

Incidence and mitigation of emerging amphibian diseases in wild and captive populations of Spain

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Emerging amphibian diseases such as chytridiomycosis, caused by *Batrachochytrium dendrobatidis* (Bd) and *B. salamandrivorans* (Bsal), and ranavirosis, caused by *Ranavirus* (Rv), pose a major threat to amphibians worldwide. Despite their relevance, national-scale studies simultaneously assessing these pathogens remain scarce. This thesis addresses this gap by analyzing the occurrence and dynamics of Bd, Bsal, and Rv in wild and captive amphibian populations, with the aim of contributing to the development of mitigation strategies.

Bd and Rv were widespread in natural amphibian populations across Spain and remained present in the amphibian pet trade and captive collections, indicating insufficient control measures. In contrast, Bsal was restricted to a single locality in Barcelona province. Despite their long-standing presence in Iberia, Bd and Rv continue to cause severe mortality events, particularly in endemic and critically endangered species.

Environmental factors strongly influenced pathogen dynamics. Bd infections were more severe at higher altitudes and during cooler periods, whereas Rv virulence increased under warmer conditions. Climate change is intensifying these patterns. This trend is especially evident for the predominant Iberian Rv strain, linked to multiple temperature-driven mortality events over recent decades.

Finally, the thesis proposed a novel approach using the fungicide tebuconazole to control Bd in natural populations of highly threatened species. Encouragingly, significant reductions in infection loads were observed following application, with minimal ecological impact.

In summary, the thesis highlighted key drivers of amphibian disease dynamics in the Iberian Peninsula, with implications for conservation and disease management at global scales.

