

TITLE: INHIBITION OF QUORUM SENSING BY EXTRACTS OF *Pycnosporus sanguineus* (L.) MURRILL.

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ABSTRACT:

Many bacteria regulate gene expression in response to diffusible signals produced in a manner dependent on cell density, in a process called Quorum Sensing (QS). This process occurs through the production, release and detection of signaling or self-inducing molecules, allowing for the distinction between bacteria, perception of population size and consequently modulation of gene expression. The flag/receptor complex regulates the expression of genes modulating bacterial phenotypes. QS plays an important role in the production of virulence factors in several human pathogenic bacteria, including *Escherichia coli*, *Pseudomonas aeruginosa* and *Bacillus* sp. The *Pycnosporus sanguineus* mushroom has been used mainly in the form of aqueous extracts to combat superficial infections by Amazonian Amerindians and its antibiotic activity was previously characterized. The goal of this study was to evaluate if *P. sanguineus* extracts showed anti-QS activity at concentrations that did not interfere with bacterial growth. This fungus was chosen because of its use in popular medicine in infectious conditions and its easy recognition. Samples of *P. sanguineus* were collected at different points in the Amazon forest in the municipalities of Itacoatiara - AM and Presidente Figueiredo - AM. Extracts were tested on Petri dishes for factors regulated by QS, such as production of violacein by *Chromobacterium violaceum* ATCC 12472 as screening and swarming motility by *E. coli*. Dishes containing ethanolic extracts and crude hot water extracts showed QS inhibition, markedly in the ethanolic extract. Sub-MIC concentrations of the ethanolic extract inhibited the production of violacein in *C. violaceum* in a quantitative manner, reducing its production compared to a control without extract and no inhibition of growth was observed at these concentrations. Ethanolic extract was also able to inhibit mobility in *E. coli*. This results suggest an QS inhibitory activity of *P. sanguineus* at sub-MIC concentrations. Future works may clarify the possible application of topical preparations using these extracts to control superficial bacterial infections.

Keywords: Fungus; Popular medicine; *Chromobacterium violaceum*.

Development Agency: Universidade Federal do Amazonas – UFAM; Conselho Nacional de Desenvolvimento Científico e Tecnológico – CNPq (Projeto Universal – 2014).