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Original Research Article

Formulation and evaluation of herbal syrup of Indian mulberry (Noni)

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ABSTRACT

Morinda citrifolia is a fruit-bearing tree in the coffee belonging to the family, Rubiaceae. Its native range extends through Southeast Asia and Australasia, and become spread through the Pacific by Polynesian sailors. The species is now cultivated all through the tropics and widely naturalized. Among a few one hundred names for the fruit throughout special areas different areas are the more common English names are morinda, Indian mulberry, noni, beach mulberry, and cheese fruit. Indian Mulberry has various pharmacological properties such as anticancer, antidiabetic, antistress, antioxidant, anxiolytic, immunomodulatory, cholesterol lowering, lipid lowering, nephroprotective, hepatoprotective and anti-cancer plant which help in maintaining body strength and curing cancer causing germ cells by eradicating them. The syrup is most used and a popular dosage form. It has many applications and many of the treatments are based on the usage of syrup for patients' compliance at every age. The herbal syrup was formulated using extract of Indian Mulberry or Noni as the main ingredient along with invert sugar base. Indian Mulberry or Noni has been used in the treatment of cancer because of many stresses condition and other oxidative reaction in body the free radical is generated by using these, syrup the condition is overcome. Formulation at laboratory scale was done of herbal syrup and evaluated for number of parameters such as PH, viscosity, density, stability testing during evaluation formulation found to be stable and ready formulas viz. F1, F2, F3 and F4 were prepared with variation in the amount of ingredients such as alcohol, sugar and a final amount of syrup. All formulations were prepared according to parameters such as density, specific gravity, pH, organoleptic properties. Results show that Herbal Syrup Formula 4 (F4) is more stable than other forms.

1. Introduction

1.1. Indian mulberry

The strong vomit smell of the fresh Noni fruit has made it a staple food in most regions, but it is still a staple food in some cultures and has been used medicinally.[1] traditional studies. In the mainstream market, it is introduced as a supplement in various forms, such as capsules, skin products, and juices. Morinda citrifolia is the scientific name of the noni tree known in the market. The known name of Morinda citrifolia also refers to the botanical name that was first derived from the Latin words 'morus' for mulberry and 'indicus' for the Indian.[2] Currently, two varieties of M. citrifolia have been identified (M. citrifolia var. citrifolia citrifolia var. bracteata) and one variety (M. citrifolia Cultivar Potteri) are found. The maximum commonly observed litter is M. citrifolia var. citrifolia, with the greatest health and economic importance.[3–5]

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1.2. Herbal syrup

Herb syrup is prepared by adding a concentrated herbal extract with sugar, and alcohol was also used. Herbal syrup was made with decoction. Mixing a decoction of herbs with sugar helps to thicken the recipe and preserve it. This increases the shelf life of the formula. Added sweeteners can also help enhance the taste of certain herbs. The resulting syrup is delicious! It is defined as a thick, sticky liquid consisting of a concentrated solution of sugar and water with or without added flavoring or medicinal ingredients.[6–9]

2. Following are the Ingredients Used in Formulation

1. *Indian Mulberry:* It is used in various herbal and ayurvedic treatments. The Soxhlet extracted alcoholic extract was obtained which was further filtered and used.
2. *Orange oil:* It consist fruit of plant citrus aurantium belonging to family: Rutaceae.it contain not less than 2.5% of volatile oil. It uses as antioxidant, anti-cancer and neurodegenerative disorder.[10]
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.[11]

Table 1: Role of ingredients in herbal syrup

Sr. No.	Ingredient	Role
1.	Indian Mulberry	Antioxidant, Free Radical Scavenging
2.	Orange oil	Flavoring agent
3.	Sugar Base Invert	Preservative
4.	Alcohol	Preservative
5.	Amaranth red	Coloring agent

3. Materials and Methods

Herbal syrup was prepared by decoction method. Steps are as follows. Indian Mulberry Extract was obtained as fine extract from Herbal Creations Pvt Ltd. The extract subjected to prepare an ethanolic extract to obtain the ethanol specific active constituents by Soxhlet extraction method. Further the extract was filtered, and the aliquots of the quantities were used as given in the table to prepared formulations F1 to F4. All extract are mixed with each other and 50ml of syrup was obtained. The coloring agent, flavoring agent are added into it. This obtained syrup was transferred to amber color bottle, close it tightly and place it into cool place.Preparation of herbal syrup: The preparation of herbal syrup was performed as per quantities given in Tables 2, 3, 4 and 5 evaluation parameters are shown in Table 6.

Table 2: Formulation No.1 (F1) - For 50ml.

Sr. No	Ingredient	Quantity
1.	Indian Mulberry extract	7ml
2.	Orange oil	5ml
4.	Invert Sugar Base	38ml

Table 3: Formulation 2 (F2) - For 50ml.

Sr. No.	Ingredient	Quantity
1.	Indian Mulberry extract	5ml
2.	orange oil	2ml
3.	Invert Sugar Base	33ml
4.	Alcohol	10ml

In above formula (F2), we used alcohol because in the formulation number 1 (F1), sugar was not able to inhibit the growth of fungi, so we use alcohol.

Table 4: Formulation 3 (F3) - For 50ml.

Sr. No.	Ingredient	Quantity
1.	Indian Mulberry extract	8ml
2.	Orange oil	2ml
3.	Invert Sugar Base	33ml
4.	Alcohol	7ml

The formulation number 2 was rejected because of more quantity of alcohol is use. In this formula we use alcohol as minimum quantity.

Table 5: Formulation 4 (F4) – For 50ml.

Sr. No.	Ingredient	Quantity
1.	Indian Mulberry extract	15 ml
2.	Orange oil	4ml
3.	Invert Sugar base	20ml
4.	Alcohol	11 ml

Following evaluation parameters were performed on formulation 4 (F4).

3.1. Evaluation parameter

3.1.1. 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

3.1.2. 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.

3.1.3. Viscosity

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

3.2. pH

pH was determined on pH meter

4. Result and Discussion

The final formulation (F4) was obtained is stable than formulations F1, F2, F3. The formulation (F4) was obtained by minimizing the error in formulation F1, F2, F3. The formulation (F4) having antioxidant property hence it will be very helpful for researchers as well as industries to make the similar formulations on large scale.

Table 6: Evaluation of herbal syrup

Sr. No.	Parameter	F1	F2	F3	F4
1.	Density	1.50gm.	1.43 gm.	1.29gm.	1.50gm.
2.	Specific gravity	0.6289	0.6195	0.6135	0.6135
3.	Viscosity pH	3.75cp.	3.67cp.	3.66cp.	3.66cp.
4.	Determination				
	a) pH paper	Neutral	Neutral	Neutral	Neutral
	b) pH meter	7.01	7.44	7.54	7.61
	Organoleptic Characters				
5.	1) Color	Reddish	Reddish	Reddish	Reddish
	2) Odor	Aromatic	Alcoholic	Aromatic	Aromatic
	3) Taste	Sweet	Sweet	Sweet	Sweet
	4) Appearance	Turbid	Turbid	Clear	Clear

5. Conclusion

The Herbal formulation was prepared and F4 can be formulated and prepared on large scale.

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8. Conflict of Interest

None.

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