

Short Communication

Isolation of dermatophytes in wild felids from screening centers

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Abstract

The aim of this study was detect the presence of dermatophyte fungi on wild felids from screening centers. Samples were taken from 30 animals, assembled in two groups: “free-ranging” and “transitory captivity”. The dermatophytes (*Trichophyton* genus), isolated from two felids (6.6%), both of the group “free-ranging”.

Key words: *Trichophyton* sp., dermatophytes, wild felids.

Dermatophytes are fungi that cause superficial mycoses in animals and humans. While studies have shown that domestic cats (*Felis catus*) are often asymptomatic carriers of dermatophytes, and thus a significant source of infection this aspect has not been studied in relation to their wild relatives (Bentubo *et al.*, 2006; Brotto *et al.*, 2005).

Dermatophytes are a group of keratinophilic fungi classified in three genera, *Microsporum*, *Trichophyton* and *Epidermophyton*, capable of invading keratinized tissues as nails, hair and cornea extract of humans and animals. These fungi are transmitted by contact with fur and dandruff infected or containing fungal particles, either from animals, environment or fomites (Sidrim *et al.*, 2004). Young animals are most susceptible than adults and therefore asymptomatic adults can be sources of infection for the young and to humans in screening centers (Pereira and Meireles, 2001).

In domestic cats *Trichophyton mentagrophytes* is the third most common agent causing dermatophytosis, after *Microsporum canis* and *M. gypseum* (Scott *et al.*, 1996). In

relation to wild felids, few studies describe the isolation and characterization of their dermatophytes. Thus, the prevalence of these fungi genera in wild cats is unknown. Given the considerable zoonotic potencial of dermatophytes, it is important to research and identify these fungi at resident and/or transitory microbiota of the fur of wild felids, to determine possible infection sources in unapparent carriers (Bentubo *et al.*, 2006). Therefore, the aim of this study was detect the presence of dermatophyte fungi on the hair and ear canal of free-ranging and transitory confined wild felids, in order to determine the prevalence of dermatophytes on these animals and related it to captivity status.

Samples were taken from 30 animals, felines, of both sexes, adults and young, admitted at Núcleo de Reabilitação de Fauna Silvestre - Centro de Triagem de Animais Silvestres, Universidade Federal de Pelotas, RS (NURFS - CETAS, UFPel) or at Centro de Reabilitação de Animais Silvestres (CRAS - IMAP), Secretaria do Meio Ambiente do Estado do Mato Grosso do Sul. Animal species include pumas (*Puma concolor* n = 11), geoffroy's

cats (*Leopardus geoffroyi* n = 9), margays (*Leopardus wiedii* n = 4), ocelots (*Leopardus pardalis* n = 2), tiger cats (*Leopardus tigrinus* n = 2), jaguar (*Panthera onça* n = 1) and jaguarundi (*Puma yagouaroundi* n = 1). They were divided in two groups: just captured (n = 23) and in transitory captivity (n = 7).

Animals included in the study were submitted to chemical restraint, with the anesthetic protocol employed at each facility. Samples were collected by rubbing sterilized carpet squares on the felids' skin on dorsum, nuchal and chest area. Material was collected from ear canal of all animals through sterile cotton sticks. These material were sent to laboratory in up to 24 hours, and then seeded by impression on plates containing Sabouraud dextrose agar with chloranfenicol and cycloheximide at 25 °C, with daily observation, until presented well defined pattern colony. To microscopical evaluation a colony's fragment was stained with lactophenol cotton blue, in order to detect typical fruiting bodies of each species. The material was submitted to

culture on potato dextrose agar, with the aim of encourage classic macroconidia growth and confirm the fungal species in the sample.

Dermatophytes were isolated from two felids (6.6%), both of the group "just captured". The only genus found was *Trichophyton* sp. The first one, a geoffroy's cat, was isolated *T. mentagrophytes*. This animal had the same agent isolated from its ear canal. Colony was white to cream with reverse tan and granular texture, characterized microscopically by spiral hyphae, numerous microconidia and rare long macroconidia thin-walled, cigar-shaped with 2-5 celled (Figure 1). The second animal positive to dermatophyte isolation was a jaguar. In this case, a *Trichophyton* sp. was isolated from its hair. On Sabouraud dextrose agar, *Trichophyton* sp. has grown as a flat downy thallus with white edges and a cream-tinted central area. On potato dextrose agar the colony presented numerous microconidia and one single macroconid cigar-shaped with nine celled (Figure 2).

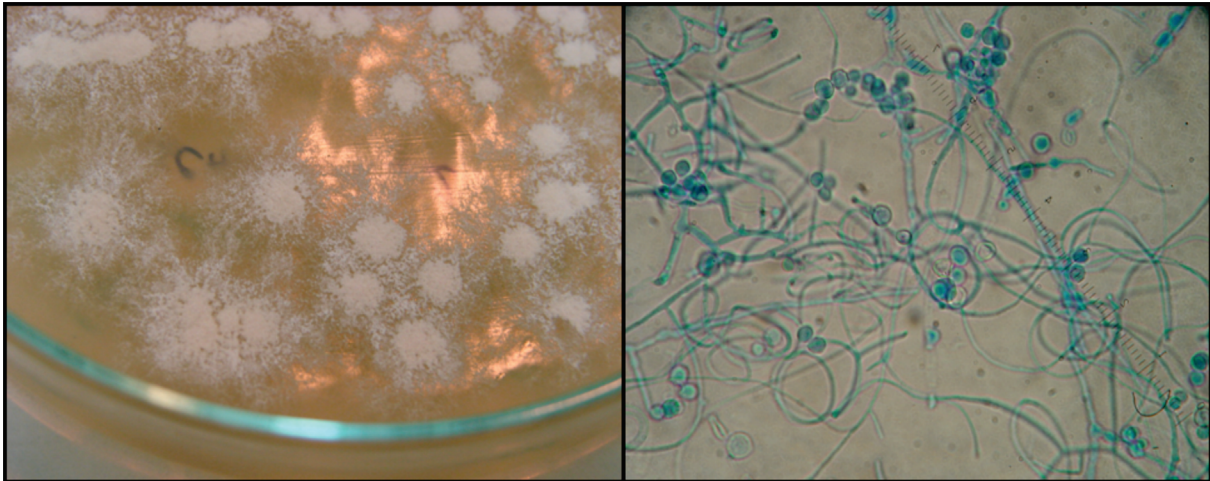


Figure 1 - *Trichophyton mentagrophytes* colony: spiral hyphae, numerous microconidia and rare long macroconidia thin-walled, cigar-shaped with 2-5 celled.

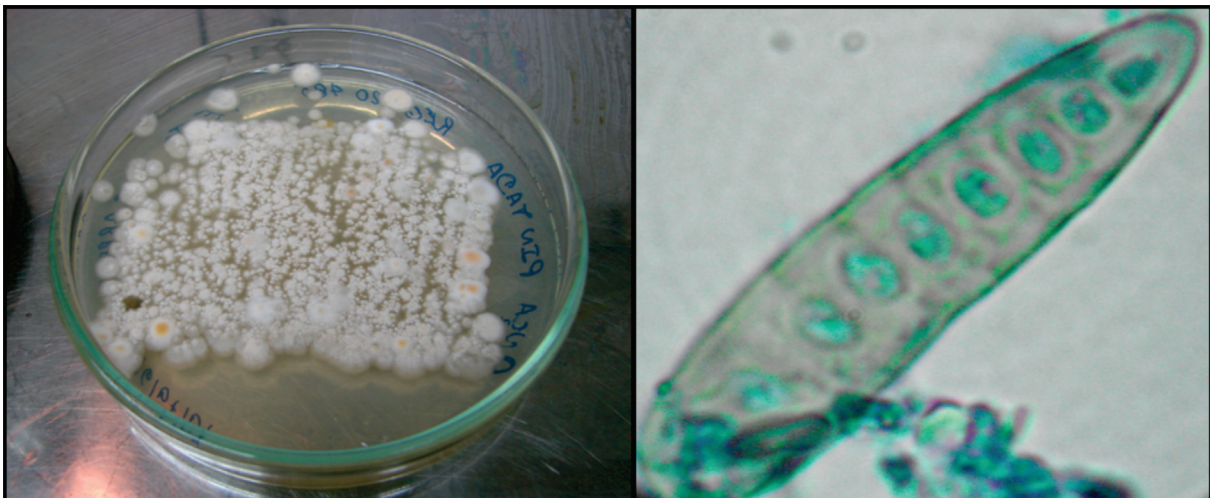


Figure 2 - *Trichophyton* sp.: colony presenting numerous microconidia and one single macroconid cigar-shaped with nine celled.

In domestic animals *M. canis*, *M. gypseum* and *T. mentagrophytes* are the main species involved in infections (Cavalcanti *et al.*, 2003). Among these, *M. canis* assumes a notable relevance as the most isolated dermatophyte in cats (Gambale *et al.*, 1993, Pier and Moriello, 1998, Zaror *et al.*, 1986). *M. canis* can be isolated in up to 88% of apparently healthy cats (Zaror *et al.*, 1986); this asymptomatic carrier state of the domestic cat is of utmost importance because animal host reservoirs represent an infection risk for the human population and a public health concern (Costa *et al.*, 1994a, Zaror *et al.*, 1986).

Although epidemiology of dermatophytosis in wild animals have not been well documented in literature, dermatophytes were isolated by many researchers from different wild species all over the world. In western Australia, *T. mentagrophytes* was recovered from many domestic and wild animals. A kangaroo was found to be carrying *T. mentagrophytes* which it transferred to a laboratory employee who developed a skin lesion (McAleer, 1980).

Salebian and Lacaz (1980) recovered the genus *Trichophyton* from 2.8% of free-ranging wild rodents in Brazil. Knudtson *et al.* (1980) reported a case of infection by *T. mentagrophytes* in a wild red fox (*Vulpes fulva*) in the USA.

The diagnostic result in animal dermatophytoses obtained by Schmidt (1996) showed that *T. mentagrophytes* has the highest prevalence rate in small rodents. *Trichophyton mentagrophytes* has been isolated from hairs of wild boars (*Sus scrofa*) in Italy, although there was no evidence of infection in these boars (Mancianti *et al.*, 1997). Dermatophytes were also isolated from the haircoat of a tiger (*Panthera tigris*) (Gierloff and Katic, 1961). Research in dermatophytes in Brazil in one specimen of each of the following wild felids: ocelot (*Felis pardalis*), lion (*Panthera leo*) and tiger (*Panthera tigris*), isolated *M. gypseum* in the ocelot (Costa *et al.*, 1995).

Given the considerable zoonotic and zoopathogenic potential of dermatophytes, it is important to research and identify these fungi in the resident and/or transitory microbiota of the haircoat of healthy wild felids, to determine possible infection sources in asymptomatic carriers. With this objective in mind this research sought to detect the presence of dermatophyte fungi on the haircoat of healthy wild felids maintained in captivity.

Both wild felids in our study were young animals, matching the results related by Balda *et al.* (2004) on domestic cats, which more than 65% of animals were younger than 12 months. Both of them were free-ranging animals, which could suggest that dermatophyte isolation is not related to captivity stress. However, the low number of samples from captivity animals (n = 7) in this study seems to acted as an interference factor in this analyses, since captivity condition is associated with stress, which increases opportunist infections frequency, as dermatophytosis.

Since *Trichophyton* is a zoophilic dermatophyte, we believe that wild rodents are a possible source of infection to wild felids, because their predation habits. The presence of dermatophytes on the fur of healthy wild felids not only increases the risk of illness but also makes them unapparent carriers, characterizing them as a source of infection for other animals and for human being (Bentubo *et al.*, 2006). Understanding this condition is essential in the adoption of prophylactic measures for sanitary maintenance for these animals and the professionals who maintain contact with them.

Due to growing interest in ecology and preservation of wild animals, it has been required the knowledge about the etiology of illness in non-domestic animals, to prevent its transmission to other hosts, such as other animals as well as humans involved in their treatment, handling and/or conservation.

References

- Balda AC, Larsson CE, Otsuka M, Gambale W (2004) Retrospective survey of dermatophytosis in dogs and cats attended at the Serviço de Dermatologia da Faculdade de Medicina Veterinária e Zootecnia da Universidade de São Paulo. *Acta Scientiae Veterinariae* 32:133 - 140.
- Bentubo HDL, Fedullo JDL, Corrêa SHR, Teixeira RHF, Coutinho SD (2006) Isolation of *Microsporium gypseum* from the haircoat of health wild felids kept in captivity in Brazil. *Braz J Microbiol* 37:148-152.
- Brotto TL, Andrade MCR, Gonçalves MAB, Gimenes F, Pina A (2005) Identification of fungi microflora in the ear conducts of rhesus macaques (*Macaca mulatta*) kept in captivity. *Braz J Vet Res Anim Sci* 42:459-464.
- Cavalcanti MP, Faustino MAG, Gomes-Filho JB, Alves LC (2003) Frequência de dermatófitos e fungos saprófitas em caninos e felinos com sintomatologia sugestiva de dermatopatia micótica atendidos no Hospital Veterinário da UFRPE. *Clín Vet* 24-28.
- Costa EO, Diniz LS, Benites NR, Coutinho SD, Carvalho VM, Dutra LF, Serra EG (1994) Surtos interespecíficos de dermatomicoses por *Microsporium canis* e *Microsporium gypseum*. *Rev Saúde Publ* 28:337-340.
- Costa EO, Diniz LSM, Carvalho VM, Coutinho SD, Benites NR (1995) Dermatoses observadas no homem e em animais de laboratório, domésticos e silvestres em São Paulo. Levantamento retrospectivo. *Arq Bras Med Vet Zoot* 47:601-607.
- Gambale W, Larsson CE, Moritami MM, Corrêa B, Paula CR, Framil VMS (1993) Dermatophytes and other fungi of the haircoat of cats without dermatophytosis in the city of São Paulo, Brasil. *Fel Pract* 21:29-33.
- Gierloff BCH, Katic I (1961) Om anvendelse of griseofulvin specielt I veterinaer praksis. *Nord Vet Med* 13:571-592.
- Knudtson WU, Gates CE, Ruth GR (1980) *Trichophyton mentagrophytes* dermatophytosis in wild fox. *J Wild Dis* 16:465-468.
- Mancianti F, Mignone E, Papini R (1997) Keratinophilic fungi from coats of wild boars from Italy. *J Wild Dis* 33:340-342.
- McAleer R (1980) Zoophilic dermatophytes and their natural hosts in Western Australia. *Med J Aust* 2:506-508.

- Pereira DB, Meireles MCA, (2001) Doenças causadas por fungos e oomycetos: dermatofitoses. In: Riet-Correa F, Schild AL, Méndez MC, Lemos RAA (eds). Doenças de Ruminantes e Eqüinos. Varela, São Paulo, Brazil, 367-373.
- Pier AC, Moriello KA (1998) Parasitic relationship between *Microsporum canis* and the cat. *Med Mycol* 36:271-275.
- Salebian A, Lacaz CS (1980) Isolamento de dermatófitos de pêlos de animais silvestres. *An Bras Dermatol* 55:125-130.
- Schmidt A (1996) Diagnostic results in animal dermatophytoses. *Zentralbl Veterinarmed B* 43:539-543.
- Scott DW, Miller WH, Griffin CE (1996) Muller & Kirk - dermatologia de pequenos animais. Interlivros, Rio de Janeiro.
- Sidrim JJC, Meireles TEF, Oliveira LMP, Diógenes MJN (2004) Aspectos clínico-laboratoriais das dermatofitoses. In: Sidrim JJC, Rocha MFG (eds). *Micologia Médica à Luz de Autores Contemporâneos*. Guanabara Koogan, Rio de Janeiro, pp 135-161.
- Zaror L, Fischman O, Vilanova A, Levites J (1986) The role of cats and dogs in the epidemiological cycle of *Microsporum canis*. *Mykosen* 29:185-188.

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