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FORMULATION AND EVALUATION OF HERBAL INFUSION FOR OVERALL WELLNESS

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ABSTRACT :

Herbal infusions are a kinda traditional plant based drinks, that are now being looked at more and more as an easy and natural way for general health and well-being support. In this study, we tried to develop and check a caffeine free polyherbal infusion, made using selected medicinal plants that have complementary traditional as well as described pharmacological actions. The blend includes Ashwagandha (Withania somnifera), Amla (Phyllanthus emblica), Tulsi (Ocimum tenuiflorum), Ginger (Zingiber officinale), Turmeric (Curcuma longa), Shankhpushpi (Convolvulus pluricaulis), and Cumin (Cuminum cyminum). Ashwagandha was chosen mainly because it is traditionally seen as adaptogenic and helpful for stress, while Amla added antioxidant potential and nutritional benefit. Tulsi, Ginger, and Turmeric were included for their reported antioxidant, anti inflammatory, and supportive wellness effects.Shankhpushpi was added with a traditional link to brain, cognitive and mind type wellness. Cumin was used mostly as a natural flavouring, and aromatic note, so it would feel more balanced.

The plant materials were processed one by one, then powdered, passed through Sieve No. 100, weighed exactly, and mixed using geometric dilution, to get a uniform polyherbal mixture. After that, the mixture was packed into separate infusion bags, and then assessed for organoleptic and physicochemical stuff like colour, odour, look, texture, weight variation, pH and moisture content. A preliminary phytochemical screening was also carried out to check selected phytoconstituent classes. Overall the formulation showed decent physical features, and infusion properties were acceptable. The early screening suggested the existence of various phytochemical groups that match the chosen herbal ingredients. So this developed formulation gives a convenient, caffeine free polyherbal infusion with a possible role as a functional wellness beverage. Still, more quantitative phytochemical work, antioxidant studies, microbial evaluation, stability checks, safety profiling and biological investigations are needed, to confirm its quality, efficacy and reproducibility.

Keywords: Polyherbal infusion, herbal formulation, overall wellness, Ashwagandha, Amla, Tulsi, Shankhpushpi, Cumin, caffeine-free beverage.

Introduction

Stress and other lifestyle related problems have really made people more curious about natural products that may, support overall health and general wellness. Medicinal plants hold a wide range of phytoconstituents, like alkaloids, flavonoids, phenolic substances, tannins, terpenoids, and other secondary metabolites, and these things might help explain different biological effects. When you mix certain botanicals together in one easy preparation, it becomes a more practical way to add plant based ingredients into everyday wellness products, so thats kind of the idea.

Ashwagandha (Withania somnifera) is traditionally viewed as an adaptogenic herb, and it contains withanolides, which have been studied for stress linked as well as other pharmacological actions. In clinical work, people have shown better perceived stress levels, and also improvements in anxiety related indicators after Ashwagandha intake.[1–3] Tulsi (Ocimum tenuiflorum), has a long tradition of use, and it has been linked with antioxidant, antimicrobial, anti inflammatory, and adaptogenic type activities.[4]

Amla (Phyllanthus emblica) is a fruit that matters nutritionally, it contains vitamin C, plus phenolic compounds, tannins and flavonoids. Those constituents are often tied to antioxidant effects and other beneficial health outcomes.[5,6] Ginger (Zingiber officinale) includes gingerols and related phenolic compounds, and it has been explored in terms of inflammatory responses and oxidative stress markers.[7,8] Turmeric (Curcuma longa) is rich in curcumin, which is a major bioactive constituent, and it has been studied a lot for antioxidant and anti inflammatory potential.[9] Shankhpushpi (Convolvulus pluricaulis) is used traditionally for things like memory, mental steadiness, and cognitive well being, along with neuropharmacological activity being reported.[12] Cumin (Cuminum cyminum) is mostly known as a culinary spice and natural flavouring agent, and cuminaldehyde plus other volatile components help create its usual aroma, while also being connected to some biological properties.[13,14]

So, based on all of that, a caffeine-free polyherbal infusion was made using the botanicals mentioned above. it was then checked for basic quality attributes, plus some preliminary phytochemical constituents, just to get an initial picture before going further.

AIM AND OBJECTIVES

Aim

- To formulate and evaluate a herbal infusion, using a short list of chosen medicinal herbs for general wellness.

Objectives

- To choose appropriate medicinal herbs based on their traditional uses, and the claimed or reported effects.
- To standardize the herbal materials through drying ,pulverizing, then sieving.
- To come up with a steady, even polyherbal infusion formulation by using those selected ingredients.
- To load the prepared blend into handy infusion bags, for easy sipping.
- To check the formulation for colour, odour, look and feel, and the general texture too.
- To determine physicochemical parameters like moisture level, pH, and weight variation.
- To run a basic phytochemical screening, for the targeted phytoconstituents, and see what turns up.
- To judge the overall quality, plus acceptability of the developed polyherbal infusion.
- To design a simple, convenient, caffeine free herbal wellness beverage, that people can actually use day to day.

Plant profile

1. Ashwagandha

Parameter	Description
Botanical name	Withania somnifera (L.) Dunal
Family	Solanaceae
Genus	Withania
Taste	Pungent
Odour	Characteristic
Uses	Adaptogenic herb; supports stress management and relaxation; helps reduce fatigue; traditionally used to support sleep; supports cognitive and mental well-being; shows antioxidant and anti-inflammatory properties.

2. Amla

Parameter	Description
Botanical name	Phyllanthus emblica L.
Family	Phyllanthaceae
Genus	Phyllanthus
Taste	Sour/Astringent
Odour	Characteristic
Uses	Nutritional and rejuvenating herb; rich source of vitamin C and polyphenols; provides antioxidant activity; supports digestive health; traditionally used as a general health tonic; supports metabolic and cardiovascular health.

3. Tulsi

Parameter	Description
Botanical name	Ocimum tenuiflorum L.
Family	Lamiaceae
Genus	Ocimum
Taste	Pungent
Odour	Aromatic
Uses	Traditionally used for respiratory complaints; supports digestive health; shows antioxidant activity; exhibits antimicrobial properties; traditionally used for stress management; supports general immunity and wellness.

4. Ginger

Parameter	Description
Botanical name	Zingiber officinale Roscoe
Family	Zingiberaceae
Genus	Zingiber
Taste	Pungent
Odour	Strongly aromatic
Uses	Supports digestion; helps relieve nausea and vomiting; traditionally used for gastrointestinal discomfort; shows antioxidant activity; exhibits anti-inflammatory properties; improves flavour and palatability of herbal preparations.

5. Turmeric

Parameter	Description
Botanical name	Curcuma longa L.
Family	Zingiberaceae
Genus	Curcuma
Taste	Bitter
Odour	Aromatic
Uses	Traditionally used as a medicinal spice; provides antioxidant activity; exhibits anti-inflammatory properties; supports digestive health; traditionally used for general health and wellness.

6. Shankhpushpi

Parameter	Description
Botanical name	Convolvulus pluricaulis Choisy
Family	Convolvulaceae
Genus	Convolvulus
Taste	Bitter
Odour	Characteristic
Uses	Traditionally used as a Medhya Rasayana; supports memory and concentration; traditionally used for mental relaxation; supports cognitive well-being; shows potential anti-stress and anxiolytic activity; exhibits antioxidant and neuroprotective properties.

7. Cumin

Parameter	Description
Botanical name	Cuminum cyminum L.
Family	Apiaceae
Genus	Cuminum
Taste	Slightly bitter
Odour	Aromatic
Uses	Used as a natural flavouring and aromatic agent; traditionally used to support digestion; helps relieve mild gastrointestinal discomfort and bloating; traditionally used to support appetite and digestive function; possesses antioxidant properties; reported to have antimicrobial activity.

MATERIALS AND METHODS

3.1 Herbal Materials

The formulation was prepared using powdered herbal materials like Ashwagandha, Amla, Tulsi, Ginger, Turmeric, Shankhpushpi and Cumin (some of them were treated as routine raw drugs in our work). The herbal materials were chosen based on their traditional uses, and the reported support for health wellbeing properties , so basically it was not random.

3.2 Authentication

All the selected herbal materials were identified first, and authenticated before the formulation actually started.

3.3 Preparation of Herbal Powders

The herbal materials were processed properly and then powdered. Each powdered material was passed separately through Sieve No. 100 so we could get a fairly uniform particle size ,and it was easier to keep the batch consistent.

3.4 Formulation

The formulation compositions used in the study were taken from the formulation table mentioned below.

Formulation table

INGREDINENTS	QUANTITY
Ashwagandha Powder	2 g
Amla Powder	0.5 g
Tulsi Powder	0.5 g
Shankhpushpi Powder	0.5 g
Cumin Powder	0.5 g
Ginger Powder	0.25 g
Turmeric Powder	0.25 g

Method of Preparation

The method of preparation was kinda like this. The powdered herbal ingredients were weighed one by one, based on the chosen formulation. After that, the powders were mixed thoroughly using geometric dilution so that you get a kind of uniform polyherbal mixture. Then the ready mixture was weighed accurately and put into separate empty infusion bags. Those bags were sealed properly, so there would be less loss of the herbal material and also less chance of contamination.

The infusion bags were packed in moisture resistant packaging, and kept in a cool and dry place. When you want to make the drink, just take one infusion bag and immerse it in hot water for a suitable time. This helps extraction of the soluble constituents as well as the flavoring components into the water, so it tastes right.

EVALUATION OF HERBAL INFUSION

4.1 Organoleptic Evaluation

The prepared formulations were looked at visually for colour, odour, appearance, and texture .

Parameter	**Result**
Colour	**Deep blue**
Odour	**Characteristic**
Appearance	**Uniform powder**
Texture	**Fine**

4.2 Weight Variation

Weight variation was checked to see how even the herbal powder quantity is inside the infusion bags. The variation was about ±5%.

4.3 pH

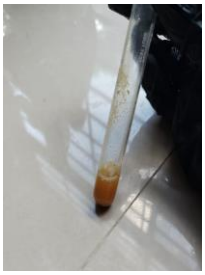
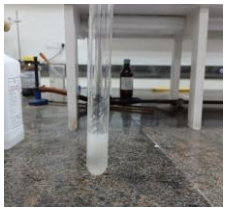
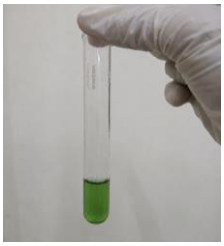
The pH of the prepared infusion was measured using pH paper . Reported value was 7.0

4.4 Moisture Content

Moisture content was taken as a key quality parameter because extra moisture can disturb stability and shelf quality of the powdered herbal formulations. The moisture content as 5% for all four formulations .

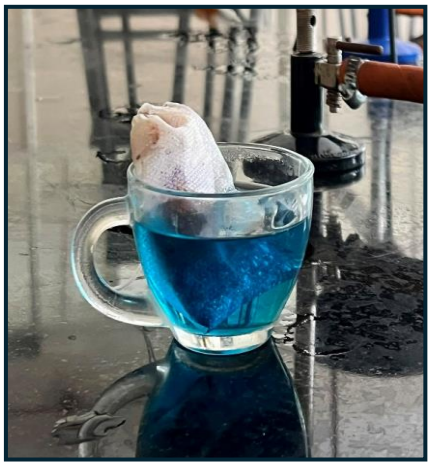
4.5 Preliminary Phytochemical Screening

Preliminary phytochemical screening was done in order to recognize certain classes of phytoconstituents , and the recorded observations were:

Sl no.	Test	Procedure	Observation	Inference	Picture
1	Dragendroffs Test	Sample + 1-2ml Dragendroffs reagent	Reddish brown precipitated	Presence of alkaloids (Ashwagandha)	
2	Hager's Test	Sample + 1-2ml hangers' reagent	Creamy white precipitate	Presence of alkaloids (Ashwagandha)	
3	Wagner Test	Sample + 1-2 ml Wagner reagent	Brown precipitate	Presence of alkaloids (Shankhpushpi)	
4	Lead Acetate Test	1 ml sample + Few ml 10% lead acetate solution	Yellow precipitate	Presence of Flavonoids (Tulsi)	
5	Conc. H2SO4 Test	Sample + Conc. H2SO4	Orange Colour Precipitate	Presence of Flavonoids (Amla)	
6	Braymer's Test	1 ml Sample + 3ml dis. H2O + 3 drops 10% Ferric Chloride	Green Colour	Presence of Tannins (Tulsi)	







RESULTS AND DISCUSSION

The developed formulation showed satisfactory preliminary physical characteristics, well , kinda. The deep-blue colour and characteristic odour were observed in the prepared powdered formulation, while the mixture stayed uniform and fine, overall. These characteristics suggest that the selected processing steps, including individual sieving and geometric dilution, did in fact lead to a visually uniform herbal mixture, fit for filling into infusion bags, more or less.

The total quantity of herbal material per infusion bag was 4.5 g. The recorded weight variation of ±5% gives some indication about how consistent the filling was, basically. The pH of the prepared formulation was recorded as 7.0 by pH paper , showing a neutral reading under the test conditions. Moisture content was recorded as 5%, and this matters for the physical stability and storage of powdered herbal materials.

Qualitative phytochemical screening demonstrated alkaloids and flavonoids in the formulation. Alkaloids were indicated by positive Dragendorff's, Hager's and Wagner's tests, while flavonoids were indicated by positive lead acetate and concentrated sulphuric acid tests. These results align with the phytochemical diversity we could expect from the selected medicinal plants. Still, qualitative screening alone does not confirm the concentration, the bioavailability, or the clinical effectiveness of individual constituents.

The combination of Ashwagandha, Amla, Tulsi, Ginger, Turmeric, Shankhpushpi and Cumin provides a formulation that includes botanicals traditionally linked with stress support, antioxidant action, digestive support, cognitive wellness and general health. The current findings are limited to preliminary quality evaluation, so any therapeutic claims should not be stated without proper pharmacological and clinical studies.

Conclusion

So basically it is a caffeine-free polyherbal infusion, with Ashwagandha , Amla , Tulsi, Ginger , Turmeric , Shankhpushpi and Cumin in it, and it was made successfully using powdered herbal materials, plus the infusion bag kind of technology. The final mix turned out to have a deep-blue colour , a characteristic odour, and overall a uniform powdered looking aspect with a pretty fine texture. When the physicochemical checks were done, the results were like within ±5% for weight variation, the pH was around 7.0, and the moisture content was 5% . Then the preliminary phytochemical screening, suggested the presence of alkaloids , and flavonoids too, kind of that standard thing.

Overall this study shows that making a convenient polyherbal infusion is feasible, and it already has decent preliminary quality features. But more work is still needed, like quantitative marker analysis, antioxidant assays, microbial evaluation, stability studies , toxicological assessment, and then relevant biological or clinical investigations , so that reproducibility, safety, and effectiveness can be really confirmed.

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