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## MONITORING OF DERMATOPHYTOSIS INCIDENCE IN DOMESTIC DOGS AND CATS IN KHARKIV, UKRAINE

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**Summary.** The spread of dermatophytosis among animals and humans in the localities of Ukraine in particular in the city of Kharkiv is due to the presence of range of the most susceptible animals. This information mainly concerns dogs and cats that can be affected by dermatophytosis and may be a reservoir of dermatophyte fungus. Particularly important is that domestic dogs and cats represent a significant epidemiological threat to the population.

The purpose of the research was to monitor the morbidity of dermatophytosis in domestic dogs and cats in Kharkiv. Diagnostic studies of dermatophytosis morbidity level determination in domestic dogs and cats were performed complexly including the clinical and epizootic data, microscopic and mycological laboratory tests conducted according to generally accepted methods (Kovalenko et al., 2017; Sutton, Fothergill and Rinaldi, 2001).

Dermatophytosis was diagnosed among 231 animals in the study of 1,277 domestic dogs kept by the inhabitants of the city of Kharkiv which was in 18.09% of samples. Dermatophytosis was also detected in 615 animals which constitutes 50.25% in the study of 1,124 cats. The cultures of dermatophytosis agent *Microsporum canis* were isolated from 126 dogs (18.98%) and 110 cats (40.74%). *Trichophyton mentagrophytes* cultures were isolated from 16 dogs (2.41%) and 16 cats (5.93%). The percentage of isolated cultures of mold and yeast-like fungi in the studies of sick dogs and cats were 38.55% and 22.25% respectively. Obtained results indicate quite high level of the dermatophytosis spreading among domestic dogs and cats in the city of Kharkiv.

**Keywords:** dermatophytosis, domestic animals, dogs, cats

**Introduction.** Despite significant advances in the study of modern issues of veterinary mycology, dermatophytosis is widespread among animals and humans (Macura, 1993; Shokri and Khosravi, 2016). This is due to the existence of a wide range of animals susceptible to the disease which may be a dermatophyte fungus reservoir (Seker and Dogan, 2011; Kovalenko et al., 2017; Ponomarenko et al., 2018). It concerns small domestic animals, namely dogs and cats, which are kept in their own homes and in the courtyards by inhabitants of large and small settlements of our country including the city of Kharkiv (Ponomarenko, 2017).

Dermatophytoses are the most common mycotic diseases in the world (Kovalenko et al., 2015). These diseases do not cause significant mortality but predetermine a high level of morbidity among animals and humans. Particularly important is that domestic dogs and cats pose a significant epidemiological threat for their owners as well as to other people.

**The aim of the study.** In a view of above, the goal of our research was to conduct monitoring of dermatophytosis morbidity of domestic dogs and cats in the city of Kharkiv.

**Materials and methods.** Research on the selected topic, analysis and generalization of obtained data were

performed in period from 2012 to 2018 in conditions of private veterinary clinics 'Fauna', 'Aibolit', and 'Avicenna' (Kharkiv) as well as in Educational and Scientific Laboratory of Molecular Genetic Research Methods at the Department of Epizootology and Veterinary Management named after P.I. Verbytskyi in the Kharkiv State Zooveterinary Academy.

Diagnosis of dermatophytosis of domestic dogs and cats was carried out in a complex, taking into account the results of clinical, epizootic, microscopic, and mycological laboratory tests. Animals were tested using Wood's light examination in case of characteristic skin and hair lesions. Biological samples were taken for further laboratory studies after the clinical study.

The study of cultural and morphological properties of isolated cultures of pathogens was carried out using elective nutrient media of Sabouraud agar, Wort Agar, Czapek medium, peptone meat extract glycerol agar, and meat peptone agar. The seedings were incubated in a thermostat at a temperature at a temperature of 28–30 °C for 20–30 days. After that, identification of the isolated cultures of fungus-dermatophytes was carried out using generally accepted methods (Kovalenko et al., 2017; Sutton, Fothergill and Rinaldi, 2001).

**Results.** During the years 2012–2018, 1,277 dogs and 1,224 cats were examined using clinical-epizootic, microscopic, and mycological methods. Animals with symptoms of skin and hair loss were tested at three private veterinary clinics of the city of Kharkiv. According to research results, dermatophytosis was diagnosed in 846 animals which was 33.83% of the total number of examined animals (Table 1).

**Table 1** — Dynamics of dermatophytosis incidence in domestic dogs and cats in the city of Kharkiv

Year of observation	Number of investigated animals, heads		Number of animals with dermatophytosis, heads (%)	
	dogs	cats	dogs	cats
2012	227	215	50 (22.03)	123 (57.21)
2013	217	200	42 (19.35)	111 (55.50)
2014	195	204	38 (19.49)	107 (52.45)
2015	194	181	34 (17.53)	95 (52.49)
2016	193	153	28 (14.51)	67 (43.79)
2017	128	138	24 (18.75)	60 (43.48)
2018	123	133	15 (12.20)	52 (42.28)
Total	1,277	1,224	231 (18.09)	615 (50.25)

The average disease incidence among 1,277 dogs was 18.09% of the number of investigated (231 sick animals) with variation in the number of sick animals from 12.20% in 2018 to 22.03% in 2012.

The average disease incidence among 1,224 cats was 50.25% of the number of investigated (615 sick animals), with fluctuations in the number of diseased animals from 42.28% in 2018 to 57.21% in 2012.

As can be seen from the data presented in Table 1 there is a gradual decrease in the incidence rate both among domestic dogs and domestic cats which are held by the inhabitants of the city of Kharkiv over the period of observation.

The monitoring of pathogens isolated from diseased animals was conducted after determining the level of morbidity of dogs and cats for dermatophytosis. Monitoring studies were carried out in laboratory conditions by studying the cultural and morphological properties of isolated cultures of pathogens on elective nutrient media.

In total, biological material from 664 dogs was investigated. Dermatophytosis was detected in 147 animals which was 22.14% of the number of investigated. In addition, biological material from 270 cats was also studied among which the disease was diagnosed in 126 animals (46.67%).

According to the results of conducted research, cultures of pathogenic dermatophytes, as well as mold and yeast-like fungi with a total of 453 cultures were isolated from domestic dogs and cats (Table 2). Percentage of

isolated cultures was calculated from the number of investigated animals of the corresponding species.

**Table 2** — Results of monitoring of dermatophytosis pathogens isolated from domestic dogs and cats

Culture	Dogs		Cats	
	Total number	%	Total number	%
<i>Microsporum canis</i>	126	18.98	110	40.74
<i>Trichophyton mentagrophytes</i>	16	2.41	16	5.93
<i>Microsporum gypseum</i>	5	0.75	-	-
<i>Malassezia pachydermatis</i>	64	9.64	18	6.67
<i>Candida albicans</i>	40	6.02	14	5.22
<i>Alternaria alternata</i>	50	7.53	11	4.07
<i>Aspergillus fumigatus</i>	49	7.38	9	3.33
<i>Mucor</i>	53	7.98	8	2.96

According to the data given in Table 2 cultures of *Microsporum canis* were isolated from 126 dogs (18.98%) and 110 cats (40.74%). It indicates a significant advantage of this pathogen in the etiological profile of the disease.

*Trichophyton mentagrophytes* cultures were isolated from 16 dogs (2.41%) and 16 cats (40.74%). *Microsporum gypseum* cultures were isolated from 5 dogs (0.75%).

The cultures of yeast-like fungi *Malassezia pachydermatis* and *Candida albicans* are isolated in 15.66% of biological samples from dogs and in 11.89% samples from cats. Cultures of mold fungi are isolated in 22.89% of biological material samples from dogs and in 10.36% of samples from cats.

It should be noted that staphylococci, streptococci, and associations of cultures are etiological factors affecting the skin and hair cover of domestic dogs and cats in addition to the aforementioned pathogens (Ponomarenko et al., 2013; Morozova, Severin and Ponomarenko, 2015).

**Conclusions.** Dermatophytosis was diagnosed among 231 animals which was 18.09% of the number of investigated animals in the study of 1,277 domestic dogs kept by residents of the city of Kharkiv during 2012–2018. Dermatophytosis was detected in 615 animals in the study of 1,124 cats which was 50.25% of the number of investigated ones.

Cultures of dermatophytosis pathogen *Microsporum canis* were isolated from 126 dogs (18.98%) and 110 cats (40.74%). *Trichophyton mentagrophytes* cultures were isolated from 16 dogs (2.41%) and 16 cats (5.93%). The share of isolated cultures of mold and yeast-like fungi was 38.55% in the studies of sick dogs and 22.25% for of sick cats.

The data obtained during the research study indicates a rather high spread of dermatophytosis among domestic dogs and cats in the city of Kharkiv.

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