

## Vaginitis Caused by *Saccharomyces Cerevisiae*: Case Report

I. Ouaziz<sup>1\*</sup>, L. Darfaoui<sup>1</sup>, M. Miloudi<sup>1</sup>, Y. El Kamouni<sup>1</sup>, L. Arsalane<sup>1</sup>, S. Zouhair<sup>1</sup>

Laboratory of Bacteriology-Virology and Molecular Biology, Avicenna Military Hospital, UHC Mohammed VI University Cadi Ayyad, Faculty of Medicine and Pharmacy of Marrakesh, Morocco

DOI: [10.36347/sasjm.2023.v09i03.003](https://doi.org/10.36347/sasjm.2023.v09i03.003)

| Received: 26.01.2023 | Accepted: 01.03.2023 | Published: 09.03.2023

\*Corresponding author: I. Ouaziz

Laboratory of Bacteriology-Virology and Molecular Biology, Avicenna Military Hospital, UHC Mohammed VI University Cadi Ayyad, Faculty of Medicine and Pharmacy of Marrakesh, Morocco

### Abstract

### Case Report

*Saccharomyces cerevisiae* is a commensal yeast of the digestive tract and not pathogen, used widely in agro-alimentary and pharmaceutical industry basically in the probiotics. Infections caused by this yeasts are rare and uncommon not only in immunocompromised hosts. However, they are some cases of vaginitis, Urinary infection and fungemia have been reported. We describe the case of an adult female with vulvovaginal infection due to *S. cerevisiae*.

**Keyword:** *Saccharomyces cerevisiae*, vaginitis, yeast, infection.

Copyright © 2023 The Author(s): This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC 4.0) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

## INTRODUCTION

*Saccharomyces cerevisiae* is a cosmopolitan yeast, traditionally used in bread and beer production. It naturally colonizes the gastrointestinal tract, female uro-genital mucosa as well as the respiratory tract. Although *S. cerevisiae* infections are rare, a significant increase over the last decades has been noted especially in a context of immunosuppression (HIV, cancer, autoimmune diseases, corticosteroid therapy) [1].

## CASE REPORT

29-year-old woman presented with dyspareunia and severe vulvovaginal burning. She was otherwise healthy and she didn't have the notion of taking probiotics or the use of yeast to prepare food. Speculum examination showed mucosal erythema and a normal appearance of leucorrhoea. The fresh microscopic examination showed numerous budding yeasts and the absence of motile trichomonads (Fig 1). Gram staining confirmed the presence of yeast cells and showed a lot of leukocytes (Fig 2). After 24 hours of incubation in aerobiosis at 35 °C, the vaginal culture on the Sabouraud's agar medium was positive and monomicrobial (Fig 3). Identification was obtained on the basis of enzymatic and biochemical profile by the

bioMérieux API system with 99% certainty. We repeated this examination three times; we were able to incriminate this species after positivity of the three cultures. For the evolution, unfortunately the patient was lost of sight for a possible clinical and biological follow-up.



**Figure 1: Fresh microscopic examination showing budding yeasts with multilateral buds and pseudohyphae (×1000)**



**Figure 2: Microscopic examination after Gram staining showing budding yeasts with multilateral buds and pseudohyphae (×1000)**



**Figure 3: *Saccharomyces cerevisiae* growing on Sabouraud's dextrose agar, demonstrating creamy-white colored, glabrous colonies**

## DISCUSSION

*S. cerevisiae* is often labeled as “brewer’s” or “baker’s” yeast since it is used in the production of fermented food, such as beer, wine and bread [1, 2]. Its nomenclature derives from Latin, where “Saccharo” means “sugar”, “myces” means “mold or fungus” and “cerevisiae” means “beer” [2]. Further this yeast

administered as probiotic capsules to treat *Clostridium difficile* associated diarrhea [3] and is employed to prevent food contamination by aflatoxin B1 [4].

The transmission of *S. cerevisiae* and the contamination of humans can be exogenous or endogenous, both in community and hospital settings.

Oral contamination occurs after consumption of bread or yogurt, ingestion of beer, wine or medicinal preparations containing *S. cerevisiae* [5-7]. The yeast can then colonize the mucosa of the gastrointestinal tract even though it is not yet known whether this colonization is permanent or transient [5, 8, 9]. In our observation, the contamination pathway would probably be from an ascending digestive colonization.

*S. cerevisiae* was still considered non-pathogenic, currently she is a real agent pathogen of low virulence, emerging and opportunistic, classified in risk group "1" [5, 9-11].

Clinical presentation of *S. cerevisiae* vaginal infections is indistinguishable from the vulvovaginitis caused by fungi belonging to the genus *Candida* [11, 12]. Vulvovaginal colonization is often associated with changes in the autochthonous vaginal microflora, as it commonly occurs in the case of antibiotic treatment, assumption of oral contraceptives, postmenopausal hormone replacement therapy, pregnancy, and diabetes. Data concerning the protective role of lactobacilli against yeast vaginal infection are conflicting, and further clarification is needed [13, 14].

The microbiological diagnosis of *S. cerevisiae* is technically easy. It grows easily on culture medium after 24 hours of incubation due to its relatively short generation time which does not exceed two hours [5, 15]. The main challenge in the diagnosis is to be able to distinguish infection and simple colonization, since it is a yeast of the normal flora in humans [2, 7, 16].

Isolation of *S. cerevisiae* from asymptomatic patient, from the peritoneal cavity after digestive perforation, or surgical intervention, or from the gastrointestinal or genitourinary tract, is in favor of colonization, rather than true infection [8]. On the contrary, to affirm the pathogenicity of *S. cerevisiae*, clinically, you must have a symptomatic infection without any other point of call, and microbiologically you must have an inflammatory reaction with the presence of a significant number of leukocytes, yeasts with pseudomycelium on direct examination and a pure and abundant culture of *S. cerevisiae* [6-8, 16]. The case reports we presented show further evidence for the pathogenic potential of *S. cerevisiae*.

The treatment of *S. cerevisiae* infection is based on the administration of amphotericin B with or without flucytosine [8, 11]. The study of the sensitivity of this yeast to antifungal agents has shown low MIC for amphotericin B, flucytosine and higher for fluconazole according to the study carried out by Tiballi et al., [7].

## CONCLUSION

In conclusion vaginitis due to *S. cerevisiae* occurred is rising and cannot be ignored. However, *S.*

*cerevisiae* infections are underestimated, either because of ignorance of the important role of this yeast as an emerging opportunistic pathogen, or because of the erroneous microbiological diagnosis considering all yeasts isolated from clinical samples as belonging to the genus *Candida*. Vaginitis due to *S. cerevisiae* species appears to be less responsive to azole therapy than *C. albicans*.

## REFERENCES

- Papaemmanouil, V., Georgogiannis, N., Plega, M., Lalaki, J., Lydakis, D., Dimitriou, M., & Papadimitriou, A. (2011). Prevalence and susceptibility of *Saccharomyces cerevisiae* causing vaginitis in Greek women. *Anaerobe*, 17(6), 298-299.
- Pillai, U., Devasahayam, J., Kurup, A. N., & Lacasse, A. (2014). Invasive *Saccharomyces cerevisiae* infection: a friend turning foe?. *Saudi Journal of Kidney Diseases and Transplantation*, 25(6), 1266-1269.
- Munoz, P., Bouza, E., Cuenca-Estrella, M., Eiros, J. M., Pérez, M. J., Sánchez-Somolinos, M., ... & Peláez, T. (2005). *Saccharomyces cerevisiae* fungemia: an emerging infectious disease. *Clinical infectious diseases*, 40(11), 1625-1634.
- Kusumaningtyas, E., Widiastuti, R., & Maryam, R. (2006). Reduction of aflatoxin B1 in chicken feed by using *Saccharomyces cerevisiae*, *Rhizopus oligosporus* and their combination. *Mycopathologia*, 162(4), 307-311.
- Popiel, K. Y., Wong, P., Lee, M. J., Langelier, M., Sheppard, D. C., & Vinh, D. C. (2015). Invasive *Saccharomyces cerevisiae* in a liver transplant patient: case report and review of infection in transplant recipients. *Transplant Infectious Disease*, 17(3), 435-441.
- Kliemann, D. A., Antonello, V. S., Severo, L. C., & Pasqualotto, A. C. (2011). *Saccharomyces cerevisiae* oesophagitis in a patient with oesophageal carcinoma. *The Journal of Infection in Developing Countries*, 5(06), 493-495.
- Aucott, J. N., Fayen, J., Grossnicklas, H., Morrissey, A., Lederman, M. M., & Salata, R. A. (1990). Invasive infection with *Saccharomyces cerevisiae*: report of three cases and review. *Clinical Infectious Diseases*, 12(3), 406-411.
- Enache-Angoulvant, A., & Hennequin, C. (2005). Invasive *Saccharomyces* infection: a comprehensive review. *Clinical Infectious Diseases*, 41(11), 1559-1568.
- Smith, D., Metzgar, D., Wills, C., & Fierer, J. (2002). Fatal *Saccharomyces cerevisiae* aortic graft infection. *Journal of clinical microbiology*, 40(7), 2691-2692.
- Tiballi, R. N., Spiegel, J. E., Zarins, L. T., & Kauffman, C. A. (1995). *Saccharomyces cerevisiae* infections and antifungal susceptibility studies by colorimetric and broth macrodilution

- methods. *Diagnostic microbiology and infectious disease*, 23(4), 135-140.
- 11 Murphy, A., & Kavanagh, K. (1999). Emergence of *Saccharomyces cerevisiae* as a human pathogen: implications for biotechnology. *Enzyme and Microbial Technology*, 25(7), 551-557.
  - 12 McCullough, M. J., Clemons, K. V., Farina, C., McCusker, J. H., & Stevens, D. A. (1998). Epidemiological investigation of vaginal *Saccharomyces cerevisiae* isolates by a genotypic method. *Journal of clinical microbiology*, 36(2), 557-562.
  - 13 Barefoot, S. F., & Klaenhammer, T. R. (1983). Detection and activity of lactacin B, a bacteriocin produced by *Lactobacillus acidophilus*. *Applied and Environmental microbiology*, 45(6), 1808-1815.
  - 14 Galask, R. P. (1988). Vaginal colonization by bacteria and yeast. *American journal of obstetrics and gynecology*, 158(4), 993-995.
  - 15 Elkhihal, B., Elhalimi, M., Ghfir, B., Mostachi, A., Lyagoubi, M., & Aoufi, S. (2015). Infection urinaire à *Saccharomyces cerevisiae*: levure émergente?. *Journal de Mycologie Medicale*, 25(4), 303-305.
  - 16 Datry, A., Thellier, M. (2002). Agents des affections à *Saccharomyces* et à *Rhodotorula*. *Biol Med*, 90-35-0045.