

## ***Opuntia cladodes* antibacterial activities: potential for mastitis**

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**Objectives:** The prickly pear cactus - *Opuntia ficus-indica* (OFI) is globally the most widespread and economically important cactus crop in arid and semiarid countries. Several publications summarize the nutritional benefits of using *Opuntia*'s cladodes (the fleshy stems) as a forage resource and its feeding quality for livestock. Recent findings suggest that cladodes may present important antibacterial activities for both animal and human consumption. In this study, we propose to study the innovative potential of OFI cladodes against bacterial strains related to bovine mastitis.

**Material and Methods:** Fresh cladodes were collected from an *Opuntia* producer (Atlantic farms), comprising three ecotypes. Total phenolic constituents were sequentially extracted using ethanol and water and tested for their antibacterial activity against Gram – and Gram + bacteria using standard procedures. The ecotype with the highest activities was further evaluated for its potential against several mastitis-inducing bacteria, kindly provided by a veterinary clinic, LMV, Laboratório de Medicina Veterinária Lda. Phenolic profiles of the three ecotypes were fractionated using an analytical reversed-phase high-performance liquid chromatography (HPLC).

**Results:** Antibacterial activity was detected, particularly in ethanol extractions in a dose-dependent way. Furthermore, the bioactivity varied significantly between ecotypes with one of the ecotypes showing higher activities. This selected ecotype revealed significant inhibitory activity against several pathogenic bacteria collected from bovines diagnosed with mastitis. HPLC results revealed specific phenolic compounds that could be associated with the most pronounced antibacterial activities in the selected ecotype.

**Conclusion:** OFI seems to have potential as an antibacterial agent against mastitis bacteria. The differences in the phenolic compound profiles suggest specific bioactive compounds that could be responsible for the higher activities and should be further pursued. Our results demonstrate promising implications for livestock health and dairy product quality.

**Keywords:** *Opuntia*, Cladodes, Antibacterial, Mastitis, HPLC, Polyphenols.

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