

Quorum quenching activity of *Rubus rosaefolius* phenolic extract

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Bacterial population density is monitored through the production and detection of signaling molecules also known as autoinducers. In this communication system known as quorum sensing, a minimal population density related to the concentration of signaling molecules is needed for the activation of phenotypes such as virulence factors, bioluminescence, production of hydrolytic enzymes, conjugation, among others, allowing bacteria to express group behavior similarly to multicellular organisms. Quorum sensing inhibition commonly referred to as quorum quenching is important due to the many phenotypes that can be controlled in this fashion and has been proposed as an antivirulence strategy. Natural substances such as phenolic compounds have been noted as promising candidates for quorum sensing inhibition. The objective of this work was to evaluate the quorum quenching activity of phenolic extracts from *Rubus rosaefolius* (wild raspberry or wild strawberry as it is known in Brazil), a fruit mainly found in the South and Southeast regions of Brazil. The pulp phenolics were extracted by solid phase extraction and further quantified by the Folin-Ciocalteu method, expressed as mg of galic acid equivalent per liter (GAE/L). Quorum sensing inhibition was evaluated in *Chromobacterium violaceum* by using a well diffusion assay, where the lack of pigment production around the well, without signs of growth inhibition, indicates a positive result, as well as by the quantification of violacein production by spectrophotometric measures. Swarming motility in *Aeromonas hydrophila* and *Serratia marcescens* as well as biofilm production in these two bacteria and in *C. violaceum* were also assayed for the quorum sensing inhibition of the phenolic extract. In all assays, the tested concentrations of the extracts did not interfere with bacterial growth and viability. The plate diffusion assay indicated a potential inhibitory role of the phenolic extracts against the quorum sensing system in *C. violaceum*. This was confirmed through the quantification of violacein production which was inhibited by 51.7 and 88.6% in the concentrations of 29.51 and 118.6 mg GAE/L (1/200 and 1/50 dilution of the extract), respectively. An expressive inhibition of bacterial swarming motility and biofilm formation in all the tested bacteria was observed. Overall the results indicate that phenolic extract from *R. rosaefolius* present promising molecules with quorum quenching capabilities.

Palavras-chave: phenolic compounds, quorum sensing, quorum quenching, *Rubus rosaefolius*

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