

## **Bighorn Sheep Sinus Tumors are Associated with Co-Infections by Pneumonia-causing Bacterial Agents in Upper Respiratory Tract**

**KAREN A. FOX,<sup>1</sup>** *Wildlife Health Center, Colorado Division of Parks and Wildlife, 317 W. Prospect Road, Fort Collins, CO 80526, USA and Department of Microbiology, Immunology and Pathology, Colorado State University, 1619 Campus Delivery, Fort Collins, CO 80523, USA*

**NATALIE M. ROUSE,** *Wildlife Health Center, Colorado Division of Parks and Wildlife, 317 W. Prospect Road, Fort Collins, CO 80526, USA and Department of Microbiology, Immunology and Pathology, Colorado State University, 1619 Campus Delivery, Fort Collins, CO 80523, USA*

**KATHRYN P. HUYVAERT,** *Department of Fish, Wildlife and Conservation Biology, Colorado State University, 1474 Campus Delivery, Fort Collins, CO 80523, USA*

**KAREN GRIFFIN,** *Wildlife Health Center, Colorado Division of Parks and Wildlife, 317 W. Prospect Road, Fort Collins, CO 80526, USA*

**HALLY KILLION,** *Wildlife Disease Laboratory, Wyoming Game and Fish Department, 1174 Snowy Range Road, Laramie, WY 82070, USA*

**JESSICA JENNINGS-GAINES,** *Wildlife Disease Laboratory, Wyoming Game and Fish Department, 1174 Snowy Range Road, Laramie, WY 82070, USA*

**HANK EDWARDS,** *Wildlife Disease Laboratory, Wyoming Game and Fish Department, 1174 Snowy Range Road, Laramie, WY 82070, USA*

**SANDRA L. QUACKENBUSH,** *Department of Microbiology, Immunology and Pathology, Colorado State University, 1619 Campus Delivery, Fort Collins, CO 80523, USA*

**ABSTRACT** Bighorn sheep (*Ovis canadensis*) sinus tumors are hyperplastic to neoplastic, predominantly stromal masses of the paranasal sinuses that expand the sinus lining and obstruct the sinus cavities. Obstruction of the sinus cavities and disruption of normal sinus lining anatomy may interfere with clearance of bacterial pathogens from the upper respiratory tract. To examine this possibility, we explored whether or not the presence of sinus tumor features (tumor score) affected the likelihood of detecting potentially pathogenic bacteria from upper respiratory sinus lining tissues in bighorn sheep. We developed or used existing polymerase chain reaction assays for the detection of leukotoxigenic *Pasteurellaceae* and *Mycoplasma ovipneumoniae* in sinus lining tissues collected from 97 bighorn sheep in Colorado from 2009 to 2012. Using logistic regression analyses, we found that tumor score was a good predictor of the probability of detecting potentially pathogenic bacteria in sinus lining tissues; we were more likely to detect potentially pathogenic bacteria from samples with high tumor scores. These findings add to our understanding of possible mechanisms for the maintenance and shedding of bacterial agents from the upper respiratory tracts of bighorn sheep.

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**KEY WORDS** bighorn sheep, leukotoxin, *Mycoplasma ovipneumoniae*, *Ovis canadensis*, *Pasteurellaceae*, polymerase chain reaction, sinus tumors.

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<sup>1</sup> E-mail: karen.fox@state.co.us