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ORIGINAL ARTICLE/ARTICLE ORIGINAL

# An epidemiological study of animals dermatomycoses in Iran



*Étude épidémiologique des animaux avec une dermatomycose en Iran*

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## KEYWORDS

Dermatomycosis;  
Animal;  
*Microsporum canis*;  
*Malassezia pachydermatis*;  
*Aspergillus fumigatus*;  
Dermatophyte

## Summary

**Objective.** – To determine the fungal species isolated from skin lesions of different animals suspected of having dermatomycoses and their prevalence in different regions of Iran.

**Materials and methods.** – A total of 1011 animals (292 dogs, 229 cats, 168 horses, 100 camels, 98 cows, 60 squirrels, 37 birds, 15 sheep, 6 goats, 5 rabbits and 1 fox) suspected of having dermatomycoses were examined. The samples were obtained by plucking the hairs and feathers with forceps around the affected area and scraping the epidermal scales with a sterile scalpel blade. All collected samples were analyzed by direct microscopy and culture. Laboratory identification of the fungal isolates was based on their colonial, microscopic and biochemical characteristics.

**Results.** – Fungal agents were recovered from 553 (54.7%) animals suspected of having dermatomycoses. Of 553 confirmed cases, 255 (49.7%) were positive for dermatophytosis, 251 (45.4%) for *Malassezia dermatitis*, 14 (2.5%) for candidiasis, 12 (2.2%) for aspergillosis and 1 (0.2%) for zygomycosis. Cats (36.3%) were the most prevalent infected animals, followed by camels (13.4%), dogs (12.8%), horses (12.5%), cows (12.3%), squirrels (5.4%), birds (3.6%), sheep (2%), goats (1.1%), rabbits (0.4%) and fox (0.2%). *Microsporum canis* (*M. canis*) was the most frequent fungus isolated from dogs and fox, *Malassezia pachydermatis* (*M. pachydermatis*) from cats, horses and squirrels, *Trichophyton verrucosum* (*T. verrucosum*) from cows and camels, *T. mentagrophytes* var. *mentagrophytes* from sheep, goats and rabbits, and *Aspergillus fumigatus* (*A. fumigatus*) from birds.

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**MOTS CLÉS**

Dermatomycosis ;  
Animal ;  
*Microsporum canis* ;  
*Malassezia*  
*pachydermatis* ;  
*Aspergillus fumigatus* ;  
Dermatophytes

**Conclusion.** – The results suggested that periodic screening of animals suspected of having dermatomycoses and necessary treatments could help in the management of their public health problem.

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**Résumé**

**Objectif.** – Pour déterminer les espèces fongiques isolées de lésions cutanées de différents animaux soupçonnés d'avoir une dermatomycose et leur prévalence dans différentes régions d'Iran.

**Matériel et méthodes.** – Un total de 1011 animaux (292 chiens, 229 chats, 168 chevaux, 100 chameaux, 98 vaches, 60 écureuils, 37 oiseaux, 15 moutons, 6 chèvres, 5 lapins et 1 renard) soupçonnés de dermatomycose ont été examinés. Les échantillons ont été obtenus en arrachant les poils et les plumes à la pince autour de la zone affectée et par grattage des squames épidermiques avec un scalpel stérile. Tous les échantillons prélevés ont été analysés par microscopie directe et par culture. L'identification en laboratoire des isolats fongiques a été basée sur l'aspect des colonies, les caractéristiques microscopiques et biochimiques.

**Résultats.** – Les agents fongiques ont été récupérés à partir de 553 (54,7 %) animaux soupçonnés d'avoir une dermatomycose. Des 553 cas confirmés, 255 (49,7 %) étaient positifs pour une dermatomycose, 251 (45,4 %) pour une dermatite à *Malassezia*, 14 (2,5 %) pour une candidose, 12 (2,2 %) pour une aspergillose et 1 (0,2 %) pour une zygomycose. Les chats (36,3 %) étaient les plus nombreux parmi les animaux infectés, suivis par les chameaux (13,4 %), les chiens (12,8 %), les chevaux (12,5 %), les vaches (12,3 %), les écureuils (5,4 %), les oiseaux (3,6 %), les moutons (2 %), la chèvre (1,1 %), les lapins (0,4 %) et le renard (0,2 %). *Microsporum canis* (*M. canis*) était le plus fréquent champignon isolé de chiens et du renard, *Malassezia pachydermatis* (*M. pachydermatis*) chez des chats, les chevaux et les écureuils, *Trichophyton verrucosum* (*T. verrucosum*) provenant de vaches et de chameaux, *T. mentagrophytes* var. *mentagrophytes* provenant de moutons, de chèvres et de lapins, et *Aspergillus fumigatus* (*A. fumigatus*) à partir d'oiseaux.

**Conclusion.** – Les résultats suggèrent que le dépistage périodique des animaux suspectés d'avoir une dermatomycose et les traitements adaptés pourraient contribuer à la gestion de ce problème de santé publique.

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**Introduction**

Among many microorganisms in nature, there are over 300 fungi that are actually pathogenic for animals [36]. Fungal infections will appear if the immune system of the host is weak. It is important to determine the factors that contribute to the mycoses development, such as fungi are widespread in nature so eradication is difficult, clinical manifestation is variable (inflammation or allergic reaction), diagnosing is not easy since clinical appearance is different and depends on the host, therapy is difficult since number of available drugs is restricted, and prevention is available for some fungi and only for some animal species [7].

Most of fungi are located superficially and are localized on the surfaces of skin, hair and nails. However, the mechanism between the host and fungus that actually contributes to the disease is not well understood. If the protective barrier is damaged, the skin presents main "door" for fungal infection. Dermatomycoses (dermal fungal infections) may occur when fungus contaminates or colonizes epidermis or hair follicles, although it has been reported that clinical changes are not always present [3]. The most significant aspects of dermatomycoses are related to the broadening of knowledge on all the factors that participate in pathogenesis, such as proteases, secretory enzymes, adhesion possibilities and

ability to modulate defense mechanisms of the host. In addition, lesions on skin induced by fungus depend on the location and structure of the skin, as well as on the skin product (superficial layer of the skin, hair or nails) [39].

Several fungal agents cause superficial and cutaneous mycoses (most often *Microsporum*, *Trichophyton* and also *Malassezia* and *Candida* species) [44]. Dermatophytosis is an infectious disease of animals caused by *Microsporum* and *Trichophyton* species that affect the hair shafts, claws and the keratin of the epidermis [12]. These fungi are widespread in nature and its classification depends on the habitat and their presence in various ecology niches. It is a major public and veterinary health problem reported from different parts of the world and causes great economic loss [37]. Yeasts of the genus *Malassezia* inhabit the skin of a variety of mammals and birds where they grow readily owing to the presence of skin surface lipids [41]. However, these yeasts are capable of acting as opportunistic pathogens in animals. They have been implicated in different skin disorders in animals, mainly otitis externa and dermatitis [16]. Several studies on the prevalence and aetiological aspects of superficial mycoses in humans have been conducted in different regions of Iran [2,6]. However, data on the prevalence and other aspects of animals dermatomycoses in Iran are lacking. This study was aimed to determine the fungal

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