

# Enhancing collection and preservation methods for fungi samples in clinical microbiology setting

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## Introduction

Following the emergence of the Covid-19 pandemic, heightened occurrences of fungal infections demand significant attention and prompt intervention<sup>1</sup>. Due to the unique biological characteristics of fungi in contrast to other microorganisms, coupled with the absence of established protocols for the collection and transportation that ensure proper preservation of fungal species, there exists an urgent necessity to optimize pre-analytical processes for fungal specimens. This study investigates MSwab® (Copan Italia) *in-vitro* performance related to preservation of yeast and mold species until downstream laboratory testing.

## Material and Methods

Colonies suspensions from *Candida albicans* (ATCC10231), *Candida glabrata* (ATCC15126), *Candida tropicalis* (ATCC750), *Candida auris* (ATCCB11-903), *Saccharomyces cerevisiae* (ATCC9763) and *Aspergillus brasiliensis* (ATCC16404) were prepared and inoculated into 1 ml of MSwab®. For yeasts and mold,  $1 \times 10^3$  colony-forming units (CFU)/ml and  $1 \times 10^4$  CFU/ml PBS dilutions, respectively, were used. These suspensions were initially cultured at time zero (T0) and subsequently stored at room temperature (RT) for 24, 72, 96, and 120 hours. Afterward, 100  $\mu$ l of the MSwab® suspensions were streaked onto Sabouraud Dextrose Agar (SDA) plates and incubated at 35°C for 24/48 hours for subsequent colony counting analysis.



Figure 1.  
MSwab®


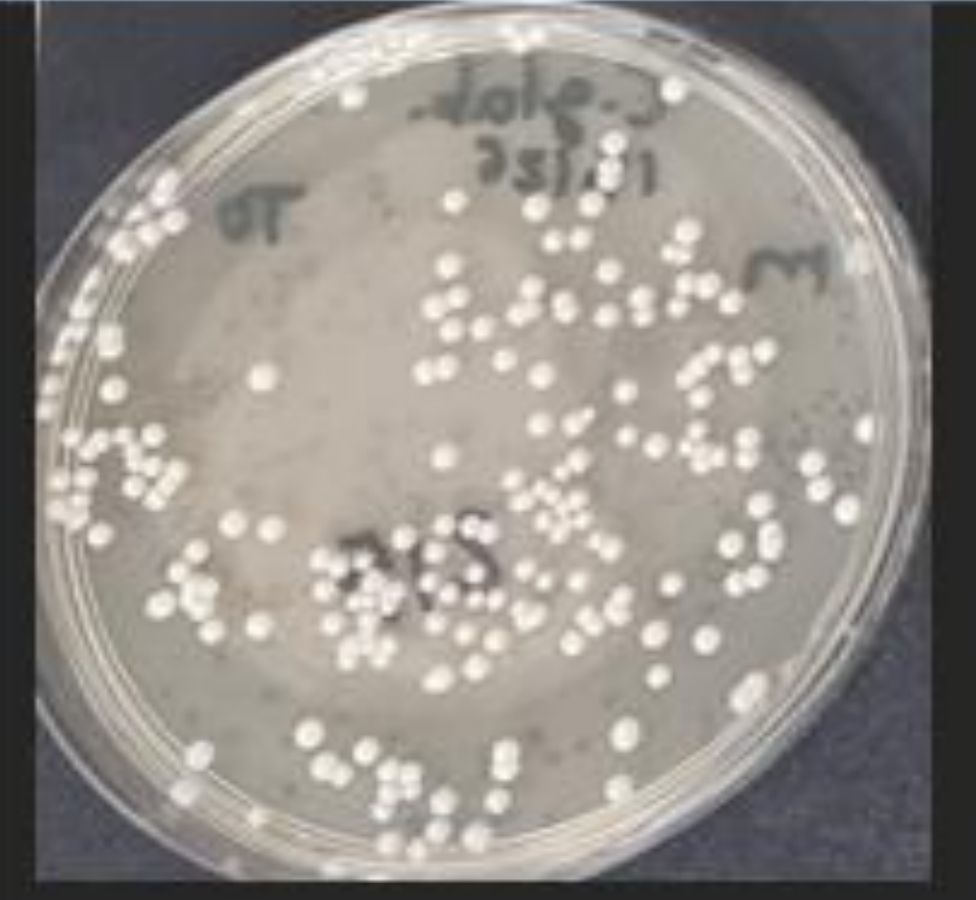

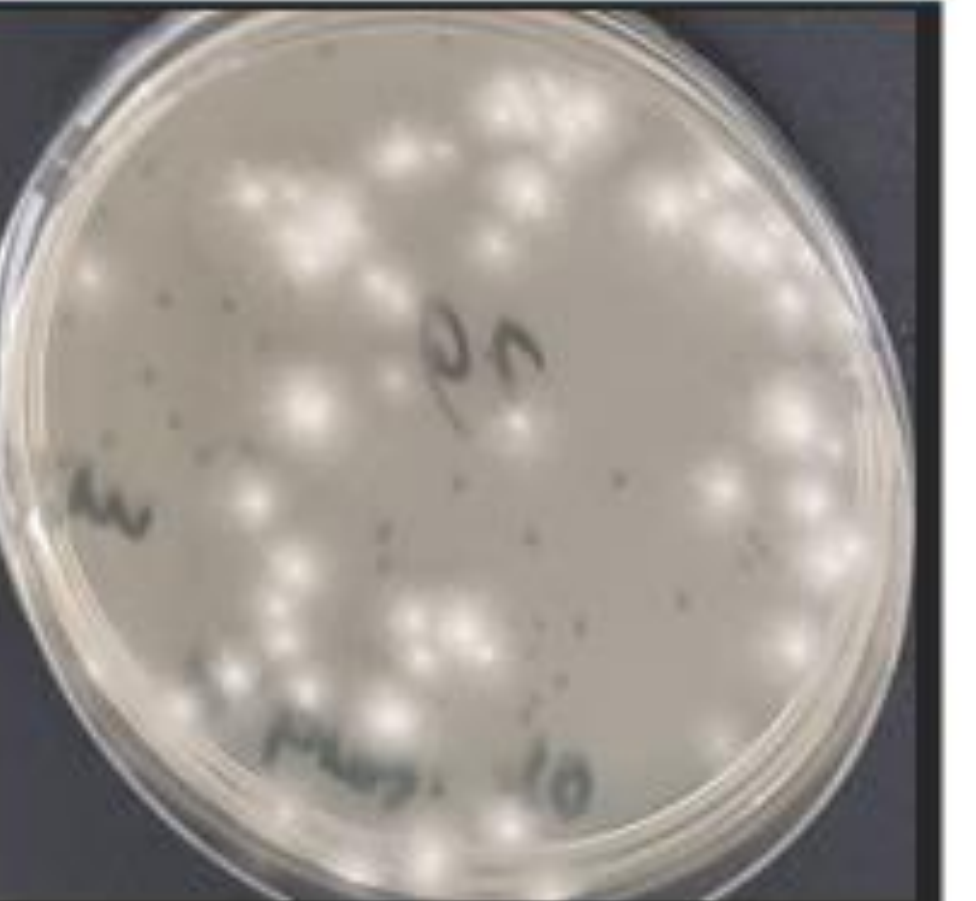
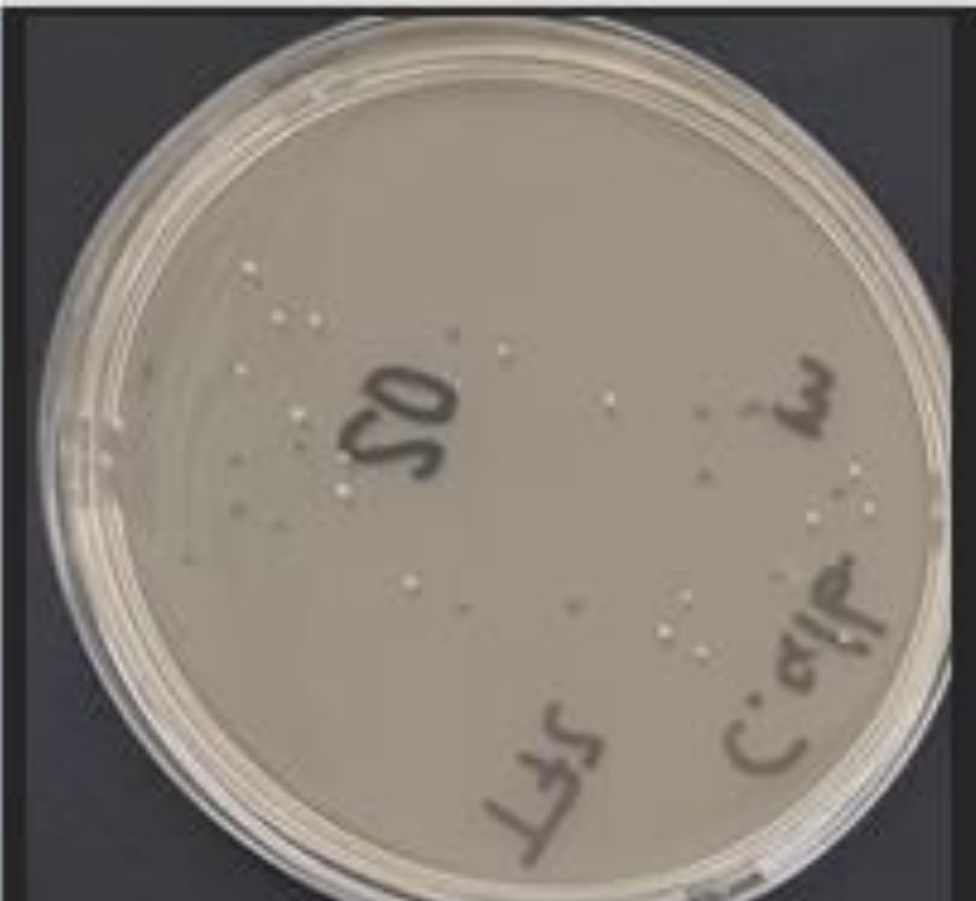
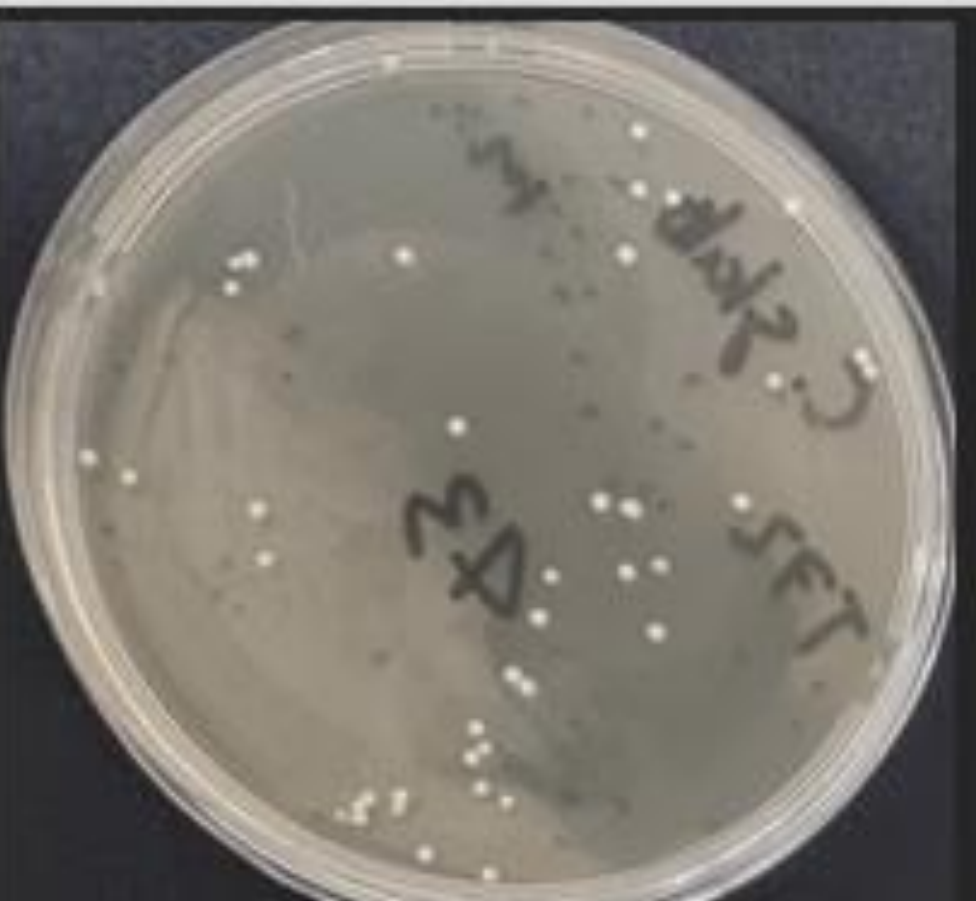


	<i>Candida albicans</i> (ATCC 10231)	<i>Candida glabrata</i> (ATCC 15126)	<i>Candida auris</i> (ATCC B11-903)	<i>Aspergillus brasiliensis</i> (ATCC 16404)
T0	 81 CFU/plate	 203 CFU/plate	 177 CFU/plate	 79 CFU/plate
T 72h	 20 CFU/plate	 43 CFU/plate	 155 CFU/plate	 47 CFU/plate

Figure 2. Colturing test at 72 hours using *C. albicans*, *C. glabrata*, *C. auris* and *A. brasiliensis* strains inoculated in MSwab®.

## Results

With an initial colony count ranging from 50 to 250 CFU/plate at time zero (T0) at room temperature (RT) using a suspension dilution of  $1 \times 10^3$  (CFU)/ml, the colony counting test for yeast strains (*C. albicans*, *S. cerevisiae*, *C. glabrata*, *C. tropicalis*) consistently remains within a range of  $\pm 1\text{Log}_{10}$ , indicating sustained preservation of viability for up to 72 hours. However, in contrast to the other yeast strains tested, *C. auris* demonstrated viability maintenance for up to 120 hours at RT. Concerning the mold strain (*A. brasiliensis*), colony counting remains into  $\pm 1\text{Log}_{10}$  for up to 120 hours, in comparison to the initial colony count (T0) ranging between 50 to 250 CFU/plate at room temperature (RT) using a suspension dilution of  $1 \times 10^4$  (CFU)/ml.

## Conclusions

Drawing from the attained results, MSwab® demonstrated a reliable capacity for preserving the tested yeast and mold strains *in-vitro*. MSwab® efficacy indicates it as a promising solution for collecting and transporting fungi samples, potentially enhancing the management of such samples for downstream analyses. Further experiments aim to increase fungi strains cohort, different storage temperatures, and molecular approaches validation are ongoing.

## References

1. Reddy GKK. Et All. Fungal infections: Pathogenesis, antifungals and alternate treatment approaches. Curr Res Microb Sci. 2022