

**Additions to the Fern Flora of Saba, Netherlands Antilles**

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**ABSTRACT.** Recent fieldwork on Saba, Netherlands Antilles, has resulted in the discovery of nine fern species unrecorded for the island. All are known from other islands in the Antilles, as well as from other tropical areas.

Saba is a volcanic island about three kilometers in diameter that rises about 850 m in a graceful cone called Mt. Scenery. The summit is the highest point in the Kingdom of The Netherlands. Saba lies south of Sint Maarten/St. Martin in the Windward Island chain at the northern end of the Lesser Antilles. About 1,300 people reside on Saba, which is little visited by tourists because of its small size and precipitous, rocky headlands that prevent beaches from forming. A beautiful fringing reef, recently declared a national park, makes the island a choice destination for SCUBA divers, but Saba also offers opportunities for hiking, birding, and botanising.

Although the island has been occupied for more than 350 years, a roller coaster-like road running the length of the island was hewed out of the rock and extensive retaining walls to contain the road were built by hand less than half century ago. Prior to the road, all travel on the island was on foot, over trails that for the most part run rather circumferentially. Even so, the trails are by no means level because of the lava ridges and valleys between them, locally called guts. A day's hike usually includes elevation changes of at least 500 m. In recent years, additional trails have been constructed on the slopes and to the top of Mt. Scenery to make more of the island accessible to hikers. The road now connects the three principal villages with a dock and jetty at the southwestern end of the island, a minute beach when it is exposed at all) on the western side, and a very short air field on the northeastern end, which is suitable only for short takeoff and landing aircraft. Ferry boats run from the dock and jetty.

Mt. Scenery is high enough to be covered by rain clouds for much of the time, and the island is therefore more moist than Sint Maarten/St. Martin and other nearby low islands that depend entirely upon convection for their rainfall. The additional water has resulted in a diverse native vegetation that has been divided into five types, which occur at different elevations above the sea as roughly concentric circles: grassy scrub near sea level, dry woodland above grassy scrub on the leeward side, moist forest above these types, rain forest above moist forest, and cloud forest at the summit of Mt. Scenery.

In the 19th and 20th centuries, much of the forest was destroyed by crop production or grazing, especially at lower elevations and where the upper slopes are not so steep. With improved access by boats, the residents of Saba imported more of their food, and cultivation and grazing ceased in the less accessible areas of the island. Native vegetation used to return slowly through a succession of relatively temporary associations of plants, the first of which was tree fern brakes (*Cyathea arborea* and *C. muricata*) (Hodge, 1990; Romeijn, 1989).

On the windward (eastern) side of the island, the forest vegetation was highly degraded by hurricanes in the 1990's. Many trees were uprooted, and those that remained were broken and battered. What was ferny, shaded forest floor is now almost fully open to the sun. Because of this, the dominant herbs are now Elephant Ear (*Philodendron giganteum*), various *Heliconia* species, and invasive vines and weeds. In the destroyed areas, there is little difference between the moist, rain, and cloud forests. All have open canopies, and weedy species are dominant on the ground. On the leeward (western) side of the island, the forests are much more intact, and it is still possible to distinguish between the forest types by their structure, moisture, dominant flowering plants, and complement of ferns.

*Nephrolepis multiflora* is often dominant in formerly cultivated fields on the windward slopes of Mt. Scenery, where it forms an impassable layer ca. 1m tall that can persist for at least a decade and probably much longer. Only a few tree ferns appear to be capable of germinating and growing through the mat, but they form insufficient cover to make a tree-fern brake. They fail to shade and to kill the *Nephrolepis* and so cannot put in motion the normal succession to moist forest or rain forest.

The usual processes of succession at elevations below 600 m are also impeded by wild goats, which cause erosion and eat the leaves and shoots of young trees before they grow beyond reach, preventing regeneration of the forest (Romeijn, 1989). At present, hunting for meat is insufficient to overcome the goats' reproduction. A small part of the northern slopes of Mt. Scenery, encompassing all the vegetation types, and the entire summit of the mountain are now a protected park. Fencing this area to exclude goats would be good park management and would provide an opportunity for interesting ecological studies as well.

The principal botanical collectors who have visited Saba and collected pteridophytes are W. F. R. Suringar in 1885, I. Bolding in 1906, Bro. M. Arnoldo in 1946 and subsequent years, A. L. Staffers in 1953, and G. R. Proctor in 1988 and 1996. Prior accounts of the pteridophytes of Saba were published by Kramer (1962) and by Proctor (1977). The latter author has also maintained an unpublished checklist of Saba plants, which he was very kind to share with me. The number of pteridophyte taxa known from Saba was 66, principally in the families Thelypteridaceae (12 taxa), Polypodiaceae (11 taxa), and Hymenophyllaceae (10 taxa).

At the suggestion of G. R. Proctor, my wife Jeannette and I spent several days in April, 1999 hiking trails and occasionally roadsides, mostly in the higher, forested parts of the island. (The grassy scrub might better be searched for ferns during the wet season in the winter.) The trails around the island are maintained by volunteers, and only the less travelled ones require the services of a guide. Considering how little botanising Saba has received, it is no surprise that we were able to find the species in the following list new to the island.

*Ctenitis meridionalis* (Pair. in Lam.) Ching. -Rare, terrestrial along trail between Sandy Cruz and Troy, near Down Gut above Wells Bay, in moist forest at 500-600 m elevation, *Lellinger 2034* (U, US).

Endemic in the Lesser Antilles.

*Diplazium cristatum* (Desr.) Alston. -Rare, terrestrial in shady places along trail above Upper Hell's Gate W and NW to beyond Sandy Cruz, in rain forest at 500-600 m elevation, *Lellinger 2033* (U, US).

Widespread in tropical America from northern South America northward.

*Nephrolepis multiflora* (Roxb.) Jarrell ex Morton. -Common along roadsides between Big Rendezvous and English Quarter, in hurricane-damaged moist forest and rain forest at 400-600 m elevation, *Lellinger 2028* (U, US).

An Old World species naturalized sporadically in the Antilles, Mexico to Peru, and Brazil.

*Pteris tripartita* Swartz. -Seen along the trail in moist forest along the trail between Sandy Cruz and Troy.

An Old World species naturalized widely in the Antilles and from Nicaragua to Venezuela and Bolivia.

*Thelypteris hispidula* (Dene.) Reed var. *hispidula*. -Rare on street-side rock walls at The Level, SW of Windwardside, in shade at 400-500 m elevation, *Lellinger 2027* (U, US).

Widely distributed in tropical America.

*Thelypteris poiteana* (Bory) Proctor. -Occasional along the trail from Troy to Bottom Hill, terrestrial in moist forest at 450-500 m elevation, *Lellinger 2038* (U, US).

Widely distributed in tropical America.

*Trichomanes krausii* Hook. & Grev. -Rare along the trail between Sandy Cruz and Troy, near Down Gut above Wells Bay, on shady, clay banks in moist forest at 500-600 m elevation, *Lellinger 2037* (U, US).

Widely distributed in tropical America.

*Trichomanes membranaceum* L. -Rare along the trail between Sandy Cruz and Troy, near Down Gut above Wells Bay, on shady, clay banks in moist forest at 500-600 m elevation, *Lellinger 2035* (U, US).

Widely distributed in tropical America.

*Trichomanes punctatum* Poir in Lam. subsp. *punctatum*. -Occasional along the trail between Sandy Cruz and Troy, near Down Gut above Wells Bay, on shady banks in moist forest at 500-600 m elevation, *Lellinger 2036* (U, US).

Distributed in the Antilles, Trinidad and Tobago, and Venezuela.

LITERATURE CITED

HODGE, W. 1990. Wildflower (Autumn 1990):34-39, 42.

KRAMER, K. U. 1962. Flora of the Netherlands Antilles, vol. I. Pteridophyta. Natuurw. Stud. Sur. Ned. Antill. 25:1-84.

PROCTOR, G. R. 1977. *Flora of the Lesser Antmes (Leeward and Windward Islands)*, vol. 2. Pteridophyta. Arnold Arboretum, Harvard University, Jamaica Plain, MA.

ROMEIJN, P. 1989. The forest of Saba. BOS NiEuWSLETTER 8(19):44-51.

