



A Leaf Pack Analysis of Potash Brook

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Research Question:

Do aquatic macroinvertebrates show a preference for leaf type?

The creation of leaf packs allows for the exploration of the feeding habits of macroinvertebrates. It also demonstrates if macroinvertebrates show preference for a given location in the stream.

Hypothesis:

If macroinvertebrates are given the choice between witch hazel (*Hamamelis virginiana*), sugar maple (*Acer saccharum*), and faux leaves, then the most aquatic bugs will choose the sugar maple.

Variables:

The independent variables in the experiment were leaf type (witch hazel or sugar maple) and the position of the leaf packs in the stream (left bank, mid channel, or right bank). The faux foliage acts as a negative control assuming that plastic is not a suitable feeding option for macroinvertebrates.

The dependent variable in the experiment was the number of bugs found in each of the leaf packets.

The controlled variables were the weight of the leaf packets and the suet feeders.

Materials:

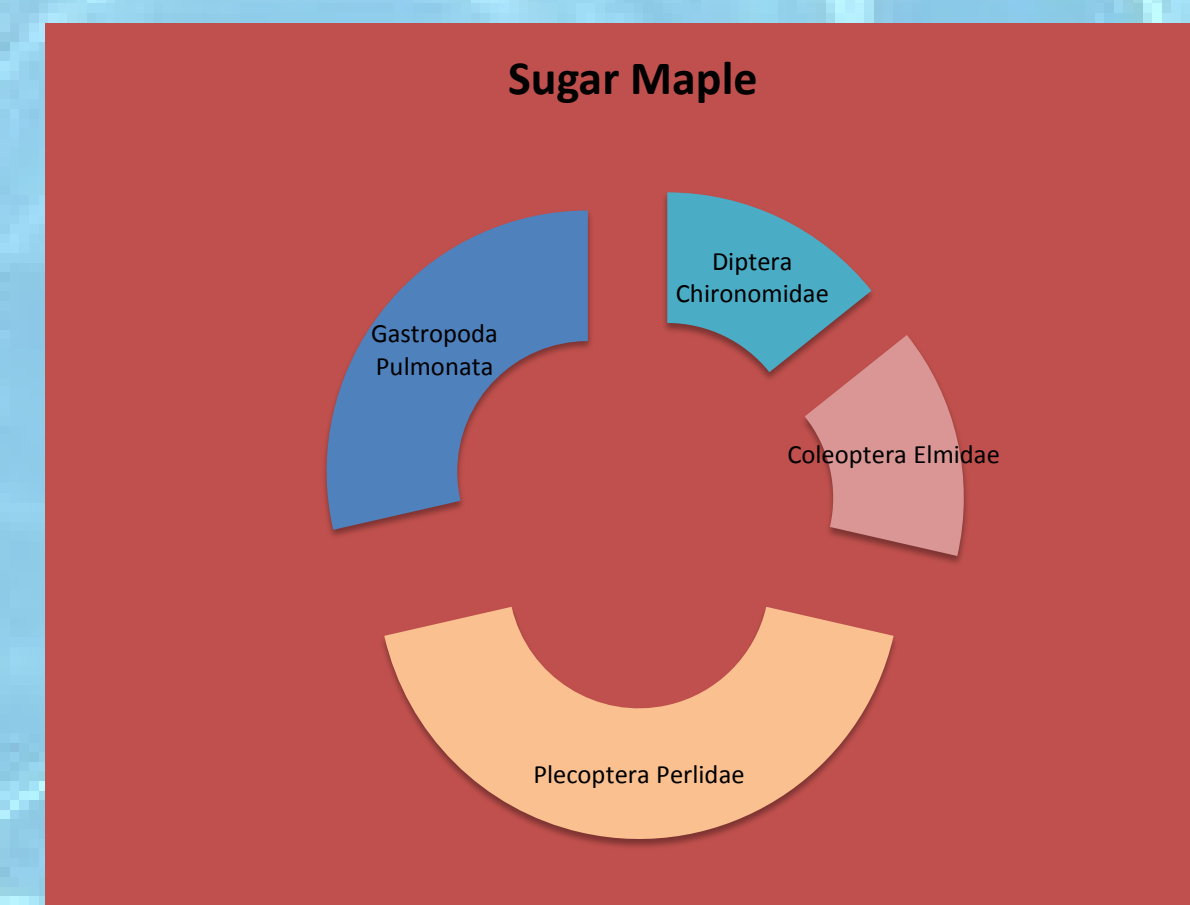
Suet feeders, witch hazel leaves, faux foliage, sugar maple leaves, rocks, scale, marker, sieve, ethanol, tweezers, zip ties, plastic bags, and lunch tray.

Procedure:

1. It was observed that the most common leaf types near Potash Brook were witch hazel and sugar maple leaves.
2. Leaves were collected from sugar maple and witch hazel trees. Faux maple leaves were purchased from Michael's and used as a negative control. About 6 grams of leaves were placed in each suet holder to make the leaf pack. There were three leaf packs for each leaf type, for a total of nine. A rock was included in each suet feeder to weigh it down.
3. Three leaf packs were zip tied together (with one of each type of leaf) and placed in the stream. One set of three was near the left bank of the stream, one near the right bank, and one in the middle of the stream.
4. The leaf packs stayed in the stream for approximately 3 weeks.
5. After collecting the leaf packs, the leaves were submerged in ethanol.
6. Later the leaves were removed from the ethanol, rinsed, sorted, and the macroinvertebrates were identified.

Results

Macroinvertebrates by leaf type						
Class	Order	Family	Common Name	Sugar Maple	Witch Hazel	Faux Foliage
Insecta	Diptera	Chironomidae	Midge	1	1	0
	Coleoptera	Elmidae	Riffle Beetle	1	0	0
	Coleoptera	Psephenidae	Water Penny	0	1	0
	Plecoptera	Perlidae	Stone Fly	3	2	0
Gastropoda	Gastropoda	Pulmonata	Snail	2	1	1
Totals				7	5	1



The leaf packs with actual leaves had macroinvertebrates, with the sugar maple having slightly more than the witch hazel. The five different species found in the various leaf packs were midges, riffle beetles, water pennies, stone flies, and snails. Only one snail was found in the faux foliage.

Analysis:

From the results it would appear that the preferred leaves were the sugar maples. However, some of the species that were found in the leaf packs were not exclusively herbivores. This might mean that they have been simply caught in the leaf packs or used the leaves as shelter, instead of a source of food. Midges and stone flies tend to prey on small invertebrates, but may also eat algae and other vegetation. Water pennies feed on algae or vegetation that grows on objects in the river; riffle beetles tend to feed on wood and decaying vegetable materials. This would indicate that the most likely macros to be actually feeding on the leaf packs would be the riffle beetles. The stone flies and water pennies may have been feeding on algae that was growing on the leaves.

It is interesting that snails were found in all three leaf packs which indicates that they may have been using it as shelter.

It seems that the macros had no preference for a particular location of the stream, and were found in approximately equal numbers in each location.

Future studies would include lengthening the time that the leaf packs were submerged, and possibly including other species of leaves. A larger sample size would help to verify the data as well.



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