. 1907. MAP 14.

Adams (1972) cited this species only from the parish of Clarendon, having overlooked the fact that the type was collected in St. Andrew. Numerous collections in recent years have revealed its occurrence in at least seven parishes—St. Thomas, St. Andrew, St. Catherine, Clarendon, St. Ann, Manchester, and St. Elizabeth. In some districts it is very common and conspicuous. MAP 14 shows its present known distribution.

Phoradendron crenulatum is most often found as a parasite on members of the Simaroubaceae, especially *Picrasma excelsa* (Sw.) Planchon and *Simarouba glauca* DC. The only other hosts known to me are *Cordia collococca* L. and *C. gerascanthus* L. (Boraginaceae). I have twice found *P. crenulatum* parasitized by other mistletoes, once by *P. tetrapterum* Krug & Urban and once by *Oryctanthus occidentalis* (L.) Eichler.

Phoradendron solandrae Proctor, sp. nov.

FIGURE 3, MAP 14.

Frutex monoecius glaber parasitatur in *Solandra grandiflora*, a *Phoradendron albivaginato* in foliis grandioribus 6–15 × 1.5–5 cm (versus 3.5–5 × 1.5–2.5 cm), spicis carnosioribus longioribusve 2–4.5 cm (versus circa 2 cm) longis usque ad 6 simul ex axillis (versus spicibus solitariis), et fructibus grandioribus 4.5 mm (versus 2 mm) in diametro, differt.

Monoecious, glabrous shrub parasitic on *Solandra grandiflora* Sw. Plant bushy, robust, up to 1.5 m tall; young stems somewhat compressed and 2-edged, not broadened below nodes, becoming terete and woody with age, up to 1 cm thick or more toward base of plant. Cataphylls basal only, tubular, 2-lipped, white margined. Petioles 5–10 mm long; leaf blades subcoriaceous, lanceolate to broadly lanceolate, inequilateral, sometimes curved, 6–15 by 1.5–5 cm, blunt at apex, cuneate-attenuate at base, decurrent, up to 7-nerved from near base. Spikes solitary or up to 6 together in axils, 2–4.5 cm long, 3- or 4-jointed, fleshy, androgynous, terminal joint staminate and deciduous after flowers have fallen, others pistillate; flowers in 4 rows; staminate flowers usually 10 (4 rows of 2 each, plus 2 single ones between and beyond each of 2 rows at distal end), 1.4–1.8 mm in diameter; pistillate flowers 4



FIGURE 3. *Phoradendron solandrae*, portion of fruiting branch.

to 10 per joint, ca. 2 mm in diameter, deeply sunken in pits in fleshy rhachis. Fruits globose, exserted, pale orange, ca. 4.5 mm in diameter.

Clarendon: Knox Woodland, ca. 1.3 mi due SE of Spaldings P.O., 2800–3000 ft, *Proctor 37430*, Nov. 19, 1977 (flowering) (holotype), *Proctor 37474*, Dec. 4, 1977; Glenwood Springs, along road between Balcarres and Sunbury, ca. 3100 ft, *Proctor 38165*, May 24, 1979; 1.7 mi due SSE of Cumberland, ca. 3000 ft, *Proctor 37603*, Jan. 18, 1978, *Proctor 37802*, April 30, 1978, ripe fruits from same plant coll. July 9, 1978. **Manchester:** 0.5 mi due NNE of Banana Ground, ca. 3100 ft, *Proctor 37592*, Jan. 18, 1978.

When compared with the Jamaican species listed by Adams (1972), the cited plants seem to key out to *Phoradendron albovaginatum* Urban, but few of the descriptive details of that species tally with the present one. In fact, examination of an isotype of *P. albovaginatum* (*Harris 6703*, NY) shows a very different plant, parasitic on *Simarouba glauca* DC. (Simaroubaceae). Although the specimen is in fragments, it obviously differs from *P. solandrae* in its smaller leaves, its more slender, solitary spikes, and its smaller flowers and fruits, the latter not so deeply sunken in pits.

Phoradendron solandrae is the only Jamaican mistletoe to have been found as a parasite of *Solandra*, and the numerous plants seen over its very limited range were only on *Solandra*. Such narrow host specificity is unusual although not unique among the Viscaceae. Because of the chaotic state of *Phoradendron* taxonomy, no precise relationship can be suggested for this

species. It is entirely unlike any other known in the West Indies, and search in several large herbaria has failed to turn up anything very similar among the continental species.

RAFFLESIACEAE

Pilostyles Guillaumin

Pilostyles globosa (S. Watson) Hemsley, Jour. Linn. Soc. Bot. **31**: 311. 1896. FIGURE 4, MAP 14.

Apodanthes globosa S. Watson ex Robinson in Coulter, Bot. Gaz. **16**: 83. pl. 9. 1891.

Family, genus, and species new to Jamaica. **Clarendon**: hill S of Broom Hall, 1.2 mi due SW of Cave Valley Square, 1800–2000 ft, *Goodfriend s.n.* (IJ 64441), Dec. 6, 1976 (flowers), *Proctor 36693*, Dec. 14, 1976 (flowers), *Proctor 36715*, Jan. 8, 1977 (fruits), *Proctor 37505*, Dec. 16, 1977 (fruits).

All of the above specimens were found on *Bauhinia divaricata* L. The species was previously known only from Mexico, where it likewise occurs as a parasite only on species of *Bauhinia*. This is the first discovery of the family Rafflesiaceae in the West Indies.

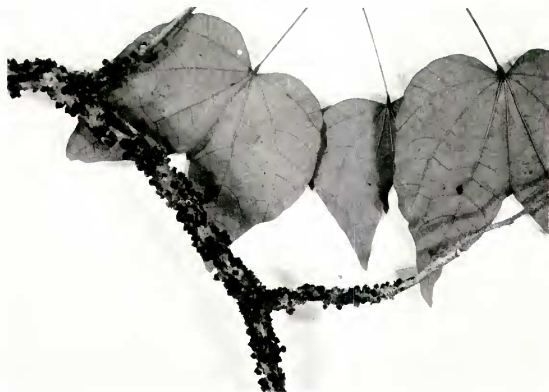


FIGURE 4. *Pilostyles globosa* in fruit on stems of *Bauhinia divaricata*.

POLYGONACEAE³**Coccoloba** P. Browne

Coccoloba priorii Fawcett & Rendle, Jour. Bot. London **51**: 124. 1913; Fl. Jamaica **3**: 120. 1914. MAP 15.

In an earlier treatment of *Coccoloba* in Jamaica (Howard, 1957), I had placed *C. priorii* in the synonymy of *C. zebra* Griseb. and noted that the latter species "is not adequately known and additional material is needed." The locality at which the type of *C. zebra* (Wilson 168, κ) was collected is not known but presumably must have been somewhere toward the eastern end of the island. The loose fruits associated with the type specimen are distinctive, and truly comparable material has not been collected again.

Recent collections of George R. Proctor from several locations in Clarendon and St. Ann parishes first appeared to be a new taxon, but after reexamination of my treatment of *Coccoloba zebra* and especially the single collection representing *C. priorii*, it appears that Fawcett and Rendle were correct in recognizing that species. Material now assigned to *C. priorii* consists of staminate and pistillate flowering specimens, mature fruits, and adventitious shoots. One noteworthy characteristic is in the ocreae, where the base of the petiole is above the middle of the ocrea; in addition, each inflorescence is normally branched above the base ("racemes . . . geminate," according to Fawcett & Rendle), and the rachis is puberulous, as is the perianth both in flower and in fruit. Both the staminate and pistillate flowers are predominantly single at the nodes of the inflorescence; the staminate buds are obovate-oblong in outline.

Clarendon: Quaco Rock, near Ritchies, ca. 3000 ft, *Proctor 34944*, March 30, 1975 (A. U), *Proctor 35245*, Aug. 31, 1975, *Morley & Whitefoord 942* (A); Glenwood Springs, along road between Balcarres and Sunbury, 3000–3100 ft, *Proctor 35642*, March 31, 1976, *Proctor 35659*, March 31, 1976. **St. Ann:** James Webster Patent, along new road between Mason River and Alexandria, 2200–2300 ft, *Proctor 31668*, March 27, 1971; Douglas Castle distr., 2200–2400 ft, *Proctor 36253*, May 21, 1976 (GH. U).

Coccoloba priorii would be placed with the key couplet of *C. longifolia* Fischer ex Lindau and *C. tenuifolia* L. in the publications of Howard (1957) and Adams (1972), as follows:

- A. Tree generally with scrambling branches; leaves usually lanceolate-ovate, apex obtusely acuminate. *C. longifolia*.
- A. Shrub or tree without scrambling branches; leaves usually elliptic, apex shortly acute.
 - B. Inflorescence single, tenuous, thin, curved; staminate flowers in clusters of 2 or 3 at each node of inflorescence; fruits glabrous, ovoid, obtuse at

³By Richard A. Howard.

- apex. *C. tenuifolia*.
 B. Inflorescence usually branched near base, erect, straight; staminate flowers borne singly; fruits puberulous, ovoid but subcoronate at apex. . . *C. priorii*.

Coccoloba longifolia Fischer ex Lindau × *C. tenuifolia* L. MAP 15.

I have also reexamined several collections from the parish of Trelawny that were previously assigned to either *Coccoloba longifolia* or *C. tenuifolia* (Howard, 1957). These appear to be intermediate between the two species in leaf shape and size but have the copious hirsute pubescence of golden brown, usually retrorse hairs on the internodes that is characteristic of *C. longifolia*, and the tenuous curved inflorescence of *C. tenuifolia*. Regrettably, only staminate or sterile material is available. A hybrid status is suggested for the following specimens:

Trelawny: Ramgoat Cave, 1500 ft, *R. A. Howard 14143*, Sept. 26, 1954 (A), *R. A. Howard & Proctor 14393*, July 4, 1955 (A), *R. A. Howard & Proctor 14420*, July 4, 1955 (A); Burnt Hill, 1640 ft, *Barkley 22J241*, April 29, 1952.

Coccoloba uvifera (L.) L. × *C. longifolia* Fischer ex Lindau MAP 15.

A collection from Prospect Estate, east of the White River, parish of St. Mary (*Proctor 36330*) appears to be a hybrid between *Coccoloba uvifera* and *C. longifolia*. The single specimen (on two sheets) has large, broadly ovate, coriaceous leaves to 24 by 20 cm, cordate at the base and tapering to an acute apex. A single inflorescence 25 cm long with multiple pedicels at each node but without flowers represents the staminate condition.

Earlier (Howard, 1957), the hybrid status of *Coccoloba* × *jamaicensis* Lindau was suggested, with the parentage *C. uvifera* × *C. tenuifolia*. On Hispaniola suggested hybrids of *C. uvifera* with *C. krugii* Lindau and *C. pubescens* L. are known. In all cases only a single or very few plants were found, and these were primarily staminate.

CHENOPODIACEAE

Salicornia L.

Salicornia virginica L. Sp. Pl. 1: 4. 1753.

I am unable to distinguish the Jamaican population of *Salicornia* from this widespread North American species. Therefore, the name *S. perennis* Miller (1768), as used by Adams (1972), must be replaced by the earlier Linnaean epithet. In any case, I believe that the name *perennis* was based on a European type and represents a different species.

Suaeda Forskål

Suaeda linearis (Ell.) Moq. Chenopod. Monogr. Enum. 130. 1840.

MAP 16.

Genus and species new to Jamaica. **Clarendon:** Rocky Point, 0.8 mi W of Jackson Bay, sea level, *Proctor 32972*, Oct. 24, 1972 (det. C. O. Hopkins).

The known range of *Suaeda linearis* includes the eastern coast of the United States, Yucatan, the Bahamas, Cuba, and Haiti; therefore, its discovery in Jamaica is not surprising. The nearly terete leaves easily distinguish *Suaeda* from other genera of Chenopodiaceae in Jamaica. In *Chenopodium* and *Atriplex* the leaves are flat; in *Salicornia* they are reduced to rudimentary scales or ridges, so the terete stems appear to be leafless unless examined closely.

AMARANTHACEAE

Amaranthus L.

The genus *Acnida* was long distinguished from *Amaranthus* on the basis of being dioecious instead of monoecious, and in lacking a perianth on the pistillate flowers. Adams (1972) listed *Acnida cuspidata* Bert. ex Sprengel for Jamaica. However, Sauer (1955, p. 7) had previously submerged *Acnida* in *Amaranthus* because of what he termed "the absence of a clear-cut morphological discontinuity . . . accompanied by the absence of an absolute reproductive barrier." This required the generic description of *Amaranthus* to be modified as follows: first, plants monoecious or dioecious (instead of monoecious only); and second, ♀ tepals 0 to 5 (instead of 1 to 5). The sole Jamaican dioecious amaranth should be known as:

Amaranthus australis (A. Gray) J. D. Sauer, *Madroño* **13**: 15. 1955.

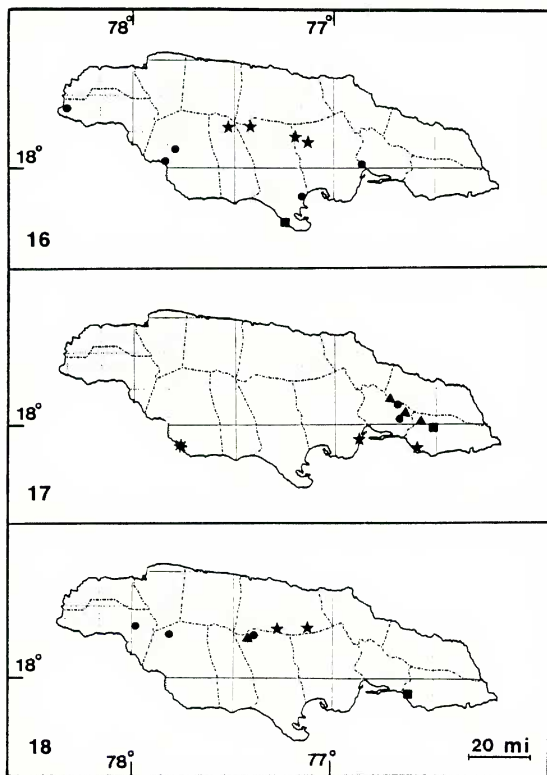
MAP 16.

Sauer cited no localized Jamaican specimens, yet his distribution map of this species showed two dots on Jamaica! In fact, there are now records of *Amaranthus australis* from at least four parishes—Westmoreland, St. Elizabeth, Clarendon, and the border of St. Catherine and St. Andrew. It is very common in some marshy localities, and under favorable conditions it may reach at least 3.5 m in height, with stems as much as 15 cm in diameter.

NYCTAGINACEAE

Guapira Aublet

The genus *Guapira* is distinguished from *Pisonia* L. especially by its drupelike, nonglandular anthocarps, and also by the fact that none of its species is either scandent or armed with thorns. However, difficulties arise in distinguishing sterile or immature material of arborescent species. This problem has led to some confusion in the treatment of these genera by Adams (1972) and has resulted in the delayed recognition of an anomalous Jamaican species of *Guapira*.



MAPS 16–18. Distributions: 16, *Suaeda linearis* (square), *Amaranthus australis* (dots), *Guapira rotundifolia* (stars); 17, *Phytolacca icosandra* var. *anomala* (square), *Portulaca aurantiaca* (stars), *P. umbraticola* (asterisk), *Cerastium glomeratum* (dots), *C. triviale* (triangles); 18, *Opuntia sanguinea* (square), *Ocotea exaltata* (dots), *O. harrisii* (triangle), *O. staminoides* (stars).

In a sense the problem is a legacy inherited from Heimerl (1912), who described a species he called *Neea* (*Pisonia*?) *rotundifolia* on the basis of immature material from Peckham Woods, parish of Clarendon (Harris 10985). Fawcett and Rendle (1914) included this species under *Neea* without comment. In 1968 I drew Dr. C. D. Adams's attention to certain material from the interior of Jamaica that matched *Pisonia subcordata* Sw., previously known from Puerto Rico and the Lesser Antilles, and Adams subsequently decided that Heimerl's *N. rotundifolia* was the same. This conclusion was published in *Flowering Plants of Jamaica* (1972). Unfortunately, he also included within his concept of *P. subcordata* certain specimens resembling this species that are now known—with more adequate material available—to represent a *Guapira*. A further complication arises from the fact that *P. subcordata* and the mysterious *Guapira* are very nearly sympatric and occur in the same kind of habitat. Since the flowering season of both species is brief and erratic, the trees are in sterile condition most of the time. Fortunately, there are leaf characters that seem to be reasonably distinctive. In addition, *P. subcordata* is deciduous and drops its leaves just before flowering, the flowers emerging with the new leaves; the *Guapira* is evergreen, producing inflorescences at the apex of mature leafy shoots.

It has recently become possible to examine some of the Harris specimens from Peckham Woods, Jamaica, on which Heimerl based his *Neea rotundifolia*. Surprisingly, this is not *Pisonia subcordata* with which Adams identified it, but instead belongs to the large-leaved evergreen *Guapira*. The anomalous persistence of perianth lobes on developing anthocarps does indeed suggest a *Neea*, but the ample flowering material now available from this and other localities has the exerted stamens and pistil of *Guapira* or *Pisonia*. The complete absence of glandularity on the anthocarps (if this is really a sufficient generic criterion!) points to *Guapira* rather than *Pisonia*, and the texture and venation of the leaves suggest a relationship to *G. obtusata* (Jacq.) Little, although the size of the leaves in the species under consideration is much larger.

Closer examination of all available material indicates possible clinal variation in the size of the staminate perianths. Much more surprising is the fact that in this species many of the staminate flowers have a well-developed, exerted pistil and are thus apparently bisexual or "perfect." The species is nevertheless essentially dioecious because some trees bear strictly unisexual pistillate flowers. Since all members of the *Neea-Pisonia-Guapira* complex are supposed to be strictly dioecious with unisexual flowers, the reproductive biology of the present species deserves closer investigation.

Neea rotundifolia was transferred to *Guapira* many years ago by Lundell, but without comment. There is a strong possibility that *Guapira* should be considered only subgenerically distinct from *Pisonia*. Whatever its ultimate generic disposition, the species *rotundifolia* must be reinstated as a member of Jamaica's endemic flora.

Guapira rotundifolia (Heimerl) Lundell, *Wrightia* 4: 83. 1968. MAP 16.

Neea rotundifolia Heimerl in Urban, Symb. Antill. 7: 218. 1912.

Pisonia subcordata of Adams, Fl. Pl. Jamaica, 262. 1972, in part, as to the citations A 12610 and P 27530.

This species differs from *Guapira obtusata* (apparently its closest Jamaican congener) in its greater stature (tree to at least 15 m tall vs. shrub or small tree 2.5–8 m tall), its larger leaves (up to 15 × 8 cm vs. 3.5–10 × 2.5–6 cm), its larger panicles (often 10 cm or more long vs. 4–6 cm), and its larger (3.6–6 mm long vs. 2.5–4 mm) staminate perianths that are often apparently bisexual. *Guapira rotundifolia* is endemic to Jamaica, whereas *G. obtusata* also occurs widely in the Bahamas, Turks and Caicos Islands, and Cuba, as well as Jamaica.

St. Catherine: Roaring River distr., 1.5 mi due SE of Lluidas Vale, ca. 1650 ft, *Proctor 31524* (sterile), Nov. 21, 1970, *Proctor 32481*, July 10, 1971 (♂); hill 1.5 mi W of Lluidas Vale, 1200–1400 ft, *Proctor 28432*, Aug. 4, 1967 (dry infl.); 2–3 mi by road W of Lluidas Vale, ca. 1750 ft, *Proctor 27530*, July 7, 1966 (♀), *Proctor 37971*, Jan. 21, 1979 (♀, young fruits). **Clarendon:** Peckham Woods, 2300–2500 ft, *Harris 10958*, July 6, 1911 (young fruits) (us), *Harris 10985*, July 7, 1911 (♀, immature) (ny, us, isotypes of *Neea rotundifolia*), *Harris 11183*, Sept. 27, 1912 (fruits) (us), *Crosby & Anderson 1263* (= *Adams 12610*), Aug. 19, 1963 (♂) (GH), *Proctor 34371*, Nov. 28, 1974 (♂?—buds only). **Manchester:** Gourie Forest, ca. 1 mi due SW of Coleyville, 2700–2900 ft, *Proctor 35602*, Jan. 16, 1976 (♂).

PHYTOLACCACEAE

Phytolacca L.

***Phytolacca icosandra* L. var. *anomala* Proctor, var. nov. MAP 17.**

A var. *icosandra* in floribus parvioribus, segmentis perianthii lanceolatis vel oblongo-lanceolatis 3–4 mm longis et 1–1.5 mm latis apicibus acuminatis vel subattenuatis et antheris circa 0.5 (haud circa 1) mm longis, differt.

Robust herb 1.5 m tall, forming thickets, differing from typical *Phytolacca icosandra* in its smaller flowers with lanceolate or oblong-lanceolate perianth segments 3–4 by 1–1.5 mm, acuminate to subattenuate at apex and narrowed at base, and in having smaller anthers (0.5 mm long vs. ca. 1 mm) devoid of pollen.

St. Thomas: along forestry road N of Union Hill, 3000–3500 ft, *Proctor 37371*, Oct. 19, 1977 (holotype).

Despite the apparent lack of pollen, this variant produces normal-appearing fruits and seeds. The perianth segments of var. *icosandra* are broadly elliptic or roundish-ovate, 3.5–4.5 by 2.5–3.5 mm, and blunt to somewhat acute at the apex.

PORTULACACEAE

Portulaca L.

The species listed by Adams (1972) as *Portulaca phaeosperma* Urban should properly be known as **Portulaca rubricaulis** Kunth in H.B.K. Nova Gen. Sp. Pl. 6: 73. 1820. Adams (p. 267) also mentioned a "larger variant with reddish petals." In fact, this variant comprises a rather distinctive population, differing not only in size and flower color but also in number of petals and in color and surface sculpture of the seeds. Somewhat similar plants also occur in Puerto Rico and the Virgin Islands (and perhaps elsewhere). I have been unable to find reference to such material in the literature, and although loath to describe a new species on the basis of incomplete evidence, have decided to do so in order to provide an epithet and a starting point for further studies.

Portulaca aurantiaca Proctor, sp. nov.

MAP 17.

Herba subsucculenta perennis a *Portulaca rubricaulis* in statura grandiore, foliis longioribus, floribus aurantiacis petalis 5 (haud flavis, petalis 6), capsulis acuminatis grandioribus, et seminis rufo-brunneis minute papillois, differt.

Erect perennial herb with long fleshy roots; stems up to 25 cm tall and 4 mm in diameter toward base, glabrous except for tufts of soft, white hairs in leaf axils. Leaves flattened-cylindrical, linear, 7–18 mm long, mostly 0.5–1.5 mm wide, sharply long-acuminate at apex, glabrous. Peduncles 1–2.5 cm long, glabrous, enlarged distally to 2–3.5 mm in diameter at apex; flower cluster subtended by whorl of few bracts similar to leaves, stem apex within this whorl bearing dense tuft of soft, white hairs mostly 6–8 mm long. Sepals not observed, petals 5, orange, 8–10 mm long. Capsules ovoid-acuminate, 4.5–5 mm in diameter, circumscissile below middle; seeds reddish brown, 0.5–0.7 mm in diameter, minutely and densely papillose.

St. Thomas: W side of Yallahs R. below coastal highway crossing, near sea level, Proctor 36519, Nov. 10, 1976 (holotype). (Presumably Adams's specimens from "beaches around Kingston" (1972, p. 267) are the same; not seen in conjunction with present study.) **St. Catherine:** Fort Clarence, 50–150 ft, Proctor 32626, Sept. 12, 1971.

At the latter locality, there appears to be a "hybrid swarm" of varying intermediates between *Portulaca aurantiaca* and *P. rubricaulis*.

Portulaca umbraticola Kunth in H.B.K. Nova Gen. Sp. Pl. 6: 72. 1820.

MAP 17.

Confirmed for Jamaica. **St. Elizabeth:** vic. of Billy Bay, 0.9 mi due WNW of Treasure Beach Hotel, ca. 50 ft, Proctor 35441, Nov. 8, 1975.

Adams (1972, p. 267) listed an unconfirmed report of this species, said to have been collected in "a coastal area of St. Elizabeth by N. L. Britton in 1907." Evidently this report was authentic, as confirmed by the present specimen, which was collected in dry rocky limestone woodland. The present species differs from *Portulaca oleracea* in its erect habit, its thin, widely scattered, narrowly spatulate leaves, and its gray, more prominently tuberculate seeds.

CARYOPHYLLACEAE

Cerastium L.

A critical examination of the *Cerastium* specimens at the Institute of Jamaica by Mr. David Good, formerly of Michigan State University, has shown the presence of two species in Jamaica, although in published floras (Fawcett & Rendle, 1914; Adams, 1972) only one is listed. These species can be distinguished as follows:

- A. Hairs of inflorescence glandular; upper bracts with green margins; pedicels much shorter than sepals. *C. glomeratum*.
- A. Hairs of inflorescence not glandular; upper bracts with broad, scarious margins; pedicels often equaling sepals in length or nearly so. *C. triviale*.

Cerastium glomeratum Thuill. Fl. Paris, ed. 2. 226. 1799. MAP 17.

St. Andrew: Silver Hill Gap, ca. 3500 ft, *Proctor 24610*, Feb. 11, 1964; along track between Guava Ridge and Bellevue, Port Royal Mts., 3000–3500 ft, *Proctor 24638*, Feb. 16, 1964.

This is the only species of *Cerastium* heretofore recorded from Jamaica.

Cerastium triviale Link, Enum. Hort. Berol. 1: 433. 1821. MAP 17.

New to Jamaica. **St. Andrew:** Clydesdale, ca. 3500 ft, *Barry s.n. (IJ 252)*, Aug. 24–31, 1943. **Portland:** near Green Hills, ca. 3600 ft, *von der Porten (née Barry) s.n. (IJ 3072)*, May 24, 1950. **St. Thomas:** Arntully, ca. 3000 ft, *Proctor 24570*, Feb. 2, 1964.

This species is very widespread in North Temperate regions. In *Flora Europaea* (1: 142. 1964) it is listed as a subspecies of *Cerastium fontanum* Baumg.

CACTACEAE

The Jamaican representatives of this family pose a number of unsolved taxonomic problems, most of which cannot be discussed at the present time. These problems occur especially in the genera *Hylocereus*, *Mammillaria*, *Selenicereus*, and *Opuntia*. In *Opuntia*, variation in *O. tuna* (L.) Miller needs

investigation, particularly with reference to populations occurring in southern Clarendon and Manchester parishes. Although this species was attributed to the Cayman Islands by Adams (1972), all the Cayman records pertain to *O. dillenii* (Ker-Gawl.) Haw.

Opuntia Miller

Opuntia sanguinea Proctor, sp. nov.

MAP 18.

Frutex multo ramosus *Opuntia tuna* et affines in habitu simile, sed in statura grandiore et floribus sanguineis staminibus pistillisque perianthis in longitudine subaequalibus, differt.

Plants bushy, much branched, ascending to erect, up to 2 or 3 m high, forming dense thickets. Joints broadly oblanceolate, oblong-oblanceolate, or elliptic, not easily detached, 14–19 cm long, 5.5–8 cm broad chiefly above middle, rounded at apex, tapering toward base; areoles 2–2.5 cm apart, each bearing tuft of yellow glochids 3–4.5 mm long, dense tuft of grayish woolly hairs much shorter than glochids, and single long, terete, brownish, retrorse spine mostly 2–3.5 cm long, or few areoles with 1 long spine and 1 usually 0.8–1 cm long. Flowers often 7 or more per joint, oxblood red, ca. 3–5 cm broad when fully open; ovary narrowly obconic, 2–2.5 cm long, 0.9–1.3 cm thick at apex, bearing numerous areoles each with tuft of glochids surrounded by much shorter mass of whitish, woolly hairs; petals obovate, up to 2.5 cm long, notched at broadly rounded apex; stamens almost equaling perianth in length, the filaments distally same color as petals, the anthers pale yellow, linear-oblong, 1–1.5 mm long; pistil about same length as stamens, stigma 6-rayed. Ripe fruits not seen.

St. Thomas: along road SE of Eleven Mile, ca. 300 ft, *Proctor 38043*, Feb. 24, 1979 (holotype).

The flowering season of this large species is very short, ranging from mid-February to a varying extent into March.

The species is unusual not only for its blood-red flowers, but also for the fact that the stamens and pistil approximately equal the perianth in length. In all other indigenous West Indian species these structures are much shorter than the perianth, whereas in the Mexican and Central American group of *Opuntia cochenillifera* (L.) Miller (*Nopalea* Salm-Dyck), they are much longer.

LAURACEAE

Ocotea Aublet

Few plant families have given rise to as much confusion as the Lauraceae, and few lauraceous genera are as confusing as *Nectandra* Rolander ex Rottb. In fact, there is a growing body of opinion that this genus is not really sep-

arable from *Ocotea*; I concur with this opinion. In the present paper the nomenclature of the four species of *Nectandra* recognized by Adams (1972) will not be considered because there exist unsolved problems of species delimitation. However, Adams's treatment of *N. coriacea* included two elements that should probably be considered separate species, as shown by the following discussion.

Fawcett and Rendle (1914) recognized six species of *Nectandra* and distinguished two (*N. sanguinea* "Roland ex Rottb." and *N. coriacea* (Sw.) Griseb.) that were separated by the following key characters:

- A. "Leaves membranous or chartaceous, axils of nerves beneath generally hairy. Inflorescence white-strigose-tomentellous, subequalling the leaves or shorter." *N. sanguinea*.
- B. "Leaves leathery, glabrous. Inflorescence glabrescent, evidently shorter than the leaves." *N. coriacea*.

The foliage characters used in this key are clear-cut, but the inflorescence distinction does not hold up; however, there are differences in the fruits not seen by Fawcett and Rendle. It should be noted in passing that Fawcett and Rendle's *Nectandra sanguinea* is equivalent to *N. exaltata* of Grisebach (1860) with regard to citations from Jamaica; Grisebach's *N. sanguinea* was what we now understand to be *N. coriacea*.

Nectandra sanguinea was cited by Fawcett and Rendle as a rare species not collected since about 1879, while *N. coriacea* was credited with numerous more modern collections. The range of *N. sanguinea* was given (p. 217) as "Mexico, Nicaragua, British Guiana, Surinam, Colombia," while that of *N. coriacea* was given (p. 218) as "West Indies, Yucatan."

Allen (1945), in discussing the two corresponding populations in Central America, pointed out that the type of true *Nectandra sanguinea* came from Suriname and represents a species different from the Central American material passing under this name. To the latter she applied the name *N. salicifolia* Kunth.

Adams (1972) did not separate or distinguish these two taxa and listed (p. 284) "*N[ectandra] sanguinea* of F. & R. (1914), not Roland ex Rottb. (1778)" as a synonym of *N. coriacea*.

My own attention was drawn to this problem in 1977 by Mr. G. Goodfriend, a student of land-snail ecology. In attempting a total listing of the flora in his study quadrat at Broom Hall, parish of Clarendon, Jamaica, he noticed several trees of a presumed *Nectandra* that seemed unlike typical *N. coriacea*; these turned out to show the differentiating characters of "*N. sanguinea*" as described by Fawcett and Rendle. After careful study of this population, I became convinced that it could not reasonably be included within the circumscription of *N. coriacea* and should probably be associated taxonomically with the Central American population called *Nectandra salicifolia* by Allen. However, if this is the case, then the oldest name applicable to the group as a whole is in fact the epithet *exaltata* as used by Grisebach, based on a Swartz collection from Jamaica. The nomenclature thus can be summarized as follows:

Ocotea exaltata (Sw.) Proctor, comb. nov.

MAP 18.

Laurus exaltata Sw. Prodr. 65. 1788.

Ocotea salicifolia Kunth in H.B.K. Nova Gen. Sp. Pl. 2: 132. 1817.

Nectandra salicifolia (Kunth) Nees, Syst. Laurin. 302. 1836.

N. exaltata (Sw.) Griseb. Fl. Brit. W. Indian Is. 281. 1860, in part.

N. sanguinea of Fawcett & Rendle, Fl. Jamaica 3: 217. 1914, not Rolander ex Rottb., 1778.

In addition to the old, unlocalized collections of this entity cited by Fawcett and Rendle, several modern Jamaican collections (including those of Goodfriend) have been seen. These are:

Clarendon: Broom Hall Hills, 1.2 mi due SW of Cave Valley Square, 1800–2000 ft, *Goodfriend s.n.* (IJ 66656), July 6, 1977, *Goodfriend s.n.* (IJ 66277, 69793), July 27, 1977, *Proctor 37385*, Oct. 22, 1977. **St. Elizabeth:** near Ipswich, 200–300 m, *Maxon & Killip 1503*, April 1, 1920 (A. GH. US). **Westmoreland:** 0.5 mi due W of Darliston, 1300–1400 ft, *Proctor 37632*, Feb. 5, 1978.

Ocotea harrisii Proctor, sp. nov.

MAP 18.

Arbor glabra parva foliis coriaceis, a *Ocotea* staminea in foliis parvioribus laevibus, venatione laterali obscura haud manifeste reticulata, et fructibus parvioribus, differt.

Glabrous tree 12 m tall. Petioles 3–5 mm long; leaf blades coriaceous, elliptic, (3)–4–7 by 1.5–3 cm, obtuse at apex, cuneate at base, margins slightly reflexed, both surfaces smooth, lateral venation obscure and not visibly reticulate. Inflorescences axillary racemes 5–8 cm long. Flowers not seen. Fruiting cupules single margined, ca. 6 mm across; fruits ellipsoid, 1.3–1.5 cm long.

Clarendon: Peckham Woods, 2500–2800 ft, *Harris 10872* (holotype, UCWI).

This is the entity described as "Sp. A" by Adams (1972, p. 282). Although there is no further information about this plant, it seems appropriate to provide it with a name.

Ocotea staminoides Proctor, sp. nov.

MAP 18.

Arbor dioecia *Ocotea* staminea affinis, sed in foliis grandioribus reti venularum multo remotiore, et floribus unisexualibus cum inflorescentiis staminatis paniculatis et inflorescentiis pistillatis racemosis, differt.

Dioecious tree to 15 m tall with glabrous foliage; youngest branchlets glabrate, 5–8 mm thick, often with small, corky lenticels. Petioles stout, 2-edged, 1–2 cm long; leaf blades thickly coriaceous, elliptic or oblong-elliptic, 11–19 by 5.5–11.5 cm, blunt to somewhat acute at apex, abruptly cuneate at base; venation prominently and coarsely reticulate, especially beneath, the

areoles to 2 mm or more across. Staminate inflorescences paniculate, minutely puberulous, 4–6 cm long and wide; flowers subsessile, cream colored, ca. 7 mm across when expanded; perianth segments broadly ovate, up to ca. 5 mm long, somewhat acute at apex, densely and minutely puberulous on outer side, glandular-ciliolate on margins, densely and minutely glandular-puberulous within; outer anthers subsessile, lance-oblong, ca. 2 mm long, acute, with both pairs of cells near margins, the lower pair not directly beneath the upper; inner anthers somewhat flattened-oblong, quadrangular, cells on opposite narrow sides; staminodes ovoid, ca. 1 mm long. Pistillate inflorescences racemose, 5–6 cm long, 7- or 8-flowered, lowermost flowers on pedicels 7–9 mm long; flowers white, very fragrant. Fruiting cupules fleshy, 2-margined, ca. 1.5 cm across, bearing persistent, reflexed, thickened perianth lobes in ring ca. 1–2 mm below and outside inner margin; fruits cylindrical, green, 2–2.3 by ca. 1 cm.

St. Ann: Douglas Castle distr., 2200–2400 ft, *Proctor 26413*, May 23, 1965 (♀) (holotype), *Proctor 36272*, June 11, 1976 (♂), *Proctor 37327*, Oct. 8, 1977 (young fruits), *Proctor 37405*, Nov. 12, 1977 (nearly mature fruits); Schwallenburgh, 2300 ft, *Harris 7169*, Jan. 27, 1898 (old fruiting cupules) (GH).

This species resembles *Ocotea staminea* (Griseb.) Mez, particularly in the size and structure of the fruits (2-margined cupules and accrescent persistent perianth segments). It clearly differs in its larger leaves with much coarser vein reticulation, and in the details of floral structure. *Ocotea staminea* has bisexual flowers; in *O. staminoides* the flowers are unisexual and the plants are dioecious.

NYMPHAEEAE

Nymphaea L.

Fawcett and Rendle (1914) reported three species of *Nymphaea* from Jamaica, but Adams (1972) accepted only one of these (*N. ampla*) as a valid record. Adams (p. 290) stated his opinion that *N. amazonum* and *N. rudgeana* should be excluded because "they have not been confirmed by recent collections and may have been cultivated plants." Since the publication of Adams's book, however, field study of aquatic plants in Jamaica by Dr. Richard M. Lowden has demonstrated that three indigenous species of *Nymphaea* are indeed present in Jamaica. The presence of *N. amazonum* has been reconfirmed, and a species not previously suspected to occur here, *N. jamaesoniana*, has been discovered. I have found no further information on *N. rudgeana*. The known Jamaican species of *Nymphaea* can be distinguished as follows:

- A. Flowers diurnal; carpels free from one another at sides; styles short, stiff, fleshy, not enlarged at tip. *N. ampla*.
- A. Flowers nocturnal; carpels united by their sides; styles slender, with enlarged, club-shaped tips.

- B. Petioles with ring of long hairs at top; stamens usually 100 to 188.
 *N. amazonum*.
 B. Petioles glabrous, lacking ring of hairs at top; stamens 52 to 65.
 *N. jamesoniana*.

Field data on the last two can be summarized as follows:

Nymphaea amazonum Martius & Zucc. Abh. Bayer. Akad. Math.-Phys.
 Cl. 1: 363. 1832. MAP 19.

St. Elizabeth: Frenchman, sea level, *Proctor 38188* (coll. Lowden), June 16, 1979. **Westmoreland:** 2.5 mi WNW of Hopewell, ca. 1500 ft, *Proctor 11218* (det. Lowden), Nov. 21, 1955. **Hanover:** in the Great Morass ca. 1.9 mi due SW of Logwood, sea level, *Proctor 37518*, Dec. 20, 1977.

Fawcett and Rendle recorded this species from the parishes of St. Catherine and St. Thomas. It is otherwise known from Cuba, Hispaniola, Puerto Rico, the Lesser Antilles, Tobago, Trinidad, and South America.

Nymphaea jamesoniana Planchon, Revue Hort. IV. 2: 66. 1853. MAP 19.

New to Jamaica. **St. Elizabeth:** Frenchman, sea level, *Proctor 38190* (coll. Lowden), June 16, 1979.

This species was recorded from Cuba, Hispaniola, Puerto Rico, and Ecuador by Britton and Wilson (1924). The flowers of both *Nymphaea jamesoniana* and *N. amazonum* open only at night, which may explain why these species have usually been overlooked by collectors.

CERATOPHYLLACEAE

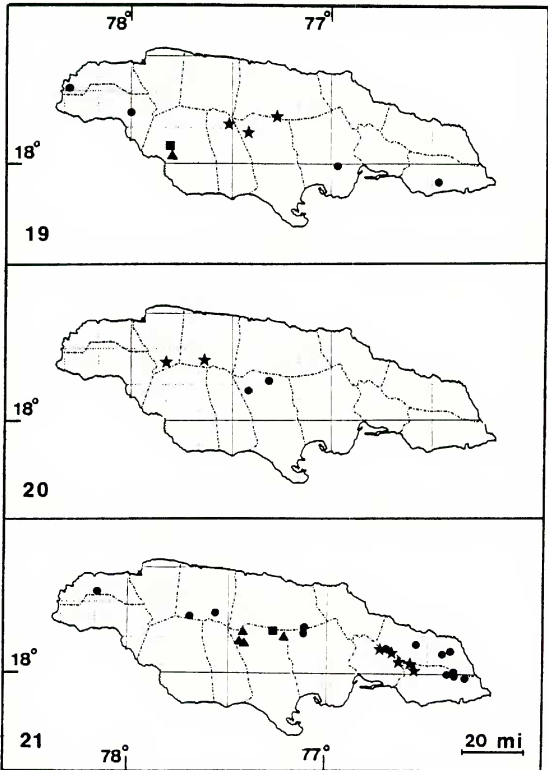
***Ceratophyllum* L.**

The genus *Ceratophyllum* was credited with but one species by Adams (1972)—the cosmopolitan *C. demersum* L. However, field work carried out early in 1978 revealed that a second species occurs in a limited area of southwestern Jamaica. Despite the difficulty of identification, this population appears to represent the plant now correctly known as *C. muricatum*.

Ceratophyllum muricatum Cham. Linnæa 4: 504. 1829. MAP 19.

New to Jamaica. **St. Elizabeth:** Salt Spring distr., sea level, *Proctor 37683*, Feb. 20, 1978, *Proctor 37708*, March 5, 1978.

Ceratophyllum muricatum has a wide distribution in eastern North America but is reported to be much less common than *C. demersum*. The two species can usually be distinguished, at least in Jamaica, by the following key:



MAPS 19–21. Distributions: 19, *Nymphaea amazonum* (dots), *N. amazonum* and *N. jamesoniana* together (square), *Ceratophyllum muricatum* (triangle), *Laplacea glabrata* (stars); 20, *Ternstroemia bullata* (dots), *T. glomerata* (stars); 21, *Clusia havetioides* var. *havetioides* (stars), *C. havetioides* var. *pauciflora* (triangles), *C. havetioides* var. *stenocarpa* (dots), *Dionaea muscipula*, *Sarracenia minor*, and *S. rubra* (location of Mason River Field Station; square).

- A. Plants of somewhat stiff, harsh texture; leaves forked 1 or 2 times (rarely unforked), with divisions of nearly uniform width up to tapered apices; fruits un-winged, with 1 long spine at distal end and 2 divergent spines from basal end. *C. demersum*.
- A. Plants of soft, slippery texture; leaves forked 2 to 4 times, with basal division inflated above narrowed base; fruits narrowly winged, with 1 apical spine and 0 to 2 or more relatively short spines along margins. *C. muricatum*.

THEACEAE

Laplacea Kunth**Laplacea glabrata** Proctor, sp. nov.

MAP 19.

Frutex vel arbor parva usque ad 8 m alta, a speciebus aliis Laplaceae Jamaicaensis in indumento fere nullo et floribus parvioribus subsessilibus differt, a Laplacea haematoxylon in forma laminae et fructibus seminisque grandioribus differt, et a *L. villosa* in sepalis multo parvioribus et filamentis brevioribus differt.

Shrub or small tree to 8 m tall. Terminal buds glabrous or minutely and sparsely puberulous; young branchlets glabrous. Leaves coriaceous, glabrous throughout, glossy deep green adaxially, paler abaxially, elliptic to narrowly obovate, 6–12 by 2.5–4.5 cm, obtuse and minutely emarginate at apex, subsessile at base or narrowed to petiole 1–2 mm long, the margins obscurely crenate-serrulate chiefly along distal half, the veins obscure, in 12 to 20 pairs, minutely prominulous on both sides when dry. Flowers solitary in upper axils, creamy white, 2.5–3 cm in diameter when open, nearly sessile, the stout glabrous peduncle nearly obsolete or scarcely 1 mm long; bracteoles 2, sepaloid, caducous; sepals 5, unequal, imbricate, rounded, concave, glabrous except for ciliate margins, 4–6 mm long and wide; petals 5 or 6, white, oblanceolate to narrowly obovate, unequal, ranging from 1.2 to 1.5 cm long and from 0.5 to 1.1 cm wide on same flower (wider petals deeply and broadly emarginate), glabrous or sparsely ciliate near apex; filaments glabrous, subequal, more or less adnate to each other at base, 2–3 mm long, anthers ca. 0.2 mm in diameter, ovary globose, appressed-puberulous, 5-locular, bearing cluster of minute, sessile stigmas at apex. Capsules woody, narrowly obovoid, 2.2–2.5 cm long, ca. 1 cm in diameter above middle, minutely and sparsely appressed-puberulous; seeds ca. 3 in each locule, 15–17 mm long including wing.

St. Ann: Mason River distr., ca. 3 mi due NW of Kellits P.O., ca. 2100 ft, *Proctor 28611*, April 12, 1968 (holotype). **Clarendon:** Glenwood Springs, along road between Balcarres and Sunbury, ca. 3100 ft, *Proctor 33486*, Aug. 18, 1973, *Proctor 37470*, Dec. 4, 1977. **Manchester:** 0.5 mi NW of Christiana, ca. 3000 ft, *Proctor 18293*, Oct. 25–26, 1958.

This species differs from both its Jamaican congeners in being nearly gla-

brous and in having smaller, nearly sessile flowers. In addition, it differs from *Laplacea haematoxylon* in leaf shape and texture and in its larger fruits and seeds, and from *L. villosa* in its much smaller sepals and shorter filaments. From *L. wrightii* Griseb. of Cuba (the only other species of *Laplacea* with glabrous terminal leaf buds), *L. glabrata* differs in its much larger leaves, nearly sessile flowers, and smaller and glabrous sepals, as well as in other details.

Laplacea glabrata is one of a large number of rare relict species representing many families that survive precariously in threatened habitats around the fringes of the region known to geologists as the Central Inlier. The following species, *Ternstroemia bullata*, is another of these.

Ternstroemia Mutis ex L. f.

Ternstroemia bullata Proctor, sp. nov.

MAP 20.

Arbor glabra 10–18 m alta ramis verticillatis foliis bullatis revolutisque, a *Ternstroemia howardiana* in petiolis multo brevioribus, pedicellis crassioribus, sepalis angustioribus, filamentis brevioribus haud dilatatis, et antheris brevioribus, differt.

Glabrous tree 10–18 m tall with verticillate branches. Petioles 2–5 mm long; leaf blades coriaceous, dark green adaxially, paler abaxially, broadly elliptic to obovate or subrotund, 3–7 by 1–4.5 cm, the margins broadly and deeply recurved-revolute (revolute portion up to 7 mm wide), entire, the apex rounded, submarginate, the base abruptly cuneate, the midvein narrowly grooved adaxially, prominent abaxially, the veins obscure, 6 to 9 pairs. Flowers solitary; pedicels 10–17 mm long, flattened and 2-edged toward ca. 1.5-mm-wide distal end; bracteoles 2, opposite, subequal, narrowly oblong-deltate, ca. 2.5 mm long, margins glandular-denticulate; sepals 5, subequal, oblong to ovate, with glandular-denticulate margins, the outer ones 4.5–5 by ca. 2.5 mm, with apex acute or apiculate, the inner similar but slightly longer and broader; petals white, subequal, slightly exceeding sepals, connate at base; filaments glabrous, 1.5–2 mm long, adnate to base of corolla, anthers ca. 1.5 mm long, calcarate at apex; ovary conical, glabrous, ca. 4 mm long and 1.8 mm in diameter at base, 2-loculate; stigma entire. Fruits not seen.

Clarendon: Glenwood Springs, along road between Balcarres and Sunbury, ca. 3100 ft, *Proctor 34103*, June 29, 1974 (holotype), *Proctor 33632*, Nov. 30, 1973, *Proctor 33825*, April 24, 1974; stream gully 0.9 mi by road E of Reckford, ca. 2000 ft, *Proctor 38109*, March 29, 1979, *Proctor 38134*, April 29, 1979.

Ternstroemia bullata is unique in its bullate-revolute leaves; in other respects it most resembles *T. howardiana* Kobuski of the John Crow Mountains among Jamaican congeners, differing from that species in its much shorter petioles, thicker pedicels, narrower sepals, shorter and nondilated filaments, and shorter anthers.

Ternstroemia glomerata Proctor, sp. nov.

MAP 20.

Arbor 10–15 m alta foliis planis late ellipticis et floribus terminalibus glomeratis subsessilibus.

Tree 10–15 m tall. Petioles 7–15 mm long; leaf blades coriaceous, broadly elliptic, 8–14 by 4–8 cm, the margins flat, entire, the apex blunt to broadly rounded, minutely emarginate, the base abruptly cuneate, the midvein grooved in lower 2/3 adaxially, prominent abaxially, the veins 8 to 10 pairs, minutely prominulous on both sides when dried. Flowers 3 to 6 aggregated in glomerate terminal clusters; pedicels 2–5 mm long, terete, ca. 2 mm thick; bracteoles 2, opposite, nearly equal, broadly ovate, ca. 3 mm long and wide, margins glandular-denticulate; sepals 5, subequal, broadly ovate, 4.5–5.5 mm long and wide, margins glandular-denticulate, apex blunt or subacute; petals white, subequal, 2–3 mm longer than sepals, rounded at apex, shortly connate at base; filaments glabrous, 2–3 mm long, adnate to base of corolla, the anthers 1.1–1.3 mm long, calcarate at apex; ovary conical, glabrous, 4–4.5 mm long, ca. 3 mm in diameter at base, 2-locular, stigma entire. Fruits (immature?) ovoid, ca. 10 by 7 mm, acuminate beaked.

St. James: White Rock Hill, 1 mi S of Sweet Water, ca. 2100 ft, *Proctor 34509*, Dec. 22, 1974 (holotype), *Proctor 34459*, Dec. 13, 1974. **Trelawny:** near Crown Lands road extension 4.5–5 mi NW of Troy, ca. 2000 ft, *Proctor 34715*, Jan. 26, 1975.

Ternstroemia glomerata is perhaps unique in the genus for its tightly clustered flowers, always borne at the apex of a leafy stem. It is also unusual in having very short, thick pedicels, which cause the flowers to appear nearly sessile. Among the West Indian species of this genus, only *T. subsessilis* Britton of Puerto Rico has shorter pedicels, but it is a shrub with solitary flowers and eglandular sepals.

GUTTIFERAE

Clusia L.

The Jamaican species of this genus, especially the complex of endemic forms included under *Clusia havetioides* (Griseb.) Planchon & Triana by Adams (1972), appear to require further study and taxonomic evaluation. In the case of *C. havetioides* it is here proposed that three varieties be recognized, rather than having all variants submerged under a single name.

- A. Ripe fruits 1 to 9 per inflorescence, 15–20 mm long; petals of staminate flowers 6 mm long.
- B. Leaves 7–18 cm long (rarely less); staminate flowers numerous per inflorescence. var. *havetioides*.
- B. Leaves 3–6 cm long (rarely more); staminate flowers 1 to 3 per inflorescence. var. *pauciflora*.

A. Ripe fruits 9 to 50 per inflorescence, 10–14 mm long (rarely more); petals of staminate flowers 3–4 mm long. var. *stenocarpa*.

Clusia havetioides (Griseb.) Planchon & Triana, Ann. Sci. Nat. Bot. IV. 13: 368. 1860.

Clusia havetioides var. **havetioides** MAP 21.

This variety is confined to the higher slopes of the Blue and Port Royal mountains at elevations of 4200–5200 ft or more.

Clusia havetioides var. **pauciflora** Proctor, var. nov. MAP 21.

A vars. *havetioides* et *stenocarpa* in ramulis ascenduntibus, foliis parvulis chartaceis, et inflorescentibus 1–3 floris differt.

Glabrous tree 10–12 m tall, d.b.h. to 25 cm; branches noticeably ascending. Leaves thin, papery, narrowly obovate to obovate, mostly 3–6 cm long, 1.5–3.5 cm broad above middle, at base narrowed to broad petiole 5–10 mm long. Inflorescences 1- to 3-flowered. Staminate flowers pale yellow; petals 6 mm long; stamens numerous, free, filaments 3.5–4 mm long. Pistillate flowers not seen. Fruits ovoid, ca. 15 mm long.

Clarendon: upper W slope of Crofts Mt., 2250–2500 ft, *Proctor 29239*, Oct. 4, 1968 (♂)(holotype, A); near S end of Crofts Mt., 2250–2500 ft, *Proctor 31185*, Jan. 10, 1970 (♀—fruits). These trees growing on steep, densely wooded hillside over limestone; numerous individuals seen. Other collections probably belonging here: **Clarendon:** Peckham Woods, ca. 2500 ft, *Proctor 34369*, Nov. 28, 1974; along road between Ritchies and Balcarres, ca. 3000 ft, *Proctor 34378*, Nov. 28, 1974.

Clusia havetioides var. **stenocarpa** (Urban) Proctor, comb. et stat. nov. MAP 21.

Clusia stenocarpa Urban, Symb. Antill. 5: 433. 1908.

This is the commonest variety of the *havetioides* complex and has a wide distribution throughout Jamaica, chiefly at medium elevations.

DROSERACEAE

Dionaea Ellis

Dionaea muscipula Ellis ex L. Mant. Pl. 2: 238. 1771. MAP 21.

Genus and species new to Jamaica. **Clarendon:** Mason River Field Station, ca. 2300 ft, *Proctor 36282*, June 11, 1976.

This well-known insectivorous plant was introduced at the above locality

from North Carolina in 1968; the population derives from a single live plant sent in a letter by the late Mrs. Marie Wurdack. The species has flourished and spread at Mason River and can now be considered naturalized. It flowers and fruits regularly in May and June every year, and numerous seedlings have become established and have grown to maturity.

SARRACENIACEAE

Sarracenia L.

Genus new to Jamaica. Two species have been introduced into Jamaica and have seemingly become established. They can be distinguished as follows:

- A. Pitcher orifice covered by hood, the hood with translucent spots; petals pale yellow. *S. minor*.
 A. Pitcher orifice exposed, the hood without translucent spots; petals dark red. *S. rubra*.

Sarracenia minor Walter, Fl. Carolin. 153. 1788.

MAP 21.

New to Jamaica. **Clarendon:** Mason River Field Station, ca. 2300 ft, *Proctor* 36301, June 10, 1976, *Proctor* 37223, Sept. 9, 1977.

I introduced this plant from Gilchrist County, Florida, in July, 1975. It has been producing flowers every year since its introduction, but no seedlings have thus far been observed.

Sarracenia rubra Walter, Fl. Carolin. 152. 1788.

MAP 21.

New to Jamaica. **Clarendon:** Mason River Field Station, ca. 2300 ft, *Proctor* 36302, June 10, 1976.

Introduced from North Carolina in 1968. This species has been flourishing vegetatively at Mason River but so far has not flowered there.

LEGUMINOSAE SUBFAMILY CAESALPINOIDEAE⁴**Caesalpinia** L.

The prickly-fruited vines called "nickal" in Jamaica were placed in two species by Adams (1972): *Caesalpinia bonduc* (L.) Roxb., with gray seeds; and *C. major* (Medicus) Dandy & Exell, with yellow seeds. He pointed out, however, that the latter name might not be correct for the Jamaican yellow-

⁴Adams (1972) recognized three legume families: Caesalpinaceae, Mimosaceae, and Papilionaceae (Fabaceae). I prefer to treat these as subfamilies of Leguminosae.

seeded plants, which would more likely show a relationship with similar Cuban species. Shortly before his untimely death, Dr. W. T. Gillis and I were investigating this problem and studied the types of the relevant Cuban taxa. Our conclusion—never published—was that Jamaica had two yellow-seeded species, both originally described by Urban from Cuba. These can be distinguished as follows:

- A. Leaflets mostly 4–6 cm long; pods ca. 4 cm broad, abruptly rounded or subtruncate at base. *C. intermedia*.
 A. Leaflets mostly 2–3.5 cm long; pods less than 3.5 cm broad, often narrowed toward base. *C. wrightiana*.

Caesalpinia intermedia Urban, Symb. Antill. 2: 274. 1900.

C. major of Adams, Fl. Pl. Jamaica, 320. 1972, not (Medicus) Dandy & Exell, 1938.

This species is quite common on the interior limestone hills of Jamaica, reaching an elevation of at least 2700 ft. It has been recorded from the parishes of St. Catherine, Clarendon, Manchester, St. Elizabeth, and Trelawny.

Caesalpinia wrightiana Urban, Symb. Antill. 2: 274. 1900.

New to Jamaica. **Manchester:** Gut R., sea level, *Proctor 38194*, June 17, 1979 (♀). **St. Elizabeth:** below Lovers Leap, ca. 1 mi due SSE of Southfield P.O., 500–1500 ft, *Proctor 32990*, Nov. 11, 1972 (fruits).

LEGUMINOSAE SUBFAMILY FABOIDEAE

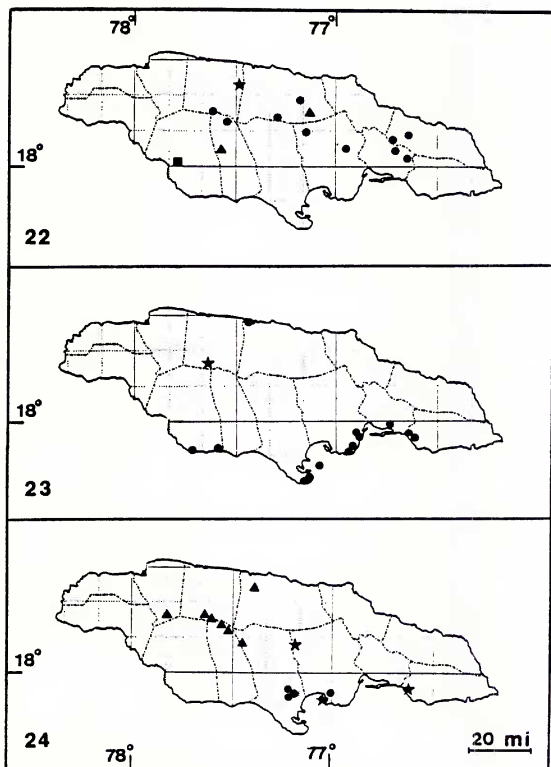
Rhynchosia Lour.

Adams (1972) listed four Jamaican species of this genus, but a recent monographic study by Grear (1978) has shown that the Jamaican material included by Adams under the name *Rhynchosia phaseoloides* in reality represents three species, among which the monographer found "absolutely no intermediates" (p. 49). These can be distinguished as follows:

- A. Pods inflated and deeply constricted, glabrous or becoming so, brown to blackish and shiny with age; each seed not equally red and black.
 B. Seeds red with small black spot. *R. pyramidalis*.
 B. Seeds black with small red spot. *R. erythrinoides*.
 A. Pods subinflated and only slightly constricted, permanently rusty-puberulous; each seed equally red and black. *R. phaseoloides*.

Rhynchosia pyramidalis (Lam.) Urban, Repert. Sp. Nov. 15: 318. 1918,
 in part. MAP 22.

For this and the following species, the specimens cited include those re-



MAPS 22-24. Distributions: 22, *Rhynchosia erythrinoides* (dots), *R. pyramidalis* (triangles), *R. erythrinoides* and *R. pyramidalis* together (star), *Sesbania emerus* (square); 23, *Spathelia coccinea* (star), *Bursera lunanii* (dots); 24, *Malpighia adamsii* (triangles), *M. cauliflora* (stars), *M. proctorii* (dots).

ported by Grear (1978) and the material at U, none of which was studied by Grear.

Manchester: Somerset distr., ca. 5 mi NW of Mandeville, ca. 2300 ft, *Proctor 16032*, Dec. 29–30, 1956 (flowers), *Proctor 11589*, Feb. 25, 1956 (young fruits). **Trelawny:** Westwood School, 1 mi NW of Stewart Town, 1000 ft, *Chevannes s.n. (IJ 4067)*. **St. Ann:** Moneague, *Alexander (Prior) 8*, 1850 (K). **St. Andrew?:** "vic. Kingston,"⁵ *Crawford 618-a*, April 22–24, 1910 (PH).

Rhynchosia erythrinoides Schlecht. & Cham. *Linnaea* 5: 587. 1830.

MAP 22.

St. Andrew: Clydesdale, 3500 ft, *von der Porten s.n. (IJ 2394)*, Aug. 28, 1948 (fruits); near Newcastle, 3937 ft, *Barkeley & Rishbeth 1119*, June 20, 1952 (fruits). **St. Catherine:** 1.5 mi due SE of Sligoville, 1800–1900 ft, *Proctor 31726*, April 16, 1971 (flowers); along road between Ewarton and Worthy Park, ca. 1700 ft, *Proctor et al. 24075*, Feb. 21, 1964 (flowers). **Manchester:** summit of Mt. Denham, 3236 ft, *Proctor 34883*, March 7, 1975 (flowers); 1.5 mi due SE of Mandeville, ca. 2100 ft, *Proctor 33755*, March 30, 1974 (flowers); vic. Mandeville, *Brown 118*, Feb. 15–26, 1910 (NY, PH). **Trelawny:** near Troy, *Harris 8775*, Aug., 1904 (BM, F, NY); vic. of Westwood High School, Stewart Town, ca. 1150 ft, *Powell 827*, March 10–12, 1960 (flowers). **St. Ann:** Douglas Castle distr., ca. 2300 ft, *Proctor 32867*, March 31, 1972 (flowers); near Lydford P.O., 1500 ft, *Proctor 8645*, April 22, 1954 (flowers), *R. A. Howard & Proctor 14100*, Sept. 23, 1954 (fruits). **Portland:** near Green Hill P.O., ca. 2600 ft, *Proctor 23411*, March 30, 1963 (flowers) (U, MICH, NY, U, US); ca. 1 mi SW of Shirley Castle, 1600–1900 ft, *Proctor 30026*, April 9, 1969 (flowers). **St. Thomas:** above Farm Hill Works, ca. 3800 ft, *Barry s.n. (IJ 933)*, July 29, 1946.

Other Jamaican specimens were seen and annotated by Grear at various herbaria but were not cited in his monograph. This species appears to be the most common of the three now being reported; it has the widest range in Jamaica.

Rhynchosia phaseoloides (Sw.) DC. *Prodr.* 2: 385. 1825, in part.

Known in Jamaica only from the unlocalized type collected by Swartz in 1784–86. Some of Swartz's material at Stockholm is mixed with specimens of *Rhynchosia pyramidalis*. This suggests that the two species may have been collected at the same time and locality (unfortunately still unknown, but most likely in the Cockpit Country area).

Sesbania Scop.

Sesbania emerus (Aublet) Urban, *Repert. Sp. Nov.* 16: 149. 1919.

MAP 22.

New to Jamaica. **St. Elizabeth:** 0.5 mi NE of Salt Spring Junction, near sea level, *Proctor 32755*, Dec. 13, 1971.

⁵This locality may be incorrect.

Occurs elsewhere in Florida, the Bahamas, the Greater Antilles, and through most of Central America, chiefly at low elevations.

Among the recorded Jamaican species, *Sesbania emerus* could be confused only with *S. exasperata* Kunth. From the latter it is distinguished by having fewer leaflets (up to 25, vs. 30 to 50), longer calyx teeth (ca. 2 vs. ca. 1 mm long), and slightly smaller flowers that are more or less densely maroon dotted (vs. nearly without such dots). It should be noted that the occurrence of *S. exasperata* in Jamaica at the present time is doubtful, the sole record being an unlocalized collection of Purdie dating from the 1840's.

RUTACEAE

Spathelia L.

This genus is represented in Jamaica by three endemic species, one of them described here for the first time. These can be distinguished as follows:

- A. Leaflets all sessile or subsessile; filaments with hairy, winglike appendages. *S. sorbifolia*.
- A. Leaflets all (or at least lower ones) distinctly stalked; filaments lacking winglike appendages.
 - B. Leaves 30–55 cm long; pedicels hispidulous with straight hairs; flowers crimson, sepals and petals bearing minute, capitate-glandular hairs; fruits acuminate at both ends. *S. coccinea*.
 - B. Leaves up to 110 cm or more long; pedicels puberulous with curved hairs; flowers pink, sepals and petals glabrous; fruits blunt at both ends. *S. glabrescens*.

Spathelia coccinea Proctor, sp. nov.

MAP 23.

Arbor gracilis haud ramosa *Spathelia glabrescenti* affine, sed in statura parviore, pedicellis hispidulis, floribus sanguineis sepalis petalisque glandibus minutis capitatis munitis, et fructibus acuminatis, differt.

Slender, unbranched tree to 5 m tall, glabrous throughout except flowers. Leaves glossy, 30–55 cm long; leaflets 14 to 18 pairs, the petiolules 1–5 mm long, the blades oblong, 3–10 by 1–2.3 cm, apiculate at apex, often inequilateral at broadly cuneate base, margins entire or crenulate. Inflorescences with branches glabrous or nearly so; pedicels densely hispidulous. Flowers crimson, both calyx and corolla bearing numerous minute, capitate-glandular hairs; sepals narrowly oblong-elliptic, 2.5–3 mm long, acute and with sessile resinous gland at apex; petals narrowly oblong-elliptic, 4–6 by ca. 2 mm, acute and with sessile resinous gland at apex; filaments without winglike appendages, glabrous or sparsely hairy toward base, 3–3.5 mm long; fertile pistil not seen. Fruits 1–1.9 by 1–1.4 cm, acuminate at both ends, apex pointed.

Trelawny: near Crown Lands road extension 4.5–5 mi NW of Troy, ca. 2000 ft,

Proctor 34571, Jan. 4, 1975 (mounted on 3 sheets bearing, respectively, leaves, flowers, and fruits) (holotype), *C. D. Adams 12844*, May 8, 1966.

This species was mentioned by Adams (1972, p. 383) as "almost certainly a distinct species"; he also stated that the flowers are scarlet, although his specimen label gives the color as crimson. Actually, "oxblood red" might be a closer approximation among these subtle shades of color, but "crimson" is a more felicitous term.

BURSERACEAE

Bursera Jacq. ex L.

Bursera lunanii (Sprengel) C. D. Adams & Dandy ex Proctor, comb. nov. MAP 23.

Amyris lunanii Sprengel in L. Syst. Veg. ed. 16. 2: 217. 1825 (Jan.–May).
Bursera simplicifolia DC. Prodr. 2: 78. 1825 (mid-Nov.).

Urban (Symb. Antill. 6: 102. 1909) placed *Amyris lunani* (*sic*) into the synonymy of *Bursera simplicifolia* after comparing the original specimens of these species, without at the time being aware that Sprengel's name antedated that of de Candolle. Adams (1972) mentioned the necessary new combination, *Bursera lunanii* (with corrected spelling of the specific epithet), without formally validating it.

MALPIGHIAEAE

Malpighia L.

In his 1979 Ph.D. thesis at Cornell University, José Vivaldi significantly revised and augmented our knowledge of this genus. Three new Jamaican species were described. Because these have not hitherto been formally published, Dr. Vivaldi has generously given permission for them to be included in this paper. He has asked that William J. Dress's aid with the Latin descriptions be acknowledged.

Malpighia adamsii Vivaldi, sp. nov.

Malpighia fucata sensu Adams, Fl. Pl. Jamaica, 398. 1972, not Ker-Gawl. Bot. Register 3: t. 180. 1817.

Ab *Malpighia harrisii* differt in ramis novellis strigosis, setis malpighiaceis 1.5–2 mm longis rectis vel parum undulatis aliquantulum rigidis pungentibusque in basibus tuberculatis prominentibus longe-persistentibus praeditis, ramis vetustioribus plerumque nigris, tuberculatis; folia (6.5–)10–17(–22) cm

longa, 3–5(–9.5) cm lata, lanceolata vel ovato-lanceolata; inflorescentia strigilosa.

Shrub or small tree 1–3(–5) m tall, the young branches densely strigose, with bristles 1.5–2 mm long, straight or slightly undulate, somewhat persistent, borne on prominently raised, long-persistent, tuberclelike bases, the older branches usually black and tuberculate. Petioles (3–)5–12 mm long, green and strigose like young branches (but bristles sessile and deciduous), usually becoming black and rough, with prominent, long, transverse lentils; stipules ca. 1.5 mm long, subulate or linear-lanceolate, black, strigillose when young; leaf blades chartaceous to subcoriaceous, lanceolate or sometimes ovate-lanceolate, (6.5–)10–17(–22) by 3–5(–9.5) cm, (2–)2.5–5 times longer than wide, the apex acute, very rarely obtuse or retuse, the base obtuse; young leaves strigose on both sides, the bristles sessile, 5–8 mm long, the adaxial surface becoming glabrous; dry leaves green, with clearly marked or sometimes prominent reticulate venation, the abaxial surface sometimes becoming glabrous, only midvein prominent. Inflorescences corymbose or umbellate panicles or racemes composed of (1 to) 3 long-stalked, 4- to 10-flowered umbels arising from common short stalk, 1.5–3.5 cm long, densely strigillose; peduncle (3–)4–9(–11) mm long; bracts 1(–1.5) mm long; pedicel with the lower part (2–)3–5 mm long, the upper part 10–20 mm long, (2–)3–7 times longer than lower part; bracteoles 1 mm long. Flower buds ca. 4 mm in diameter, corolla at anthesis ca. 15 mm in diameter; sepals (2–)2.5–3.5(–4) mm long, somewhat strigillose, the glands 6 (to 8), 1.5–2(–2.5) mm long, all about equal in size; petals slightly winged, with wings up to 0.5 mm wide and decurrent at apex, the posterior petal 7–10 mm long, with claw (2.5–)3.5–4 mm long and limb 4–6.5 mm in diameter; filaments (2.5–)3.5–4(–4.5) mm long, lateral anthers 1.5–1.7 mm long, others 0.8–1 mm long; styles uncinatate at apex, lateral ones 4–5 mm long with pollination gap ca. 1 mm long, anterior one 3–4 mm long, the ovary 1.5–2 mm in diameter, usually 3-lobed. Fruits ca. 1 cm in diameter, pyramidal-globose; pyrenes 6–9 by 4–7 mm, the dorsal wing entire, 1–1.5 mm wide, the lateral wings small, blunt, crenate.

Trelawny: Troy, ca. 1550 ft, *Proctor 9908*, March 13, 1955 (holotype, A; isotypes, U, NY); Crown Lands area, ca. 5 mi NW of Troy, 1750–2000 ft, *Proctor 35234*, June 10, 1975. **Manchester:** slopes of Mt. Denham, 3000–3100 ft, *Proctor 34890*, March 7, 1975; ½ mi NW of Christiana, 3000 ft, *R. A. Howard & Proctor 14326*, July 3, 1955 (A, U). **Clarendon:** Ritchies to Banana Ground, 2 mi S of White Shop, ca. 2000 ft (*sic*), *Vivaldi 366* and *367*, Nov. 28, 1974 (BH, U, SJU). **St. Ann:** Browns Town, ca. 2000 ft, *Adams 12744*, Nov. 13, 1965 (MO). **St. James:** White Rock Hill, 1 mi S of Sweet Water, ca. 2100 ft, *Proctor 34508*, Dec. 22, 1974.

Named for Dr. C. Dennis Adams, author of *Flowering Plants of Jamaica* (1972), who first recognized this taxon as distinct from *Malpighia harrisii* Small.

Malpighia cauliflora Proctor & Vivaldi, sp. nov.

Frutex vel arbor parva usque ad 6 m. Folia (3.5-)4.5-6(-8) cm longa, (2-)2.5-4.5(-5) cm lata, plana, subcoriacea, elliptica vel elliptico-ovata, utrinque glabra, apice acuta, rarissime obtusa, base acuta, margine integra, petiolo (2-)3-4(-6) mm longo, glabro. Umbellae 2- ad 10-florae, sessiles, cauliflorae, pedunculo nullo, parte inferiore pedicelli 1.5-3 mm longa, pilis malpighiaceis tenuibus, minutis, rufis, sparsis, parte superiore pedicelli 9-12 mm longa, glabra. Flores rosei, 12-15 mm diametro, sepalis 2-2.5 mm longis, ovatis, glabris, apice acutis, raro obtusis, glandulis 6, 1.5-2 mm longis, oblongis, staminibus duobus petalis lateralibus oppositis quam ceteris manifeste longioribus crassioribusque, curvatis, stylis 2 posticis quam antico manifeste longioribus crassioribusque, curvatis, apice uncinatis.

Shrub or small tree up to 6 m tall, the young branches green, smooth, the older branches usually with prominent lenticels. Petioles (2-)3-4(-6) mm long, slender, glabrous; stipules 0.3-0.5(-0.7) mm long, early deciduous; leaf blades subcoriaceous, elliptic to elliptic-ovate, (3.5-)4.5-6(-8) by (2-)2.5-4.5(-5) cm, apex acute (rarely obtuse), base acute, glabrous on both surfaces; glands located near base. Inflorescences sessile, cauliferous, 2- to 10-flowered, umbel-like, contracted panicles or racemes, 1.5 cm long, sparsely covered with reddish, minute hairs except for glabrous upper part of pedicel; bracts 0.5-1 mm long; pedicel with lower part 1.5-3 mm long, upper part 9-12 mm long; bracteoles 0.5 mm long, usually 0.5-1 mm below articulation of lower and upper parts of pedicel. Flower buds up to 4 mm in diameter, corolla at anthesis 12-15 mm in diameter; sepals 2-2.5 mm long, glabrous, the glands 6, 1.5-2 mm long; petals not winged, the posterior petal 5.5-7.5 mm long, with claw 2.5-3 mm long and limb 3-4.5 by 4-6 mm; filaments 2-2.5 mm long, lateral anthers 1.3-1.5 mm long, others 0.7-1 mm long; lateral styles 2-2.5 mm long, apex uncinately with pollination gap 0.5-1 mm long, the anterior style ca. 1.5 mm long, apex obtuse or truncate, the ovary 1.5 mm in diameter, unlobed. Fruits 5-8 mm in diameter; pyrenes ca. 5 mm long, the lateral wings coarse, blunt, ca. 3 mm wide, the dorsal wing poorly developed.

St. Catherine: hilltop 1.5 mi W of Lluïdas Vale, 1200-1400 ft, *Proctor 34120*, July 12, 1974 (holotype, U; isotype, BH), *Vivaldi 376*, Nov. 30, 1974 (BH); Great Goat Is., near sea level, *Scott 296*, Sept. 9, 1970 (UCW, U). **St. Thomas:** Eleven Mile, 300 ft, *Lewis s.n.*, May 14, 1952 (U, US).

The leaves of this species usually suffer from corky spots and blistered areas on the underside, a condition known as "edema"; this is believed to be caused by a physiological upset in the water balance of affected plants that occurs when the roots take in water faster than it can be transpired. The excess water builds up pressure in the mesophyll cells of the leaf, causing them to enlarge and burst. Within the genus *Malpighia*, the condition seems to occur only in *M. cauliflora*.

***Malpighia proctorii* Vivaldi, sp. nov.**

Frutex vel arbor parva usque ad 4 m, ramis novellis rubellis, strigillosis. Folia (1.5-)2-3.5(-5) cm longa, 1-2.3(-3.5) cm lata, plana vel undulata, coriacea, elliptico-oblonga, interdum obovata, apice obtusa, interdum retusa, plerumque mucronulata, base obtusa, raro cuneata, margine integra vel crenata, supra atroviridi, nitida, fere vel omnino glabra, infra olivacea, dense strigillosa, pilis malpighiaceis flavescentibus, translucetibus, rigidis, rectis, 0.5-0.7(-1) mm longis, petiolo (1-)1.5-2 mm longo, strigillosa. Umbellae 2- ad 4- (ad 6-)florae, axillares, pedunculo strigilloso, 2-8(-12) mm longo, parte inferiori pedicelli strigillosa, (2.5-)3.5-5.5(-6.5) mm longa, parte superiori pedicelli (7-)10-12 mm longa, glabra. Flores rosei, albescentes, ca. 20 cm in diametro, sepalis (2.5-)3-3.5 mm longis, ovato-lanceolatis, apice obtusis, ciliatis, glandulis 10, 1.5-2 mm longis, oblongis, staminibus aequalibus, eis petalis lateralibus oppositis quam ceteris manifeste crassioribus, curvatis, antheris 0.8-1.2 mm longis, ovatis, connectivo ovato, apice valde acuto, atrorubo vel nigro, stylis 2 posticis quam antico manifeste longioribus crassioribusque, curvatis, apice uncinatis. Fructus 0.8-1 cm in diametro, subglobosus.

Shrub or small tree up to 4 m tall, the young branches reddish, strigillose, with hairs 0.5-1 mm long, sessile, undulate or v-shaped, both arms about same in length. Petioles (1-)1.5-2 mm long, densely strigillose, with hairs like those on young branches; stipules 0.7-1.2(-1.5) mm long; leaf blades coriaceous, elliptic-oblong or sometimes obovate, (1.5-)2-3.5(-5) by 1-2.3(-3.5) cm, flat or somewhat undulate, the apex obtuse, sometimes retuse, the base obtuse, rarely somewhat cuneate, the margin entire or slightly crenate, usually unarmed, the adaxial surface shiny dark green, glabrous or sometimes sparsely strigillose but becoming glabrous, the abaxial surface pale green, usually very densely strigillose, with hairs 0.5-0.7(-1) mm long, somewhat stiff, sessile, 2-armed, the arms about equal in length. Inflorescences 2- to 4- (to 6-)flowered, 2-2.5 cm long, equal to or shorter than leaves, strigillose except for the glabrous upper part of pedicels; peduncle 2-8(-12) mm long; bracts 1-1.5 mm long; pedicel with the lower part (2.5-)3.5-5.5(-6.5) mm long, the upper part (7-)10-12 mm long, 1.5-3 times longer than lower part, usually with collar of stiff hairs just below calyx; bracteoles 0.5-1 mm long. Corolla at anthesis ca. 20 mm in diameter; sepals (2.5-)3-3.5 mm long, glabrous but with apex usually ciliate, the glands 10, 1.5-2 mm long, $\frac{1}{2}$ to $\frac{2}{3}$ as long as sepals; posterior petal 9-12.5 mm long, the claw 4-6 mm long, the limb 5-6.5 mm long, usually sharply reflexed backward; filaments 2-3.5 mm long, the anthers 0.8-1.2 mm long, the connective dark red to black, usually sharply pointed at apex; styles uncinat at apex, the lateral ones 3-4.4 mm long with pollination gap 1-1.5 mm long, the anterior one 0.5-1 mm shorter than others, with pollination gap ca. 0.5 mm long, the ovary ca. 1.5 mm in diameter. Fruits 8-10 mm in diameter; pyrenes 5-7 by 4.5-5.5 mm, dorsal wing ca. 1 mm wide, lateral wings small, thick.

Clarendon: along road from Free People S toward Harris Savanna, 300-400 ft, Proctor 34236, Oct. 31, 1974 (holotype); Harris Savanna, 300-400 ft, Proctor

34203, Oct. 1, 1974, *Proctor 34307*, Nov. 13, 1974, *Vivaldi 349* and *351*, Nov. 26, 1974 (BH, U, SJU); along road 1-1.5 mi SSW of Inverness, toward Breadnut Gully, 200-300 ft, *Proctor 34194*, Oct. 1, 1974. **St. Catherine:** Hellshire Hills, area W of Salt Island Lagoon, 10-100 ft, *Proctor 28785*, June 23, 1968.

Named for Dr. George R. Proctor, who first collected it and recognized it as new.

Malpighia proctorii is closely related to *M. nummulariifolia* Niedz. of Cuba, but differs in its much larger leaves and its pedunculate inflorescences. It is also closely related to *M. micropetala* Urban of Hispaniola, but differs from that species in having densely strigillose leaves. With both of these species it shares the black to dark red anther connectives that are usually pointed at the apex, as well as the very thickly coriaceous, flat leaves.

POLYGALACEAE

Polygala L.

Polygala leptocaulis Torrey & Gray, Fl. N. Am. 1: 130. 1838. MAP 25.

New to Jamaica. **St. Elizabeth:** Slipe distr., in savannalike pasture along edge of swamp, near sea level, *Proctor 33389*, July 1, 1973.

This species has also been found in Cuba and ranges on the continent from the southern United States to South America. It somewhat resembles *Polygala paniculata* L. (a common Jamaican weed) but differs in having glabrous instead of glandular-puberulous stems; narrower, more widely scattered leaves; smaller, more numerous flowers with shorter pedicels; and smaller seeds.

Polygala spathulata Griseb. Catal. Pl. Cubens. 13. 1866. MAP 25.

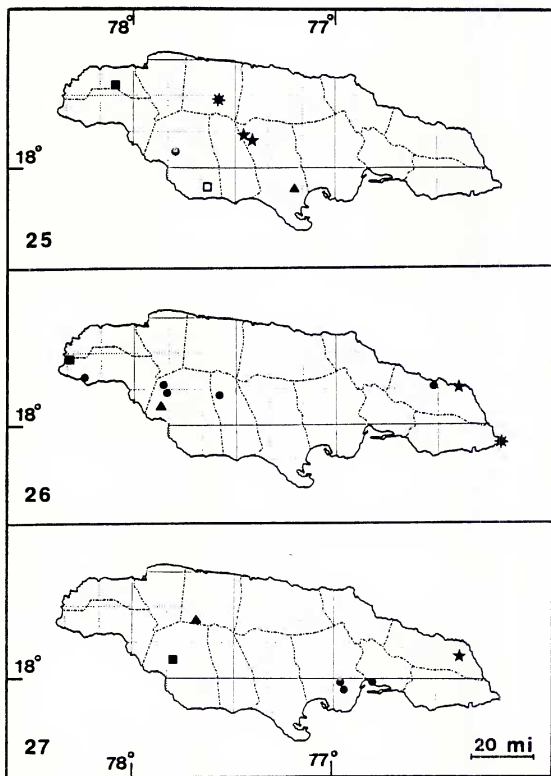
New to Jamaica. **Clarendon:** along road S from Free People toward Harris Savanna, 300-400 ft, *Proctor 34248*, Oct. 31, 1974.

This is a very small species differing markedly in growth habit from the other herbaceous Jamaican congeners. The plants form small, flat rosettes not more than ca. 10 cm across, the several short stems lying flat on the ground, radiating out from a central woody taproot. The spatulate leaves, in whorls of four, are usually 4-7 mm long and nearly as wide. The racemes are short, sessile, and few flowered, with the greenish white flowers ca. 2.5 mm long. The species is otherwise known only from the Bahamas and Cuba.

EUPHORBIACEAE

Sebastiania Sprengel

The number of known species of *Sebastiania* in Jamaica has been increased from three to six, of which one occurs in two varieties. Despite certain dif-



MAPS 25-27. Distributions: 25, *Polygala leptocaulis* (dot), *P. spathulata* (triangle), *Sebastiana crenulata* (solid square), *S. lesteri* (stars), *S. lesteri* var. *glabrata* (hollow square), *S. howardiana* (asterisk); 26, *Cuerveia hawkesii* (star), *C. jamaicensis* (dots), *C. kappleriana* (triangle), *Elachyptera floribunda* (square), *Hippocratea volubilis* (asterisk); 27, *Huerteia cubensis* (triangle), *Abutilon indicum* (dots), *Hibiscus striatus* subsp. *lambertianus* (square), *Wercklea flavovirens* (star).

faculties inherent in keying out dioecious plants, these taxa can usually be distinguished as follows:

- A. Uppermost leaves opposite or in whorls of 3, sessile or nearly so. *S. fasciculata*.
- A. Leaves alternate or subopposite, distinctly petiolate.
 - B. Leaves with distinctly crenulate margins; staminate floral glands rudimentary; anthers subsessile. *S. crenulata*.
 - B. Leaves entire or minutely toothed; staminate floral glands well developed; anthers terminating distinct filaments.
 - C. Inflorescences terminal; staminate flowers sessile. *S. spicata*.
 - C. Inflorescences chiefly axillary (or few terminal); staminate flowers pedicellate.
 - D. Stems and leaves puberulous. *S. lesteri*.
 - D. Stems and leaves glabrous.
 - E. Leaves emarginate; sepals lance-linear. *S. howardiana*.
 - E. Leaves not emarginate; sepals ovate or broadly deltate.
 - F. Leaf blades somewhat narrowed at both ends, the apex obtuse, not apiculate. *S. alpina*.
 - F. Leaf blades rounded at both ends, the apex minutely apiculate. *S. lesteri* var. *glabrata*.

***Sebastiania crenulata* Proctor, sp. nov.**

MAP 25.

Frutex glaber circa 2 m altus, ab speciebus aliis Jamaicensibus in foliis crenulatis et floribus staminatis glandulis rudimentariis sepalis obsoletis et antheris subsessilibus, differt.

Glabrous shrub ca. 2 m tall; youngest branchlets terete or slightly angulate. Leaves alternate; petioles 4–11 mm long; blades chartaceous, elliptic or oblong-elliptic, 5–10 by 2.5–4.5 cm, rounded and sometimes slightly emarginate at apex, obtuse at base, the margins somewhat unevenly crenulate, the midrib prominent adaxially, prominent abaxially, the veins prominent on both sides. Staminate inflorescences axillary, subracemose, racemes 1.5–3.5 cm long; floral bracts deltate, fimbriolate, 0.3 mm long; glands rudimentary, lingulate; pedicels 0.2–0.5 mm long; flowers ca. 0.8–1 mm across; sepals obsolete; anthers subsessile, filaments 0.2 mm or less long. Pistillate inflorescences, capsules, and seeds not seen.

Hanover: summit of Bubby Hill, ca. 1 mi SW of Hillsbrook, ca. 1450 ft, Proctor 31314, May 31, 1970 (♂) (holotype).

This rare shrub was collected at the type (and only known) locality of *Reynosa jamaicensis* M. C. Johnston (Rhamnaceae). It is unique among the Jamaican species of *Sebastiania* not only in its crenulate leaves, but also in its reduced staminate flowers with rudimentary glands, obsolete sepals, and subsessile anthers, the filaments being 0.2 mm or less long. Unfortunately, the pistillate flowers and fruits have not yet been seen. With incomplete material, it is not possible to suggest the affinities of this plant in *Sebastiania*.

Sebastiania lesteri Proctor, sp. nov.

MAP 25.

Frutex a speciebus aliis Jamaicensibus in indumento puberulo differt; *Sebastiania alpina* affine, sed in foliis brevioribus rotundatis apicibus emarginatis, floribus parvioribus, et bracteis ciliatis sepalisve parvioribus, differt.

Shrub ca. 2 m tall; youngest branches shallowly sulcate or terete, densely puberulous with short pluricellular hairs. Leaves alternate or sometimes subopposite; petioles 2–4 mm long; blades stiffly chartaceous, broadly elliptic to rotund, 1–4 by 1–3 cm, rounded and emarginate at apex, rounded or very broadly cuneate at base; midrib prominulous adaxially, prominent abaxially, nerves more or less prominulous on both sides; adaxial surface glabrous to sparsely puberulous, petiole and abaxial surface densely puberulous, or at least puberulous on midrib. Staminate inflorescences terminal and axillary, puberulous, racemose; racemes 1–2(–4.5) cm long; pedicels 0.3–0.6 mm long; flowers ca. 1 mm across; floral bracts and sepals deltate, ciliate; glands cylindrical with minute, cup-shaped apex. Pistillate inflorescences terminal, puberulous; sepals lanceolate, ciliate, ca. 2 mm long; ovary puberulous, styles puberulous on lower side. Capsules puberulous, 6–7 mm in diameter; seeds brown, smooth, ca. 3.5 mm long.

Clarendon: summit of Quaco Rock, near Ritchies, ca. 3000 ft, *Proctor 34940*, March 30, 1975 (♂) (holotype), *Proctor 34941*, March 30, 1975 (♀), *Proctor 33821*, April 24, 1974 (♂); Glenwood Springs, along road between Balcarres and Sunbury, ca. 3100 ft, *Proctor 33649*, Nov. 30, 1973 (♂), *Proctor 33706*, Jan. 4, 1974 (♀).

Named for Mr. Lester Dinnall, of Glenwood Springs, who originally discovered this plant and brought it to my attention, insisting (despite my initial doubts) that it was new and "different." It is, in fact, a very distinct species, especially in its pubescence, its small, rotund, emarginate leaves, and its very small, pedicellate staminate flowers. The staminate flowers of *Sebastiania alpina* (Fawcett & Rendle) Pax & K. Hoffman (apparently the most closely related species) are about twice as large.

Sebastiania lesteri var. **glabrata** Proctor, var. nov.

MAP 25.

A var. *lesteri* in foliis glabris lucidis ellipticis apicibus apiculatis et floribus pistillatis sepalis late ellipticis marginibus glabris glandulosisque, differt.

Shrub resembling var. *lesteri* but differing in its glabrous, elliptic to broadly elliptic leaves minutely apiculate at the apex, and in its broadly deltate pistillate sepals, these glabrous and glandular on the margins.

St. Elizabeth: 2 mi NNE of Top Hill P.O., 1700 ft, *R. A. Howard & Proctor 13925*, Sept. 16, 1954 (♀) (holotype).

It is possible that this plant represents a species distinct from *Sebastiania lesteri*, but the material available is not sufficient to establish this fact.

Sebastiana howardiana Proctor, sp. nov.

MAP 25.

Frutex *Sebastiana lesteri* affine sed in trichomatibus carentibus, foliis multo grandioribus, floribus pistillatis pedicellis longioribus, et seminis nigriscentinereis, differt.

Glabrous shrub 2–3 m tall; youngest branchlets longitudinally sulcate and striate. Leaves alternate; petioles 4–6 mm long, minutely glandular along adaxial groove; blades coriaceous, broadly elliptic to rotund, 4–9 by 2.5–6 cm, rounded and shallowly to deeply emarginate at apex, rounded or very broadly cuneate at base, margins narrowly and tightly revolute; midrib prominent adaxially, prominent abaxially, the venation strongly reticulate-prominulous on both sides, the tissue dark green adaxially, noticeably paler abaxially. Staminate inflorescences axillary, yellow, 0.6–3 cm long; floral bracts deltate, acute, fimbriolate, 0.2–0.3 mm long; glands cylindrical with minute, cup-shaped apex; pedicels 0.2–0.5 mm long; flowers ca. 0.8–1 mm across; sepals dark brown, lance-linear, fimbriolate, ca. 0.3 mm long; filaments 0.2–0.4 mm long. Pistillate inflorescences terminal and axillary, 2- or 3-flowered; bracts broadly deltate, minutely fimbriolate, the glands simple or sometimes bifurcate, abruptly expanded and cup-shaped at apex; pedicels 2–2.5 mm long; sepals not seen. Capsules glabrous, 6–8 mm in diameter; seeds blackish gray, smooth, ca. 3.5 mm long.

Trelawny: Ramgoat Cave area, ca. 1500 ft, *R. A. Howard & Proctor 14396*, July 4, 1955 (fruits) (holotype), *R. A. Howard & Proctor 14135*, Sept. 26, 1954 (fruits), *R. A. Howard & Proctor 14421*, July 4, 1955 (♂).

The affinity of this species seems to be with *Sebastiana lesteri*, but *S. howardiana* is a much more robust plant with larger, glabrous leaves of thicker texture, longer pistillate pedicels, and blackish gray instead of light brown seeds.

CELASTRACEAE SUBFAMILY HIPPOCRATEOIDEAE

This subdivision of the Celastraceae has often been treated as an independent family (Hippocrateaceae) even though it was always recognized that the two taxa are closely allied. However, it was conclusively shown by Ding Hou (1964) that all the characters used to differentiate the two groups break down at one point or another. It is necessary to emphasize this fact because in Jamaica the two groups are sharply distinct, and on a local basis it is tempting to treat them as separate families. This distinctiveness can be summarized in the following key, which in the present context applies only to Jamaica:

- A. Woody vines; leaves opposite; stamens 3, attached at base of ovary within disc, anthers dehiscing extrorsely near apex; fruits consisting of 3 capsular carpels attached only at base; seeds without endosperm. . . . subfam. Hippocrateoideae.
- A. Shrubs or trees; leaves alternate, opposite, or whorled; stamens 4 or 5, attached outside disc or fused with it, anthers dehiscing introrsely; fruits drupes or capsules

(if capsules, carpels fused and not winglike); seeds with endosperm.
 subfam. Celastraceae.

The treatment of the Celastraceae by Adams (1972) included the Hippocrateoideae, thought at that time to be represented in Jamaica by but a single species, *Cuervea kappleriana* (Miq.) A. C. Sm. However, recent field studies have revealed that not only does the genus *Cuervea* have more than one representative in Jamaica, but also that two other related genera are present as well. Observations of these plants have shown that the subfamily is a much more important element in the flora than was previously supposed. In the classification of the Jamaican species, the generic concepts of Smith (1940) have been followed. The three genera represented can be keyed as follows:

- A. Inflorescence branches glabrous; petals glabrous within; disc cup shaped, membranous.
 - B. Inflorescence branches terete, nonglandular; flowers few, loosely arranged; petals 4–9 mm long; fruiting carpels broadly obovate or suborbicular in outline. *Cuervea*.
 - B. Inflorescence branches quadrangular, minutely and densely granulose-glandular; flowers numerous, densely arranged; petals less than 1 mm long; fruiting carpels elliptic or ovate-elliptic in outline. *Elachyptera*.
- A. Inflorescence branches minutely and densely puberulous with pluricellular hairs; petals bearded within; disc thickly fleshy, annular-pulvinate. . . . *Hippocratea*.

***Cuervea* Triana ex Miers**

It has been very difficult to decide just how many species of this genus are really represented in Jamaica. The chief reason for this is the extraordinary infrequency of flowering and fruiting in a taxon whose vegetative parts fail to provide much in the way of differentiating features. Yet considerable populations of these plants occur at many widely scattered localities; in fact, in certain areas these high-climbing woody lianas are quite an important element in the flora. I am convinced that several species can be distinguished in Jamaica, despite the fact that Smith (1940) attributed only three species to the whole genus, and but one of these to Jamaica.

The following key will serve to differentiate the three Jamaican species of *Cuervea* now being recognized:

- A. Flowers pink; fruiting carpels longer than wide, diverging from each other by narrowed, stipitate bases. *C. hawkesii*.
- A. Flowers cream or pale yellow; fruiting carpels mostly wider than long, closely contiguous from about middle to short-stipitate or nearly truncate base.
 - B. Petals 4.5–5 mm long; fruiting carpels 3–4 cm broad. *C. jamaicensis*.
 - B. Petals 5.5–9 mm long; fruiting carpels mostly 7–9 cm broad.
 *C. kappleriana*.

***Cuervea hawkesii* Proctor, sp. nov.**

MAP 26.

Liana lignosa glabra floribus roseis et carpellis fructificantibus longioribus quam latis per bases angustatae stipitatae divergentibus.

Glabrous liana or scrambling shrub; branchlets opposite, cinereous to brownish, with numerous small lenticels. Petioles 9–12 mm long; leaf blades chartaceous, lance- or elliptic-oblong, 13–20 by 5–7 cm, gradually acuminate at apex, rounded at base, the margins entire, the costa somewhat prominent on both surfaces, the secondary nerves about 7 or 8 per side, prominulous on both surfaces, the veinlets reticulate and prominulous, the adaxial surface glossy. Inflorescences 2–3 cm long, few flowered; peduncle terete or faintly angled, 2–10 mm long, together with the few branches dark purple-brown; bracts irregularly ovate-deltate, 0.5–0.9 mm long, fimbriate, fimbriae gland tipped. Pedicels slender, 1.5–2.5 mm long; flowers fragrant, 10–12 mm across at anthesis; sepals imbricate, unequal, broadly rounded-deltate, 1–1.5 mm long and as broad or broader, margins fimbriate-ciliolate; petals "peach-pink," very broadly elliptic with narrowly inflexed entire margins, 6–6.5 by 3.5–5 mm, rounded at apex; disc membranous, ca. 1.5 mm in diameter and 0.3–0.4 mm high; filaments flat, ca. 0.5–0.7 mm long, the anthers roundish in outline, 0.4–0.6 mm in diameter; style 0.5–0.7 mm long, apex irregularly lobulate, stigmas minute and inconspicuous. Fruiting carpels (capsules) elliptic to obovate in outline, noticeably longer than broad, 5.5–6 by 3.5–4 cm, rounded at apex, tapering to stipelike base ca. 5 mm long; seeds 2 per carpel, main body of each ca. 2.5 cm long, wing ca. 6 mm long with maximum width of 2 mm.

Portland: Turtle Cove, Drapers P.A., 0–50 ft, *Hawkes s.n.* (IJ 48280), May 2, 1970 (holotype) (specimen from cultivated plant originally collected wild in adjacent coastal woodland).

This species is named to commemorate the late Alex D. Hawkes, who discovered it.

Cuervea jamaicensis Proctor, sp. nov.

MAP 26.

Liana lignosa glabra floribus luteolis, a *Cuervea kappleriana* in petalis brevioribus 4.5–5 mm (versus 5.5–9 mm) longis et carpellis fructificantibus parvioribus 3–4 cm (versus 7–9 cm) latis, differt.

Glabrous, high-climbing, woody liana; branchlets opposite, the younger ones green, smooth, the older ones brownish-cinereous, finely roughened by numerous narrowly elliptic lenticels. Petioles 5–10 mm long; leaf blades chartaceous or somewhat coriaceous, ovate, ovate-oblong, or elliptic, 6–19 by 3–9 cm, short-acuminate at apex, rounded to broadly cuneate and slightly inequilateral at base, the margins entire, the costa prominent on both surfaces, the secondary nerves 5 to 9 per side, prominent on both surfaces, the veinlets reticulate and strongly prominulous. Inflorescences 3–12 cm long, many flowered, peduncle 0–2.5 cm long, together with the several branches

green and subangulate; bracts variable in shape, tips acute and colorless. Pedicels 1.5–2 mm long; flowers fragrant, 9–10 mm across at anthesis; sepals imbricate, unequal, 1–1.5 by up to 2 mm, the margins rounded, minutely crose-denticulate; petals pale yellow, oblong or elliptic-oblong with inflexed entire margins, 4.5–5 by 2–2.5 mm, subacute at apex; disc subcarinose, ca. 1 mm in diameter and 0.3 mm high; filaments ca. 0.5 mm long, the anthers obcordate in outline, ca. 0.4 mm in diameter; style 0.3–0.4 mm long, roughened-truncate at apex. Fruiting carpels (capsules) oblate in outline, 3–4 by 3.5–4.5 cm, broadly rounded at apex, similarly rounded at base except for abruptly stipelike point of attachment 1–1.5 by 3 mm; seeds 2 or 3 per carpel, main body of each 2–2.5 cm long, wing 7–10 mm long with maximum width of 4 mm.

Portland: near mouth of Rio Grande, on wooded brink of vertical cliff overlooking E end of highway bridge, ca. 100 ft, *Proctor 37458*, Nov. 30, 1977 (holotype), *Proctor 25653*, Nov. 19, 1964. **Manchester:** 0.3 mi SE of Comfort Hall Halt, ca. 1100 ft, *Proctor 38356*, Nov. 7, 1979. **St. Elizabeth:** between mileposts 4 and 5, Redgate to Ipswich road, ca. 500 ft, *Proctor 36762*, April 20, 1977; Y.S. Falls, 150–250 ft, *Proctor 37567*, Jan. 8, 1978. **Westmoreland:** Negril Hills 0.5 mi E of Little Bay, ca. 100 ft, *Proctor 11153*, Nov. 18, 1955.

A plant cultivated at Mountainside, St. Elizabeth, grown from a seed said to have been obtained in the parish of Westmoreland, may possibly represent still another species, but the available material (*Proctor 38100*, March 26, 1979; *Proctor 38172*, May 31, 1979) is too incomplete for determination.

Elachyptera A. C. Sm.

Elachyptera floribunda (Bentham) A. C. Sm. *Brittonia* **3**: 387. 1940.
MAP 26.

Genus and species new to Jamaica. **Westmoreland:** inland from milepost 23, 2.5 mi NE of Negril, wooded swamp with peat substrate, sea level, *Proctor 35347*, Oct. 7, 1975, *Proctor 35535*, Dec. 13, 1975, *Proctor 37128* (flowers) and *Proctor 37129* (fruits), July 18, 1977.

Previously known from Belize and eastern Guatemala to Guyana and Amazonian Brazil at widely scattered localities; this new Jamaican record is the first for its genus and species in the West Indies.

Hippocratea L.

Hippocratea volubilis L. *Sp. Pl.* **2**: 1191. 1753. MAP 26.

Genus and species new to Jamaica. **St. Thomas:** Morant Point, coastal thickets over limestone, near sea level, *Proctor 34368*, Nov. 27, 1974, *Proctor 37495*, Dec. 9, 1977, *Proctor 38583*, Feb. 16, 1980.

It is rather surprising that this common and widespread species had not previously been found in Jamaica, particularly since it grows at a locality that has been repeatedly visited by botanists. However, it flowers very seldom there, and numerous observations have thus far failed to reveal any fruits.

The range of *Hippocratea volubilis* extends throughout tropical America from Florida to Argentina; in the West Indies this species has been recorded from Cuba, Hispaniola, Puerto Rico, and the Lesser Antilles.

STAPHYLEACEAE

Huertea Ruiz & Pavon

Huertea cubensis Griseb. Catal. Pl. Cubens. 66. 1866. MAP 27.

Genus and species new to Jamaica. **Trelawny:** Cockpit Country, dense woods on limestone hills beyond Belmore Castle, ca. 1-2 mi NW of Quick Step, alt. ca. 1500 ft, G. L. Webster 5262, August 11, 1954 (A).

The small family Staphyleaceae was previously thought to be represented in Jamaica only by the genus *Turpinia*, with a single rather common species. *Huertea cubensis* is otherwise known from Cuba and Hispaniola. *Huertea* and *Turpinia* can be distinguished by the following key:

- A. Leaves opposite, leaflets 3 to 11; styles 3, free; fruits 3-locular. . . . *Turpinia*.
 A. Leaves alternate, leaflets 17 to 21; style single, short, with 2-lobed stigma; fruits 1- or 2-locular. . . . *Huertea*.

MALVACEAE

Abutilon Miller

Abutilon indicum (L.) Sweet, Hortus Brit. 54. 1826. MAP 27.

According to Adams (1972, p. 463), this species is "very rare and known only from two unlocalized early collections" (*Distin s.n.*, 1830-40; and *March s.n.*, 1857-58). Material recently gathered, however, suggests that *Abutilon indicum* is in fact not uncommon in a limited area between Kingston and Spanish Town. The following specimens can be cited:

Kingston: Newport East, near sea level, *Proctor 34253*, Nov. 4, 1974. **St. Catherine:** along bypass highway S of Spanish Town, ca. 50 ft, *Proctor 34208*, Oct. 1, 1974; 1.5 mi WSW of Bernard Lodge Factory, ca. 50 ft, *Proctor 32653*, Sept. 23, 1971.

Hibiscus L.

Hibiscus striatus Cav. *Monad. Cl. Diss. Decem* **3**: 146. *t. 54, fig. 1.* 1787.

Hibiscus striatus subsp. **lambertianus** (Kunth) Blanch., comb. et stat. nov.⁶ MAP 27.

Hibiscus lambertianus Kunth in H.B.K. *Nova Gen. Sp. Pl.* **5**: 226. *t. 478.* 1822.
Hibiscus cubensis A. Rich. *Essai Fl. Cuba*, 140. 1845.

New to Jamaica. **St. Elizabeth**: Frenchman, sea level, *Proctor 38095*, March 26, 1979, *Proctor 38186*, June 16, 1979 (both det. P. A. Fryxell).

In addition to its occurrence in Cuba, this entity has a wide continental range from the Gulf coast of Texas and Mexico south to northern Bolivia. The type of Kunth's *Hibiscus lambertianus* was found in Venezuela. This plant resembles *H. trilobus* Aublet but has leaves undivided or only slightly lobed at the base, and larger flowers with pink petals up to 12 cm long.

Pavonia Cav.

Pavonia schiedeana Steudel, *Nomencl. Bot. ed. 2.* **2**: 279. 1841.

Pavonia rosea Schlecht. *Linnaea* **11**: 355. 1837, not Moris, 1833, or Adams, 1972.

Dr. Paul Fryxell (pers. comm.) has pointed out this necessary change of name. The Moris publication, including a full description and a plate, was based on a plant from Calcutta presumably collected by Wallich, but Moris did not mention Wallich by name; therefore, the specific epithet must be attributed to Moris alone.

Wercklea Pittier & Standley

Wercklea flavovirens Proctor in Fryxell, *Jour. Arnold Arb.* **62**: 475. 1981. MAP 27.

Genus and species new to Jamaica. **Portland**: McRobert Patent, in John Crow Mts. ca. 6 mi by road S of Sherwood Forest, ca. 1150 ft, *Watts, Podzorski, & Kelly JCM 1548 (IJ 69960)*, March 27, 1979 (flower) (holotype), *Proctor 36707*, Dec. 20, 1976 (juvenile), *Proctor 37837*, May 12, 1978 (fruit).

THYMELAEACEAE

Daphnopsis Martius & Zucc.

Daphnopsis occidentalis (Sw.) Krug & Urban, *Bot. Jahrb.* **15**: 349. 1892.

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This species, usually listed as endemic to Jamaica, also occurs on Grand Cayman (*Proctor 31041*) and Cayman Brac (*Proctor 29020*).

FLACOURTIACEAE

Xylosma Forster f.

Xylosma proctorii Sleumer, Fl. Neotrop. **22**: 142. 1980. MAP 28.

This plant is listed as "sp. A" by Adams (1972). In publishing it as a new species, Sleumer had but two collections available. Additional material includes:

Trelawny: Belmore Castle area, N of Quick Step, ca. 1500 ft, *Proctor 36290*, June 12, 1976, *Proctor 38057*, March 3, 1979; Tyre distr., N of Troy, ca. 1750 ft, *Proctor 9948*, March 14, 1955, *Proctor 15736*, Aug. 28, 1956; Burnt Hill, 1700–1800 ft, *Proctor 34335*, Nov. 23, 1974. **Manchester**: Glasgow distr., ca. 1250 ft, *Proctor 31533*, Dec. 1, 1970 (holotype, v; isotype, v). **St. Ann**: 2 mi W of Albion, ca. 2500 ft, *Proctor 33144*, Feb. 3, 1973.

TURNERACEAE

Piriqueta Aublet

Piriqueta viscosa Griseb. Catal. Pl. Cubens. 114. 1866. MAP 28.

New to Jamaica. **Clarendon**: Harris Savanna, ca. 350 ft, *Proctor 34296*, Nov. 13, 1974.

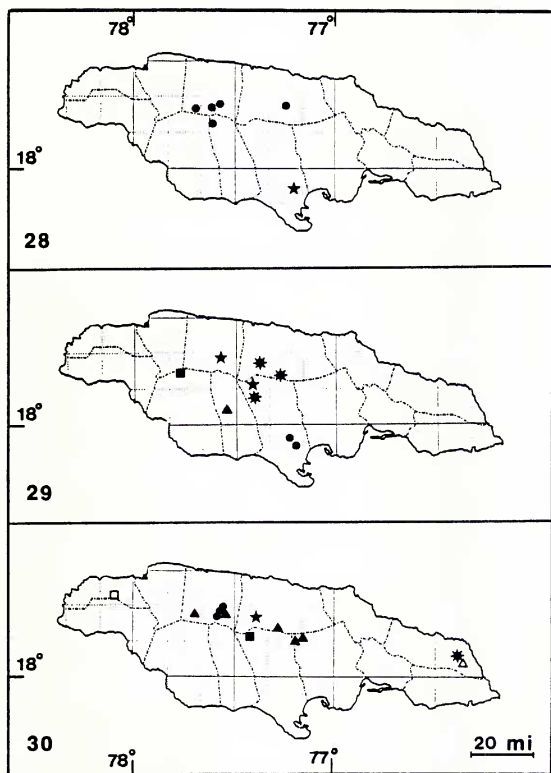
Originally described from Cuba, this species is also known to occur at scattered South American localities as far south as Paraguay. As an ephemeral annual, it is easily overlooked by collectors unless they happen to be in the right locality at just the right time.

Piriqueta viscosa is easily distinguished from *P. cistoides*, the only other Jamaican species, by its dense covering of viscid glandular hairs and its pink flowers. The flowers of *P. cistoides* are yellow.

Turnera L.

Turnera pumilea L. Syst. Nat. ed. 10. **2**: 965. 1759. MAP 28.

Until recently, this rare, short-lived annual had been gathered in Jamaica but a few times, notably by the pre-Linnaean collectors Sloane (1686–87) and Browne (1746–55), and later by Swartz (1784–86). In modern times it had only been found by William Harris (*12066*), who collected it at "Two mile Wood, St. Catherine" on June 8, 1915. It is now possible to record a more recent collection.



MAPS 28-30. Distributions: 28, *Xylosma proctorii* (dots), *Piriqeta viscosa* and *Turnera pumilea* together (star); 29, *Passiflora calcicola* (stars), *Begonia guaduensis* (triangle), *Ammannia auriculata* (dots), *Calyptanthes capitata* (asterisks), *C. uniflora* (square); 30, *Eugenia aboukirensis* (star), *E. crassicaulis* (hollow triangle), *E. hanoverensis* (hollow square), *E. kellyana* (asterisk), *E. laurae* (dots), *E. websteri* (solid triangles), *E. laurae* and *E. websteri* together (solid square).

Clarendon: Harris Savanna, ca. 350 ft, *Proctor 34297*, Nov. 13, 1974.

Numerous plants were observed when this collection was made, but none has been seen at this locality again during many subsequent visits.

PASSIFLORACEAE

Passiflora L.

Passiflora calcicola Proctor, sp. nov.

MAP 29.

Planta glabra scandens *Passiflora cubense* affine, sed in lamina transversaliter oblonga vel late obdeltoidea basi cordata, pedunculis infra medium articulatis, bracteis parvioribus, floribus pallide purpureis, tubo calycis longiore et angustiore base cuneato, sepalis petalisve angustioribus, operculo angustiore integro, fructibus parvioribus ellipsoideis, et seminis grandioribus alatis transversaliter rugulosis, differt.

Trailing, glabrous vine; stems pale green, flattened-angulate, striate; stipules linear-subulate, 1–4 mm long, persistent. Petioles 6–11 mm long, glandless; leaf blades transversely oblong to very broadly obdelate, 3-nerved, entire and truncate or very slightly 2- or 3-lobed, 4–12 cm in greatest width, the midrib 1.5–4.5 cm long, together with principal side nerve on each side terminating in a mucro, the base shallowly cordate, the tissue rigidly coriaceous, lustrous, ocellate, the venation prominulous on both sides. Peduncles solitary or in pairs, 2–3 cm long, articulated below middle (0.9–1.1 cm above base); bracts setaceous, 0.5–1 mm long, borne at and below point of articulation; flowers light purple, the calyx tube narrowly cup shaped, ca. 10 mm long, 6–7 mm wide at top, cuneate at base, the sepals and petals narrowly linear-oblong, 2–2.5 cm by 2–3 mm, the corona filamentose, with filaments in single series, narrowly linear, ca. 4 mm long, pale green, the operculum incurved, 0.3 mm wide, entire, the ovary ellipsoid, smooth. Fruits ellipsoid, 1.7–1.9 cm long; seeds broadly fusiform, ca. 4 by 2 mm, transversely rugulose, winged along 1 side.

Trelawny: 0.6 mi N of Spring Garden, crevices of exposed vertical limestone cliff, ca. 1800 ft, *Proctor 34499*, Dec. 18, 1974 (holotype), *Proctor 35318*, Sept. 20, 1975. **Clarendon:** Peckham Woods, in crevices of limestone crags, ca. 2500 ft, *Proctor 35677*, April 4, 1976.

Among the Jamaican species, *Passiflora calcicola* is most nearly related to *P. perfoliata* but differs markedly in the petiole and differently shaped leaves and in the shape and color of the fruits.

BEGONIACEAE

Begonia L.

Begonia fischeri Schrank, Pl. Rar. t. 59. 1820.

This is believed to be the correct name of the species listed by Adams (1972) as *Begonia patula* Haw. He attributed it only to the parish of Westmoreland, but it is now also known from St. Elizabeth.

Begonia guaduensis Kunth in H.B.K. Nova Gen. Sp. Pl. 7: 178. 1825.
MAP 29.

New to Jamaica. **Manchester:** Mike Town distr., ca. 2.5 mi NW of Mandeville, ca. 2200 ft, *Proctor 37590*, Jan. 17, 1978 (det. L. B. Smith).

Smith and Schubert (1946) gave the known distribution of *Begonia guaduensis* as Panama, Colombia, and Venezuela. In Jamaica the species may be an escape from cultivation, yet it was found growing under wholly natural conditions on a wooded, rocky, limestone hillside. If not indigenous, it should nevertheless be considered fully naturalized.

This species somewhat resembles *Begonia glabra* Aublet in technical characters; the latter, however, is a high-climbing vine rooting at the nodes, with the roots serving as holdfasts. *Begonia guaduensis* is said to become somewhat scandent, but the Jamaican plants are upright herbs. It also differs from *B. glabra* in its oblong or lance-oblong leaves; these are strongly asymmetric and have petioles 2–8 mm long. Leaves of *B. glabra* are broadly ovate and symmetrical, and they have much longer petioles. In Adams's (1972) key to the Jamaican species of *Begonia*, *B. guaduensis* would seem to come out to *B. acutifolia* or possibly *B. purpurea*. From both of these species it differs in having completely glabrous leaves.

LYTHRACEAE

Ammannia L.

Ammannia auriculata Willd. Hortus Berol. 1: 7. t. 7. 1803. MAP 29.

New to Jamaica. **Clarendon:** Harris Savanna, ca. 350 ft, *Proctor 34313*, Nov. 15, 1974, *Proctor 38028*, Feb. 10, 1979; Mineral Heights, ca. 1.3 mi due S of May Pen, ca. 250 ft, *Proctor 37199*, Aug. 25, 1977.

This pantropical species is rare in the West Indies, being known previously in this area only from Cuba. It is widespread in central and southern United States, Mexico, and parts of Central America.

Ammannia auriculata can be distinguished from other Jamaican species of

this genus (all of which have sessile flowers) by its pedicellate flowers in small axillary cymes. It differs from all but *A. coccinea* in having flowers with petals.

MYRTACEAE

The proliferation of this family in Jamaica is emphasized by the rather numerous new discoveries made in recent years.

***Calyptranthes* Sw.**

***Calyptranthes capitata* Proctor, sp. nov.**

MAP 29.

Arbor glabra, gracilis, usque ad 6 m alta, a speciebus aliis *Calyptranthes* in Jamaica in inflorescentiis haud ramosis capitatis, capitulo 6–8 mm in diametro e floribus circa 18 ad 25 sessilibus composito pedunculo 2–2.5 cm longo terminanti, a speciebus in Cuba in inflorescentiis congruentibus sed in petiolis 3–6 mm longis et lamina ovato-lanceolatis acuminibus longis, differt.

Slender, dense-crowned tree to 6 m tall; youngest branchlets cinereous, terete, glabrous, ca. 0.8 mm in diameter. Leaves glabrous; petioles 3–6 mm long; blades coriaceous, opaque, glandular-punctate (dots not pellucid), ovate-lanceolate, 3–4.5 by 1–1.8 cm, sharply long-acuminate at apex, rounded at base, midrib lightly impressed adaxially and somewhat prominent abaxially, secondary venation obscure. Inflorescence an apparently unbranched pedunculate capitulum, solitary or paired from axils of penultimate pair of leaves; peduncles 2–2.5 cm long, compressed, minutely brownish-tomentose; flower buds obovoid or ellipsoid, bluntly apiculate, minutely tomentellous, 1.5–1.7 mm long; flowers white, fragrant, sessile, ca. 18 to 25 together in dense head 6–8 mm in diameter at anthesis, each flower ca. 1 mm in diameter at apex of hypanthium. Fruits dark red, globose, glabrous, 1- or 2-seeded, 3–4 mm in diameter.

St. Ann: Douglas Castle distr., ca. 2300 ft, *Proctor 36274*, June 11, 1976 (flowers) (holotype), *Proctor 37329*, Oct. 8, 1977 (fruits); vic. of Aboukir, ca. 2200 ft, *Proctor 37445*, Nov. 26, 1977 (fruits). **Clarendon:** Glenwood Springs, along road between Balcarres and Sunbury, 3000–3100 ft, *Proctor 35645*, March 31, 1976, *Proctor 36359*, July 21, 1976.

Among Jamaican species of *Calyptranthes*, this species is unique in its apparently simple, headlike inflorescence with the minute flowers crowded together in a dense capitulum. Actually, the heads are not strictly simple; if dissected, they are seen to be minutely 3-branched, the branches each approximately 1 mm long and completely hidden by the crowded sessile flowers.

***Calyptranthes uniflora* Proctor, sp. nov.**

MAP 29.

Frutex foliis petiolatis ovatis vel oblongo-ovatis apicibus acuminatis, e speciebus aliis Antillanae Calyptanthus in floribus solitariis terminalibus pedunculis 4.5–6.5 cm longis, differt.

Shrub 2.5 m tall; youngest branchlets terete, deciduously covered with appressed, flattened, whitish, dibrachiate hairs and with few thin, irregular, subarachnoid scales; older branchlets glabrous. Petioles glabrous, 5–9 mm long, deeply grooved adaxially; leaf blades coriaceous, opaque, at first with scattered whitish arachnoid tomentum, soon becoming glabrous, ovate to oblong-ovate or elliptic, 3.5–7.5 by 2–3.8 cm, acuminate at both ends, the midrib narrowly grooved in lower half adaxially, prominent abaxially, the side nerves obscurely prominulous on both sides. Inflorescences 2 or 3, terminal, 1-flowered, the peduncles soon glabrous, compressed, 4.5–6.5 cm long; flower buds ovoid, acuminate, ca. 10 mm long, deciduously covered with appressed dibrachiate hairs like those of youngest branchlets. Flowers and fruits unknown.

St. Elizabeth: Cooks Bottom, E of Elderslie, 1600–1700 ft, *Proctor 20862*, May 13, 1960 (holotype).

This plant was listed as "sp. B" in Adams (1972).

***Eugenia* L.**

***Eugenia aboukirensis* Proctor, sp. nov.**

MAP 30.

Arbor tenui ad 6 m alta *Eugenia clarendonense* affine, sed petiolis brevioribus, laminis longioribus tenuioribusve, et floribus pluribus parvioribusve, differt.

Slender tree to 6 m tall; youngest branchlets slightly compressed, glabrous; older ones terete, cinereous. Leaves glabrous; petioles 3–4 mm long; blades chartaceous, lanceolate to narrowly elliptic, 3–5.5 by 0.8–1.7 cm, acuminate at apex, cuneate at base, the midrib slightly grooved toward base adaxially, prominent abaxially, the veins slightly prominulous on both sides, the tissue with scattered very minute pellucid dots. Flowers up to 8 in subumbellate clusters in leaf axils; rachis 0–1 mm long; bracts brown, deltate-acuminate, 0.5 mm long, ciliate; bracteoles similar to bracts; pedicels glabrous, 2–3 mm long; calyx minute, the lobes broadly rounded, 0.5–0.6 mm long after anthesis, glabrous; petals light pink, ca. 2.5 mm long, ciliate at apex; hypanthium apex puberulous within calyx; filaments pink, ca. 2.5 mm long; style ca. 3 mm long. Fruits not seen.

St. Ann: vic. of Aboukir, ca. 2200 ft, *Proctor 37484*, Dec. 4, 1977 (holotype), *Proctor 37444*, Nov. 26, 1977, *Proctor 37493*, Dec. 4, 1977.

This species keys out to the group of species that includes *Eugenia rhom-*

bea (O. Berg) Krug & Urban, *E. clarendonensis* Urban, and *E. brownei* Urban, but it differs from all of these in leaf shape and in having much smaller flowers. Its flowers are even smaller than those of *E. axillaris* (Sw.) Willd., but they are borne on longer pedicels and are pink, with glabrous instead of ciliate sepals.

***Eugenia crassicaulis* Proctor, sp. nov.**

MAP 30.

Frutex, ramulis juvenilissimis crassis 3–4 mm in diametro, floribus subsessilibus solitariis vel binatis ad nodos defoliatos instructis, pedicellis glabris 1–3 mm longis, sepalis fructificantibus circa 3.5 mm longis, et fructis late ovoideo-ellipticis 1.3–1.5 mm longis.

Shrub of stiff texture; youngest branchlets somewhat compressed, glabrous, 3–4 mm thick; older ones with rough, gray, corky bark. Leaves glabrous; petioles thick, 2–5 mm long; blades thick, coriaceous, broadly ovate-elliptic, 5–7.5 by 4–5.5 cm, blunt to very bluntly short-acuminate at apex, rounded or subcordate at base, the midrib grooved adaxially, prominent abaxially, the venation prominulous on both sides, the tissue opaque. Flowers solitary or paired at leafless nodes along stems, subsessile; bracts not seen; bracteoles broadly deltate, ca. 2 mm long, ciliolate at apex; pedicels glabrous, 1–3 mm long; petals, stamens, and style not seen; hypanthium black when dried; fruiting sepals ca. 3.5 mm long, rounded at apex. Fruits broadly ovoid-ellipsoid, 1.3–1.5 by 1–1.2 cm; seeds ca. 9 mm long.

Portland: E slope of John Crow Mts. 2.5 mi SE of Ecclesdown, 2000–3000 ft, *Proctor 5733*, April 4, 1951 (holotype).

This species, known only from the unicate type specimen, seems related to a group of species (*Eugenia lamprophylla* Urban, *E. marchiana* Griseb., and *E. amplifolia* Urban) characterized by leaves 9–30 cm long and flowers clustered at leafless nodes of older stems. It differs from all of them in its much smaller leaves, its mostly solitary or paired flowers, its much shorter pedicels, and its shorter sepals.

***Eugenia hanoverensis* Proctor, sp. nov.**

MAP 30.

Arbor *Eugenia jamaicense* affine, sed in ramulo glabro, foliis angustioribus et longioribus, inflorescentiis pubescentia brunneola praeditis, et sepalis longioribus, differt.

Tree 10 m tall; youngest branchlets somewhat compressed, glabrous. Petioles 5–8 mm long, appressed-puberulous; leaf blades chartaceous, glabrous or nearly so, lanceolate, 6–10.5 by 1.5–2.3 cm, sharply acuminate-attenuate at apex, cuncate at base; midrib narrowly grooved its entire length adaxially, prominent abaxially, the veins slightly prominulous beneath only, the tissue dark green adaxially, paler abaxially, with scattered minute pellucid dots.

Flowers white, fragrant, in densely brown-puberulous axillary racemes; rhachis up to 1.5 cm long (often less); bracts deltate, ca. 1 mm long, puberulous; bracteoles similar but smaller; pedicels puberulous, 5–7 mm long; sepals puberulous, broadly rounded, 1.5–1.8 mm long; petals ca. 6 mm long, ciliate at apex; filaments and style white, slightly exceeding petals. Fruits not seen.

Hanover: 0.7 mi due W of Hillsbrook, 700–800 ft, *Proctor 26665*, Aug. 29, 1965 (holotype).

This species is near to *Eugenia jamaicensis* O. Berg but differs in its glabrous branchlets, narrower and longer leaves, light brown instead of white pubescence on the inflorescence, and slightly longer sepals. Comparison of the fruits has not been possible.

Eugenia kellyana Proctor, sp. nov.

MAP 30.

Arbor tenui *Eugenia virgultosa* affine, sed in foliis tenuioribus, indumento breviori non strigoso, pedicellis longioribus, sepalis apicibus rotundato-apiculatis (haud acuminatis) et filamentis longioribus, differt.

Slender tree 10 m tall; youngest branchlets compressed and shallowly bisulcate, densely puberulous. Petioles puberulous, 2–3 mm long; leaf blades thinly chartaceous, finely appressed-pubescent adaxially, glabrate abaxially except along midrib, lanceolate to ovate, 1.8–6 by 1–2.3 cm, sharply acuminate at apex, cuneate at base, the midrib narrowly grooved adaxially, prominent abaxially, the veins scarcely evident adaxially, finely prominulous abaxially. Flowers white, in puberulous axillary racemes; rhachis 4–8 mm long; bracts deltate, sharply acute, 0.8 mm long; bracteoles similar but smaller; pedicels filiform, puberulous, 5–8 mm long; sepals minutely puberulous, rounded-apiculate, 1.5–2 mm long; petals ca. 4 mm long, ciliate; stamens and style white, glabrous, ca. 6 mm long. Fruits not seen.

Portland: John Crow Mts. ca. 6 mi by road S of Sherwood Forest, 1200–1500 ft, *Proctor 37189*, Aug. 18, 1977 (holotype).

With its pointed sepals, this plant seems to key out to *Eugenia virgultosa* (Sw.) DC., from which it differs in its thinner leaves, shorter and nonstrigose pubescence, longer pedicels, rounded-apiculate (vs. acuminate) sepals, and longer filaments. *Eugenia kellyana* is named for Dr. Daniel Kelly, in recognition of his ecological studies at the locality where this tree was found.

Eugenia laurae Proctor, sp. nov.

MAP 30.

Frutex vel arbor tenui ad 5 m alta, *Eugenia alexandri* affine, sed in indumento strigilloso, foliis parvioribus aliter formati, pedicellis sepalisve brevioribus, et filamentis pubescentibus, differt.

Shrub or slender tree to 5 m tall; youngest branchlets somewhat compressed, strigillose-puberulous. Petioles 5–8 mm long; leaf blades rigidly coriaceous, finely and sparsely pubescent adaxially at first, becoming glabrous, broadly lanceolate to broadly ovate, 3–6.5 by 1.5–3.4 cm, bluntly short-acuminate at apex, rounded or broadly cuneate at base, the midrib narrowly grooved adaxially, prominent abaxially, the veins scarcely evident or faintly prominulous on both sides. Flowers in densely strigillose axillary racemes; rhachis up to 1.4 cm long; bracts deltate, 0.5 mm long; bracteoles similar but carinate; pedicels flattened, densely strigillose, 2.5–4(–6) mm long; sepals densely strigillose, rounded and often minutely apiculate, ca. 1.5 mm long; petals white with central pink spot, ca. 2.5 mm long; filaments pubescent, 2–3 mm long, anthers lightly pubescent. Fruits globose or obovoid, ca. 7 mm in diameter, sparsely strigillose.

Trelawny: Miss Laura's Hill, Wilson Valley distr., ca. 1 mi N of Warsop, 2000–2200 ft, *Proctor 24841*, May 17, 1964 (holotype); Island View Hill, ca. 1.5 mi N of Warsop, 2000–2200 ft, *Proctor 21343*, June 26, 1960; Ramgoat Cave distr., ca. 1500 ft, *R. A. Howard & Proctor 14413*, July 4, 1955 (A). **Clarendon:** Peckham Woods, ca. 2500 ft, *Proctor 10223*, May 26, 1955 (GH. II).

This material long remained unidentified or else was tentatively associated with *Eugenia alexandri* Krug & Urban. *Eugenia laurae* can be distinguished from *E. alexandri* by its strigillose pubescence, smaller leaves, shorter pedicels and sepals, and pubescent filaments. The last character is unusual if not unique among the Jamaican species of *Eugenia*.

Eugenia mandevillensis Urban, *Symb. Antill.* 7: 306. 1912.

Eugenia mandevillensis* var. *perratonii (Proctor) Proctor, comb. et stat. nov.

Eugenia perratonii Proctor, *Rhodora* 59: 305. 1958.

This and the following new combination were listed but not formally published in *Flowering Plants of Jamaica* (Adams, 1972). Their validation is long overdue.

Eugenia virgultosa (Sw.) DC. *Prodr.* 3: 280. 1828, in part.

Eugenia virgultosa* var. *jamaicensis (O. Berg) Proctor, comb. nov.

Eugenia modesta DC. *β jamaicensis* O. Berg in Martius, *Fl. Brasil.* 14(1): 314. 1857. (Type from Jamaica, ex *Hooker*, w, not seen.)

Eugenia websteri Proctor, sp. nov.

MAP 30.

Frutex vel arbor tenui e *Eugenia clarendonense* et *E. brownei* in foliis lucidis grandioribus crassioribusve apicibus rotundatis, pedicellis multo bre-

voribus vel obsoletis, et floribus grandioribus saepe solitariis ad nodos defoliatos instructis, differt.

Glabrous shrub or slender tree to 6 m tall; youngest branchlets longitudinally striate. Petioles 1–3 mm long; leaf blades lustrous, rigidly coriaceous, elliptic or broadly oblong to broadly obovate or rotund, 3–6(–7) by 1.5–4(–5) cm, usually broadly rounded at apex and sometimes slightly emarginate, broadly cuneate or rounded at base, the midrib channeled adaxially in lower half, prominent abaxially, the veins prominulous on both sides, the tissue opaque. Flowers solitary and sessile or in small umbellate clusters on older leafless or leafy stems; bracts dark brown, deltate, 0.5 mm long; bracteoles rotund, apiculate, minutely ciliolate, ca. 1.5 mm long; pedicels 0–6 mm long; sepals (on fruits) broadly rounded, 3–4 mm long; petals, filaments, and style not seen. Ripe fruits crimson, with juicy, astringent but edible flesh, irregularly globose, ca. 1 cm or more in diameter; seeds 7 mm in diameter.

St. Catherine: 3.6 mi N of Worthy Park, ca. 1500 ft, *G. L. Webster 13644*, July 4, 1965 (holotype); Forest Reserve area E of Crofts Mt., 1650–1850 ft, *Proctor 22737*, Sept. 6, 1962. **Clarendon:** Peckham Woods, ca. 2500 ft, *Proctor 10224*, May 26, 1955. **Trelawny:** 5.3 mi by road N of Quick Step, ca. 1250 ft, *Proctor 36332*, July 14, 1976; Burnt Hill, 1800–1900 ft, *Proctor 26690*, Sept. 3, 1965. **St. Ann:** Douglas Castle distr., 2100–2300 ft, *Proctor 28451*, Aug. 25, 1967.

This very distinctive species keys out to the group represented in Jamaica by *Eugenia clarendonensis* Urban and *E. brownei* Urban and characterized by flowers borne in sessile umbels. It differs markedly from these, however, in its larger, thicker, more lustrous leaves rounded at the apex, in the much shorter or obsolete pedicels, and in the apparently larger flowers often solitary at leafless nodes. It is named for Dr. Grady L. Webster, collector of the holotype, in recognition of his contributions to Jamaican botany.

Mitranthes Berg

The presence of this genus in Jamaica has been known since the studies of McVaugh (1968) and was reported in Adams (1972). Until now, however, the species have not been worked out or—in the case of published taxa—transferred to *Mitranthes* from *Calypranthes*. The group is still imperfectly known, but it seems advisable at this time to present a preliminary treatment on which further studies can be based. According to McVaugh, *Mitranthes* is similar to *Calypranthes* in its inflorescence and calyx but differs in having a multilocular, multiovulate ovary and a myrcioid type of embryo. The type species is *M. ottonis* Berg of Cuba. So far as can now be determined, there are at least five Jamaican species belonging to *Mitranthes*. All of these differ from the Cuban type species in having sessile, cordate or subcordate leaves. They can be distinguished from each other as follows:

- A. Youngest branchlets compressed, more or less keeled or narrowly winged distally.
 B. Leaves less than 2.5 cm long; inflorescence 3-branched, with a total of up to 12 flowers in 3 capitate clusters. *M. maxonii*.
 B. Leaves 4–7 cm long; inflorescence unbranched, flowers solitary or sometimes in single capitate cluster of 3. *M. nivea*.
 A. Youngest branchlets terete, grooved, or quadrangular, not compressed or keeled.
 C. Leaves glabrous on both sides. *M. glabra*.
 C. Leaves tomentellous abaxially, at least when young.
 D. Leaves 2.5–5 cm long. *M. clarendonensis*.
 D. Leaves 6–10 cm long. *M. macrophylla*.

Mitranthes maxonii (Britton & Urban) Proctor, comb. nov. MAP 31.

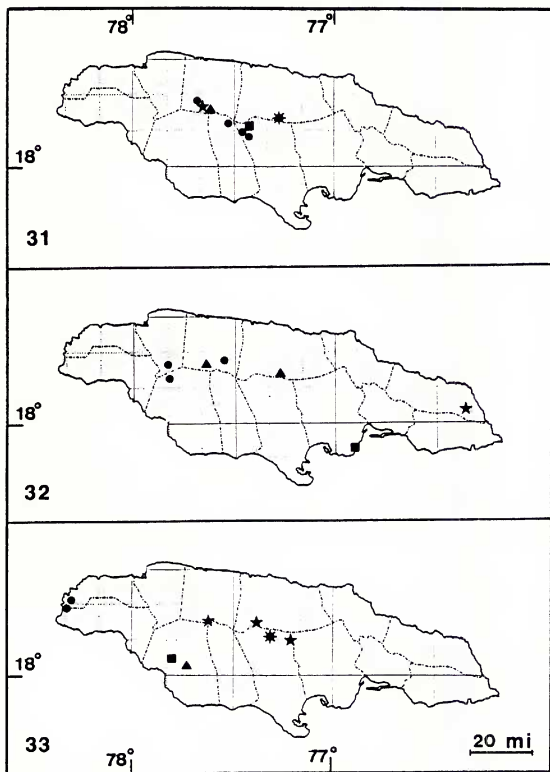
Calyptranthes maxonii Britton & Urban in Urban, Symb. Antill. 7: 296. 1912.
 TYPE: Jamaica, parish of Trelawny, near Troy, *Maxon* 2896. Because the holotype at Berlin was presumably destroyed in the second World War, a duplicate at NY or US should be selected as lectotype.

Mitranthes nivea Proctor, sp. nov. MAP 31.

Arbor parva ramulis juvenibus glabris complanatis bicarinatis 2–3 mm in diametro, a *Mitranthes maxonii* in foliis multo grandioribus et inflorescentiis haud ramosis, floribus solitariis vel 3 simul in fasciculis sessilibus dispositis, differt.

Small tree to 8 m tall; youngest branchlets somewhat compressed and keeled or narrowly winged distally, glabrous, cinereous, 2–3 mm in diameter. Leaves sessile, glabrous, oblong-ovate or broadly oblong-elliptic, 4–7 by 3–5 cm, rounded at apex, subcordate at semiclasping base, the midrib channeled adaxially, prominent abaxially, enlarged at base, the secondary venation evident and prominulous on adaxial side, less so abaxially. Inflorescences terminal or subterminal, 1 or often 2 per axil; peduncles simple, mostly 5–10 cm long, angulate, minutely appressed-puberulous with dibrachiate hairs. Buds oblong-obovoid, 12–15 mm long, 5–7 mm thick above middle, acute to abruptly acuminate (acumen 1–3 mm long), minutely sericeous with dibrachiate hairs. Flowers white; hypanthium projecting beyond top of ovary; calyx splitting irregularly into several unequal lobes, the largest calyptrate, the others concave, 5–11 mm long, all deciduous; petals absent; stamens very numerous, 6–12 mm long, slightly exceeded by slender style. Fruits black, globose, 10–12 mm in diameter, crowned with irregularly split free portion of hypanthium; seeds several, light brown, smooth, ca. 5 mm in diameter.

St. Ann: Mason River distr., ca. 3 mi due NW of Kellits P.O., ca. 2300 ft, *Proctor* 26480, June 30, 1965 (flowers) (holotype), *Proctor* 15973, Dec. 21–22, 1956 (sterile), *Proctor* 26471, June 22, 1965 (buds), *Proctor* 26659, Aug. 19, 1965 (young fruits); Douglas Castle distr., 2200–2400 ft, *Proctor* 26546, July 15, 1965 (flowers), *Proctor* 26726, Dec. 13, 1965 (fruits); James Webster Patent, along road #144 between Mason River and Stepney, ca. 2100 ft, *Proctor* 32860, March 31, 1972 (fruits).



MAPS 31-33. Distributions: 31, *Mitranthes clarendonensis* (square), *M. glabra* (dots), *M. glabra* and *M. nivea* together (asterisk), *M. macrophylla* (star), *M. maxonii* (triangle); 32, *Myrcia calcicola* (star), *Pimenta obscura* (dots), *P. richardii* (triangles), *Psidium longipes* var. *orbiculare* (square); 33, *Ludwigia alata* (dots), *L. inclinata* (square), *Myriophyllum pinnatum* (triangle), *Anagallis pumila* (asterisk), *Mastichodendron floribundum* (stars).

The specific name of this species alludes to its likeness, when in full bloom, to a snowdrift. This is the species discussed by McVaugh (1968); it was described as "sp. A" under *Calyptanthes* in Adams (1972).

Mitranthes glabra Proctor, sp. nov.

MAP 31.

Arbor parva ramulis juvenibus glabris teretibus 1–1.3 mm in diametro, a *Mitranthes clarendonensis* in foliis parvioribus glabris basi rotundatis (haud cordatis et amplectentibus), pedunculis glabris, et fructibus glabris leviter grandioribus, differt.

Glabrous tree to 10 m tall, or sometimes shrub; youngest branchlets terete or slightly grooved, 1–1.3 mm in diameter. Leaves sessile, obovate to broadly elliptic or rotund, 2–3.5 by 1.3–2.8 cm, blunt to shortly subacuminate at apex, rounded to subcordate at base, the midrib channeled toward base adaxially, prominent abaxially, enlarged at base, the secondary venation faintly prominulous on both sides. Inflorescences solitary, arising from either ultimate or penultimate leaf axils; peduncles glabrous, 2.5–5 cm long, simple or shortly 3-branched at apex, the flowers solitary, in capitate cluster of 3, or apparently solitary at apex of peduncle branches. Flowers not seen; hypanthium in fruit slightly projecting beyond ovary, entire, with flaring apex; ovules 3 to 12. Fruits black at maturity, asymmetric and very unequal in size, 10–17 mm in diameter, 3- to 12-seeded.

St. Ann: Douglas Castle distr., 2100–2300 ft, *Proctor 26833*, Jan. 22, 1966 (holotype, u; isotype, GH). **Clarendon:** Glenwood Springs, along road between Balcarres and Sunbury, 3000–3100 ft, *Proctor 35657*, March 31, 1976; Knox Woodland, ca. 1.3 mi due SE of Spaldings P.O., 2800–3000 ft, *Proctor 37424*, Nov. 19, 1977. **Manchester:** 1 mi SE of Pike, ca. 3000 ft, *Proctor 18306*, Oct. 25, 1958. **Trelawny:** 5.3 mi by road N of Quick Step P.A., 1250–1500 ft, *Proctor 35327*, Sept. 26, 1975.

Of the Jamaican species of *Mitranthes*, *M. glabra* evidently has the widest distribution.

Mitranthes clarendonensis (Proctor) Proctor, comb. nov.

MAP 31.

Calyptanthes clarendonensis Proctor, *Rhodora* **60**: 323. 1958. TYPE: Jamaica, parish of Clarendon, Peckham Woods, *Proctor 11399*.

Mitranthes macrophylla Proctor, sp. nov.

MAP 31.

Frutex vel arbor parva ramulis juvenibus tomentosus, subteretibus vel sulcatis 1.8–2.5 mm in diametro, a *Mitranthes clarendonensis* in foliis multo grandioribus, floribus grandioribus, et fructibus seminibusque parvioribus, differt.

Shrub or slender tree to 7 m tall; youngest branchlets nearly terete to deeply grooved, 1.8–2.5 mm in diameter, deciduously tomentose with pale brown,

crispate hairs. Leaves sessile, deciduously brownish tomentellous abaxially, oblong-ovate to very broadly ovate, 6–10 by 4–8 cm, blunt at apex, cordate-clasping at base, the midrib broadly channeled toward base adaxially, prominent abaxially, enlarged at base, the secondary venation prominulous on both sides. Inflorescences paired in penultimate leaf axils; peduncles tomentose, simple, the flowers sessile in cluster of 3 at apex. Buds tomentose, acuminate, 6–7 mm long. Flowers white; filaments 3–4 mm long; ovary 4-locular. Fruits globose, tomentellous, 8–10 mm in diameter, usually 4-seeded; seeds light brown, smooth, 4–6 mm in diameter.

Trelawny: near Crown Lands road extension 4.5–5 mi NW of Troy, ca. 2000 ft, *Proctor 34573*, Jan. 4, 1975 (flowers and fruits) (holotype), *Proctor 34140*, Aug. 20, 1974 (sterile).

This is the largest-leaved species of *Mitranthes* so far discovered.

Myrcia DC. ex Guillemain

Myrcia calcicola Proctor, sp. nov.

MAP 32.

Frutex glaber foliis ovatis 4.5–8 cm longis et 2–4.5 cm latis rigidis coriaceis apicibus acuminatis, calyce 4-lobato lobis deltatis acutis, baccis globosis 4–5 mm in diametro.

Glabrous shrub 2 m tall; youngest branchlets terete. Petioles 2–4 mm long; leaf blades stiffly coriaceous, opaque, ovate to broadly ovate, 4.5–8(–9) by 2–4.5 cm, acuminate at apex, broadly cuneate at base, the midrib shallowly channeled adaxially, prominent abaxially, the venation closely reticulate-prominulous on both sides. Panicles terminal or arising from penultimate leaf axils, many flowered, 5–8 cm long, basal stalk 3–5 cm long, ultimate branches mostly ending in 3-flowered dichasia. Flowers not seen; fruiting hypanthium produced beyond ovary; fruiting calyx 4-lobed, the lobes deltate, acute, ca. 1 mm long. Berries globose, 4–5 mm in diameter.

Portland: E slope of John Crow Mts. 1.5–2.5 mi SW of Ecclesdown, 1500–2500 ft, *Proctor 23871*, July 27, 1963 (holotype, Δ).

This species was listed in Adams (1972) as “sp. A.” Although it has not yet been found again, it should be provided with a specific epithet. Its glabrous, stiffly coriaceous, ovate-acuminate leaves, four-lobed calyx, and small berries are distinctive among the Jamaican and other West Indian species.

Pimenta Lindley

Pimenta obscura Proctor, sp. nov.

MAP 32.

Frutex vel arbor aromatica ad 10 m alta a *Pimenta dioica* in foliis obovatis vel rotundatis, compositione olei essentialis, paniculis parvioribus, lobis calycium brevioribus acutioribusve, stylis pubescentibus, et fructibus cylindraceis vel ovoideis costatis vel angulatis, differt.

Aromatic shrub or tree to 10 m tall; youngest branchlets slightly compressed, glabrous or sometimes puberulous, or at least terminal leaf buds strigillose-puberulous. Petioles 5–10 mm long; leaf blades obovate to rotund, 2.5–9 by 1.5–5(–9) cm, obtuse or rounded at apex, cuneate at base, glabrous or sometimes minutely and deciduously appressed-puberulous beneath, the midrib channeled adaxially, prominent abaxially, the lateral nerves prominulous especially abaxially. Inflorescences glabrous to puberulous, few-flowered, axillary panicles usually shorter than leaves; stalk 1–3(–4) cm long; bracts puberulous, narrowly deltate, 0.2–0.3 mm long, soon deciduous; bracteoles similar, to 0.7 mm long. Flowers sessile, solitary or 2 or 3 together on short panicle branches; hypanthium glabrous or puberulous, densely glandular-verrucose, narrowly angular-obconic, 1–1.2 mm long, abruptly expanded at apex into 4 (rarely 5) thick calyx lobes, these dark brown, deltate, acute, 0.6–1 mm long; petals white, somewhat longer than calyx lobes; filaments ca. 1 mm long, glabrous; style ca. 1.5 mm long, pubescent toward base. Fruits cylindrical to ellipsoid or ovoid, 8–10 mm long, up to 7 mm thick, ribbed or angulate, densely verrucose-glandular; ripe seeds not seen.

St. James: White Rock Hill, 1 mi S of Sweet Water, ca. 2100 ft, *Proctor 34507*, Dec. 22, 1974 (holotype), *Proctor 23170*, Jan. 27, 1963, *Proctor 34463*, Dec. 13, 1974, *Proctor 34507-a*, Dec. 22, 1974 (form with especially large, rotund leaves). **St. Elizabeth:** along road between Mulgrave and Elderslie, 1600–1700 ft, *Proctor 20841*, May 13, 1960. **Trelawny:** Burnt Hill, ca. 1800 ft, *Proctor 22536-b*, July 29, 1962, *Proctor 26692*, Sept. 3, 1965.

Pimenta richardii Proctor, sp. nov.

MAP 32.

Arbor ad 15 m alta, a *Pimenta dioica* in compositione olei essentialis et floribus in glomerulis densis puberulis in ramulis panicularum terminalium insertis, differt.

Tree to 15 m tall; youngest branchlets 2.5–3 mm thick, at first dark brown, bisulcate on each side below leaf nodes, becoming terete and somewhat cinereous with age, glabrous but minutely roughened or scurfy, terminal bud densely but very minutely strigillose-puberulous. Petioles 5–11 mm long, dark brown, very minutely stellate-puberulous on one side; leaf blades rigidly coriaceous and often broadly revolute, oblong, oblong-elliptic, or oblong-obovate, 4.5–11 by 2–4.5 cm, obtuse at apex, cuneate or broadly cuneate at base, the midrib narrowly grooved adaxially, prominent and dark brown abaxially, the surface smooth adaxially, the venation prominulous abaxially. Inflorescences terminal, densely but deciduously puberulous, glomerate panicles, the very short panicle branches terminating in dense secondary heads

of tightly packed flowers; main peduncles up to 2.5 cm long; bracts and bracteoles not observed. Flowers sessile, in heads 0.8–1.3 cm in diameter, ca. 30 or more per head; hypanthium densely puberulous, broadly obconical, ca. 1 mm long, slightly wider than long at apex; sepals 4, ovate, densely puberulous on both sides, ca. 1 mm long; petals obovate, ca. 2 mm long, puberulous on inner face; filaments glabrous, ca. 2 mm long; style glabrous except at base, ca. 2.5 mm long, terminated by thickened stigma. Fruiting panicles glabrate; fruits globose, puberulous and minutely glandular-verrucose, 6–7 mm in diameter, with somewhat lemonlike aroma when crushed; ripe seeds not seen.

Trelawny: near Crown Lands road extension 4.5–5 mi NW of Troy, ca. 2000 ft, *Proctor 34170*, Sept. 7, 1974 (fruits) (holotype). **St. Ann:** Douglas Castle distr., 2200–2400 ft, *Proctor 35686*, April 9, 1976 (flower buds), *Proctor 36252*, May 21, 1976 (flowers), *Proctor 36275* (with R. F. Thorne), June 11, 1976 (flowers).

The major oil constituents of *Pimenta obscura* and *P. richardii* are caryophyllene and limonene, respectively, as contrasted with methyl eugenol for *P. dioica*. I am indebted to Dr. Shirley Thomas, formerly with the Chemistry Department, University of the West Indies, Mona, Jamaica, for analyzing the oils of these plants. *Pimenta richardii* is named for Dr. Richard A. Howard; the type material was collected with the aid of his namesake, Richard A. Proctor.

Psidium L.

Psidium longipes (O. Berg) McVaugh, Jour. Arnold Arb. **54**: 312. 1973.

Psidium longipes var. **orbiculare** (O. Berg) McVaugh, Jour. Arnold Arb. **54**: 314. 1973. MAP 32.

New to Jamaica. **St. Catherine:** Hellshire Hills inland from Half Moon Bay, 50–100 ft, *Proctor 38392*, Nov. 16, 1979, *McKenley 2*, Jan 4, 1980.

This entity is very common in the Bahamas and Turks and Caicos Islands and also occurs in Antigua, Barbuda, Anguilla, and St. Barthélemy. Its discovery in Jamaica constitutes a rather surprising range extension.

ONAGRACEAE

Ludwigia L.

Ludwigia alata Ell. Sketch Bot. S. Carolina Georgia **1**: 213. 1821.

MAP 33.

New to Jamaica. **Westmoreland:** inland from milepost 23, ca. 2.7 mi ENE of Negril Village, sea level, *Proctor 37733*, March 22, 1978. **Hanover:** in the Great

Morass, ca. 1.9 mi due SW of Logwood, sea level, *Proctor 37134*, July 19, 1977.

This species is otherwise known from the Coastal Plain of the southeastern United States from Florida to Virginia.

Ludwigia alata is similar only to *L. simpsonii* Chapman among Jamaican species, having alternate leaves and small, sessile flowers with minute or apparently absent petals; it differs in its much larger size, with leaves (at least the lower ones) up to 5 cm or more long, and in its conspicuously winged stems.

Ludwigia inclinata (L. f.) Gómez de la Maza, Anal. Hist. Nat. **23**: 66. 1894. MAP 33.

New to Jamaica. **St. Elizabeth**: Slipe distr., sea level, *Proctor 34212*, Oct. 16, 1974 (det. confirmed by P. Raven), *Proctor 37918*, July 25, 1978.

This species has a chiefly continental range from southern Mexico (Chiapas) to South America; in the West Indies it is otherwise known only from Cuba.

Ludwigia inclinata is an aquatic species with floating stems that often become inflated and spongy; it bears conspicuous yellow flowers. It differs from *L. peploides* (Kunth) Raven, another often floating species, in its quadrangular, obconical capsules (those of *L. peploides* are terete and cylindrical). In addition, the petioles of *L. inclinata* are usually at least as long as the leaf blades, with the relative length much greater than in *L. peploides*. *Ludwigia sedioides* (Humb. & Bonpl.) Hara, another species with floating stems, differs from *L. inclinata* in having all its leaf blades rhombic, floating, and forming a symmetrical rosette on the surface of the water.

HALORHAGIDACEAE

Myriophyllum L.

Myriophyllum pinnatum (Walter) B.S.P. Prelim. Catal. 19. 1888. MAP 33.

Genus and species new to Jamaica. **St. Elizabeth**: upper course of Broad R., ca. 1 mi due W of Burnt Savanna, sea level, *Proctor 36659*, Nov. 28, 1976 (sterile), *Proctor 37925*, July 25, 1978 (fertile).

This species has a wide range in the eastern half of the United States and has also been recorded from Cuba. *Myriophyllum* can be distinguished from *Proserpinaca*, the only other genus of this family known from Jamaica, according to the following key:

- A. All leaves except uppermost (i.e., in inflorescence) divided into capillary segments; calyx 4-lobed, tube 4-grooved; ovary 4-celled. *Myriophyllum*.

- A. Leaves mostly lanceolate with serrate margins; calyx 3-lobed, tube 3-winged; ovary 3-celled. *Proserpinaca*.

PRIMULACEAE

Anagallis L.

Anagallis pumila Sw. Prodr. 40. 1788.

MAP 33.

Until recently, this species, which has a wide general distribution in the tropics, was known in Jamaica only from Swartz's type specimen, collected at an unknown locality during the period 1784–1786. It has now been re-discovered in Jamaica, growing along the base of a steep roadside bank of damp acidic clay, where it was associated with *Drosera capillaris* and other unusual plants.

Clarendon: 1 mi by road W of Rhoden (or Rodon) Hall, ca. 2000 ft, *Proctor 35488*, Nov. 23, 1975.

SAPOTACEAE

Mastichodendron (Engler) Lam

Mastichodendron floribundum (Griseb.) Cronq. *Lloydia* 9: 248. 1946.

FIGURE 5, MAP 33.

This species, well characterized by Cronquist, was placed in the synonymy of *Mastichodendron foetidissimum* (Jacq.) Lam by Adams (1972), without explanation. Late in 1976 I came upon a large mastic tree in moist primary forest near the center of Jamaica. This tree displayed the leaf characters given for *M. floribundum* and grew in a habitat far removed from the rather dry woodland near the seacoast at low elevations characteristic of *M. foetidissimum*. The tree was observed frequently over the following months, and eventually good flowering and fruiting material, together with mature seeds, was obtained. The evidence now available confirms the distinctness of *M. floribundum* and requires it to be removed from the synonymy of *M. foetidissimum*. The two species are distinguished as follows:

- A. Bark gray; leaves broadly elliptic, rounded to somewhat acute at both ends, usually with minute pocket at apex of petiole on adaxial side; flowering period June–July; flowers pale yellow, strongly scented; corolla 3.5–5 mm long, the lobes elliptic-ovate, not or only slightly auriculate at base; filaments shorter than corolla; staminodes nearly as long as filaments, entire or minutely toothed; fruits yellow, ellipsoid, usually more than 2 cm long; seed coat not or scarcely raised around hilum scar. *M. foetidissimum*.
- A. Bark reddish; leaves elliptic or ovate-elliptic, acuminate at apex, without minute pocket at apex of petiole; flowering period March–May; flowers pale green, un-

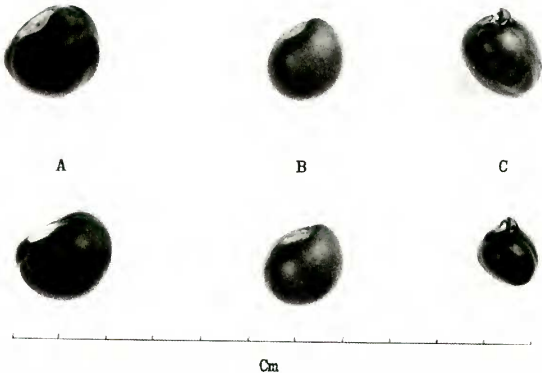


FIGURE 5. Seeds of *Mastichodendron*: A, *M. foetidissimum* from Jamaica; B, *M. foetidissimum* from Florida; C, *M. floribundum*.

scented; corolla ca. 5.5 mm long, the lobes nearly orbicular, conspicuously auriculate at base; filaments equal to or longer than corolla; staminodes much shorter than filaments, 2- or 3-lobed at apex; fruits light green or yellowish green, globose to broadly ellipsoid, 1.5–2 cm long; seed coat raised in conspicuous protuberance on one side of hilum scar. *M. floribundum*.

The relative thickness of the seed coat, a character used by Cronquist to distinguish these two species, does not hold with mature seeds and is not necessary for separating them. Specimens seen of *Mastichodendron floribundum* indicate that it has a distinctive range in the interior of Jamaica.

Trelawny: near Troy, 2000 ft, *J. R. Perkins 1424*, March 23, 1917 (GH). **St. Ann:** Cedar Valley distr., ca. 1.5 mi NE of Cave Valley Square, ca. 2000 ft, *Proctor 36706*, Dec. 18, 1976, *Proctor 36757*, April 8, 1977, *Proctor 36811*, May 4, 1977, *Proctor 36850*, May 13, 1977, *Proctor 37940*, Aug. 18, 1978. **Clarendon:** Crofts Mt., 2500 ft, *Harris 11217*, Sept. 30, 1912 (GH).

OLEACEAE

Forestiera Poiret

Forestiera rhamnifolia Griseb. Catal. Pl. Cubens. 169. 1866.

Forestiera rhamnifolia var. **pilosa** Stearn, Jour. Arnold Arb. 52: 615. 1971. MAP 34.

The recent segregation of two varieties of *Forestiera rhamnifolia* by William T. Stearn associated the Jamaican population of this species with one specimen from Cuba as var. *pilosa*. The glabrous variant of this species (var. *rhamnifolia*) was credited with a wide range throughout the Antilles but was believed to be absent from Jamaica. Recent collections have shown that the situation in Jamaica is more complex. Var. *pilosa* is mostly confined to lower slopes of the Blue Mountains region in the eastern part of the island, but two disjunct records are known. *Forestiera rhamnifolia* var. *rhamnifolia* is now known to occur in the central part of the island, at a higher elevation than any collection of var. *pilosa*.

St. Catherine: 3 mi NW of Old Harbour, 400–500 ft, *Proctor 38316*, Oct. 3, 1979 (fruits). **St. Elizabeth:** Santa Cruz Mts., *Purdie s.n.*, 1842 (κ, as reported by Stearn).

Forestiera rhamnifolia var. **rhamnifolia** MAP 34.

New to Jamaica. **Clarendon:** Glenwood Springs, along road between Balcarres and Sunbury, ca. 3100 ft, *Proctor 34183*, Sept. 27, 1974.

GENTIANACEAE

Fagraea Thunb.

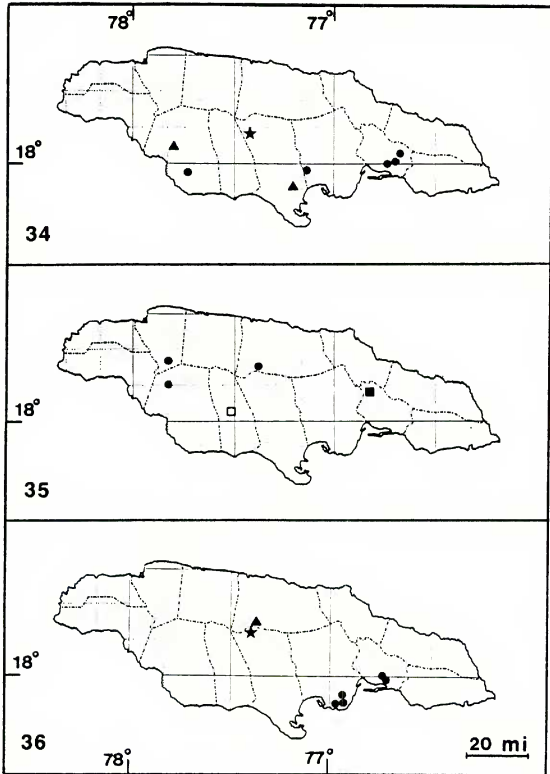
This genus, which was placed by Adams (1972) in the Loganiaceae, has been removed from that family by Fosberg and Sachet (1980) and placed in the Gentianaceae.

Schultesia Martius

Schultesia guianensis (Aublet) Malme, Ark. Bot. 3(12): 9. 1904. MAP 34.

Clarendon: Harris Savanna, ca. 350 ft, *Proctor & Adams 34341*, Nov. 26, 1974. **St. Elizabeth:** Slipe distr., sea level, *Proctor 35445*, Nov. 8, 1975.

Only once previously recorded from Jamaica (*Macfadyen s.n.*, as cited by Adams, 1972), this rare species has now been rediscovered at two rather widely separated localities. The second specimen was found in a grassy, savannalike pasture, where it was associated with a number of other rare or unusual species including *Angelonia angustifolia*, *Cheilophyllum jamaicense*, *Curculigo scorzonifolia*, *Pectis linearis*, *Polygala leptocaulis*, *Reynaudia filiformis*, *Sachsia polycephala*, and *Scleria setuloso-ciliata*. A small pond in the same pasture, when full of water, contains the rare *Sagittaria guay-*



MAPS 34–36. Distributions: 34, *Forestiera rhamnifolia* var. *pilosa* (dots), *F. rhamnifolia* var. *rhamnifolia* (star), *Schultesia guianensis* (triangles); 35, *Forsteronia domatiella* (dots), *F. wilsonii* (solid square), report of *F. wilsonii* (which may be *F. domatiella*) (hollow square); 36, *Jacaima costata* var. *costata* (dots), *J. costata* var. *goodfriendii* (triangle), *J. parvifolia* (star).

anensis; when nearly dried out during the dry season it is the only known Jamaican locality of *Heliotropium lagoense*. Most of the above-listed plants are discussed elsewhere in the present paper.

APOCYNACEAE

Forsteronia G. F. W. Meyer

Forsteronia wilsonii (Griseb.) Woodson, Ann. Missouri Bot. Gard. **22**: 174. 1935. MAP 35.

One of two previously known Jamaican species of *Forsteronia*, *F. wilsonii* is recorded from but a single modern collection, and the fruits have never been collected. The lectotype is an unlocalized specimen gathered by Nathaniel Wilson in the mid-nineteenth century (κ). Wilson's specimens were collected in the eastern third of the island, first during his tour of duty (beginning in 1846) as Superintendent of the Bath Botanic Garden in St. Thomas, and later during the establishment of the botanic garden at Castleton, St. Mary, which was officially opened in 1862. In supervising the development of the latter site, he must have visited the valley of the Wag Water River on many occasions, traveling over the Stony Hill watershed from Kingston to Castleton. It was in this locality that I found *F. wilsonii* in 1962 (Proctor 22624), and perhaps this was also where Wilson found it. Unfortunately, the population from which I collected specimens has been obliterated by road reconstruction.

When Grisebach first described this species (1862), he also cited a Purdie specimen from Manchester, which I have not seen. I suspect that this may belong to the smaller-leaved species of this affinity that has been discovered in several localities in mid-western Jamaica, growing in a very different type of habitat from the steep, noncalcareous hillsides of *Forsteronia wilsonii*.

Forsteronia domatiella Proctor, sp. nov.

MAP 35.

Frutex scandens *Forsteronia wilsonii* affine, sed in ramulis 1–1.5 (versus 2–2.5) mm in diametro, foliis parvioribus glandibus conicis nigris 2 ad 5 ad basem costae adaxialis instructis et pagina abaxiali domatiis parvioribus pubescentibus in axillis nervorum instructis, inflorescentiis 1.2–2.5 (versus 3–7) cm longis, et floribus parvioribus, differt.

High climbing, slender, woody vine with latex; youngest stems subquad-rangular, minutely puberulous and glandular; older stems terete and glabrous; ultimate branches 1–1.5 mm in diameter. Petioles puberulous, 1–2 mm long; leaf blades lanceolate to oblong-elliptic, 2–5(–9) by 1–2(–2.5) cm, acuminate to long-acuminate at apex, rounded to subcordate at base, bearing 2 to 5 black, conical glands (mostly paired) toward base of midvein adaxially and very small, more or less hairy domatia in principal nerve axils abaxially.

Inflorescences terminal, dense, puberulous, mostly 1.5–2.5 cm long, branches puberulous and minutely glandular; bracts linear, 3–4.5 mm long, ciliolate. Calyx lobes very narrowly deltate, 2–2.5 mm long, 0.5–0.6 mm wide at base; corolla white, tube ca. 1 mm long, deltate lobes ca. 1.5 mm long. Follicles linear, nearly straight or somewhat curved, 15–18 cm by 4–5 mm; coma pale brown, ca. 2 cm long; seeds not observed.

St. Elizabeth: between mileposts 4 and 5, Redgate to Ipswich road, ca. 500 ft, *Proctor 36763*, April 20, 1977 (flowers) (holotype), *Proctor 36824*, May 5, 1977 (fruit). **St. James:** White Rock Hill, 1 mi S of Sweet Water, ca. 2100 ft, *Proctor 34511*, Dec. 22, 1974 (sterile). Sight record. **St. Ann:** Cedar Valley distr., ca. 1.5 mi NE of Cave Valley Square, ca. 2000 ft, *Proctor*.

All the cited plants were growing on wooded, rocky, limestone hillsides.

ASCLEPIADACEAE

Cynanchum L.

Cynanchum hartii (Schlechter) Proctor, comb. nov.

Metastelma albiflorum Griseb. Fl. Brit. W. Indian Is. 417. 1862.

M. hartii Schlechter in Urban, Symb. Antill. 1: 256. 1899.

Cynanchum albiflorum (Griseb.) Stearn, Phytologia 21: 138. 1971, not Koidz., 1930, or Woodson, 1947.

The epithet *albiflorum*, used by Adams (1972) for this species, is invalid and must be replaced by the next available one.

Jacaima Rendle

Jacaima costata (Urban) Rendle, Jour. Bot. London 74: 340. *fig. 1*. 1936. MAP 36.

This rare species, representing one of Jamaica's few endemic genera, was until quite recently thought to be confined to arid rocky thickets and woodlands near the south coast of the island. It was known from just two areas (Adams, 1972): St. Andrew Parish, Long Mountain (the type locality, overlooking the city of Kingston); and St. Catherine Parish, Hellshire Hills. It was recorded from near sea level to 800 ft altitude. The recent discovery of *Jacaima costata* growing in damp mesophytic forest at a much higher elevation near the center of the island is therefore most unexpected. The population at this locality, although similar to typical plants from near the south coast, nevertheless differs in several minor characteristics. These, together with geographic disjunction, justify segregation at the varietal level. It is named for its discoverer.

Jacaima costata var. *goodfriendii* Proctor, var. nov.

MAP 36.

A var. *costata* in lamina basi cuneata (haud rotundata vel subcordata), bracteis circa 0.5 mm (haud 1 mm) longis, et lobis calycis oblongis 0.5 mm latis (haud ovatis 1 mm latis), differt.

Differs from typical variety in having leaf blades cuneate (vs. rounded to subcordate) at base, inflorescence bracts ca. 0.5 mm (vs. 1 mm) long, and calyx lobes oblong and 0.5 mm wide (vs. ovate and 1 mm wide). (The single, not quite mature fruit found on var. *goodfriendii* is 7.5 cm long—perhaps not significantly larger than the 6.5 cm average for var. *costata*.)

St. Ann: Cedar Valley distr., ca. 1.5 mi NE of Cave Valley Square, ca. 2000 ft, *Goodfriend s.n.* (IJ 65657), May 17, 1977 (flowers) (holotype), *Goodfriend s.n.* (IJ 66697), July, 1977 (fruit).

Jacaima parvifolia Proctor, sp. nov.

MAP 36.

A *Jacaima costata* in foliis parvioribus, inflorescentibus subsessilibus, floribus paucioribus viridibus purpureo-reticulatis, lobis corollae haud reflexis, et folliculis 3-angulatis parvioribus, differt.

Slender, high-climbing vine with copious latex; stems and leaves puberulous throughout. Petioles 0.3 mm in diameter, mostly 1–1.7 cm long; leaf blades membranous-papery, lance-oblong to ovate-oblong, mostly 2.5–5 by 1–2 cm, mucronate at apex, rounded at base. Inflorescences subsessile, puberulous; peduncle ca. 1 mm long. Flowers about 5 in a small cyme; pedicels 2–4 mm long; bracts narrowly deltate-acuminate, 0.7–0.9 mm long; calyx pilosellous in line along back, the lobes lance-oblong, ca. 2 mm long, acute; corolla campanulate, 5–6 mm across when expanded, greenish with reticulum of maroon lines, glabrous on outside, lightly tomentellous within in ring at base of lobes, the lobes broadly deltate, ca. 2.5 mm long, acute, not reflexed; gynostegium ca. 1 mm high; corona of 5 fleshy lobes adherent to flat top of gynostegium; pollinia horizontal. Follicles narrowly oblong-acuminate, 4.5 cm long, prominently 3-angled, angles narrowly winged.

Clarendon: Broom Hall hills, 1.2 mi due SW of Cave Valley Square, 1800–2000 ft, *Proctor 37887*, July 9, 1978 (holotype).

Although a mature flowering and fruiting plant of this species has been found at but a single site, seedlings are not uncommon on wooded hillsides in the general area. For several years the identity of these young plants was a mystery; they were thought perhaps to represent an unknown species of *Cynanchum*. Discovery of the flowers and fruits revealed the much closer affinity with *Jacaima*. *Jacaima parvifolia* differs from *J. costata* (the only other known species of the genus) in having smaller, more delicate leaves; subsessile inflorescences with fewer flowers, these of a different color and with the corolla lobes not reflexed; and smaller, 3-angled (vs. 5-angled) follicles.

CONVOLVULACEAE

Ipomoea* L.**Ipomoea carmesina*** Proctor, sp. nov.

MAP 37.

Frutex scandens *Ipomoea horsfalliae* affine, sed in foliis trifoliatis, floribus parvioribus lobis calycium inaequalibus, et capsulis parvioribus, differt.

High-climbing, glabrous woody vine; bark of older stems longitudinally ridged. Petioles 2–2.5 cm long; leaflets 3, stalked (petiolules 1–4 mm long), obovate, elliptic, or very broadly elliptic, the middle one 5–8.5 by 3–4.5 cm, short-acuminate at apex, cuneate at base. Inflorescences mostly 8- to 25-flowered, terminating stout peduncles 2.5–7.5 cm long arising from leafless nodes of older stems. Calyx lobes broadly rounded, unequal, the longer ca. 6 mm long; corolla crimson, narrowly tubular with rotate lobes, tube 2.5–3 cm long; stamens exserted; style 3–3.5 cm long, stigma 2-lobed. Capsules 9–10 by 7–8 mm, rounded and abruptly long-pointed at apex due to persistent style base. Ripe seeds not seen.

Trelawny: near Crown Lands road extension 4.5–5 mi NW of Troy, ca. 2000 ft, *Proctor 34169*, Sept. 7, 1974 (holotype); 5.3 mi by road N of Quick Step, 1250–1500 ft, *Proctor 35324*, Sept. 26, 1975.

Ipomoea mauritiana Jacq. Collect. 4: 216. 1790.

MAP 37.

New to Jamaica. **Trelawny:** Dry River distr., ca. 1 mi NNE of Linton Spring, 800–900 ft, *Proctor 29322*, Nov. 4, 1968 (det. D. F. Austin).

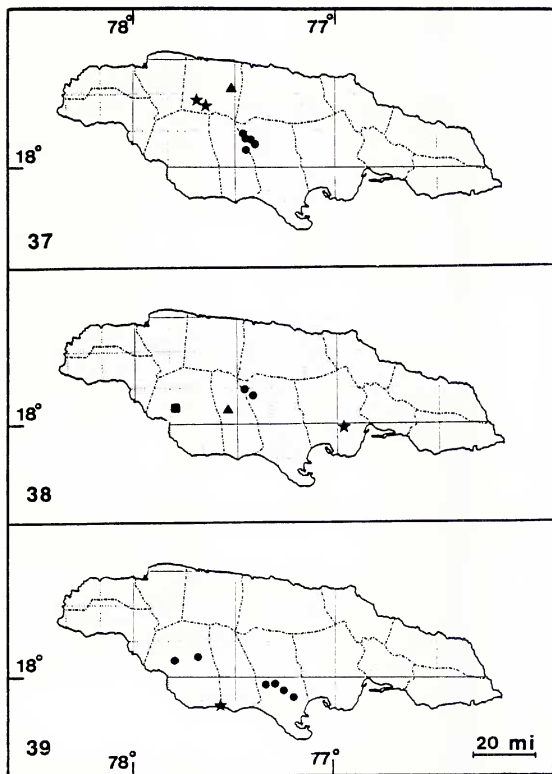
This species was found growing in wet swales and clearings in the bottom of a deep karst valley. It was a "wild trailing or twining herbaceous vine from large underground tuber; corolla light pink with deep pink throat." The leaves are deeply five-lobed, with the lobes oblong or oblanceolate and mostly 4–6 by 1.5–2.5 cm. *Ipomoea mauritiana* is related to *I. batatas* (L.) Lam., the common sweet potato.

Ipomoea saxicola Proctor, sp. nov.

MAP 37.

Frutex scandens foliis trifoliatis, a *Ipomoea ternata* in pubescentia densa, floribus roseis, et capsulis seminibusve parvioribus, differt.

High-climbing subwoody vine, densely pubescent throughout with grayish pluricellular hairs mostly 1–1.5 mm long, each arising from pustulate base; older stems shallowly sulcate, remaining covered with persistent hairs. Leaves very variable in size; petioles 2–10 cm long; leaflets 3, stalked (petiolules 2–10 mm long), the middle one obovate or broadly elliptic, 6–24 by 3–13 cm, shortly and sharply acuminate at apex, cuneate at base. Inflores-



MAPS 37-39. Distributions: 37, *Ipomoea carmesina* (stars), *I. mauritiana* (triangle), *I. saxicola* (dots); 38, *Heliotropium lagoense* (square), *Tournefortia smaragdina* (dots), *Nicotiana alata* (triangle), *N. plumbaginifolia* (star); 39, *Angelonia angustifolia* (star marks location of Alligator Pond Savanna).

cences axillary, 5- to 13-flowered, almost sessile or on peduncles up to 13 cm long. Calyx lobes rounded or blunt, slightly unequal, the outer 2 densely pubescent, 8–10 mm long, the inner 3 slightly longer, glabrous; corolla light pink with deep pink throat, oblong-campanulate, ca. 5 cm wide across expanded lobes, the inflated tube 3.5–4.5 cm long, up to 2 cm thick toward distal end, abruptly contracted just above base; stamens included; style ca. 3 cm long, with linear undivided stigma. Capsules globose, 1.2–1.5 cm in diameter, shortly apiculate; seeds 4–4.5 mm in diameter, densely puberulous, with dense fringe of tawny-silky marginal hairs up to 10 mm long.

Clarendon: Glenwood Springs, along road between Balcarres and Sunbury, ca. 3100 ft, *Proctor 34185*, Sept. 27, 1974 (flowers) (holotype), *Proctor 33630*, Nov. 30, 1973 (fruits); 0.6 mi due S of Sunbury Church, ca. 3000 ft, *Proctor 37864*, June 22, 1978 (flowers); along road between Ritchies and Balcarres, ca. 3000 ft, *Proctor 34379*, Nov. 28, 1974 (fruits); vic. of Quaco Rock, near Ritchies, ca. 3000 ft, *Proctor 33715*, Jan. 4, 1974 (sterile). **Manchester:** 0.5 mi due NNE of Banana Ground P.O., ca. 3100 ft, *Proctor 37601*, Jan. 18, 1978 (fruits).

BORAGINACEAE

Argusia

Argusia Amman ex Boehmer in Ludwig, *Defin. Gen. Pl.* ed. 3. 507. 1760; Dandy, *Reg. Veg.* **51**: 28, 121. 1967.

Messerschmidia L. ex Hebenstreit, *Novi Comment. Acad. Sci. Imp. Petrop.* **8**: 315. 1763; I. M. Johnston, *Jour. Arnold Arb.* **16**: 161. 1935.

Mallotonia (Griseb.) Britton, *Ann. Missouri Bot. Gard.* **2**: 47. 1915.

Many years ago, I. M. Johnston (1935) proposed uniting the common West Indian seaside shrub often known as *Mallotonia gnaphalodes* (L.) Britton with two Old World species with which it shares characters of fruit, indument, and habitat. He placed them in the genus *Messerschmidia*, overlooking valid publication of the earlier name *Argusia*, which was based on the same type species. Britton (1915) had already raised Grisebach's sect. *Mallotonia* (of *Tournefortia*) to the generic level for the West Indian plant alone. More recently, Nowicke and Skvarla (1974) have shown that the pollen reveals no features differentiating this group from many species of *Tournefortia*. Although I have a preference for broad, inclusive genera, in the present case maintaining *Mallotonia* alone (or sinking it along with its postulated Old World congeners back into *Tournefortia*) does a disservice to taxonomy by concealing significant facts about apparent relationships and possible phylogeny. At the same time, neither *Mallotonia* by itself nor *Messerschmidia* is a suitable candidate for conservation, since at most but three species are involved, and all have already received combinations in *Argusia*. The West Indian representative of this taxon should therefore be known as follows:

Argusia gnaphalodes (L.) Heine, *Fl. Nouv. Caléd.* **7**: 108. 1976.

- Heliotropium gnaphalodes* L. Syst. Nat. ed. 10. 2: 913. 1759, Moen. Acad. 5: 394. 1760.
Tournefortia gnaphalodes (L.) R. Br. ex Roemer & Schultes in L. Syst. Veg. 4: 538. 1819.
Mallotonia gnaphalodes (L.) Britton, Ann. Missouri Bot. Gard. 2: 47. 1915.
Messerschmidia gnaphalodes (L.) I. M. Johnston, Jour. Arnold Arb. 16: 165. 1935.

Heliotropium L.

Heliotropium lagoense (Warming) Gürke in Engler & Prantl, Nat. Pflanzenfam. IV. 3a: 97. 1893. MAP 38.

- Heliotropium antillanum* Urban, Symb. Antill. 4: 528. 1910.
H. trinitense Urban, Symb. Antill. 7: 350. 1912.

New to Jamaica. **St. Elizabeth:** Slipe distr., near sea level, *Proctor 33730*, March 3, 1974, *Proctor 35620*, March 13, 1976.

This prostrate, matlike herb grew abundantly in dried mud around the sides of a small pond reduced by seasonal drought. The same species occurs in Cuba, Puerto Rico, Mexico, Guatemala, Panama, Trinidad, and various South American localities. It can be distinguished from other Jamaican members of the genus by the completely prostrate stems and the solitary flowers, these on axillary or supra-axillary peduncles 2–6 mm long. Although plants of this species are said to be "apparently perennial" by Britton and Wilson (1925, p. 136), the Jamaican plants grow as ephemeral annuals at their single known locality, which for most of the year is submerged beneath the waters of a small pond.

Tournefortia L.

Among the Antillean species of this genus is a small group represented by a widespread taxon (*Tournefortia maculata* Jacq.) that also has an extensive continental distribution, and by two others that appear to be locally derived endemics. One of these (*T. laurifolia* Vent.) perhaps occurs only in Puerto Rico, although Urban (1929) reported a single collection (*Abbott 305*) from the Samaná Peninsula in Hispaniola. A somewhat similar population has been discovered in Jamaica; this was initially determined as *T. laurifolia* by E. C. Leonard (about 1953), but this record was overlooked and not mentioned by Adams (1972). A pollen study of this material (under the name *T. laurifolia*) was published by Nowicky and Skvarla (1974). However, in some large herbaria (e.g., the New York Botanical Garden) all specimens of this complex are filed under *T. maculata*, although *T. laurifolia* seems clearly distinct in details of floral and fruit morphology.

In attempting to verify the identity of the Jamaican material, now known from several collections, I noted a number of differences from *Tournefortia laurifolia* as it occurs in Puerto Rico. These, together with a geographic dis-

junction of more than 600 miles, suggest that the Jamaican population should be recognized as a separate species, differing from both *T. maculata* and *T. laurifolia* in leaf shape and many floral details. Unfortunately, the fruits of the Jamaican entity have not yet been seen and therefore cannot be compared. The fruits of *T. laurifolia* are orange and 7–8 mm in diameter; those of *T. maculata* are yellow and 4–5 mm in diameter.

***Tournefortia smaragdina* Proctor, sp. nov.**

MAP 38.

Frutex scandens *Tournefortia laurifolia* affine, sed in foliis angustioribus basibus cuneatis vel anguste acutis, floribus smaragdinis lobis calycibus brevioribus, corolla longiore tubo latiore lobis brevioribus acuminatis (haud attenuato-filiformis), et anthera angustiore apice cum processu gongylodi instructa, differt.

Slender woody vine or vinelike, scrambling, or arching shrub; young stems glabrate to sparsely puberulous except for tuft of yellowish septate hairs in each leaf axil. Petioles 0.6–1.8 cm long; leaf blades membranous, narrowly ovate to elliptic, 5–12.5 by 1.5–5 cm, sharply long-acuminate at apex, cuneate or acuminate at base, entire and sparsely short-ciliate. Inflorescences lax, open, 2- to 4-branched cymes, the branches 2–3 cm long, 5- to 9-flowered, glabrate or sparsely puberulous. Calyx lobes narrowly deltate-acuminate, 1.5 mm long, 0.7–0.8 mm wide at base; corolla deep emerald green, the tube glabrate or sparingly strigillose, 6–7 mm long, inflated at base, 1.2–1.7 mm in diameter near middle, the lobes deltate-acuminate, 1.5–2 mm long, carinate on inner side. Anthers sessile, inserted in corolla tube just below its mouth, lanceolate, 1 mm long, 0.3 mm wide below middle, with

TABLE 1. Comparison of floral details of *Tournefortia laurifolia* and *T. smaragdina*.*

Floral character	<i>T. laurifolia</i>	<i>T. smaragdina</i>
FLOWER COLOR	Greenish yellow, "apricot"	Deep emerald green
CALYX LOBES, LENGTH × WIDTH	2 × 0.8	1.5 × 0.7–0.8
COROLLA TUBE LENGTH	5.5–6.5	6–7
DIAMETER AT NARROWEST POINT	0.7–1.3	1.2–1.7
COROLLA LOBES SHAPE	Attenuate-filiform	Acuminate
LENGTH	4–5	1.5–2
ANTHERS SHAPE	Narrowly deltate, no appendage	Lanceolate, with appendage
WIDTH	0.5 (at base)	0.3 (below middle)

*All measurements are in millimeters.

small, knoblike appendage at apex; stigma minutely hirsutulous. Fruits unknown.

Clarendon: Glenwood Springs, along road between Balcarres & Sunbury, ca. 3100 ft, *Proctor 34863*, March 1, 1975 (holotype), *Proctor 38066*, March 4, 1979; Knox College, Spaldings, 2800 ft, *Proctor 6320* (us), March 5, 1952.

Although this species resembles *Tournefortia laurifolia* in habit and general appearance, the leaves differ in being proportionately narrower and are always cuneate to acuminate at the base. In addition, the flowers differ strikingly in color as well as in various dimensional details. The fruits cannot be compared because those of *T. smaragdina* have not yet been found. TABLE 1 compares the floral details of *T. laurifolia* and *T. smaragdina*.

SOLANACEAE

Nicotiana L.

Nicotiana alata Link & Otto, Ic. Pl. Rar. Horti Regii Berol. **1:** 63. *t.* 32. 1828. MAP 38.

New to Jamaica. **Manchester:** Marshalls Pen, ca. 2.25 mi due NW of Mandeville, ca. 2100 ft, *Proctor 31108*, Nov. 23, 1969.

An escape from cultivation, this was found growing in chinks of an old stone wall by the roadside. The species is indigenous to southern Brazil, Paraguay, Uruguay, and northern Argentina, but there are many cultivated forms elsewhere.

Nicotiana plumbaginifolia Viv. Elenchus Pl. Horti Bot. **26.** *t.* 5. 1802. MAP 38.

Confirmed for Jamaica. **St. Catherine:** Spanish Town, in open waste ground, 50 ft, *Proctor 27600*, Aug. 16, 1966.

Goodspeed (1954), in giving the range of this species, did not include Jamaica. Alain (1957) did so but gave no source for his information. Adams (1972) mentioned the Alain report but said he had seen no specimen.

The range of *Nicotiana plumbaginifolia* outside Jamaica includes southernmost Florida, Cuba, Trinidad, and various continental localities from Mexico to Paraguay and northern Argentina.

SCROPHULARIACEAE

Angelonia Humb. & Bonpl.

Angelonia angustifolia Benth in DC. Prodr. **10:** 254. 1846. MAP 39.

Although Adams (1972, p. 660) stated that this species is "cultivated and

naturalized locally," its widespread if scattered occurrence in Jamaica at remote marshy and savannalike localities suggests that it may be indigenous after all. Wild plants were collected as long ago as 1853 (only seven years after the species was first described) at "Alligator Pond Savanna," parish of Manchester. I have found it at a number of comparable localities. It is true that cultivars of this species are sometimes grown in Jamaica, but since its natural range includes Cuba, Hispaniola, and Mexico, I can perceive no reason for excluding it from the list of indigenous Jamaican plants.

Clarendon: Harris Savanna, ca. 350 ft, *Proctor 34356*, Nov. 26, 1974; Mineral Heights, ca. 1.3 mi due S of May Pen, ca. 250 ft, *Proctor 37234*, Sept. 9, 1977; Denbigh, 100–200 ft, *Proctor 26796*, Jan. 9, 1966; 0.8 mi by road E of Toll Gate, in low, wet swale, ca. 50 ft, *Proctor 37814*, May 5, 1978. **St. Elizabeth:** Horse Savanna, sea level, *Proctor & Mullings 21840*, Dec. 24, 1960; Slipe distr., sea level, *Proctor 27591*, July 31, 1966, *Proctor 33139*, Jan. 27, 1973.

Cheilophyllum Penn.

Cheilophyllum jamaicense Penn. Bull. Torrey Bot. Club **62**: 256. 1935.

Until recently, this diminutive creeping plant was known only from the type collection, gathered at Ashley Hall Savanna, parish of Clarendon, on December 6, 1917. After a lapse of 56 years, it has been found again in two localities exactly the same as for *Schultesia guianensis* (see MAP 34).

St. Elizabeth: Slipe distr., in a savannalike swale, near sea level, *Proctor 33384*, July 1, 1973. **Clarendon:** Harris Savanna (just N of type locality), ca. 350 ft, *Proctor 34401*, Dec. 7, 1974.

BIGNONIACEAE

Tabebuia DC.

Tabebuia rosea (Bertol.) DC. Prodr. **9**: 215. 1845. MAP 40.

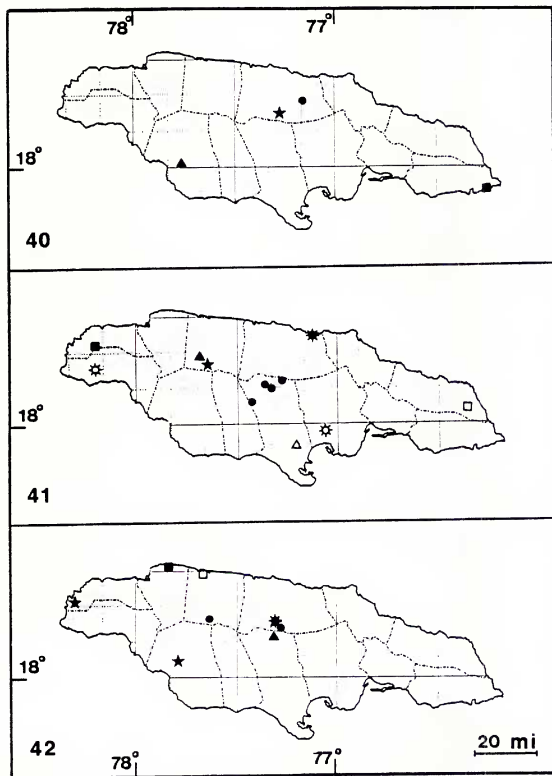
This tree was recorded by Adams (1972) as a cultivated plant only. However, *Tabebuia rosea* has escaped and is becoming naturalized in sandy coastal thickets toward the southeastern end of the island.

St. Thomas: Rocky Point Bay, sea level, *Proctor 36297*, June 15, 1976.

Tabebuia sauallei Britton(?), Bull. Torrey Bot. Club **42**: 377. 1915.
MAP 40.

New to Jamaica. **St. Ann:** Reynolds mine area near Lydford P.O., ca. 1500 ft, *R. A. Howard & Proctor 14209*, June 30, 1955 (A. U).

The cited material was originally identified as *Tabebuia angustata* Britton, from which it differs in its very much smaller leaflets with rounded apices,



MAPS 40-42. Distributions: 40, *Tabebuia rosea* (square), *T. sauvalliei* (dot), *Utricularia purpurea* (triangle), *Justicia mckenleyi* (star); 41, *Antirhea tomentosa* (solid triangle), *Coccocypselum guianense* (dots), *Diodia teres* (hollow triangle), *Exostema orbiculatum* (star), *Hedyotis callitrichoides* (solid asterisk), *Psychotria bryonicola* (hollow square), *P. hanoverensis* (solid square), *Spermacoce tetraquetra* (hollow asterisk); 42, *Egletes prostrata* (hollow square), *E. prostrata* and *Flaveria trinervia* together (solid square), *Pentacalia inornata* (triangle), *P. subdiscolor* (dots), *P. inornata* and *P. subdiscolor* together at type locality of both (asterisk), *Sachsia polycephala* (stars).

and in its shorter calyx and shorter fruits. The flowers have not been seen. The plant is entirely unlike *T. platyantha* (Griseb.) Britton and differs from *T. riparia* (Raf.) Sandwith (which itself is probably not separable from the widespread Antillean *T. heterophylla* (DC.) Britton) in the totally dissimilar shape and venation of its leaflets. Among the numerous Cuban species of this difficult genus, *T. sauuvallei* seems to come closest to matching this collection.

LENTIBULARIACEAE

Utricularia L.

Utricularia purpurea Walter, Fl. Carolin. 64. 1788.

MAP 40.

New to Jamaica. **St. Elizabeth:** upper course of Broad R., sea level, *Proctor* 37920, July 25, 1978.

The species was first discovered by Mr. Andrew Podzorski while he was investigating the diatoms of this area. Podzorski's specimens are deposited in the herbarium of the University of the West Indies, Mona, Jamaica (UCWI).

Utricularia purpurea is easily distinguished from all other Jamaican species of its genus by its light purple or lilac-colored flowers. Its range elsewhere includes eastern North America from Maine to Florida; it also occurs in the Bahamas and Cuba.

ACANTHACEAE

Justicia L.

Justicia mckenleyi Proctor, sp. nov.

FIGURE 6, MAP 40.

Liana sublignosa tenuis, a *Justicia anabasa* in pilis retrorsis (haud antrorsis) in ramulis praeditis, foliis parvioribus, calyce glanduloso, et corolla luteola haud glandulosa, differt.

Slender, high-climbing subwoody vine; stems subangulate, minutely hirsute to substrigillose, the hairs downwardly curved or retrorse, up to 0.2 mm long, septate, the lower parts of the stem glabrate. Petioles 2–3 mm long, densely hirsutulous with upwardly curved hairs; leaf blades ovate, 2–3.5 by 1–2.3 cm, subacute, narrowed at base, of firm papery texture, the margins entire, slightly revolute, the surfaces glabrous or nearly so except for hirsutulous costa on both sides, the hairs antrorsely curved, the lateral veins about 4 pairs, glabrous, the tissue minutely pellucid-punctate, the cystoliths oblong, obscure. Inflorescences short, axillary and terminal, few-flowered racemes (2 to 4 pairs of flowers), these scattered at intervals along ultimate stem branches, mostly less than 3 cm long; peduncles 3–15 mm long, 0.5–1

mm thick, hirsutulous like stems; rhachis internodes 2–5 mm long, densely puberulous with straight hairs; flowers sessile at tips of pedicellike branches, these 1–4 mm long, puberulous like rhachis, bearing apical pair of deltate-linear, sparingly hirtellous bracts 2 by 0.5 mm at thickened base; bracts subtending flower-bearing branches obovate, 2–4 mm long, lowermost ones leaflike. Calyx ca. 5 mm long, 5-parted, the segments equal, narrowly deltate, ca. 4 mm long, 0.9–1.2 mm wide at base, puberulous and densely capitate-glandular. Corolla 3–3.2 cm long, light yellow, densely puberulous, with hairs 0.1 mm long or less, not glandular; tube 3 mm broad above subsaccate base, widening to 5–6 mm at mouth; lips subequal, ca. 2 cm long, the upper nearly straight and somewhat hooded, ca. 6 mm broad near base, gradually narrowed to 2-lobed tip, the lower lip broadly recurved, ca. 4 mm wide at base, 3-lobed, with lobes oblong, ca. 10 by 1.5–2 mm. Stamens 2, exerted, reaching to within 2 mm of tip of upper lip and partially enfolded by it; filaments puberulous; anther cells straight, 3 by 0.6 mm, glabrous, superposed and attached vertically to connective, lower cell calcarate. Style about equaling lips of corolla, basal half antrorsely hispidulous; stigma subentire; ovary densely puberulous. Capsules narrowly fusiform, 2–2.2 cm long, sparsely puberulous; retinacula oblong, 1.5 mm long, flattened and subscariosus at tip; seeds 4, dark brown, papillose-roughened.

St. Ann: James Webster Patent, along road no. 144 between Mason River and Stepeny, 2100 ft, *Proctor 38672*, March 24, 1980 (holotype, A).

The plant was a slender, high-climbing vine growing on a wooded, rocky, limestone hillside. From a distance, its flowers resembled those of a *Columnnea* (Gesneriaceae). The species is named for Mr. Clifton G. McKenley, my diligent field assistant (1978–1980), who helped to collect the type material.

From the other Jamaican species of *Justicia*, *J. mckenleyi* is obviously distinct in its climbing habit and its yellow flowers. In fact, very few other congeners anywhere are vines. It differs from the climbing Colombian species *J. anabasa* Leonard in its retrorse (vs. antrorse) hairs on the stems, its smaller, differently shaped leaves, its glandular calyx but nonglandular corolla (just the reverse of *J. anabasa*), its light yellow instead of "burnt orange" corolla, and its densely puberulous ovary. Otherwise, except for minor dimensional differences, the two species show many resemblances. *Justicia mckenleyi* has tetralporate pollen of a typical *Justicia* type, as shown in FIGURE 6.

RUBIACEAE

Antirhea Comm.

Antirhea tomentosa (Sw.) Fawcett, Provis. List Fl. Pl. Jamaica, 19. 1893. MAP 41.

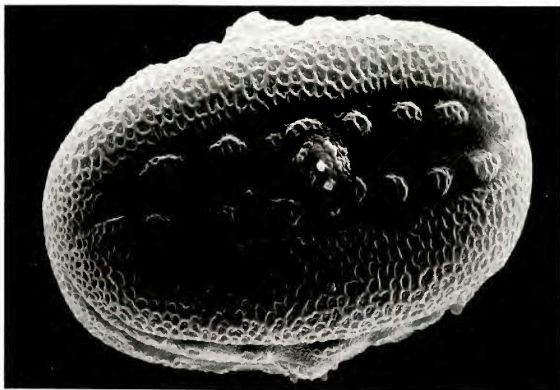


FIGURE 6. *Justicia mckenleyi*, pollen grain, $\times 2000$.

Previously known only from the type, collected by Olof Swartz in 1784–86 at an unknown Jamaican locality, this species has now been rediscovered in the heart of the Cockpit Country. Unfortunately, the area in which it was found is rapidly being cut over and denuded, so the ultimate survival of this and other rare species is in grave jeopardy.

Trelawny: 5.3 mi by road N of Quick Step P.A., 1250–1500 ft, *Proctor 35328*, Sept. 26, 1975.

Coccocypselum P. Browne

Adams (1972) credited this genus with two Jamaican species, *Coccocypselum herbaceum* Aublet and *C. pseudotontanea* Griseb. However, a congeneric population occurring in the central part of Jamaica corresponds to neither of these and in fact represents *C. guianense* (Aublet) Schum., a species not very distinct from *C. herbaceum* but nevertheless separated from it by most authors. The Jamaican species of this genus can be distinguished as follows:

- A. Flower heads sessile or nearly so. *C. herbaceum*.
- A. Flower heads obviously pendunculate.
 - B. Corolla blue or lavender, tube 6 mm or more long; berries 6–10 mm in diameter. *C. guianense*.
 - B. Corolla white, tube 4–5 mm long; berries ca. 4 mm in diameter.
 *C. pseudotontanea*.

Coccocypselum guianense (Aublet) K. Schum. in Martius, Fl. Brasil. 6(6): 315. 1889. MAP 41.

New to Jamaica. **Clarendon:** Mason River Savanna, ca. 2300 ft, *Proctor 15819*, Nov. 22, 1956, *Proctor 26426-b*, May 23, 1965, *Proctor 34321*, Nov. 17, 1974; Fairburn Savanna, 1 mi SW of Corner Shop, 2000 ft, *Proctor 8474*, March 11, 1954; Carters Hall Savanna, near James Hill, ca. 2000 ft, *Proctor & Harkness 9724*, Jan. 6, 1955; Cabbage Hall distr., 0.5–1 mi SE of Cumberland, ca. 2700 ft, *Proctor 33597*, Nov. 10, 1973.

At the first of the above localities, there is a glabrous variant differing also in habit; this can be designated as follows:

Coccocypselum guianense var. **glabratum** Proctor, var. nov.

Plantae decumbentes vel suberectae, aliquantum fragiles, glabrae, sed foliis ciliato-marginatis.

Decumbent to suberect herb of somewhat brittle texture, glabrous throughout or nearly so except for ciliate margins of leaves.

Clarendon: Mason River Savanna, ca. 2300 ft, *Proctor 15818*, Nov. 22, 1956 (holotype), *Proctor 26426-a*, May 23, 1965.

Diodia L.

Diodia teres Walter, Fl. Carolin. 87. 1788.

MAP 41.

This rare species was cited by Adams (1972) only from the parish of St. Andrew. A large population of it was subsequently discovered at a locality that has also yielded many other rare or unknown species.

Clarendon: along road from Free People S toward Harris Savanna, 300–400 ft, *Proctor 34240*, Oct. 31, 1974; Harris Savanna, ca. 350 ft, *Proctor 34317*, Nov. 15, 1974.

Exostema (Pers.) L. C. Rich. ex Humb. & Bonpl.

Exostema orbiculatum Proctor, sp. nov.

MAP 41.

Frutex glaber arcuatis foliis subsessilibus orbiculato-cordatis 2.5–6 cm longis et 2–6 cm latis rigide coriaceis, floribus terminalibus sessilibus solitariis vel 2–3 simul, hypanthio late obconico circa 5 mm longo laciniis circa 3.5 mm longis, corolla alba tubo 10–13 mm longo intus pilis praedito lobis linearis recurvatis 7–9 mm longis, filamentis tenuissimis versus basem tubi corollae insertis 5 mm longis, antheris linearis 4.5 mm longis. Fructus non visus.

Unarmed, glabrous, arching shrub to 3 m tall; branchlets somewhat compressed and grooved, or flattened and 4-angulate. Leaves sessile, rigidly coriaceous, orbicular or rarely very broadly ovate, 2.5–6 by 2–6 cm, obscurely subacuminate at apex, cordate or subcordate at base, the midvein obscurely grooved adaxially and prominent abaxially, the lateral veins 4 to 6 pairs, prominulous on both sides, the margins narrowly revolute; stipules spinescent from flat deltate base, 4–5 mm long. Flowers terminal, sessile, solitary or 2 or 3 together; hypanthium broadly obconical, ca. 5 mm long, teeth ca. 3.5 mm long; corolla white, the tube 10–13 mm long, hairy within, the recurved linear lobes 7–9 by 1–1.5 mm, sparsely hairy toward base on inner side; filaments inserted near base of corolla tube, filiform, ca. 5 mm long, the anthers linear, 4.5 mm long; style linear, terminated by minutely 2-lobed stigma. Fruits not seen.

Trelawny: Crown Lands area ca. 5 mi NW of Troy, 1750–2000 ft, *Proctor 35236*, June 10, 1975 (holotype).

In the absence of ripe fruits and seeds, the generic affinity of this plant cannot be inferred with certainty. It is assigned to *Exostema* of the Cinchoneae on the basis of the terminal flowers, the linear-recurved corolla lobes, and the attachment and structure of the stamens. It is, however, entirely unlike any other known species of this genus.

Hedyotis L.

I consider the species listed by Adams (1972) under the generic name *Oldenlandia* to belong in *Hedyotis*, following the studies of Lewis (1961) and others. The Jamaican species should therefore be known as follows:

Hedyotis corymbosa Lam. Tabl. Encycl. 1: 272. 1791.

Hedyotis lancifolia Schum. Beskr. Guin. Pl. 72. 1827.

Hedyotis pumila L. f. Suppl. Pl. 119. 1781.

Hedyotis uniflora DC. Prodr. 4: 421. 1830.

To these is to be added another, recently discovered in Jamaica:

Hedyotis callitrichoides (Griseb.) W. H. Lewis, *Rhodora* 63: 222. 1961. MAP 41.

New to Jamaica. **St. Ann:** Ocho Rios, near sea level, *Proctor 37709*, March 7, 1978.

The plants were found growing on soil in a shaded grotto of a limestone sea cliff, associated with *Pilea herniarioides* (Sw.) Wedd.

This species is the smallest and most delicate of its genus in the West

Indies, with filiform stems rooting at nodes and minute, ovate-orbicular leaves. The corolla, although very small, is much longer than the calyx lobes; in the other species, the corolla does not exceed the calyx. *Hedyotis callitrichoides* is also known from the Bahamas, Cuba, Hispaniola, Puerto Rico, St. Croix, St. Barthélemy, Guadeloupe, Dominica, and Trinidad.

Palicourea Aublet

The beautiful endemic species *Palicourea pulchra* Griseb. was stated by Adams (1972, p. 730) to be quite variable in the shape of its corolla. He also mentioned a "striking variant" from Trelawny, noting its "triangular lobes to a broader than usual corolla of deep magenta colour, combined with a leaf with purple abaxial surface." In fact, this variant, which remains distinct in at least one locality where it grows with typical *P. pulchra*, has other differentiating features. The most striking of these is the indument of very short, stiff hairs that covers the inflorescence branches, the calyx, and (to a lesser extent) the upper surface of the leaves. Typical *P. pulchra* is entirely glabrous. Further, the inflorescences of the "variant" are more abruptly deflexed-pendent, have longer peduncles, and are more compact; this compactness is especially noticeable when the plant is fruiting. A case could be made for describing this population as a separate species, were it not for the existence of intermediates. Unless these intermediates can be demonstrated to be of hybrid origin, it is better to name the distinctive local population as a variety.

Palicourea pulchra var. **hispidula** Proctor, var. nov.

Frutex a var. *pulchra* in foliis paginis superioribus ramulis inflorescentiarum et calyce indumento hispidulo praeditis, inflorescentiis compactioribus pedunculis longioribus terminantibus, et corollis atro-magenteis vel purpureis (haud roseis) differt.

Shrub; differing from var. *pulchra* in its hispidulous upper leaf-surfaces, inflorescence branches, and calyx; its more compact inflorescences terminating a longer peduncle; and its deep magenta or purple (vs. pink) corollas.

Trelawny: Mango Tree Hill, ca. 1750 ft, *R. W. Read* 1904, May 27, 1967 (holotype, us); Ramgoat Cave, ca. 1500 ft, *R. A. Howard & Proctor* 14389, July 4, 1955, *Proctor* 10612, Aug. 26, 1955; Windsor Castle, 1200 ft, *B. Vuilleumier* 53 (A), Aug. 14, 1963. Specimen intermediate between var. *pulchra* and var. *hispidula*: ca. 1-2 mi NW of Quick Step, ca. 1500 ft, *G. L. Webster* 5269, Aug. 11, 1954.

Both varieties of *Palicourea pulchra* have horticultural potential, but var. *hispidula* is exceptionally beautiful.

Psychotria L.

Psychotria brynicola Proctor, sp. nov.

MAP 41.

Arbor parva glabra *Psychotria clusioides* affine, sed in foliis parvioribus rotundatis venulis 5 ad 7 (versus 11 vel 12) paribus, paniculis corymbosis compactioribus, calyce campanulato lobis rotundatis, et fructibus basibus truncatis, differt.

Small tree, glabrous throughout. Petioles stout, 1–2 cm long; leaf blades stiffly leathery, elliptic to rotund, 5–9 by 3–6.5 cm, broadly rounded at apex, abruptly cuneate at base, the margins revolute, the midrib channeled adaxially, prominent toward base abaxially, the lateral veins ca. 5 to 7 pairs, prominulous adaxially, obscure abaxially. Stipules not seen. Panicle terminal, compact-corymbose with ascending branches, stalked, the stalk ca. 3 cm long, the bracts foliaceous, 1.5–2 cm long; bracteoles deciduous, not seen. Flowers not seen; fruiting calyx campanulate, 1.5–2 mm long, broadly 5-lobate, lobes rounded. Fruits oblong-ellipsoid, 6–7 by ca. 4 mm, longitudinally ribbed.

Portland: E slope of John Crow Mts. ca. 2.5 mi SW of Ecclesdown, ca. 2500 ft, *Proctor 22702*, Sept. 1, 1962 (holotype).

This species resembles *Psychotria clusioides* Proctor in general appearance and grows in the same locality, but differs in having smaller, more rotund leaves with fewer veins, more compact corymbose panicles, a campanulate calyx with rounded lobes, and fruits truncate at the base.

Psychotria hanoverensis Proctor, sp. nov.

MAP 41.

Frutex *Psychotria hirsuta* affine, in ramulis glabris, stipulis oblongis vel ovatis persistentibus, foliis grandioribus venulis lateralibus pluribus, calyce pubescente, corollis parvioribus, et fructibus grandioribus, differt.

Shrub 1.5–2 m tall with glabrous branchlets; stipules sheathing, persistent, oblong to ovate, 8–11 mm long, densely rusty-hirsute with septate hairs. Petioles 1–3 cm long, rusty-hirsute; leaf blades broadly elliptic to obovate, 8–19 by 4–9.5 cm, short-acuminate at apex, cuneate at base, usually with 9 to 12 pairs of lateral veins, densely rusty-hirsute especially on midvein and lateral veins abaxially, both surfaces also hirsute, and margin ciliate with septate hairs. Inflorescence rusty-hirsute, shorter than leaves; panicle pentagonal, 4–7 cm long and wide, stalked, stalk 3–5 cm long. Flowers clustered at ends of panicle branches, sessile; calyx densely pubescent and ciliate, the lobes ca. 0.5 mm long, deltate, acute; corolla with glabrous tube ca. 2 mm long, the lobes narrow, recurved, lightly pubescent on outside. Fruits glabrous, longitudinally ribbed, orange, 7–9 mm long.

Hanover: Baulk Pen Mt., ENE of Glasgow, 400–600 ft, *Proctor 36312*, July 2, 1976 (holotype), *Proctor 35525*, Dec. 13, 1975.

Although clearly related to *Psychotria hirsuta* Sw., from the opposite end of Jamaica, this species differs in many details.

Spermacoce L.

Most modern authors have maintained *Borreria* G. F. W. Meyer (nomen conserv.) separate from *Spermacoce* on the basis that both valves of the *Borreria* capsule open instead of only one. Recently, however, the opinion that such a distinction is merely artificial and serves no useful purpose has been gaining support and is beginning to be reflected in scattered literature (e.g., Fosberg, 1976). If the Jamaican species of these taxa are united, the correct names are as follows:

Spermacoce assurgens Ruiz & Pavon, Fl. Peruv. Chil. **1**: 60. *t.* 92, *fig.* C. 1798.

Borreria laevis of modern authors, not *Spermacoce laevis* Lam., 1791.

S. suffrutescens Jacq. Pl. Rar. Horti Caes. Schoenbr. *t.* 322. 1798 (later than *S. assurgens*).

Spermacoce confusa Rendle, Jour. Bot. London **74**: 12. *figs.* D-F. 1936.

Spermacoce repens (DC.) Fosberg & Powell, Smithson. Contr. Bot. **45**: 30. 1980.

Spermacoce and *Borreria ocyroides* of modern authors, not *S. ocyroides* Burman f., 1768.

Spermacoce spinosa Jacq. ex L. Sp. Pl. ed. 2. **1**: 148. 1762.

Spermacoce tenuior L. Sp. Pl. **1**: 102. 1753.

Spermacoce tetraquetra A. Rich. in Sagra, Hist. Fís. Pol. Nat. Cuba **11**: 29. 1850. MAP 41.

New to Jamaica. **Westmoreland**: grounds of Little London Secondary School, ca. 50 ft, *Proctor 37123*, July 18, 1977. **St. Catherine**: 1.25 mi due NE of Spring Village, ca. 75 ft, *Proctor 38168*, May 30, 1979.

Otherwise known from the Bahamas, Cuba, and Cayman Brac.

Spermacoce verticillata L. Sp. Pl. **1**: 102. 1753.

COMPOSITAE

Egletes Cass.

Egletes prostrata (Sw.) Kuntze, Rev. Gen. Pl. **1**: 334. 1891. MAP 42.

Adams (1972, p. 758) cited this species as "very rare (St. Ann); not recently collected." There are, however, two specimens from Jamaica in the

Institute of Jamaica herbarium that show that *Egletes prostrata*, although rare, occurs at widely scattered sites near the north coast of the island.

St. James: Rose Hall, ca. 50 ft, *Proctor 35284*, Sept. 6, 1975. **Trelawny:** Fal-mouth, sea level, *Mr. Curtis s.n. (UCWI 3236)*, March, 1957 (originally submitted for identification by the late Mrs. Edith Robertson, University of the West Indies).

Flaveria Juss.

Flaveria trinervia (Sprengel) C. Mohr, *Contr. U. S. Natl. Herb.* **6:** 810. 1901. MAP 42.

Genus and species new to Jamaica. **St. James:** Rose Hall, ca. 50 ft, *Proctor 35286*, Sept. 6, 1975.

The genus *Flaveria* belongs in the tribe Helenieae; it differs from other Jamaican genera of this group (*Pectis*, *Porophyllum*) in lacking resinous glands in the tissues, and from *Pectis* in lacking ray flowers.

Flaveria trinervia is recorded from the southern United States, Mexico, Venezuela, and a few other South American localities, as well as from the Bahamas, Cuba, and Puerto Rico in the West Indies. Long and Lakela (1971) also cited a report from Hawaii.

Sachsia Griseb.

Sachsia polycephala Griseb. *Catal. Pl. Cubens.* 150. 1866. MAP 42.

Genus and species new to Jamaica. **St. Elizabeth:** Slipe distr., sea level, *Proctor 33564*, Oct. 26, 1973, *Proctor 33729*, March 3, 1974. **Hanover:** Sambo Clump (Sambo #1) in the Great Morass, ca. 2 mi due SW of Logwood, sea level, *Proctor 37152*, July 19, 1977, *Proctor 37744*, March 23, 1978.

Sachsia, construed in the broad sense as a monotypic genus, has been recorded from Florida, the Bahamas, Cuba, and Hispaniola. Its discovery in Jamaica is therefore not a very surprising extension of its known range.

This genus belongs in the tribe Inuleae, otherwise represented in Jamaica by the genera *Gnaphalium*, *Pterocaulon*, and *Pluchea*. From all of these it differs in habit, being a small rosette-forming herb with a slender, erect flowering scape that bears such inconspicuous leaves as to appear nearly naked. The plants resemble a small *Erigeron* (such as *E. cuneifolius*) but can be distinguished by the tailed anthers and the 4- or 5-angled achenes. The anthers of *Erigeron* lack appendages, and the achenes are flat.

Senecio L.

It has been customary in most floras to treat this genus in a broad sense, and Adams (1972) continued this tradition. If left to my own devices, I would probably do likewise in resistance to the modern tendency toward what seems

to be excessive generic fragmentation. However, the discovery of two new eligulate species related to the endemic Jamaican *Senecio discolor* (Sw.) DC. led to consultation with Dr. Harold Robinson at the Smithsonian Institution regarding generic delimitation among these plants. Dr. Robinson kindly agreed not only to describe the new species, but also to provide a brief review of Jamaican Senecioneae (as follows) according to the systematic treatment that he and some other present-day authors are using.

The various members of the Senecioneae from Jamaica have been subject to extensive revision, mainly at the generic level, since the publication of Adams's flora. Two endemic genera have been described by Nordenstam (1978), *Jacmaia* for the species previously known as *Gynoxys incana* (Sw.) Less., and *Odontocline* for six species previously placed in *Senecio*. More recently, the tropical American genus *Pentacalia* has been resurrected from synonymy under *Senecio* (Robinson & Cuatrecasas, 1978), and that genus now proves to include three species from Jamaica, two of which are previously undescribed. One species mentioned by Adams in his key to *Senecio*, *S. confusus* Britton, is introduced from Mexico and Central America and is properly placed in the genus *Pseudogynoxys* (Greenman) Cabrera (see Robinson & Cuatrecasas, 1977) under the name *P. chenopodioides* (Kunth) Cabrera. At present, therefore, the large north- and south-temperate genus *Senecio* proves to be represented in Jamaica only by its introduced type species, *S. vulgaris* L.

It might be noted that some other Jamaican genera that have previously been placed in the Senecioneae, and which were placed in their traditional positions near *Senecio* by Adams, are now known to belong elsewhere—*Liabum* Adanson in the tribe Liabeae and *Neurolaena* R. Br. in the Heliantheae.

The following is a key to the genera included in *Senecio* by Adams:

- A. Leaves pinnatifid, sessile, mostly in a basal rosette; one introduced annual species. *Senecio*.
- A. Leaves entire to serrate, distinctly petiolate, alternate on elongate stems; indigenous perennial species.
 - B. Style branches and anther appendages with acute tips; flowers reddish orange; endothelial cells with single thickenings on transverse walls; vines. *Pseudogynoxys*.
 - B. Style branches and anther appendages blunt; flowers whitish or yellow; endothelial cells with numerous thickenings on vertical walls; shrubs, small trees, or woody vines.
 - C. Flowers yellow; style branches with single stigmatic area covering inner surface; achenes usually with 8 to 10 nerves. *Odontocline*.
 - C. Flowers of Jamaican species whitish; style branches with paired stigmatic lines; achenes with 5 to 8 nerves. *Pentacalia*.

The three indigenous Jamaican genera of the Senecioneae can be briefly summarized as follows:

Jacmaia Nordenstam

Jacmaia incana (Sw.) Nordenstam, Op. Bot. 44: 66. 1978.

Gynoxys incana (Sw.) Less. Synopsis Gen. Composit. 390. 1832; Adams, 1972.

Odontocline Nordenstam

The following key is mostly adapted from that of Adams (1972):

- A. Leaves divided about halfway to midrib in proximal part, the lobes more or less triangular, up to 40 by 12 cm, equally coarsely pubescent on both surfaces; small tree. *O. laciniata*.
- A. Leaves at least on flowering branches entire or at most repand-dentate, smaller in size and otherwise in pubescence; shrubs or vines.
 - B. Leaves on flowering branches distally toothed, each tooth tip a thick gland; 7 to 12 pairs of conspicuous lateral veins prominent beneath when dry.
 - C. Lamina coarsely serrate, elliptic, base obtuse. *O. dolichantha*.
 - C. Lamina with minute teeth, slightly obovate, base short-acute. *O. fadyenii*.
 - B. Leaves on flowering branches entire, or if denticulate then tooth tips not obviously thickened; lateral veins up to ca. 7 pairs, obscure.
 - D. Involucral bracts 5; florets 5 or 6; erect shrub with obtusely tipped leaves. *O. tercentenariae*.
 - D. Involucral bracts 6 to 8 (to 10); florets 8 to 14; leaf tips mostly acute or acuminate; leaves on nonflowering branches narrower and more distinctly toothed.
 - E. Erect or straggly branched shrub, or small tree with brittle branches; leaves on flowering branches cuneate at base; lateral veins forming 70–80° angle with midrib. *O. glabra*.
 - E. High-climbing woody vine; leaves broadly cuneate to rounded at base; lateral veins forming 30–60° angle with midrib. *O. hollickii*.

These can be listed alphabetically as follows:

Odontocline dolichantha (Krug & Urban) Nordenstam, Op. Bot. **44**: 25. 1978.

Senecio fadyenii Griseb. var. *dolichantha* Krug & Urban in Urban, Symb. Antill. **1**: 470. 1900.

S. dolichanthus (Krug & Urban) S. Moore, Jour. Bot. London **67**: 130. 1929.

This entity was reduced to synonymy under *Senecio fadyenii* by Adams (1972).

Odontocline fadyenii (Griseb.) Nordenstam, Op. Bot. **44**: 25. 1978.

Senecio fadyenii Griseb. Fl. Brit. W. Indian Is. 382. 1861; Adams, 1972.

Odontocline glabra (Sw.) Nordenstam, Op. Bot. **44**: 25. 1978.

Senecio swartzii DC. Prodr. **6**: 411. 1838; Adams, 1972.

Odontocline hollickii (Britton ex Greenman) Nordenstam, Op. Bot. **44**: 25. 1978.

Senecio hollickii Britton ex Greenman, Ann. Missouri Bot. Gard. **3**: 201. 1916; Adams, 1972.

Odontocline laciniata (Sw.) Nordenstam, Op. Bot. **44**: 25. 1978.

Cineraria laciniata Sw. Fl. Ind. Occ. **3**: 1352. 1806.

Senecio swartzianus Bueck, Index DC. Prodr. **2**: vi. 1840; Adams, 1972.

Odontocline tercentenariae (Proctor) Nordenstam, Op. Bot. **44**: 25. 1978.

Senecio tercentenariae Proctor, Bull. Inst. Jamaica Sci. **16**: 75. t. 33. 1967; Adams, 1972.

Pentacalia Cass.

This taxon, originally based on a Colombian species, was distinguished by Robinson and Cuatrecasas (1978, p. 38) from *Senecio* by "the fruticose to scandent habit with woody stems, the distinctly petiolate usually non-stipitate leaves, the minutely fistulose or non-fistulose receptacles, the tails on the anthers, and the rather stout 5-ribbed achenes. . . ." The separation of *Pentacalia* from *Odontocline* (the latter an endemic Jamaican genus), although primarily based on characters not easy to see without special techniques, is made simpler by the consistent difference in flower color. However, it should be noted that the white or whitish color of *Pentacalia* flowers in Jamaica is somewhat anomalous in this genus, which elsewhere usually has yellow flowers.

- A. Heads radiate (rays white); achenes mostly with 8 nerves and with many short mucilage hairs. *P. discolor*.
- A. Heads entirely discoid; achenes with 5 nerves, glabrous.
 - B. Stems, lower surface of leaves, and involucre with white tomentum; corollas ca. 3.5 mm long, bearing few short hairs on outer surface. *P. subdiscolor*.
 - B. Stems, leaves, and involucre essentially glabrous; corollas ca. 4.5 mm long, glabrous. *P. inornata*.

Pentacalia discolor (Sw.) H. Robinson, comb. nov.

Cineraria discolor Sw. Prodr. 114. 1788.

Senecio discolor (Sw.) DC. Prodr. **6**: 412. 1838; Adams, 1972.

Although this species differs from typical *Pentacalia* in having eight (vs. five) nerves in the achene, it nevertheless falls within the broad concept of the genus. The setae on the achenes release mucilage from the tips when they are ruptured. Such setae are not common in *Pentacalia* but are known elsewhere in the Senecioneae. *Pentacalia discolor* is a very common and widespread species in Jamaica and is locally called "whiteback." It has frequently been used as an ingredient of "bush tea" and as such has been implicated as a carcinogen, especially in cases of liver cancer among children. Adams (1972) pointed out that although this species is endemic to Jamaica,

it is closely related to a Cuban species. The latter should therefore be known as *Pentacalia almironcillo* (Gómez Maza) Proctor, comb. nov., based on *Senecio almironcillo* Gómez Maza, Ann. Hist. Nat. Madrid **19**: 277. 1890.

Pentacalia inornata H. Robinson, sp. nov.

MAP 42.

Ab speciebus affinis plurimis in corollis albis differt, ab speciebus affinis Jamaicensibus in caulibus foliis et squamis involucri distincta.

Shrub with arching branches 2–3 m long; stems becoming pale brownish and subcarnose, slightly striate, glabrous. Leaves alternate; petioles 8–11 mm long; blades narrowly ovate, 5–8 by 1.5–2.5 cm, acute to short acuminate at apex, short-acute at base, margins subtly remotely mucronate-denticulate, both surfaces glabrous, adaxial surface with prominulous veins, abaxial surface slightly paler, secondary veins pinnately arranged, with 6 or 7 on each side. Inflorescences terminal on leafy branches, pyramidally paniculate with corymbose parts, peduncles 2–5 mm long, with appressed tomentum. Heads 6–7 mm high and ca. 3 mm wide; subinvolucral bracts linear, ca. 1 mm long, forming short calyculus; involucral bracts 8, oblong, ca. 5 mm long and to 1.3 mm wide, apices short-acute, glabrous. Flowers disciform, 10 to 14 per head; corollas white, ca. 4.5 mm long, externally glabrous, the tube cylindrical, wider below, strongly indurated, ca. 2 mm long, with throat narrowly funnellform, ca. 1.5 mm long, the lobes ca. 1 mm by 0.5 mm; anther collar ca. 0.3 mm long, the thecae ca. 0.8 mm long, with tails to 0.15 mm long, the anther appendages oblong, ca. 0.25 by 0.15 mm; apices of style branches very short fringed abaxially. Achenes submature, ca. 3 mm long, 5-costate, glabrous; pappus setae ca. 35 in 1 or 2 series, ca. 3 mm long, very easily deciduous, with apices not or scarcely broadened. Pollen grains ca. 30 μm in diameter.

St. Ann: James Webster Patent, along road #144 between Mason River and Stepney, 2100 ft, *Proctor* 32855, March 4, 1972 (holotype, us), *Proctor* 32792, Jan. 14, 1972, *Proctor* 32833, Feb. 12, 1972, *Proctor* 32863, March 31, 1972. **Clarendon:** stream gully 0.9 mi by road E of Reckford, ca. 2000 ft, *Proctor* 37553, Jan. 7, 1978, *Proctor* 38111, March 29, 1979.

Pentacalia inornata is the only glabrous member of the genus in Jamaica, but in this respect it is more like most of its congeners in Central America and northern South America. The denticulate margins of the leaves indicate that this and the other Jamaican species are most closely related to the typical element of *Pentacalia*, which is distributed primarily in the northern Andes.

Pentacalia inornata is an arching or scrambling shrub with stems up to 3 m long; the flower heads are "creamish." This species has been found in thickets on rocky limestone hillsides and on the steep bank of a stream.

Pentacalia subdiscolor H. Robinson, sp. nov.

MAP 42.

A *Pentacalia discolor* in capitulis discoideis et achaeniis 5-costatis distincta.

Erect shrub 2 m high, with stems, abaxial surfaces of leaves, pedicels, and involucre covered with appressed, grayish white tomentum; stems becoming glabrous, irregularly rugulose when dry. Leaves alternate; petioles 8–11 mm long; blades narrowly ovate, 6–9 by mostly 1.8–2.5 cm, acute at apex, short-acute at base, margin subtly remotely mucronate-denticulate, adaxial surface glabrous with prominulous veins, abaxial surface grayish white tomentose, secondary veins pinnate, with ca. 7 or 8 on each side. Inflorescences terminal on leafy branches, pyramidally paniculate with densely corymbose parts, peduncles 2–5 mm long. Heads ca. 5 by 2.5 mm; subinvolucral bracts ca. 5, ca. 1 mm long in short calyculus; involucral bracts mostly 8, oblong, ca. 3.5 by 1.3 mm, with short-acute apices, becoming glabrous on part of outer surface. Flowers disciform, ca. 14 per head; corollas white, ca. 3.5 mm long, the tube cylindrical, ca. 1.5 mm long, with throat narrowly funnelform, ca. 1.3 mm long, both tube and throat sparsely minutely puberulous externally, the lobes ca. 0.9 by 0.4 mm; anther collars ca. 0.25 mm long, thecae ca. 0.8 mm long, with tails to 0.15 mm long; apices of style branches abaxially and laterally short fringed. Achenes submature, ca. 1.8 mm long, 5-costate, glabrous; pappus setae ca. 35 in 1 or 2 series, ca. 3 mm long, very easily deciduous, with apices not or scarcely broadened. Pollen grains ca. 30 μ m in diameter.

St. Ann: James Webster Patent, along road #144 between Mason River and Stepney, ca. 2100 ft, *Proctor* 32382, Feb. 12, 1972 (holotype, us), *Proctor* 32864, March 31, 1972; Douglas Castle distr., 2200–2300 ft, *Proctor* 35685, April 9, 1976. **Trelawny:** near Crown Lands road extension 4.5–5 mi NW of Troy, ca. 1750 ft, *Proctor* 34708, Jan. 26, 1975.

Pentacalia subdiscolor is similar to *P. discolor* in the whitish pubescence of the leaf undersurface but differs sufficiently in details, especially in achene structure, to make close relationship seem doubtful. The relationship is much closer to the partly sympatric *P. inornata*, and the two might be considered pubescence variants except for the secondary differences in leaf acumination, head size, and corolla size and texture. The presence of some hairs on the corolla is probably a reflection of the general pubescence seen on other parts of the plant.

Pentacalia subdiscolor is recorded as an erect or arching shrub 2 m tall, with whitish, ill-scented heads. It grows in thickets on rocky limestone hill-sides.

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