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"FORMULATION AND EVALUATION OF BUCCAL GEL WITH USING COCCINIA GRANDIS LEAVES EXTRACT "

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ABSTRACT:

Coccinia grandis (Ivy gourd) is a plant found in many hot parts of India and is known in traditional medicine for its many health benefits like reducing inflammation, controlling diabetes, and fighting infections. It contains natural compounds called cucurbitacins that help with healing and improving health. In this study, a herbal gel was made using Coccinia grandis extract. The gel sticks to the inside of the mouth (mucoadhesive), helping the medicine stay in place longer and get absorbed better. Ingredients like HPMC (a gel-forming substance) and PEG 400 (which helps the gel spread and improves absorption) were used. The gel was tested for its look, texture, pH, stickiness, drug content, how fast the drug is released, and how stable it is. This kind of gel can be a useful and natural way to deliver herbal medicine, especially for long-lasting effects in the mouth.

Keywords: Mouth Ulcer, Coccinia Grandis, Buccal Gel, Anti-Ulcer.

Introduction:

Mouth ulcers are small but painful sores that can form inside the mouth. They are very common and can happen for different reasons.

Two of the most common causes are:

o Injury or irritation, like from sharp teeth or dental work.

o Canker sores (aphthous ulcers), which come and go for reasons we don't fully understand.

- These ulcers can hurt a lot, making it hard to eat or talk comfortably. While they usually heal on their own, the pain and discomfort often make people look for faster and more soothing treatments.
- Many current treatments, like anti-inflammatory drugs (NSAIDs or steroids), can help, but they often come with side effects, especially when used for a long time. That's why many people are turning to herbal or natural remedies as a safer option. One such plant is Coccinia grandis (also known as Ivy gourd).
- It has been used in traditional medicine for its healing, anti-inflammatory, and anti-ulcer properties. Scientists are now studying how it can be used in modern medicine, especially for treating mouth ulcers.
- A mouth ulcer, also known as a canker sore, is a small, painful lesion that develops on the soft tissues inside the mouth, such as the inner cheeks, gums, tongue, or lips. They can be white, yellow, or gray in color, with ared border. Mouth ulcers can be caused by various factors such as injury, stress, hormonal changes, or certain medical conditions. They usually heal on their own within 1-2 weeks but can cause discomfort during that time.

Types of mouth ulcer:

1. Minor ulcers: These are small, round or oval ulcers with a white or yellow center and a red border.

2. Major ulcers: Also known as Sutton's disease or periadenitis mucosa necrotica recurrens, these ulcers are larger and deeper than minor ulcers.

3. Herpetiform ulcers: These ulcers consist of clusters of multiple small sores that merge together to form a larger ulcer. Despite the name, they are not caused by the herpes virus.

Drug	role
Coccinia grandis leaves	Active ingrdients
НРМС	Thickning agent
Propylene glycol	Humectant, solvent
glycerin	Smoothing agent

Purified water	Volume make up
Purified water	Volume make up

Drug profile:

> Coccinia Grandis



Fig.no.1 Croccinia grandis

Botanical Name: Coccinia Grandis. Common Name: Kundru, Tonduli. Family: Cucurbitaceae. Geographical Source: North-central East Africa and the Indo-Malayan-region.

Chemical Constituent: Resins, Alkaloids, Fatty acids, Flavonoids, Proteins, Steroids, Tannins.

Therapeutic Uses:

- Helps Lower Blood Sugar Levels.
- Reduces Swelling And Inflammation.
- Fights Harmful Free Radicals In The Body.
- Helps Heal Cuts And Wounds Faster.

Extraction methods of coccinia grandis:

Drying: Lay the leaves on newspaper and let them dry. The leaves are Dry when they have a crinkly Texture.

Grinding: Start by grinding the dried Coccinia grandis into fine powder.

- Extraction Process: Extraction process for coccinia grandis leaves extract
- Water Decoction Extraction (Traditional Method):

Materials:

- · Coccinia grandis powder
- Distilled water
- · Heating Vessel (Stainless steel or Glass)
- Heating Source
- Stirring Rod
- Filter Paper
- Storage Container
- 1) Weigh coccinia grandis powder. 50gm of coccinia grandis powder.
- 2) Add 10 times the volume of water (500ml of distilled water).
- 3) Boil gently for 30-60 min with occasional stirring. Avoid vigorous boiling to preserved sensitive compounds.
- 4) Let it cool naturally to room temperature.
- 5) Filter the decoction to remove residues.

6) Store in airtight container, preferably ambar bottle. Refrigerate if no preservatives are added; use within 3-5 days.

Procedure Of Formulation Of Buccal Gel:

1) Specified amount of hydroxypropyl methylcellulose (HPMC) dispersed in required amount distilled water with continuous stirring (0.5gm in 50ml).

- 2) Methyl paraben dissolve in hot distilled water over a water bath in beaker.
- 3) After heating, allow the solution to cool before adding another ingredients.
- 4) Add propylene glycol and after adding coccinia grandis leaves extract.
- 5) Finally, full mixed ingredients was mixed properly to the HPMC swell gel with continuous stirring.
- 6) Volume was made up to 30 50ml with distilled water.
- 7) Few drop of glycerin were added as smoothing agent.

Packaging:

Buccal gel comes in small tubes, pump bottles, or little packets that are easy to use and keep clean. The packaging protects the gel from air, light, and dirt so it stays fresh and works properly. It also helps you use the right amount each time. This way, it's simple and safe to put the gel inside your cheek.

Storage:

Keep buccal gel in a cool, dry place, away from heat and sunlight. Some gels need to go in the fridge, so always check the label or ask your pharmacist. Make sure the lid is closed tightly so it stays clean and doesn't dry out. Keep it away from children and pets, and don't use it after the expiration date. Don't freeze it unless the instructions say it's okay. Storing it the right way helps the medicine work properly.

Dispensing:

A doctor or pharmacist will give you buccal gel and tell you how much to use and when. Before using, wash your hands. Then, squeeze or pump out a little gel and put it inside your cheek using a clean finger or tool. After putting it on, don't eat or drink for a bit so the gel can work properly. Always follow the instructions to use it safely.

Evaluation Of Formulation:

1) Physical Evaluation: Physical parameters such as color, odor and consistency were checked visually.

- 1. Color The color of the formulations was checked by visual inspection.
- 2. Consistency The consistency of the formulations was checked by applying on skin.
- 3. Odour The odor of the formulations was checked by mixing the cream in water and observing the smell.

2) pH: Measurement of pH The pH of the gel formulation were determined by using digital pH meter.1gm of gel was taken and dispersed in 10 ml of distilled water and keep aside for two hours. The measurement of pH of formulation was carried out in three times and the average values are reported.

3) Spread ability: A glass plate with a circle that was already marked with a 1 cm diameter was coated with 0.5 g of gel to test the spreadability. 250g of weight was placed on the top glass plate and left there for five minutes.

The formula was used to calculate it is,

L = Length of glass slide.

T = Time required to separate the slides.

M = weight fastened to upper slide.

4.Homogeneity: All developed cream formulations were tested for homogeneity by visual inspection after the cream have been set into the container. They were tested for their presence and appearance of any aggregates. Homogeneity of gel formulation was reported.

5) Antimicrobial Activity: Agar well diffusion method Nutrient agar medium was prepared and sterilized by autoclaving at 121°C for 15 minutes. The three to four agar plates were prepared and labeled. The nutrient agar after sterilization was poured into the two plates and allowed to solidify. After solidification the culture, lactobacillus were applied on each plate. Then the wells were prepared using cork borer. Then the samples were poured in respective wells using micropipette. The plates were incubated at 37°C for 24 hours.

Sr.no.	Ingridients	Quantity		
		F1	F2	F3
1.	Croccinia grandin leaves extract	30ml	30ml	30ml
2.	НРМС	0.3gm	0.8gm	0.3gm
3.	Glycerine	0.2ml	0.5m.	0.6ml

Propylene glycol	1ml	1.5ml	2ml
Methylene paraben	0.3ml	0.2ml	0.5ml
Distilled water	q.s	q.s	q.s
-	Propylene glycol Methylene paraben Distilled water	Propylene glycol 1ml Methylene paraben 0.3ml Distilled water q.s	Propylene glycol 1ml 1.5ml Methylene paraben 0.3ml 0.2ml Distilled water q.s q.s

Result And Discussion:

Physical Evaluation:

Sr.No.	Formulation	Colour	Consistency	Odour
1)	F1	Creamy white	Smooth	Characteristics
2)	F2	White	Smooth	Characteristics
3)	F3	white	Smooth	Characteristics

• pH:

Sr. No.	Formulation	рН	
1)	F1	6	
2)	F2	5.8	
3)	F3	6.3	

• Spradability

Sr.No.	Formulation	Spredability (gm/cm/sec)
		-
1)	F1	5.3
2)	F2	6.5
3)	F3	

• Homogeneity:

Sr.No.	Formulation	Homogeneity
1)	F1	Good
2)	F2	Good
3)	F3	Good

Antibacterial Studies:

Sr.No.	Formulation	Antibacterial Studies (mm)
		Lactobacilli
1)	Standard	27
2)	Formulation 3	24
3)	Blank	14

Conclusion:

- Natural remedies are more acceptable in the belief that they are safer with lesser side effects than the synthetic medicines. Nowadays herbal
 formulation have increasing demand in the sworld market. The presented study of coccinia grandis extract and Psidium guajava leaf extract
 for the effective management of mouth ulcers may boost drug penetration from the affected area, indicating antifungal and antibacterial action.
- The presence of propylene glycol may boost the cream stability. Coccinia grandis extract has antiulcer properties. It also possesses antioxidant properties, which aid in the protection of the mouth's surface from oxidative damage. The leaf extract of Psidium guajava contains phenolic acids, flavonoids, terpenoids, glycosides, and saponins, which have antibacterial and antiulcer activity. As a result, a polyherbal combination of coccinia grandis extract and Psidium guajava leaf extract has been added into the cream used to treat mouth ulcers.
- The F3 formulation had higher viscosity due to its higher carbapol934 content. Since F1 and F2 had no significant variation in evaluating parameters, the F3 formulation was chosen as the superior formulation because of proper appearance and uniformity. According to in vitro studies, polyherbal gel made of Coccinia grandis extract and Psidium guajava leaf extract is useful to heal mouth ulcers. The result showed that due to combination dosage form developed new herbal gel formulation having good anti -inflammatory activity so it is safe, stable and good for mouth ulcer treatment.

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