

## **The E. W. Heier Teaching Greenhouse**

### **A Self Guided Tour - 3**

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*State University of New York*

### **Tropical & Carnivorous**



Stepping into the Tropical Room is like stepping into a mini-rainforest - vines and epiphytes (air plants) climb to the upper canopy, trees drape branches over the walks and the tallest reach towards the peak of the 25-foot glass roof. The 800 square foot in-ground plant bed displays tropical plants in a situation fairly close to natural. What are the morphological adaptations of many of these plants? How do these adaptations address the limitations of their environment?

Plants in the tropical rainforest compete for light. Note the many **Bromeliads** (**Bromeliaceae**) in pots on benches or perched as epiphytes in the branches of trees, such as the Banyon Tree (**Ficus benghalensis**) or the Common Fig Tree (**Ficus carica**). An **Allamanda** (Golden Trumpet) vine rises above the bench on the North wall and a **Bougainvillea** (Paper Flower) has pride of place in the Southeastern corner. Large leaves are found on many plants in the tropics. Bananas (genus **Musa**), with their large, elongated leaves, are scattered throughout, both in the plant bed and on the benches. Many ferns (**Pterophyta**) have adapted to the lower light levels of the tropical under

story, and different species are either terrestrial or epiphytic. Note the maidenhair ferns (**Adiantum**) and the holly ferns (**Cyrtomium**). What different kinds of microclimates exist in this zone? How are they established and what does this imply about the number of niches and resulting diversity of plant life and overall biodiversity found in the tropics?

The plants in the tropical room flourish in the high humidity provided by an automatic misting system built in at the west and north walls, where a plant propagation bench is located. Look for the screw pine (**Pandanus**) in the southeastern corner of the planting bed. Pandanus requires constant moisture and heat and is native to the Old World Tropics. Their long, spiny-margined leaves are used for thatching material. Note the positioning of the leaves in spiral crowns at the ends of the branches, which give rise to the plant's common name. Note also the prominent aerial prop roots. What are the possible benefits of prop roots to plants such as the **Pandanus** or **Ficus**? How does this adaptation relate to their environment?



Along the south-facing window hang numerous pots of tropical cacti. How are they similar to the desert cacti? Are they adapted to the same stresses and limitations as their family members living in desert climates? Phenotypically, they look very similar to desert cacti. Consider the stresses in terms of where they would be found growing naturally in the tropical canopy.

Now reverse your path and see if you notice any more adaptations and aspects of the evolutionary process that you may have missed the first time through the greenhouse. Bet

you will! What did you find most “artificial” about the greenhouse, in terms of a model for ecological zones?

Proceed into the main Greenhouse Hallway to view the terrarium just outside the Tropical Room door....

### **Carnivorous Plants – Greenhouse Hallway, Terrarium Display**

Carnivorous plants are sometimes called ‘insectivorous’ plants. Most are perennial herbs that inhabit very humid, boggy, sheltered but sunny, acidic environments. What is in short supply for these plants?

Our terrarium includes Venus Flytrap (**Dionaea muscipula**), sundews (**Drosera sp.**), Pitcher Plant (**Sarracenia sp.**) and Climbing Pitcher Plant (**Nepenthes sp.**). All of these plants have evolved unique mechanisms for trapping and digesting animal prey, primarily small insects, in order to obtain extra nitrogen. What plant part has evolved for this purpose? The plant traps are of various sorts, including the pit-falls of the pitcher plants, the sticky “fly-paper” of the sundews and butterworts, and the spring-loaded type action of the Venus flytrap. Carnivorous plants have a slow growth rate, so they are very suitable for existence in terrariums if the conditions mimic those of the bog.

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