

Effects of *Areomonas hydrophila* and Amphibian Decline

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**Introduction**

- FDA definition:
  - *Areomonas hydrophila* is a species of bacterium that lives in freshwater bodies. It can cause illness and infection if ingested or transported through an open wound (in humans) ([FDA.gov, 2014](#)).

- First discovered in 1962 while researchers were looking at the causes of the fish disease “red fin.”

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**So what about the amphibians?**

- Factor 1:
  - Anurans and Caudates have highly permeable skin and need water to carry out their life history strategies. Unfortunately, *Areomonas hydrophila* needs water to exist, and...
Red Leg Syndrome = Areomonas hydrophila bacterium

Signs:
* Redness at cloaca and base of legs
* Skin lesions
* Necrosis

Cause:
* Hemorrhaging intestines

Signs of Areomonas hyrdophila:

Evidence in die-offs and declines
According to sapiens.revues.org:

S.A.P.I.E.N.S Surveys

Total (green/blue) and threatened (green) numbers of amphibian species that are affected by five of the six major environmental risks. N.B. Data were not available for determining how many amphibian species are threatened by global climate change (Chanson et al., 2008).
1948: Outbreak of red leg in Charleston, West Virginia

Pond was visited 3 days in a row

All but a few breeding pairs died

Study revealed red leg to blame [Shotts, 1948]

Cause?

- Explosive breeders

Golden Toad males prepping for breeding season

massmigrations

Cause?

- Mass Migrations

River frogs, Lithobates hecksheri

10 GE Facility, Adams Co., OH March 1, 2012 (92)
Stressors

Breeding Season:
Very stressful!

Stressors lower immune response

“stress directly causes suppression of the immune system, or indirectly causes immunosuppression by effecting elevated secretion of adrenal cortical hormones.”
(Carey, 1993).

Disease Transmission

Skin to skin contact will spread disease

Antibiotics?

In a study conducted on the virulence of the bacterium on the Chinese giant salamander (Andrias davidianus), Aeromonas hydrophila was found to be resistant to antibiotics such as vibramycin, furazolidone and erythromycin, although certain antibiotics such as sulfadiazine, ciprofloxacin and penbritin proved to fight the bacterium (Wong et al, 2012).
Ubiquity of *Areomonas hydrophila*

'Red-leg' is a bacterial infection caused by *Areomonas* (formerly *Pseudomonas* hydrophila) (Shotts 1984).

These bacteria, found ubiquitously in freshwaters, infect fish, amphibians, reptiles and even humans (Reed & Toner 1942; Shotts 1984; Davis et al. 1978).

References