TITLE: ADHESION AND BIOFILM FORMATION BY *Scedosporium apiospermum*, *S. aurantiacum, S. minutisporum* and *Lomentospora prolificans* ON GLASS SURFACE

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ABSTRACT:

Scedosporium apiospermum, *S. aurantiacum, S. minutisporum* and *Lomentospora prolificans* are saprophytic fungi, which emerged as agents of localized and disseminated infections in immunocompromised and immunocompetent individuals. Biofilms are microbial communities attached to a surface covered by an extracellular matrix, which confers resistance to antimicrobial agents and immune system defenses. The objective of this study was to demonstrate the ability of these species to adhere and form biofilms on a glass and poly-L-lysine coated surface. After 4 h of fungus-substrate interaction, there are a predominance (more than 80% of adhered cells) of germinated conidia and all the species adhered with a higher avidity to poly-L-lysine surface than glass. These data corroborated the high electronegativity (zeta potential) and elevated cell surface hydrophobicity measured in the conidial cells of *S. apiospermum* (-41.98 ± 9.45 and 79.98 ± 7.34, respectively)*, S. minutisporum* (-60.17 ± 5.43 and 94.14 ± 1.51)*, S. aurantiacum* (-54.01 ± 9.35 and 87.82 ± 1.85) and *L. prolificans* (-60.36 ± 4.31 and 93.61 ± 0.13). The structure of the biofilm was analyzed after 24, 48 and 72 h, staining the biomass with crystal violet, the extracellular matrix with safranin and XTT reduction for metabolic activity. The biofilms were further studied by confocal laser scanning microscopy (CLSM). All the fungal species were able to form biofilms on glass with the following biomass: *S. aurantiacum* (ABS_{570} = 0.8605; 0.7017; 1.841, respectively after 24, 48 and 72 h), *S. minutisporum* (ABS_{570} = 0.4965; 0.7896; 2.245), *S. apiospermum* (ABS_{570} = 0.2529; 0.6184; 2.059) and *L. prolificans* (ABS_{570} = 0.0.3563; 0.4892; 2.186). The same time-dependent pattern were observed for the quantitation of extracellular matrix and metabolic activity. CLSM images demonstrated the intertwined mycelial mass and the presence of extracellular matrix between the hyphal cells. Collectively, our results demonstrate that *S. apiospermum*, *S. aurantiacum, S. minutisporum* and *L. prolificans* have different abilities to form biofilms, and these results can contribute to the understanding of the high levels of resistance shown by these species to antifungal agents.

Keywords: biofilm, adhesion, filamentous fungi

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