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PRE FORMULATIONS STUDY OF TERMINALIA ARJUNA POWDER

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ABSTRACT

The purpose of the study was to develop and evaluate herbal products of Arjuna powder. Preformulation studies of Arjuna bark powder were carried out to assess its suitability for formulation development. The parameters evaluated included organoleptic properties such as colour, odour, and texture, along with flow properties like bulk density, tapped density, angle of repose, Hausner's ratio, and Carr's index. In addition, phytochemical screening and physicochemical properties such as moisture content, ash value, and pH were also determined. Arjuna is a wellknown medicinal plant widely used in the management of cardiovascular disorders. The results of the preformulation studies indicated that Arjuna bark powder possesses good physical and chemical characteristics with acceptable flow properties and stability. Therefore, it is suitable for the preparation of different herbal formulations.

KEYWORD: Terminalia Arjuna Powder, angina pectoris, blood vessels blocked Hypercholesteraemic.

(1) INTRODUCTION

Terminalia arjuna, commonly known as *arjuna*, belongs to the family of Combretaceae. Its bark decoction is being used in the Indian subcontinent for anginal pain, hypertension, congestive heart failure, and dyslipidemia, based on the observations of ancient physicians for centuries. The utility of *arjuna* in various cardiovascular diseases needs to be studied further. Therefore, the present review is an effort to give a detailed survey of the literature summarizing the experimental and clinical studies pertinent to *arjuna* in cardiovascular disorders, which were particularly performed during the last decade. Systematic reviews,

meta-analyses, and clinical studies of *arjuna* were retrieved through the use of PubMed, Google Scholar, and Cochrane databases. Most of the studies, both experimental and clinical, have suggested that the crude drug possesses anti-ischemic, antioxidant, hypolipidemic, and antiatherogenic activities. Its useful phytoconstituents are: Triterpenoids, β-sitosterol, flavonoids, and glycosides. Triterpenoids and flavonoids are considered to be responsible for its beneficial antioxidant cardiovascular properties. The drug has shown promising effect on ischemic cardiomyopathy. So far, no serious side effects have been reported with *arjuna* therapy. However, its long-term safety still remains to be elucidated. Though it has been found quite useful in angina pectoris, mild hypertension, and dyslipidemia, its exact role in primary/secondary coronary prevention is yet to be explored.

MATERIALS AND METHOD

- **Materials:** Terminalia arjuna bark powder is widely used in Ayurvedic medicine for the management of cardiovascular disorders such as angina pectoris and hypertension. In preformulation studies, Arjuna bark powder is considered an important herbal drug due to its cardiotonic properties. It helps in strengthening the cardiac muscles, improving blood circulation, and maintaining normal blood pressure levels.

- **Methods**

(a) Organoleptic properties of terminalia arjuna powder

The bark powder of Terminalia arjuna was taken and evaluated for its organoleptic properties. The parameters observed included colour, odour, size, shape, and texture of the powder. These characteristics help in the identification and preliminary quality assessment of the crude drug.

(b) Flow properties of Arjuna powder

- **Bulk Density**: Bulk density of Arjuna powder was determined by using a flatround measuring Cylinder of 100 ml capacity. A known quantity of Arjuna powder was carefully Poured into the cylinder without compacting the powder and the initial volume was Noted as bulk volume.

Formula:- Mass/ Volume

- **Tapped density**: Same cylinder use in bulk density The cylinder was then tapped repeatedly until a constant Volume was obtained. This final volume was recorded as

tapped volume. tapped density were calculated by dividing the weight of the powder By the bulk volume and tapped volume respectively.

Formula:-Mass/ tapped volume

- **Angle of Repose**:-The angle of repose of Arjuna powder was determined by the fixed funnel method. In this method, the funnel was fixed at a certain height above a graph paper placed On a flat surface. Arjuna powder was allowed to flow through the funnel to form a Conical heap. The height and radius of the heap were measured, and the angle of Repose was calculated using the formula:

Angle of repose :- $\Theta = \tan^{-1}(h/r)$

Calculation:- $\Theta = \tan^{-1}$

Hausner Ratio: Hausner Ratio is a parameter used to evaluate the flow property of powders. It is calculated as the ratio of tapped density to bulk density. A higher Hausner ratio indicates poor flowability of the powder.

Formula: Hausner Ratio = Tapped Density / Bulk Density

- **Compressibility Index (Carr's Index)**: Carr's Index is used to determine the compressibility and flow characteristics of powders. It is calculated from the difference between tapped density and bulk density.

Formula: Carr's Index = (Tapped Density – Bulk Density) / Tapped Density × 100

(c) Phytochemical screening test of Arjuna powder

(1) Alkaloids test

- **Dragendoroff's reagent test**:- Take 2 ml arjuna drug extracted in test tube and then add in 2-3 drop dragendoroff reagent.
- **Wagner's reagent**:- Take 2 ml arjuna drug extracted in test tube and add in 2-3 drop wagner's reagent.

(2) Flavonoids test

- **Shinoda test**:- Take 2 ml arjuna drug extracted from the test tube and add in 1 pinch magnesium ribbon and then add 1-2 drop sulfuric Acid.

(3) Glycosides test

- **Keller – killiani test**:- Take 2 ml arjuna drug extracted from the test tube and add 2 ml glacial acetic acid and 1 pinch ferric chloride then add in 1 ml Sulphuric acid.

(4) Tannins test

- **Ferric chloride test:**- Take 2 ml arjuna drug extracted in test tube and add in 1 ml ferric chloride solution.

(d) Physico – chemico properties

- **Solubility test of terminalia arjuna powder:**- In this study, the Arjuna drug was taken and its solubility was evaluated in different solvents. The drug was added separately to 10 ml of ethanol, chloroform, methanol, sulfuric acid, and water. The mixtures were observed to determine in which solvent the drug showed maximum solubility.
- **Moisture content:-** 5 g of Arjuna powder was taken in a watch glass and kept in a hot air oven (drying oven) for 2 hours. After drying, it was observed to determine the amount of moisture loss.
- **Ash value:-** 5 g of Arjuna powder was taken in a crucible dish and placed in a muffle furnace for 1 hour. After heating, the sample was observed and evaluated for its quality.
- **PH Test:**- 2 g of the drug sample was accurately weighed and dissolved in 10 ml of distilled water to prepare a solution. The pH of the solution was then determined using pH paper.

RESULT AND DISCUSSION

- **Organoleptic properties:-** The organoleptic properties of the sample were evaluated, and the following results were observed.

Table: Organoleptic properties of Arjuna powder.

S.No	Organoleptic properties	Observation
1.	Colour	Light brown to reddish brown
2.	Odour	Odoureless or faint characteristic
3.	Taste	Artringent slightly bitter
4.	Texture	Coarse to moderately fine gritty.

- **Flow properties:-** following result were observed in flow properties :

Table:- Flow properties of terminalia arjuna powder.

S.No	Parameters	Result
1.	Bulk density	0.6 g/ml
2.	Tapped density	0.8 g/ml
3	Angle of repose	26.58 ° (Excellence)
4	Carr,s index	7.90 %
5.	Hanser- ratio	1.33 g/ml

- **Phytochemical screening test :-** "The results were observed in Phytochemical Screening.

Table: Phytochemical screening test of Arjuna powder.

S. No	Name of Test	Observation
1.	Dragendoroff's reagent test	Positive (+)
2.	Wagner's reagent test	Positive (+)
3.	Shinoda test	Negative (-)
4.	Ferric chloride test	Positive (+)
5.	Keller killiani test	Positive (+)

Physico – Chemico properties – The following result observed in physico – chemico properties.

Table: physico - chemico properties of Arjuna powder.

1.	Moisture content	16 % w/w
2.	Ash value	27.8 % w/w
3.	PH test	5 (Slightly acidic)

- **Solubility test:-** Result are observed in solubility:

Table: Solubility test of Arjuna powder.

S. No	Solvent use	Observation of result
1.	Distilled water	Insoluble
2.	Methenol	Sparingly soluble
3.	Chloroform	Slitely soluble
4.	Ethanol	Sparingly soluble
5.	0.1 N HCL	Sparingly soluble

Fig.: Bulk and tapped density Arjuna.

Fig.: Angle of Repose of Arjuna.

Fig.: Phytochemical screening test.

Fig.: PH Test of Arjuna.

Fig.: Ash value of Arjuna.

Fig.: Moisture content of Arjuna.

SUMMARY AND CONGRATULATIONS

We carried out various preformulation studies on Terminalia arjuna powder, including organoleptic properties such as colour, odour, shape, size, and texture. We also evaluated flow properties like bulk density, tapped density, angle of repose, Hausner's ratio, and Carr's index. In addition, phytochemical screening tests and physicochemical evaluations such as moisture content, ash value, solubility test, and pH determination were performed.

From these results, it can be concluded that Terminalia arjuna powder is a suitable drug and is capable of being used for the development of various pharmaceutical formulations.

REFERENCE

1. Gami B, Parabia MH. Pharmacognostic evaluation of bark and seeds of Mimusops elengi L. Int J Pharm Pharm Sci., 2010; 2(4): 110-3.
2. The Ayurvedic Pharmacopoeia of India, Part-I, NISCOM, CSIR, New Delhi, 1999, II: 17-18.
3. World Health Organization, Quality Control Methods for Medicinal Plant Materials, WHO, Geneva, Switzerland, 1996.
4. World Health Organization, Quality Control Methods for Medicinal Plant Materials, WHO, Geneva, Switzerland, 2005.
5. Chaudhari GM, Mahajan RT. Comparative Antioxidant Activity of Twenty Traditional Indian Medicinal Plants and its Correlation with Total Flavonoid and Phenolic Content. International Journal of Pharmaceutical Sciences Review and Research, 2015; 30(1): 105-111.
6. Dwivedi S. Terminalia arjuna Wight & Arn.—A useful drug for cardiovascular disorders. Journal of ethno pharmacology, 2007; 114(2): 114-129.
7. Kumar D, Kumar K, Kumar S, Kumar T, Kumar A, Prakash O. Pharmacognostic evaluation of leaf and root bark of Holoptelea integrifolia Roxb. Asian Pacific journal of tropical biomedicine, 2012; 2(3): 169-175.
8. WHO. Quality control methods for medicinal plants. Geneva, 2002; 28-31.
9. Bhowmik S, Datta BK, Saha AK. Determination of mineral content and heavy metal content of some traditionally important aquatic plants of Tripura, India using atomic absorption spectroscopy. Journal of Agricultural Technology, 2012; 8(4): 1467-1476.
10. Sarveswaran Sivalokanathan, Marati Radhakrishnan, Vijayababu Maruthaiveeran and Periyasamy Balasubramanian World J Gastroenterol, 2006; 21. 12(7): 1018-1024.