

Casbane diterpene as novel and natural antimicrobial agent against biofilm infections

Victor Carneiro², Edson Teixeira, Hécio Santos², Maria Olivia Pereira³, Mariana Henriques³, Telma Lemos⁴, Vassiliepe Arruda²

¹DBBM/Faculdade de Medicina de Sobral, Portugal, ²Centro de Ciências Exatas e Tecnologia, Brazil

³IBB/CEB, Universidade do Minho, Portugal, ⁴Departamento de Química UFMG, Brazil

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Croton nepetaefolius is a plant native from northeastern Brazil and belongs to Euphorbiaceae family. The essential oil of this plant is widely used in folk medicine from the treatment of gastrointestinal disorders to the use as an antiseptic agent, with an antifungal action scientifically proven. The action of this plant has been extensively explored by the scientific community, being the secondary metabolites, which are responsible for their properties, alkaloids, diterpenes, and triterpenes. The aim of this study was to evaluate the ability of the secondary metabolite, casbane diterpene (CD) (isolated of the species mentioned above), to inhibit microbial growth and biofilm formation of several clinical relevant species (about 15 species among bacteria and fungi). Minimal inhibitory concentration was assessed by the standard technique of microdilution and biofilm inhibition was tested using microtiter plates with biomass quantification by crystal violet staining method. It was found that the CD possessed biocidal and biostatic activity for the majority of the species screened, with the minimal concentration active between 125 and 500 mg/L. Moreover, CD anti-biofilm action was also observed for some of the species. In addition, it was noticed some biofilm formation inhibition even when the planktonic growth was not significantly affected. In conclusion it can be speculated that casbane diterpene shows potential to be a natural tool for the treatment of diseases caused by different infectious microorganisms.