



INTRODUCTION cont.

- Rana genus is targeted
 - Other documented targets
- 1991 New Hampshire
- Documented outbreaks
- Zoospores
- Transmission



(Cook 2008)

INFECTION

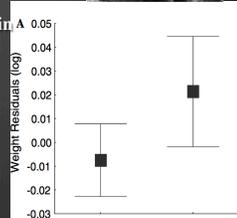
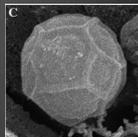
- Anorexia
- Lack of energy
- Pallor
- Weight loss
- Diarrhea
- Blood in the feces
- Dehydration
- Liver and Kidney failure



(Densmore 2007 and Cook 2009)

DECLINES

- Southern Leopard frog 5 km of Athens, Georgia in 2006
 - 5 ponds
 - 1st survey: 10 dead and at least 500 living
 - Additional surveys: decline in living tadpoles, until May 2006
 - 87 individuals taken from the ponds, 25% were infected
 - Liver of infected 2x size of non-infected tadpoles



(Davis et al. 2007)

DECLINES cont.

- April 2011 GHBSPP's Pebble Lake (3.64 ha)
- 100% of bullfrogs and gopher frogs
- 33.3 % of leopard frogs
- Older bullfrogs had more intense infection



The pathology of the alveolate pathogen can be severe, and infections are threatening the federally endangered Mississippi gopher frog

(Cook 2008 and Landsberg 2013)

Alveolates are Important



- Climate tolerance
- Fear of the unknown
- Thousands species of Alveolates
- Die-off's to endangered species

SUMMARY

- What are Alveolates
- How do Alveolates kill amphibians
- Real world declines
- Why are Alveolates important

Literature Cited

- ✓ Cook, J. O. 2009. An alveolate agent in southeastern amphibians. Southeastern Partners in Amphibian and Reptile Conservation. Disease, Pathogens and Parasites Task Team. Information Sheet #3.
- ✓ Cook, J. O. 2008. Transmission and Occurrence of *Dermomyces* sp. In *Rana Sevosa* and other Ranids in the North Central Gulf of Mexico States. Thesis, University of Southern Mississippi, Hattiesburg, USA.
- ✓ Davis, A.K., M.J. Yabsley, M.K. Keel, J.C. Maerz. 2007. Discovery of a novel alveolate pathogen affecting southern leopard frogs in Georgia: Description of the disease and host effects. *EcoHealth*. 4:310-317.
- ✓ Densmore C.L., D. E. Green. 2007. Diseases of Amphibians. *ILARJ*. 48:235-254.
- ✓ Leander, Brian S. 2008. Alveolates. Alveolata. Version 16 September 2008 (under construction). <http://tolweb.org/Alveolates/2379/2008.09.16> in The Tree of Life Web Project.
- ✓ Landsberg, J. H., Y. Kiryul, M. Tabuchi, T. B. Waltzek, K. M. Enge, S. R. Tolen, A. Preston, and A. P. Pessier. 2013. Co-infection by Alveolate Parasites and Frog Virus 3-like Ranavirus During an Amphibian Larval Mortality Event in Florida, USA. *Disease of Aquatic Organisms* 105:89-99