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Original Research Article

Formulation and evaluation of medicated herbal syrup of vinca extract

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ABSTRACT

Cancer is deadliest disease ever known. Vinca extract has the potential and beneficial in treating various cancer conditions. However, till date no known syrup of Vinca plant or its extract has been formulated. Cancer is a debilitated condition and formulation and evaluation of herbal syrup of alcoholic vinca extract may serve the patient compliance in debilitated condition and ease of administration of the syrup by oral route. The Vinca extract syrup was formulated using alcoholic extract of Vinca. The Vinca extract Syrups are easy to formulate and help overcome many disease states and are patient compliant. This paper deals with the formulation of laboratory scale vinca syrup. Various parameters were evaluated such as PH, viscosity, Density, stability testing. The syrup was found to be stable and ready for technology transfer.

1. Introduction

1.1. Cancer and Indian scenario

The number of Indians with cancer is expected to increase from 26.7 million in 2021 to 29.8 million in 2025. The highest incidence rate last year was in the North (2,408 patients per 100,000) and the Northeast (2,177 per 100,000). It is higher in men. According to the Indian Council of Medical Research report on "Cancer burden in India", seven cancers account for more than 40% of the total disease burden: lung (10.6%), breast (10.5) %), esophagus (5.8%)., mouth (5.7%), stomach (5.2%), liver (4.6%), and cervix (4.3%). Explaining the projections for the period 2021-2025. According to the National Centre for Disease Informatics and Research (NCDIR), said that men will contribute 14.7 million life years lost. (YLL), 0.72 million disability-adjusted life years (YLD) and 15.5 million Disability-adjusted life years (DALY) by 2025. The numbers for women would be 13.6 million YLL, 0.69 million YLD and 14.3 Daly.[1]

1.2. Role of vinca in cancer

Vinca alkaloids are a subset of drugs obtained from the Madagascar periwinkle. They are naturally extracted from the pink periwinkle, Catharanthus roseus G. Don and have hypoglycemic and cytotoxic effects. They have been used to treat diabetes, high blood pressure and have been used as antiseptics. Periwinkle alkaloids are also important for fighting cancer. There are four main vinca alkaloids in clinical use: vinblastine, vinorelbine, vincristine, and vindesine. These active constituents have been approved for use in the United States. Vinflunine is also a novel synthetic alkaloid from periwinkle, which has been approved in Europe for the treatment of second-order transitional cell carcinoma of the ureter and is under development for other malignancies. Vinca alkaloids are the second most widely used class of cancer drugs and will remain one of the primary cancer therapies.[2]

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1.3. Herbal syrup with invert sugar base

1.3.1. Definition of syrup

Syrup is a concentrated solution containing pure sugar and water. In syrups of other types of syrup solutions. Syrups may or may not contain drugs or mixed flavors. When syrups without drugs but with flavouring agents are said to be flavoured or non-medicated syrups.[3]

Flavoured syrups are commonly used as a means mask for unpleasant drug results (found to be) in medicinal syrups. Syrup is present in syrup in large quantities, so it is often susceptible to bacterial contamination used as a preservative.[4]

Syrup is a widely used carrier for anti-tissue drugs, as it provides a gentler swallowing (oral) effect than tablets and capsules. This drug was quickly observed. There are similar synthetic cough preparations that cause some undesirable effects.

Ayurvedic formulations belong to the liquid form of the drug or combination of drugs. However, the combination of medicinal herbs in syrup form give rise to herbal syrup.[5]

1.4. Herbal syrup

Herbal syrup is a concentrated herbal tea, preserved in sugar or honey. Historically, herbal syrups were used to sweeten the taste of bitter medicinal herbs to make them more palatable and extend their shelf life. They are a versatile alternative to alcoholic beverages for children or those who avoid alcohol. The classic herbal syrup that many of us use during cold and flu season is elderberry syrup, which is used to boost immune function and fight infections. Herb syrup may be produced as a medicine or a flavouring agent. The syrup can be added to teas, cocktails or mocktails, made into herbal soft drinks, or simply deliciously eaten with a spoon.[6]

1.5. Medicated herbal syrup

Herbal Syrup containing medicinal extracts intended for medicinal use may be categorized as medicated Herbal syrups. These extracts may be adopted from classified systems of alternative and complimentary medicine, ayurveda or herbal medicine or pharmacognosy classification systems which may contain invert sugar or sugar base with or without alcohol. The alcohol itself acts as preservative in the herbal syrup.[6]

This research paper deals with the preparation of medicated herbal syrup with invert sugar base.

2. Materials and Methods

Herbal syrup is prepared by the method of decoction. Vinca extract was obtained as a fine extract from Herbal Creations Pvt Ltd.

2.1. Preparation of vinca extract

The extract was prepared with an ethanol, extracted to obtain ethanol-specific active ingredients by the Soxhlet extraction method. Furthermore, the extract was filtered, and the extracts of the quantities used as shown in the table were used to prepare formulation on laboratory scale, these were further mixed with invert syrup to obtain 100 ml of medicated syrup of vinca extract. Suitable dyes, flavoring agents were added to it. This resulting syrup was transferred to an amber bottle, tightly closed, and placed in a cool, dry place.Table 1 gives the final formulation prepared on laboratory scale selected for scale up.

2.2. Formula for herbal medicated syrup

Following are the ingredients used in formulation:

1. *Vinca Extract:* It is used in various herbal and ayurvedic treatment of cancer. The Soxhlet extracted alcoholic extract was obtained which was further filtered and used.
2. *Orange oil:* It consist of fruit of plant citrus aurantium.It contains not less than 2.5% of volatile oil.[7]
3. *Alcohol:* It uses in small quantity act as preservative.
4. *Invert sugar base:* It was prepared by mixing 2 cups (480 mL) of water with 4.4 cups (1 kg) of granulated sugar and 1/4 teaspoon of cream of tartar in a pot. The mixture was boiled over medium heat until it reaches 236°F (114°C), stirring occasionally. Next, remove the mixture from the heat, cover, and let cool.[8,9]

The role of these ingredients is given in Table 2.

2.3. Formulation of final medicated herbal syrup

To prepare final herbal syrup 30ml of Vinca extract and 8ml of orange oil and 22ml of alcohol was added to 40 ml of invert sugar base, were mixed slowly by side with subsequent stirring. The final herbal syrup was prepared and then subjected for evaluation. Herbal syrup was prepared, and solubility was checking by observing clarity of solution visually and passing it after filtration through proper medium. The syrup was lustrous and clear.[10]

2.4. Evaluation parameter

The prepared medicated herbal syrup was evaluated for color, odor, taste, pH, density, specific gravity and viscosity.

2.5. Density

It was evaluated by Formula as given below,

Formula for density: Density of liquid under test (syrup) = weight of liquid under test/volume of liquid under test = w_3/v

2.6. Specific gravity

Specific Gravity was evaluated by the formula as given below

Specific gravity of liquid under test (syrup) = weight of liquid under test /weight of water = w_5/w_4.

2.7. Viscosity

Viscosity was determined using the following formula

$$Viscosity+ = \frac{Density\ of\ test\ liquid \times Time\ required\ to\ flow\ test\ liquid}{Density\ of\ water \times Time\ required\ to\ flow\ water} = Viscosity\ of\ water$$

2.8. pH

pH was determined on pH meter.

The evaluated parameters of the final extract have been given in Table 3.

Table 1: Role of ingredients in herbal syrup

Sr. No.	Ingredient	Role
1.	Vinca Extract	Anticancer
2.	Orange oil	Flavoring agent
3.	Sugar Base Invert	Preservative
4.	Alcohol	Preservative
5.	Amaranth red	Coloring agent

Table 2: Final formulation as Vinca Extract as medicated herbal syrup

Sr. No.	Ingredient	Quantity
1.	Vinca extract	30 ml
2.	Orange oil	8ml
4.	Invert Sugar base	40ml
5.	Alcohol	22 ml

Table 3: Evaluation parameters for herbal medicated syrup of vinca extract (Final Formulation)

Sr. No.	Parameter	F1
1.	Density	1.50gm.
2.	Specific gravity	0.63000
3.	Viscosity	3.95cp.
	pH Determination	
4.	a) pH paper	Neutral
	b) pH meter	7.05
	Organoleptic Characters	
	1) Color	Reddish
5.	2) Odor	Aromatic
	3) Taste	Sweet
	4) Appearance	Clear

2.9. Stability testing

Stability Testing of the prepared herbal syrup was performed on keeping the sample at accelerated temperature conditions. Nine portions of the final herbal syrup was taken kept thawed at accelerated temperature at 4c and Room temperature further to 47 c respectively. The sample were tested for all the physicochemical parameters, turbidity, sand homogeneity at the interval of 24hr 48hr and 72hr to observe any change.

3. Result and Discussion

The final formulation was obtained is stable form. The final formulation was readily prepared and ready for technology transfer and can be adopted by researchers as well as industries to make the similar formulations on large scale.

4. Conclusion

The Herbal formulation was prepared and F1 can be formulated and prepared on large scale. This is ready study for technology transfer for industries involved in formulation and development of medicated herbal syrup.

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