

THE SOUFRIÈRE PLANT OF ST. VINCENT

RICHARD A. HOWARD AND KRISTIN S. CLAUSEN

THE SOUFRIÈRE PLANT (*Spachea elegans* (Meyer) Juss.; originally *S. perforata* Juss.) was collected by Alexander Anderson along the Essequibo River in British Guiana in 1791 and introduced into cultivation in the botanical garden of St. Vincent. The following notes should end the saga of a species considered extinct in the wild but preserved in a botanical garden. How the story became a legend of the Caribbean area is not clear.

For many years the tale has been repeated that *Spachea perforata* had been a native of the slopes of the Soufrière on St. Vincent, and that all native plants had been destroyed by the eruption of that volcano in 1902. A single plant supposedly remained under cultivation in the botanical garden near Kingstown. When the senior author visited St. Vincent in 1950, the location of the plant in the garden was not known, for most specimens in the garden were without labels. Two trees belonging to the Malpighiaceae were found in flower; herbarium specimens were made and determined, and the garden plants were again labeled. In a history of the St. Vincent Botanic Garden (Howard, 1954) the tale was published that, according to the records of the garden, these plants had been grown from seed obtained in the mountains.

Extensive general collecting on St. Vincent by H. H. and G. W. Smith, John and Pamela Beard, Conrad Morton, George Proctor, R. A. Howard, and Keith and Elizabeth Laidler has not turned up a single native specimen of the Soufrière tree.

More recently, Keith and Elizabeth Laidler (1975, 1978) became interested in propagating and reestablishing the species in the mountains of St. Vincent. These authors (1975) stated, "The eruption of Mt. Soufrière in the last century practically wiped out this arboreal species, which used to grow in relative abundance on the slopes of the volcano. The mature thirty-foot specimen now thriving in the Gardens is the only cutting that grew successfully from the single sapling which was discovered on the mountain after the catastrophe." The Laidlers sent flowering specimens to Kew to verify that the plant was hermaphroditic. They also rooted cuttings of the tree, planted them in several places on the island of St. Vincent, and speculated on the possibility that the plant might still be discovered in the remote areas of the northwestern corner of the island. In the final report of their work it is admitted that, lacking care, the transplants all died.

During the summer of 1979, Gavin Bridson, Librarian of the Linnean Society in London, called to the attention of the senior author a large and unappreciated manuscript of a "Hortus" of the West Indies written by Alexander Anderson in approximately 1803. Anderson, whose life story is being compiled by the senior author, was appointed director of the St. Vincent Botanic Garden in 1783 and served

in this capacity until ill health forced his resignation in 1811, a few months before his death. It was he who received and nurtured the plants, including several varieties of breadfruit, delivered from the South Seas by Capt. William Bligh. With William Lochhead, who was to succeed him as director of the Garden, Anderson made expeditions to Trinidad and Guiana to secure plants for the Botanic Garden. Anderson's manuscript described in detail the plants under cultivation in the garden and their sources, uses, and culture; it included many descriptions of plants new to science, as well as numerous exquisite drawings. The manuscript was sent to William Forsyth at Kensington Gardens and was intended for publication. Among the drawings was a colored plate of "*Cullenia malpighioides*," supplemented in the text by a complete Latin description of the new genus and species. The name honored a Dr. Cullen of Edinburgh, who was the first in Scotland to use the Linnaean system in his teaching. Anderson reported that in 1791 he saw the plant some 200 miles up the Essequibo River, collected seeds, and secured some small plants to return to the garden on St. Vincent. When they flowered, he prepared the description and had the plant sketched. Although "*Cullenia malpighioides*" antedates the genus *Spachea*, the name was never validly published.

In 1818 G. F. W. Meyer described *Malpighia elegans* as new, based on an E. K. Rodschied specimen collected on the shores of the island of Arowabisch in the Essequibo River. The original specimen is preserved at Göttingen. In 1824 de Candolle transferred the species to the genus *Byrsonima*, and in 1838 A. Jussieu created the new genus *Spachea* and published an illustration. Both de Candolle and Jussieu cited a collection of Leschenault from Surinam, now preserved in Paris and there indicated incorrectly as the type.

In 1840 Jussieu added to the genus *Spachea parviflora* and *S. ossana*, from Cuba; *S. perforata*, from St. Vincent; and *S. tricarpa*, from Brazil. All of the species were described, but without the citation of specimens. Longer descriptions were published in 1843 (Jussieu, 1843), and collections were cited. Most critical characteristics used by subsequent scholars seem to be derived from Jussieu's descriptions. *Spachea parviflora*, based on a specimen in "herb. DC," was credited as "In insula Cubae juxta Habannam legit cl. de la Ossa." *Spachea ossana*, based on specimens in "herb. DC, Hook.," was described with the note "In Ins. Cubae juxta Habbannam legit cl. de la Ossa (herb. DC), et alterum specimen ex Ins. S. Vincentii exhibit herbarium Hookerianum cum *S. perforata* confusum." *Spachea littoralis* ("herb. Mus. Par.") was attributed thus: "Ad littora maris in Insulâ S. Thomae legit cl. Finlay." Finally, *S. perforata* (herb. Hooker) was reported as "Specimen in Ins. S. Vincentii lectum communicavit cl. Hooker.—Adsunt in herb. Lessert specimen ibidem a cl. Caley lecta, foliis paulo majoribus, tenuioribus et omnino membranaceis, minus manifeste punctatis paulisper distincta." Each of these species requires a comment for clarification.

José Antonio de la Ossa became the first director of the Jardín Botánico de la Habana on May 30, 1817. León (1918) referred to the fact that Ossa had prepared a work listing the uses of plants and their common names and had also included plants recently introduced from other countries and acclimatized there. The death of Ossa, which occurred shortly afterwards, frustrated the publication of his work. This manuscript has not been studied in detail, and it is not known if it exists in Cuba

today. It is clear that *Eupatorium ossaeum* DC. (de Candolle, 1836), with a type "de la Ossa, Havana, Cuba," is an endemic species of St. Vincent. It is probable that *Spachea parviflora* and *S. ossana*, attributed to Cuba, are plants obtained from the botanical garden of St. Vincent. A similar error was made by Jussieu in reporting *Spachea littoralis* was collected by Finlay from St. Thomas. Britton and Wilson (1924) noted that "*Spachea littoralis* A. Juss., described by A. Jussieu as from St. Thomas, collected by Finlay, was really collected in Trinidad." R. O. Williams (1947), who with the critical help of N. Y. Sandwith prepared the treatment of the Malpighiaceae for the *Flora of Trinidad and Tobago*, accepted only *S. elegans* and stated, "*S. perforata* Juss. recorded from St. Vincent and cultivated in the Royal Botanic Gardens, Trinidad, appears to be the same species." In a later section Cheesman (1947) referred to Niedenzu's work but noted, "A synonym of the latter [*S. parviflora* Juss. var. *perforata* (Juss.) Niedz.] is *S. littoralis* Juss., which was based on *Finlay 198* from Trinidad, but this collection may have been from a cultivated plant."

The collectors of the material Jussieu cited for *Spachea perforata* were Guilding (for the specimen sent to Hooker and now in the herbarium at Kew) and Caley (for the specimen in the Lessert Herbarium (P)). Reverend Lansdown Guilding wrote a history (1825) of the botanical garden of St. Vincent that included Anderson's list of the plants growing in the garden in 1806. "*Cullenia malpighioides*" is not included in this list, but neither is any species of *Spachea*. According to Guilding's letters now in the archives at Kew, Guilding did send many specimens and drawings of plants in the St. Vincent Botanic Garden to Hooker for identification. George Caley, the director of the Garden from 1816 to 1819, commented in letters also preserved at Kew that Anderson neither numbered nor labeled the plants of the garden, making it necessary to send specimens to various people for identification.

Grisebach (1859) recognized both *Spachea elegans*, from Trinidad (Purdie) and Guiana, and *S. perforata*, from St. Vincent (Guilding). In the synonymy of *S. perforata*, Grisebach listed "*Ossana Vincentiana*, Juss." with an exclamation mark, indicating that he had seen material. This name has not been published.

Two monographs of the Malpighiaceae that treated the genus *Spachea* were published subsequently by Small (1910) and Niedenzu (1928). Small recognized four species: *S. parviflora*, from Cuba and St. Vincent; *S. littoralis*, from St. Thomas; *S. perforata*, from St. Vincent; and *S. ossana*, from Cuba and St. Vincent. No specimens are cited in treatments for *North American Flora*, and the lack of representative material in the herbarium of the New York Botanical Garden, where Small worked, suggests the descriptions and distinguishing characteristics were derived from the literature. Niedenzu treated these four species in a different manner. He accepted *S. elegans*, including his previously established forma *ossana* (Juss.) Niedz. (1914) (typified by the Ossa collections "ca. 1825: Havana"), and *S. parviflora* Juss. (typified by Ossa "ca. 1825: Havana"), consisting of varieties *typica* and *perforata* (Juss.) Niedz. (1914). He cited *S. littoralis* in the synonymy of the species *S. parviflora*, but not under either variety *typica* or variety *perforata*. Niedenzu did cite *Finlay 198*, from Trinidad, along with material of Caley and Guilding from St. Vincent under his variety *perforata*. Recent collections from Trinidad and northern South America, as well as six different collections from the

trees in the botanical garden on St. Vincent, reveal that the distinctions between *S. elegans* and *S. parviflora* as used by previous workers are not reliable, and that only one species is represented.

There remains a problem of the fertility or sex of the flowers of *Spachea* and particularly the “*Spachea perforata*” of the St. Vincent Botanic Garden. William Anderson, of the University of Michigan, a current specialist on the Malpighiaceae, states (pers. comm.), “Most Malpighiaceae have monotonously bisexual flowers, so it was a great surprise to discover that *Spachea* does not. Some plants are functionally pistillate, while the flowers on plants that produce pollen are morphologically perfect but perhaps functionally staminate, i.e., they do bear ovule-containing carpels, but I suspect that those carpels do not set seed, since I have found no enlarging fruit on old inflorescences of those plants. These observations are based only on material of *S. elegans* and *S. tricarpa*.” An examination of six collections of “*Spachea perforata*” made between 1825 and 1980 from the botanical garden in St. Vincent, as well as some collections from plants in Trinidad propagated from the St. Vincent plant, reveals anthers with pollen and carpels with ovules, but no specimen has fruit. The records of the St. Vincent Botanic Garden were examined by Dr. George Cooley in 1962. He noted the entry for 1912: “A large number of cuttings made of the old *Spachea perforata*, about a dozen appear to have rooted. These will be distributed when strong enough. No recent record of seed produced though it flowers profusely.” An entry for 1915–16: “*Spachea perforata* showed signs of decay. A limited number of young plants have been raised, one of which was planted out in the Garden.” In 1918–19: “*Spachea perforata*. Young specimen to replace old dying tree making good growth. No seeds produced in recent years.” In 1929: “The old plant of *Spachea perforata* which was regarded as dead nine months ago produced a strong shoot from its base during the year. Probably planted by Anderson 130 years ago. In 1912 rooted cuttings from this tree were sent to various botanical establishments in the West Indies. One was planted in that part of the St. V. gardens known as Nutmeg ground. Now a healthy tree, 20 ft. in height.” These records certainly suggest that the St. Vincent plants are functionally staminate and perhaps date the cultivated plants in Trinidad from which specimens in various herbaria have been taken.

Small (1910), in a key to the species, distinguished *Spachea parviflora* as having “stigmas truncate” and noted “fruits not seen.” According to Small, *S. littoralis*, *S. perforata*, and *S. ossana* have “stigmas slightly 2-lobed or reniform-capitate.” He did not see the fruits of *S. littoralis* but did record fruit size for *S. perforata* and *S. ossana*. The lobed stigma characteristic may well be correlated with functional carpels. As we have indicated, no existing specimen of *S. perforata*—considered to be endemic to St. Vincent and known only from the plants in the botanical garden—is known in fruit, and the source of Small’s descriptive detail of the fruit is a mystery. However, examination of the type material of *S. ossana* Juss. (DC.) reveals one sterile, leafless shoot, one leafless shoot with an inflorescence, and one leafless shoot with a small, unattached leaf trapped in a fruiting inflorescence. It is possible that Anderson sent to Ossa in Cuba some plants of the original 1791 introduction of his “*Cullenia malpighioides*,” one of which was functionally pistillate, while retaining only functionally staminate plants on St. Vincent. The material of *S. parviflora*

Juss. (DC.) attributed to "La Havanna, de la Ossa 1825" is a leafy shoot with functionally staminate flowers, the anthers of which bear pollen. With regard to both *S. parviflora* and *S. ossana*, León and Alain (1953) stated, "No observada por los botánicos modernos."

The legend of the Soufrière tree must be discounted, and the plant in the St. Vincent Botanic Garden must be recognized as *Spachea elegans* (Meyer) Juss., with the other taxa considered in this paper as synonyms. The synonymy of *S. elegans* is presented below.

Spachea elegans (Meyer) Juss. in Delessert, Ic. Selec. Pl. **3**: 19, t. 31, 1838.

BASIONYM: *Malpighia elegans* Meyer, Prim. Fl. Esseq. 178, 1818.

Byrsonima elegans (Meyer) DC. Prodr. **1**: 580, 1824.

Spachea parviflora Juss. Ann. Sci. Nat. Bot. ser. 2. **13**: 326, 1840; Monogr. Malpigh. 72, 1843. TYPE: *Ossa s.n.*, Cuba (G-DC).

Spachea ossana Juss. Ann. Sci. Nat. Bot. ser. 2. **13**: 326, 1840; Monogr. Malpigh. 72, 1843. TYPE: *Ossa s.n.*, Cuba (G-DC).

Spachea perforata Juss. Ann. Sci. Nat. Bot. ser. 2. **13**: 326, 1840. TYPE: St. Vincent (Herb. Hooker, K).

Spachea littoralis Juss. Arch. Mus. Paris **3**: 328, 1840. TYPE: *Finlay s.n.*, "St. Thomas" (in error, really Trinidad) (P).

Ossana vincentiana Juss. ex Griseb. in Griseb. Fl. Brit. W. Indian Is. 116, 1859, in synonym.

Spachea elegans f. *ossana* (Juss.) Niedz. Arbeit Bot. Inst. Lyc. Hosianum **5**: 18, 1914.

Spachea parviflora var. *typica* Niedz. *Ibid.* 19, 1914.

Spachea parviflora var. *perforata* (Juss.) Niedz. *Ibid.*

ACKNOWLEDGMENTS

We are grateful to the curators of the herbaria mentioned for the privilege of examining specimens on site or by loan, to the officers of the Linnean Society for the opportunity to transcribe the Anderson "Hortus," and to the library staff at Kew for their help in locating the letters of previous directors of the St. Vincent Botanic Garden.

LITERATURE CITED

- BRITTON, N. L., & P. WILSON. 1924. *Spachea littoralis*. P. 448 in Scientific survey of Porto Rico and the Virgin Islands. Vol. 5. New York Academy of Sciences, New York.
- CANDOLLE, A. P. DE. 1824. Malpighiaceae. Prodr. **1**: 580.
- . 1836. Compositae. *Ibid.* **5**: 144.
- CHEESMAN, E. E. 1947. *Spachea*. P. 499 in Flora of Trinidad and Tobago, additions and corrections. Vol. 1. Guardian Commercial Printery, Port-of-Spain.
- GRISEBACH, A. H. R. 1859. Flora of the British West Indian Islands. xvi + 789 pp. Lovell Reeve & Co., London.
- GUILDING, L. 1825. An account of the botanic garden in the island of St. Vincent. 47 pp. Richard Griffin & Co., Glasgow.

- HOWARD, R. A. 1954. A history of the botanic garden of St. Vincent, British West Indies. *Geogr. Rev.* **44**: 381–392.
- JUSSIEU, A. H. L. de. 1838. *Malpighiaceae*. P. 19, *t. 31* in J. P. B. DELESSERT, *Icones selectae plantarum*. Vol. 3. Fortin, Masson et Soc., Paris.
- . 1840. *Malpighiacearum synopsis*. *Ann. Sci. Nat. Bot.* ser. 2. **13**: 326.
- . 1843. *Monographie des Malpighiacées*. *Arch. Mus. Hist. Nat. Paris* **3**: 5–151, 265–616.
- LAIDLER, K., & E. LAIDLER. 1975. Synopsis of the results of the 1975 Durham University expedition to St. Vincent. *Carib. Conserv. News* **1**(3): 9, 10.
- & ———. 1978. Synopsis of the results of the 1975 Durham University expedition to St. Vincent. *Ibid.* **1**(13): 19, 20.
- LEÓN, H. 1918. Las exploraciones botánicas de Cuba. *Memorias de la Sociedad Poey*, 48 pp. Sociedad Editorial Cuba Contemporánea, Havana.
- & H. Alain. 1953. *Spachea*. P. 16 in *Flora de Cuba*. Vol. 3. Contr. Ocas. Mus. Hist. Nat. No. 13.
- MEYER, G. F. W. 1818. *Malpighia elegans*. Pp. 178, 179 in *Primitiae florae Essequiboensis*. H. Dieterich, Göttingen.
- NIEDENZU, F. 1914. *Malpighiaceae americanae*. *Arbeit Bot. Inst. Braunsberg* **5**: 18, 19.
- . 1928. *Malpighiaceae*. In A. ENGLER & L. DIELS, eds., *Pflanzenr.* IV. **141**(III): 588.
- SMALL, J. K. 1910. *Malpighiaceae*. *N. Am. Fl.* **25**(2): 149, 150.
- WILLIAMS, R. O. 1947. *Malpighiaceae*. P. 449 in *Flora of Trinidad and Tobago*. Vol. 1. Government Printer, Port-of-Spain.

ARNOLD ARBORETUM

HARVARD UNIVERSITY

22 DIVINITY AVENUE

CAMBRIDGE, MASSACHUSETTS 02138