Sarcoptic mange

(*Sarcoptes scabiei*)

in Alberta

Common name

mange, scabies, sarcoptic mange

Scientific name

mange mite/ itch mite, *Sarcoptes scabiei*

What's Bugging Wild Critters?

Fact sheet #9: Sarcoptic mange

Significance

Mange mites must "itch like crazy" and thus lead to scratching, loss of hair and its valuable insulating qualities, and reduced fitness in infected animals. In some cases death occurs, particularly in young wolves, coyotes, and foxes. People who handle infected animals may occasionally get a mild skin rash.

What? Where? How?

Mites are tiny microscopic animals related to ticks and spiders (adults all have 8 legs). As a group, mites are extremely successful and have a global distribution in almost every natural region around the world, including deserts, polar regions, mountain tops, and hot springs. Millions of mites can live in one square metre of soil. However, some species live in the skin of a wide variety of mammals throughout the world. One species, *Sarcoptes scabiei*, can survive on over 100 mammal species.

Mange is a disease condition that involves significant damage to the hair and skin. The damage is due, in part, to the burrowing activity of mites in the upper layers of the skin and, in part, to the scratching, chewing, and rubbing done by the critter whose skin has the mites in it! In North America, wild canids (red foxes, coyotes, and wolves) are most likely to be affected, and periodic outbreaks can involve up to 80% of a local coyote population.

Damage to the skin is progressive, starting on the rear legs and tail and gradually expanding toward the back and head.

In severely affected animals, little or no normal hair remains, and there may be crusty build-up on the skin, as well as loss of weight and body condition.

Such animals may be slow, emaciated, and fearless of people. They tend to spend more time in farmyards or in other areas where it is easier to find food and places to stay warm. Young-of-the-year (i.e., pups) tend to be more severely affected.

Historically, it appears this mite was introduced into western North America (Montana, to be precise) in the early 1900s as a potential biological control of wolves. Although this seems foolhardy and unjustifiable now, it probably made good sense at a time when human interests were the only interests of any concern! However, the mites were extremely adaptable and established a persistent association with wolves, coyotes, and foxes rather than exterminating them.

Transmission Cycle

Adult mites use their cutting mouthparts to create tunnels in the skin. The tunnels provide food, shelter, and a safe place to live, as well as a place for females to lay their eggs. The eggs hatch as larvae, which then moult to nymphs, moult to bigger nymphs, then moult to adults. All this happens in about two weeks and the cycle repeats continually! Each stage adds to the tunnel system and it is easy to see why the area of skin damage also expands. Mange mites can be transferred by direct contact with affected individuals (often from females to pups in the den) or by contact with contaminated areas, particularly territorial scent-marking posts, bedding sites, or dens.

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Distribution in Alberta

Mange mites live in coyotes, wolves, and red fox throughout their ranges in Alberta. However, mange is most often seen in coyotes in the parkland and prairies because there are more coyotes and more people to see them in these regions. Infections are largely unnoticed in the fall when there are few mites and damage is minimal. However, by mid- to late winter, it is common to see thin scruffy-looking coyotes with little or no visible hair and a naked rat-like tail.

Importance for Wildlife Management

From a mite's perspective, the more individuals in a canid population, the more habitat for mites and the more opportunity for transfer to other individuals. Thus, we see mange more often in areas and in years when canid populations are high. Although we rarely see direct evidence of mortality due to mange, trapping records suggest a correlation between increased prevalence of mange and decreased number of pups in a local population. This may involve direct mortality of youngsters due to severe cases of mange during early life, perhaps even before they leave the den. It may also involve reduced number of offspring or lower maternal effort from affected females. Extensive or repeated outbreaks of mange can reduce local populations of red foxes, coyotes, and occasionally wolves. The effect of this mortality ripples through the ecosystem, beginning with increased survival of small rodents, the primary prey of wild canids. Increases in rodent populations then provide a feast for hawks and owls, and so it goes.

Public Significance

There are limited reports of people getting mange from handling infected wild canids. Parasitologists conducting research on mange are particularly at risk! However, considering how often trappers and hunters handle "mangy" carcasses, the risk to humans is extremely low. It seems our skin is just not good habitat for the mites to flourish. Human infections from wildlife are rare, short-lived (a few days to a few weeks long), and can be treated medically. Similarly, mange from wildlife rarely, if ever, transfers to domestic species and is not associated with significant skin damage in dogs. Mange greatly reduces the value of pelts of furbearers, significantly reducing income and discouraging trappers.

There is a completely different strain of *S. scabiei* that regularly infects humans. Public health officials need to be aware that this is NOT the same strain that occurs in wildlife.

Prevention/Control

Since the early 1900s, mange mites have established widespread populations throughout Alberta and western North America. Control of the mites in wildlife currently is not possible. Infected individuals taken by trappers or hunters can be burned or buried to ensure that the mites are not passed on; however, this will have minimal effect on the overall population of mites. People handling wild canids should wear gloves and disinfect their workspace to avoid transfer of mites. [See the fact sheet on Hydatid tapeworms for further reasons why you should take precautions when handling wild canids, dead or alive.]

Summary

Sarcoptic mange is common in most populations of wild canids throughout their range in North America. Generally, infections are mild and impact is minimal. However, outbreaks can occur and some severe infections can result in reduced fitness and death. Infection in humans is mild and rare.

Additional Information

Parasitic Diseases of Wild Mammals, Second Edition, Edited by William M. Samuel, Margo J. Pybus and A. Alan Kocan, 2001. Chapter 5 – *Sarcoptes scabiei* and Sarcoptic mange.

Fish and Wildlife, Alberta Sustainable Resource Development: http://www3.gov.ab.ca/srd/fw/wolves/prob.html

Alberta Agriculture, Food and Rural Development: http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex812?opendocument

University of Northern British Columbia: http://www.unbc.ca/nlui/wildlife_diseases_bc/sarcoptic_mange.htm

For more information on wildlife diseases in Alberta: http://www3.gov.ab.ca/srd/fw/diseases/index.html

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