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Exploring the Distribution of *Coccidioides immitis* in South Central Washington State

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Objective

Our objective is to describe the environmental conditions associated with confirmed *Coccidioides immitis* growth and accumulation sites in south central Washington in an effort to understand the ecology and identify additional potential sites across this emerging endemic zone.

Introduction

Coccidioidomycosis, commonly referred to as Valley Fever, is caused by the soil-borne saprophytic fungus *C. immitis* and *posadasii*. These species have historically been found in the desert southwest and Mexico; however, in 2010 there were three coccidioidomycosis cases identified in central Washington. Colonization of soils by *C. immitis* has been confirmed at exposure sites associated with these cases[1]. Multiple studies have identified a relationship between environmental conditions and *C. immitis* growth areas[2,3,4], but these relationships have not been evaluated in Washington. The Washington State Department of Health has been conducting environmental surveillance in an effort to understand the geographic distribution of *C. immitis* in central Washington and the associated risk to humans and animals. Here we describe our environmental surveillance efforts and present preliminary findings related to environmental conditions of *C. immitis* growth areas in central Washington.

Methods

We collected soil samples at potential human exposure sites in central Washington, as identified through clinical surveillance and patient interviews. Soil samples were also collected from areas not associated with human cases by looking for similar soils in areas of interest Soil samples are analyzed by the U.S. Centers for Disease Control and Prevention using real-time PCR that detects *Coccidioides*-specific targets. We employed data from the USDA Soil Survey Geographic (SSURGO) database to describe environmental conditions associated with positive samples. We used our findings to identify un-sampled regions of central Washington that could potentially support *C. immitis* growth.

Results

We detected *Coccidioides* in 13 soil sampling sites at five locations withing the region. These detections included locations not previously described in central Washington. We identified a band stretching across central Yakima and Benton counties with similar soil characteristics to our positive sample sites, which suggests these regions could potentially support the growth of *C. immitis*.

Conclusions

Coccidioidomycosis is emerging in south central Washington, and the ecology and geographic distribution of the pathogen are poorly understood. We found that *C. immitis* presents a risk to humans and animals across a larger region of central Washington than previously described and highlights a need for continued environmental surveillance. The potential growth sites we identified also provide a valuable tool for human and veterinary health care providers and public health practitioners to understand and mitigate disease risk.

Keywords

Valley Fever; Coccidioides; Spatial Analysis; Environmental Surveillance

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