



## Demo Station: Pitcher Plants



### Objectives

The amount of time a visitor spends with you at this station is ultimately up to him/her, and visitors may come and go in the midst of an activity. Therefore we cannot expect or require that every visitor comes away with the same knowledge or experience. However, a given visitor could be expected to come away with some combination (though not *all*) of the following objectives:

After having participated in the pitcher plant exploration, the visitor can

- Discuss the functions of a pitcher plant leaf (photosynthesis as well as trapping and digesting insects).
- List characteristics of the pitcher plant's natural habitat, particularly the low nutrient content of bogs.
- Relate the characteristics of the bog environment to the adaptation for carnivory.
- Describe adaptations the pitcher plant has for attracting, trapping, and digesting insects, including:
  - Colors, patterns, scents, and nectar attract insects to the leaf opening;
  - Colors, patterns, scents, and hairs to disorient or direct an insect downwards.
  - Slippery edge at the opening of the leaf that causes insects to fall inside.
  - Digestive juices secreted from glands at the base of leaf, and reabsorbed with the insects' nutrients.
- Identify common insects found in dissected pitchers.
- Correctly use a dissecting microscope.
- Correctly locate hairs on the inside of the pitcher's leaf and identify their function.

### Materials

- Living pitcher plants
- Dried pitchers (about one per day)
- Scissors
- Pins and foam for mounting
- Probes, forceps, and Petri dishes for handling and observing insect carcasses
- Hand lenses
- Dissecting scope
- Videoscope



## Procedure

### Setting up the Demo Table

- The station should have a dissected, dried pitcher available. If you are the first facilitator of the day, you may have to prepare a new mount. To do this, obtain a dried pitcher leaf and cut it from edge to base. A scissors works well. If the pitcher has insects inside, pin the edges of the pitcher to the foam mount for displaying. Use the "Count the Corpses" exhibit as your guide. If the pitcher lacks a sufficient number of carcasses, use another pitcher if available. Either display the dissected pitcher on the demo table or keep it on the shelves to take out during the appropriate time in your facilitation.
- Place a living pitcher plant under the videoscope.
- Place a dissecting scope in an area where it can be used to view insect carcasses. You should have Petri dishes, forceps, and probes available: during the exploration you or the visitor can carefully move individual pieces of insect from the pitcher to the Petri dish to place under the scope.

### Facilitating the Station

Your presentation will vary based on a variety of factors, but you can use the following as guidelines:

- You may want to start a conversation by asking the visitor either "What do you notice about this plant?" or "what do you know about this plant already?" You can use their answers to focus the direction of the conversation (such as in "Tips and Tricks" below).
- Depending on time, you may wish to focus on one or both of the following areas:
  - *The dissection reveals carcasses of digested insects.* Ask the visitors to predict what they might see inside the leaf based upon what they know about the plant. Next, show them the dissected dried pitcher. Ask "What do you see? Did you expect to see that? What is different or similar to what you expected?" You can next encourage the visitor to figure out what kinds of insects the pitcher trapped. The visitor may use the probe to carefully root through the leaf's contents. Try asking, "What insects do you see? What is left of the insect? What parts of insects do you see?" Either you or the visitor can carefully use forceps to transfer pieces to the Petri dish to place under the dissecting scope for closer viewing.
  - *The living plant attracts and traps insects with special adaptations.* You or the visitor can use the videoscope to examine the living pitcher plant. Try asking "What might make an insect attracted to



this plant. If it eats insects, what could make an insect want to come near it?" Allow time, but if visitors need more guidance, ask them what they notice about colors, patterns, shapes, even nectar. Use the videoscope to focus on the edge of the leaf and the inner surfaces, focusing on the slippery ledge, sticky nectar, and the hairs. Ask visitors to predict what might happen to an insect that is so attracted to the plant that it lands on the leaf or moves inside. Next ask "What do you see at the base of the leaf? Can you predict what the water is for? How do you know?" Have a discussion about digestion and absorption of nutrients.

- Much of the facilitation of this station will involve fielding visitor questions. People are often very curious about these unique plants. Some questions may necessitate direct answers, but try encouraging the visitor to make his/her own conclusions when possible and as time permits. You can respond to questions with your own, such as "How might we find that out?" or "What do you think about that?"

### **Tips and tricks**

- Use open-ended questions, but don't play "guess what I'm thinking". To help the visitor discover the functions of the hairs on the inner leaf surface, for instance, you might try asking "Can you predict the function of these?" and follow up with "What makes you say that?", continuing to facilitate based upon the responses. If the visitor is way off base, you still have the opportunity to understand where the answer comes from. You can bring the conversation back in the right direction by saying something like "that is a good conclusion, it makes sense. The other way to look at it is \_\_\_\_\_, and in fact that is what scientists think the function is."
- Open-ended questions can be used even if you would like the direct the learning towards a particular objective. The process would vary for each visitor, but for instance, to help the visitor learn that the leaf still undergoes photosynthesis, you may ask
  - "Tell me about the colors you see."
  - "How do these colors compare to other leaves?"
  - "What do you know about the colors of leaves?"
  - "What could we guess about the colors in this leaf?"

You can then follow up by using some of the information the visitor provided with facts you supply about the plant. For example you may say, "You noticed that the leaf was green and you know that other green leaves make food. In fact, this leaf also makes its own food. It



- eats the insects to get the important nutrients that many other plants would just take from the soil.”
- Encourage the visitors to explore the other exhibits about carnivorous plants. If they have already visited those exhibits, encourage them to draw upon the information they have already learned.
  - There are many options; be flexible to allow the process to vary based on time, size of the group, visitor interest, etc. Challenge yourself as a facilitator to try new directions. Share “notes” with other facilitators.