

TITLE: Presence of *Candida* spp in groundwater for consumption and potential food contamination

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ABSTRACT:

Water is an essential and indispensable asset for life, and must be free of contaminants to ensure its quality. Contamination of water by pathogenic microorganisms can lead to waterborne diseases. The presence of *Candida* spp yeast genus can lead to contamination of food and humans. So this study aimed to isolate and identify yeasts from groundwater for human consumption, and to evaluate the susceptibility to antifungal, as well as the biofilm formation capacity of yeasts from genus *Candida* spp. The groundwater was collected from 82 semi artesian wells, isolating 54 yeasts by membrane filtering technique on Sabouraud dextrose agar with chloramphenicol, and the identification was performed by the amplification of the universal ITS region of the ribosomal DNA. The molecular identification sequencing revealed the occurrence of 10 genus: *Candida* spp, *Meyerozyma* spp, *Exophiala* spp, *Pichia* spp, *Clavispora* sp, *Hanseniopsis* sp, *Kazachstania* sp, *Kodamaea* sp, *Rhodospiridium* sp and *Rhodotorula* sp. 27 isolates of *Candida* spp were tested for antifungal susceptibility by broth microdilution, according to the CLSI M27-A3 standard for amphotericin B, fluconazole, itraconazole and voriconazole, and the biofilm formation was also evaluated. Four isolates presented resistance, which *C. glabrata* and *C. tropicalis* were resistant to itraconazole and dose dependent for fluconazole, *C. parapsilosis* was resistant to fluconazole and *C. tropicalis* to voriconazole. All isolates were sensitive to amphotericin B. 24 isolates were able to form biofilm, and at its formation process, the microorganisms accumulation protected them from antimicrobials action, being a source of microorganisms dissemination. The presence of genus *Candida* spp yeasts that are resistant to antifungals, and capable of forming biofilms, plus the plumbing system that provides a favorable environment for the formation of biofilm, make possible to transmit resistant microorganisms and pathogenic yeasts to the consumers of these waters. It is worth noting that yeasts with resistance to antifungals are not strictly related to medical practice, but they can also be observed at the environment as well as in the groundwater. In this way, their presence leads to a concern regarding the water quality for human consumption and to more discussions about the drinking water criteria.

Keywords: *Candida*; antifungal, biofilm, groundwater, private wells

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