



## Investigation of pharmacognostical parameters of *Moringa oleifera* lam. and *Syzygium cumini* (L.) skeels

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### Abstract

The traditional system of medicine is so ingrained in our culture that, about 80 % of the Indian population depends on this indigenous system for relief. With such a huge section of an ever increasing population relying on herbal remedies, it is imperative that the plant products which have been in use for such a long time be scientifically supported for their efficacy. The present paper deals with the investigation of pharmacognostical parameters of seeds of *Moringaoleifera* Lam. and *Syzygiumcumini* (L.) Skeels. In these study physicochemical parameters, extraction and preliminary photochemical screening was reported.

**Keywords:** herbs, pharmacognostical parameters, extraction

### Introduction

In the last few years there has been an exponential growth in the field of herbal medicine and these drugs are gaining popularity both in developing and developed countries because of their natural origin and less side effects. Many traditional medicines in use are derived from medicinal plants, minerals and organic matter. A number of medicinal plants, traditionally used for over 1000 years named rasayana are present in herbal preparations of Indian traditional health care systems. In Indian systems of medicine most practitioners formulate and dispense their own recipes. The World Health Organization (WHO) has listed 21,000 plants, which are used for medicinal purposes around the world. Among these 2500 species are in India, out of which 150 species are used commercially on a fairly large scale. India is the largest producer of medicinal herbs and is called as botanical garden of the world. <sup>[1]</sup> The present work was aimed on development of standardization parameters of selected herbs used in the treatment of diabetes mellitus, a major crippling disease in the world leading to huge economic losses. *Moringaoleifera* Lam., Family: Moriaceae is commonly cultivated throughout India up to 1500 m. All part of the plant is used medicinally. The leaves and fruits are rich in iron, proteins and vitamins. The plant possess analgesic, anti-inflammatory activity and used extensively for the treatment of ulcer in traditional system of medicine. *Syzygiumcumini* (L.) Skeels, Family: Myrtaceae is commonly Cultivated throughout India up to 1800 m. Bark is used in nonspecific acute diarrhoea and in topical therapy for mild inflammation of the oral-pharyngeal mucosa; externally in mild, superficial inflammation of the skin. The seed is used in hyperglycaemia and polyuria. Seed extract exhibited potent anti-inflammatory action against both exudative and proliferative and chronic phases of inflammation, besides exhibiting significant anti-arthritis, antipyretic and analgesic activities <sup>[2]</sup>.

### Material and Methods

#### Selection, Collection and Authentication of the plant materials

The seeds of *Moringaoleifera* Lam. (Sarjan) and *Syzygiumcumini* (L.) Skeels (Jamun) were extensively used in the treatment of ulcer as mentioned in folklore; several tribal people of India are using these plants for the treatment of ulcer, therefore these plants were selected. The seeds of the plant were collected from local area of Bhopal in the month July-Sep. 2019 and were authenticated by Dr. S.N. Dwivedi, Retd. Professor & Head, Department of Botany, Janata PG College, Rewa, (M.P.) and was deposited in our laboratory, Voucher No. J/Bot/2019-117MOS & J/Bot/2019-118SCS were allotted to the selected plant on the date 13/09/2019.

#### Pharmacognostical Evaluation <sup>[3-5]</sup>

##### Macroscopic studies

The macroscopy of different parts of the plant such as color, odor, size, shape, taste, surface characters and fractures were carried out.

##### Physicochemical Evaluation

The dried parts were subjected to standard procedure for the determination of various physicochemical parameters.

##### Determination of foreign organic matter (FOM)

Accurately weighed 100 g of the drug sample and spread it out in a thin layer. The foreign matter should be detected by inspection with the unaided eye or by the use of a lens (6X). Separate and weigh it and the percentage present was calculate.

##### Determination of moisture content (LOD)

Place about 10 g of drug (without preliminary drying) after accurately weighing in a tared evaporating dish and kept in oven at 105<sup>0</sup> C for 5 hours and weigh. The percentage loss

on drying with reference to the air dried drug was calculated.

#### Determination of ash value

The determination of ash values is meant for detecting low-grade products, exhausted drugs and sandy or earthy matter. It can also be utilized as a mean of detecting the chemical constituents by making use of water-soluble ash and acid insoluble ash.

#### Total ash

Accurately about 3 gms of air dried powder was weighed in a tared silica crucible and incinerated at a temperature not exceeding 450°C until free from carbon, cooled and weighed and then the percentage of total ash with reference to the air dried powdered drug was calculated. The percentage of total ash with reference to the air-dried drug was calculated.

#### Acid insoluble ash

The ash obtained in the above method was boiled for 5 minutes with 25ml of dilute HCl. The residue was collected on ash less filter paper and washed with hot water, ignited and weighed. The percentage of acid insoluble ash was calculated with reference to the air dried drug.

#### Water soluble ash

The ash obtained in total ash was boiled for 5 minutes with 25 ml of water. The insoluble matter was collected on an ash less filter paper, washed with hot water and ignited to constant weight at a low temperature. The weight of insoluble matter was subtracted from the weight of the ash. The difference in weights represents the water soluble ash. The percentage of water soluble ash with reference to the air dried drug was calculated.

#### Determination of swelling index

Swelling index is determined for the presence of mucilage in the seeds. Accurately weigh 1 g of the seed and placed in 150 ml measuring cylinder, add 50 ml of distilled water and kept aside for 24 hours with occasional shaking. The volume occupied by the seeds after 24 hours of wetting was measured.

#### Determination of extractive value

This method determines the amount of active constituents extracted with solvents from a given amount of medicinal plant material. It is employed for materials for which as yet no suitable chemical or biological assay exists.

#### Cold maceration

Place about 4.0g of coarsely powdered air-dried material, accurately weighed, in a glass-stoppered conical flask. Macerate with 100ml of the solvent specified for the plant material concerned for 6 hours, shaking frequently, then allow to stand for 18 hours. Filter rapidly taking care not to lose any solvent, transfer 25 ml of the filtrate to a tared flat-bottomed dish and evaporate to dryness on a water bath. Dry at 105°C for 6 hours, cool in a desiccator for 30 minutes and weigh without delay. Calculate the content of extractable matter in mg per g of air dried material. For ethanol-soluble extractable matter, use the concentration of solvent specified in the test procedure for the plant material concerned; for water-soluble extractable matter, use water as the solvent.

#### Preparation of extract

The seeds of *Moringaoleifera* and *Syzygiumcumini* were shade dried and reduced to coarse powder in a mechanical grinder and passed through sieve No. 40. The powdered bark was defatted with petroleum ether (40°- 60° C) for about 09 hrs & complete defatting was ensured by placing a drop from the thimble on a filter paper which did not exhibit an oily spot. The defatted material was removed from the Soxhlet apparatus and air dried to remove last traces of petroleum ether. The defatted material was subjected to extraction by hydroalcohol as solvent. The extracts were collected in a tared conical flask. The solvent was removed by distillation. Last traces of solvent being removed under vacuum. The extract obtained with each solvent was weighed to a constant weight and percentage w/w basis was calculated. The obtained crude extract was stored in dark glass bottles for further processing. The extracts thus obtained were subjected to phytochemical analysis.

#### Preliminary phytochemical screening of extracts

The various extract obtained after extraction were subjected for phytochemical screening to determine the presence of various phytochemical present in the extracts. The standard procedures were adopted to perform the study.

#### Results and Discussion

The plant parts viz., seeds of *Moringaoleifera* Lam. (Sarjan) and *Syzygiumcumini* (L.) Skeels (Jamun) were collected from local area of Bhopal, Madhya Pradesh, India and identified morphologically and compared with standard pharmacopoeial monograph. The sample of drug was also identified & authenticated by Dr. S. N. Dwivedi, Retd. Prof. and Head, Department of Botany, Janta PG College, A.P.S. University, Rewa, (M.P.) The macroscopy of different parts of the plant such as color, odor, size, shape, taste, surface characters and fractures were carried out. The results were presented in table 1. The shade dried coarsely powdered plant material of seeds of *Moringaoleifera* Lam. (Sarjan) and *Syzygiumcumini* (L.) Skeels (Jamun) were subjected to standard procedure for the determination of various physicochemical parameters. The results were presented in table 2. The seeds of *Moringaoleifera* and *Syzygiumcumini* were shade dried and reduced to coarse powder in a mechanical grinder and passed through sieve No. 40. The powdered bark was defatted with petroleum ether (40°- 60° C) for about 09 hrs & complete defatting was ensured by placing a drop from the thimble on a filter paper which did not exhibit any oily spot. The defatted material was removed from the Soxhlet apparatus and air dried to remove last traces of petroleum ether. The defatted material was subjected to extraction by hydroalcohol as solvent. The extracts were collected in a tared conical flask. The solvent was removed by distillation. The extracts obtained were evaluated for pH, color and % yield. The results are presented in table 3.

**Table 1:** Macroscopic Characters of *Moringaoleifera* Lam. and *Syzygiumcumini* (L.) Skeels

S/No.	Parameters	MOS	SCS
1.	Color	White	Deep purple
2.	Odor	Characteristics	Sweet
3.	Taste	Sweet	Sweet
4.	Shape	Oval & triangular	Oval
5.	Size	Variable	Variable
6.	Surface character	Smooth	Rough
7.	Fractures	Absent	Absent

**Abb:** MOS=*Moringaoleifera* Lam. (seeds); SCS=*Syzygiumcumini* (L.) Skeels (Seeds)

**Table 2:** Physicochemical Evaluation of *Moringaoleifera*Lam. and *Syzygiumcumini* (L.) Skeels

S/No.	Parameters	MOS	SCS
1.	FOM	1.19±0.02	2.17±0.28
2.	LOD	4.11±0.25	3.02±0.02
3.	TA	8.74±0.28	9.32±0.02
4.	AIS	1.06±0.02	2.34±0.92
5.	WSA	2.34±0.81	2.11±0.06
6.	SI	2.10±0.17	3.22±0.18
7.	WSEV	18.32±1.18	19.98±1.02
8.	ESEV	6.11±1.02	12.34±1.27

**Note:** All values are expressed as Mean ± SEM, n=3  
**Abbr:** MOS=*Moringaoleifera* Lam. (seeds); SCS=*Syzygiumcumini* (L.) Skeels (Seeds)

**Table 3:** Estimation of % Yield of HydroalcoholicExtract of *Moringaoleifera*Lam. And *Syzygiumcumini* (L.) Skeels

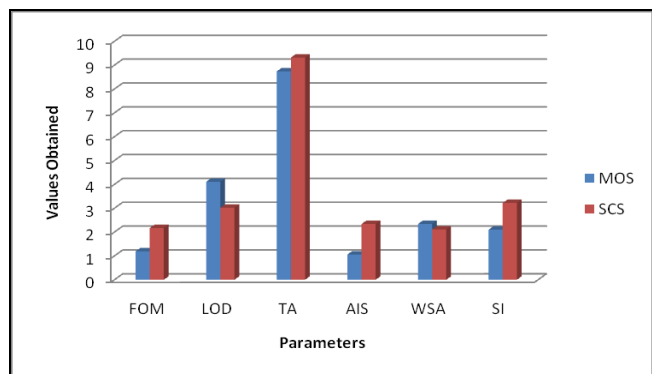
S/No.	Extract	Parameters			
		Nature of Extract	Color	pH	% Yield
1.	Haemos	Semi Solid	Cream	7.01	12.43
2.	Haescs	Semi solid	Light Purple	7.02	18.61



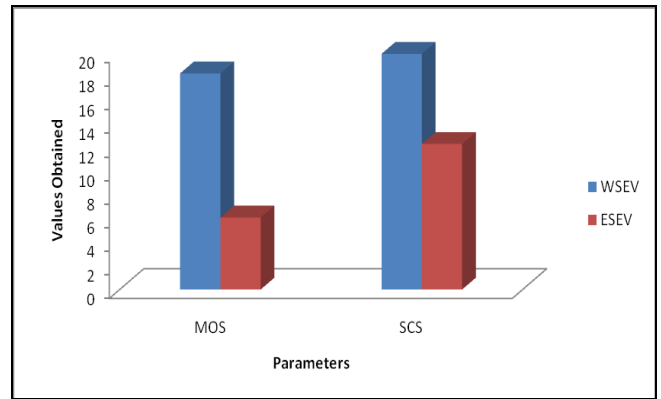
**Fig 1:** *Moringaoleifera*Lam. (Seeds)



**Fig 2:** *Syzygiumcumini* (L.) Skeels (Seeds)



**Graph 1:** Physico-chemical evaluation of *Moringaoleifera*Lam. And *Syzygiumcumini* (L.) Skeels



**Graph 2:** Extractive values of *Moringaoleifera*Lam. and *Syzygiumcumini* (L.) Skeels

The hydro-alcoholic extract obtained after extraction were subjected for phytochemical screening to determine the presence of various phytochemical present in the extracts. The standard procedure was adopted to perform the study. The results were presented in table 4

**Table 4:** Preliminary Phytochemical Screening of *Moringaoleifera* Lam. and *Syzygiumcumini* (L.) Skeels

S/No.	Constituents	Seed Extract	
		Haemos	Haescs
1.	Carbohydrates	+	+
2.	Glycosides	-	+
3.	Alkaloids	-	-
4.	Protein & Amino acid	+	-
5.	Tannins & Phenolic compounds	-	+
6.	Flavonoids	-	+
7.	Fixed oil and Fats	+	-
8.	Steroids& Triterpenoids	+	+
9.	Waxes	-	-
10.	Mucilage & Gums	-	-

+ = Present; - = Absent

**Conclusion**

The present work was undertaken to revel the pharmacognostical parameters of seeds of *Moringaoleifera*Lam. and *Syzygiumcumini* (L.) Skeels. In these study physicochemical parameters, extraction and preliminary photochemical screening was reported.

**References**

1. Seth SD, Sharma B. Medicinal plants of India. Indian J. Med. Res,2004;120:9-11.
2. *The Ayurvedic Pharmacopoeia of India*, Part-I, Vol-I, Published by The controller publication, Govt. of India, Ministry of Health & Family Welfare, 2001, 137-146.
3. Divakar MC. *Plant drug evaluation-a laboratory guide*, published by, CD remedies, 2<sup>nd</sup> Ed, 2002, 84-92.
4. Kokate CK. *Practical Pharmacognosy*, Vallabh Prakashan, Delhi, 4<sup>th</sup> Edition, 1997, 107-111.
5. Khandelwal K.R., *Practical Pharmacognosy*, Thirteenth edition NiraliPrakashan, Pune, 2005, 149-156.