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Farnesol beyond morphogenesis control: effect in Non- Candida albicans Candida species
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Candididasis is one of the most important life-threatening opportunistic mycosis mainly occurring
in individuals with impaired immunity. Although Candida albicans remains the most common
fungal isolate, an increase in Non-Candida albicans Candida (NCAC) species is being reported.
In fact, Candida glabrata, Candida krusei, Candida parapsilosis and Candida tropicalis are
emerging as clinically relevant pathogens. So it is of great importance to study the mechanisms of
infection by these new species. Recently, farnesol, a quorum sensing molecule in Candida
albicans has been the focus of intense study concerning its effect in Candida’s virulence and
consequently its potential application as therapeutic agent. Nevertheless, to date, the action and
role of farnesol within Candida genus is yet not known. In this sense, the aim of this study is to
gain insights into the effect of farnesol in NCAC species. Accordingly, the effect of farnesol on
Candida glabrata, Candida krusei, Candida parapsilosis and Candida tropicalis reference strains
morphology and growth was evaluated. To assess morphological alterations, cells were grown
overnight in RPMI medium supplemented with 150 micromolar farnesol and inspected under
contrast light microscopy, after overnight growth. Candida species farnesol susceptibilities were
assayed at 0.5, 5, 50, 100 and 150 micromolar. Growth medium, farnesol solutions and inocula
were prepared following the recommendations outlined by the National Committee for Clinical
Laboratory Standards M-27A adapted to micro-dilution. The obtained results show that, at the
concentrations assayed, farnesol has an antifungal activity against NCAC species, with different
susceptibility profiles. Additionally, surviving cells exposed to the highest farnesol concentrations
did not present morphological alterations comparing to controls. These findings show that the
quorum sensing molecule, farnesol, has distinct species-specific effects, different from those
described for Candida albicans. Moreover, the results presented herein suggest that farnesol may
play a pivotal role in inter-species growth control, namely within mixed Candida species cultures
by the regulation of different cellular processes.

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