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FORMULATION AND EVALUATION OF HERBAL POWDER FOR TREATMENT OF ANGINA PECTORIS

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ABSTRACT

Angina pectoris is a cardiovascular disorder caused due to reduced blood supply to the heart muscles. Herbal medicines are widely used for the management of cardiovascular diseases because of their safety and therapeutic efficacy. The present study aimed to formulate and evaluate an herbal powder containing Arjuna, Ginger, Ashwagandha, Brahmi, and Turmeric for the treatment and management of angina pectoris. Different formulations (F1, F2, and F3) were prepared by dry mixing method and evaluated for organoleptic properties, bulk density, tapped density, angle of repose, moisture content, and ash value. The prepared formulation showed good flow properties and acceptable evaluation parameters. Among all formulations, F2 showed better stability and acceptable physicochemical characteristics. The study concluded that the formulated herbal powder may serve as a promising natural remedy for angina pectoris management.

KEYWORDS: Angina pectoris, Herbal powder, Arjuna, Ashwagandha, Turmeric, Brahmi, Ginger.

1. INTRODUCTION

Angina pectoris is a cardiovascular condition characterized by chest pain caused due to insufficient oxygen supply to the heart muscles. Modern treatment provides symptomatic relief but may produce adverse effects during long-term use. Herbal medicines have gained attention because of their natural origin, safety, and therapeutic effectiveness. Terminalia

arjuna is widely used for cardioprotective activity, while Ginger possesses antioxidant and anti-inflammatory properties. Ashwagandha acts as an adaptogen and helps reduce stress. Brahmi improves blood circulation and Turmeric exhibits strong antioxidant activity. The combination of these herbs may provide beneficial effects in the management of angina pectoris.

1.1 Withania somnifera (Ashwagandha)

Withania somnifera, commonly known as Ashwagandha, is a medicinal plant belonging to the family Solanaceae. It is widely found in India, especially in dry and subtropical regions. The plant is a small shrub, and its roots are mainly used for medicinal purposes. It has been used in traditional Ayurvedic medicine fora long time due to its multiple health benefits. The roots contain important bioactive compounds such as withanolides, alkaloids, and saponins whichcontribute to its therapeutic effects. It is commonly used to reduce stress, improve physical and mentalstrength, and enhance overall well-being. Due to its adaptogenic and neuroprotective properties, Ashwagandha is widely used in herbal formulations like powders and extracts for managing heart tack

1.2 Bacopa monnieri (Brahmi)

Bacopa monnieri, commonly known as Brahmi, is a small creeping herb belonging to the family Plantaginaceae. It grows in wet and marshy areas across India and has been extensively used in traditionalmedicine for brain-related conditions. It is mainly used to improve memory, enhance cognitive function, and reduce anxiety. Due to its calming and neuroprotective properties, Brahmi is widely used in herbal formulationslike powders and extracts for the management of depression and other mental health conditions.

1.3 Arjuna powder is commonly used in Ayurvedic medicine for heart-related disorders. It is obtained from the bark of the Terminalia arjuna tree. It is mainly used for the treatment and management of cardiovascular disorders. Arjuna possesses strong cardioprotective, antioxidant, and anti-inflammatory properties that help in improving heart function and blood circulation. It is widely used in the management of angina pectoris, hypertension, and high cholesterol levels. Arjuna powder helps strengthen heart muscles, reduce oxidative stress, and maintain healthy blood pressure.

1.4 Ginger is an important medicinal herb obtained from the rhizome of Zingiber officinale. It is widely used in herbal medicine because of its antioxidant, anti-inflammatory, and

cardioprotective properties. Ginger helps improve blood circulation and reduces inflammation in the body. It also helps in lowering cholesterol levels and preventing oxidative stress, which may contribute to cardiovascular diseases. In the treatment of angina pectoris, ginger supports heart health by improving circulation and reducing discomfort associated with chest pain. Additionally, ginger aids digestion, relieves nausea, and enhances the therapeutic effectiveness of herbal formulations.

1.5 Turmeric is used for its anti-inflammatory, antioxidant, antiseptic, and healing properties. It is commonly used in herbal medicines, food products, cosmetics, and health supplements. In herbal formulations, turmeric helps reduce inflammation, improve blood circulation, support heart health, and boost immunity. Its main active chemical constituent is curcumin.

2. MATERIALS AND METHODS

2.1 Experimental Requirements

Withania somnifera (Ashwagandha), Bacopa monnieri (Brahmi), Arjuna Cardioprotective (Ginger), Turmaric were obtained from the local market of Marotiya Bazar, Indore. All the raw materials were cleaned, dried, and used for the preparation of the herbal churna.

2.2 List of Equipment

Sieve, mixer grinder, weighing balance, mortar and pestle, and airtight container were used for the preparation and storage of the formulation.

2.3 Preparation of poly herbal churna

A) Extraction Process

Accurately weighed required quantity of powdered Arjuna Ginger Ashwagandha Brahmi Turmeric). Mixed the powder with hydroalcoholic solvent (ethanol: water, 70:30) in a 1:10 ratio (drug: solvent). Kept the mixture in a closed container for 24–48 hours for maceration with occasional shaking. After complete extraction, filtered the mixture through muslin cloth followed by Whatman filter paper. Collected the filtrate and concentrated it using a water bath until a thick extract was obtained. Dried the extract to obtain semi-solid mass and stored it in an airtight container for further phytochemical screening and evaluation studies.

Fig. No. 1: Extraction Process.

B) Formulation of Arjuna Powder

- Arjuna Powder was prepared using three ingredients: Arjuna Powder Ginger Ashwagandha Brahmi Turmeric equal proportion.
- All raw drugs were procured from the local market and properly authenticated.
- The collected drugs were cleaned manually to remove dust, dirt, and other foreign matter.
- The cleaned drugs were dried under shade to reduce moisture content and to prevent degradation of active constituents.
- Each dried drug was powdered separately using mortar and pestle to obtain a fine powder.
- The powdered drugs were passed through sieve number 80 to ensure uniform particle size.
- The powders were accurately weighed in equal quantities, i.e., 10 gm of each ingredient to obtain a total of 30 gm formulation.
- All Three powders were mixed uniformly by geometric mixing method to ensure homogeneity
- The prepared Arjuna Powder was transferred into an airtight container to protect it from moisture and contamination.

Table No. 1: Formulation of Polyherbal Churna.

Ingredients	F-1	F-2	F-3
Arjuna Powder	12 gm	8gm	6gm
Ginger Powder	5gm	6gm	7gm
Ashwagandha Powder	5gm	6gm	7gm
Brahmi Extract	4gm	5gm	5gm
eric Powder	4gm	5gm	5gm

Fig. No. 2: Poly herbal churna.

RESULT AND DISCUSSION

Evaluation Parameters

A) Phytochemical Screening

• **Test for Alkaloid Wagner's test**: About ten mg of extract was taken and few drops of Wagner's reagent (Dissolve 2 g of iodine and 6g of KI in 100 cm3 of water) was added and the formation of a reddish-brown precipitate indicates the presence of alkaloids.

•Flavonoids Test

2. Test for Flavonoid Lead acetate test: Ten mg of extract was taken and few drops of 10% lead acetate solution was added. Appearance of yellow colour precipitate indicates the presence of flavonoids.

3. Test for Tannin Ferric Chloride Test: To 5 ml of the sample, a few drops of 0.1% ferric chloride were added. The presence of a brownish green or blue-black colour indicated that the material possessed tannins.

Table No. 2: Phytochemical Screening test of Poly herbal powder.

Phytochemical Screening	Ethanol	Acetone	Aqueous
Flavonoids	Present (+)	Present (+)	Present (+)
Tannins	Present (+)	Present (+)	Present (+)
Alkaloids	Absent (-)	Present (+)	Present (+)

B) Organoleptic Properties

Table No. 3: Organoleptic Properties.

Property	Description
Appearance	Light brown.
Color	Natural brownish or earthy tone.
Odor	Characteristic earthy, slightly pungent.
Taste	Bitter, astringent, and slightly pungent
Texture	Hard with a smooth or slightly rough surface.

5.1 Physical properties of Arjuna Powder

Table No. 4: flow properties.

S.No.	Parameters	Value
1	True Density(g/ml)	0.83
2	Bulk Density(g/ml)	0.50
3	Angle of Repose	38.9
4	Carr Index (%)	39.75
5	Hausner Ratio	1.66
6	Ash	1

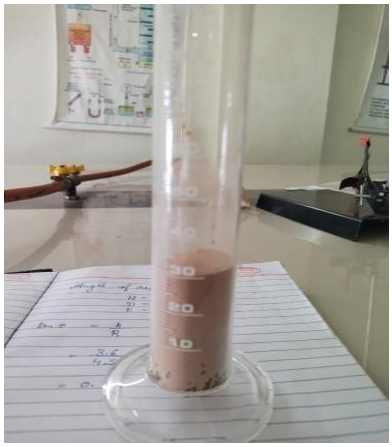

Fig. No. 3 Angle of repose.

Fig.No.4: Tapped Density.

C) Ph Determination – pH determines the acidity or alkalinity of the formulation, which influences stability and compatibility.1% or 10% aqueous solution of Arjuna Powder was prepared using distilled water. The pH was measured to all three Ingredient Of Arjuna Powder using pH paper.

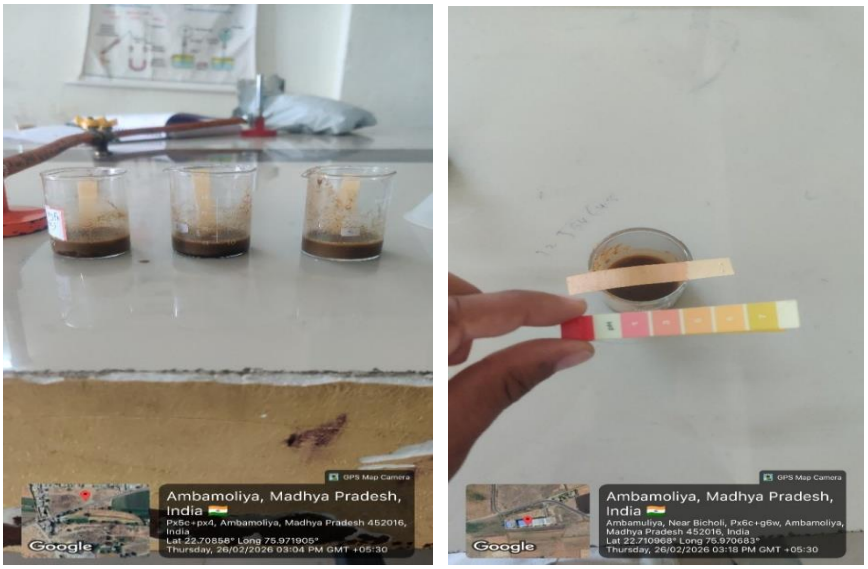

Fig. No. 5: Ph Determination.

D) Particle Size – Particle size affects dissolution rate, absorption, and uniformity of the formulation. The powder was passed through a series of standard sieves (e.g., #40, #60, #80). The amount retained on each sieve was recorded.to all three Ingredient of Arjuna Powder the help of sieves.

Fig. No. 6: Particle Size.

SUMMARY

Angina pectoris is a clinical condition characterized by chest pain due toreduced blood flow and oxygen supply to the heart muscles. Considering thelimitations and side effects of synthetic drugs, the use of herbal medicines hasgained importance due to their safety and

therapeutic potential. In this study, a combination of medicinal plants including Arjuna, Ginger, Ashwagandha, Brahmi, and Turmeric was selected based on their well-known pharmacological properties: Arjuna acts as a cardioprotective and heart tonic Ginger improves blood circulation and has anti-inflammatory effects. Ashwagandha functions as an adaptogen and helps in stress reduction Brahmi provides antioxidant activity and supports the nervous system Turmeric possesses strong anti-inflammatory and antioxidant properties All the herbal ingredients were shade-dried, powdered, and passed through a suitable sieve to obtain a fine powder. The powders were then accurately weighed and mixed using proper techniques to prepare three different formulations (F1, F2, and F3) with varying proportions of ingredients to optimize therapeutic efficacy.

CONCLUSION

The present study successfully developed a polyherbal powder formulation using Arjuna, Ginger, Ashwagandha, Brahmi, and Turmeric for the management of angina pectoris. All the prepared formulations (F1, F2, and F3) showed acceptable physical and evaluation parameters such as good organoleptic properties, proper flowability, and stability. Among them, the formulation containing a higher proportion of Arjuna (F1) demonstrated better cardioprotective potential. The selected herbal ingredients contributed synergistically by providing antioxidant, anti-Inflammatory, and stress-reducing effects, which are beneficial in improving heart function and reducing the symptoms of angina. Therefore, it can be concluded that the formulated polyherbal powder is a safe, effective, and economical natural alternative for the treatment and management of angina pectoris, with minimal side effects and better patient compliance.

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