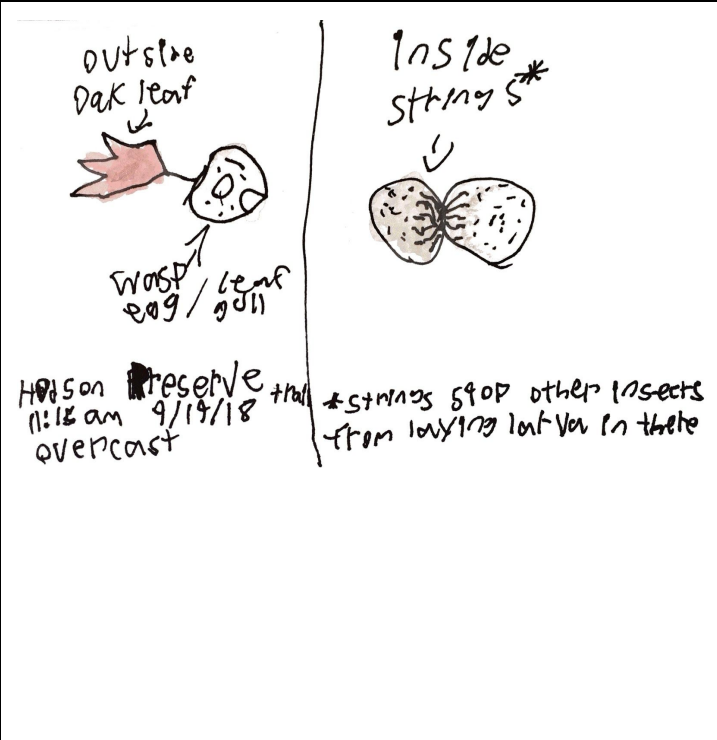
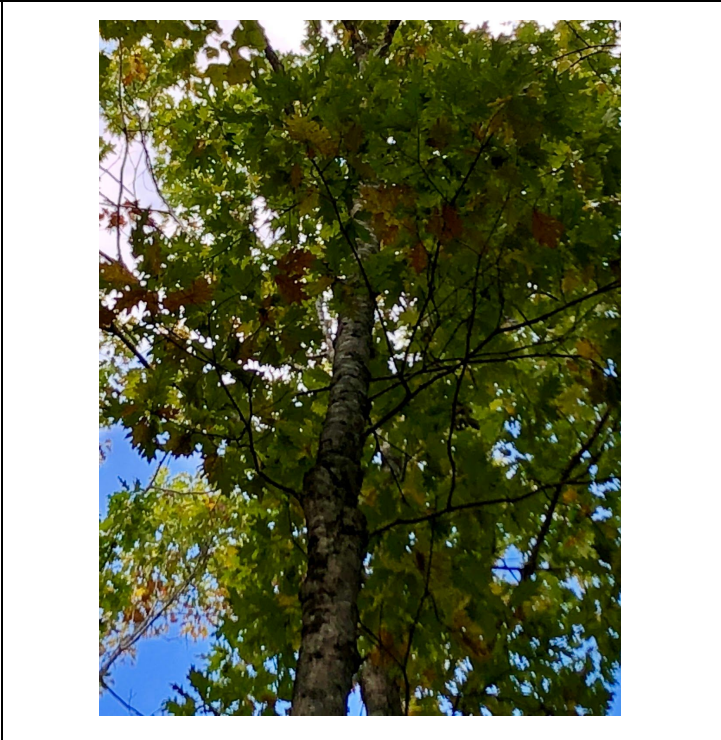


Blue
Gall Wasp and Scarlet Oak

Introduction: In science class we are learning about symbiosis, which according to the Merriam-Webster Dictionary is “the living together in more or less intimate association or close union of two dissimilar organisms” (merriam-webster.com). We went on a hike to identify some possible symbioses we could do for this project, and while we were nature journaling, I found what I would later know to be an “Oak Apple Gall” dead, on the ground. This sparked my interest in what galls are, and what creates them. It was round and kind of a grayish-brown, and drained of all life, it had these dark indents on the outside too. It looked normal on the inside, except for the web of string type hair web in the middle, that stops other insects from laying their larva in it.

Claim: I observed one organism of one species (Gall Wasp, *Cynipidae*) and a second organism of a different species (Scarlet Oak Tree, *Quercus Coccinea*) in a symbiotic relationship (Parasitism)

Evidence: This first photo shows the gall of a gall wasp, as we found it on our hike (at the Hodson Preserve), dead on the ground. It explains what the strings on the inside of the gall do, and provides a visual example of them. The second image shows a Scarlet Oak Tree, the most likely candidate for where the gall was imbedded.

	
<p>Image 1: A oak apple gall, found dead on the ground On 9/19/18 11:15 am, at the Hodson Preserve (Image by Author)</p>	<p>Image 2: A Scarlet Oak Tree at Hodson Preserve on 10/20/18 at 2:12 pm. (Image by Author)</p>

Reasoning: The images here show that both the Gall wasp (*Cynipidae*), and the Scarlet Oak Tree (*Quercus Coccinea*), have been found in the location observed. The 3rd image shows energy transfer through a ecosystem (see description below image).

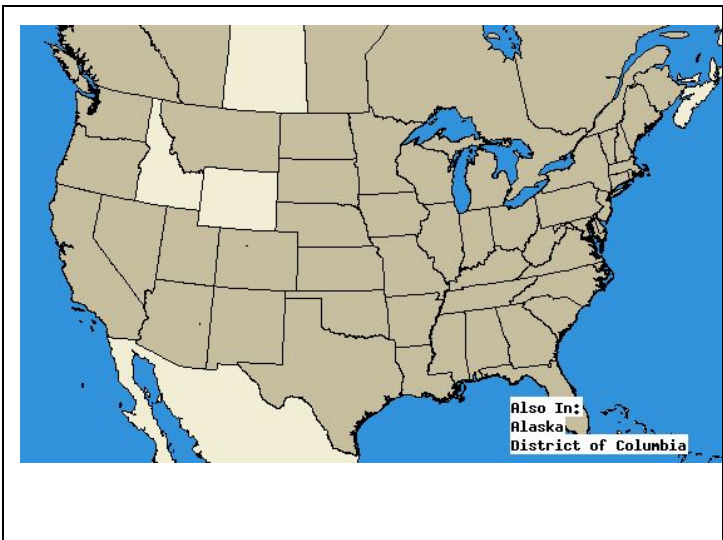


Image 3: Range of the Gall Wasp, which includes the location observed. (bugguide.net)



Image 4: Range of the Scarlet Oak, which includes the location observed. (en.m.wikipedia.org)

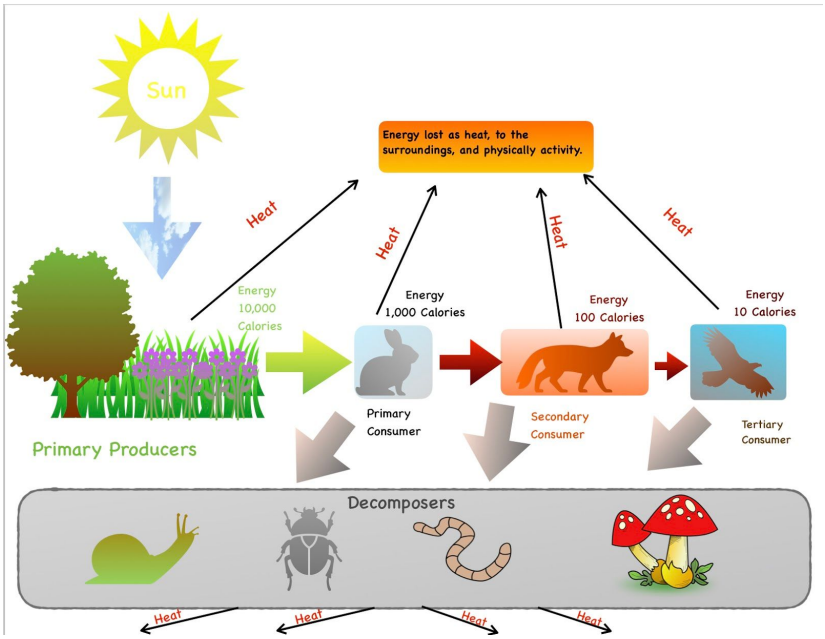


Image 5: This diagram shows the sun sending energy to the Producers like grass and other plants. These plants use photosynthesis (absorbing the energy from the sunlight instead of eating) to capture 10,000 calories of this energy. But then they are eaten by Primary Consumers, like bunnies and other small animals, giving 1,000 calories of energy to the Primary Consumers. Then these animals are eaten by the Secondary Consumers, like foxes and other medium sized animals, giving 100 calories of energy to the Secondary Consumers. These are then eaten by the Tertiary Consumers, like eagles and other big animals, giving 10 calories of energy to the Tertiary Consumers. But during this whole cycle these animals are losing energy by burning it off through exercise and other forms of energy use. And then when the animals die the energy is transferred to the decomposers, like worms, and parasites, when they consume its dead body. The decomposers then give off energy, in the form of over 120 degrees Fahrenheit, of heat.

Conclusion: In this paper I have shown, the symbiotic relationship between a Gall Wasp, and a Scarlet Oak Tree, which is parasitism (+ -) and that it is possible to observe this in Maine. This was an interesting symbiosis to study because, of the different way this wasp reproduces, and how it is only on a certain type of tree.

Works Cited:

Quote: <https://www.merriam-webster.com/dictionary/symbiosis>

Range Map 1: <https://bugguide.net/node/view/14878/data>

Range Map 2: https://en.m.wikipedia.org/wiki/Quercus_coccinea