

In vitro evaluation of the effects of *Pelargonium sidoides* dc. Root extract and proanthocyanidins on oral bacteria viability

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Abstract

Elevated proportions of some subgingival microbial species have been associated with destructive periodontal disease activity. Biologically active compounds of *Pelargonium sidoides* root extract (PSRE) or Proanthocyanidins (PACNs) from this extract modulate bacterial virulence and stimulate host immune responses. There is no local delivery system of sustained release formulations with PSRE or PACNs available, however, bioactive capacities of these substances suggest them as promising prolonged local periodontitis treatment candidates. The purpose of this study: to evaluate the antimicrobial effect of different concentrations of PSRE and PACNs obtained from PSRE, against *Porphyromonas gingivalis*, *Aggregatibacter actinomycetemcomitans* and *Streptococcus salivarius*. Specific objective: Identification of the effective dose of PSRE and PACNs obtained from PSRE against i) the anaerobic strain *P. gingivalis*, major cause of periodontitis; ii) the putative periodontal pathogen *A. actinomycetemcomitans* and iii) the oral commensal (*S. salivarius*). Methodology: Preparation of different concentrations solutions from PSRE and (PACNs). Solutions were added in direct contact with bacteria at different concentration (v/v from mother solution). Bacteria and growth conditions: 1×10^5 /ml Bacteria were seeded in the log exponential growth phase (by o.d. evaluation). Metabolic evaluation: After 48 hrs bacteria viability was evaluated by metabolic colorimetric assay (alar blue). Results: PSRE extract was effective in reducing *P. gingivalis* viability in a significant manner in comparison with untreated controls at all the tested concentrations. PSRE showed a strong antimicrobial effect also against *A. actinomycetemcomitans* and *S. salivarius* as the viability was significantly decreased in comparison with the untreated controls at all the tested concentrations. A statistically significant reduction of *P. gingivalis* viability was observed starting from 5% of PACNs extract. Conclusions & Significance: the use of a 30% PSRE and 20% PACNs dosage are suggested.

Biography:

Nijole Savickiene is the professor in the Department of Pharmacognosy, Lithuania Lithuanian University of Health Sciences. Scientific interests: the investigations of the biologic active substances in plants, search of the new drugs and pharmacological activities in them. Activity: She was the head and coordinator of International "Eureka" project E! 3695 „Creation of the methodology for effects of natural antioxidants on the development of the Diabetes mellitus complications “. Nijole Savickiene participated in the research supported by a Grant (N.MIP-10180) of Lithuania Foundation for Research and Studies for the Projects according initiative of scientists „The estimation of biological activity and the technological functionalization of lectins“. Together with Department of Physiology and Pharmacology of Sapienza University of Rome was evaluated investigation of lectin-enriched protein fraction from *Urtica dioica* L. as antitumor and antimutagenic agent. She participated in Project entitled „Research and elaboration of directions for use of new plant polypeptides in the lectin family as potential immunomodulators and cytostatic agents“ jointly with V. F. Kuprevich's Institute of Experimental Botany of Belarus Academy of Sciences, Horizon 2020 m.era.net Project " PELARGODONT" ("Engineering and functionalization of delivery system with *Pelargonium sidoides* biologically active substance on inflamed periodontal surface area"), 9 Publications over last 5 years cited in the database of the Thomson Reuters ISI Web of Science. Nijole Savickiene is Expert of European Commission, Member of the Council of Faculty Pharmacy, Lithuania Lithuanian University of Health Sciences, Member of Lithuania pharmacists association Council, Member of A. Kaikaris relief and charity Council, Member of Lithuania Apitherapy Society, President of Endobiogenic Medicine and Integrative Physiology Association.