

## STANDARDIZATION OF *ATASI BEEJA* (*LINUM USITATISSIMUM* LINN) W.S.R TO PHYSICOCHEMICAL AND PHYTOCHEMICAL EVALUATION

T. Mahesh Babu<sup>1</sup> Ch. Ravi Kumar<sup>2</sup>

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### ABSTRACT

Plants can be described as a major source of medicines, not only as isolated active principles to be dispensed in standardized dosage form but also as crude drugs for the population. In the present scenario, the demand for herbal products is growing exponentially throughout the world and major pharmaceutical companies are currently conducting extensive research on plant materials for their potential medicinal value. Growing demand, the market value and the lack of quality of raw materials which affects the safety and efficacy created the need for standardization and critical evaluation of the herbal drugs. Flaxseed is one of the most important oilseed crops for industrial as well as food, feed, and fibre purposes. This article highlights the importance of standardization of *atasibeeja* considering evaluation of the pharmacognostical, physicochemical and phytochemical parameters. The Pharmacognostical and physicochemical results were found to be genuine as per the standards *Ayurvedic Pharmacopoeia* of India. The phytochemical study of *atasibeeja* shows 40% of fixed oil content and is a good source of various phytochemicals. This study of *atasibeeja* can serve as a preliminary step towards its standardization emphasizing the need of further research.

**Keywords:** *Linum usitatissimum* Linn *atasibeeja*, standardization, physicochemical,

### INTRODUCTION

Ever since the excipients of mankind on earth there has been a relationship between life, disease and plants. Primitive people started using plants and found that majority of plants were suitable as food, where as other were either poisonous or medicinally useful. By their experience, this knowledge of herbal remedies was transferred to generation as folk medicine. So the history of herbal medicine is as old as human history. Herbal medicine is still the mainstay of about 75–80% of the world's

population, mainly in developing countries, for primary health care because of better cultural acceptability, better compatibility with the human body and lesser side effects. It is estimated that approximately one quarter of prescribed drugs contain plant extracts or active ingredients obtained from or modelled on plant substances.

Most of the plant-derived drugs were originally discovered through the study of traditional cures and folk knowledge of indigenous people and some of these could not be substituted despite the enormous advancement in synthetic chemistry. Consequently, plants can be described as a major source of medicines, not only as isolated active principles to be dispensed in standardized dosage form but also as crude drugs for the population. In the present scenario, the demand for

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T. Mahesh Babu<sup>1</sup> Ch. Ravi Kumar<sup>2</sup>  
PG Scholar, Professor & HOD,  
Department of Dravyaguna, Dr. B.R.K.R. Govt  
Ayur College, Hyderabad, Telangana, India  
**E-mail:** mahe1brick@gmail.com

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herbal products is growing exponentially throughout the world and major pharmaceutical companies are currently conducting extensive research on plant materials for their potential medicinal value. Growing demand of herbal products, the market value and mainly the lack of quality of raw materials which affects the safety and efficacy created the need for standardization and critical evaluation of the herbal drugs.

### **Linum usitatissimum Linn**

Flaxseed is one of the most important oilseed crops for industrial as well as food, feed, and fibre purposes. Almost every part of the flaxseed plant is utilized commercially, either directly or after processing. Flaxseed is emerging as an important functional food ingredient because of its rich contents of quality protein, soluble fibre, -linolenic acid (ALA), lignans, and fibre. This article highlights the importance of standardization of *atasibeeja* considering the pharmacognostical, physicochemical and phytochemical parameters and emphasizing the need of further research.

*Atasi* (*Linum usitatissimum* Linn.) belongs to the family Linaceae. It is a native of Egypt but also cultivated in India for the purpose of its oil & fibres and is best adapted to fertile, fine textured, clay soils. It is an annual herb with 60-120 cm high; its leaves are linear, lanceolate or ovate, Flowers are small, blue, bluish violet. Fruits are capsular with 5 cells containing compressed, ellipsoid, smooth, dark brown and shining seeds. Seeds are mucilaginous, oily and slightly bitter in taste. 10-20 seeds in the capsule, oval lenticular 4-6 mm in length. Surface is smooth, shiny and dark brown. [1]

### **Vernacular names:**

**Sanskrit** : *Uma, Ksuma* ; **Assamese** : *Tisi, Tusi* ; **Bengali** : *Masina, Atasi*; **English** : *Linseed* **Gujrati** : *Alshi, Arasi*; **Hindi**: *Alsi*; **Kannada** : *Agasebeeja, Semeagare, Agasi*; **Kashmiri** : *Alsi*; **Malayalam** : *Agastha, Agasi, Cheru charm* **Marathi** : *Atshi*; **Oriya** : *Atushi* ; **Punjabi** : *Ali* **Tamil** : *Ali, Virai* ; **Telugu** : *Avisa* ; **Urdu** : *Alsi, Katan* [2] *Atasi* possess sweet (*madhura*), bitter (*tikta*) taste, unctuous (*snigdha*), hot potency (*ushnavirya*) and pungent end metabolism (*katuvipaka*). It alleviates *vata* and also pacifies *pitta* and *kapha*. Flax seed oil has sweet taste (*madhura rasa*), promoting digestion and metabolism (*Agneyaguna*), heavy (*guru*), unctuous (*snigdha*), hot (*ushna*) properties

and promotes vitality (*bala*). It pacifies *vata*dosha and increases *pitta* & *kapha*. It is useful in skin diseases (*kushtha*), worm infestation (*krimi*), dyslipidemia (*medodosh*) and inflammatory condition (*vranashotha*) [3]

### **Aim and objectives:**

- 1) To standardize *flaxseeds*
- 2) To carry out the pharmacognostical, physicochemical and phytochemical analysis of *flaxseeds*

### **Materials and Methods**

Flax seeds were purchased from Begum bazar, Hyderabad. Pharmacognostical evaluation of flax seed including Organoleptic, Transverse sections, Powder Microscopy and Histo-chemical tests were carried out. Transverse sections were made by free hand sections, powder microscopy of flax seed was carried out with and without staining. Slides were first studied under distilled water (without staining), then stained with Phloroglucinol and Concentrated HCl to identify lignified elements. Photomicrographs were taken using Binocular Microscope (10×40) attached with camera. Aqueous and alcoholic extracts were extracted through soxhlet apparatus Physico-chemical analysis and phytochemical analysis were carried out at Dept of *Dravyaguna*, Dr. B.R.K.R. Govt *Ayurvedic* College and Telangana State level Drug Testing Laboratory, Hyderabad as per the guidelines of *Ayurvedic Pharmacopoeia* of India. [4]

### **RESULTS AND DISCUSSION:**

#### **Organoleptic characters**

Organoleptic characters like mucilaginous, sweet in taste, whitish yellow in colour and bland odour.

#### **Macroscopic**

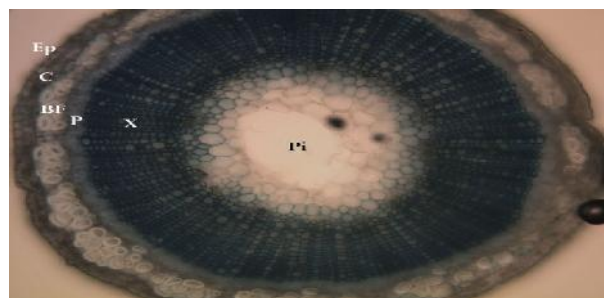
*Atasi* consists of dried, ripe seeds of **Linum usitatissimum**L. (Family: Linaceae) Seed is small, brown, glossy with minutely pitted surface, elongated-ovoid, flattened, rounded at one end and obliquely pointed at the other, near which on **one edge**, a light depression enclosing hilum and **microphyll**, embryo consisting of two yellowish-white, flattened plano-convex cotyledons and a radical, nearly fills the seed and completely surrounded by a thin, whitish endosperm, both endosperm and embryo oily, testa mucilaginous when soaked in water, odour, characteristic, taste, oily when chewed [4], [5]



**Fig 1 Atasi Beeja**

**Microscopic**

Transverse section of seed showed testa consists of isodiametric cells with mucilaginous outer walls, collenchymatous cells of middle layer of seed coat cylindrical, single layered, yellowish brown, longitudinally elongated, thick, and lignified and with pitted walls, single layer of flattened polygonal pigment cells with reddish-brown contents, aleurone grains in the cotyledons, abundant globule of fixed oil [4],[5]



**Figure 2 Transverse section of flax seed,**

**Ep- Epidermis, C-Cortex, BF- Blast fibres, P-phloem, X-xylem**

**Powder Microscopy**

Microscopical characteristics of powdered drug observed were yellow coloured fibre, pitted walls, lignified sclerides, rounded collenchymatous cells in hypodermis and polygonal epidermis cells filled with mucilage, pigment layer, square cells with orange brown mass, aleurone grains and fatty oil globules. (Tanna et al Physicochemical characterization of Atasi)

The present study pharmacognostically shows fibres, lignified sclerides, pigment layer, aleurone grains.

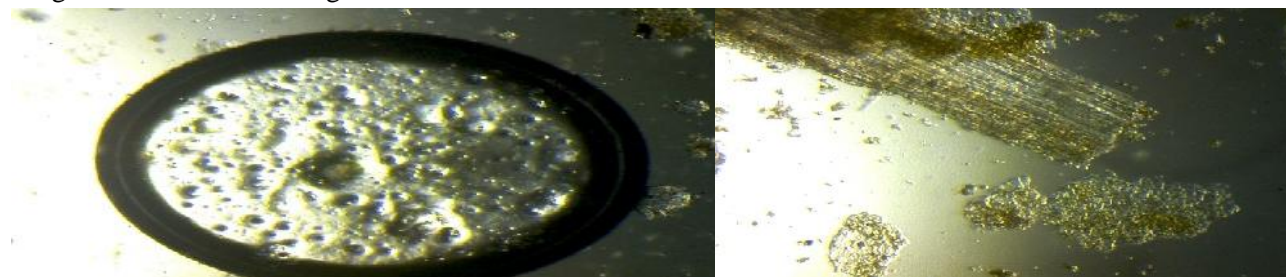
**Histochemical Evaluation:**

**Table 1 Transverse sections of flax seed were subjected to various Histochemical tests**

Sr. No.	Reagent	Observation	Characteristics	Result
1	Phloroglucinol+Conc. HCL	No effervescence	Calcium oxalate	--
2	Phloroglucinol+Conc. HCL	Pink	Lignified sclerides	++
3	Sudan Red III	Red	Oil globules in the cells of endosperm and cotyledon	++

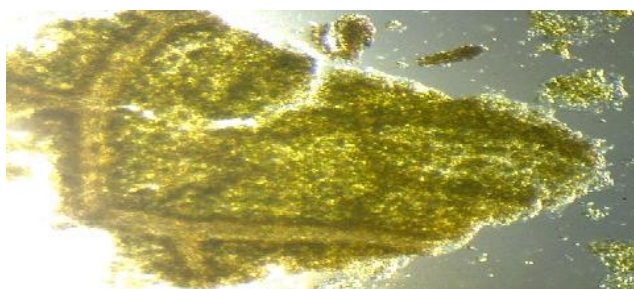
**Fig3 Powder microscopy of Atasibeeja (Linum usitatissimum Linn)**

Oil globules with aleurone grains Fibres



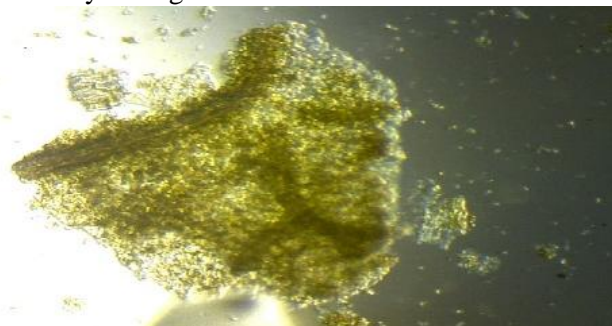
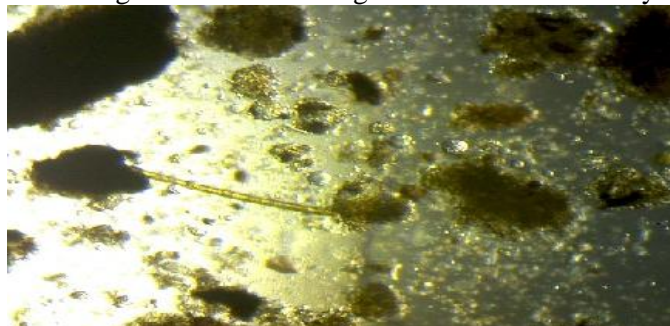
Parenchyma with Protein content





Fixed oil globules &amp; aleurone granules

Sclerenchymatous layer &amp; lignified fibre

**Physico-Chemical Evaluation:**

Foreign matter	: < 1%
Total Ash	: 3.415 %
Acid-insoluble ash	: 2.67 %
Alcohol-soluble extractive	: 7.60 %
Water-soluble extractive	: 4.21%
Fixed oil	: 40%

All the physicochemical parameters are as per the standards of the *Ayurvedic Pharmacopoeia of India* thus proving the genuinity of the drug. Results of physicochemical analysis proves the purity and genuineness of the drug as per the standards of the *Ayurvedic Pharmacopoeia of India* [2]

**Phytochemical Analysis:**

The medicinal value of plants is attributed to the presence of some chemical substances which produce a definite physiological action on human body (Edeoga et al., 2005). These chemical substances are called phytochemicals. The phytochemical screening was assessed by a standard

method as described by (Brinda et al., 1981; Siddiqui and Ali, 1997 and Savithamma et al., 2011). Phytochemical screening was carried out to identify the major natural chemical groups such as Tannins, Saponins, Flavonoids, Phenols, Terpenoids, Alkaloids, Glycosides, Cardiac Glycosides, Coumarins and Steroids. (Mahesh *et al wjpps*, Vol 4, Issue 08, 2015)

The phytochemical study shows 40% of fixed oil content of flax seed. This study conclusively demonstrates that flaxseed (*Linum usitatissimum* L.) is a good source of various phytochemicals like alkaloids, flavonoids, phenol, steroids, coumarins, glycosides, saponins, tannins, terpenoids and also highlighting flaxseed as a natural food supplement with strong antioxidant property due to the high phenol content present in it thus making sense about the need of its standardization.

**Table 2: Qualitative phytochemical analysis of flax seed (*Linum usitatissimum* L.)**

Phytochemicals	Aqueous extract	Alcoholic extract
Tannin	-	-
Saponins	+	+
Quinones	+	+
Steroids	+	+
Coumarins	+	+
Phenols	++	++
Terpenoids	+	+

Cardiac glycosides	-	+
Glycosides	-	-
Flavonoids	-	-
Carbohydrates	+	+
Proteins	+	+

## CONCLUSION

The present study explores Pharmacognostical, physico-chemical and phytochemical study of *atasibeeja* which can serve as a preliminary step towards its standardization. Further study is necessary to explore other parameters related to standardization of flax seed to be carried out indifferent batches to set the limit for the reference standards for the Quality Control and Quality Assurance.

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