

Antimicrobial activity of phenolic extracts of *Eucalyptus globulus* and *Juglans regia* against dairy industry pathogens

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Bovine mastitis (BM) is the most expensive pathology for dairy industry and *Staphylococcus aureus* is amongst the most prevalent causative agents of this disease. Nowadays, it is known that *S. aureus* contaminated milk can enter the dairy production chain and be the origin of food contamination. Due to the poor efficacy of antibiotics and to the ability to form biofilms evidenced by this pathogen, BM has become increasingly difficult to control and to eradicate. Phenolic plant extracts are nowadays being evaluated since they are a rich source of bioactive molecules. Thus, in this work the antimicrobial activity of *E. globulus* and *J. regia* alone and in combination against *S. aureus* BM isolates was evaluated and compared with penicillin G (Pen G), an antibiotic commonly used in the treatment of this pathology. The evaluation of the cytotoxic potential of both extracts was also performed.

E. globulus evidenced a bacteriostatic and a significant inhibitory effect against *S. aureus* planktonic cells and biofilms, respectively. *J. regia* only had inhibitory activity against biofilms. No synergy was observed when combining plant extracts, but on biofilms a slightly more effective activity was obtained, than when testing extracts individually. As expected, Pen G at MIC presented an inhibitory effect only against planktonic cells of some strains and at 16×MIC a slight antimicrobial activity against biofilms. Although *E. globulus* and *J. regia* were cytotoxic to animal cells at MIC concentration, non-toxic concentrations of *E. globulus* presented inhibitory effect on planktonic cells. On the other hand, higher concentrations can be used aiming their application as disinfectants in dairy industries.

In conclusion, as therapeutic strategy, plant extracts demonstrated to have effects higher than or similar to Pen G for penicillin resistant strains. As preventive approach such as equipment and surface disinfection, plant extracts seem to have promissory antibacterial potential.