PERFORMANCE OF THE ALBICANS ID2® CHROMOGENIC MEDIUM FOR RAPID IDENTIFICATION OF CANDIDA ALBICANS

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ABSTRACT

The aim of our study was to evaluate the accuracy of the chromogenic media Albicans ID2® (bioMérieux, France) for the identification of Candida albicans among 330 yeast strains. All C. albicans (100) and C. dubliniensis (20) strains exhibited blue color when cultured on Albicans ID2®. However, the blue color was also exhibited by cultures of C. rugosa (30/30) and C. tropicalis (3/50) isolates.

Key words: Candida albicans, chromogenic medium, Albicans ID2® media

During the past decade, there has been increasing recognition of emerging fungal pathogens. The cause of the emergence of different new fungal pathogens is not completely understood. The changing spectrum of invasive mycoses is probably secondary to a combination of factors including the substantial improvements in the management of malignant diseases, advances in critical care and organ transplantation, the increasing number of patients undergoing invasive medical procedures and the selective pressure of antimicrobial drug use (9,19).

Although Candida albicans still accounts for most of the species isolated from yeast-infected patients, other Candida species such as C. glabrata, C. tropicalis, C. parapsilosis and C. krusei are emerging as opportunistic pathogens (13,15). Of interest, invasive infection due to non-albicans species may be refractory to therapy with conventional antifungal agents (1).

Traditionally, rapid identification of C. albicans depends on the germ tube test, which can identify C. albicans strains in 2h since the fungus produces germ tubes during growth at 37ºC in serum. However, up to 5% of the C. albicans isolates have been reported as germ tube negative, and non-albicans isolates may produce some structures which can be misinterpreted as germ tubes (12,17).

Otherwise, this method is time consuming and requires manipulation of human or animal serum. Alternative methods for quick C. albicans identification include the use of chromogenic media, as well as simple and rapid biochemical tests for detection of specific enzymes (2,11). Albicans ID2® chromogenic medium (bioMérieux, Marcy l’Etoile, France) has been developed and marketed for the identification of C. albicans (blue colonies). This assay is based on a chromogenic indolyl glucosaminide substrate, which is hydrolyzed by C. albicans to give a turquoise or blue color (4,12). The purpose of this study was to evaluate the accuracy of Albicans ID2® plates to identify C. albicans strains among yeasts different species with clinical relevance.

A total of 330 yeast isolates obtained from the fungal culture collection of the Laboratório Especial de Micologia, UNIFESP-EPM, was used to assess the accuracy of Albicans ID2® in the identification of C. albicans strains. All isolates were obtained from clinical material and included the following strains: C. albicans (100), C. dubliniensis (20), C. tropicalis (50), C. glabrata (30), C. rugosa (30), C. parapsilosis (20), C. krusei (20), C. lusitaniae (20), C. guilliermondii (20), Cryptococcus neoformans (10), Trichosporon spp. (10). The isolates were identified by standard methods, except for C. dubliniensis strains that were identified by molecular methods RAPD (random amplified polymorphic DNA analysis).

The purity and viability of original yeast cultures were checked by plating on CHROMagar Candida (CHROMagar Microbiology Paris, France). C. albicans and C. dubliniensis isolates were screened by their ability to produce green colonies on CHROMagar Candida and chlamydoconidia on corn meal-Tween 80 agar (Difco laboratories, Detroit, USA). All positive chlamydoconidia isolates

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were submitted to growth test at 42°C on Sabouraud dextrose agar. The isolates that did not grow at 42°C were genotyped by randomly amplified polymorphic DNA (RAPD) analysis using the oligonucleotide primers CDU (5’GCG ATC CCC A3’) and B14 (5’GAT CAA GTC C3’) in order to confirm the identification of C. dubliniensis (18,14). Candida non-albicans isolates were identified on the basis of their micromorphology on corn meal-Tween 80 agar and biochemical tests using the commercial system ID 32C, bioMérieux Marcy l’Etoile, France (3).

Suspensions of all isolates were prepared in physiological saline (scale 3 McFarland), and 0.1 mL of each suspension was plated onto Albicans ID2® plates. The reading of the plates and interpretation of the results were conducted after 24h, 48h and 72h of incubation at 32°C. In order to prevent prejudice in reading the results, the determination of the color and the size of colonies of C. albicans were considered non-albicans yeasts.

Sensitivity, specificity, positive predictive value and negative predictive value were calculated comparing the identification of C. albicans on Albicans ID2® and the preliminary identification by standard methods (5).

A total of 330 isolates were successfully cultured on Albicans ID2®. Table 1 presents the colony color exhibited by the tested isolates. The plates were incubated for 72h, but 24h and 48h partial results were also recorded.

After 24h of incubation at 32°C, all 100 C. albicans strains exhibited growth on the chromogenic media and were identified by their blue pigmentation on the media (sensitivity 100%). There was no significant change in the reading pattern of the blue colonies after 48h and 72h of incubation. C. dubliniensis strains also gave smooth blue colonies but, unlike C. albicans strains, exhibited weak growth at 24h reading. Significant growth of C. dubliniensis was observed only after 48h of incubation. This is an original finding because previous publications did not attempt to evaluate the dynamics of colony growth between 24h and 72h of incubation (4,7).

Besides C. albicans and C. dubliniensis strains, isolates representative of other species also exhibited blue colonies on Albicans ID2® media after 48h of incubation, including 30 out of 30 C. rugosa (100%) strains, 3 out of 50 C. tropicalis (6%) and 5 out of 10 Trichosporon spp. (50%) strains.

Table 1. Colony colors exhibited by 330 yeast isolates cultured on Albicans ID2® media after 48 h incubation at 35°C.

<table>
<thead>
<tr>
<th>Species</th>
<th>Number of strains</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Blue</td>
</tr>
<tr>
<td>C. albicans</td>
<td>100</td>
</tr>
<tr>
<td>C. tropicalis</td>
<td>3</td>
</tr>
<tr>
<td>C. rugosa</td>
<td>30</td>
</tr>
<tr>
<td>C. glabrata</td>
<td>0</td>
</tr>
<tr>
<td>C. dubliniensis</td>
<td>20</td>
</tr>
<tr>
<td>C. parapsilosis</td>
<td>0</td>
</tr>
<tr>
<td>C. lusitaniae</td>
<td>0</td>
</tr>
<tr>
<td>C. guilliermondii</td>
<td>0</td>
</tr>
<tr>
<td>C. krusei</td>
<td>0</td>
</tr>
<tr>
<td>Trichosporon spp.</td>
<td>5</td>
</tr>
<tr>
<td>C. neoformans</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>158</td>
</tr>
</tbody>
</table>

Rapid identification of C. albicans

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RESUMO

Performance do meio cromogênico Albicans ID2® para a rápida identificação de Candida albicans

O objetivo do nosso estudo foi avaliar a eficácia do meio cromogênico Albicans ID2® (bioMérieux, France) na identificação de Candida albicans entre 330 amostras de leveduras. As cepas de C. albicans (100) e C. dubliniensis (20)
exibiram corolação azul quando semeadas em Albicans ID®. Contudo, a coloração azul também foi verificada em culturas de C. rugosa (30/30) e C. tropicalis (3/50).

**Palavras-chave:** Candida albicans, meio cromogênico, meio Albicans ID®

**REFERENCES**