



DETECTION OF SNAKE FUNGAL DISEASE IN AN EASTERN RATSNAKE (*PANTHEROPHIS ALLEGHANIENSIS*) IN PENNSYLVANIA

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Introduction

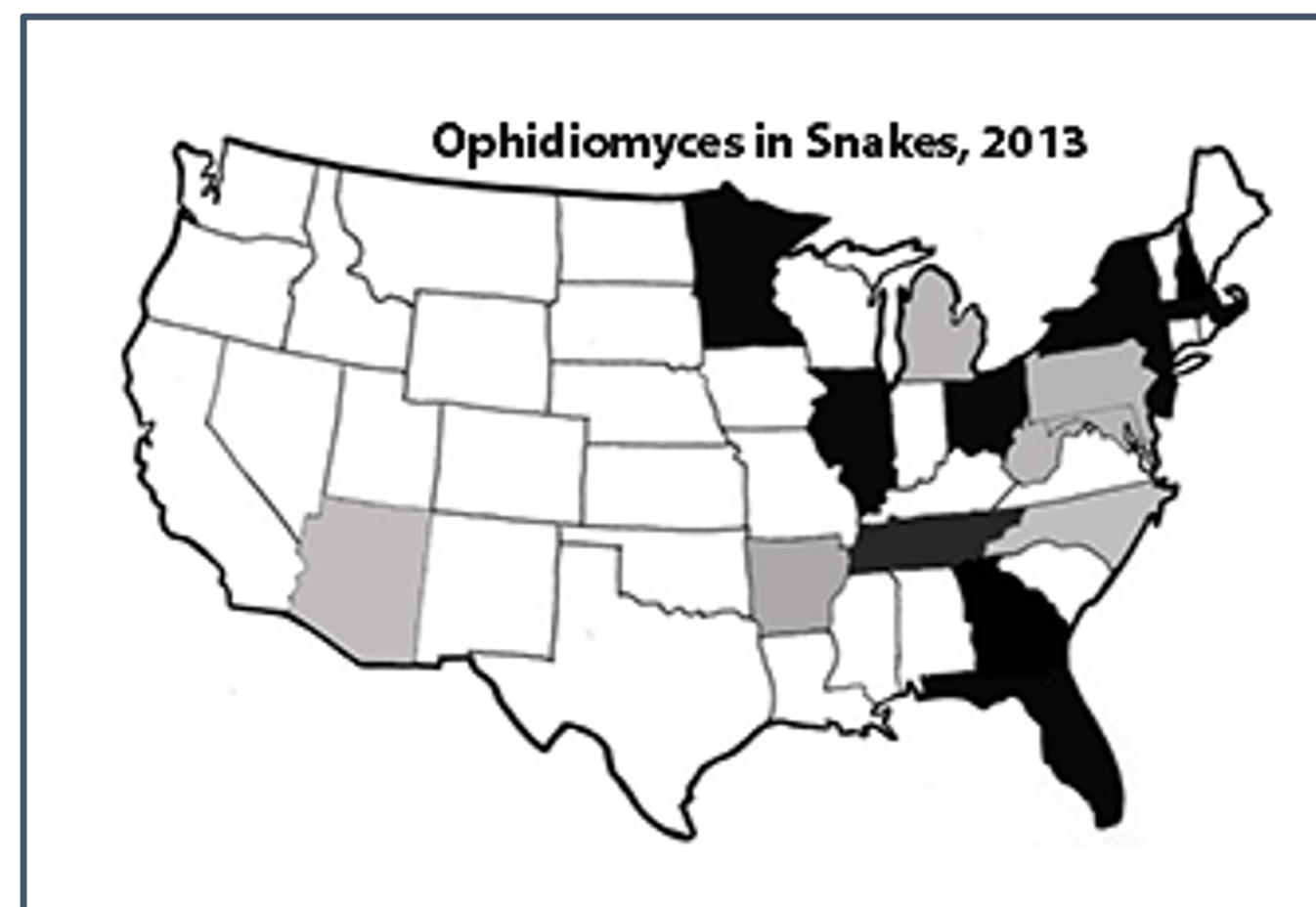
Ophidiomyces ophiodiicola is a fungus found in snakes that's been shown to lead to Snake Fungal Disease (SFD), one of emerging infectious diseases

- SFD was first observed in 2006, with the first confirmed case coming from Illinois in 2008
- SFD has been linked with widespread morbidity in various snake species within the US
- Species distributed in PA such as timber rattlesnakes (*Crotalus horridus*), eastern massasauga rattlesnakes (*Sistrurus catenatus*), eastern ratsnakes (*Pantherophis alleghaniensis*), and northern water snakes (*Nerodia s. sipedon*) have been found to be impacted by SFD
- Crusty scales, scabs, skin swelling, and ocular cloudiness are often symptoms of SFD
- Emergence and impact of other fungus related infectious diseases in the US (white nose, *Bd*) make studying SFD a priority

Objectives

1) Use molecular assay to assess prevalence of *O. ophiodiicola* among snakes in PA

- Neighboring states such as NY, NJ, and OH have had confirmed cases of SFD



States highlighted black have had confirmed cases of SFD, states highlighted gray are suspected to have SFD present. Credit to Illinois Wildlife Epidemiology Lab.

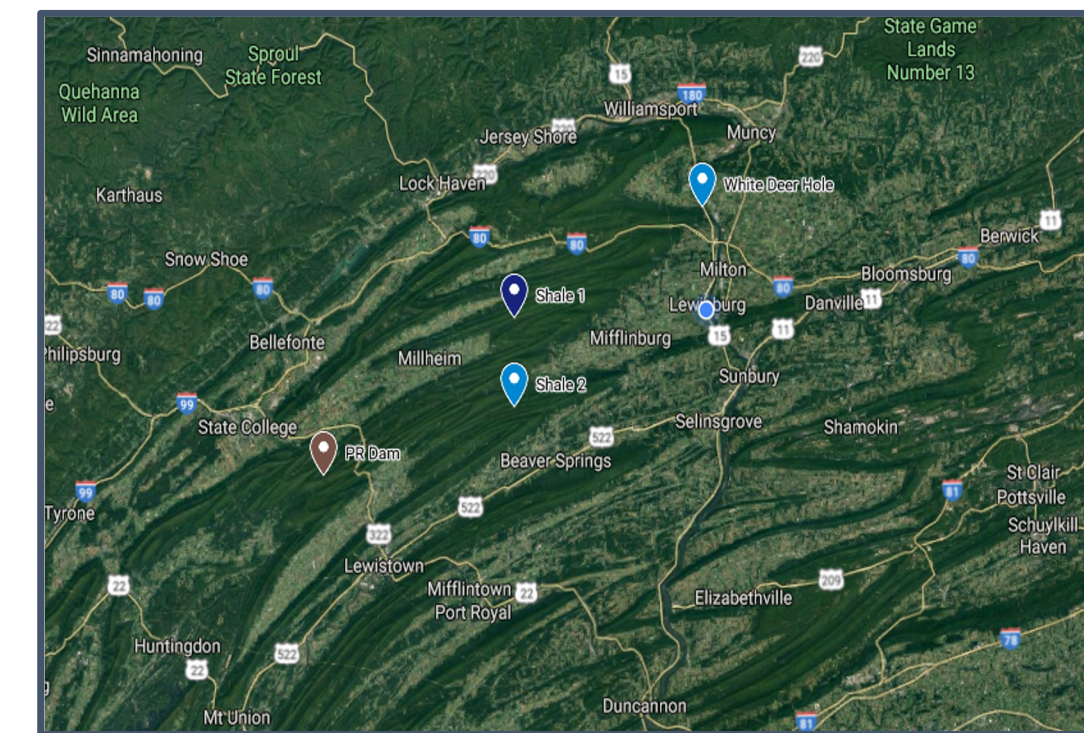
Methods

Field Methods

- All snakes were wild caught during the summer of 2018 and examined by Mizuki Takahashi and I
- Snakes were swabbed and samples were brought back to the lab at Bucknell University for testing
- 7 snakes swabbed in total to date
- All sampling was in accordance and approved by IACUC and PA Fish and Boat Commission



Example of swab sampling



Map of sampling sites



Unhealthy scales on a deceased eastern ratsnake, likely due to SFD



Crusty nasal scales and ocular cloudiness both present on a deceased eastern ratsnake, likely due to SFD

Lab Methods

- DNA extraction was performed using QIAGEN DNeasy kit (Allendar et al. 2015)
- PCR was performed using the protocols described in Allender et al. (2015) and Buhuski et al. (2015)
- PCR products were visualized following gel electrophoresis

Results

Preliminary analysis suggests that one snake was carrying *O. ophiodiicola*, and likely died due to SFD infection

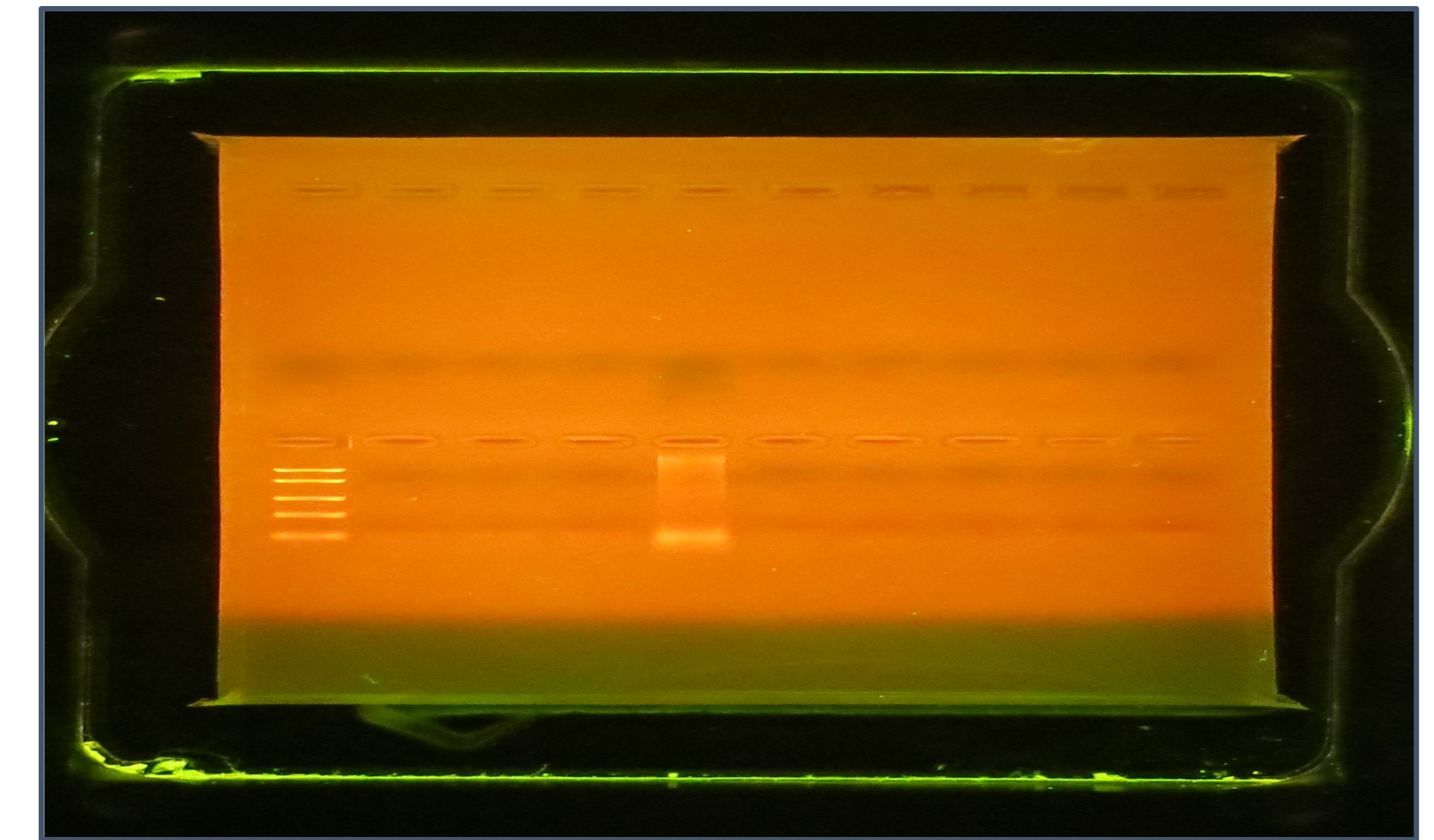


Image of the PCR gel showing 1 likely positive

| Common Name | Scientific Name | PCR Results |
|----------------------|---|-------------|
| Eastern Gartersnake | <i>Thamnophis sirtalis</i> | Negative |
| Eastern Milksnake | <i>Lampropeltis triangulum triangulum</i> | Negative |
| Eastern Ratsnake | <i>Pantherophis alleghaniensis</i> | Positive |
| Eastern Gartersnake | <i>Thamnophis sirtalis</i> | Negative |
| Eastern Ratsnake | <i>Pantherophis alleghaniensis</i> | Negative |
| Northern Water Snake | <i>Nerodia sipedon</i> | Negative |
| Eastern Gartersnake | <i>Thamnophis sirtalis</i> | Negative |

Table of all sampled snakes from the summer of 2018

Conclusions

Our preliminary PCR analysis suggests that there was one snake, eastern ratsnake, carrying *O. ophiodiicola*, and likely died due to SFD infection

- First confirmed case in the state of Pennsylvania

Obtaining a PCR positive from a deceased snake shows that SFD is potentially already taking a toll on PA snake populations

- This situation shows how important it is to learn more about SFD in PA in order to prevent major loss in certain snake populations

Future research is required in order to better understand SFD distribution and its impacts on snake populations in PA

- This study is still ongoing in the hopes of increasing the sample size, which may reveal more positive results
- Future studies should be conducted in PA, with emphasis on species such as eastern ratsnakes, northern water snakes, and the two rattlesnake species in the state (timber and eastern massasauga)

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