Biodiversity of Fungi

EMPACTS Project

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Biodiversity

What is Biodiversity?

- Biodiversity is the measurement of the diversity, or variety, of life, such as microorganisms, animals, plants, and fungi, in genetics, organisms, ecosystems or the whole planet.

Why is biodiversity important?

- Biodiversity is important for all life. Life is a system of networks that work in synergy to support and maintain life. Each individual species on earth contributes to the support and maintenance of life in its own unique way. Without biodiversity, all life would fail to exist. Life relies on the support provided by each individual, species and community by helping provide things such as food, clean water, medicine, habitats and other support that helps regulate life.

How is it measured?

- The Shannon Index:

This is one equation that is used to measure species richness, and species evenness in an area or quadrant of land. Species richness is typically the number of species in an area while species evenness is the number of groups or genetically similar individuals.

Biodiversity of Fungi

What are fungi?

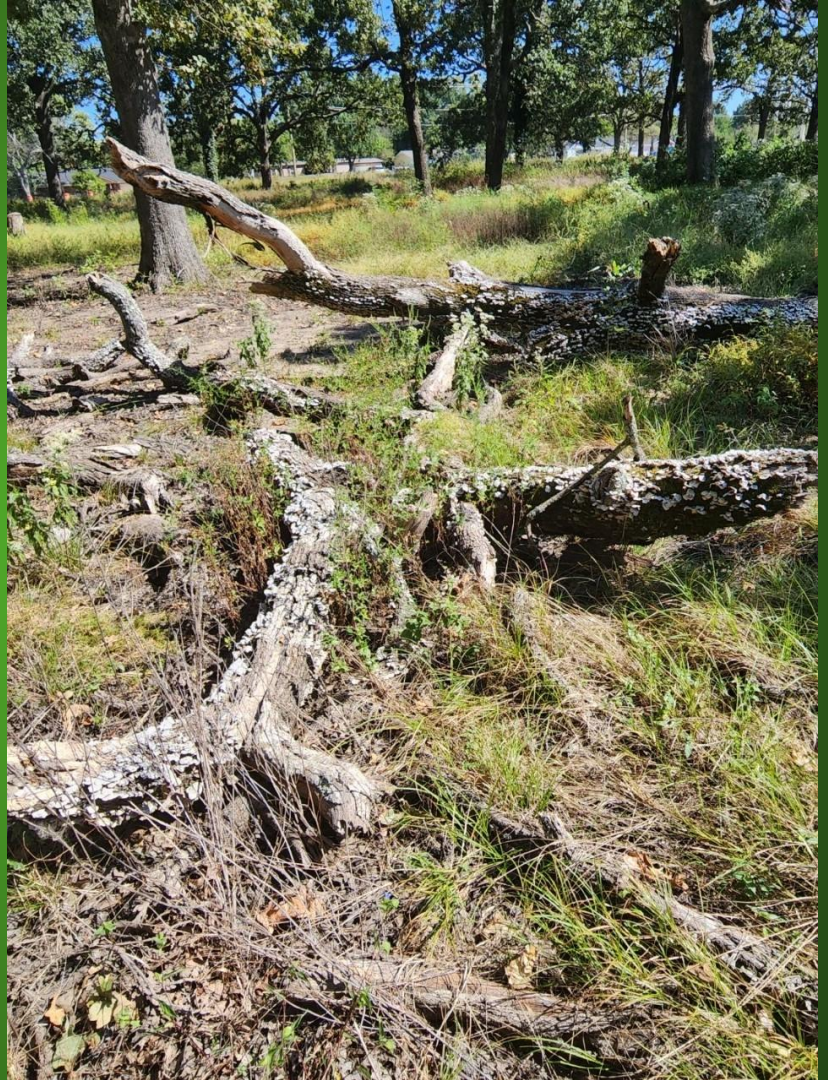
- Fungi are heterotrophic eukaryotic organisms.

Why is the diversity of fungi important?

- Fungi, as decomposers, have the ability to break down plant and animal debris making nutrients available for plants.

Why is fungi relevant?

- Without fungi, dead and decaying organic matter would pile up rapidly and nutrients would not recycle through the food webs.



Methodology

- Biodiversity of Fungi was measured in the outdoor living lab behind Northwest Arkansas Community College.
- The transect of land used to collect the data was 3,000 meters squared.
- Data was collected by counting and recording all the different types of fungi in the area.
- The “seek” app helped to identify the different fungi species found.
- By measuring the fungi population in the transect, we were able to estimate the richness and evenness, and calculate the biodiversity of the outdoor learning lab as a whole.

Map of Outdoor Living Laboratory

The Shannon Index

- *The Shannon Diversity Index*: measures the diversity of species in a community.
- Formula: $H = -\Sigma p_i * ln(p_i)$
- The higher the value of *H*, the higher the diversity of species in a particular community. The lower the value of *H*, the lower the diversity. A value of *H* = 0 indicates a community that only has one species.

- *The Shannon Evenness Index:* measures the evenness of species in a community. "Evenness" refers to how similar the abundances of different species are in the community.
- Formula: $E_H = H / ln(S)$ (Shannon Diverstiy Index divided by the total of unique species)
- The measurement ranges from 0 to 1, where 1 indicates complete evenness.

Data Results and Summary :

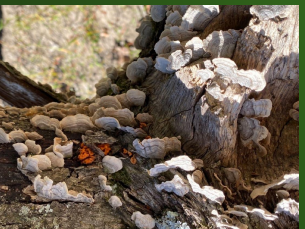
- During our exploration, we discovered seven different types of fungus in a 3,000 meters squared transect.

The species of fungi discovered

- Trametes: 12
- Yellow Wig Gall Waspy: 9
- Crowded Parchment: 1
- Golden Ear: 1
- Agaricomyetes: 3
- Bracket: 3
- Golden Reishi: 1

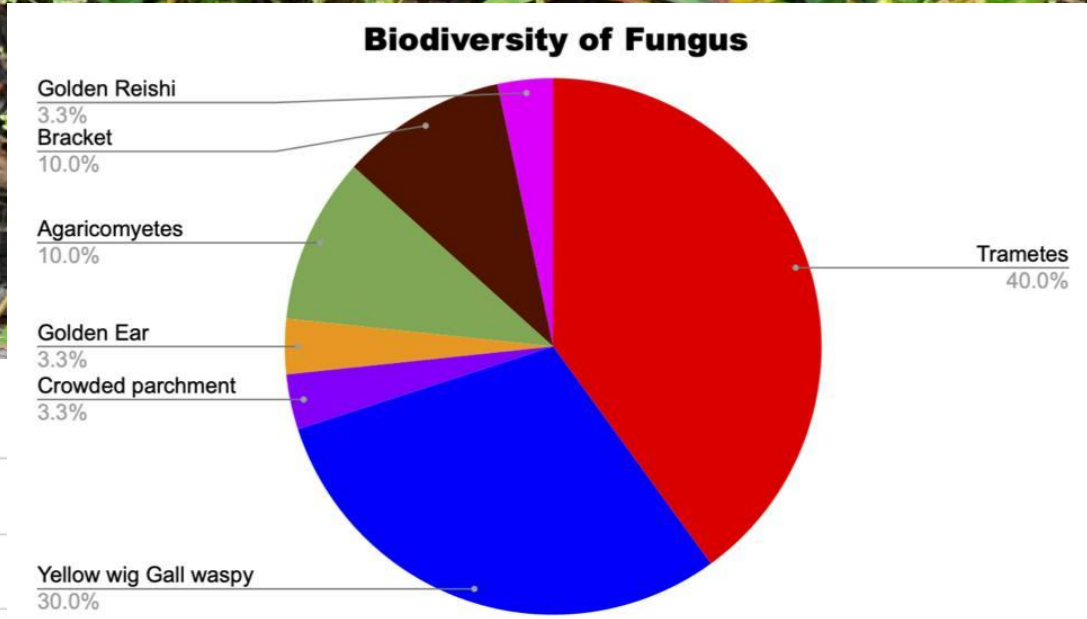
The Shannon Index:

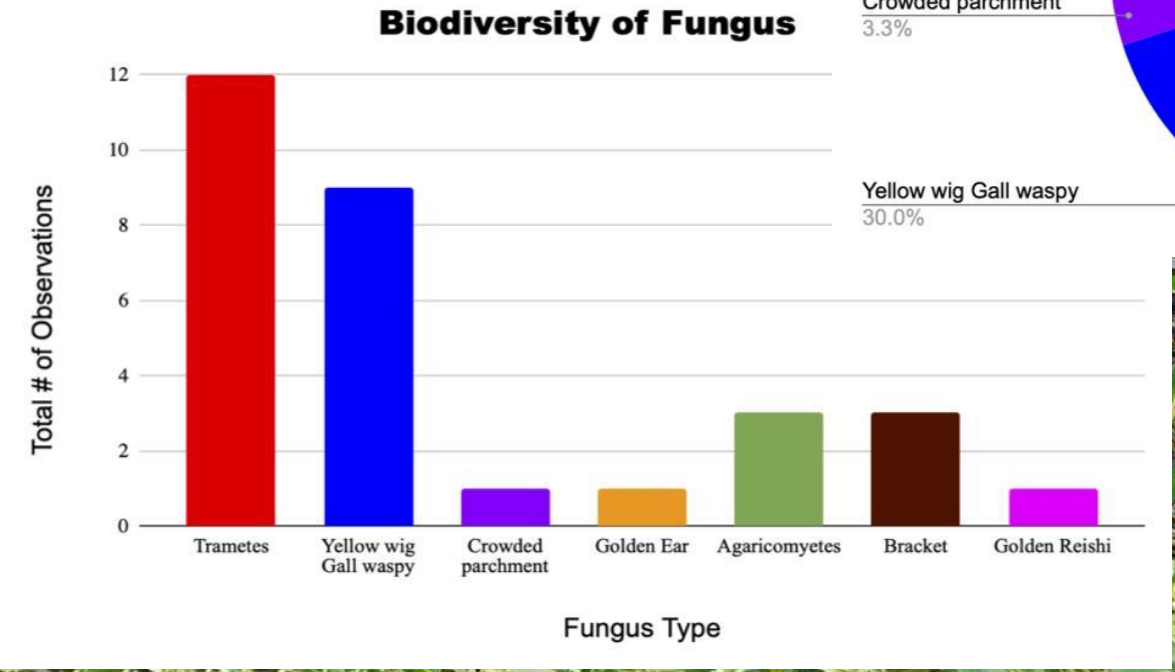
- The Shannon Diversity Index is 0.785 on a scale from zero to one.
- The Shannon Evenness Index is .4034.
- The Fungi in the measured transect are diverse and rich, but the fungi in the transect are not even.




Fungi

Biodiversity of Fungi Results:

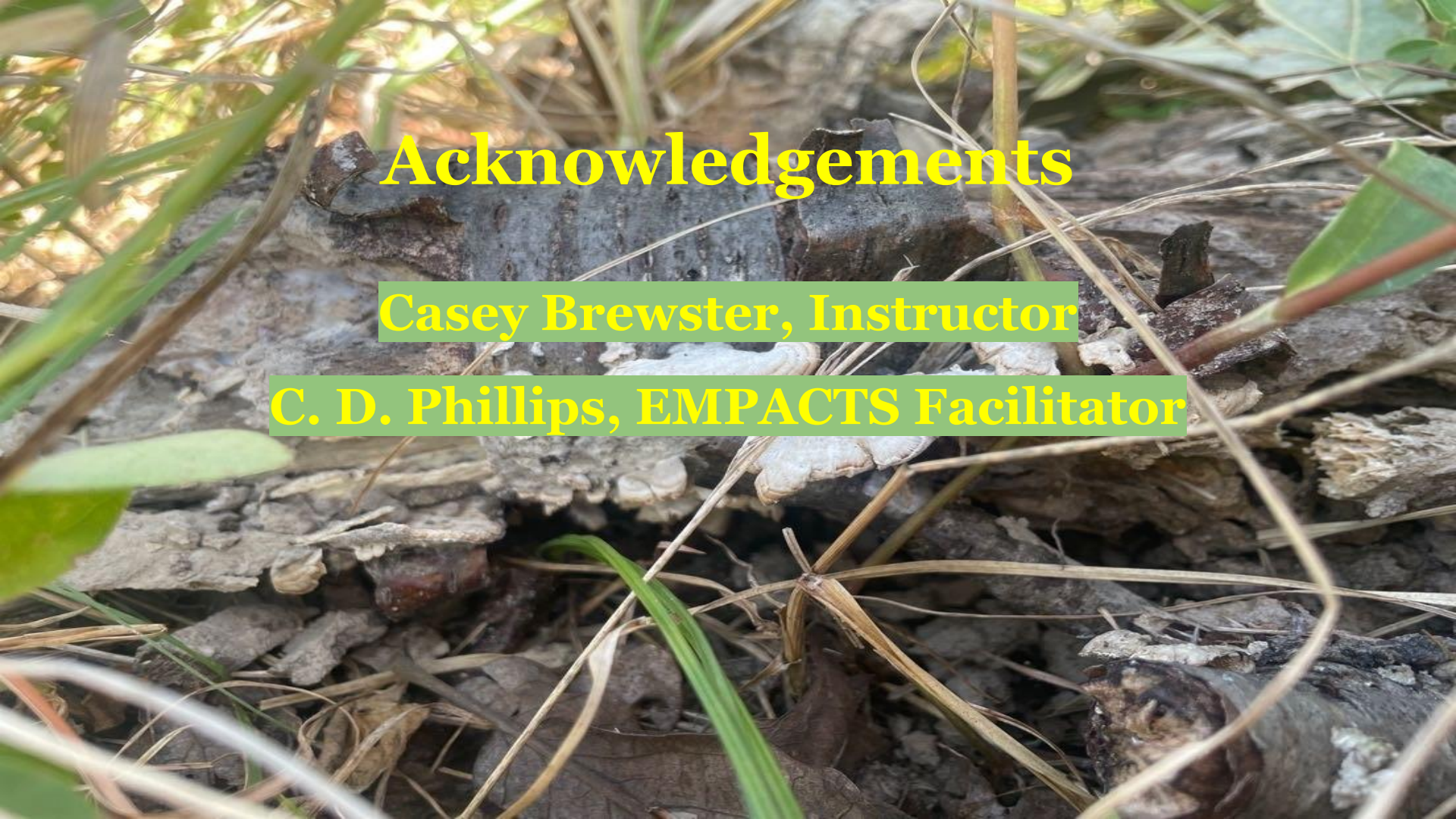




	Transect #					A	P	H	J
#	Distance (m) or Observation #	Species ID# (A-Z)	Species Common Name	Total	Species ID# (A-Z)	Total # of observations (# ***Obs***) each species	Proportion of each species (*P*) = A/ (∑*A*)	(**–*LN (P)*P**)	
1	1		Trametes		A	12	0.4	0.367	
2	2		Yellow wig Gall waspy		B	9	0.3	0.361	
3	3		Crowded parchment		C	1	0.03333333333	0.113	
4	4		Golden Ear		D	1	0.03333333333	0.113	
5	5		Agaricomyeles		E	3	0.1	0.230	
6	11		Bracket		F	3	0.1	0.230	
7	13		Golden Reishi		G	1	0.03333333333	0.113	
8	15				H				
9	17				I				
10	19				J				
11	21				K				
12	23				L				
13	25				M				
14	27				N				
15	29				O				
16	31				P				
17	33				Q				
18	35				R				
19	37				S				
20	39				T				
21	41				U				
22	43				V				
23	45				W				
24	47				X				
25	49				Y				
26	51				Z				
					∑*R*	(∑*A*)	(∑*P*) this should = 1	(∑*H*)	(∑H) / ln(S)
					7	30	1	1.528	0.785

Team Members

- Amelia Hladick: Project Proposal
- Ella Young: Project Summary
- Alondra Castaneda: Graphs
- Evelyn Diaz: Powerpoint creation
- Johnny Barrera: Powerpoint Edits
- Ryker Bowman: Project Map



Acknowledgements

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Citations

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