EFECTS OF DICHLOROMETHANE ROOT FRACTIONS OF THE Wunderlichia azulensis AGAINST Candida SPECIES

Trindade, F.G.¹; Taveira, G.B.²; Moreira, V.F.³; Gomes, V.M.²; Vieira, I.J.C.³; Da Cunha, M.¹

¹Laboratório de Biologia Celular e Tecidual, CBB, Universidade Estadual do Norte Fluminense, Campos dos Goytacazes, RJ, Brazil. ²Laboratório de Fisiologia e Bioquímica de Microrganismos, CBB, Universidade Estadual do Norte Fluminense, Campos dos Goytacazes, RJ, Brazil; ³Laboratório de Química, CCT, Universidade Estadual do Norte Fluminense, Campos dos Goytacazes, RJ, Brazil.

Chemical protection plays a important role in the resistance of plants against pathogens and herbivores. The so-called secondary metabolites, are especially important and can protect plants against a wide variety of microorganisms. These molecules also represent an important source of active pharmaceutical molecules. Thus, the aim of this study was to evaluate the effects of dichloromethane fractions from Wunderlichia azulensis roots against Candida tropicalis and C. buinensis. Plant roots were sequentially extracted by immersion in methanol and filtered. Following, the material was concentrated by rotary evaporator at 40 °C and partitioned with water and with three solvents from different polarity. Subsequently, the dichloromethane root extract (21 g) was chromatographed in silica-gel 60 column and eluted with different gradients (hexane, ethyl acetate, and methanol). After chromatography, were obtained twelve different fractions named WRD1 - WRD12. These fractions were prepared in DMSO and submitted to antimicrobial tests against C. tropicalis yeast using the concentration of 400 µg/mL. All fractions were able to inhibit the growth of C. tropicalis yeast, with the exception of the WRD10 and WRD 11 fractions. The greatest growth inhibition was observed in WRD5 and WRD7 fractions (84% and 9.5% respectively). In analysis by scanning electron microscopy, yeast treated with WRD5 and WRD7 fractions showed morphological alterations, with the apparent formation of pseudohyphae, cell agglomeration and apparent difficulty in buds releasing. These fractions, with high antimicrobial activity (WRD5 and WRD7), were also tested against C. tropicalis and C. buinensis with concentrations of 50 and 100 µg/mL. Strong growth inhibition was observed and the plasma membrane permeabilization assay demonstrates that WRD5 and WRD7 fractions induced permeability in both tested yeast. In conclusion plant secondary metabolites act against various important yeasts, and it is believed that they might be a viable alternative for the production of future drugs.

Keywords: yeast; antimicrobial activity; secondary metabolites

We acknowledge the financial support of the Brazilian agencies CNPq, FAPERJ, and CAPES.