

Characterization of Squamate Microbiomes



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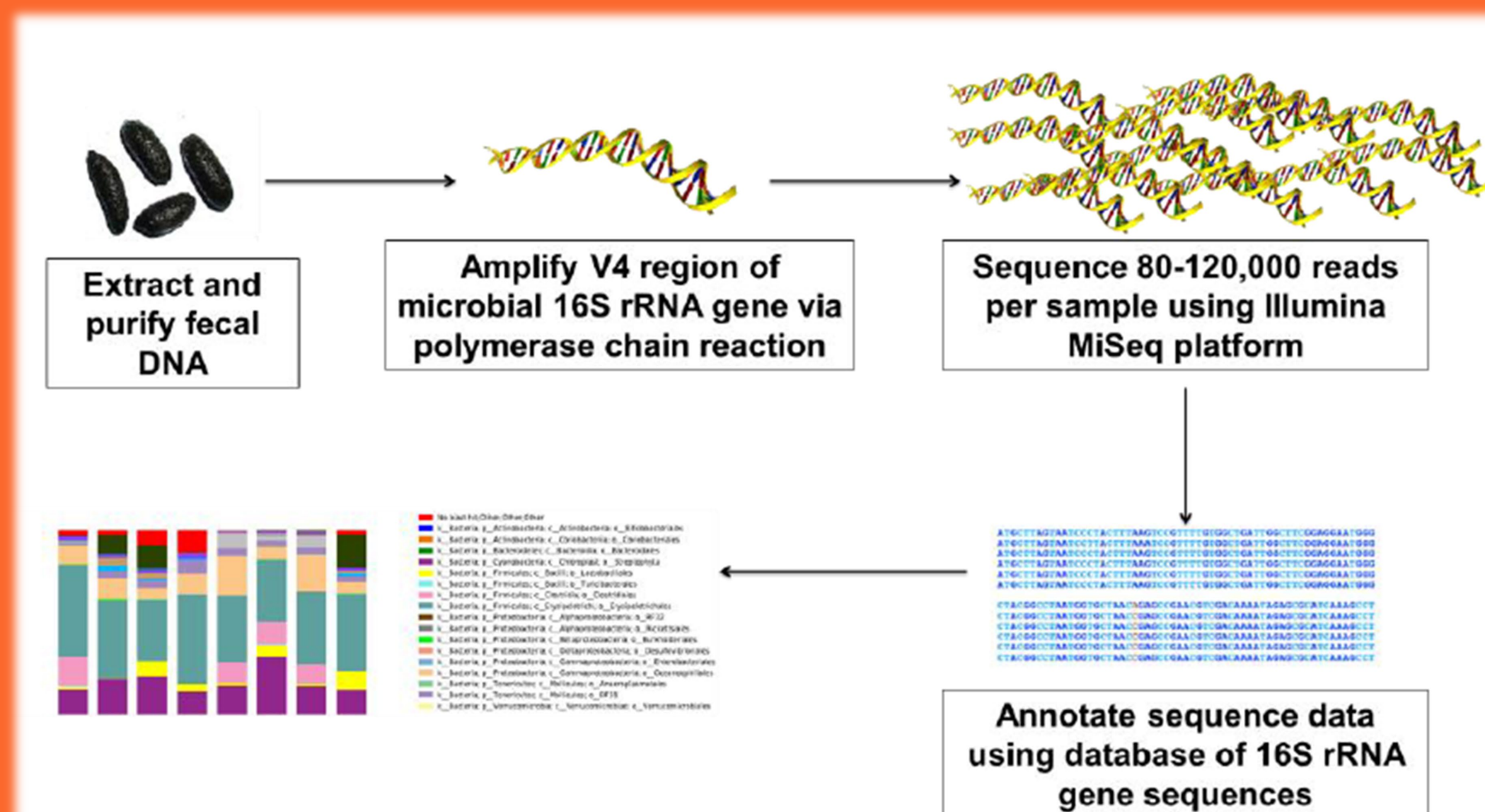


Background

- Microbiome research has expanded the role of microbes in health and disease beyond classical roles of aiding in digestion, immune system development & pathogen defense.
- Only 2 papers have investigated the intestinal microbiome on snakes (McLaughlin et. Al 2015, Qin et. Al, 2019).
- All medicines used for snakes are off label .
- Snake's feces is representative of their health status.



Microbiome Analysis Pipeline



Results

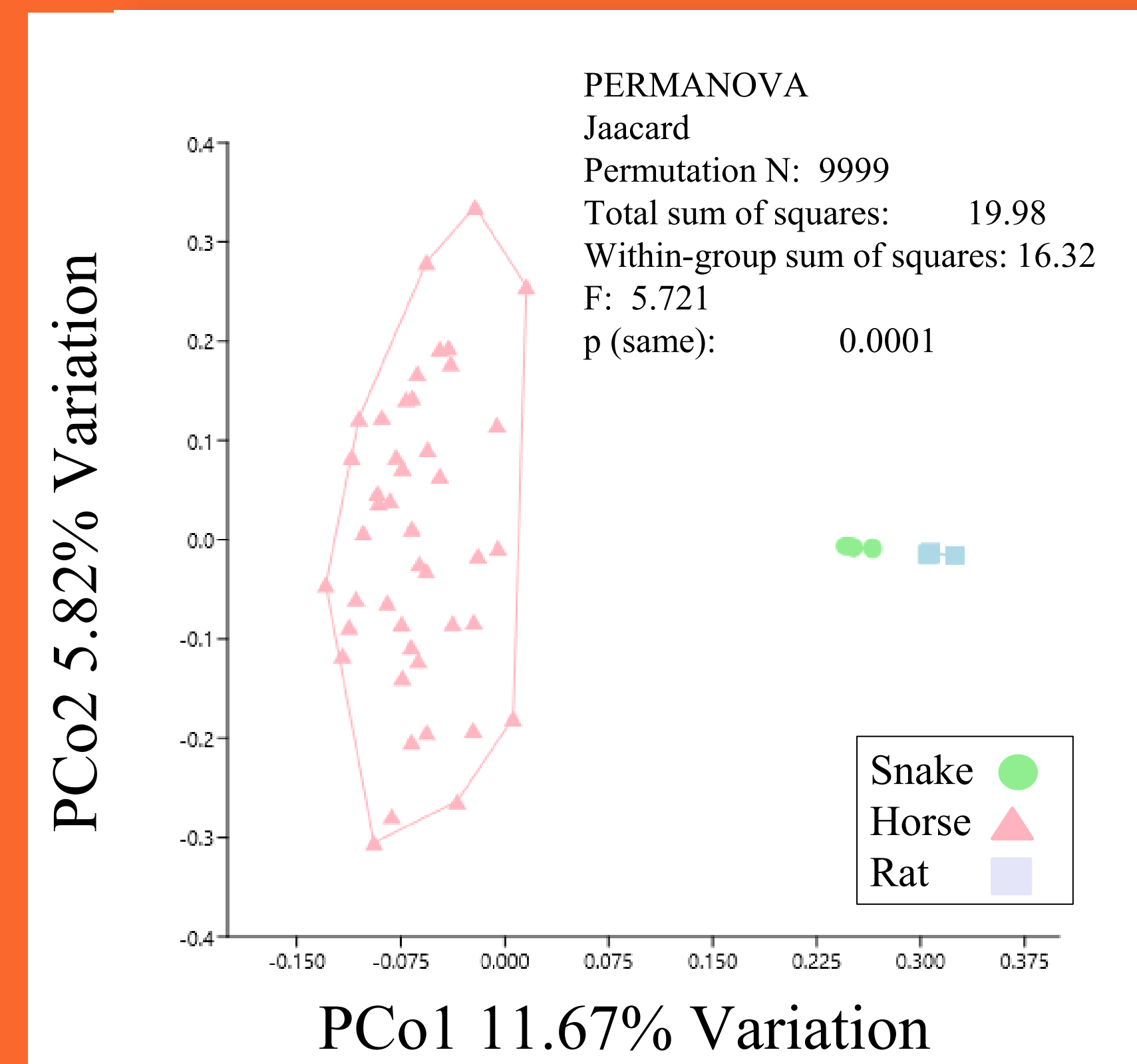


Figure 1: PCoA of 6 snakes, 4 rats, and 44 horses showing a significant difference between species

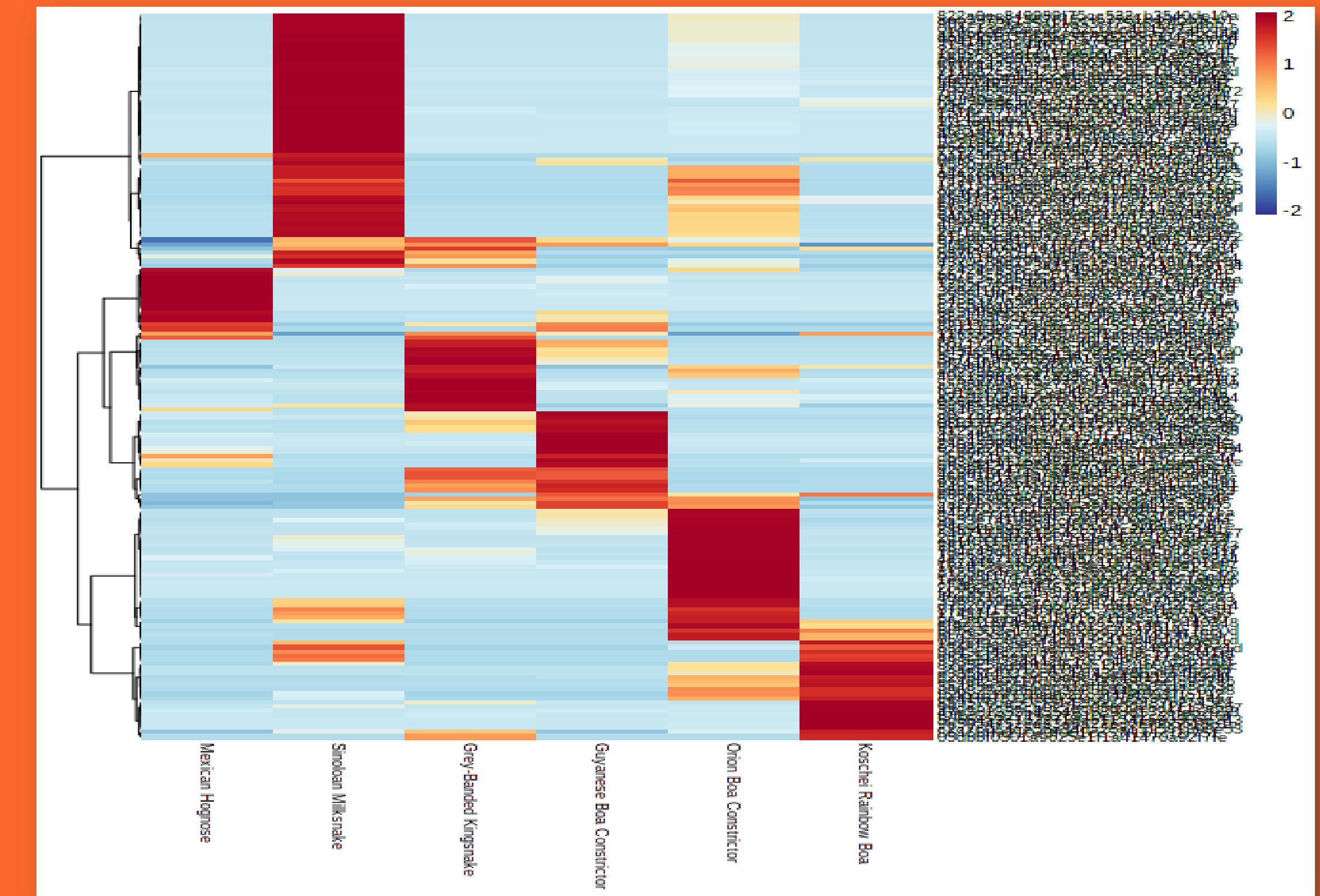


Figure 2: Heatmap of the 6 snake samples collected showing marked variation in amplicon sequence variants (ASVs) of snake fecal samples

Metadata Example

	A	B	C	D	E	F	G	H	I	J	K
1	Subject	Species	Age	Sex	Environment	Food	Health Status	Sample Status	Date	Time of collection	Time since last fecal
2	Ex: BR452	Black Rat: <i>P. Osboletus</i>	2	F	Tub with paper	Frozen rat	Healthy, aggressive	Firm	2/2/2022	1:21 PM	4 days

Conclusions

- Significant differences in microbiome composition were found when comparing snake samples to two other species.
- As expected, snake samples showed marked variation in microbiome composition.
- Six institutions have agreed to participate in this project, and we are in discussion with another 35 institutions.

Future Directions

- Additional sample analysis will allow for comparisons of different independent variables including species, environment and disease states.
- This information will serve as a baseline of snake fecal microbiome data that can be used for future development of therapeutic and preventative medicines.

Informatics and Statistics

- DNA sequences assembled with FLASH software
- Principal coordinate analyses and alpha-diversity determined with PAST software
- Differences assessed with ANOVA and PERMANOVA



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