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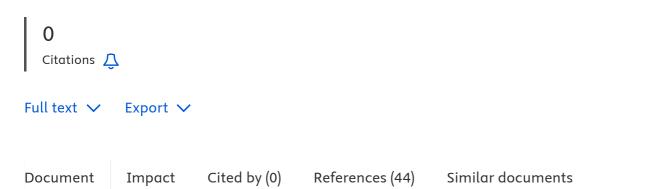
Aggregation and biofilm formation of mono- and coculture Candida species and Staphylococcus aureus are affected by nutrients in growth media

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Abstract

Candida species and Staphylococcus aureus coexist in nosocomial infections. These interkingdom interactions are associated with oral biofilm formation, leading to various oral diseases. This study elucidated the interkingdom interactions of these microorganisms, particularly their aggregation and biofilm formation, in three different media. Candida auris, Candida albicans, Candida lusitaniae, Candida dubliniensis, Candida parapsilosis, Candida glabrata and S. aureus were used in this study. Aggregation assays were conducted to determine planktonic interaction, and biofilm assays were performed to investigate intra- and interkingdom interactions in a static biofilm environment. Most Candida spp. exhibited a high auto-aggregation percentage in brain heart infusion broth supplemented with yeast extract (BHIYE). In addition, co-culture biofilm with S. aureus significantly reduced the total cell counts of Candida spp. compared to mono-culture (p < 0.05). In conclusion, co-aggregation, biofilm biomass and total cell count were species- and growth medium-dependent, and S. aureus interacted antagonistically with Candida spp. © 2025 Informa UK Limited, trading as Taylor & Francis Group.

Author keywords

aggregation; biofilm; Candida; co-infections; growth media; Interkingdom interactions

Indexed keywords

MeSH

Biofilms; Biomass; Candida; Coculture Techniques; Culture Media; Microbial Interactions; Nutrients; Staphylococcus aureus

GEOBASE Subject Index

bacterium; biofilm; biomass; fungus; infectious disease; monoculture; nutrient dynamics; yeast

EMTREE medical terms

biofilm; biomass; Candida; chemistry; coculture; culture medium; growth, development and aging; microbial interaction; nutrient; pharmacology; physiology; Staphylococcus aureus

Chemicals and CAS Registry Numbers

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Culture Media