DEVELOPMENT & EVALUATION OF HERBAL SYRUP FROM COURoupITA GUIANENSIS USED AS EXPECTORANT

G.Sandhyarani1* and K.Praveen kumar2

1Vaageswari College of Pharmacy, Karimnager, Andhra Pradesh, India.
2Vaagdevi College of Pharmacy, Medicinal Chemistry Research Division, Hanamkonda, Warangal, Andhra Pradesh, India.

ABSTRACT

The oral use of liquid pharmaceuticals has generally been justified on the basis of ease of administration to those individuals who have difficulty in swallowing solid dosage forms. Ayurvedic formulations are preferentially administered by oral route. The fresh leaves juice of Couroupita guianensis is used by some local Ayurvedic practitioner as strong expectorant in chronic, acute cough and in bronchitis. In the present study the locally used herbal juice was selected for developing herbal syrup. The prepared herbal syrup was evaluated immediately after preparation and all the tested parameter along with turbidity/homogeneity were compared with the changes in accelerated stability testing. The final syrup found to have pH 4.5 and specific gravity 1.1610 g/ml. The results of stability study of the final syrup reveal that no changes were noticed in all the tested physicochemical parameter as well as turbidity/homogeneity during 24 hr, 48 hr and 72 hr.

Key words: Herbal formulation, Liquid dosage form, Syrup, Physicochemical Parameters.

INTRODUCTION

The oral use of liquid pharmaceuticals has generally been justified on the basis of ease of administration to those individuals who have difficulty in swallowing solid dosage forms. With rare exceptions, a drug must be in solution in order to be absorbed. A drug administered in solution is immediately available for absorption, and in most cases, is more rapidly and efficiently absorbed than the same amount of drug administered in a tablet or capsule [1].

Ayurvedic formulations are preferentially administered by oral route [2]. The formulation of solutions presents many technical problems to the industrial pharmacist. Designing of oral herbal formulations (solutions) is a challenge in modern pharmaceutics till date. However the final preparation must satisfy the requirements of pharmaceutical elegance with regard to taste, appearance and viscosity. Couroupita guianensis is used by some local Ayurvedic practitioner as strong expectorant in chronic, acute cough and in bronchitis. In the present study the locally used poly herbal formulation was selected for developing poly herbal syrup.

MATERIALS AND METHODS

Plant material

The crude drugs were procured from the local crude drug shop, Vaidya store and their identity was confirmed by correlating their morphological and microscopical characters with those given in literature.

Development of herbal syrup

a) Method of preparation of decoction

100gm Couroupita guianensis was taken and mixed with 1000 ml of water. The mixture was boiled until total volume become one fourth of the initial volume. Then the decoction was cooled and filtered. Filtrate was taken to prepare final herbal syrup.

b) Method of preparation of simple syrup (USP)

666.7 g of Sucrose was weighed and added to purified water and heated until it dissolved with occasional stirring. Sufficient boiling water was added to produce 1000 ml.

c) Method of preparation of final herbal syrup

One part of decoction was mixed with five parts of simple syrup (1:5). Required quantity of Methyl paraben was added as preservative, to the above mixture. Solubility was checked by observing the clarity of solution visually.

Corresponding Author: G.Sandhyarani E-mail: sandhyaguggilla9@gmail.com
The final herbal syrup was then subjected for evaluation.

**Evaluation of herbal syrup**

**Physicochemical parameters**

The herbal syrup was evaluated for various physicochemical parameters such as physical appearance (colour, odour, and taste), pH and Specific Gravity.

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

b) Odor 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.

### Table 1. Result of Physicochemical parameters of developed poly herbal syrup

<table>
<thead>
<tr>
<th>Sl.No.</th>
<th>Physicochemical parameters</th>
<th>Observed Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Color</td>
<td>Reddish-grey</td>
</tr>
<tr>
<td>2</td>
<td>Odor</td>
<td>Pleasant odor</td>
</tr>
<tr>
<td>3</td>
<td>Taste</td>
<td>Sweet</td>
</tr>
<tr>
<td>4</td>
<td>pH</td>
<td>4.5</td>
</tr>
<tr>
<td>5</td>
<td>Wt/ml at 25°C</td>
<td>1.3421 g</td>
</tr>
<tr>
<td>6</td>
<td>Specific gravity</td>
<td>1.2710 g/ml</td>
</tr>
</tbody>
</table>

### Table 2. Stability studies through Physicochemical parameters of developed poly herbal Syrup

<table>
<thead>
<tr>
<th>Sample Code</th>
<th>Time Duration (in hour)</th>
<th>Temperature (°C)</th>
<th>Physicochemical parameters</th>
<th>Physicochemical parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Color</td>
<td>Odor</td>
</tr>
<tr>
<td>1A</td>
<td>24 hr</td>
<td>40°C</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>1B</td>
<td>Room temp</td>
<td>NC</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>1C</td>
<td>47°C</td>
<td>NC</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>2A</td>
<td>48 hr</td>
<td>40°C</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>2B</td>
<td>Room temp</td>
<td>NC</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>2C</td>
<td>47°C</td>
<td>NC</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>3A</td>
<td>72 hr</td>
<td>40°C</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>3B</td>
<td>Room temp</td>
<td>NC</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>3C</td>
<td>47°C</td>
<td>NC</td>
<td>NC</td>
<td>NC</td>
</tr>
</tbody>
</table>
e) Specific gravity at 25°C

A thoroughly clean and dry Pycnometer was selected and calibrated by filling it with recently boiled and cooled water at 25°C and weighing the contents. Assuming that the weight of 1 ml of water at 25°C when weighed in air of density 0.0012 g/ml was 0.99602 g. The capacity of the Pycnometer was calculated. Adjusting the temperature of the final syrup to about 20°C and the Pycnometer was filled with it. Then the temperature of the filled Pycnometer was adjusted to 25°C, any excess syrup was removed and weight was taken. The tare weight of the Pycnometer was subtracted from the filled weight. The weight per milliliter was determined by dividing the weight in air, expressed in g, of the quantity of syrup which fills the Pycnometer at the specified temperature, by the capacity expressed in ml, of the Pycnometer at the same temperature. 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 25°C [3,4].

Stability testing

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 accelerated temperature at 4°C, Room temperature and 47°C 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 [5,6].

RESULTS AND DISCUSSION

In the past it was the practice in many pharmaceutical manufacturing companies to evaluate the stability of pharmaceutical preparations by observing them for a year or more, corresponding to the normal time that they would remain in stock and in use. Such approach was time consuming. Now a day’s Accelerated stability studies are used by most of the pharmaceuticals for stability evaluation of all types of formulations.

Though the primary aim of this work was to develop poly herbal syrup but the stability study will mark an important advancement in the area of phyto pharmaceuticals. The prepared poly herbal syrup was evaluated immediately after preparation and all the tested parameter along with turbidity/homogeneity were compared with the changes in accelerated stability testing. The final syrup found to have pH 4.5 and specific gravity 1.1610 g/ml (Table 1). The results of stability study of the final syrup (Table-2) reveal that no changes were noticed in all the tested physicochemical parameter as well as turbidity/homogeneity during 24 hr, 48 hr and 72 hr.

REFERENCES