College of Veterinary Medicine

Department of Population Health | Southeastern Cooperative Wildlife Disease Study

Case #: R15-769

Presenter and Co-Presenters: Kellyn Sweeley (University of Georgia (UGA) College of Veterinary Medicine, Athens, GA 30602, kellyn.kearney25@uga.edu), Sarah Peltier (Big Cypress Field Office, Naples, FL 34114), Heather Fenton (Southeastern Cooperative Wildlife Disease Study [SCWDS], UGA, Athens, GA 30602), Kevin Niedringhaus (SCWDS), Michael Yabsley (SCWDS and Warnell School of Forestry and Natural Resources, UGA), Justin Brown (Pennsylvania Game Commission's Animal Diagnostic Laboratory, University Park, PA 16802)

Signalment: 3-year-old, female, free-ranging American black bear (*Ursus americanus*).

History: This bear was immobilized with ketamine (4.4 mg/kg) and xylazine (1.8 mg/kg) intramuscularly and biopsy samples of alopecia and lichenification were taken on May 29, 2014, in Cambria County, PA. The bear had never been handled previously.

Gross Findings: Widespread alopecia and lichenification affected approximately 90% of the coat with marked gray, dry crusting and cracking of the affected areas of skin. The main affected areas included the head, shoulders, and ventral surface of the body. Focal erosive to ulcerative lesions were also present in these areas.

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Histopathology: The epidermis is irregularly thickened (acanthotic) and overlain with orthokeratotic and parakeratotic keratin. Hair follicles are often dilated and plugged with fragmented keratin. The surface keratin is often eroded to ulcerated and associated with colonies of coccoid bacteria admixed with degenerate neutrophils, cellular debris, nuclear debris, and occasional yeast. Multiple cross sections of arthropod parasites measuring ~ 100 x 200 microns are present embedded within the superficial epidermis that occasionally form "mite tunnels." Arthropods have the following features: a ridged cuticle that is occasionally chitinized, a hemocoel, a reproductive tract, a gastrointestinal tract, striated muscle, and jointed appendages. Rare eggs ~ 15-20 microns in diameter are present within fibrinocellular debris.

Morphological Diagnosis: Multifocal to coalescing, severe, chronic proliferative epidermitis with marked orthokeratotic and parakeratotic hyperkeratosis, follicular keratosis and ectasia with intralesional arthropod mites, bacteria, and yeast

Etiology: Sarcoptic mange (*Sarcoptes scabiei*)

Comments: Many free-ranging mammals are susceptible to infestation by *Sarcoptes scabiei*. Mite eggs, larvae, nymphs, and adults can be found in tunnels created within the surface keratin or embedded in the epidermis.[1] The burrowing females and feeding habits of larvae and nymphs stimulate inflammation in the skin that can progress to hyperkeratosis, hair loss, and secondary *Malassezia* and bacterial dermatitis in advanced cases.[2] Cytology and molecular methods can be used to confirm infection with *S. scabiei*. Differential etiologies for mange in black bears would be *Demodex* sp. and *Ursicoptes* sp. While once thought to be sporadic in free-ranging black bears, sarcoptic mange is being reported throughout the northeastern United States.

References:

[1]Schmitt, S., Schillhorn Van Veen, T., Friedrich, P., & Cooley, T. 1987. Clinical mange of the black bear (*Ursus americanus*) caused by *Sarcoptes scabiei* (Acarina, Sarcoptidae). *J Wildlife Dis*, 23(1), 162-165.

[2]Salkinw, I.F., Stonem, B., Gordon, A. 1980. Association of *Malassezia* (*Pityrosporum*) *pachydermatis* with sarcoptic mange in New York State. *J Wildlife Dis*, 16(4), 509-514.[3]Spickler, A. R., and J. A. Roth. 2006. *Emerging and exotic diseases of animals*, 3rd ed. Institute for International Cooperation in Animal Biologics, Iowa State University, College of Veterinary Medicine, Ames, Iowa. pp 225-227.