



DEVELOPMENT AND EVALUATION OF HERBAL COUGH SYRUP FROM THE ROOT EXTRACTS OF WITHANIA SOMNIFERA AND GLYCYRRHIZA GLABRA

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Article Received on
01 August 2017,

Revised on 22 August 2017,
Accepted on 14 Sept. 2017,

DOI: 10.20959/wjpps201710-10104

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ABSTRACT

The interest on herbal medicines and their utilization have been increasing rapidly in recent years, even in areas where modern medicine is available. Plant derived substances and herbal medicines have recently attracted the great interest towards their versatile application, as medicinal plants are the richest source of bioactive compounds used in traditional and modern medicine. There has been growing demand for plant based medicines, health products, pharmaceuticals, food supplements. The objective of the study is to develop and evaluate herbal cough syrup from the root extracts of

Glycyrrhiza Glabra & Withania Somnifera. The syrup formulation was designed by using Ashwagandha, Liquorice, Saccharin Methyl Paraben and required amount of distilled water. The present research has been undertaken with the for the development and evaluation of the herbal syrup containing Liquorice & Ashwagandha extract. These two drugs exhibit anti-tussive & expectorant properties. The prepared herbal syrup was evaluated for different parameters such as pH, colour, odour, taste, thermal stability, specific gravity, turbidity, moisture content, Total solid content & accelerated stability studies officially. A review of chemical constituents present in various parts of Glycyrrhiza Glabra & Withania Somnifera is given in the present article. This may be useful in discovering potential therapeutic effects & developing new formulations.

KEYWORDS: Liquorice, Ashwagandha, Herbal Cough Syrup, Anti tussive, Expectorant.

INTRODUCTION

Cough is a forceful release of air from the lungs that can be heard. It begins with a deep breath in at a point opening between the vocal cords at the upper part of the larynx (glottis), trapping the air in the lungs^[1]. Herbal medicines are naturally occurring, plant-derived substances that are used to treat illness within local or regional healing practices. These products are complex mixtures of organic chemicals that may come from any raw or processed parts of a plant. The World Health Organization recently estimated that 80 percent of people worldwide rely on herbal medicines for some part of their primary health care. Herbal medicines have minimum or no toxic effects. Cough and cold is quite a common occurrence that hits almost every age group. When it comes to India, people in this country mostly prefer herbal remedies and keeping this sentiment in mind, the Indian market has been introduced to a lot of effective herbal cough syrups with quick action^[2]. Syrups are a popular delivery vehicle for anti-tussive drugs because they feel more soothing to swallow than a tablet or capsule, and the medication is more quickly absorbed. Due to various adverse effects of available synthetic cough syrup preparations, the present study was performed to develop and evaluate herbal cough syrup containing natural ingredients having no side effects.

Benefits of liquid dosage forms

1. Homogenous liquid.
2. Ease of administration.
3. Fast onset of action.
4. For patients having difficulty in swallowing, liquid medications are easier to administer
5. Drug is in solution form, immediately available for absorption.

MATERIALS

Powdered root extracts of Ashwagandha & Liquorice were purchased from local herbal drug store.

Preformulation Properties^[3]

1) Determination of foreign matter: Weigh about 500g of the original sample and spread it out in a thinner layer. Inspect the sample with the naked eye (or) with the 6X lenses and separate the foreign organic matter manually as completely as possible. Weigh and determine the percentage of foreign organic matter from the weight taken.

2) Moisture content: Weighed 2 g of sample & glass petri dish separately, and then heat in hot air oven at 105°C for 1 hour. Then put off the petri dish from oven and allowed to cool.

Percentage moisture content was calculated using following formula

(Weight of petri dish + Weight of Sample – Dried weight) X 100 / Weight of Sample

3) Determination of pH: The required quantities of the powdered drugs were taken and syrup preparations were made. Place an accurately measured amount 10 ml of the final syrup in a 100 ml volumetric flask and made up the volume up to 100 ml with distilled water, the solution was sonicated for about 10 minutes. pH was measured with the help of digital pH meter.

Methods of Preparation^[4]

A) Method of Preparation of Decoction

50gm Ashwaganda and 50gm Liquorice was taken and mixed with 1000ml of water. The mixture was boiled until total volume becomes one fourth of initial volume. then the decoction was cooled and filtered. The obtained filtrate was taken to prepare final herbal syrup.

B) Method of Preparation of Simple Syrup(IP)

66.7% w/w of sucrose was mixed in required quantity of distilled water to prepare a concentrated solution of simple syrup.

C) Method of Preparation of Herbal Syrup

One part (100ml) of decoction was mixed with five parts (500ml) of simple syrup i.e (1:5). Sufficient quantity of methyl paraben was added as preservative, to the above mixture. Solubility was checked by observing the clarity of solution visually. The final herbal syrup was then subjected for evaluation.

Evaluation Studies^[5-6]

Organoleptic Properties

The herbal cough syrup was evaluated for various organoleptic parameters such as colour, odour, and taste.

a) Color examination: Five ml final syrup was taken into watch glasses and placed against Gravity. white back ground in white tube light. It was observed for its color by naked eye.

b) **Odour examination:** Two ml of final syrup was smelled individually. The time interval among two smelling was kept 2 minutes to nullify the effect of previous smelling.

c) **Taste examination:** A pinch of final syrup was taken and examined for its taste on taste buds of the tongue.

d) **Determination of pH:** Placed an accurately measured amount 10 ml of the final syrup in a 100 ml volumetric flask and made up the volume up to 100 ml with distilled water. The solution was sonicated for about 10 minutes. pH was measured with the help of digital pH meter.

e) **Specific gravity:** A thoroughly clean and dry pycnometer was selected and calibrated by filling it with recently boiled and cooled water at 25⁰C and weighing the contents. adjusting the temperature of the final syrup to about 20⁰C and the pycnometer was filled with it. then the temperature of the filled pycnometer was adjusted to 25⁰C, any excess syrup was removed and weight was taken. the tare weight of the pycnometer was subtracted from the filled weight. Specific gravity of the final syrup was obtained by dividing the weight of the syrup contained in the pycnometer by the weight of water contained, both determined at 25⁰C.

Stability Testing: (72HRS)^[7-8]

Stability testing of the prepared poly herbal syrup was performed on keeping the samples at accelerated temperature conditions. Nine portions of the final syrup (1A, 1B, 1C, 2A, 2B, 2C, 3A, 3B and 3C), were taken in amber colored glass bottles and were kept at room temperatures (38⁰C) and at accelerated temperatures (47⁰C) respectively. The samples were tested for all the physicochemical parameters, turbidity and homogeneity at the interval of 24 hr, 48 hr and 72 hr to observe any change.

RESULTS

Table-1: Preformulation studies of the developed herbal cough syrup.

S. No	Parameters	Ashwagandha	Liquorice
1.	Foreign matter (%)	0.04	0.03
2.	Moisture Content (%)	5.2	5.0
3.	pH	7.4	6.65

Table-2: Physico-chemical studies of the developed herbal syrup.

S. No	Physical Parameters	Obseravtion
1.	Colour	Brownish
2.	Odour	Pleasant
3.	Taste	Sweet
4.	pH	8.5
5.	Specific gravity(g/ml)	1.36

Table-3: Accelerated stability studies data of the developed herbal cough syrup.

Sample Code	1A	1B	1C	2A	2B	2C	3A	3B	3C
Time	24hrs			48 hrs			72hrs		
Temperature (⁰ c)	5	37	45	5	37	45	5	37	45
Colour	Light brown			Light brown			Light brown		
Odour	pleasant			Pleasant			Pleasant		
Taste	Sweet			Sweet			Sweet		
p ^H	8.5			8.5			8.5		
Specific gravity(g/ml)	1.36			1.36			1.36		
Thermal stability	OK			OK			OK		
Turbidity/Homogeneity	NO			NO			NO		
Degradation	NO			NO			NO		

DISCUSSION

The pre-formulation studies of powdered herbal drugs displayed the percentage foreign matter, percentage moisture content and pH of herbal ingredients. The results can be seen in table 1.

The developed herbal cough syrup was evaluated for organoleptic parameters like odour, colour, taste and texture. The results can be seen in table 2.

The developed herbal cough syrup was evaluated for total solid content. The results can be seen in table 3.

The final herbal cough syrup found to have pH 8.5 and specific gravity 1.36g/ml (table 3).

The results of stability study of final syrup (table 3) reveal that no changes were noticed in all the tested physicochemical parameters such as thermal stability, degradation and as well as turbidity during 24 hrs, 48 hrs and 72 hrs.

Thus, it can be discussed that prepared herbal cough syrup may be used as a stable liquid dosage form and the results of the accelerated stability study may help for the further study of shelf life.

CONCLUSION

In the present study, an attempt was made to develop and evaluate herbal cough syrup by using Ashwagandha and Glycyrrhiza glabra herbal powders. The herbal cough syrup was prepared by performing decoction and simple syrup preparations. From the results obtained, it was concluded that herbal cough syrup containing herbal ingredients was found to be in compliance with all evaluation tests and other formulations also exhibited satisfactory results. Further, more accelerated stability studies are needed to be conducted in future to develop a herbal cough syrup to be safe and effective.

ACKNOWLEDGEMENTS

The author is thankful to the principal, Dr. KV. Subramanyam of Samskruti College of Pharmacy for providing the services in carrying out the work. The author is also thankful to karthik, madhavi and mounika- final year B.Pharm students of the above college.

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