

A Photographic Field Guide to Epiphytic Vascular Plants on Dominica

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ABSTRACT

This photographic guide to the epiphytic, vascular plants on Dominica provides reference for 19 species from 6 families of the plant kingdom. A description of the epiphytic morphology and use is provided. The region of the island where each species is commonly found is also noted.

INTRODUCTION

Epiphytes are non-parasitic organisms that obtain support from host trees. They obtain water, minerals, and nutrients from the environment and not their host tree. These plants can grow at any height and on most surfaces of a tree. Vascular plants have specialized tissues called xylem, which is used for support and the passive transport of water, and phloem, which is used for active transport of nutrients. The roots of epiphytic plants have evolved to accommodate support and assimilation of water and nutrients from surfaces other than the ground.

Dominica is an island in the Caribbean that is a part of the Lesser Antilles. It consists of the following forest types: swamp forest, littoral woodland, dry scrub woodland, deciduous forest, rainforest proper, montane rainforest, and elfin woodland. The Springfield station is located in rainforest proper.

Epiphytes are a vital component of the island of Dominica. The amount of diversity and large biomass of epiphytes in tropical environments are essential for the existence of many species. Microhabitats support an array of canopy invertebrates. These microhabitats are created from dead organic matter that accumulates underneath the soil mats from the epiphytes (Nadkarni and Matelson, 1989). Identification of the vascular epiphytes can assist in understanding climatology processes, as well as factors affecting flora and fauna. They are keystone species that indicate the overall functionality of an ecosystem.

METHODS AND MATERIALS

Prior to our departure for Dominica, correspondence with the stations supervisor, Nancy Olser, was made to gain insight to the island's epiphytic life. Her assistance along with Dr. Kalan

Iykes, enabled us to format an identification sheet which included species of vascular epiphytes that were commonly found on the island.

Upon arrival to Archbold Tropical Research and Education Center, ATREC, we surveyed the station's surrounding areas (i.e. West trail, East trail, Check Hall River) for suitable climbing trees. Two fig trees (*Ficus insipida*) and a saman (*Samanea saman*) tree were climbed to gain access to the canopies vascular epiphytes.

The Sidewinder by Jeff Newman is an efficient tool that is essential in obtaining entry into the canopy. This giant slingshot extends to 10' and allows the climber to obtain a throw line over a designated branch high in the canopy. A slick line attached to an 8 oz throw bag is placed in the sling shot and shot over the designated branch. The line is then pulled back to the ground. Using a Cloves Hitch we attached our climbing rope to the throw line and pulled our ropes over the branch. Our initial ascent in each tree began with the "Yoyo" Single Rope Technique. We used the Double Rope Technique to traverse through the canopies which enabled us to photograph various epiphytic species and collect samples if needed. Unpredictable rain showers resulted in hazardous and complex climbing conditions. Collection of data via climbing was not entirely efficient due to a small time frame and large sampling area. Therefore a portion of our findings were collected on foot.

Data were collected at various sites on ATREC, Springfield Plantation. Both the east trail and west trail were observed and sampled. We explored approximately half a mile along the Check Hall River on the ATREC and photographed all vascular epiphytic life on trees close enough to access without climbing. We photographed the vascular epiphytes seen on our excursions to Middleham Falls, Cabrits National Park, Syndicate National Park, Elfin Woodland at Fresh Water Lake and Boeri Lake. Disturbed vegetation areas were excluded from this study in order to obtain data from natural conditions. Plant samples were taken of the epiphytes that were difficult to identify on location and presses were made.

Several sources were used to assist in identifying the vascular epiphytes. The identification charts designed previous to our arrival on Dominica were very beneficial to this process. The pictures usually resulted in immediate identification of a majority of species. Species were also identified using dichotomous keys from the Flora of Dominica Part 1:

Monocotyledoneae (Hodge, 1954) and Flora of Dominica Part 2: Dicotyledoneae (Nicolson, 1991). Further assistance in identification in the epiphytes is acknowledged at the end of the paper. The herbarium on ATREC created by Dr. Steven Hill of the Illinois Natural History Survey which contains a variety of Dominica's flora that aided us in our identification process as well.

Gear used for climbing and photo collection:

Climber 1 - digital camera, 200' climbing rope, Sidewinder (sling shot), 8oz throw bags, 180' throw line, Saddle (harness), CMI Ascenders, Petzl Grigri, Carabiners, CMI Pulley, Helmet, Tarp, Cambium/Rope Saver

Climber 2 – waterproof digital camcorder/camera, 150' arborist rope, Throw Ball, 200' Throw Line, New Tribe Work Saddle, CMI Texas System Ascenders, Petzl Grigri, Button Locking Carabiners, Screw Link, CMI Pulley, Army Pot (helmet), Lanyard, Cambium/Rope Saver

Additional gear- 100' measuring tape, binoculars

RESULTS

Family:	Species:	Location(s):
Araceae	<i>Anthurium acaule</i>	ATREC, Syndicate, Middleham
	<i>Anthurium grandifolium</i>	ATREC, Syndicate, Middleham
	<i>Anthurium palmatum cf.</i>	ATREC, Syndicate, Middleham
Begoniaceae	<i>Begonia oblique</i>	ATREC
Bromeliaceae	?	Trail to Middleham

	?	Freshwater lake
	<i>Guzmania plumeiri</i>	ATREC
	<i>Tillandsia utriculata</i>	ATREC
Cyclanthaceae	<i>Asplundia rigida</i>	Trails along ATREC, Syndicate, Boeri Lake, Freshwater Lake, Middleham Falls, Emerald Pool,
Rubiaceae	?	ATREC
	<i>Psychotria guadalupensis</i>	Syndicate
Piperaceae	<i>Peperomia emarginella</i>	Syndicate
	<i>Peperomia rotundifolia</i>	ATREC
	<i>Piper dussii</i>	ATREC
	<i>Piper dilatatum</i>	ATREC
	<i>Peperomia sp</i>	ATREC
	<i>Piper sp</i>	ATREC
	<i>Piper sp</i>	ATREC

Table 1. Listing of known and unknown vascular epiphytes and the location they were observed

Family Araceae

Species within the family Araceae are mainly non-woody and encompass a great deal of variation in leaf shape. The flowers are generally small compared to the leaves and have a leaf-like spathe. The spadices are large and many attract flies that are known to feed on dung or carrion because of the foul smell they give off. (68, Lack et al)



Anthurium acaule

Birds Nest Anthurium (common name) is one of the most abundant and largest of rosette epiphytes found on Dominica. (68, Lack et al)



Anthurium grandifolium

This is a common climber found in the rain forests all over the island of Dominica. It has large leaves at 50cm and a spadix of 30cm. (68, Lack et al)



Anthurium cf. palmatum

Family Begoniaceae

The begonias are a family well known as house plants, with asymmetric leaves, fleshy stems and inflorescences bearing male flowers with two large and two small petals and female flowers with a more conventional five. (23, Lack et al)



Begonia cf obliqua

Family Bromeliaceae

This family contains the most abundant of rosette epiphytes on Dominica. Identification is difficult due to the similarities among these rosettes. Flowering is frequent in March through September. Bromeliads are habitats for various species of arthropods and herpotofauna making them crucial to rain forest ecosystems. (70, Lack et al)



*Unknown bromeliad



Guzmania megastachya

This epiphyte is similar to *G. plumieri* but smaller. It contains tall inflorescences and is prevalent throughout the montane region. (70, Lack et al)



Guzmania plumeiri

This species is common in montane rain forest. It possesses 1m inflorescence containing red flowers. (70, Lack et al)



Tillandsia utriculata

This narrow-leafed bromeliad is the only common species of *Tillandsia*. It contains a light green flowering inflorescence reaching 1 m. (71, Lack et al)

Family Cyclanthaceae

These are the common palm-like climbing epiphytes found in rain forest domain. (Lack et al, 1997)



Asplundia rigida

This species of Cyclanthaceae is common in many of the regions we explored. Its distinctive fish like palm leaves grow along many heights of the trunk of the trees. Its abundance can be viewed in parts of the rainforest even in low lit areas. Its inflorescence is present during March-May. (71, Lack et al)

Family Piperaceae

These peppers are herbs and smallish green shrubs (not woody), with tiny greenish flowers borne in spike-like inflorescences. (54, Lack et al)



Peperomia sp (possibly *emarginella*)



Peperomia sp (possibly rotundifolia)



Piper dussii

This species is the most frequent species of Piperaceae seen in through out Dominica. It has large stipules, rectangular fruits, and leaves nearing 25cm. (54, Lack et al)



Piper dilatatum

Similar to Piper dussii but with smaller deciduous stipules and narrower fruit spikes each fruit maturing to a triangular shape giving the spike a spiral appearance. (54, Lack et al)



Peperomia sp



Piper sp



Piper sp

Family Rubiaceae

A large and important family consisting mostly of small trees and shrubs; in Dominica many are associated with clearings and gaps in rain forest. (56, Lack et al)



*Species unknown



Psychotria guadalupensis

DISCUSSION

Unpredictable rain showers resulted in hazardous and complex climbing conditions. A large sampling area and lack of time were additional conditions that led to climbing being inefficient for all data collection. However, climbing up into the canopy enabled us to view even more species of epiphytes. Diversity of epiphytic life was viewed throughout various parts of the island. Several species were found in multiple ecosystems on the island.

During our three week stay on the island of Dominica, we were able to document epiphytic plant species from 6 different families. Some of the species viewed were excluded from documentation because they were found in a terrestrial state. Through our observations we noted that the Piperaceae contained the most diversity of species through out the island. The most prevalent species of any epiphyte observe was *Asplundia rigida* in the family Cyclanthaceae. This palm-like epiphyte was abundant in nearly all the vegetation levels that we explored. All together, 19 species of vascular epiphytes with in 6 families were viewed. The families depicted above are as follows: Araceae, Begoniaceae, Bromeliaceae, Cyclanthaceae, Rubiaceae, and Piperaceae. Each family viewed plays a vital role in this island's natural processes.

CONCLUSION

The island of Dominica is an exceptional site to study epiphytic life. The assortment of different ecosystems and range of elevations allow for an abundance of biological diversity among the flora and fauna. Photographic documentation of Dominica's epiphytic life can be beneficial to many studies. Although the information provided is not extensive, it does however provide efficient identification to species that are commonly seen in many locations throughout the island. On a larger scale, epiphytes provide essential data that is beneficial to preservation practices. Epiphytic life is a magnificent contribution to the pristine island of Dominica.

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