Comparison of CHROMagar, polymerase chain reaction-restriction fragment length polymorphism, and polymerase chain reaction-fragment size for the identification of Candida species.

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Abstract

Background and Purpose:

The epidemiological alteration in the distribution of *Candida* species, as well as the significantly increasing trend of either intrinsic or acquired resistance of some of these fungi highlights the need for a reliable method for the identification of the species. Polymerase chain reaction (PCR) is one of the methods facilitating the quick and precise identification of *Candida* species. The aim of this study was to compare the efficiency of CHROMagar, PCR-restriction fragment length polymorphism (PCR-RFLP), and PCR-fragment size polymorphism (PCR-FSP) assays in the identification of *Candida* species to determine the benefits and limitations of these methods.

Materials and Methods:

This study was conducted on 107 *Candida* strains, including 20 standard strains and 87 clinical isolates. The identification of the isolates was accomplished by using CHROMagar as a conventional method. The PCR-RFLP assay was performed on the entire internal transcribed spacer (ITS) region of ribosomal DNA (rDNA), and the consequent enzymatic digestion was compared with PCR-FSP results in which ITS1 and ITS2 regions were separately PCR amplified. In both molecular assays, yeast identification was carried out through the specific electrophoretic profiles of the PCR products.

Results:

According to the results, the utilization of CHROMagar resulted in the identification of 29 (33.3%) *Candida* isolates, while the PCR-RFLP and PCR-FSP facilitated the identification of 83 (95.4%) and 80 (91.9%) clinical isolates, respectively. The obtained concordances between CHROMagar and PCR-RFLP, between CHROMagar and PCR-FSP, as well as between PCR-RFLP and PCR-FSP were 0.23, 0.20, and 0.77, respectively.

Conclusion:

The recognition of the benefits and limitations of PCR methods allows for the selection of the most efficient technique for a fast and correct differentiation. The PCR-RFLP and PCR-FSP assays had satisfactory concordance. The PCR-FSP provides a rapid, technically simple, and cost-effective method for the identification of *Candida* species. Nevertheless, to accurately differentiate among the taxonomically related species, PCR-RFLP should be implemented.