

THE NATURAL OCCURRENCE OF "REDLEG," *PSEUDOMONAS HYDROPHILA*, IN A POPULATION OF AMERICAN TOADS, *BUFO AMERICANUS*

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The natural occurrence of an epidemic of "Redleg," *Pseudomonas hydrophila* (Chester), in a population of American Toads, *Bufo americanus* Holbrook, seemed significant for two reasons: 1) to the writer's knowledge it is a new naturally occurring host record; and 2) it showed how easily disease is overlooked in the casual observations made by many biologists.

It was purely by chance that the epidemic was discovered. On March 22, 1948, George H. Breiding and the writer visited the lower of two small ponds in lower Donnelly Hollow near Charleston, West Virginia. There a large population of American Toads was observed and estimated to be about 300 individuals. The toads were mating and were very actively clasping. They seemed very tame and could easily be picked up. The writer returned the following day to make some photographs of the toads and found the population reduced to about two dozen individuals. Many dead toads were seen on the bottom of the pond and on the shore where they had crawled from the water and died.

None of the specimens examined showed any mark of violence. On March 24, only three pairs of living toads were found and an additional number were found dead. The only remaining pair was collected on March 25. This pair had been observed for several days. It was unique in that the female was dead when the pair was first observed, on March 23, but the male continued clasping until separated four days later, after being transported to the Ohio State University at Columbus, Ohio.

The following day the male died. External symptoms and bacteriological tests proved that the disease was "Redleg."

The site of the epidemic was visited again on April 24, 1948. Water samples were taken at both ponds and at three stations two-tenths of a mile apart in the stream which flows from the ponds. Blood samples and smears were made from one specimen each of Spotted Newt, *Triturus v. viridescens*, Pickerel Frog, *Rana pipiens*, and an American Toad tadpole taken from the upper pond and from one specimen of an American Toad tadpole and two Spotted Newts taken from the lower pond.

Tests showed that from the upper pond, only the tadpole contained *Pseudomonas hydrophila*; two water samples and one Newt from the lower pond contained the bacillus; and that the three water samples taken at the stations along the stream were all infected.

Bacteria from each positive culture were injected into toads which died subsequently and from whose heart blood *Pseudomonas hydrophila* was then recovered.

A limited amount of laboratory experimentation was done in which specimens of American Toads and Spotted Newts were placed in aquaria containing water contaminated with *Pseudomonas hydrophila*. No disease specimens resulted. The animals were then injured slightly to provide a means of entry for the bacteria. This resulted in contraction of the disease by the toads but not in the newts.

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From the foregoing, it was concluded that "Redleg" occurs in nature in American Toads. This occurrence would probably only come about during the breeding season during which toads are found in water, the natural habitat of *Pseudomonas hydrophila*, and also the period during which their activity in clasping provides the abrasions which permit the entry of the bacillus into the blood stream.

The experimentation might also indicate that the Spotted Newt is an immune species and a carrier of "Redleg." However, too little data have been collected to make this a positive assertion.

A point of importance is the ease at which this epidemic could have occurred unnoticed had not the pond been visited several days in succession. Certainly many similar and many more lesser epidemics of disease frequently occur unnoticed in nature. The cases observed and reported are probably, for the most part, chance records as was this one.
