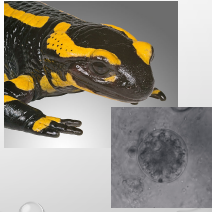


**BATRACHOCHYTRIUM
SALAMANDRIVORANS**

SHELBY VAZQUEZ
WFS 433

CHYTRID FUNGUS: BACKGROUND

- Chytrid- fungi in the order Chytridiales
- Usually a mild-mannered fungus that breaks down dead or decayed organic matter
- *B. dendrobatidis*- first "chytrid killer" of amphibians
- Now *B. salamandrivorans* is affecting salamanders.




<http://bama.ua.edu/~msfpeet/>

DISCOVERY

In 2010, volunteers were monitoring an amphibian population of fire salamanders when they returned with very few. The population has since declined by 96%. This was recognized as an indication of either a chemical spill or a disease outbreak.

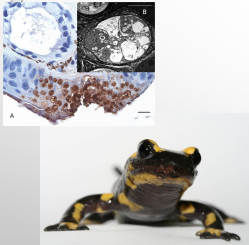
- Remaining 150 organisms kept
- Necropsies performed on dead
- Signs pointed to *B. dendrobatidis*
 - Fungus growth in skin lesions
 - BUT tested negative
 - → new species



Salamandra salamandra terrestris

Burke, K. L. (2015). New Disease Emerges as Threat to Salamanders. *American Scientist*, 103(1), 6-7.

BATRACHOCHYTRIUM SALAMANDRIVORANS- BS




- Asian species are more resilient, suggesting it originated in Asia
- Causes chytridiomycosis
- Kills by eating through salamanders' skin and exposing them to lethal bacterial infections.
- Kills within 12 days

MILLIUS, S. (2014). Asian fungus threatens salamanders. *Science News*, 186(11), 6.

Bd and Bs initially looked very similar, but there are differences such as:

- Amphibians affected: Bs only affects salamander species. When tested on the midwife toad (*Alytes obstetricans*) it had no effect, even though this species is known to be susceptible to Bd.
- Optimal growth temperature:
Bs: 10-15 C Bd: 17-25 C



Bales, E. K., Hyman, O. J., Loudon, A. H., Harris, R. N., Lipps, G., Chapman, E., & ... Terrell, K. A. (2015). Pathogenic Chytrid Fungus *Batrachochytrium dendrobatidis*, but Not *B. salamandrivorans*, Detected on Eastern Hellbenders. *PLoS ONE*, 10(2), 1-9. doi:10.1371/journal.pone.0116405

BATRACHOCHYTRIUM SALAMANDRIVORANS- BS

35 amphibian species were picked to be tested against the fungus.




- Frogs, toads, and caecilians were unaffected.
- It killed 41/44 salamander individuals tested from the Western temperate zones.
- Again- the Asian salamander species were found to be quite resilient.

MILLIUS, S. (2014). Asian fungus threatens salamanders. *Science News*, 186(11), 6.
Wei, Z., Feng, X., Changming, B., Xuan, L., Supen, W., Xu, G., & ... Yiming, L. (2014). A survey for *Batrachochytrium salamandrivorans* in Chinese amphibians. *Current Zoology*, 60(6), 729-735.

DISTRIBUTION


As of 2014, *Bs* was only found on two of the four continents surveyed.

- Thailand, Vietnam, Japan- present but no dieoffs reported
- Netherlands- outbreak 2010- 2012
- Belgium- outbreak Dec. 2013



MILLIUS, S. (2014). Asian fungus threatens salamanders. *Science News*, 186(11), 6.

- If the disease continues at its current rate in 25-50 years all salamanders in Europe will be affected.
- Currently not found in the Americas, but that could easily change.
- The effects could be devastating.
- US does not require people to prove imported animals are clean.
- Currently no legal tool to prevent the introduction



Red-spotted newt found in the Eastern US experienced 100% mortality when exposed to *B. salamandrivorans*


Burke, K. L. (2015). New Disease Emerges as Threat to Salamanders. *American Scientist*, 103(1), 6-7.

FURTHER PREVENTION


Preventing the spread of *Bs* both in currently affected areas and unaffected areas is of the utmost importance.

The United States has the highest diversity of salamanders in the world, many of which are already struggling. We want to prevent *Bs* from sweeping through salamander species as *Bd* did to frogs in 2004.


Possible prevention methods:
 Legislation calling for health checks on imported amphibians
 Preventing the import of foreign salamander species



California tiger salamander- Vulnerable



Shenandoah salamander- Vulnerable



Texas blind salamander- Endangered



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