

**FORMULATION AND EVALUATION OF DENTAL GEL CONTAINING CLOVE AND TULSI FOR PERIODONTAL DISEASES****Dr. Ojas Patel<sup>a\*</sup>, Mona Patel<sup>b</sup>, Ravina Patel<sup>c</sup>, Kamini Patel<sup>d</sup>, Roshani Bhoja<sup>e</sup>, Vipul Padvi<sup>f</sup> and Hemanshu Patel<sup>g</sup>**<sup>a</sup>Professor, Faculty of Pharmacy, SSSRGI, Vadasma.<sup>b</sup>Assistant Professor, Faculty of Pharmacy, SSSRGI, Vadasma.<sup>c-g</sup>Faculty of Pharmacy, SSSRGI, Vadasma.

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SSSRGI, Vadasma.**ABSTRACT**

Medicinal plants have been used as traditional treatments for numerous human diseases for thousands of years and in many parts of the world. Periodontal disease is recognized as a major public health problem throughout the world and occurs in all groups, ethnicities, races, gender and socioeconomic levels. It is characterized by inflammation and degeneration of the gums, supporting bone, periodontal ligament and cementum and accumulation of bacterial pathogens, mainly within the periodontal pockets. The periodontal disease commonly refers to inflammatory diseases that are plaque induced i.e. gingivitis and periodontitis. The present study was aimed to formulate dental gel containing clove oil for the treatment of periodontal diseases and then evaluated for their physicochemical properties including drug content, spreadability, extrude ability and in-vitro antibacterial activity. Medicinal plants have been used as traditional treatments for numerous human diseases for thousands of years and in many parts of the world. In rural areas of the developing countries, they continue to be used as the primary source of medicine. Dental gel of clove oil is used for the treatment of periodontal disease. This gel is for pain relieve of gums. Clove oil is one such product exhibiting multiple benefits and has gained considerable importance in clinical research. The active ingredient of this dental gel is clove oil.

**KEYWORD:** Dental gel, Tulsi, Clove oil, Periodontitis, Anti Microbial.**INTRODUCTION**

Medicinal plants have been used as traditional treatments for numerous human diseases for thousands of years and in many parts of the world. In rural areas of the developing countries, they continue to be used as the source of medicines, about 80% of the people in developing countries use traditional medicines for their health care.

Periodontal disease is recognized as a major public health problem throughout the world and occurs in all groups, ethnicities, races, gender and socioeconomic levels. It is characterized by inflammation and degeneration of the gums, supporting bone, periodontal ligament and cementum and accumulation of bacterial pathogens, mainly within the periodontal pockets. The periodontal disease commonly refers to inflammatory diseases that are plaque induced i.e. gingivitis and periodontitis.

The present study was aimed to formulate dental gel containing clove oil for the treatment of periodontal diseases and then evaluated for their physicochemical

properties including drug content, spreadability, extrude ability and in-vitro antibacterial activity. Medicinal plants have been used as traditional treatments for numerous human diseases for thousands of years and in many parts of the world. In rural areas of the developing countries, they continue to be used as the primary source of medicine.



Fig. 1: Periodontal Disease.

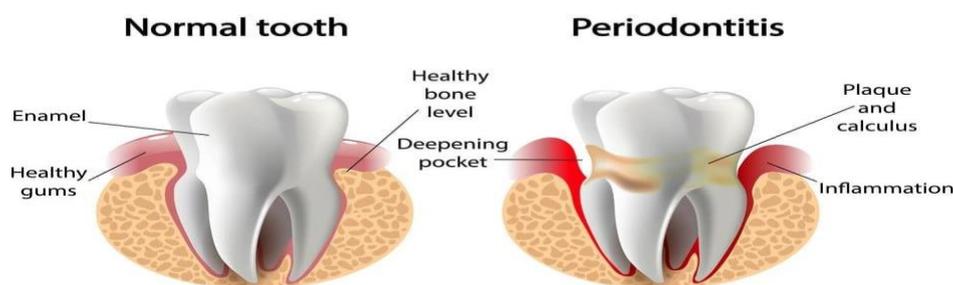


Fig. 2: Difference between normal tooth and periodontitis.

It is considered the main cause of tooth loss for adults worldwide. In its more serious form, called periodontitis, the gums can pull away from the tooth and bone can be lost and the teeth may loosen or fall out. Bad breath may also occur.

Periodontal disease is generally due to bacteria in the mouth infecting the tissue around the teeth. Factors that increase the risk of disease include smoking, diabetes, HIV/AIDS, family history, high levels of homocysteine in the blood and certain medications.

**Herbal gels**

Dental gel of clove oil is used for the treatment of periodontal disease. This gel is for pain relief of gums. Clove oil is one such product exhibiting multiple benefits and has gained considerable importance in clinical research. The active ingredient of this dental gel is clove

oil.

**Benefits of using natural ingredients**

Natural ingredients like clove oil and Tulsi offer a myriad of benefits for dental care products. They provide antibacterial, antimicrobial, and anti-inflammatory properties, which can help combat oral infections and promote overall oral health.

**EXPERIMENTALWORK**

**Materials:** The dental gel of clove oil and tulsi was prepared using following chemical apparatus and instrument.

**Chemicals:** Clove oil, Carbopol, Polyethylene glycol, Glycerine, Methyl Paraben, Propyl Paraben, Sugar, Distilled water.

**Materials and its properties**

Table No. 1: Materials use in dental gel.

Sr.No.	Materials	Quantity (gm/ml)	Properties
1	Clove oil	0.99	Active pharmaceutical ingredients
2	Tulsi	0.99	Active pharmaceutical Ingredients
3	Carbapol934	1.32	Gelling agents
4	Polyethylene glycol	20	Co-solvents
5	Glycerine	0.24	Drug solubilise
6	MethylParaben	0.025	Preservatives
7	Propyl Paraben	6.65	Preservatives
8	Sugar	0.52	Sweetening Agents
9	Distilled Water	Q. S	Vehicles

**METHODS OF PROCESS**

- **Tulsi Oil Extractions Process**

Collect Tulsi fresh leaves and wash the Tulsi leaves with distilled water to remove dust



After wash tulsi leaves dry them and crushed or moderately crouse powder



Take 50gm Tulsi powder in 250ml water in conical flask



Continuously stirring mix well solution



Stand for 24hours this solution



After 24hr decant the solution and filter it.

- **FINALPROCESS (Procedure for the preparation of dental gel)**

Soaking: soaked Carbo polinwater



Neutralization: Neutralize with tri ethanol amine to pH 9.4



Addition of preservative: Addition of propyl and methyl Paraben



Addition of co-solvent and API: Addition of propyl eneglycol and clove oil in an other test tube



Addition of sweetener: Finally, sugar is added



Stirring: Stirring is done until a homogeneous product is formed.

using inoculating loop. Put in its incubator for 24hrs to bacterial growth. Observed a dental gel kill or not bacteria.

**EVALUTIONPARAMETERS**

- **Anti-microbial test**

**Preparation of nutrient agar**

Suspend 28g of nutrient agar powder in 1 liter of distilled water. Heat this mixture while stirring to fully dissolve all components. Autoclave the dissolved mixture at 121°C for 15 minutes. Once the nutrient agar has been autoclaved, allow to cool but not solidify.

**Spread plate method**

Inoculate empty plate. Add melted nutrient agar. The liquid medium was kept until it turned into a solid medium. Spread a bacterium (E.coli) in zig-zig pattern by

**RESULT AND DISCUSSION****Table No. 2: Result And Discussion.**

Sr.no	Physical Characteristics	Description	Result
1.	Anti-microbial test	Anti-microbial activity is checked by antimicrobial test.	An antimicrobial is an agent that kills microorganisms (microbicide) or stops their growth (bacteriostatic agent).
2.	Determination of pH	pH is recorded by using pH meter.	6.86
3.	Determination of Spread ability	The product is easily spread or not.	Easily spreadable
4.	Appearance	Colour Odour	Pale yellow Pungent/ Aromatic
5.	Consistency	The consistency was checked by applying on skin	Thin consistency
6.	Determination of Viscosity	Viscosity is measured by Brookfield viscometer.	4500 CP
7.	Greasiness	The greasiness was assessed by the application on to the skin.	Sticky

**CONCLUSION**

The present research work concluded that the herbal dental gel developed and the clove oil and tulsi extract gel was well formulated. The dental gel was prepared by using carbapol 934. The formulated dental gel exhibited antimicrobial activity against the bacterial strain *E. coli*. The results from this research evidently noted that the natural plant clove and tulsi use may be a new approach for tooth gel formulation, from the above experimental duty it is clear that a gel formulation with herbal ingredients such as clove oil, tulsi has good characteristics and also possesses a good antimicrobial activity which is necessary in the management of periodontal disease.

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