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Formulation and evaluation of medicated sucrose - free herbal lozenges of turmeric for sore throat

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Abstract

The Objective of present work is to formulate and evaluate sucrose free medicated Lozenges using Curcumin. Turmeric Lozenges were prepared to prevent the inflammation and itching in sore throat. Several Lozenges are available in market having high content of sucrose as base. Patients suffering from Diabetes mellitus are avoid sucrose containing Lozenges. Hence, it was necessary to develop and prepare sucrose free Lozenges. Prepared Herbal Lozenges contain Jaggery base and also extract of Turmeric, Decoction of Tulsi, Cinnamon, Black pepper, menthe oil for flavour. Quality of final herbal lozenges was evaluated for formulation parameters like organoleptic characteristics, Hardness, Disintegration time, Friability, pH, weight uniformity and water content. The results of stability study of the final herbal Lozenges that no changes were observed in all the tested physiochemical parameters.

Keywords: Herbal Lozenges, Curcumin, Hardness, Disintegration, Friability, Stability

1. Introduction

Ayurvedic formulations are mainly administered by oral route, and most of the orally administered Ayurvedic formulations belong to Solid dosage form of herbal drug or various drug combination. Now a days, Herbal plants and formulations are used for many types of medical conditions. Turmeric Lozenges were prepared to prevent the inflammation and itching in sore throat. Several Lozenges are available in market having high content of sucrose as base. Patients suffering from Diabetes mellitus are avoid sucrose containing Lozenges. Hence, it was necessary to develop and prepare sucrose free Lozenges. Herbal formulations are most commonly used in development as well as developing countries as health care aid. [1-5]

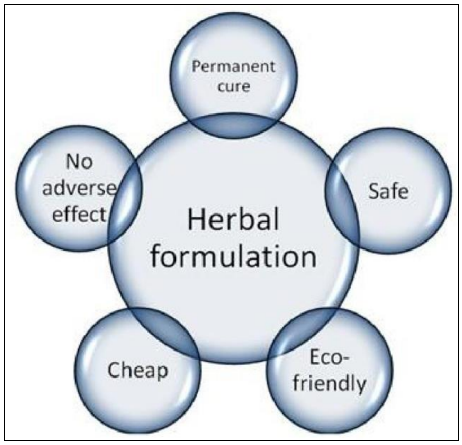

Fig 1: Advantages of Herbal Formulation [10]

Stability testing of Herbal formulations

Stability testing studies help to establish recommended storage conditions, shelf life and retest period of herbal products by providing evidence on how the quality of herbal products varies with time under the influence of environmental factors such as

temperature, light, oxygen, moisture, presence of other ingredients or excipients in dosage form, microbial contamination, particle size of drug, trace metal contamination, and other factors. [12-14]

2. Material and methods

Following herbal drugs are used in the formulation of herbal Lozenges.

Table 1: List of Material

S. No	Ingredients
1	Turmeric Extract
2	Decoction of Tulsi
3	Cinnamon
4	Black pepper
5	Liquorice
6	Peppermint
7	Jaggery

Table 2: Details of used Herbal ingredients

S. No	Ingredients	Biological source	Uses
1.	Turmeric	Curcuma longa	Expectorant, Anti-inflammatory
2.	Tulsi	Ocimum sanctum	Antibacterial, Anti-inflammatory
3.	Cinnamon	Cinnamonum zeylanicum	Aromatic, Expectorant
4.	Black pepper	Piper nigrum	Antibacterial
5.	Liquorice	Glycyrrhiza glabra	Expectorant
6.	Peppermint	Mentha piperita	Flavouring agent
7.	Jaggery	---	As sucrose free Base

2.1 Pre formulation evaluation parameters are as follow:

Table 3: Pre- formulation of raw material

S. No	Test	Procedure
1.	Moisture content	1. Weigh 2 gm of sample and take in Petridish. 2. Heat it in the hot air oven at 100 ^{O}C for 1 hr. 3. Then allowed to cool. Weight the sample again.
2.	Determination of ethanol extractive value	1. Take macerated 5 gm of air dried, shaken coarsely powdered drug with 100 ml of 95% ethanol in closed flask for 24 hrs. 2. Shake it frequently for first 6 hours and then allowed to stand for 18 hrs. 3. Then filter it rapidly (take care for loss of ethanol). 4. Evaporated 25 ml filtrate to dryness in a flat bottomed petridish. 5. Dry at 105 ^{o}C and weighed.
3.	Determination of water extractive value	1. Macerated 5 gm of air-dried drug coarsely powdered with 100 ml chloroform water (2.5 ml chloroform in 1000 ml water) in closed flask for 24 hrs. 2. Shaken frequently for first 6 hrs. 3. Allowed to stand for 18 hrs. 4. Evaporate 25 ml of filtrate to dryness in a flat bottomed petridish. 5. Dry at 105 ^{o}C and weighed.

2.2 Formulation Table

Table 4: Formulation table for herbal Lozenges

S. No	Ingredient	Quantity taken (for 1 Lozenges)
1	Turmeric extract	7 ml
2	Decoction of Tulsi	5 ml
3	Cinnamon	350 mg
4	Black pepper	200 mg
5	Liquorice	300 mg
6	Peppermint oil	5 ml
7	Jaggery	1.5 gm

2.3 Preparation of herbal Lozenges

2.3.1 Method of preparation of Turmeric extract

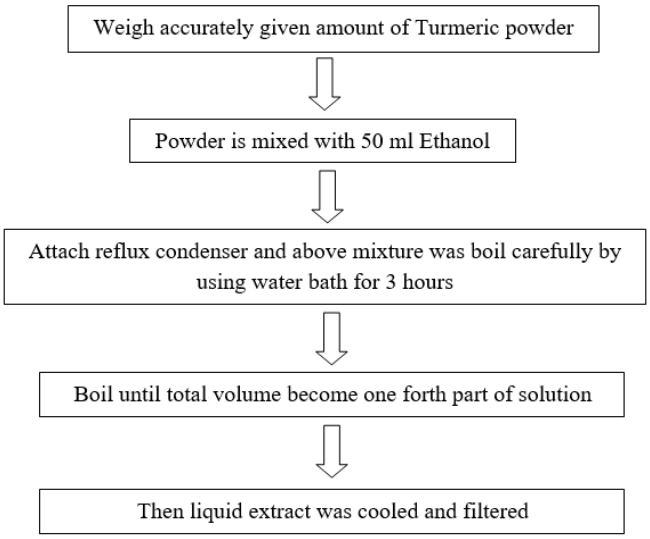

Chart 1: Method of preparation of Turmeric extract

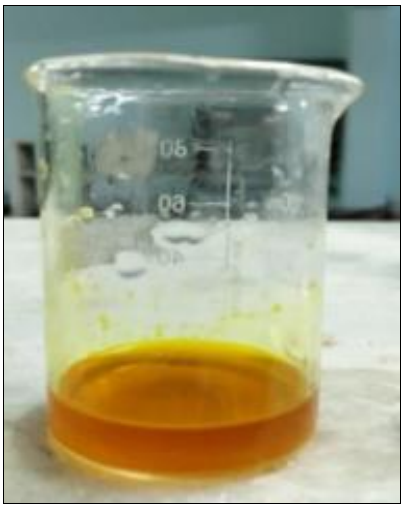

Fig. 2: Prepared Turmeric extract

2.3.2 Method of preparation of Decoction of Tulsi

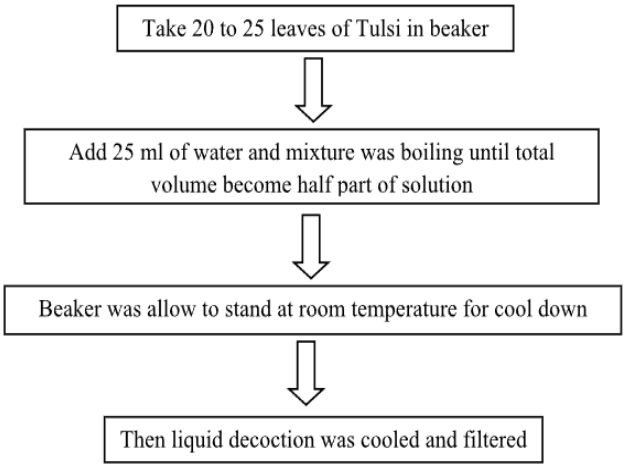

Chart 2: Method of preparation of Decoction of Tulsi

Fig 3: Decoction of Tulsi

2.3.3 Preparation of final herbal Lozenges

2.3.3.1 Herbal Lozenges were prepared by Melting and mold technique

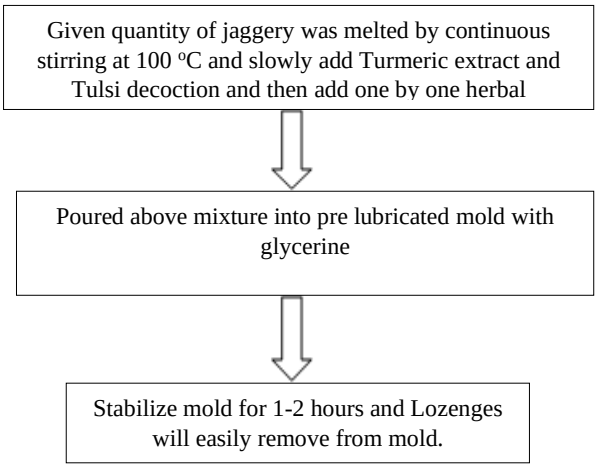

Chart 3: Preparation of final Lozenges

Fig 4: Boiling Jaggery

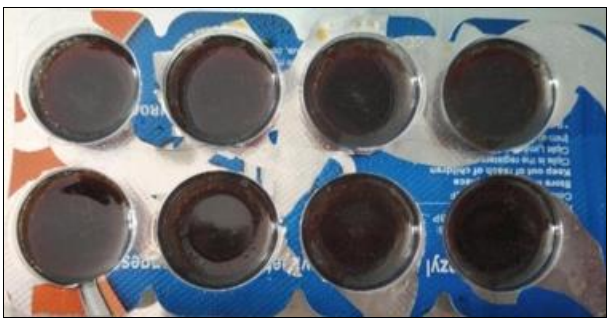

Fig 5: Final prepared Herbal Lozenges

2.4 Post formulation evaluation parameters are as follow

Table 5: Post formulation evaluation parameters of final Lozenges

S. No	Test	Procedure
1	Colour examination	Colour of Lozenges was observed by naked eyes.
2	Odour	2 Lozenges were taken and smelled by individually.
3	Taste examination	A Lozenge was taken and examined on taste buds of the tongue.
4	Thickness and Diameter	The thickness & Diameter of a lozenges are measured using vernier caliper or screw gauge.
5	Hardness	Place the lozenges between the jaws of monsanto hardness tester and slowly go on rotating the screw until the lozenges break.
6	Weight Uniformity	20 lozenges were taken and weighed collectively and individually on an electronic balance. From the collective weight, average weight was calculated. Each lozenge weight was then compared with average weight to assure whether it was within permissible limits or not.
7	Friability	Place 20 lozenges into friability test apparatus and measured.
8	Disintegration test	Place the six lozenges into each tube and add a disc to each tube. Suspend the assembly in the beaker containing 6.2 Sodium Phosphate buffer solution and operate the apparatus for specified time. The lozenges pass the test if all of them have disintegrated.
9	pH determination	Crushed Prepared Lozenges was taken in 100 ml of volumetric flask. Make up volume to 100 ml with dist. water. Sonicated for 10 minutes. pH was measured by using digital pH meter.
10	Water content	Water content was determined by karl fisher apparatus.

3. Result

3.1 Pre formulation studies

Table 6: Physicochemical evaluation of raw material

S. No	Parameters	Result
1	Moisture content	1.2
2	Ethanol soluble extractive	12.5
3	Water soluble extractive	12.8

3.2 Post formulation studies

Table 7: Evaluation of formulated medicated herbal Lozenges

S. No	Parameters	Observed value
1	Colour	Yellowish-Brown
2	Odour	Aromatic
3	Taste	Sweet
4	Thickness	6.35 mm
5	Diameter	10.45 mm
6	Hardness	12.58 kg/cm^2
7	Average weight	2 gm
8	Weight Uniformity	Complies
9	Friability	0.09 %
10	Disintegration test	45 minutes
11	pH	7.1
12	Water content	1.75 % w/w

3.3 Stability study

Table 8: Stability testing of Herbal Lozenges

S. No	Parameters	Observed value	
		Initial	After 1 month
1	Colour	Yellowish-Brown	No change
2	Odour	Aromatic	No change
3	Taste	Sweet	No change
4	Thickness	6.35 mm	No change
5	Diameter	10.45 mm	No change
6	Hardness	12.58 kg/cm^2	12.05 kg/cm^2
7	Average weight	2 gm	No change
8	Weight Uniformity	Complies	Complies
9	Friability	0.09 %	0.08%

10	Disintegration test	35.26 minutes	32.12 minutes
11	pH	7.1	7.0
12	Water content	1.75 % w/w	1.78 % w/w

4. Conclusion

Medicated Sucrose free Poly- Herbal Lozenges having expectorant and Anti-inflammatory were Formulated and Evaluated by various Parameters. Pre- formulation studies of prepared formulation were within specifications. Also, the Physicochemical properties of prepared herbal lozenges like colour, odour, taste, Weight uniformity, Hardness, Disintegration test, Friability, pH and water content were within standard limits. The results of stability study of the final lozenges reveal that no changes were noticed in all the tested physicochemical parameters during 1 month. Thus, it can be concluded that the prepared herbal lozenges may be used as a stable solid dosage form.

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