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FORMULATION AND EVALUATION OF POLYHERBAL CHEWABLE TABLETS TO TREAT ALLERGY

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ABSTRACT

Plants have always been a exemplary source of drugs and many of the currently available drugs have been derived directly or indirectly from them. The present study aimed at the formulation and evaluation of polyherbal chewable tablets to treat allergy. **Methodology:** Polyherbal chewable tablets for allergy was prepared by using pineapple (*Ananas comosus*), Tulsi (*Ocimum tenuiflorum*), Cinnamon (*Cinnamomum Zeylanicum*), Lemon (*Citrus aurantifolia*), Honey as binding and sweetening agent and potato starch is used as binding agent following wet granulation technique. Granules were evaluated for Angle of repose; Carr's compressibility index, particle size distribution and tablets were evaluated for friability, hardness, organoleptic properties, diameter and thickness, weight variation test and the time required for complete chewing. **Results:** All the evaluation parameters were found to be in acceptable limits. **Conclusion:** The evaluation of granules and tablets indicate successful formulation of chewable tablets. Chewable tablets are with minimum disintegration time, sufficient hardness, pleasant taste and meeting all official limits.

INTRODUCTION

Allergic conditions are well spread on the rise in the world now-a-days (1). Some symptoms attributable to allergic diseases are mentioned in ancient sources (2). The concept of "allergy" was originally introduced in 1906 by the Viennese pediatrician Clemens von Pirquet, after he noticed that patients who had received injections of horse serum or smallpox vaccine usually had quicker, more severe reactions to second injections (3). Pirquet called this phenomenon "allergy" from the Ancient Greek words *allos* meaning "other" and *ergon* meaning "work" (4). There are several different types of allergies which include allergic rhinitis, drug allergy and food allergies. Signs and symptoms of allergy include red eyes, itchy rash, shortness of breath, swelling, sneezing etc (5). Treatment of allergy involves administration of Drugs like steroids (hydrocortisone), antihistamines (cetrizine, chlorpheniramine maleate), antibiotics (penicillin), NSAIDs etc. Several antiallergic drugs are associated with adverse effects like dizziness, sedation, confusion, hypotension, heartburn, cramping, nausea, headache, blurred vision etc (6). Herbal medicines are safer than Allopathic medicine with lesser adverse effects. Hence there is a pressing need to exploit natural resources for the effective treatment of allergy with minimum or nil adverse effects. Literature reveals that leaves of Tulsi, bark of Cinnamon, fruits of Pineapple, fruits of lemon and honey possess anti allergic properties (7-9). Hence the present study was designed to formulate and evaluate Polyherbal chewable tablets by using leaves of Tulsi (*Ocimum tenuiflorum*), Fruit of Pine apple

(*Ananas comosus*), fruit of Lemon (*Citrus aurantifolia*), bark of Cinnamon (*Cinnamomum zeylanicum*) and honey.

MATERIALS AND METHODS

Raw materials: Fruits of Pineapple bark of Cinnamon, fruits of lemon, leaves of Tulsi, Honey and tubers of Potatoes.

Collection of raw materials: Ripe fruits of Pine apple, Cinnamon bark, Lemon fruits, potatoes and honey were collected from local market. Leaves of Tulsi were collected from the herbal garden of Bharat institute of technology, Mangalpally.

Identification and authentification: Ripe fruits of Pine apple, Cinnamon bark, Lemon fruits and Tulsi leaves were identified and authenticated by Dr. Sateesh Suthari, Department of Plant Sciences, School of Life Sciences, University of Hyderabad. The voucher specimens were deposited in the University of Hyderabad Herbarium with accession number 2612, 2614, 2613 and 2611 respectively

Preparation of raw materials

Pineapple fruit powder: Pineapple is taken, peeled off and sliced into small pieces and it is dried for 10 to 12 days then it is converted into powder

Tulsi leaf powder: Tulsi leaves are taken and dried for 2 to 3 days then it is converted into powder.

Lemon concentrate: Lemons were taken and juice was extracted from it and heated it until it become concentrated and dried.

Cinnamon bark powder: Dried cinnamon bark is taken and made into powder form.

Honey: Honey was collected from local market and was used as such.

Preparation of potato starch: Potatoes were taken and washed. They were decorticated, cut it into small pieces and ground it in a mixer to make a slurry. Slurry was kept aside for a few minutes to allow the starch to settle at the bottom of the container. Supernatant was decanted and starch was rinsed with water 2 to 3 times and then it was dried

Method of Preparation: Polyherbal chewable tablets were prepared by following wet granulation method (Table 1). For this, 5 grams of Pineapple fruit powder, 3 grams of Tulsi leaf powder, 2 grams of cinnamon bark powder, 1 ml of honey, 1 gram of lemon concentrate were taken and accurately weighed. The powders were mixed well and the powder mixture was converted into dough by using 10% Potato starch solution. Granules were prepared by following wet granulation method by passing through sieve number 14. Granules were dried in an oven and evaluated for flow properties. Tablets were prepared by 8 station rotary press tablet compression machine (10).

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Evaluation of Polyherbal chewable tablets

Evaluation of granules

Angle of repose: The angle of repose is a relatively simple technique for estimation of the flow property of a powder. The angle of repose was calculated by using the formula (11)

Angle of repose (θ) = $\tan^{-1}$ (height /radius)

Carr`s compressibility index: The Carr's compressibility index was calculated by calculating the tapped and bulk density using the 100-ml measuring cylinder. Compressibility is calculated by the formula,

$C = 100 \times (1 - \rho B/\rho T)$

A carr`s index greater than 25 is considered to be an indication of poor flowability, and below 15, of good flowability

Particle Size distribution: The particle size distribution of granules was evaluated by sieve analysis using standard sieves in the range of sieve no. 10-36 (12).

Evaluation of tablets

Organoleptic properties: The colour, odour and taste characteristics were evaluated.

Diameter and Thickness: It was measured by using vernier calliper scale

Friability: The test is performed by using Roche friabilator.

Formulation of polyherbal chewable tablets

Table 1: Formula

Materials	Quantity
Pineapple powder	5 g
Cinnamon powder	2 g
Tulsi powder	3 g
Lemon concentrate	1 g
Starch	q.s
Honey	ml

Evaluation of granules: The results of evaluation parameters for the prepared granules were presented in the Table 2

Table 2: Evaluation of granules

Parameter	Observation
Angle of Repose	23.7°
Bulk density	0.324 g/ml
Tapped density	0.389 g/ml
Carr's index	14.4%
Hausner'ratio	0.83
Type of flow	Excellent

Table 3: Evaluation of tablets

S.no	Parameter	Observation
1	Colour	Dark Brown
2	Odour	Good and aromatic
3	Taste	Sweet and sour
4	Diameter (cm)	1.0 cm
5	Thickness (Cm)	0.5 cm
6	Weight variation test	Tablet complies as per specification
7	Friability Test	1.72%
8	Hardness Test	5.5-6.0kg/cm2
9	Time required for complete chewing	7-8 min

Friability= Initial weight- final weight/initial weight ×100

Hardness: The hardness test is performed to provide a measure of tablet strength. The Pfizer tester is commonly used (13).

Weight variation: The USP weight variation test is run by weighing 20 tablets individually and comparing individual weight to the average. The tablets meet the USP test if no more than 2 tablets are outside the percentage limit and if no tablet differs by more than 2 times the percentage limit (14).

Angle of repose: Angle of repose was found to be 23.7° which indicates excellent flow properties of the granules.

Carr`s compressibility index: Bulk density and tapped density for the prepared granules were found to be 0.324 g/ml and 0.389 g/ml. based on the above two densities Carr's compressibility index was found to be 14.4% which is less than 15% which indicates good flowability. Haussner's ratio was found to be 0.83 which is less than 1.25 which also indicates good flowability.

Particle Size distribution: The average particle size was found to be in the range of 548-665 µm.

Evaluation of Polyherbal chewable tablets

The results of evaluation parameters for the Polyherbal chewable tablets were presented in the Table 3

Organoleptic properties:

The colour of the chewable tablets was found to be dark brown, odour was good and aromatic and taste was sweet, sour and aromatic. Finally the chewable tablets were found to be palatable.

Diameter and Thickness: Diameter of chewable tablets was found to be 1 cm and thickness was found to be 0.5 cm.

Friability: Friability of polyherbal chewable tablets was found to be 1.72%.

Hardness: Hardness value of chewable tablets was found to be in the range of 5.5 – 6.0 kg/cm^2

Weight variation: Chewable tablets showed percent weight variation within given limits i.e., less than 5%.

DISCUSSION:

Allergies are abnormal immune system reactions to things that are typically harmless to most people. Substances that cause allergic reactions, such as certain foods, dust, plant pollen, or medicines, are known as allergens (15). Several antiallergic drugs are associated with adverse effects like dizziness, sedation, confusion, hypotension, heartburn, cramping,

nausea, headache, blurred vision etc (6). Herbal medicines are safer than Allopathic medicine with lesser adverse effects. Hence there is a pressing need to exploit natural resources for the effective treatment of allergy with minimum or nil adverse effects. Literature reveals that leaves of Tulsi, bark of Cinnamon, fruits of Pineapple, fruits of lemon and honey possess anti allergic properties (7-9). Now a day's herbal chewable tablet are becoming popular due to their effective and safe use. Hence the present study was conducted to formulate and evaluate Polyherbal chewable tablets by using leaves of Tulsi, bark of Cinnamon, fruits of Pineapple, fruits of lemon and honey. Honey was also used as sweetening agent. 10% starch solution was used as binding agent. Honey was used as sweetening agent. A polyherbal chewable tablet was formulated by wet granulation method. Evaluation of granules revealed good flow properties. Organoleptic properties like color, odor and taste of chewable tablets were found to be acceptable. Tablets showed % weight variation within given limits (< 5%). Friability was found to be 1.72%. Hardness value was found to be in the range of 5.5 – 6.0 kg/cm^2. Disintegration i.e., Time required for complete chewing ranges from 8-10 min.

CONCLUSION:

Herbal formulations share growing demand in the world market. It is very good attempt to establish the poly herbal chewable tablets containing powdered mixture of pineapple, cinnamon, tulsi, lemon concentrate, and honey. The above drugs have been reported to possess good antiallergic properties. Polyherbal chewable tablets were prepared by using varied concentration of powders, prepared formulation was evaluated for various parameters like colour, odour, taste, diameter, thickness, weight variation test, friability test, hardness test, angle of repose, bulk density, tapped density, carr's index, hausner's ratio, type of flow. The evaluation of granules and tablets indicate successful formulation of chewable tablets. Chewable tablets are with minimum disintegration time, sufficient hardness, pleasant taste and meeting all official limits. Further, detailed investigations and evaluation of antiallergic activity need to be done in order to introduce this tablet for human use.

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