



## What can Amphibians Tell us about Environmental Health?

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Amphibians are a fascinating class of Vertebrate animals with a double life, relying on the water during their “infancy” to metamorphose into terrestrial adult ones. More than eight thousand species are reported worldwide, and the order Anura (frogs and toads) makes up ninety percent of the total [1].

### Why must we worry about amphibians conservation?

In most people’s daily lives, including the veterinarians, amphibians represent a distant and unfamiliar animal group of unknown or neglected importance. However, they are critical, both for the environment, within the ecological networks, as regulators of the food web; and for humans as producers of biomolecules, as cultural patrimony, as bioindicators, and recently as pets [2].

Bioindicators are any living organisms, which are used for assessing natural ecosystem health. Due to industrial waste, air pollution, contamination of the water and soils, poor agricultural practices, and forest degradation, many changes have reached the diversity, richness, and physical health of several animal species [3]. These parameters provide information about a global health situation, as the “One Health” concept has lately taught us [4]. Then, different taxa contribute with indications of good or bad fitness of their specific environment. Amphibians play a crucial role in this context, working as bioindicators equally for freshwater and terrestrial environments [5].

In the last three decades, scientists have worried about the decline of amphibian populations around the world. The first causal hypothesis was their habitat losses due to deforestation, but it was not enough to explain why amphibian populations declined even in remote places of the Earth. Some time later, researchers con-

cluded that *Batrachochytrium dendrobatidis* (Bd), a fungal organism considered benign to soil and plants, was causing lethal skin infection in many amphibian species. Bd is now designed as the most destructive pathogen for biodiversity ever documented, responsible for the decline or extinction of more than five hundred amphibian species [6].

Beyond the amphibian health strictly, Bd panzootic shows us a scenario somewhat similar to the currently Sars-Cov2 pandemic: 1) an organism which is worldwide distributed but whose pathogenic strains spread from Asia through global trade/travelling; 2) highly transmissible among multiple hosts and relatively stable; 3) well adapted to its hosts and able to spread from its tolerant/asymptomatics reservoirs. Moreover, like many other emergent diseases, it can have been triggered and supported by environmental and climate changes [6,7].

This situation configures a single perspective of many possibilities of health disasters involving wildlife, the natural environment, and emergent diseases.

For these reasons, we should observe, take care and preserve the amphibians. They are a very efficient mirror of the environmental health status, and their living or dying can help us drive essential decisions about public health. Wildlife and exotic pet veterinarians are welcome to join this cause and contribute to preserving the global One Health.

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