Wandering the Woods with Matt

Beadtongues (genus *Penstemon*)

A carnivorous plant?!

Observed 6/15/20 at Glen Run Nature Preserve (and Matt's backyard)

Carnivorous plants in the garden?

This observation is about a fascinating plant-insect interaction that I just learned about last week.

With more than 250 species*, Penstemon*, known as beardtongues, is the largest genus of flowering plants endemic to North America. A few species range into Mexico, but the species of this genus are mostly found in the US and Canada.
The species have showy, tube-shaped flowers and are popular cultivated plants used in landscaping.

Six species can be found in Pennsylvania, including *Penstemon digitalis* (tall white beardtongue), which I photographed recently at Glen Run Nature Preserve. It is still in flower now – right by the sign kiosk near the parking lot – go check it out!

I have a different species of *Penstemon, (P. calycosus)* growing in a native plant patch in my backyard and I took a close look at it one evening last week. The flowers, sepals, pedicels and peduncles are all thickly covered with sticky hairs. I took a yet closer look and saw that many tiny insects appeared to be trapped in these hairs. Some were visibly struggling to get free while others were stuck so tightly they couldn't wiggle.
I've been looking at *Penstemo*n for at least 10 years and I never noticed this before?

Hmm, I thought to myself – that looks a lot like carnivorous behavior, but I'm used to carnivorous plants being a small group of highly specialized plants found in bogs – sundews, pitcher plants and bladderworts. I also saw lots of ants cruising the plant – maybe this was a way for the plant to attract ant defenders by providing insect rewards? I asked my wife (a professor of evolutionary biology) what she thought and her suggestion was that the sticky hairs were probably a defense against insect herbivory.

Now I was thoroughly intrigued, so after a modest amount of google searching I discovered that someone had written an entire PhD dissertation on this topic. (The link to the abstract is here: https://www.ideals.illinois.edu/handle/2142/77627).

In her dissertation, the researcher considered both hypotheses (deterrence against herbivory as well as attracting ants) and rejected both. Furthermore, digestive enzymes were present in the sticky exudates and through radioactive tracing, the researcher was able to prove nutrient uptake directly from fruit flies caught on the sticky hairs.

Just a reminder that there is much to reward the careful observer!