

PHARMACOGNOSTIC AND PHYTOCHEMICAL STANDARDIZATION OF ATASI (*LINUM USITATISSIMUM* LINN)

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Abstract

The good old days of herbal medicine is antique. Atasi (*Linum usitatissimum* Linn) is a beneficial herb narrated in Ayurveda. 'Atasi' (*Atatisatatamgachhati*) is the plant which is annual herbaceous growing up to 60- 120 cm of height and useful to prevent all vatavyadhi. It belongs to Linaceae family which is most important medicinal plants traditionally used for not only various diseases but also nutritional purposes. Atasi plant is source of food, feed, fiber, and medicine. Linseed oil rejuvenate body mainly due to its high content in omega-3 alpha linolenic acid (55-57%). In Ayurveda Atasi narrated in aharavarga and tailvarga due to its lots of nutritional value. It is commonly known as flax when grown for the fiber extracted from the stem and as linseed or oilseed flax when grown for the oil extracted from the seed. Also, Flax has various properties including anti-inflammatory, analgesic, antioxidant, antimicrobial, immunomodulatory, insecticidal, antiprotozoanalgesic, anti-hyperlipidemia, anti-hyperglycemic, anti-tumor, wound healing and Feticidal activities. The present study aims to collect nearly all available information about Ayurvedic aspect Phyto-chemical constituents, nutritional value of Flax, as well as pharmacological properties and confirmed therapeutic usage of it.

KEYWORDS: Atasi, *Linum usitatissimum* Linn, Phyto- chemical constituent, Nutritional value, Pharmacological property

INTRODUCTION

Atasi (*Linum usitatissimum* Linn.) commonly known as Flax or linseed. It belongs to Linnaceae family. It cultivated in different nations due to its applications in medicine and industry.¹ It is annual herb and growing up to 60-120 cm height. The flowers are blue, tiny, white, bluish violet in terminal panicles. The fruits are capsular with five cells, each having 2 seeds.² Atasi is mainly cultivated for the purpose of oil and fibre. *Linum usitatissimum* means most useful because of oil obtained from the seeds, nourishment from meal. The Atasi beej (Flax seed) are Balya (Tonic), Inigdha (Oily), Vedanasthapaka (Demulcent) properties mentioned in Bhavprakash Nighantu.³ It contains omega-3 essential fatty acids, Lignans and fibers.⁴ The plant has displayed distinct pharmacological and biological activities like anti-inflammatory, analgesic, antioxidant, antimicrobial, immunomodulatory, insecticidal, anti- hyperglycemic, anti-hyperlipidemia activities. This article provides available information on pharmacological actions and chemical constituent of Atasi plant.

Aim and Objectives-

To accomplish the pharmacognostical and phytochemical analysis of Atasi.

MATERIALS AND METHODS

Pharmacognostical evaluation of atasi including organoleptic, transverse sections, powder microscopy and histo-chemical tests were carried out. Transverse sections were made by free hand sections, powder microscopy of atasi beej was carried out with and without staining.⁸

Collection of sample- 3 samples of flax seeds were purchased from different laboratories in month of December. Pharmacognostical evaluation of flax seed including organoleptic, transverse section were carried out. Sample were self-collected in December month in from 3 different pharmacies and named as Sample 1, Sample 2, Sample 3.

Observations-

Macroscopic Properties of Atasi beej- Ripe, dried, brown, minutely pitted surface and small seeds which is elongated ovoid, rounded, flattened at one end and pointed at second end, about 4-6 mm long and 2-2.5 mm in maximum width, both endosperm and embryo oily, testa mucilaginous when soaked in water, odour, typical taste, oily when chewed.

Organoleptic characters- It has taste like mucilaginous sweetish, odour is bland and colour is whitish yellow.

Microscopic Properties of Atasi Seed- Transverse section of seed shows testa consists of isodiametric cells with mucilaginous outer walls, collenchymatous cells of middle layered, raw sienna, longitudinally elongated, about 120-190 μ long and 14-17 μ wide, solid, lignified and with pitted walls, solo layer of flattened polygonal pigment cells with reddish-brown contents, aleurone grains in the cotyledons, upto 20 μ in diameter, each with globoid and crystalloid, abundant globule of fatty oil and occasional starch grains present.

Histochemical evaluation- Transverse sections of flax seed were subjected to various Histochemical tests.

Table 1: Histo- chemical tests⁹

Sr.No.	Reagent	Observations			Characteristic s	Result		
		Sample 1	Sample 2	Sample 3		S1	S2	S3
1.	Phloroglucin ol+Conc. HCL	No effervescence	No effervescence	No effervescence	Calcium Oxalate	--	--	--
2.	Phloroglucin ol+Conc. HCL	Pink	Pink	Pinkish Red	Lagnified sclerides	++	++	++
3.	Sudan Red III	Red	Reddish brown	Red	Oil globules in cells of endosperm and cotyledon	++	++	++

Physico- Chemical Composition- The sample of flax seed was first subjected to fixed oil content parameter and the result showed that it contains 42.05% fixed oil which confirms the genuinity of the drug as per API standards.

Table 2: Shows physico- chemical parameters

Physico-chemical parameters	Sample 1	Sample 2	Sample 3
Parameters	Atasi Taila	Atasi Taila	Atasi Taila
pH	6.66	6.66	6.67
Viscosity	0.0525	0.0524	0.0525
Refractive Index	1.9865	1.9864	1.9865
Acid value	1.021 mg/g	1.021 mg/g	1.021 mg/g
Specific Gravity	0.9177 gm/ cm ³	0.9177 gm/ cm ³	0.9177 gm/ cm ³
Iodine Value	106 mg/ g	107 mg/ g	106 mg/ g
Saponification Value	182 mg/ g	181 mg/ g	182 mg/ g
Density	236.69 g/m ³	236.69 g/m ³	236.69 g/m ³
Foreign Matter	0.02%	0.02%	0.02%

Flax seed oil, being a rich source of Omega 3 fatty acids, has a potential role neurological and brain health. The present study explores pharmacognostic and histo-chemical analysis of atasi beeja which can play preliminary step towards standardization of flax seed oil.

DISCUSSION

In Ayurveda action of drug is understood on the basis of composition i.e. rasa panchakas. Tikta rasa, katu vipaka, Ushna veerya of Atasi Beeja which reduces vata and kapha prakopa. It has also analgesic and anti- inflammatory property. Tikta Rasa performs ama pachana and thus competent for digestion. Katu vipaka and ushna veerya helps in vatashaman. Atasi Taila is indicated in medodosh. So, it reduces Stambha and Shoola. *Linum usitatissimum* contains palmitic, chlorogenic acid- its isomer, oleic, stearic, linoleic acids, besides amino acids and sugars. The seeds of Atasi contain Fatty oil (30- 40 %), mucilage (3-10 %) in epidermis, Cynogenic Glycosides (0.05-0.01 %) mainly Lignans; Linustanin, Neolinustatine and Linamarin; Phenylpropane derivatives including linusitamarin. The seeds are an excellent source of dietary alphanolenic acid for modifying plasma and tissue lipids. It is also a rich source of Omega-3 Fatty Acids. Thus, Atasi is very useful drug in Ayurveda in various manner internal as well as external. According to API Standards, atasi tail has pH 6.66, viscosity 0.0525, Refractive Index is 1.9865, Acid value 1.021 mg/g, Specific gravity 0.9177 gm/ cm³, Iodine value 106 mg/ g, Saponification value 182 mg/ g, density is 236.69 g/m³, foreign matter 0.02%.

CONCLUSION

Atasi (*Linum usitatissimum* Linn) content of omega-3 alpha linolenic acid which can be endogenously converted to longer chain omega 3 fatty acids. This study pharmacognostically present fibres, lignified sclerides, pigment layer, aleurone grains. The phytochemical study shows that 42.05% of fixed oil. It supports the fact that Omega- 3 fatty acids affect brain derived neurotrophic factor, which encourages synaptic plasticity, provides neuroprotection, enhances neurotransmission and has anti- depressant effects. The plant has displayed distinct pharmacological and biological activities like anti-inflammatory, analgesic, antioxidant, antimicrobial, immunomodulatory, insecticidal, anti- hyperglycemic, anti-

hyperlipidemia activities. This article provides available information on pharmacological actions and chemical constituent of Atasi plant.

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