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Formulation and characterization of antimicrobial oral gel from some herbal extracts for treatment of periodontal diseases

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Purpose: The aim of the present work was to develop an oral gel for brushing with antimicrobial activity which will cure/protect from various periodontal diseases such as periodontitis, gingivitis and pyorrhea.

Methods: Plant materials procured from local suppliers were extracted and standardized. Screening of antimicrobial activity was carried out with the help of disk diffusion method. Gel was formulated by dried extracts of *Butea monosperma* and *Cordia obliqua*. Gels were evaluated on various parameters and standardization of the formulation was performed. Release of drugs was studied in pH 6.8 using a mastication device. Total phenolic and flavonoid contents were estimated by Folin-Ciocalteu and aluminium chloride method, and stability studies were performed (40°C and RH 75% ± 5% for 90 days) to assess the effect of temperature and humidity on the concentration of phenolic and flavonoid contents. The results of accelerated stability conditions were compared with that of samples kept at controlled conditions (RT). The control samples were kept at room temperature (25°C, 35% RH for 180 days).

Results: Results were encouraging. Extracts possess significant antimicrobial activity at very low concentration (15 µg/disc, 20 µg/disc and 15 µg/disc) on oral pathogenic bacteria. Formulation has optimal characteristics as well as, has pleasant appearance, fragrance, texture and taste is highly acceptable by the volunteers. The diffusion coefficient values ranged from 0.6655 to 0.9164. Since the R values of korsmayer papas were close to 1. Drug release from formulation follows matrix diffusion kinetics. Hence, diffusion was the mechanism of the drug release. Formulation follows non-Fickian transport mechanism. Most formulations released 50% of their contents within 25-30 minutes. Results obtained from the accelerated stability studies are indicative of a slight reduction in flavonoids and phenolic contents with time on long time storage. When measured degradation under ambient conditions, degradation was significantly lower than in accelerated stability study.

Conclusion: Plant extracts possess compounds with antimicrobial properties. Developed formulation will cure/protect from various periodontal diseases. Further development and evaluations of oral gel including the isolated compounds on commercial scale and their clinical and toxicological studies are the future challenges

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Adipose-derived mesenchymal stem cell tracking using green fluorescent protein

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In 2002, researchers at UCLA published a manuscript in Molecular Biology of the Cell describing a novel adult stem cell population isolated from adipose tissue—the adipose-derived stem cell (ASC). Since that time, the ASC has gone on to be one of the most popular adult stem cell populations currently being used in the stem cell field. Many different roles for stem cells exist in varying regeneration processes. The capacity of adipose-derived stem cells (ASCs) to promote angiogenesis, secrete growth factors, regulate the inflammatory process, and differentiate into multiple cell types makes them a potential ideal therapy for medicine applications. The aim of this study was to cell tracking of mesenchymal stem cell derived from intra scapular adipose tissue of rabbit with green fluorescent protein. In this study adipose tissue of intra scapular region of 12 male New Zealand rabbits was harvested during the direct surgery or liposuction. After derivation of stem cells they were tracking via green fluorescent protein of lentivirus. However, our study has confirmed the ability of getting stem cell from adipose tissue it seems that more investigation is necessary for the suitable conditions and characteristics of their production.

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