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Red-Pigmented *Candida albicans* in Patients with Cystic Fibrosis

In patients with cystic fibrosis (CF), *Candida albicans* often leads to chronic colonization (2). Here we report the first known human isolate of a red-pigmented adenine auxotrophic *C. albicans* strain from a sputum surveillance culture of a 19-year-old man suffering from pulmonary and gastrointestinal CF. The patient received treatment with multiple antibiotics because of chronic colonization with multidrug-resistant *Pseudomonas* spp. Pulmonary colonization with *C. albicans* had been confirmed several years previously. Recently, a red-pigmented yeast strain was isolated between white growing *Candida* colonies on Sabouraud-glucose agar.

The isolation of red yeast strains, usually representing nonpathogenic *Rhodotorula* species, from CF patients is well known. The isolate described here evoked our interest because of its uncommon brownish color. Surprisingly, further investigation of this strain revealed a *Candida*-like morphology, the organism forming chlamydospores on rice and yeast morphology agar. On chromogenic agars and in rapid identification tests (Bichro-Latex Albicans [Fumouze Diagnostics]; germ tube test), the strain showed a reaction positive for *C. albicans.* Interestingly enough, the red isolate revealed an uncommon primary resistance to flucytosine (MIC, >32 μg/ml) in the E Test (AB BIOdisk) (1). The patient had never been treated before with the appropriate antimycotic. Biochemical tests showed affiliation of the red-pigmented strain with an ascomycetous yeast genus, excluding the possibility of the organism being a basidiomycetous *Rhodotorula* species. The application of molecular typing techniques identified the red yeast strain as *C. albicans*. Routine biochemical tests (AUXACOLOR [Pasteur], ID32C [bioMerieux]) failed to identify the strain to the genus level.

DNA fingerprinting was performed by arbitrarily primed PCR using a primer derived from the intergenic spacer region (T3B) (4). The resulting banding patterns were compared by the Pearson correlation coefficients and clustered by the unweighted pair group method using arithmetic averages. The results revealed 65% correlation of the described strain with the *C. albicans* reference strains CBS 562 and 1905, whereas other *Candida* species or *Rhodotorula* species showed 40 or 15% correlation, respectively.

Determination of the sequence of the 18S rRNA gene (accession number AJ005123) and subsequent comparison with sequences in the EMBL and GenBank databases were performed as described previously (3). This analysis revealed 99.9% similarity to the 18S rRNA gene sequence from *C. albicans* (accession number M 60302), corroborating the data from biochemistry, morphology, and DNA fingerprinting.

These findings will give good reason for a more detailed characterization of red yeasts with unexpected resistance to antimycotics isolated from human specimens.

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