

PHYSICO-CHEMICAL AND PHYTOCHEMICAL ANALYSIS OF SHATAPUSHPA AND BRAHMI ALONG WITH ITS EFFECT ON MEMORY

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ABSTRACT

A medical quartet with optimum qualities for the treatment of any disease is required according to Ayurveda. Drug is an important component among them. The drug should lend itself to diver's form for delivery, have several desirable properties to counter disease, be available in plenty and be suitable for administration in relation with time and location. Ample of reference are available in classics regarding the wonders a good drug can produce as well as the ill effects an improper usage of drug can create. The combination of medicine described in the textbook of Ayurveda are the products of thorough analysis and clinical trials. Brahmi (*Bacopa Monnieri*) is the drug of choice in the memory related health issues, which is in practice since ages. Shatapushpa (*Anethum sowa Roxb*) is said to have Medhya (intellect) property by Acharya Kashyapa. But Shatapushpa is not used

as a Medhya drug in current practice. In this article, an attempt is made to compare the quality of Brahmi and Shatapushpa (*Anethum sowa Roxb*) with the help of micro and macro physico chemical parameters and to assess its effect on memory. Shatapushpa is found to have similar phytochemicals to that of Brahmi.

KEYWORDS: Shatapushpa, Brahmi, memory.

INTRODUCTION

Ideal drug should be suitable for preparing many recipes, possess many food qualities, endowed with virtues and suitable in different disease condition.^[1]

Brahmi is used extensively in various forms and various diseases. Brahmi is said to have Medhya, Swarya (enhancing clarity of voice), Smritiprada (memory enhancing), Rasayani (rejuvenation) properties.^[2] Acharya Kashyapa had well praised the drug Shatapushpa by indicating it to increase Medha, Smruthi and to boost the individual as shruthadhara.^[3] It is easily available, cost effective and has no side effects and also help in adolescence growth.

Memory is once ability to store, retain and retrieve specific pieces of information on request.^[4] Working memory is type of short-term memory which stops recent knowledge and happening within 30 sec. Working memory can significantly influence intelligence. It helps once ability to quickly and easily retrieve and applied stored information in situation where there is a need for solving problems.^[5] Methylphenidate, Amphetamine, Modafinil are the drug of choice in contemporary medicine, which can cause effects like Anorexia, Insomnia, Headache, Abdominal discomfort and bowel upset.

As a result, there is a growing need to develop a memory-enhancing medicine that is readily available, cost-effective, and appealing.

MATERIALS AND METHODS

Identification and authentication of raw drugs of Brahmi and Shatapushpa was done at AYUSH approved Drug Testing Laboratory for ASU drugs, Govt. of India, KLE shri B M Kankanwadi Ayurveda Mahavidyalaya & Research Centre, Belagavi.

Shatapushpa seeds and Brahmi were, cleaned well and dried followed by Mechanical powdering and sieved under 80 number mesh from KLE Ayurveda Pharmacy, Belagavi. The powder was subjected to Organoleptic, Physiochemical, preliminary phytochemical screening as per standard protocol.

AIMS AND OBEJECTIVES

- Identification and authentication of raw drugs used in *Brahmi churna* and *Shatapushpa churna*.

- Preparation of Brahmi churna and Shatapushpa churna as per classical explanation at the GMP certified KLE Ayurveda pharmacy, Khasbagh, Belagavi.
- Physicochemical, phytochemical analysis of *Brahmi churna* and *Shatapushpa churna*.

Organoleptic Parameters: Organoleptic parameters include test for form, colour, taste and odour.

Physico-chemical parameters: Physico chemical parameters include assessment of loss on drying, Ash value, Acid insoluble Ash, water soluble extractive and Alcohol soluble extractives.

OBSEVATION

Organoleptic analysis

Table no 1: Showing organoleptic characters.

SAMPLE	BRAHMI CHURNA	SHATAPUSHPA CHURNA
Form	Churna	Churna
Colour	Light brown	Brownish
Taste	Slightly bitter	Pungent
Odour	Characteristics	Aromatic

Brahmi Churna is light brown fine powder with characteristic odour and bitter taste whereas Shatapushpa Churna is Brownish fine powder with aromatic odour and pungent taste.

Physico-Chemical analysis

Table no 2: Showing Physico-chemical parameters.

SI.NO.	PARAMETERS	BRAHMI CHURNA (VALUE)	SHATAPUSHPA CHURNA (VALUE)
1	Moisture Content	10.526 %	4.156%
2	Ash value	16.774 %	9.530%
3	Acid insoluble Ash	4.593%	1.679%
4	Water soluble extractive	17.494%	27.134%
5	Alcohol soluble extractive	8.011%	18.891%

Physico-Chemical analysis of Brahmi Churna shows 10.526% of moisture content. Ash content of drug was 16.774% & 4.593% of acid insoluble ash. Water soluble extractives 17.494% denotes the presence of inorganic contents. Alcohol soluble extractives 8.011% represent extraction of polar constituents like alkaloids, flavonoids. Physio chemical analysis of Shatapushpa Churna shows 4.156% of moisture content. Ash content of drug was 9.530%

& 1.679% of acid soluble ash. Water soluble extractives 27.134% denotes presence of inorganic contents. Alcohol soluble extractive 18.891% represent extraction of polar constituents.

Preliminary Phytochemical Screening

Table no 3: Showing Preliminary Phytochemical Screening.

TEST	BRAHMI CHURNA		SHATAPUSPHA CHURNA	
	WATER	ALCOHOL	WATER	ALCOHOL
Test for carbohydrate	Positive	Positive	Positive	Positive
Test for Reducing sugar	Positive	Positive	Positive	Positive
Test for monosaccharide	Positive	Positive	positive	Negative
Test for pentose sugar	Negative	Negative	Negative	Negative
Test for non-reducing sugar	Negative	Negative	Negative	Negative
Test for hexose sugar	Negative	Negative	Negative	Negative
Test for proteins	Positive	Negative	positive	Negative
Test for amino acid	Negative	Negative	positive	Negative
Test for steroids	Negative	Negative	Negative	Positive
Test for flavonoids	Positive	Positive	positive	Negative
Test for alkaloids	Negative	Negative	Negative	Negative
Test for tannins	Positive	Negative	positive	Positive

Preliminary phytochemical test of aqueous alcoholic extract of Brahmi Churna shows presence of carbohydrate, reducing sugar, monosaccharide, flavonoids & absence of pentose sugar, non-reducing sugar, hexose sugar, proteins, amino acid, steroids, alkaloids & tannins.

Water extract of Brahmi Churna shows presence of carbohydrate, reducing sugar, monosaccharide, proteins, flavonoids, tannins and absence of pentose sugar, non-reducing sugar, hexose sugar, amino acids, steroids, alkaloids.

Preliminary phytochemical test of aqueous alcoholic extract of Shatapushpa Churna shows presence of carbohydrate, reducing sugar, steroids & tannins and absence of monosaccharide, pentose sugar, non-reducing sugar, hexose sugar, proteins, amino acid, flavonoids and alkaloids.

Water extract of Shatapushpa Churna shows presence of carbohydrate, reducing sugar, monosaccharide, flavonoids and absence of pentose sugar, non-reducing sugar, hexose sugar, proteins, amino acids, steroids, alkaloids and tannins.

Table no 4: Showing test of glucosides.

TEST	BRAHMI CHURNA		SHATAPUSHPA CHURNA	
	WATER	ALCOHOL	WATER	ALCOHOL
Cardiac glycoside	Positive	Negative	Negative	Positive
Anthraquinone glycoside	Negative	Negative	Negative	Negative
Saponin glycoside	Negative	Negative	Negative	Negative

Glycoside test of aqueous alcoholic extract of Brahmi Churna shows absence of cardiac, anthraquinone, saponin glycosides. Water extract of Brahmi Churna shows presence of cardiac glycoside & absence of anthraquinone, saponin glycosides.

Glycoside test of aqueous alcoholic extract of Shatapushpa Churna shows presence of cardiac glycoside & absence of anthraquinone, saponin glycosides. Water extract of Shatapushpa Churna shows absence of cardiac, anthraquinone, saponin glycosides.

DISCUSSION

Brahmi possess Madhura (sweet) Tikta (bitter) and Kashaya Rasa (astringent taste) where as Shatapushpa is of Katu (pungent) and tikta Rasa. According to Acharya Charaka Shatapushpa falls under Maduraskanda Dravya (group of drugs having sweet taste or potency)^[6] even though it has Katu, Tikta rasa and Katu Vipaka. Drugs having predominantly of Madhura Rasa and Vipaka (final transition) or that can produce effect similar to that of Madhura Rasa or Vipaka are included under Madhuraskanda.^[7] Madhura rasa is said to have Medhya action according to Acharya Charaka.^[8]

Preliminary phytochemical analysis is helpful in determining the chemical constituents of plant materials. They are also useful in locating the source of pharmacologically active chemical compounds. Preliminary phytochemical analysis of Brahmi revealed the presence of carbohydrate, reducing sugar, monosaccharides, proteins, flavonoids and tannins. Preliminary phytochemical analysis of Shatapushpa revealed the presence of Carbohydrates, reducing sugar, monosaccharide, tannins, flavonoids and Proteins in methanol extractive of Shatapushpa. Presence of these phytochemicals gives the action of anabolism, weight promotion, rectification of, soothing, finally diuretic.^[9] Flavonoids are potent water-soluble antioxidants and free radical scavengers, which can prevent oxidative cell damage. Shatapushpa significantly showed the presence of flavonoids, which are protective in

action.^[10] These are considered as naturally dietary biologic response modifiers, disease preventing and health promoting may be effective in the management of reduced memory.

Relation between flavonoids and memory

Emerging evidence suggests that a group of dietary-derived phytochemicals known as flavonoids are able to induce improvements in memory acquisition, consolidation, storage and retrieval. These interactions include an ability to activate signaling pathways, critical in controlling synaptic plasticity, and a potential to induce vascular effects capable of causing new nerve cell growth in the hippocampus.^[11]

Flavonoids are said to have the potential to improve human memory and neuro-cognitive performance via their ability to protect vulnerable neurons, enhance existing neuronal function and stimulate neuronal regeneration. Long-term potentiation (LTP) is widely considered to be one of the major mechanisms underlying memory acquisition, consolidation and storage in the brain and is known to be controlled at the molecular level by the activation of a number of neuronal signaling pathways. These pathways include the phosphatidylinositol-3 kinase/protein kinase B/Akt, protein kinase C, protein kinase A, Ca-calmodulin kinase and mitogen-activated protein kinase pathways.^[12]

CONCLUSION

Shatapushpa is found to have presence of flavonoids, tannin and glycoside, which present in Brahmi. These constituents will help in enhancing the memory due to the protective action by flavonoids. Since Shatapushpa fall under Madhura Skanda Dravya, due its Prabhava (potency) it might act on memory. Preliminary physico chemical analysis of Brahmi and Shatapushpa show many similarities regarding the presence of phytochemicals. Further quantitative analysis of phytochemicals and antioxidant property will be helpful in substantiating the memory enhancing property of Shatapushpa and Brahmi.

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