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Bioprospecting of chalcones against mixed biofilm of Candida albicans and Candida tropicalis.

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Resumo

Denture Stomatitis (DE) is a multifactorial inflammation of the region of the buccal mucosa associated with the use of total dentures that causes pain, burning and discomfort to the patient. When triggered by Candida spp. infection, the symptoms of the clinical condition are prolonged and aggravated. Candida spp is a dimorphic fungus that lives in symbiosis in the human microbiota and that due to changes in the environment may trigger pathological situations such as that cited. Aminochalcone is a flavonoid that has anti-inflammatory, antipyretic and analgesic properties and which, due to the development of resistance to conventional antimicrobials, has become the target of studies for antibacterial and antifungal activity. The objective of this project was the bioprospection of aminochalcones against C. albicans and C tropicalis planktonic, as well as biofilms of C. albicans and C. tropicalis (mono and mixed), human gingival fibroblast (FGH) toxicity (in vitro) and in Galleria mellonella (in vivo) of chalcona with better activity.

Palavras-chave:
Candida, biofilm, aminochalcone, toxicity.

Introduction

Denture stomatitis is one of the most common oral mucosal candidiasis present in up to 60% of denture wearers and is characterized as a local inflammatory reaction observed by the presence of an erythematous lesion on the hard palate. Candida species are present in 100% of cases of prosthetic stomatitis, and 70% of these are *Candida albicans*.

Chalcones are aromatic ketones belonging to the class of flavonoids and have proven anti-inflammatory, antipyretic and analgesic actions. The study of synthetic chalcones, in which functional groups are introduced, has been widely carried out in order to increase these activities.

Thus, this project aimed to prospect 30 chalcones modified against *C. albicans* and *C. tropicalis* through the study of Minimum Inhibitory Concentration (MIC) and Minimum Fungicidal Concentration (MFC), in addition to the biofilm study of *C. albicans* and *C. tropicalis* (mono- and mixed), human gingival fibroblast (HGF) toxicity (in vitro) and *Galleria mellonella* (in vivo) of chalcone with better activity.

Results and Discussion

Aminochalcone I35 presented excellent antifungal activity, with MIC and MFC of 7.8 µg / mL against C.albicans and of 3.9 / 7.8 µg / mL against C.tropicalis. The use of 1X MIC of aminochalcone I35 in the biofilm in the formation of *C. albicans* reduced 1 $\log_{10}$ when compared to the control, while the use of the 10x MIC concentration of the same substance was able to inhibit 100% of the fungal biofilm of *C. albicans*. Analyzing the results obtained after the plating of the biofilm in the formation of *C.tropicalis*, it can be observed that the use of 1x and 10x the MIC showed the same result both being able to decrease 3 $\log_{10}$ when compared to the control. These findings support the view that the inhibitory effects of aminochalcone I35 on biofilm formation are comparable with the drug chlorhexidine. Finally, aminochalcone toxicity tests were performed on *G. mellonella* and it was shown to be very low for toxicity at the concentrations tested as indicated in figure 1.

Figure 1. In vivo systemic toxicity of compound I35 in *G. mellonella* larvae. The compound showed no toxic effects at the concentrations used.

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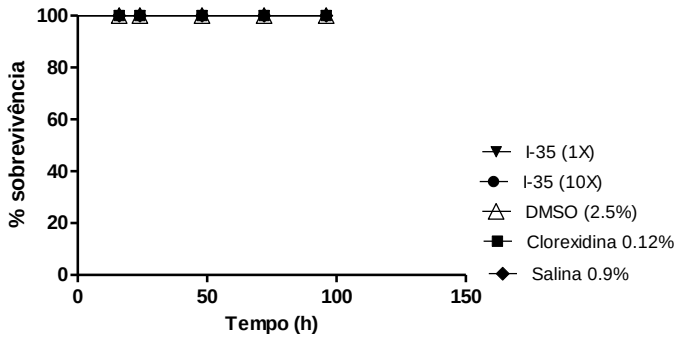

Conclusion

I-35 demonstrated excellent antibiofilm activity on *Candida albicans* and *Candida tropicalis*, in addition to presenting a low in vivo toxicity, and could be proposed as an alternative agent in the control of oral cavity-dependent biofilm diseases involving these two microorganisms.

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