

Arizona Wildlife Podcast Comprehension Activity

Episode 12: Amphibian Fungal Disease

Part A: *Define each of the terms below.*

1. Antibodies – special proteins made by the immune system to help fight infections
2. Flagellate – a single-celled organism that uses a tail-like structure to move
3. Histology – to study tissues under a microscope
4. Keratin – a tough protein used to make hair, nails, and skin
5. Mark-recapture – a common technique used to estimate population sizes by capturing individuals, marking them, and recapturing to compare the number of marked and unmarked animals
6. Pathogen – an object (usually an organism) capable of causing disease
7. PCR – polymerase chain reaction, a technique which isolates a specific section of DNA and copies it repeatedly

Part B: *Analogies, or comparisons between two things, are often used by biologists to explain complex concepts. In your own words, explain the analogies below mentioned in the podcast.*

1. The fungal infection is like a person dying of zits.

Answers may vary. The fungal infection that is killing amphibians around the world only infects the upper two layers of the skin. It is quite a superficial infection. On any other organism with tougher skin, it probably would be harmless.

2. Xenopus is like the white lab rat of the amphibian world.

Answers may vary. The white lab rat is used in many scientific studies, particularly focused on medicine and animal behavior in mammals. For amphibians, Xenopus is the group of frogs that is used for almost all experiments.

Part C: *Answer each question below in complete sentences. The answers are not necessarily included in the content. They may require some critical thinking.*

1. Why is a skin infection particularly dangerous to amphibians?

Answers may vary. Unlike most animals where the skin is primarily used as a barrier from the outside world to protect the internal organs, amphibians actually use their skin to breathe among other biological functions. As a result, a skin infection can restrict these actions, causing the amphibians to die.

2. Explain the “Out of Africa” and “Recency” hypotheses mentioned in the podcast. Which one is better supported by genetics. Why?

Answers may vary. The “Out of Africa” hypothesis states that the fungal infection started as early as the 1930s. Xenopus frog species, which contained the fungus, were taken from their original location in the wilds of Africa and shipped around the world for biomedical research. This spread the fungus around the world. The “Recency” hypothesis states that the disease must have spread much more recently. This is supported by the genetic data which indicates that the fungus strains found around the world are too similar to each other to have separated years and years ago.

3. What do you think the biologist meant when he said, “If it weren’t so tragic, it’s really a fascinating story.”?

Answers may vary. The biologist was describing the relationship between the fungus and the amphibian. From an impartial scientist viewpoint, it can be absolutely fascinating to study how these two organisms relate to each other. However, from a frog biologist standpoint, it is tragic because the fungus is killing all of the frogs.