Title: EVALUATION OF THE ANTIBACTERIAL ACTIVITY OF HYDROALCOHOLIC EXTRACTS FROM GRAPE POMACE AND BLACK TEA

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Abstract:

Antibiotics are frequently used and discarded in the environment, mostly unmetabolized by humans and animals, remaining biologically active against bacteria. The wide and indiscriminate application of antibiotics can lead to the appearance of drug resistant bacteria. Therefore, the use of natural antimicrobials could contribute to the reduction of resistant pathogens and increase bacteria susceptibility to antibiotics. In this context, the objective of this work was to evaluate the antibacterial activities of hydroalcoholic extracts from bordô grape pomace (*Vitis labrusca)* and black tea (*Camellia sinensis*). The choice of grape pomace from bordô variety was based on the fact that it is an important agroindustrial residue in Brazil, which is still rich in phenolic compounds, and black tea is produced and consumed worldwide. Agar well diffusion plate assay was carried out with different concentrations of the hydroalcoholic extracts (100%, 75%, 50% and 25%) individually or in combination with commercial antibiotics against *Escherichia coli* ATCC 25922, *Staphylococcus aureus* ATCC 25923, *Pseudomonas aeruginosa* ATCC 27853, *Streptococcus pyogenes* ATCC 19615, and *Enterococcus faecalis* ATCC 29212. Samples of ethanol 40% (v/v) and the antibiotics cephalexin and amoxicillin were used as negative and positive controls, respectively. The hydroalcoholic extracts of grape pomace and black tea were effective against *S. aureus* and *P. aeruginosa*, inhibiting partially or totally the growth of this bacteria in agar well diffusion assay. The combination of amoxicillin and grape pomace extract resulted in a synergistic effect against *S. aureus* increasing the inhibition of this bacterium in comparison with the individual results of the antibiotic and the extract. The interaction of amoxicillin and black tea extract was observed to be synergistic against *P. aeruginosa*. The results from this *in vitro* study showed that the hydroalcoholic extracts of bordô grape pomace and black tea present antibacterial effects against pathogenic bacteria and could be an alternative as natural antimicrobials. The synergistic effects of the extracts in combination with antibiotics might be a valuable mean to potentialize growth inhibition of strains of *S. aureus* and *P. aeruginosa*.

Keywords: antibiotics, bacteria, natural antimicrobials, synergism.

Funding agency: CNPq