



Conference Abstract

DNA-based biomonitoring in the tropics: Detection and control of *Batrachochytrium dendrobatidis* in Ecuadorian ecosystem

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Abstract

Batrachochytrium dendrobatidis (Bd) is a fungus that parasites vertebrates, and is associated with population declines worldwide in endemic amphibian species. As such, it is one of several invasive species which pose a serious threat to a variety of vertebrate hosts, *in casu*: amphibians. Detection of such invasive species is generally based on DNA-based methods where, for instance, swabs or tissue samples of candidate hosts are analysed for their presence. Any management strategy of these invasive species would greatly benefit from sensitive and rapid detection methods which can be applied at a large scale. The analysis of eDNA from the habitat of candidate host organisms may hold significant potential for this purpose. In this study, we compare the ability of eDNA from habitat samples with that of swab and/or tissue samples of candidate hosts to detect the presence of Bd in Ecuador.

We collected individuals from the amphibians: *Pristimantis* (Anura: Craugastoridae), *Rhinella* (Anura: Bufonidae), *Gastroteca* (Anura: Hemiphractidae), from the endangered

toad species of the genus *Atelopus* (Anura: Bufonidae) as well as water samples from different water bodies in Andean and coastal Ecuadorian areas. Samples were processed using a portable field molecular laboratory. Commercial primers for the internal transcribed spacer (ITS), in combination with a new set of primers designed from Bd sequences from tropical countries, were used. Positive PCR results from both types of samples were obtained within eight hours after sampling.

Prevalence of BD was detected in eDNA, swab and tissue samples in four of the six ecosystems monitored -14 out of 26 water samples and 27 out of 43 amphibian of in total 12 species- including three endangered toad species (*Atelopus balios*, *A. nanay*, and the rediscovered *A. bomolochos*). Our results highlight the potential of eDNA-based monitoring to assess the presence and prevalence of Bd in Ecuadorian aquatic ecosystems, in accordance with the National Action Plan for the Conservation of Ecuadorian Amphibians. Furthermore, our field lab approach leads to reliable and fast results for the monitoring of invasive species in a tropical context of a pandemic.

Keywords

eDNA-based monitoring, tropical aquatic ecosystems, amphibians, *Batrachochytrium dendrobatidis* (Bd)

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