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FORMULATION AND EVALUATION OF HERBAL DRINK

Purnima Debnath[1],Komola N[2] ,Kavitha P.N.[3]

*[1,2,3] K R College of Pharmacy, Bengaluru, Karnataka, India.
Email: purnimanath850@gmail.com, komsramesh@gmail.com

ABSTRACT :

The growing interest in plant based functional beverages has, kind of pushed the development of herbal formulations with multiple botanicals, that work together in a complementary phytochemical kind of way. In the present study we propose the formulation and also the evaluation of a brand new seven herb functional beverage, containing Hibiscus sabdariffa, Withania somnifera, Ocimum tenuiflorum, Phyllanthus emblica, Curcuma longa, Zingiber officinale and Cuminum cyminum. Hibiscus is especially suitable for beverage development because it is traditionally consumed as a hot or cold herbal drink and it also includes anthocyanins, phenolic acids and organic acids. Ashwagandha provides a characteristic withanolides contribution, while amla offers a varied range of phenolic and tannin constituents. Ashwagandha contributes withanolides, whereas turmeric ginger tulsi and cumin provide more phenolic plus aromatic constituents.

The herbal materials will be authenticated, dried , sieved and blended in predetermined proportions to get a uniform formulation. The developed formulation will be checked for organoleptic characteristics, physicochemical properties, pH, pH again, preliminary phytochemical constituents and also in-vitro antioxidant activity. The DPPH radical-scavenging assay may be used to judge the antioxidant potential, more or less. The study will also look at formulation acceptability, and a bit of preliminary stability .

The suggested formulation is meant as a functional beverage research model, not a therapeutic product, so its more about function than treatment. Experimental evaluation will help show whether the combination provides a reasonable sensory profile , and measurable phytochemical as well as antioxidant properties.

Keywords: Hibiscus, ashwagandha, tulsi , amla, turmeric , ginger, cumin, polyherbal beverage, functional drink, phytochemical screening, antioxidant activity.



Figure : Herbal Infusion

INTRODUCTION

- Functional foods and beverages have been getting a lot of attention lately, mostly because people are more interested in foods that contain bioactive compounds that are naturally occurring . So, in comparison to conventional foods, functional foods are not only seen as normal nutrition, but also as something that might offer physiological benefits as well . Within this group, herbal beverages look quite attractive since they can include plant materials with phenolics, flavonoids, anthocyanins, tannins, terpenoids and other phytochemicals, and they do it in a convenient, easy to take kind of form.

- Herbal drinks have been made in the past, using different medicinal plus culinary plants, kind of like, day to day needs. Nowadays, research has become more interested in these beverages too, mostly by looking into what they contain in phytochemical terms. People also check things like antioxidant activity, how they smell and taste, their physicochemical stability and even the functional food angles. But still, the biological

effects of a final drink are not only about how each plant behaves on its own, it's also about things like the proportion of the ingredients, how extraction is done, what happens during processing, storage conditions, and also interactions between those components, sort of togetherness in a way.

- Hibiscus Phyllanthus scus sabdariffa is, in a practical sense, a really good ingredient for beverage development, because its calyces are traditionally used to make refreshing hot and cold drinks. Hibiscus has anthocyanins, flavonoids, phenolic acids and organic acids, and these help explain the typical red colour, the sour-ish taste and the antioxidant properties. The fact that Hibiscus is rich in anthocyanin, makes it good for naturally coloured herbal beverages too. So, in the proposed formulation, Hibiscus can basically act as the key drink component, the main part anyway.
- Withania somnifera, commonly called Ashwagandha, is one of those important medicinal plants with multiple characteristic phytochemicals inside it, especially steroidal lactones referred to as withanolides. Ashwagandha has been studied quite a lot, both for its phytochemistry and also for its traditional uses, you know how people use it over time. Adding Ashwagandha into the current formulation brings in a botanical part with a noticeably different phytochemical profile than Hibiscus, though the overall blend still makes sense. Still, because Ashwagandha may have a stronger, more bitter taste, the amount has to be fine tuned, in order to keep the drink palatable.
- Ocimum tenuiflorum, commonly known as Tulsi or Holy Basil, is an aromatic plant that is broadly used in traditional Indian medicine and also in everyday food preparations. Tulsi includes phenolic compounds, flavonoids and various volatile constituents, and these are the things that shape its typical aroma and flavour. So its presence can add phytochemical variety, while also giving the herbal drink an aromatic edge, sort of like a subtle lift.
- Emblica, which is commonly known as Amla or Indian gooseberry , is another important botanical that's selected for the formulation. Amla has a range of phenolic compounds, tannins, flavonoids, and other phytochemicals too. Its slightly sharp sour taste can kind of balance the acidic profile of Hibiscus while also adding more phytochemical variety. The antioxidant properties of Amla, have been explored in many experimental studies, over and over, sort of.
- Curcuma longa , (Turmeric) is included because it has the typical curcuminoid constituents. Those curcuminoids are behind a lot of the familiar yellow colour of turmeric, and they've been studied extensively in experimental research. Turmeric also brings a distinctive flavour note to the blend. Still, if you use too much turmeric it can create a stronger taste, and it may shift the beverage appearance, so the amount needs careful optimization.
- Zingiber officinale , (Ginger) is a widely used culinary and medicinal plant that contains pungent phenolic constituents, including gingerols and related compounds. Ginger contributes that warm spicy flavour, and it can also help improve the sensory complexity of a multi herbal beverage. Putting it in, also increases the diversity of phytochemical constituents that are already in the formulation, in a practical way.
- Cuminum cyminum (Cumin) is an aromatic spice, it holds volatile constituents too, plus other phytochemicals that are, sort of, part of its natural make up. Cumin is commonly used in food preparations and it gives that warm spicy type aroma, the kind you notice right away, even if someone says it's " subtle ". In the formulation that's being proposed, cumin can work as an aromatic component and might help build a more recognizable sensory profile, as long as it's used at the right concentration not too much, not too little.
- So, bringing these seven botanicals together is meant to make a multi herbal beverage, with a range of phytochemical activity and sensory traits.

AIM OF THE STUDY

- Trying to formulate ,and then properly evaluate a new polyherbal functional drink that uses hibiscus , plus ashwagandha, tulsi, amla , turmeric, ginger and cumin, so it can work as intended.

OBJECTIVES

1. To select and standardize enough herbal ingredients , a bit suitable for it.
2. To develop a tasty polyherbal drink formula, that people can actually enjoy.
3. To determine the organoleptic characteristics, like taste, aroma and all those sensory things.
4. To evaluate physicochemical parameters such as pH moisture and solubility ,properly.
5. To carry out preliminary phytochemical screening, just the first layer maybe.
6. To evaluate the in-vitro antioxidant activity, and see how well it performs.
7. To study short-term stability of the formulation , over time and under basic conditions.

INGREDINT AND THEIR FUNCTION

INGREDIENT	FUNCTION
Hibiscus	Provides natural red colour, rich in antioxidants, help in reducing blood pressure and supports heart health.
Ashwagandha	Helps in stress relief, improves energy and supports mental health.
Tulsi	Boost immunity, relieves stress and has anti-microbial property

Amla	Rich in vitamin C; boosts immunity and supports overall wellness..
Turmeric	Anti-inflammatory and antioxidant; supports mental heath.
Ginger	Aids digestion, relieves nausea and has anti-inflammatory properties.
Cumin	Antioxidant, helps digestion and metabolic health benifit.



Figure: Ingredients

PLANT PROFILE OF HERBAL INGREDIENTS

1**. Hibiscus**

- Botanical name: Hibiscus sabdariffa L.
- Family: Malvaceae
- Common name: Roselle
- Part used: Calyx
- Main constituents: Anthocyanins, flavonoids, phenolic acids and organic acids.

2**.Ashwagandha**

- Botanical name: Withania somnifera (L.) Dunal ,
- Family: Solanaceae
- Common name: Indian ginseng ,
- Part used : Root
- Main constituents: Withanolides , alkaloids and sitoindosides , basically the active compounds people look for.

3.**Tulsi**

- Botanical name: Ocimum tenuiflorum L.
- Family: Lamiaceae
- Common name: Holy basil
- Part used: leaves, only
- Main constituents: eugenol, phenolics, flavonoids and volatile oils

4. **Amla**

- Botanical name: Phyllanthus emblica L.
- Family: Phyllanthaceae
- Common name: Indian gooseberry
- Part used: fruit
- Main constituents: phenolic compound, tannins, flatannins, flavonoids and organic acids

5. **Turmeric**

- Botanical name: Curcuma longa L.
- Family: Zingiberaceae
- Common name: Haldi
- Part used: Rhizome
- Main constituents: Curcuminoids and volatile oils.

6. **Ginger**

- Botanical name: Zingiber officinale Roscoe
- Family: Zingiberaceae
- Common name: Ginger
- Part used: Rhizome
- Main constituents: Gingerols, shogaols and volatile oils.

7. Cumin

- Botanical name: Cuminum cyminum L.
- Family: Apiaceae
- Common name: Jeera/Cumin
- Part used: Seed Main constituents: Cuminaldehyde and volatile oils.

MATERIAL AND METHOD

The ingredient which are used in the formulation of herbal drink that are

INGREDIENTS	QUANTITY
Hibiscus	2g
Ashwagandha	0.5g
Tulsi	0.5g
Amla	0.5g
Ginger	0.25g
Turmeric	0.25g
Cumin	0.5g

Collect and Preparation

- **All the products that was used for the preparation were bought directly from the market, like no extra stuff was ordered.**

METHOD OF PREPARATION

1.Sieving:

- All the powdered ingredients were passed each separately through a suitable sieve, to take away coarse particles , and to get basically an even particle size.

2.Weighing:

- The sieved ingredients were weighed accurately, as per the predetermined formulation that was already set.

3.Mixing:

- The weighed ingredients were mixed thoroughly, using the geometric dilution method, so everything gets evenly spread, like no part is left lopsided.

4.Final Sieving:

- The mixed powder was passed through the sieve again, to make sure the herbal blend is uniform and sort of homogeneous, yes and workable as one powder.

5.Packaging:

- The prepared herbal powder was packed in clean , dry, airtight , and moisture-resistant packaging material, then it was properly labelled too.

6.Storage:

- The packed formulation was kept in a cool , dry place, away from direct sunlight and moisture, until the next round of evaluation.

7.Preparation of Drink:

- The needed amount of herbal powder, or the tea bag, is dipped in hot water (around 80–90°C) for 2-3 minutes. After that it is gently stirred, and filtered if necessary before taking it.



Figure: Method of Preparation

EVALUATION TEST

1.ORGANOLEPTIC PERAMETER

- Appearance: The powder was sort of seen in normal light to check how it looked, plus its overall uniformity, without doing anything too fancy.
- Color: The colour of the powder was looked at visually and then compared to a standard colour reference , to be sure it matched.
- Odour : A small amount of the powder was gently smelled, just to notice its characteristic odour.
- Taste : A small quantity of the prepared infusion was tasted to figure out the characteristic taste.

2.PHYSICOCHEMICAL PARAMETERS

- **Moisture content : It's kind of refers to the amount of water that is in the material.**
- pH : this measure the acidity and the alkalinity, of the product, more or less.
- Weight Variation: The weight variation of the Tea bag was measure, to make sure the consistancy, stays consistent.







Figure: Evaluation Test

Result of evaluation test

A. Organolaptic Parameter

Parameters	Result
Appearance	Uniform powder
Taste	Slightly sour,herbal taste
Texture	Fine
Colour	Deep red
Odour	Characteristic

B. Physicochemical Parameter

Parameters	Result
Weight variation	4.5 ± 0.5 g
Moisture Content	5%
pH	6.5

DISCUSSION

- The seven-herb formulation gives a chemically diverse botanical matrix, you know not just one thing really. Hibiscus brings anthocyanins ,and phenolic compounds, while Ashwagandha provides withanolides, sort of in a different lane. Adding Tulsi, Amla Turmeric Ginger and Cumin ups the diversity of phytochemical as well as sensory traits. Still, the final beverage can't be assumed to show the joint impact of each individual herb. Stuff can interact, extraction efficiency ,concentration, and even the processing conditions may shift what ends up in the cup.

CONCLUSION

- Conclusion: This proposed study kinda puts forward a fresh formulation idea for a seven-herb functional drink, it includes Hibiscus, Ashwagandha, Tulsi, Amla, Turmeric, Ginger and Cumin. The setup basically blends botanicals that have different phytochemical profiles and also rather varied sensory traits. If we do a systematic check of the organoleptic characteristics , along with physicochemical properties, phytochemical composition, total phenolic/flavonoid levels and antioxidant activity, it can give more scientific data about the quality plus the functional features of the beverage that is made. After that, more work will still be needed—like deeper chemical characterization, safety assessment, stability testing and human trials designed in the right way . Only then, you would be able to support specific therapeutic or health claims , in a more responsible manner.

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