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Case report

Psoroptes ovis mange in a dog in Brazil

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ABSTRACT. *Psoroptes ovis* (Acari: Psoroptidae, Hering, 1838) is an ectoparasite that poses a high risk to herd animals and causes a severe dermal disease called psoroptic mange. This work aimed to report *P. ovis* parasitism in a dog. A male Pinscher that lives in rural areas and had free access to sheep farming showed hair loss in the dorsal region and mild itching. Dermatological examination demonstrated irregular alopecia, scabs, dry desquamation and erythema around the dorsal region of the thorax and pelvis. Hemogram has shown mild eosinophilia and the fungal culture was negative. In skin scrapings, *P. ovis* was observed, and its morphological characteristics were recorded. Treatment with ivermectin (0.5 mg/kg) was initiated orally once weekly for six weeks and amitraz for environmental control shown positive results. The diagnosis of psoroptic mange in dogs was performed based on morphological characterization of mite and the report of sheep contact. This is the first report of the occurrence of *P. ovis* in dog.

Keywords: *Psoroptes ovis*, alopecia, dermatopathy, mites, dog

Psoroptic mange are dermatological diseases common in several species of animals. These are caused by microscopic ectoparasites (*Psoroptes* spp.) that inhabit the cutaneous and subcutaneous dermal regions, feeding on fragments of the epithelium and occasionally, blood. This dermal disease is highly contagious and is an obligatory notification, when it occurs in sheep in Brazil due to scab mite infestation posing a major economic threat to sheep production [1,2].

Psoroptes ovis, or scab mite, is a common ectoparasite of sheep, cattle, and goats. Many species of *Psoroptes* mites can be found in other hosts, from horses to rabbits. It can survive outside the host for a long time and is readily transmitted through fomites and direct contact [3,4].

Secretions from a mange mite bite trigger the immunoinflammatory response of the body and cause pruritus effect and pathological changes. Moreover, an immediate hypersensitivity reaction triggered by allergens causes the formation of lesions and degradation of blood proteins that aid in feeding of the mite [5].

Natural transmission between hosts of different species rarely occurs under field conditions and therefore usually has no epidemiological importance. An example would be the incidence of psoroptic mange in United Kingdom and Belgium. In UK, psoroptic mange in sheep is endemic but rare in cattle, whereas in Belgium, the disease is extremely frequent in cattle but rarely affects sheep [6].

This study aims to report unusual parasitism by *P. ovis* in dog in Brazil, since it is a probable occurrence, and very difficult to find in studies.

Case presentation

The reported animal was a male domestic dog (*Canis lupus familiaris*) of the Pinscher breed, four months of age, with black fur coat, and weighed to about 1.35 kg. The patient was attended by the veterinarians of Jatai Regional Veterinary Hospital

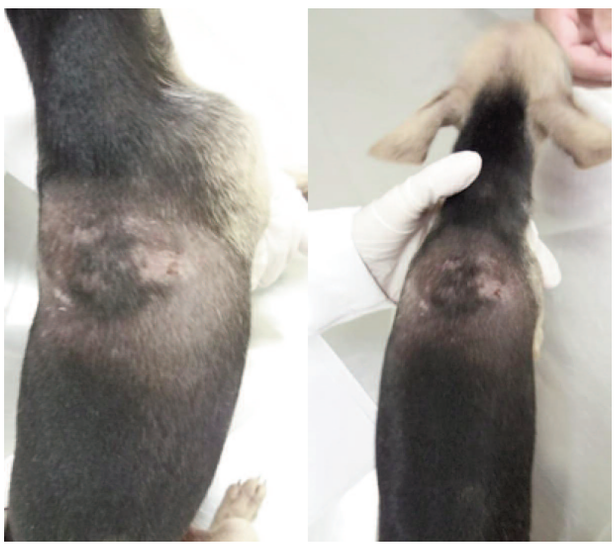

Figure 1. Dermatological lesions in dog parasitized by *Psoroptes ovis* showing irregular alopecia areas in the thoracic dorsal region, presence of crusts, dry desquamation and erythema

in April of 2017 with suspected case of dermatopathy from observation. The owner reported during the anamnesis that the patient lived in a rural area and had free access to the neighboring property where sheep were kept and reared, sometimes observing ticks, immunoprophylaxis, and desvermination were complete. The patient underwent physical examination and laboratory tests (Complete Blood Count and Blood Chemistry). Culture-based methods such as fungal growth test were also carried out. Skin scraping was performed to determine the presence of parasitic infestation by mites. The collected sample was placed on a glass slide, overlaid with mineral oil and covered with a thin glass slip. It was observed under the microscope, in 100× and 400× magnification.

The study was carried out under hospital conditions, with minimal stress to the animal, and with authorization from the animal ethics committee of the Federal University of Jatai. During the physical examination it was reported that the animal has loss of hair and dorso-caudal injury, absence of pruritus, and alopecia with crusts. All tests on the digestive and urinary systems were within normal range. Hematological showed mild eosinophilia, which is common in some calves parasitized by psoroptic mange, although some animals do not show changes, except in persistent conditions [7]. Biochemical test showed no changes. Through an in-depth dermatological inspection, irregular alopecia areas, with remaining formed crusts, dry desquamation, and erythema, were observed in the dorsal region of the thorax (Fig. 1). Skin scraping results have identified the presence of *P. ovis* and identification was based from morphological characteristics compatible with the cited descriptions of the parasite [8,9]. Growth in fungal culture was considered negative as no growth of dermatophyte was observed after 15 days of incubation.

The treatment consisted of ivermectin administration at a dose of 0.5 mg/kg orally once per week for six weeks. Mite control with amitraz was also done at the infested environment once every week for six weeks. Significant improvements of the patient's condition, less itching and healing of lesions were observed throughout the medication.

Gathered information of the patient's anamnesis and test results and the morphological characterization according Wall and Kolbe [10] of the located mite allowed us to conclude that the patient was diagnosed with psoroptic mange caused by *P. ovis*.

In regard to the diagnosis, prior claims for the causative agent of the disease were between the two most common canine mange mites, *Sarcoptes scabiei* and *Demodex canis* [11]. Assumption of the veterinarians has inclined more on the former claim which was *S. scabiei*. In reference, *S. scabiei* has circular bodies that are flattened ventrally and covered with fine transverse striations with pointed scales, short paws, and a non-segmented pedicel [11]. On the other hand, the result obtained from the examination of the skin showed the presence of a mite with oval body, long conical mouthparts, and four long pairs of legs with fragmented pedicel. The most common mite of the Psoroptidae family in dogs are of the genus *Otodectes*, which especially affect the ear and attached regions. Upon finding a mite with morphological characteristics of the Psoroptidae mites, and not identified as *Otodectes*, a morphological description was necessary. Wall and Kolbe [10] described the morphological characteristics, which differentiate the genus *Psoroptes*, and later of the species *P. ovis*, which are identical to those observed in the dog's skin scrape in this report. Reports on the incidence of *Psoroptes* infestations, in general, on other animal species such as cattle, horses, donkeys, mules, rabbits, goats, and nondomestic species, were also reviewed however, in dogs no reports were founded [12].

Losson et al. [6] determined the susceptibility of some beef cattle breeds to *P. ovis* infestation. In many countries, including New Zealand, Canada, and United States, ovine psoroptic mange has long been eradicated owing to its impending threat on the

economy and herd production of the country. Infestation of mange mites caused a strain on the milk production, health, and mortality, and prevention cost of cattle and sheep production [12]. In Brazil, psoroptic mange is declared as a notifiable disease when it occurs in sheep.

Some animals in confinement may appear asymptomatic to the disease when under stressful conditions or immunosupressed, a frequent situation in animal industries [13]. Analysis of the factors that might have possibly promoted the occurrence of the disease in the dog was difficult as no specific timeline was described. Although it was not a species specific parasite, experimental infections were proven unsuccessful [14].

There were recent reports of the occurrence of of others psoroptic mange in Brazil, such as equine mange caused by *Psoroptes* sp. [15]. The case was diagnosed based on the baseline animal history, epidemiological data, and skin scaling by microscopic visualization of adult. Therefore, it is said that infestation of this mite in animal industries is common.

In relation to canine breeds, there were no studies found on the predisposition. The course on Parasite Disease at Federal Rural University of Rio de Janeiro (Veterinary Institute, Department of Epidemiology and Public Health) has mentioned parasitism in dogs by *P. ovis* (Fonseca, pers. comm.) as a possible and unusual occurrence. There are no reports of *P. ovis* in dogs, being this study as the first report of this occurrence, showing the morphological diagnosis is essential. Although the treatment is correlated to that of other mange mites, the control and prevention depends on knowledge about biology and epidemiology, and psoroptic mange has primary hosts and biology different from mites that commonly occur in dogs.

The diagnosis of psoroptic mange in dogs was possible in view of anamnesis performed in detail, the report of contact with sheep, detailed evaluation of the lesions and morphological characterization of the *P. ovis* mite species. This is the first report of the occurrence of *P. ovis* in dog.

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