

The Fungal Microbiota Isolated from Cats and Dogs

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Abstract

The possible involvement of saprobe fungi in dermatomycoses, as well as the incidence of dermatophytes in dogs and cats with skin lesions was studied. During a period of one year 54 dogs and 47 cats were included in this study. Of the 101 samples, 34 resulted in positive cultures for dermatophytes. Dermatophyte fungi pure cultures were obtained from 12 samples. A simultaneous growth of dermatophytes plus saprobe fungi was observed in 22 of the samples. Of the remaining 67 samples, no fungal growth was observed in 15 samples and others samples only the saprobe fungi was presented. *M. canis* as the main dermatophyte detected in this study. The following genera of saprobe fungi were also isolated: *Alternaria sp* (0.99%), *Rhizopus sp* (2.97%), *Trichoderma*.

Keywords: dermatophytes, saprobe fungi, cat, dog

1. Introduction

In animals, especially dogs and cats, the skin diseases could due to parasitism, bacterial and fungi infections, allergies, immunologic diseases, nutritional related dermatosis, hormonal disorders, some skin cancers.

The fungi included in the genera *Microsporum*, *Trichophyton* and *Epidermophyton* cause in human and animals a group of diseases named dermatomycoses. These organisms, called dermatophytes, are the pathogenic members of the keratinophilic (keratin digesting) soil fungi. *Microsporum* and *Trichophyton* are human and animal pathogens. *Epidermophyton* is a human pathogen.

The saprobe fungi which could be found on the skin are considered belonging to skin microbiota. [1, 2, 3]. These are also implicated in mycoses especially, when the host is debilitated by a chronic disease, prolonged antibiotic treatment, steroids therapy, or immune depressing conditions, saprobe fungi can proliferate and elicit an infection, but their role was not enough

emphasized.. This situation associated with the mistaken diagnostic techniques, could explain, at least in part, the misunderstood role of these fungi as skin pathogens [4].

This study reports laboratory results of a survey evaluating fungal etiology of skin diseases in dogs and cats with clinical suspicion of dermatophytosis between 2007 and 2008

2. Materials and methods

A total of 101 samples composed of fur, nail and skin scraping specimens were collected from 54 (53.46%) dogs and 47 (46.53%) cats with clinical suspicion of dermatophytosis in one veterinary clinic, and analyzed to the Mycology Research Laboratory of the Faculty of Veterinary Medicine from Timisoara. Each sample corresponds to an animal and collected from skin lesions or from the fur for those animals that not presented any lesions.

The mycological analysis was undertaken by means of the visualization of fungal structures, after suspending representative material in 30% potassium hydroxide, and by macro and microscopic characteristics of the colonies, which were obtained after inoculation of the clinical

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specimens onto chloramphenicol Sabouraud agar. The tubes were incubated at room temperature (25°C) and observed for 30 days. When the fungal morphology, as determined in the primary medium, was not possible to be identified, it was relocated onto rice agar to induce the growth of the characteristic fructification structures. The slide culture was made simultaneously, for a better visualization of typical structures of each fungi species

3. Results and discussion

Table 1 displays the list of fungal agents identified in specimens collected from cats and dogs.

A total of 86 (85.14%) out of 101 samples were positive to mycotic agents. Among those, dermatophytes were identified in 34 (33.66%) samples. No fungal growth was observed in 15 samples. In 52 samples only the saprobe fungi was presented. Dermatophyte fungi pure cultures were obtained from 12 samples.

A simultaneous growth of dermatophytes plus saprobe fungi was observed in 22 of the samples. The percentages of samples positive for dermatophytes from canine and feline specimens

were 16.8% and 26.7%, respectively *Microsporium canis* was the most prevalent fungal species observed in those specimens.

It was recovered from 5.9% of the positive cultures for dermatophytes from dogs, and 11.8% of the positive cultures for dermatophytes from cats. In addition, *T. mentagrophytes* were isolated in samples from dogs in a proportion of 13.8% and only in two samples from cats (1.9%)

Among yeasts, *Malassezia pachydermatis* in dogs, and *Candida albicans* in cats, were the most prevalent agents isolated from animals with skin diseases. The specie *Candida spp.* isolated in this survey was related in all animals to a history of interdigital dermatitis.

The following genera of saprobe fungi were also isolated: *Alternaria sp* (0.99%), *Rhizopus sp* (2.97%), *Trichoderma sp* (0.99%), *Fusarium sp* (4.95%), *Penicillium sp* (19.80%) and *Aspergillus sp* (26.73%).

The proportion of positive samples in relation to the number of samples examined from cases of dog and cat dermatophytosis varies considerably from one investigation to another.

Table 1. Mycotoxin concentrations in experimental diets (mg/kg)

Fungi species	Animals species					
	Canine species (54)	%	Feline samples (47)	%	Total samples (101)	%
Dermatophytes	17	16.8	17	26.7	34	33.66
<i>Microsporium canis</i>	6	5.9	12	11.8	18	17.82
<i>Trichophyton mentagrophytes</i>	14	13.8	2	1.9	16	15.84
Yeasts						
<i>Candida sp</i>	1	0.9	4	3.9	5	4.95
<i>Malassezia pachydermatis</i>	5		0		5	4.95
Saprobe fungi						
<i>Alternaria sp</i>	0		1		1	0.99
<i>Rhizopus sp</i>	2		1		3	2.97
<i>Trichoderma sp</i>	1		0		1	0.99
<i>Fusarium sp</i>	4		1		5	4.95
<i>Penicillium sp</i>	14		6		20	19.80
<i>Aspergillus sp</i>	19		8		27	26.73
TOTAL					101	100

In dogs, it ranges between 4% and 10% and few studies show higher prevalences. [5]. On the other hand, the percentages of positive cultures cited in the reviewed literature from dogs with or without suspected dermatophytosis are quite similar. [6]. Fungal skin disease is considered to be clinically over diagnosed in veterinary medicine, especially

in dogs [7]. In dogs with suspected lesions of dermatophytosis, with few exceptions, *Microsporium canis* is the most common species isolated. *Trichophyton mentagrophytes* and *Microsporium gypseum* are less frequently isolated. In cats the prevalence of dermatophytes

is usually higher than in dogs, and it is usually higher than 20%.

However the frequency of positive findings is higher in cats with suspected dermatophytosis than in cats without visible lesions, with the exception of asymptomatic infected cats and transient carrier cats. Cats are accepted as the principal reservoir for *M. canis*. The prevalence of dermatophytes in dogs with suspected lesions of dermatophytosis is relatively low, usually ranging between 4% and 15% [8, 9, 10].

These data are in accordance with the results obtained in our laboratory, but considerably higher values have been reported elsewhere [11]. The rate of prevalence of dermatophytosis obtained in our survey was slightly lower than in other reports from Brazil.

Clinical symptoms of skin diseases may vary from asymptomatic, to patchy hair loss, a papulocrustous eruption, an exfoliative dermatosis, erythematous plaques, and to a suppurative nodular disorder. Besides dermatophytoses, other mycoses have been prominent in veterinary medicine [12]. Among these diseases are the mycoses resulting from saprobe fungi, which classically belong to skin microbiota [13]. When the host is debilitated by a chronic disease, anticancer therapy, prolonged antibiotic treatment, steroids therapy, or immune depressing conditions, saprobe fungi can proliferate and elicit an infection.

Therefore, this situation associated with the improvement of diagnostic techniques, could explain, at least in part, the role of these fungi as primary pathogens.

These issues may justify either the relatively low rate of laboratorial confirmation of dermatophytes in dogs with suspected lesions of dermatophytosis, or the misdiagnosis of the samples.

Yeast infections in dogs are usually the result of *Malassezia pachydermatis*. This is considered a normal resident of the skin and an opportunistic pathogen, thus only cultures presenting high number of colonies were accounted in this study. Malasseziosis can be a primary problem but is more commonly seen as a secondary infection and tends to complicate other problems, especially allergies, keratinisation disorders, skin fold dermatitis, immunodeficiency and previous antibiotic administration. Candidosis is rare in pets, and predominantly causes mucocutaneous diseases [14, 15].

4. Conclusions

1. *M. canis* as the main dermatophyte detected in this study.
2. This study further showed the presence of a great variety of saprobe fungi in dogs and cats with superficial lesions.
3. Nevertheless, the participation of these fungi as the primary etiology of the lesions is inconclusive.
4. These data also pointed to the importance of fungal culture as the definitive diagnostic test for dermatomycoses, considering that the results of direct microscopy examinations alone did not enable a safe diagnosis, owing to the occurrence of false negative results.

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