Dermatophytosis caused by a *Chrysosporium* species in two cats in Turkey: a case report

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ABSTRACT: Dermatophytes are infectious agents and can cause the zoonotic disease dermatophytosis in animals and humans. Keratinophilic fungi and especially dermatophytes can be detected on the hair coat and skin of cats. The aim of this report is to present a rarely seen dermatophytic skin disease in cats. Two Persian cats, living in the same house, were found to be positive for *Chyrososporium* spp. using mycological culture. At that time the owner of the cats was undergoing chemotherapy for a mammary tumour. This treatment led to low immunity, intensive pruritus and also to scaling on the inside of her arms. *Chrysosporium* spp. were also detected in the cats' owner. Antifungal therapy was applied with fluconazole to both cats. Because of widespread lesions and alopecia, intravenous fluconazole was administered with a saline solution. The lesions improved inside a six week period after fluconazole therapy and no adverse effects were observed.

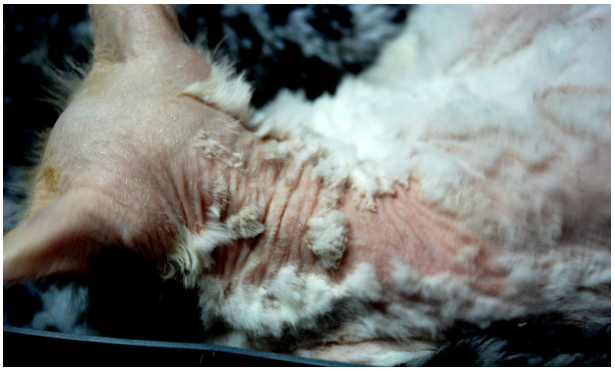
Keywords: dermatophytes; *Chrysosporium* spp.; fluconazole

Keratinophilic fungi live on the hair coat of dogs and cats. Generally, they do not cause any adverse effects on health, but among them, the dermatophytes are infectious agents that can cause the zoonotic disease dermatophytosis (Guzman-Chaves et al. 2012). *Chrysosporium* is a keratinophilic filamentous fungus commonly isolated from soil where it lives on the remains of hairs and feathers. *Chrysosporium* species are occasionally isolated from nail scrapings and skin, especially from feet, and may cause skin infections and onychomycosis in animals and humans. However, because they are common soil saprophytes they are usually considered as contaminants (http://www.cmpt.ca/pdf).

Case description

A two-year-old, female, spayed Persian cat, weighing 3 kg was presented to the Department of Internal Medicine, Faculty of Veterinary Medicine, Istanbul University with symmetric alopecia, hyperpigmentation, pruritus and loss of appetite. Widespread hair loss had been observed for four months (Figure 1). The owner also owned another Persian cat that had developed skin lesions. In addition, the owner herself reported pruritus and scaling on the inside of her arms. (Figure 2 and 3). Enlarged submandibular lymph nodes and mild dehydration were detected on physical examination of the black Persian cat. No abnormal clinical findings were detected in the white Persian cat. The diagnostic work-up began with a complete blood count (CBC) and blood serum biochemistry panel. CBC revealed severe leucocytosis (white blood cells – WBC):

Figure 1. Clinical appearance of the patient at the first referral



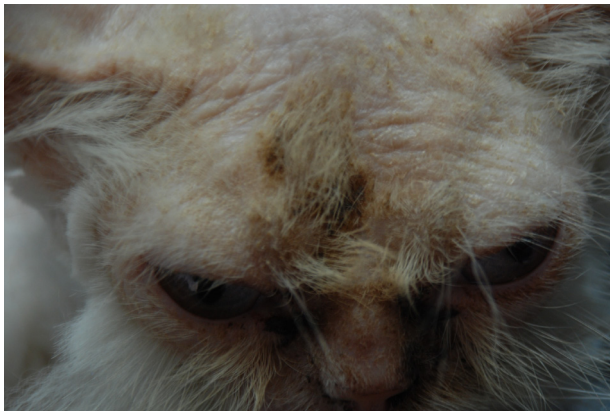


Figure 2 and 3. Alopecia and decreased hair coat quality in the second household cat

68.2 × 10^3 µl, reference ranges: 5.5–19.5 × 10^3 µl). Because of severe leucocytosis, ancillary diagnostic tests had to be done. Rapid tests for feline leukaemia virus (FeLV), feline immunodeficiency virus (FIV) and feline infectious peritonitis (FIP) yielded negative results. Measurements of IgG and IgM antibodies to *Toxoplasma gondii* in the blood using the indirect immunoflourescent technique (IFAT) were also negative. Plucked hairs and scraped scales were examined for fungal elements using direct microscopy in 10% potassium hydroxide and were inoculated on sabouraud dextrose agar (SDA) with 0.05% of cycloheximide and 0.005% chloramphenicol and dermatophyte test medium (DTM). The plates were incubated at 25 °C for up to 15 days (Hungerford et al. 1998). Primary identification was based on the colour of the colony, as it is well known that most dermatophytes exhibit a white-to-creamy colour, with the colony texture ranging from velvety to cottony (Figure 4). The isolates were examined for microscopic morphology using lactophenol cotton blue staining. In those isolates exhibiting dermatophyte characteristics the slide culture technique was used in order to identify their characteristic macro- and microconidias as well as any other feature of the isolate. A complete characterization of each isolate down to the species levels was performed using routine methods by an individual at the Microbiology Laboratory at the Veterinary Faculty of the University of Istanbul. Treatment was initiated with a 5% dextrose solution (20 ml/kg *i.v.*), marbofloxacin (2 mg/kg, q24h, *p.o.*), vitamin E (100 IU/day, *p.o.*). Fluid therapy lasted for five days. Antibiotic therapy was applied for 10 days orally. After the treatment, the WBC value was lowered to 2.59 × 103 µl at the second referral. In samples taken from both cats, *Chrysosporium* spp. were identified. According to the results of mycological culture, fluconazole therapy was started immediately. Because of widespread alopecia and skin lesions, fluconazole was administered in a dosage of 5 mg/kg/day *i.v.*, the same as oral dosage with a saline solution three times per week. No gastrointestinal effects (eg. vomiting, diarrhoea, anorexia, nausea) were observed in either of the cats. After three weeks of this therapy, there a pronounced growth of new hair coat was observed in both cats (Figure 5 and 6). The therapy was continued with oral fluconazole in the same dosage. The cats healed within a six week period. When the antifungal therapy was finished, the alopecia had resolved and a new hair coat had regrown (Figure 7). The health status of the cats was then normal.

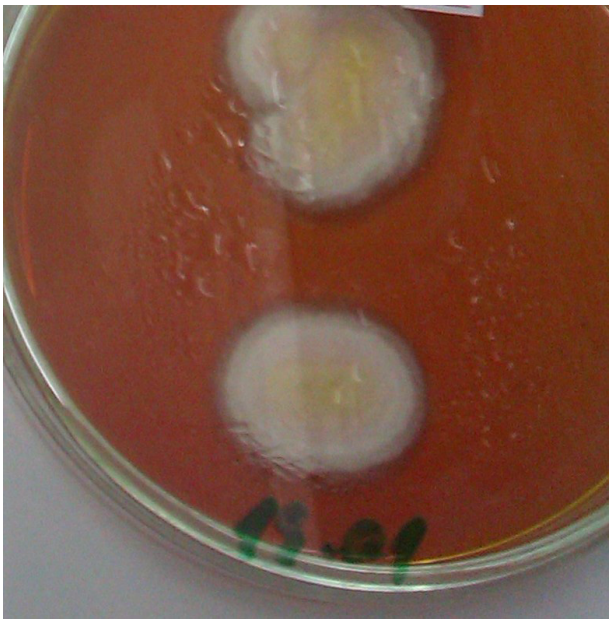


Figure 4. Colony morphology of the strain on the dermatophyte test medium plate

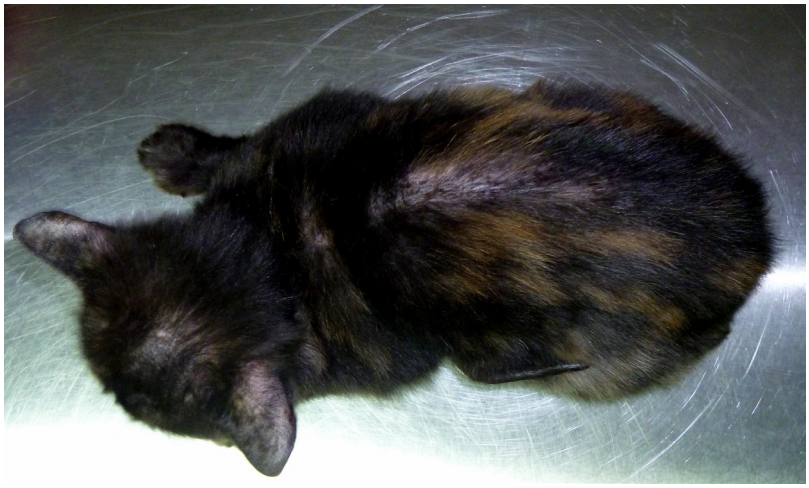


Figure 5. The cat's hair coat after three weeks of fluconazole therapy

DISCUSSION AND CONCLUSIONS

Various fungal organisms are commonly found on the hair coats of cats. These organisms include dermatophytes and other fungi which are normally considered to be saprophytic. Members of the genus *Chrysosporium* are closely related to the dermatophytes and *Chrysosporium* spp. which may occur in clinical material; they are frequently misidentified as dermatophytes. Many authors have reported the presence of *Chrysosporium* species in different animals including cows, sheep, goats, rabbits, pigs, donkey, dogs, cats and iguanas in many countries. In New Zealand, Woodgyer (1977) reported that in addition to the dermatophyte isolates, *Chrysosporium* species were isolated from 11 of 199 (5.5%) cats. Guzman-Chavez (2000) reported that out of one hundred samples of cats the keratinophilic fungi isolated in pure culture numbered 25 isolates of *Chrysosporium* spp. (25%), in mixed cultures *Chrysosporium* spp./*T. terrestre* numbered eight isolates each (8%) and *Chrysosporium* spp./*M. gypseum* numbered two isolates each (2%). Apart from *Chrysosporium* spp., a non-pathogenic keratinophilic fungus was also recovered, and this is similar to the reports made by Piontelli and Toro (1987) in Chile and Caretta (1989) in Italy. Whereas treatment of dermatophytosis in dogs can generally be achieved with topical treatment alone, cats usually require systemic treatment (Rochette et al. 2003). Very limited data are available concerning *Chrysosporium* therapy (http://www.cmpt.ca/pdf). Fluconazole is a synthetic bis-trizaole antifungal agent that is available as an oral or intravenous preparation (Guzman-Chaves et al. 2000, Or et al. 2000b, http://www.cmpt.ca/pdf). The pharma-

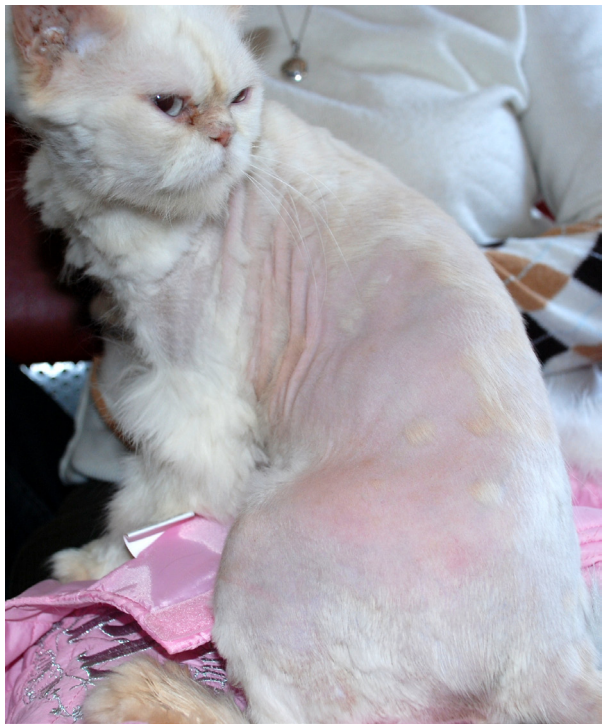


Figure 6. New hair coat was observed after the third week the flucanozole therapy

Figure 7. The cats' clinical appearance when the fungal therapy was ended

cokinetics and tissue penetration of fluconazole are quite different from that of the other azole antifungals because fluconazole has a higher degree of water solubility and is only slightly lipophilic (Or et al. 2000b). Because of its polarity, low molecular weight and metabolic stability, fluconazole is probably eliminated principally by the kidney, although this has not been directly studied in the cat (Heit and Riviere 1995; Or et al. 2000b). Although gastrointestinal upset as evidenced by nausea, vomiting and diarrhoea are the most common adverse effects; these symptoms were not observed in either of the cats (Derbryne and Ryckelynek 1993). Fluconazole is completely absorbed and, therefore, oral and intravenous dosage recommendations are the same (Or et al. 2000a,b; Vaden et al. 2007). Fluconazole MICs are relatively higher than amphotericin B, ketoconazole, itraconazole and voriconazole (http://www.cmpt.ca/pdf). For all these reasons, therapy was started with intravenous dosage and continued with oral administration of fluconazole. In the authors' opinion, the intravenous use of fluconazole shortened the therapy duration. Reported data suggest that cats are much more likely to have keratinophilic fungi and specially dermatophytes on their hair coats than dogs (Guzman-Chaves et al. 2000). This is the first report in Turkey to describe in cats dermatophytosis caused by *Chrysosporium* species of keratinophilic filamentous fungi.

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