

TITLE: GROWTH INHIBITION OF BACTERIA FROM HOSPITAL ORIGIN BY *Vaccinium macrocarpon*

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ABSTRACT:

Bacterial resistance is a problem of worldwide proportions, and multidrug resistant (MDR) bacteria is becoming increasingly common. As a result of this reality, the search for alternative therapies has increased, including the use of natural products. *Vaccinium macrocarpon*, known as cranberry, has in its constitution several bioactive compounds, such as anthocyanidins, flavonoids and proanthocyanidins, which are related to antibacterial activity. The objective of this study was to verify the *in vitro* susceptibility of cranberry products (*V. macrocarpon*) in clinical isolates of *Escherichia coli* and *Klebsiella pneumoniae*. The dry extract (DE) of standardized cranberry in 25% of proanthocyanidins and commercially obtained cranberry juice (CJ) powder were evaluated. Regarding the bacterial isolates, 40 clinical isolates were analyzed, of which were *E. coli* non-MDR (10), *E. coli*-MDR (10), *K. pneumoniae* non-MDR (10) and *K. pneumoniae*-MDR (10). The strains ATCC, *K. pneumoniae* (ATCC 700603) and *E. coli* (ATCC 25922) were used as controls. The antibacterial activity was evaluated according to the standard method of dilution in a 96-well microplate, Mueller-Hinton (MH) broth and incubation at $36\pm1^{\circ}\text{C}$ for 24 hours for further determination of the minimum bactericidal concentration (MBC). The bacterial inoculum was standardized on a McFarland 0.5 scale and diluted to 5×10^4 CFU/ml. From the cranberry products, concentrations of 0.97-500 mg/mL for DE and 0.48-250 mg/ml for CJ were prepared. By confirming inhibition of bacterial growth by each concentration, MBC was determined after sowing 10 μL aliquots on the surface of Petri dishes containing MH agar under the same incubation conditions as above. The results showed bactericidal action of cranberry DE with MBC from 250 mg/mL to 90% *E. coli*-MDR and 50% of *K. pneumoniae*-MDR. For non-MDR bacteria, the same activity at the same concentration was found in 90% *E. coli* and 60% *K. pneumoniae*. No inhibition of growth of any isolates against CJ was observed. In relation to the *E. coli* ATCC 25922 and *K. pneumoniae* ATCC 700603 bacteria, both showed susceptibility to DE whose MBC was 250 mg/ml. We can conclude that DE presented a potential bactericidal effect, highlighting the MDR phenotypes of *E. coli* and *K. pneumoniae*, which reflects the possibility of a therapeutic alternative for infections by these species, strengthening future biotechnological research.

Keywords: antibacterial activity, cranberry, multidrug-resistant

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