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A detail pharmacognostic, physicochemical and phytochemical study of Satyadi yoga

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Abstract

Standardization of a compound Ayurvedic formulation is a critical and essential issue to be considered in assuring the therapeutic efficacy and safety and to rationalize their use in the health care. *Satyadi yoga churna* is a polyherbal Ayurvedic formulation which is mentioned in the classical book named *Yogaratanakar* at 17th century. *Satyadi yoga* is a polyherbal medicine consisting of dried rhizomes of Sati (*Hedychium spicatum Ham*) and Sunthi (*Zingiber officinale*), dried fruits of Haritaki (*Terminalia chebula*), dried roots and rhizome of Vacha (*Acorus calamus*) and Ativisha (*Aconitum heterophyllum*), dried stem of Guduchi (*Tinospora cordifolia*) and dried bark of Devadaru (*Cedrus deodara*) that are native to the Indian subcontinent. It is prescribed for the treatment of amavata with special reference to rheumatoid arthritis which is mentioned in the classical textbook of *Yogaratanakar*. The rising use of herbal drug by the human is forcing the driving force to evaluate the health claim of these agents and to develop standards of quality, purity, safety and efficacy of the drug. Mostly herbal drugs are effective but due to adulteration and lack of standardization, the effectiveness of the herbal drug is decreased. So there is need of development of standardization parameters. In this standardization of the Ayurvedic drug the physical, chemical and analytical parameters are carried out. It assures the quality, purity and safety of herbal drug.

Keywords: Standardization, Amavata, quality, purity

1. Introduction

Ayurveda, the traditional Indian medicine, is the “great tradition” with sound philosophical, experiential, and experimental basis. The Ayurvedic system touted as an “alternative system of medicine” has already gained worldwide attention due to increased side effects of drugs, lack of remedy for several chronic diseases, microbial resistance, high cost of synthetic drugs, and emerging diseases. These are some facts for renewed public interest in traditional medicines. With increasing demand for safer drugs, attention has been drawn to the quality, safety, efficacy, and standards of the Ayurvedic formulations^[1].

Ayurvedic pharmacy advocates the use of quality control tests to make sure that the formulated products adhere to the standards mentioned in Ayurveda. Most of the tests mentioned in ancient literature appear to be based on observation and seem subjective without valid scientific backing; therefore, formulation prepared may not have the desired quality and batch-to-batch consistency. Quality is the critical determinant of safety and efficacy of herbal medicines; however, herbal formulations rarely meet the standards of quality. Hence, there is a need for standardization, and development of reliable quality protocols for Ayurvedic formulations using modern techniques of analysis is extremely important^[2, 3]. The World Health Organization (WHO) has appreciated the importance of medicinal plants for public health care in developing nations and has evolved guidelines to support the member states in their efforts to formulate national policies on traditional medicine and to study their potential usefulness including evaluation, safety, and efficacy^[4-6].

The investigation was carried out to develop standardization parameters. The objectives include performing powder microscopic characterization, physico-chemical analysis, phytochemical screening and thin layer chromatography (TLC).

There is an utmost need to standardize such traditionally used herbs for the proper use by the people and also for the establishment of an unique identification data among the common species. Keeping all these in view, the present study was carried out to get a standardized data of *Satyadi yoga*.

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2. Materials and Methods

2.1 Collection of plant material

The fresh fruit material was collected from different region of Assam and Jaipur (Rajasthan), it was identified in the Dept. of

Dravyaguna of Govt. Ayurvedic College. It was then dried and powdered and mixed to form Satyadi yoga as per the references and the Satyadi yoga was stored in an air tight container for future use.



Fig 1: Ativisha



Fig 2: Sati



Fig 3: Sunthi



Fig 4: Devdaru



Fig 5: Guduchi



Fig 6: Haritaki

2.2 Place of work

Pharmacognostic, physicochemical and phytochemical studies were carried out in State Drug Testing Laboratory, AYUSH, Govt. Ayurvedic College and Hospital, Ghy-14.

2.3 Pharmacognostic studies

Fine powder was used to study microscopical characters, physicochemical parameters and phytochemical investigation [6]. The powder microscopy was performed according to the method of Khandelwal.

2.3.1 Macroscopic study

It refers to evaluation through organs of sense and includes the macroscopic appearance, color, odour, taste etc. of the drugs [7].

2.4 Quantitative estimation

Different physicochemical properties like LOD, PH value, total ash, acid insoluble ash, extractive values of the dried powder were determined using the methods described in the British Pharmacopoeia and Ayurvedic Pharmacopoeia.

2.5 Phytochemical Screening

The aqueous and methanolic extracts along with other solvent extracts of powdered material were studied for various phytochemicals like alkaloids, carbohydrates, flavonoids, glycosides, gums and mucilages, phenols, tannins, reducing sugars, saponins, steroids, tannins and terpenoids by using

precipitation and coloration reactions [8].

2.6 Extraction

300gm of powdered satyadi yoga was extracted successively with solvents like petroleum ether, benzene, chloroform, acetone and methanol respectively in a Soxhlet apparatus [9]. Each solvent extract was then concentrated by distilling off the solvent under reduced pressure.

2.7 Thin layer chromatography: Thin layer chromatography was carried out with the methanolic extract and maximum spots been separated on precoated silicagel G TLC plate with trial and error methods [10].

2.8 Physicochemical properties

Physicochemical parameters were determined as per guidelines of WHO [11]. Total ash value, loss on drying, water soluble ash, acid insoluble ash, solubility of the extract in different solvents, melting point, boiling point, pH, heavy metal analysis, petroleum ether soluble extractive, alcohol soluble extractive and water soluble extractive values were determined.

3. Result and Observation

The Satyadi yoga was investigated in a systematic way covering pharmacognostical, phytochemical, and physicochemical aspects to rationalize its use as a drug of therapeutic importance.

3.1 Macroscopic characteristics

Table 1: The details of characters and Satyadi yoga

Characters	Satyadi yoga
Colour	Light brown
Odour	Aromatic
Taste	Less pungent
Touch	Fine

3.2. Microscopical characteristics

3.2.1. Powdered microscopy

Microscopic method is one of the simplest and cheapest methods to start with for establishing the correct identity of the source materials. Powdered microscopy showed the presence of calcium oxalate crystals, starch grains, stone cells, spiral vessels etc.

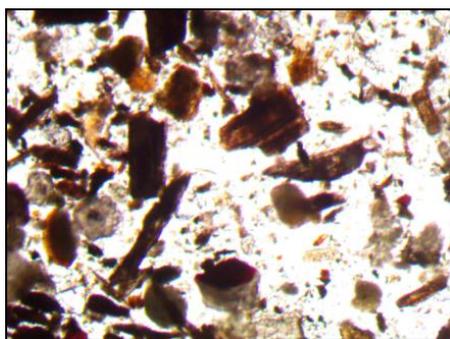


Fig 7: Powdered microscopy

3.3. Determination of Quantitative standards

Table 2: Physico-Chemical Evaluation

Physico-Chemical Evaluation	LoD (Loss on Drying)	5.69%
	Total Ash	9.30%
	Acid Insoluble Ash	0.80%
	Alcohol Soluble Extractive	34.4%
	Water Soluble Extractive	33.2%

3.4. Chromatographic profile of dried powder ethanolic extract

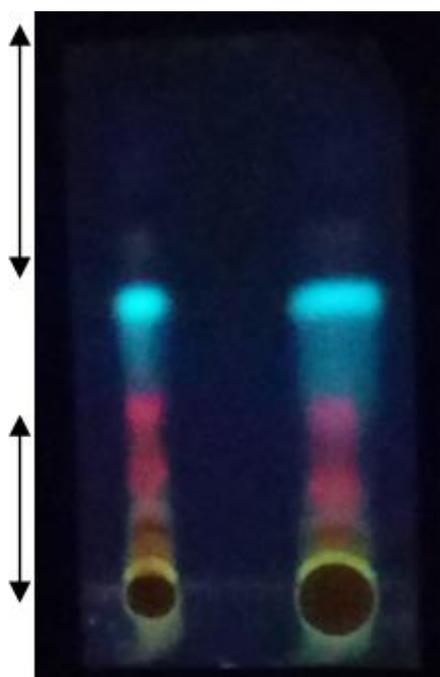


Fig 8: TLC

Table 3: The details of solvent system and the Rf values are mentioned

Extract	Solvent system	No. of spots	Rf values
Methanol	Nhexane: ethyl acetate	3	0.72
			0.40
			0.32

Table 4: Phytochemical analysis of Satyadi yoga mentioned

Phyto-Chemical Screening	a)	Test for Phenols	Present
	b)	Test for Alkaloids	Present
	c)	Test for Glycosides	Present
	d)	Test for Flavanoids	Present
	e)	Test for Steroids	Absent
	f)	Test for Tannins	Present
	g)	Test for Tarpenoid	Absent

4. Discussion

The standardization of a polyherbal formulation for establishing its correct identity is utmost important. Before any crude drug can be included in an herbal pharmacopoeia, pharmacognostic parameters and standards must be established. Microscopic method is one of the simplest and cheapest methods to start with for establishing the correct identity of the source materials. The physical constant evaluation of a drug is an important parameter in detecting adulteration or improper handling of drugs. Ash values and extractive values are important in the evaluation of purity of drugs i.e., the presence or absence of foreign inorganic matter. Extractive values are also useful to evaluate the chemical constituents present in the crude drug and also help in estimation of specific constituents soluble in particular solvents. Physicochemical parameters showed that alcohol soluble extractive value is more than water soluble extractive value, which indicates the presence of more alcohol soluble contents in the drug. PH of the drug determines acidity or alkalinity of drug. Phytochemical analysis of the drug showed presence of alkaloids, flavonoids, glycosides, sterols, tannins and phenols.

5. Conclusion

The ability to provide timely, accurate and reliable data is an essential part of discovery, development and manufacture of Pharmaceuticals. Here an attempt was made to get a standardized data of Satyadi yoga. The pharmacognostical, phytochemical and physicochemical characters of Satyadi yoga are useful to generate standards to assess the quality and purity of the drug. The information provided by this study may be useful to carry out further study of Ayurvedic drugs of traditional medicinal practice of present era.

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