WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 12, Issue 19, 1541-1547. Research Article ISSN 2277–7105

PHARMACOGNOSTICAL & PHYTOCHEMICAL STUDY OF *ERANDA* LEAVES *KSHAR* & *SH. HINGU*

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Article Received on
21 September 2023,

Revised on 11 October 2023,
Accepted on 01 Nov. 2023

DOI: 10.20959/wjpr202319-30374

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ABSTRACT

Eranda & Hingu are two important drugs used in treatment. These are widely used in different formulations in clinical practice. *Aacharya Bhavprakash* had described a formulation of *Eranda* leaves *kshara* & *Hingu* in the treatment of *Medovruddhi*. This research article is the pharmacognostical and phytochemical evaluation of a clinical trial drug *Eranda* leaves *kshara* and *Hingu*. This work was done to check the purity and quality of *Eranda patra kshara* and *hingu* and to establish the pharmacognostical & phytochemical standards of the trial drugs as per API. Physical parameters like moisture content (loss on drying), aqueous and alcohol soluble extract values, ash value and chemical parameters like phytochemical study for detection of alkaloids, flavonoids, saponins, carbohydrates, proteins etc. and TLC (Thin Layer Chromatography) were also done and results were documented for future references.

KEYWORDS: Pharmacognostical**,** Phytochemicals, *Eranda*, *Hingu*, *Kshara*.

INTRODUCTION

Eranda (*Ricinus communis* Linn.) from Euphorbiaceae family and *Hingu* (*Ferula asafoetida* Linn.) are two important medicinal plants mentioned in the classical texts of *Ayurveda* dating back to the *Vedic* era. Both plants are widely used in the treatment of various diseases. Ricinus communis, which is thought to be native to Africa, can withstand a broad range of weather conditions and is widespread in India's drier regions. In the *agreya dravyas* described in *Charak samhita sutra sthana Erandamoola* is described as "***Vrushyavataharanam.***"[1] Oil obtained from its seeds is said the best medicine for *Aamvata* [2] (Rheumatic disorders). *Susrutha* cited *Erandataila* as the greatest oil purgative.[3] The oil extracted from seeds and

the root are frequently utilised in formulations, although the leaves are rarely used. However, in *Bhavprakash samhita*, the usage of delicate leaves and aged leaves for particular ailments like ***yakruthvikaras*** and ***medovriddhi*** [4] has been mentioned.

Ferula asafoetida is an herbaceous, monoecious, perennial plant of Umbelliferae family. Asafoetida is native to central Asia, eastern Iran to Afghanistan, and today it is grown chiefly in Iran & Afghanistan, from where it is exported to the rest of the world. It is not native to India but has been used in Indian medicine and cookery for ages. Resin obtained from its roots also called as *Hingu Niryas* is used for medicinal purpose. In the *agreya dravyas Hingu Niryas* is described as *agreya* in *Chedniya*, *Deepniya*, and *Shoolprashaman*.[5] However, API made no reference of the phytochemical analysis of Ricinus communis leaves *Kshara*. Therefore, standardised measures are required for the creation of unique identity data. Due to its comprehensive approach, *Ayurveda* is becoming more and more accepted and well-liked by the general people nowadays. By defining quality parameters for the safe and efficient use of the medications in clinical practice, the drugs should be standardized.

In *Bhavprakash samhita Kshara* of *Eranda* plant leaves and *Hingu* is described in the treatment of *Medovriddhi*.[6] A clinical research trial had been done to evaluate the *Lekhana karma* of this formulation. Before the trial, the photochemical and pharmacognostical study of the prepared drug of *Kshara* and *Hingu* was done to check their purity and quality. A preliminary physicochemical analysis is a step towards determining the drug's authenticity and purity. This study includes macroscopic study (color, odor, taste), Moisture Content, Extractive Values (Aqueous, Alcoholic, Petroleum ether), pH ,Total Ash, Acid insoluble Ash, Water soluble Ash, Qualitative analysis of Phytochemical profiling and TLC (Thin Layer Chromatography) of prepared drugs *Eranda* leaves *Kshar* and *Hingu*. Results obtained were documented for future references.

MATERIALS AND METHODS

Fresh leaves of Ricinus communis were collected, dried in shade, burnt in open air and *Kshara* was prepared from the obtained ash according to standard given in *Sushrut samhita.*[7] Sh. *Hingu* was taken in powder form. Formulation was divided in three groups, one containing only *Kshara*, 2nd containing only *Hingu* and 3rd having mixture of both .Physical and physicochemical analysis of all 3 groups done separately. Apparatus used for this purpose were round bottom flask, conical flask, measuring jars, beakers, silica crucible, funnel, watch glass, glass rod, and filter paper, and electronic balance, pH measuring

apparatus, soxhelet apparatus, and different reagents for phytochemical screening. For TLC mobile phase solution of Toluene: Chloroform: Methanol (5:3:4) was used as given in book Quality Standards of Indian Medicinal Plants [8]. The spots were first viewed in visible light and then visualized in UV and Iodine chamber.

RESULTS

A) MACROSCOPIC STUDY

S.No.	Macroscopic study	*Eranda Patra Kshara*	*Hingu*	*Eranda Patra Kshara & Hingu*
1.	Color	Greyish white	Reddish brown	Creamy white
2.	Odor	No odor	Pungent	Weak Pungent
3.	Taste	Sharp, hot	Pungent	Sharp, Hot, Pungent

B) QUANTITATIVE PARAMETERS

S.No.	EXPERIMENT	*Kshara*	*Sh. Hingu*	*Kshara & Sh. Hingu*
1.	Moisture Content	**3.18 %**	**7.30 %**	**5.67 %**
2.	Total Ash	**95.83 %**	**1.70 %**	**35.65 %**
3.	Acid insoluble ash	**6.73 %**	**0.054 %**	**6.18 %**
4.	Water soluble ash	**87.14 %**	**1.11 %**	**25.75 %**
5.	Water soluble extract	**97.46 %**	**28.21 %**	**75.55 %**
6.	Alcohol soluble extract	**36.01 %**	**7.18 %**	**24.90 %**
7.	Petroleum ether soluble extract	**0.26 %**	**10.39 %**	**4.13 %**
8.	pH value	**9.11**	**8.16**	**8.66**

C) QUALITATIVE ANALYSIS

PHYTOCHEMICAL SCREENING

Name of test	*Eranda leaves Kshara*		*Eranda leaves Kshara & Hingu*		*Hingu*	
	Aq.	Al.	Aq.	Al.	Aq.	Al.
Carbohydrate						
Molish test	+ve	+ve	+ve	+ve	+ve	+ve
Benedict test	-ve	-ve	+ve	+ve	+ve	+ve
Fehling test	-ve	-ve	-ve	-ve	+ve	+ve
Alkaloids						
Dragendroff test	+ve	+ve	-ve	+ve	-ve	-ve
Wagner's test	-ve	-ve	-ve	-ve	+ve	+ve
Hager's test	+ve	-ve	+ve	-ve	+ve	+ve
Amino acids						
Ninhydrine	+ve	+ve	-ve	+ve	+ve	+ve
Protein						
Biuret test	-ve	-ve	-ve	-ve	+ve	-ve
Xanthoprotic test	-ve	-ve	+ve	+ve	+ve	-ve
Millon test	-ve	+ve	-ve	+ve	-ve	-ve
Saponin						

Foam test	-ve	-ve	-ve	-ve	-ve	-ve
Glycosides						
Borntrager's test	-ve	-ve	-ve	-ve	-ve	-ve
Phenolic compounds						
Phenolic test	-ve	-ve	-ve	-ve	+ve	+ve
Steroids						
Salkowaski	-ve	-ve	-ve	-ve	+ve	+ve
Tannins						
$Fecl_3$	-ve	+ve	-ve	+ve	+ve	+ve
Lead acetate	+ve	+ve	+ve	+ve	-ve	-ve
Pot. Dichromate	-ve	-ve	-ve	+ve	+ve	+ve

D) CHROMATOGRAPHY

TLC (Thin Layer Chromatography)

S.No.	Sample	Distance of Solvent	Distance of Spot	Rf Value
1.	***Eranda Patra Kshara***	6.5cm	6.5cm	1
			5.5cm	0.84
			3.2cm	0.49
			2.5cm	0.38
			1.4cm	0.21
			1cm	0.15
			o.7cm	0.10
2.	***Eranda Patra Kshara* + *Hingu***	6.3cm	6.3cm	1
			6.1cm	0.96
			5.6cm	0.88
			5.1cm	0.80
			4.2cm	0.66
			3.5cm	0.55
			3cm	0.47
			1.7cm	0.26
3.	***Hingu***	6cm	6cm	1
			5.2cm	0.86
			4.7cm	0.78
			4.2cm	0.7
			3.8cm	0.63
			3.4cm	0.56
			2.7cm	0.45
			2.3cm	0.38
			1.5cm	0.25

DISCUSSION

The evaluation of prepared drugs is necessary due to biochemical variation in drug components, deterioration during preparation & storage, substitution and adulteration. Standardization of drug is must to check its purity and genuineness & to establish its correct identity. All the macroscopic, qualitative and quantitative parameters studied here define the

purity of prepared drug. Moisture content is the water holding capacity of sample, higher the moisture content lowers the stability of drug. Results showed a low value 3.18 % of moisture in *Kshara* which shows its high stability. As per API moisture content in *Kshara* must not cross the 4%.[9] According to the results obtained all 3 samples shows normal moisture content. pH values of all three samples were above 7 which indicates the basic nature of drugs of which *Kshara* had the highest pH of 9.11 on the pH scale. Extract values by different solvents are used to assess the quality, purity and to detect the adulteration. Less extractive value indicates addition of exhausted material, adulteration or incorrect processing during drying or storage or formulating.[10] From the results, high aqueous extract values of *Kshara* and *Kshara* with *Hingu* shows their high purity and quality. Alcohol soluble extract values also signify the same thing. From the results, low petroleum ether soluble extract values of all 3 samples shows the presence of very small amounts of fats, lipids and steroids in the drug. Total ash value of *Kshara* as obtained from the results was very high 95.83% out of which only 6.73% was acid insoluble and 87.14% was water soluble ash. Total ash is the amount of material remaining after ignition. This includes both physiological ash (derived from plant tissue itself) and non physiological ash which is the residue of extraneous matter adhering to plant surface.[11]

Acid insoluble ash indicates the siliceous and heavy metal impurities. Results shows low amount of acid insoluble ash of all 3 samples. Water soluble ash gives an estimation of inorganic contents. High water soluble ash values from the results define the good quality of drug. Phytochemical screening results shows positive test for Carbohydrates, Alkaloids, Amino acids, Tannins and shows negative tests for Proteins, Saponins, Glycosides, Phenolic compounds and Steroids.[12] Thin layer Chromatography is a tool for separation, identification, quantification and isolation of chemical constituents of medicinal plants. Mobile phase solution of Toluene: Chloroform: Methanol (5:3:4) was used.[13] Spots were first viewed under visible light, then under UV radiation 366nm & 254nm and also in Iodine chamber. Spots obtained in *Kshara* sample were 7 of which highest distance travelled by solute is 6.5cm, in *Hingu* were total 9 spots noted and highest distance travelled was 6 cm. In 3rd sample total 8 spots were noted and highest travelled distance was 6.3cm. Analyzing the above results, quality of the *Eranda* leaves *Kshara* and *Hingu* was found good. These results were documented for future reference.

CONCLUSION

Karma or action of any drug in the body depends on its active compounds. Also these active compounds or physio-chemical parameters are the base to check the purity and correct identity of any drug for a safe and effective clinical use of drug, it must fulfill the standardization parameters established in API. Physio-chemical parameters of *Eranda* leaves *kshara* are not mentioned in API. But this *Kshara* has been mentioned in *Samhitas* for treatment of many diseases. The physio-chemical evaluation was done for the drug and obtained values were documented for further reference, more pre-clinical and clinical researches can be done regarding the drug. As this study provides data regarding quality parameters of *Eranda* leaves *Kshara*, so it would be a reference document for authentication of drug and can be helpful for researchers and many pharmaceutical industries.

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