

Genetic and population-level influences on Boreal toad susceptibility to the fungal pathogen, *Batrachochytrium dendrobatidis*.

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The emerging fungal pathogen, *Batrachochytrium dendrobatidis* (*Bd*), is a major threat to the survival of many amphibians. Studies of host susceptibility to *Bd* infection demonstrate a remarkable range of responses across different species. The boreal toad, *Anaxyrus boreas*, is susceptible to *Bd* infection and many populations have declined after the arrival of *Bd* in the Southern Rocky Mountains. Boreal toads have been extirpated from New Mexico, yet other *Bd*-positive boreal toad populations persist. In this study, I raised boreal toads from sibling egg clutches to adults from a purportedly *Bd*-tolerant Utah population and a *Bd*-susceptible Colorado population. I experimentally infected lab-reared toads with a global panzootic *Bd* isolate from Colorado boreal toads. Day 7 mean *Bd* infection load was significantly greater in Colorado toads, but mean infection load was not significantly different among treatments for the rest of the 34-day *Bd* challenge. At late infection, Colorado toad body condition declined significantly compared to the control ($P = 0.012$), while Utah toad body condition was unchanged. Clinically, all Colorado toads at late infection presented advanced signs of chytridiomycosis whereas Utah toads presented mild or no signs of disease. The negative impacts of *Bd* infection observed in Colorado boreal toads were not observed in Utah toads in this common garden experiment, supporting the hypothesis that boreal toad population-level genetic differences contribute to *Bd* tolerance. Strategies to increase immunogenetic diversity among populations in the Southern Rocky Mountains are needed to conserve this species of greatest conservation concern.