

FORMULATION AND EVALUATION OF HERBAL GEL

¹Pooja Bornare, ²Amol Gayke, ³Akshay Harpade

¹Studeent, ² Professor, ³Student

Jagdamba Education Society's SND College of Pharmacy, Babhulgaon, Yeola, Dist. Nashik, Maharashtra, India

Abstract - The main objective of this work is the formulation and evaluation of herbal products such as the dental gel of clove oil from the treatment of gum disease. Clove oil has a antibacterial activity against a number of periodontal pathogens, hence clove oil is selected for the treatment gum disease. Clove oil is formulated by using agar –agar as gelling agent, clove oil as medicinal agent, polyethylene glycol as a co-solvent, neem oil as a presevatives and required quantity of distilled water as a vehicle.

The gum disease is recognized as the one of the major public health problem in the world. The clove oil was evaluated for some physical parameters such as acid value, ester value, saponification value. The prepared gel was evaluated for the various properties such as the ph, spreadability, drug content etc.

Keywords : Gum disease, clove oil, dental gel, antimicrobial activity.

Introduction:

Define Herbal gels: 1) Herbal gel is a drug or preparation made from a plant and plants used for any purpose. 2) Medicinal plants have been used as traditional treatments for human diseases for the thousands 1of years.

Gum Diseases:

- 1) Gum diseases is one of the most important concerns for dentists and patients.
- 2) It is recognized as a major public health problem in whole world.
- 3) Gum disease in that most common cause of the tooth loss.
- 4) Gum disease commonly refers to inflammatory disease.
- 5) Clove oil is one such product shows the multiple benefits and has important considerable in clinical research.
- 6) Clove oil shows the low intrinsic toxicity along with the biological actions like analgesic, antiseptic, carminative Stimulant etc.
- 7) Its very useful in dentistry also.

Benefits of Herbal Drugs :

- Herbal drugs have long period of use.
- Better patient tolerance.
- Improving gum strength.
- Inflammation of the gums.

Plant Profile :

Synonyms –clove buds , Lavang (Hindi),Caryophylli.

Biological Source- Clove consists of the flower buds of *Eugenia Caryophyllus* Thumb. Its belonging to family **Myrtaceae**.

Chemical Constituents: 15-20% Volatile Oil , 10-13% tannin, Small quantities of ester and alcohol.



Uses:

- 1.Dental analgesic.
- 2.Carminative.
- 3.Simulant.
- 4.Flavouring agent.
- 5.Widely used as antiseptic.

Material and Functions:

Sr.No	Material	Functions
1	Clove oil	Active Pharmaceutical ingredients
2	Agar-Agar	Gelling agent
3	Polyethylene glycol	Co-solvent
4	Glycerine	Drug Solubiliser
5	Neem oil	Presevatives
6	Honey	Sweetening agent
7	Distilled water	Vehicle

Formulation of Dental gel of Clove oil:

Sr.No	Ingredients	Quantity
1	Clove oil	0.75 ml
2	Agar-Agar	0.4 gm
3	Polyethylene glycol	3 ml
4	Glycerine	2 ml
5	Neem oil	0.03 ml
6	Honey	0.8 ml
7	Distilled water	Q.s

Procedure For the preparation of Dental Gel:

- 1) Agar gels were prepared by soaking agar in water and by neutralizing with Triethanolamine to pH .
- 2) Weighed the amount of Neem oil and its added in to the given solution.
- 3) In another beaker , the required quantity of propylene glycol was taken in another test tube and accurately
Measured the clove oil and Glycerine.
- 4) Finally the mixture was added to the beaker containing agar with stirring.
- 5) The sweetening agent was also added to the polymer dispersion and stirred continuously till it forms a Homogenous product.
- 6) Last the volume was made up with distilled water and stirring was done vigorously.
- 7) Finally product is formed.



Introduction to ingredients :

1. Agar-Agar:

Agar is a white powder it exhibits short flow properties of a creamy sensory profile and it is therefore well suited for use as a rheology modifier in gels and creams

2. Polyethylene glycol:

PFG is a polyether compound with many application form industrial manufacturing to medicine PEG is also known as polyethylene oxide (PEO).

3. Glycerin:

Glycerin is a trihydroxyalcohol with localized osmotic diuretic and laxative effects. This agents also prevents water reabsorption in the proximal tubule in the kidney leading to an increase in water and sodium excretion and a reduction in blood volume.

4. Neem Oil:

Neem oil has antibacterial and antifungal properties that can prevent gum inflammation and cavities .

5 . Honey :

Honey commonly used as an Artificial sweetener it has a role of sweetening agent , a nutraceutical.

Evolution of gel formulation:

Physical Appearance:

Color =

color of the formulation was checked put against a white background . All the formulation of clove oil gel were pale yellow in color.

Consistency=

The consistency was checked by applying the formulation on the skin.

Greasiness=

The greasiness was assessed by the skin.

Odour=

The odour of gels was checked by mixing the gel in water and then taking the smell.

Determination of PH:

PH of gel was determination by using digital PH meter by dipping the glass electrode Completely into the gel.

PH of gel is 6.7

Determination of spreadability:

$S=ML/T$

Where,

S=spreadability in grams.cm/sec

M=mass in grams

T= time in second

Spredability ws determined by modified wooden block and glass slide apparatus.The apparatus consistent of a wooden block with fixed glass slide and a pulley .A pan was attached to another glass side with the help of string.for the determination of spredability measure amount of gel was placed in the fixed glass slide the movable glass slide with a pan attached to it,was placed on the fixed glass slide such that the gel was sandwiched between the two slides for 5 min low about 50 grams of weight was added to the was noted.

Determination of blomogenecity:

All the developed gels were tested for homagenecity by visual inspection after the gels have been set in container.They were tested for their appearance nd presence of any aggregates.

Determination of Extrudability:

Extrudability was determined by using a tube filled with the gel,having tip of 5 mm opening and measuring the amount of gel that extracted through the tip when a pressure was applied on the tube was noted down.

Determination of antimicrobial activity:

Agar cup plate method was used for screening of antimicrobial activity of clove oil gel .all formulation of clove oil about 2% were placed aseptically in cups of agar plate which was previously included with cellulare.The plates were left at ambient temperature for 30 min.prior to incubation at 37°c.for 24 hrs.The broad spectrum antibiotics i.e tetracycline was used as positive control for obtaining comparative results plates were observed after 24.48hrs incubation for the appearance of the zone of inhibition.Antimicrobial activity was evaluated by measuring the diameter of zones of inhibition.(Millimeters) of microbial growth.

Discussion:

The procured clove oil was characterized for the following parameters.

Acid value - 3.64

Ester value -37.20

Stability - freely soluble in ethanol

Density - 1.01 gm / ml

Refractive index - 1.45

Result:**Table – Physiochemical characteristics of clove oil.**

Sr.No	Parameters	Clove oil procured	Clove oil standard
1	Colour	Pale yellow	Pale yellow
2	Odour	Aromatic	Aromatic
3	Acid value	3.65	3.84
4	Ester value	37.20	38.22
5	Solubilty in ethanol	Freely soluble	Freely soluble
6	Density	1.01g/ml	1.05g/ml
7	Refractive index	1.451	1.532

Table 2 – Characteristic of gel formulation.

Formulation	Appearance	Ph	Spredability (G cm/sec)	Extrudability %	Homagenecity
1	Pale yellow	6.7	17.45	94.9	Very good

Conclusion:

The clove oil was found to have antimicrobial activity against streptococcus salivarius . The formulation developed from clove showed significant results so it can be further used commercially to develop dental gels after conducting clinical trials on human beings .

References:

- 1) Khandelwal R. Practical pharmacognosy, Techniques and experiments 9th edition Pune Nirali Prakashan : 2002: 149-160
- 2) Pawar Mokashi VA, Bhagat TB, Toshniwal me ND khandelwal and evaluation of essential oil OF KR formulation dental gel containing coriander against oral pathogens. Int Reg I pharm. 2013; 4(10):461
- 3) vijaya kumar voleti Formulation and development of dental gel containing clove oil for the disease NO = 1-7. treat ment of human periodontal I Compts phar 2016; 3(1): page
- 4) Gupta A.K, Tandon Neeraj sharma Madhu Quality standards of Indian Medicinal plants, Indian Council of Medical Research. New Delhi 2011:8.
- 5) Sanjay J, Padsalg A, Patel K, Makale V formation and Development evaluation of fluconazole gel in various polymer bases. Asian J pharm 2017
- 6) Misal G, Dixit G1 Gulkarni V Formulation and Evaluation of herbal gel India J nat prod resour 2013; 3(4): 501-505
- 7) Patil sc, GP dade. DD Rathis PB. Design. Development and Evaluation of Herbal for Treatment Of Psoriasis ITPBS 2015 12(1): 72-87
- 8) Trambelli, Farina. F. Franceshetti G.. Minenna 1 Utilizzadel Single flap approach in chirurgia pardontale ricostruttiva. Denial Cadmos 2007 8 15 25.