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Letter to the Editor

Fecal flotation in the detection of canine *Demodex* mites

Dear Editors,

The diagnosis of canine demodicosis is made according to clinical signs, deep skin scrapings, examination of plucked hairs and sometimes acetate-tape impressions; molecular diagnostic tools also are available.[1,2] Unlike feline *Demodex* infestations, we are unaware of published studies documenting fecal examination as a diagnostic tool for canine demodicosis.[3] The aim of our study was to compare the results of skin scrapings and fecal examination for the diagnosis of canine demodicosis.

Fifty six dogs with skin lesions were presented to veterinary clinics in Vladivostok. Deep skin scrapings (three scrapings per individual on a skin area of approximately 3 × 8 cm) were obtained from each animal. Three fecal samples (each 2 g) per individual were examined using a zinc sulfate (specific gravity 1.2) centrifugal flotation technique.[4] We counted the number of *Demodex* mites per slide in both the skin scrapings and fecal samples. A correlation between the presence of *Demodex* mites in the skin samples and the presence of *Demodex* mites in the fecal samples was estimated using Pearson's chi-square test with the Yates correction, using StatPlus:mac Pro (AnalystSoft; Walnut, CA, USA).

Deep skin scrapings and fecal examination were negative for the presence of *Demodex* mites for 47 dogs and positive in nine dogs. *Demodex* mites were found in both skin scrapings and fecal samples from five dogs, with generalized and localized skin lesions. In skin scrapings from five dogs only *Demodex canis* was found and a further two dogs had both *D. canis* and the *D. canis* variant *cornei;* one dog was positive for *D. canis* variant *cornei* (mean number of mites 22.8).[2] In the ninth dog, mites were not found in skin scrapings and one mite was found in the fecal sample. Morphological identification of mites found in fecal samples (mean number of mites: 1) was not possible due to mite shrinkage and distortion in the flotation fluid. The number of *Demodex* mites found on scrapings of localized lesions was statistically significantly fewer than found on scrapings of dogs with generalized infection, whereas the number of mites in fecal samples was not significantly different between

Table 1. Comparison of *Demodex* mites counts in skin scrapings and fecal samples in nine dogs

Dog	Form of demodicosis	Clinical signs	Number of *Demodex* specimens in skin scrapings, mean ±SD	Number of *Demodex* specimens in fecal samples; (min–max specimens per slide)
5-year-old crossbreed, male	Generalized	Alopecic lesions on tail and thighs, erythematous lesion on the head	84 ± 26.2 (*D. canis* + *D. canis var cornei*)	1–3
6-year-old crossbreed, male	Generalized	Erythematous lesions located on thighs, abdomen, back and tail	76.3 ± 17.2 (*D. canis)*	2
6-year-old shar-pei, male	Generalized	Alopecia and erythematous lesions on head, back and thighs	3.3 ± 1.5 (*D. canis* + *D. canis var cornei*)	0
8-year-old crossbreed, female	Localized	Three erythematous lesions on the head and thigh	10.3 ± 4.5 (*D. canis*)	1
10-year-old crossbreed, female	Localized	Scaly lesions on the thigh	-	1
1-year-old Scottish terrier, female	Localized	Three small alopecic lesions on dorsum	1.6 ± 1.3 (*D. canis var cornei*)	0
2-year-old Boerboel, female	Localized	Facial pustules	1.5 ± 1.1 (*D. canis)*	1
10-month-old shar-pei, male	Localized	Two alopecic lesions on the neck and dorsum	3.1 ± 1.1 (*D. canis*)	0
1-year-old Scottish terrier, male	Localized	Lesion with alopecia on the head	2.3 ± 1.5 (*D. canis*)	1

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the two clinical forms of demodicosis (Table 1). There was a statistically significant difference ($P < 0.05$) between the presence of *Demodex* mites in the skin scrapings and the presence of mites in the fecal samples.

Deep skin scraping is the most common and simplest procedure for *Demodex* mite detection although false-negative results can occur if the skin is not squeezed prior to scraping. Parasitic arthropods, including mites, are taken up by animals through grooming and then passed in the gut and can be detected on fecal floatation.[3] Fecal flotation methods have low sensitivity for parasites; the results of flotation techniques are highly dependent on the concentration of parasites in the feces. In our study, mites were found on fecal examination for dogs in which *Demodex* mites were found on skin scrapings; however, definitive speciation of *Demodex* mites found in feces was not possible due to alteration of mite morphology after gastrointestinal transit and processing. It cannot be assumed that all types of canine *Demodex* mite can be found equally on fecal examination; future studies, using other fecal floatation methods/solutions and PCR analysis to determine mite species in fecal samples, are indicated.[2] Our study shows that *Demodex* mite numbers in fecal samples are substantially lower than in skin scrapings and false negative results are not uncommon. However, *Demodex* mites were found on fecal analysis in one dog with localized disease in which skin scrapings were negative, illustrating that fecal floatation may be helpful as a complementary tool for the diagnosis of canine demodicosis.

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