Brazilian Journal of Microbiology 45, 3, 1101-1103 (2014)
ISSN 1678-4405

Short Communication

First isolation of the *Stephanoascus ciferrii* in feline otitis in Brazil

Angelita dos Reis Gomes[1], Ângela Leitzke Cabana[1], Luiza da Gama Osório[2], Rosema Santin[2], Isabel Duarte Schuch[3], Emanoele Figueiredo Serra[1], Patrícia Silva Nascente[4], Mário Carlos Araújo Meireles[1]

[1]Laboratório de Doenças Infecciosas, Faculdade de Veterinária, Universidade Federal de Pelotas, Pelotas, RS, Brazil.
[2]Instituto de Ciências da Saúde, Universidade Federal do Rio Grande do Sul, Porto Alegre, RS, Brazil.
[3]Departmento de Clínica Veterinária, Hospital Veterinário, Universidade Federal de Pelotas, Pelotas, RS, Brazil.
[4]Departmento de Microbiologia e Parasitologia, Instituto de Biologia, Universidade Federal de Pelotas, Pelotas, RS, Brazil.

Submitted: June 15, 2013; Approved: March 14, 2014.

Abstract

Ear infections in cats are uncommon, especially involving yeasts. This report describes the first isolation of the *Stephanoascus ciferrii,* teleomorph of the *Candida* genus, in a case of feline otitis in Brazil. The identification and characterization of *Stephanoascus ciferrii* were confirmed by the Vitek2 System (BioMerieux ®).

Key words: mixed infection, identification, external otitis, cat, *Stephanoascus ciferrii*.

An eight month old male mixed breed cat, weighing 3.3 kg was referred to the Veterinary Hospital - Federal University of Pelotas (HCV-UFPel), Brazil. The chief symptoms of the patient were pruritus and secretion in the left ear for three days. At the clinical examination, the animal was within the physiological parameters of the species. In the ear specific examination, scaly dermatitis was observed and an otoscopy of the left ear showed a dark secretion and erythema in the auricle, external meatus and the ear canal lining. There were no parasites in the ears examined. There were no alterations on the right ear. Secretion was collected from both ears using a sterile swab and sent for mycological and bacteriological analysis.

Mycological analysis was performed at the Laboratory of Infectious Diseases (Mycology Sector) of the School of Veterinary of the Federal University of Pelotas, Brazil. The sample was processed in duplicate on Petri dishes containing Sabouraud dextrose agar (SDA, Neogen Acumedia®, Michigan, USA) and Sabouraud dextrose agar cloranfenicol and olive oil, incubated at 37 °C and observed daily, heavy growth of yeast colonies was observed after 24 h, there after fungal colonies were subcultured in Mycosel® agar and malt agar. The macromorphological and micromorphological characteristics of the fungal colonies were analyzed. Direct examination of the colony was carried out based on a smear of the cultures using the Gram staining technique, observed in 100x objective. To characterize the genus and species, and confirm the conventional mycological diagnosis, a test of characterization and identification was performed by automated Vitek2 system (BioMerieux ®) using pure colonies streaked in SDA medium, incubated at 37 °C for 24 h. Bacteriological examinations were performed at the Laboratory of Infectious Diseases (Bacteriology Sector) of the School of Veterinary of the Federal University of Pelotas, Brazil. The isolated bacteria were *Escherichia coli*, *Staphylococcus* sp. coagulase negative and *Streptococcus* sp; antibiogram showed resistance to cephalexin (30 μg), sulfazotrim (30 μg), tetracycline (30 μg), and amoxicillin clavulanic acid (30 μg) in all isolates. Macroscopically the isolated fungal colony had yeast form aspect, cream coloration and a rough aspect (Figure 1).

Microscopically extensive branches and blastoconidia ovals chain of different sizes, arranged along pseudo-

Send correspondence to A.R. Gomes. Laboratory of Infectious Diseases, Faculty of Veterinary, Universidade Federal de Pelotas, Pelotas, RS, Brazil. E-mail: angelitagomes@gmail.com.

Figure 1 - Macroscopy of *Stephanoascus ciferrii* on Sabouraud's dextrose agar when cultured at 37 °C for 2 days. Colony of the clinical isolate was cream-colored, rough, raised and wrinkled.

hyphae and true hyphae were observed (Figure 2) according to the species description (Smith and Johannsen, 1976).

The confirmation of the conventional *S. ciferrii* was completed through the automated Vitek 2 system (BioMérieux®) comparing sample data with data from the isolated yeast strains standard ATCC (*American Type Culture Collection*).

In humans *S. ciferrii* (Smith *et al.*, 1976), teleomorph of *Candida ciferrii* (Kreger-Van Rij, 1965), is considered an emerging species (De Gentile *et al.*, 1991; García-Martos *et al.*, 2004; Hazen, 1995) associated with ear diseases, non-insulin dependent diabetes, vascular disorders, valvular heart disease and most especially with cases of onychomycosis (De Gentile *et al.*, 1991; Furman and Ahearn, 1983; Hazen, 1995). Occurences have been reported in cases of immunocompromised patients (García-Martos *et al.*, 2004; Gunsilius *et al.*, 2001) and candidemia (Agin *et al.*, 1991).

In veterinary medicine the occurrence of fungal infections caused by *S. ciferrii* is rare, especially in small animals. Only one reported case of feline otomycosis (Kano *et al.*, 2000). Likewise, its isolation is also rarely reported in other animal species, although it has been found in the neck of swine, bovine placenta (Furman and Ahearn, 1983) and mastitis (Krukowski *et al.*, 2000). However, its role in the pathogenesis of the disease is still unclear. This report describes the first isolation of the *S. ciferrii* in mixed infection in feline otitis in Brazil.

Prior to laboratorial confirmation of the agents involved in the case of otitis, the treatment was based on the mechanical removal of earwax with the cleaning of the auricular pavilion and ear canal made twice a day with a solution based on acetylsalicylic acid, lactic acid, boric acid, aloe-vera and calendula. After 12 days, the owner reported just kept on cleaning the ear canal, at clinical examination regression of the clinical signs was observed, with apparent cure. However, there was no return of the animal in subsequent consultations.

The prognosis of otitis caused in humans and animals by *S. ciferrii* is good (Kano *et al.*, 2000). Nevertheless, consideration should be given to the opportunistic character of this yeast (De Gentile *et al.*, 1991), the immune status of the patient (García-Martos *et al.*, 2004) and the resistance displayed to itraconazole, fluconazole, bifonazole and miconazole (De Gentile *et al.*, 1991; Hazen, 1995; Kano *et al.*, 2000). The zoonotic potential of this yeast is still unknown (Kano *et al.*, 2000).

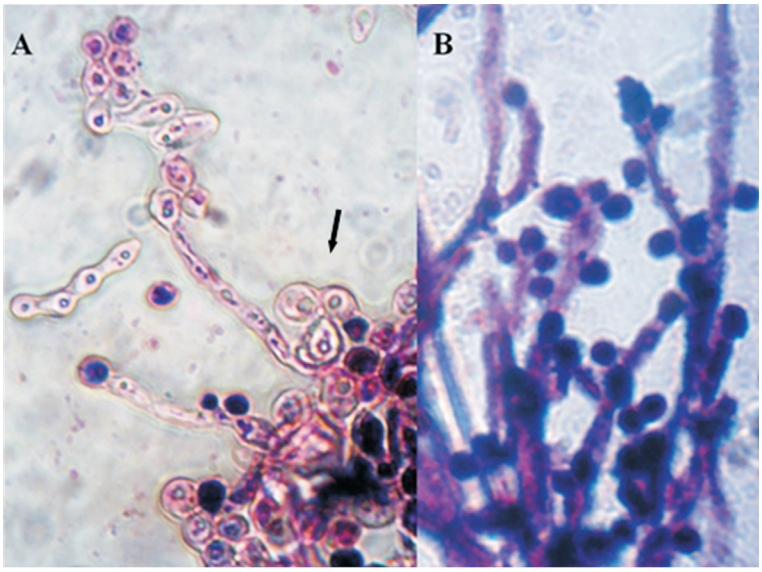

Figure 2 - Microscopy of isolated *Stephanoascus ciferrii* from Sabouraud dextrose agar visualized by Gram stain technique, 100x objective. A: oval blastoconidia of varying size arranged along the pseudo-hyphae and asci (arrow). B: ramifications of true hyphae and chains of oval blastoconidia.

This case confirms the association of the *S. ciferrii* in the case of external otitis in felines, demonstrating that polymicrobial infections of ordinary diseases in the veterinary clinic may involve microbial agents not previously diagnosed and considered rare. We also evaluate that incidence of isolations and infections associated with uncommon yeast are likely to be significantly underestimated, due to the fact of being only estimated by case reports.

Acknowledgments

Thanks to Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES) and Dr. Zoilo Pires de Camargo of the Departamento de Microbiologia Imunologia e Parasitologia of the Universidade Federal de São Paulo (UNIFESP).

References

Agin H, Ayhan Y, Devrim I, Gullfidan G; Tulumoglu S, Kayserili E (2011) Fluconazole, Amphotericin-B, Caspofungin and Anidulafungin Resistant *Candida ciferrii*: An Unknown Cause of Systemic Mycosis in a Child. Mycopathologia 172(3):237-239.

De Gentile L, Bouchara JP, Cimon B, Chabasse D (1991) *Candida ciferrii*: clinical and microbiological features of an emerging pathogen. Mycoses 34:125-128.

Furman RM, Ahearn DG (1983) *Candida ciferrii* and *Candida chiropterorum* isolated from clinical specimens. J Clin Microbiol 18(5):1252-1255.

García-Martos P, Ruiz-Aragón J, García-Agudo L, Saldarreaga A, Lozano MC, Marín P (2004) Aislamento de *Candida ciferrii* en un paciente inmunodeficiente. Rev Iberoam Micol 21:85-86.

Gunsilius E, Lass-Flöri C, Kähler CM, Gastl G, Petzer AL (2001) *Candida ciferrii*, a new fluconazole-resistant yeast causing systemic mycosis in immunocompromised patients. Ann Hematol 80:178-179.

Hazen KC (1995) New and emerging yeast pathogens. Clin Microbiol Rev 8(4):462-478.

Kano R, Makimura K, Kushida T, Nomura M, Yamaguchi H, Hasegawa A (2000) First isolation of Stephanoascus ciferrii from a cat. Microbiol Immunol 44 (8):711-713.

Kreger-Van Rij NJW (1965) *Candida ciferrii*, a new yeast species. Mycopathol Mycol Appl 26:49-52.

Krukowski H, Tietze M, Majewski T, Rozanski P (2000) Survey of yeast mastitis in dairy herds of small-type farms in the Lublin region, Poland. Mycopathologia 150:5-7.

Smith MT, Van der Walt JP, Johannsen E (1976) The genus *Stephanoascus* gen. nov. (Ascoideaceae). Antonie van Leeuwenhoek J Microbiol Serol 42:119-127.