**TITLE:** EVALUATION OF ANTIMICROBIAL AND ANTIBIOFILM ACTIVITY OF ESSENTIAL OIL FROM *Lippia gracilis* Schauer AGAINST *Streptococcus mutans* AND *Candida albicans*

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## ABSTRACT

Oral diseases were classified as a relevant public health problem worldwide. *Candida albicans* and *Streptococcus mutans* are the causative agents of oral candidiasis and tooth decay, respectively. In oral biofilms, complex interspecies interactions occur that can be synergistic, as between *C. albicans* and *S. mutans*. Essential oils extracted from several native species have shown promising antimicrobial activity against pathogens of health interest, as essential oils from genus *Lippia*. Thus, the aim of this work was to evaluate the antimicrobial activity of the essential oil extracted from the leaves of *L. gracilis* Schauer and its potential to inhibit the formation of biofilms of *S. mutans* UA159, *S.mutans* UA130 and *C. albicans* ATCC 900028. The microbial culture was grown in BHI Agar and isolated colonies were inoculated in BHI broth with the addition of 1% sucrose and incubated at 37°C in 5% $CO_2$ for 24h. Antimicrobial activity was determined by the minimal inhibitory concentration (MIC) and minimal bactericidal concentration (MBC) in 96-well polystyrene plates. The biofilm formation assay was evaluated by biomass quantification (crystal violet staining), viable cell count (colony-forming unit enumeration) and biofilm metabolic activity (XTT assay) after 24h of growth in the presence of essential oil at ranging from 5.0 to 0.078%. The control group of all assays consisted of BHI Broth with 1% sucrose and the bacterial or fungal strains used in the study. The essential oil of *L. gracilis* was able to inhibit the growth of *S. mutans* UA159, *S. mutans* UA130 and *C. albicans* at 0.312, 0.156 and 0.156% respectively, and showed bactericidal activity at 1.25% for *S. mutans* UA159 and *S. mutans* UA130; and 0.156% for *C. albicans*. Regarding the antibiofilm activity, the essential oil was able to inhibit the bacterial biomass formation in all concentrations; and for *C. albicans* ATCC 900028 caused reduction in concentrations between 2.5 to 0.078%. In the cell viability assay, the oil was able to reduce the number of colony-forming unit in concentrations ragging from 5.0 to 0.078% for all strains tested. The metabolic activity of biofilms was evaluated, was observed a reduction of the metabolic activity in concentrations ragging from 5.0 to 0.078% for all strains tested. Based on the results obtained here, was observed that the essential oil of *L. gracilis* represents an important natural biological tool for the development of new antimicrobial agents against oral infections.

**Keywords:** antimicrobial, *Lippia gracilis*, essential oil, *Streptococcus mutans*, *Candida albicans*

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