Formulation and Evaluation of Herbal Toothpaste

Mr. Sable Kundan[1], Mr. Bhati Deepak[2], Mr. Havelikar Ujwal[3], Mr. Ghuge Saurabh [4], Dr. Thorat Rajendra[5]
[1, 2, 3, 4] Student, [5]Assistant Professor
K. T. Patil college of Pharmacy Osmanabad, Maharashtra, India.
Email – [1] kundansable4343@gmail,com

Abstract: *The aim of current research to formulate herbal toothpaste utilizing plant extract like Neem, Tulshi leaves, Guava leaves and other ingredients are Camphor, Honey. The plant extract ingredients possess, antibacterial, anti-inflammatory activity and prevent the bad smell by maintain oral hygiene. The herbal tooth paste formulates which can satisfy all the required condition to keep the mouth fresh and prevent tooth decay by bacteria. The anti-microbial evaluation against staphylococcus aureus reveals that formulated herbal toothpaste exhibit notable antibacterial activity. The other parameters like color, spread ability, foam ability, determination of shard and edge abrasive particles was evaluated in formulated herbal tooth paste. The outcome of this research herbal toothpaste shows equal patronizing and engrossing passion over marketed tooth paste.*

Key Words: *Formulation, Evaluation, Tulsi, Neem, Antimicrobial activity.*

1. INTRODUCTION:

Oral hygiene is an important key to maintain good appearance, impression of an individual and parts, crown and the root. The crown is covered by outer surface called enamel and it is the hardest tissue in tooth in tooth. The major composition of enamel is hydroxyl apatite other than that it consists of water and keratin.[1] The plague, caucus, paradental diseases are the major issues related to tooth. It is mainly caused by bacterial action and mineralized deposition leads to calculus. This disease is mainly due to negligence in proper caring of tooth. So it can be prevented and controlled by proper brushing by using effective toothpaste and tooth powders.[2] Toothpaste is a dentifrice used to clean, maintain and improve the health of teeth. Toothpaste is mainly used to promote oral cleanliness and also acts as on abrasive that helps to prevent dental plague and food particles from the teeth, releases active ingredients such as fluoride to aid in preventing tooth and gum disease.[3] Dentifrice can be prepared by synthetic and herbal ingredients. Now a day's herbal formulation is in high demand. Due to its efficiency to avoid the side effects when compares with synthetic formulation. Toothpaste and toothpowders are based on abrasive property, the paste and powder apply on the tooth to rub against the tooth, which helps to remove the deposited food debris and minerals from teeth.[4] The toothpaste is mainly composed of abrasive agents ($CaCo_3$), detergents(SLS), humectants (Propylene glycol), gelling agents (gum tragacanth) which is used to maintain the stability, dispersability, foam properties. Other ingredients such as sweeting agents, preservatives, colors also used in formulation, water is as vehicle.[5] The extracts are used in various category like Neem-antibacterial, Guava-anti-inflammatory, Kalmi-flavouring agent and other ingredients are Camphor-antiseptics, Honey sweetening agent, Glycerin- Humectant, $CaCo_3$ –Abrasive, SLS- Detergent. This led to paying increased attention on using natural ingredients in herbal dentifrices.[6]

2. OBJECTIVES:

The objectives of this research work was to formulate the toothpaste.

1) The formulation does not show any side effects or adverse reaction.
2) The paste also act as teeth fairness.
3) It's possess nutritional value which provide required nutrients to the teeth.
4) To Formulate herbal Toothpaste by using herbal ingredient's such as Tulsi, Neem,
5) Evaluation of herbal toothpaste such as spread-ability, consistency, antimicrobial activity, pH, etc.

3. MATERIALS AND METHODS:

1) Preparation of plant Extract : [7-10]

The extract was prepared by simple maceration, Firstly we taken 20mg of each leaves of plant such as Neem and tulsi, they were dried pulverized in air and then they were soaked with 200ml of water for 48hr, after 24hr solvent was decanted and the residue again soaked with the same solvent for 24hr. The total extract was combined and filter

then the evaporation of solvent was done on heating on mantle, then the obtained product was dried and stored in desiccator for further use.

- **Peparation of extract of Gauva leaf:**

The Gauva leaves were were taken and washed, They were Shade dried for 5 days, after drying they were graduated into fine powder and passed through sieve no-6. The powder was packed in soxlate apparatus and continousely extraction process was done for about 7hrs at 50^0C with etanol. After Extraction process,The product was collect and dried for 10 days and extract was powdered.

2) Formulation of Toothpaste : [11]

- ✓ All herbal ingredient were dried and grounded using domestic mixer
- ✓ The required quantity of ingredient were weighed and taken in morterm (Calcium carbonate, Sodium lauryl sulphate, Honey, Glycerin) was mixed in water.
- ✓ Acacia was mixed into above mixture.
- ✓ This solution was added drop wise into morter containing herbal ingridients and triturate well until the paste consistency is formed.

Fig no.1 : Formulated Toothpaste.

- ❖ **Formula:**

Table No.2 : Formula of herbal Tooth Paste

Sr.No	Ingidients	Quantity
1	Neem	0.5 gm
2	Tulsi	0.5 gm
3	Gauva	0.5 gm
4	Camphor	0.3 gm
5	Accacia	0.2 gm
6	Honey	0.5 gm
7	Calcium Carbonate	3.5 gm
8	Glycerin	2 ml
9	Sodium Lauryl Sulphate	0.5 gm
10	Para Hydroxy Benzoic acid	0.2 gm
11	Menthol	0.3 gm
12	Distilled water	Q.S

3) Evaluation of Tooth Paste: -

The including parameters were checked to evaluate the formulation

- ***Physical Appearance : - [12]***

The formulated tooth paste was subjected to detect any change in appearance of tooth paste when kept for long period of time.

Appearance: Semisolid in Nature
Color: Brown
Odour : Pleasant

- ***pH : - [13-14]***

pH of formulated herbal tooth paste was determined by using pH meter. 1gm of tooth paste placed 100ml beaker. 10ml of distilled water, stir vigorously and make mixture.

Fig no.2 : pH Test

- ***Foam ability: - [15]***

The suspension/solution of tooth paste in measuring cylinder and shaken the suspension cylinder and shaken the suspension for 12 times and measure the volume of foam produced after shaking for 5 minutes Procedure:- Weighed 5gm of tooth paste taken in 100ml glass beaker. Add 10ml of water caver the glass beaker with a watch glass and stand for 30 minutes. Stir the suspension/solution with glass rod and transferred in 250ml measuring cylinder. Then make up cylinder with 50ml of water. Stirred the contents with up – down movements to get uniform suspension at 30^0C after shaking. Keep the cylinder stand for 5 minutes. Finally, the volume obtained with foam and water was recorded.

Fig no.3: Foam ability Test

- ***Spread ability: - [16]***

The spread ability of formulated cream was determined by 1gm of paste sandwiched between 2 slides. A weight of 2kg was placed an upper slide. After 30 minutes the diameter of the paste is measured in Cm.

Fig no.4: Spread ability Test

- ***Determination of microbial content: - [17]***

5gm of cream dissolved in nutrient agar culture and volume was adjusted to 100ml with same medium. About 10ml of sample was transferred into 100ml of nutrient agar culture broth and incubated for 18-24 hours at 43-45^{0}C. A subculture was prepared on plate with nutrient agar culture and incubated at 43-45^{0}C for 18-24 hours. The growth of red, generally non mucoid colonies of gram –ve rods appearing as reddish June indicate presence of E.coli, if not than it indicates the absence of E.coli.

Fig no.6: Bacillus

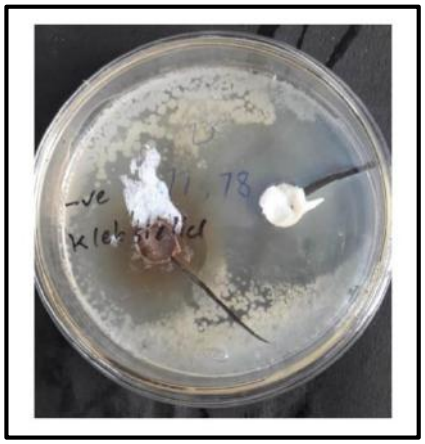

Fig no. 7: Klebselia pneumoni

Fig no .8 : Strptococci

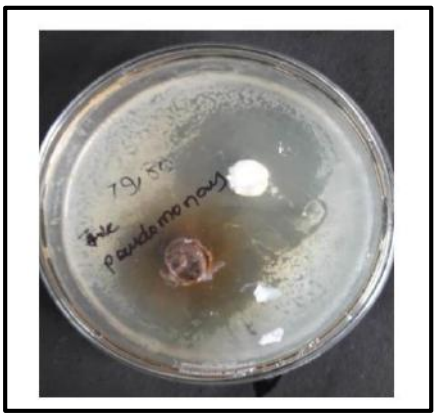

Fig no. 9 : Pseudomonas

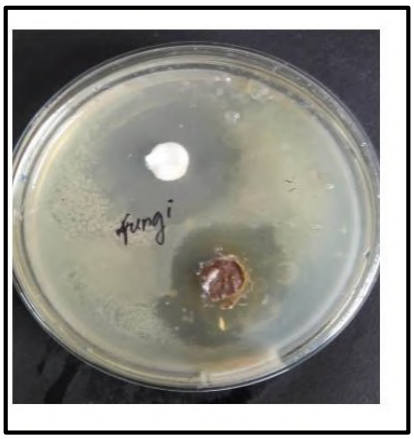

Fig no.10: Fungi (Asparagus)

- **Determination of moisture a volatile matter: - [18]**

5gm of formulation placed in porcelain dish. Dry sample in an oven at 105^0C.

Fig no 11: Moisture Content

- **Determination sharp and edge abrasive particles: [19] -**

The content was taken a finger and scratched on the butter paper for 15-20cm long to check for the presence of any sharp or abrasive particles.

4. RESULT:

The herbal toothpaste was formulated by adding the required amount of herbal ingredients and other excipients. This prepared herbal toothpaste was evaluated by using some parameters such as spreadability, pH, Foamability, Consistancy, Antimicrobiual activity against E.coli, Streptococci, Streptomycin, Klebsiella pneumonia, Pseudomonas and fungi (Asparagus).

Table no.3: Evaluation of Herbal Toothpaste

Evaluation Parameters		Observation	
Appearance		Semisolid, Brown, Pleasant Odor	
pH		6.57	
Foam ability		4.4ml	
Spread ability		Easily Spreadable	
Moisture content		44%	
Abrasive Nature		No abrasive Particle	
Antimicrobial Activity			
Sr.No	Test Microorganism	Diameter of zone of inhibition	
		Standard	Test
1	Bacillus	18mm	16mm

2	Streptococcus	16mm	18mm
3	Klebsillella	17mm	15mm
4	Pseudomonas	18mm	18mm
5	Fungi	17mm	17mm

5. CONCLUSION :

- It was conclude that the herbal toothpaste which are prepared from herbal ingredients they shows fewer side effects as compaired to synthetic toothpaste which are prepared from synthetic compound
- The prepared herbal Toothpaste was evaluated using various parameter and was found to be satisfied for the use.

REFERANCES:

1. Jensena JL, Barkvoll P, Clinical Implications of Dry Mouth : Oral mucosal Disease Annals of the new York Academy of science, 1998, 156-162.
2. NC Mohire, AV Yadav, Chitoson- Based Polyherbal toothpaste; as novel oral hygiene product, Indian Journal of dental research, 2010, Vol.21,Issue-3, 380-384.
3. AI Kholani, Comparison between the efficiency of herbal and conventional dentrifrices on established gingivitis, Dental Research Journal, 201, Vol.2011, Volume-8, Issue-2, 57-63.
4. W.Scherer, The ability of an herbal mouth rinse to residue gingival bleeding, Journal of clinical Dentistry 1998.97-100.
5. P.P. Shrama, Cosmetics ; formulation monofacture, quality control, 7th edition, pardana publication pvt ltd, 507-519.
6. Singh k, Singh P, COmpartile studied between herbal toothpaste and non-herbal tooth paste, International journal of dentle research 2016, vol.4, Issue-2. 53-56.
7. D.Mamatha,, G.Naveen kumar, preparation, Evaluation and comparision of herbal toothpaste with marketedly available toothpaste, Vol. 12, Issue 6, (Nov-Dec ; 2017), 01-06
8. Handa SS, Khanuja SPS, Longa G, Rakesh DD, Extraction Technologies for medicinal and Aromatic plant. International center for science and high technology , Triesre 2008; 21-25.
9. D.K.Shrivastava & Kshma Swarnkar, Antifungal activities of Azadirachta indica, Extraction of neem, Int.J.curr. Microbiol. App.Sci, 2014; 3(4): 306.
10. Gomathinayagam subramanium, Birj. B.T ewari, Antimicrobial propertied of different leaf extract of tulsi, American international journal of comtemporatary research, Vol.4 : August 2014; 151.
11. Pawan Deshmukh, Roshan Telrandhe, Mahendra Gunde, Formulation and evaluation of herbal toothpaste compared with marketed preparation, International journal of pharmacy and drug analysis 2017, Vol.5,Issue-10; 406-410.
12. AM Akotakar, RR Thenge, AV patil, AB Ghonge ; Formulation and comparision standasrdization of toothpaste, International journal of pharmaceutical science and research, Vol.3, issue 4, October 2018, 12-15.
13. BM Mithal, Saha RN. Handbook of Cosmetics, Vallabh Prakashan, New Delhi. 204-216.
14. Sukhbir Khokra, Ram kumar sahu, Rajendra jungle, Preparation and evaluation of herbal cosmetic cream, Pharmacologonline, 2011; 1258-1264.
15. Shivprasad doijaj, Ranjit Jadhav, Vijay jadhav An approach formulation and evaluation of herbal toothpaste by comparision of herbal toothpaste by comparison with commercial toothpaste, IJPPR, June 2018,Vol.12,Issue-3: 174-182.
16. Sethiya, saloni , Sadhana, Formulation and evaluation of herbal toothpaste Asian journal of pharmaceutical research and development, Vol 4(1), Jan-Feb 2016, 1-5.
17. Saemond, Ghazi mohmmel, Comprotive study in vitro antibacterial activity of miswak extract and different toothpaste, American J agri on Biosci 2013; Vol.8, Issue-1, 82-88.
18. Pavan Deshmukh, Rushan Telrandhe, Formulation and evaluation of herbal toothpaste compared with marketed preparation, International journal of Pharmaceutical and drug analysis; Vol.5,Issue-10: 2017; 406-410.
19. Kondrav Done, Development and evaluation of antibacterial herbal toothpaste containing Eugenia Caryophyllus, acciosia nilotica and mimusops elengi IAJCPS.2014; Vol.2,Issue-3, 666-673.