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‘‘Formulation and Evaluation of Herbal Aqueous Gel for Mouth Ulcer Treatment’’

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ABSTRACT
The objects of present disquisition were to formulate and estimate herbal gel for mouth ulcer treatment of dried pulverized guava leaves. A herbal gel was formulated by combining varying attention of pulverized guava leaves with Carbopol 934 and Propylene glycol, serving as the gel base. phrasings were estimated for colorful parameters Infrared spectroscopy revealed that there was no commerce between pulverized Guava leaves and Polymer. The gel that was created appeared transparent and invariant, with a pH ranging from 7 to7.5. expression showed respectable rheological geste with applicable Spread ability and Extrudability parcels. Anti-fungal studies of phrasings showed excellent efficacity against Aspargilious aureus, Candida albicans. From the experimental substantiation of invitro studies it was observed that pulverized guava leaves contain flavonoids so it showed significant antioxidant effect. Developed herbal expression was stable, safe and effective over to synthetic phrasings for the treatment of mouth ulcer.

Keywords - Guava Leaves Powder, Azadirachta Indica leaves extract, Gel, Mouth Ulcer

I. INTRODUCTION

Apthous stomatitis or mouth ulcer is an ulcerative condition that is related to the oral mucosa and is characterised by repeating ulcers in the throat and oral depression (Charde K, 2020).Mouth ulcers are generally generated by a number of causes, similar as smelling the inner subcaste of impertinence, food disinclinations, hard teeth brushing, hormonal changes, vitamin scarcities, bacterial infection and conditions (Deshmane S, 2014).Treatment of mouth ulcers may include soothing antiseptic mouthwashes, similar as chlorhexidine mouthwash or povidone iodine mouthwash or use of antibiotic or anesthetic gel phrasings (Mohd, 2011). Semi-solid phrasings include gel having a liquid phase which are also thickened by other factors. Topical gels are intended for the operation on skin or to certain mucosal shells for original action or percutaneous penetration of cure medications (Misal G, 2012).A large number of Indian medicinal shops are attributed with colorful pharmacological conditioning as they contain diversified classes of phytochemicals. As the conventional synthetic medicines suffer from a multitudinous side goods, these herbal constituents give a good volition (Teresa A, 2017).Leaves of Aloe barbedensis generally called as aloe vera, belonging to family Asphodelaceae, are veritably generally used in skin care products. They're rich in phytoconstituents similar as aminoacids, anthraquinones, enzymes, hormones, lignin, minerals, salicylic acid, saponins, sterols, sugars, vitamins The medium involved in product of antiulcer exertion of the factory is due to its antioxidant, antiinflammatory, mucus concealing, cytoprotective or mending conditioning. Reported pharmacological conditioning of the factory are hypoglycemic, hypolipidemic, woundhealing, immunomodulatory, antifungal andhepatoprotective. It's traditionally used for mouth ulcer treatment (Sharma TR, 2011).Leaves of Azadirachta indica, generally called as neem, belonging to The Meliaceae family boasts a rich array of phytoconstituents akin to nimbin, nimbidin, nimbolide, and limonoids, alongside quercetin and sitosterols. They've veritably strong antibacterial, antifungal and anti-inflammatory activity (Alzohairy MA, 2016) and are relatively generally used for oral and dental treatments. Leaves of Ocimum tenuiflorum, called as tulsi, belonging to family Lamiaceae, is a common condiment known for its wide variety of pharmacological conditioning similar as antimicrobial, anti-oxidant, anti-inflammatory, analgesic, antipyretic, immunomodulatory, hepatoprotective and neuroprotective goods.

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Pharmacological conditioning of Ocimum tenuiflorum could be attributed due to the presence of the phytoconstituents similar as eugenol, methyl eugenol, carvacrol, sesquiterpine, apigenin, luteolin, and ursolic acid (Kumar A, 2015). therefore in the present exploration work, the ethanolic excerpts of these shops have been incorporated in gel phrasings which could be used for the operation of mouth ulcers, a condition that's associated with microbial irruption.

Fig. 1: Aphthous stomatitis

II. MATERIALS AND METHOD

The fresh factory accoutrements of Psidium guajava were collected from original area from Agricultural grange (Karad, Satara quarter). Fresh factory leaves were washed under running distilled water as well as valve water and shade drying was carried out.

Preparation of herbal Gel

Specified Quantum of Carbopol 934 was dispersed in demanded amount of distilled water with continuous stirring. 5 ml of distilled water was taken and demanded volume of methyl paraben and propyl paraben were dissolved by toast on water bath after cooling propylene glycol was added. further varying attention of Psidium guajava cream and azadirachta indica leaves prize was mixed to the below amalgamation and volume was made up to 20 ml with distilled water. ultimately full mixed ingredients were mixed properly to the Carbopol 934 gel with continuous stirring and triethanolamine was added drop wise to the expression for adaption of demanded pH(6.8- 7) Das, 2010).

Fig. 2: - Herbal mouth ulcer gel

The composition of herbal gel prepared from the pulverized guava leaves coded as G1, G2, and G3 is tabulated in Table 1.

Table 1: Composition of various gel formulations containing powdered guava leaves & neem extract.

Ingredients	G1	G2	G3
Guava leaves powder	2%	1%	0.5%
Azadirachta indica leaves extract	2%	1%	0.5%
Carbopol 934	3%	3%	3%
Methyl Paraben	0.0015%	0.0015%	0.0015%
Propyl Paraben	0.01%	0.01.%	0.01%
Triethanolamine	q.s + pH 6.5-7	q.s + pH 6.5-7	q.s + pH 6.5-7

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Distilled water	Up to 20 ml	Up to 20 ml	Up to 20 ml

EVALUATION OF HERBAL GEL

Physical Appearance:

Physical parameters such as appearance and colour were checked.

Measurement of pH:

The pH of herbal gel phrasings were determined by using digital pH cadence. 1 gm of gel was taken and dispersed in 10 ml of distilled water and keep away for two hours. The dimension of pH of expression was carried out in three times and the average values are reported (Sanghavi, 1989). pH of gel expression was reported in table no 2

Homogeneity:

All gel phrasings passed unity testing through visual examination after being set into holders. The examination concentrated on detecting any summations or irregularities in their appearance (Gupta, 2010). The unity of gel phrasings was proved in Table 2.

Spreadability:

Spreadability was determined by glass slide and rustic block outfit. Weights about 20 gm were added to the visage and the time were noted for upper slide to move to separate completely from the fixed slide(Shivhare, 2009). An spare amount of gel 2 gm under study was placed on this ground slide. The gel was also squeezed between this slide and another glass slide having the fixed ground slide and there's handed with the hook.

A 1 kg burdened was placed on the top of the slides for 5 beats to give a steady film of the gel and remove air between the slides. redundant of the gel was removed off from the edges. The top plate was also subdued to pull with the help of string attached to the hook and the time in seconds demanded by the top slide to cover a distance of7.5 cm be noted. A shorter or lower interval indicates better Spreadability. The spreadability of the gel was determined using the formula handed by Pawar,(2013). and is proved in Table 2.

$S = M \times L / T$

Where, S = Spreadability,

M = Weight in the pan which is tied to the upper slide,

L = Length moved by the glass slide

T = Time in second taken to separate the slide completely each other.

Clarity:

Visual Examination was employed to determine the clarity of all three batches(Pandey, 2011).

Viscosity:

Density was determined by using Brookfield viscometer(DV- III programmable Rheometer). Formulated gels were tested for their rheological actions at 250 C. The dimension was made over range of speed from 10rpm to 100rpm with 30seconds between 2 consecutive pets and also in a rear orders(Bhramaramba, 2015).

Extrudability:

The gel phrasings were filled in standard limited collapsible aluminium tubes and sealed to the end. The ability to be squeezed or pressed was tested by using the thumb.

III. RESULT AND DISCUSSION

Formulation	**G1 (2%)**	**G2 (1%**	**G3 (0.5%)**
Physical Appearance	Greenish	Greenish	Greenish
pH	6.8±0.9	7±0.09	6.9±0.5
Spreadability (gm.cm/sec)	5.30 ± 0.1	5.76 ± 0.15	6.23 ± 0.057
Viscosity (Pa·S)	3.111 ± 0.004	3.029 ± 0.049	2.292 ± 0.012

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Extrudability	Good	Good	Good
Homogeneity	Good	Good	Good
Stability study for 1 Month	Open Container	Not Stable	
	Closed Container	Stable	

Table 2: In vitro evaluation parameters

From the results it's easily shows that all the set gel phrasings having good unity and gelatinizing property(Gupta, 2010). The pH of all gel phrasings was in the range compatible with normal pH range of the skin(Sanghavi, 1989). The rheological geste was studied with rheometer ranging between2.292 to3.111 .Which is indicated that formulated gel was neither too thick and nor too thin(Bhramaramba, 2015).

The study of Spreadability shows that with adding the density of expression Spreadability diminishments and vice versa (Shivhare, 2009). Extrudability study was done by pressing thumb and it's fluently extendable. The gelatinizing & bioadhesive strength of all the batches was set up in the suitable range (Jaiswal, 2012). 1 Month stability study was done with open and close vessel and it's showed that open vessel containing gel wasn't stable and close vessel gel was stable. Formulated gel containing open vessel when expose to medium room temperature also syneresis was observed it means liquid exudates separating (Kaur, 2013). Syneresis arises when the commerce between patches of the dispersed phase intensifies to the point where separation occurs upon standing. In that dispersing medium is squeezed out in driblets forms and the gel shrinks. Syneresis it means the form of insecurity in waterless gels. In syneresis system separation of a solvent phase is do only because of the elastic compression of the polymer means polymeric motes (Allen L). Infrared gamuts of gel phrasings did not show the presence of any fresh peaks so infrared spectroscopy revealed that there was no commerce between pulverized Guava leaves and polymer. Infrared gamuts have shown groups2925.48-CH,476.93- Hematite,1717.3-C=O,1187.46,1187.72- C-O. The major peaks of medicine gamuts remained unchanged in the admixture were observed in Infrared gamuts. All the three batches of developed expression showed antifungal exertion against Aspargilious aureus & Candida Albicans this are main microorganism responsible for mouth ulcer and expression it can also use to treat mouth ulcer infection(Koland, 2011). A farther DPPH assay study it was observed that pulverized guava leaves contains flavonoids so it showed significant antioxidant effect(Blois, 1958) &(Mathangi, 2013).

IV. CONCLUSIONS

Currently there's a lot of demand for herbal phrasings in the request due to their cost effectivity and absence of any side goods. From the below experimental data it is clear that a gel expression with herbal constituents similar as aloe, neem and tulsi has good characteristics, density and also possesses a good antimicrobial exertion which is necessary in the operation of mouth ulcers.

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Conflict of Interest
The authors declare that no conflict of interest of any financial or other issues.

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