

Antimicrobial activity of aqueous extracts from four plants on bacterial isolates from periodontitis patients

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Received: 24 January 2017 / Accepted: 27 March 2017
Springer-Verlag Berlin Heidelberg 2017

Abstract Four aqueous extracts of different plant organs are the following: *Artemisia herba-alba*, *Opuntia ficus-indica*, *Camellia sinensis* and *Phlomis crinita* were evaluated against two bacterial strains: *Porphyromonas gingivalis* and *Prevotella intermedia*, which are implicated in periodontal diseases. By using a disc method, these plant extracts demonstrated powerful bacterial activity against these Gram-negative strains. The minimum inhibitory concentration values of the four plant extracts varied between 0.03 and 590.82 mg/ml for the microbes. Another assay using commercial antibiotics and antibacterials as positive controls was also conducted. Values obtained after statistical analysis of inhibition diameters of all plant extracts demonstrated that for

P. gingivalis, the aqueous extracts of *A. herba-alba* and *O. ficus-indica* were most effective, followed by those of *C. sinensis* and *P. crinita*. For *P. intermedia*, aqueous extracts of *O. ficus-indica* and *C. sinensis* appeared to be more efficient with significantly different ($P > 0.05$) inhibition diameters, followed by those of *O. ficus-indica* and *P. crinita*. In summary, the statistical results reveal that these plant extracts exert stronger antibacterial activity on *P. intermedia* germ as compared to *P. gingivalis*.

Keywords *Artemisia herba-alba* · *Opuntia ficus-indica* · *Camellia sinensis* · *Phlomis crinita* · Antibacterial activity · *Porphyromonas gingivalis* · *Prevotella intermedia*

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Introduction

The oral cavity represents one of the most complex collections of microorganisms and represents a very important passage for entry of agents responsible of infectious diseases. Several hundreds of microbial species cohabit in the buccal environment. By accumulation of pathogenic bacteria in periodontal pockets, an infectious disease called periodontitis develops. Periodontitis is a result of an ecological imbalance within the resident microbial community of the dental plaque, thus favouring growth of pathogenic species initially present in lower amounts (Grenier and Mayrand 2000). These niches, once created, foster a pathogenic bacterial flora growth and cause micro-ulcerations in tissues and allowing them to pass into the bloodstream and remotely migrate to other organs, such as the heart, resulting in cardiovascular diseases among others.

A number of studies have demonstrated an association between seriousness of the periodontal illness and risks of coronary heart disease and stroke (Beck and Offenbacher 1998).

