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Short communication

Isolation of *Sporothrix schenckii* from the nails of domestic cats *(Felis catus)*

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We report the first isolation of *Sporothrix schenckii* from the nail surfaces of cats. The fungus grew from nail clippings of three cats associated with three household outbreaks of sporotrichosis involving cats and human beings. The identification of the isolates was based on macroscopic and microscopic morphological characteristics at 25 °C and conversion of *S. schenckii* to the yeast-like form at 37 °C.

Keywords cats, isolation, nails, *Sporothrix schenckii*

Introduction

The close contact between human beings and pets has been identified as a risk factor for both groups in the transmission of disease, with several mechanisms being involved in this phenomenon [1]. Domestic cats have been held responsible for the transmission of infectious agents such as *Toxoplasma gondii*, *Pasteurella multocida*, *Bartonella henselae* and dermatophytes [2]. Their characteristic hygiene habits (licking their coat and burying their feces), their developed hunting instinct, relative independence from their owners, and excursions beyond the household limits definitely contribute to the transport of these microorganisms into the human environment.

Sporotrichosis is a granulomatous disease caused by *Sporothrix schenckii*, a dimorphic fungus widely dispersed in nature, especially in temperate and tropical climates [3]. The subcutaneous form of the disease is acquired by inoculation of the fungus through the skin and mainly affects persons who are in contact with soil and plants [4,5]. Feline sporotrichosis has been described in the literature [6–8] and its importance as a source of human infection has been reported, especially among pet owners and veterinarians [9–11]. In such cases, in addition to the direct contact with lesions and exudates, the scratching mechanism has been cited as a possible form of transmission, although isolation of *S. schenckii* from nails has not been reported [12–16].

In the present communication we report the isolation of *S. schenckii* from the skin lesions and nails of three cats associated with three household outbreaks of sporotrichosis involving cats and human beings.

Methods

The investigation was started after three index cases of human sporotrichosis not connected with each other were seen at the Infectious Dermatology Service of the Evandro Chagas Hospital Research Center, Fiocruz. All patients reported a cat residing in their home which presented ulcerous skin lesions. Two patients reported that their own lesions had arisen at a site previously scratched by a sick cat. The three cats were sacrificed before the patients first visited our hospital.

There was a second cat which later also showed skin lesions in each of the three households. These three additional cats were examined clinically and, after sedation, were submitted to biopsies of the skin lesions

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obtained with a 6-mm punch. Serous-purulent secretion was also collected from the lesion of one animal. Even though no animal showed involvement of the toes, the extremities of the five nails from each footpad of the animals were cut and pooled.

All samples were submitted to mycologic examination according to the following routine: direct microscopy with 4% sodium hydroxide and seeding onto Sabouraud glucose agar and Mycobiotic agar (DIFCO, Detroit, MI, USA) at 25 °C. The isolates were studied for macroscopic and microscopic morphology on potato dextrose agar medium (DIFCO) at 25 °C and conversion of *S. schenckii* to the yeast-like form was performed on brainheart infusion agar medium (DIFCO) at 37 °C [3,17].

Case reports

Case 1

A 1-year-old female Siamese cat had been presenting an ulcerous lesion located in the preauricular region (biopsied) for 2 months, as well as other nodular-tuberous lesions in the posterior region of the trunk.

Case 2

A 1-year-old mongrel male had been showing an ulcerous region in the left anterior footpad (biopsied) for 4 months.

Case 3

A 1-year-old female Siamese cat had been showing an extensive ulcerous lesion involving the distal half of the anteromedial region of the left anterior limb (biopsied and submitted to collection of secretion) for the past 2 months. She also presented three other small ulcerous lesions of similar aspect located in the proximal portion of the left anterior limb, menton region and distal portion of the right posterior limb.

Results

The microscopic examination was positive for all lesion biopsies, with the visualization of small yeast cells compatible with *S. schenckii*. In both lesion and nail samples, the microscopic examination of the colonies at 25 °C showed hyaline septate hyphae, conidia hyaline to brown, ovoid and thin-walled, grouped at the tips of the conidiophores. The presence of characteristic brown conidia, ovoid and thick-walled, attached to the sides of the hyphae, distinguished the isolates from non-pathogenic *Sporothrix* species (Fig. 1). The conversion to the yeast-like form at 37 °C was obtained for all isolates [5,18].

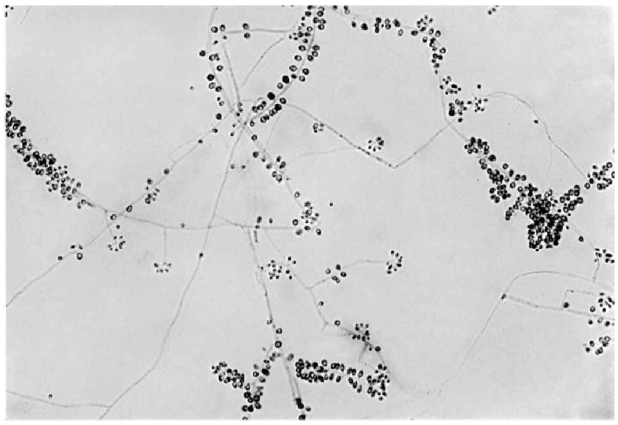

Fig. 1 Filamentous growth of *Sporothrix schenckii* on potato-dextrose-agar medium at 25 °C (magnification × 400).

Discussion

We decided to undertake this investigation on the basis of diagnosed human cases in which the patients reported that the disease had arisen after a cat scratch. In these previous cases, no attempt was made to isolate the fungus from nail surfaces of infected animals [11–13]. The cats directly involved in scratching the present patients could not be investigated. The isolation of *S. schenckii* from the nails of the other infected cats residing in the same households leads us to conclude that inoculation of *S. schenckii* by scratching may represent a significant form of transmission of this mycosis.

The association of lesions with the face and anterior limbs of the cats studied leads us to think that nail contamination and skin infection may have occurred in these animals during activities such as burying their feces, hunting, climbing trees, passing between bushes, or by contact with their own lesions or lesions of other sick cats [17,19]. It is also quite possible that sporotrichosis was acquired by inoculation from the contaminated nails of other cats, e.g. during playing or fighting, or by self-inoculation during the scratching of pruritic areas [10,19]. The detection of *S. schenckii* in the feces of cats with skin lesions of sporotrichosis suggests that the hair licking habit may be involved in the contamination of the digestive tract of the animal [10].

Mice are susceptible to *S. schenckii* when inoculated in the laboratory [20]. There are reports of natural infection of rats, mice and wild rodents, as well as reports of the possible transmission of *S. schenckii* from rodents to human beings [21–23]. All three households had a history of the presence of rodents. Studies on other cats and on rodents that may be captured around the foci in question are in progress.

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After documenting the presence of *S. schenckii* in the nails of domestic cats, as well as the possibility of multiple inoculations through scratching, the authors emphasize the zoonotic potential of feline sporotrichosis.

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