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Disrupted Soil Microbiomes from Fusarium Infections Threaten Reproductive Success in an Endangered Turtle Species: A One Health Perspective

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Fungal pathogens pose an emerging threat across ecosystems, yet their role in One Health contexts remains underexplored. *Fusarium* spp., listed by WHO as high-priority fungal pathogens, affect plants, animals, and humans. In this study, we examined the impact of *Fusarium* infections on microbial communities in the nests of the endangered European pond turtle (*Emys orbicularis*) in Austria's Donau-Auen National Park. Across 238 environmental and biological samples, we found that *Fusarium* presence in nest soil significantly reduced bacterial richness and phylogenetic diversity—microbial shifts that were directly associated with lower hatching success. Interestingly, fungal community composition remained stable, highlighting bacteria-specific disruptions. These results suggest that *Fusarium* may destabilize key microbiomes that underpin soil and host health. Our findings demonstrate how soil serves as a critical interface in One Health systems—linking environmental integrity to wildlife reproduction and disease risk. Integrating microbiome monitoring into conservation efforts may offer novel insights into mitigating emerging infectious disease risks in wildlife conservation contexts.

Keywords

Fusarium, wildlife health, microbiome, disease ecology, Emys orbicularis, soil biodiversity, conservation

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No, I am not a Junior Scientist.

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