



**PRELIMINARY PHYSICO-CHEMICAL & PHYTO-COGNOSTICAL EVALUATION OF
THE *PROSOPIS CINERARIA* (L.) DRUCE STEM IN EAST U.P(INDIA) REGION**

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Article Received on 30/08/2023

Article Revised on 20/09/2023

Article Accepted on 10/10/2023

ABSTRACT

Ayurvedic herbal medicines ensure physical and mental health without side effects containing the natural ingredients. Herbal medicine prepare different part of plant are used. It is an important source of Indian system of medicine. Herbal plants are huge sources of secondary metabolites. Secondary metabolites are responsible for different pharmacological activity. *Prosopis cineraria* (L.) Druce, (Family Leguminosae) common name is Ghaf,shami are broadly used in traditional system of medicine throughout different part of India. It is widely available Pakistan, but smaller populations occur in Iran, Afghanistan, and the Arabian Peninsula also *P. cineraria* (L.) is an important native species to the Northeastern United Arab Emirates (UAE) regions. The *Prosopis cineraria* (L.) Druce occurs in most of the world's hot arid and semi-arid regions as native. The study of diseases and their treatment are important part of our ancient time worldwide. Its leaves, roots, stem, and bark have beneficiary actions for medicinal purposes such as Antioxidant activity, Antidiarrheal activity, Antibacterial activity, Analgesic activity, Antihyperglycemic activity, Anti-cancer activity, Antitumor activity, Bronchodilatory activity, Skeletal muscle relaxant and Anticonvulsant activity. It is used to treatment of anxiety, asthma, bronchitis, dyspepsia, fever, dysentery, leprosy, piles, and tremors, asthma, bronchitis, dysentery, leukoderma, leprosy, muscle tremors and piles. The main aims of this research are Preliminary physico-chemical & Phytocognostical evaluation of the stem parts. The current study deals with the characterization of morphological features, determination of physical constant such as the Total ash value 13.5%, Loss of weight drying was 10.01%, foaming index >100, swelling index were 1.4cm, the percent yield for methanol 12.5%, and aqueous 16.01%.

KEYWORDS: *Prosopis cineraria*, Fabaceae, Ghaf, swelling index.

INTRODUCTION

The Ayurvedic herbal medicines help bring arogya to human body and mind ("arogy" means free from disease) while allopathic drugs/medicines have more side effects due to the presence of various toxic chemicals. Herbal drugs are key resource worldwide to treatment & prevention of different diseases. India has number of approved indigenous systems of medicine viz-Ayurveda, Siddha, Unani, Homeopathy is applied for the health care of mankind.^[1] Herbal plants are economical and more acceptable globally. Many of the modern medicines & different traditional system of medicine the basic composition is derived from medicinal plants and has become acceptable for easy availability, least side effects, and low prices, eco-friendlily & curative property compared to allopathic medicine.^[2-3] In the studies of the World Health Organization, it is estimated that aprox 80 per cent of the population of developing countries relief on traditional plant-based medicines for their health requirements.^[4-7] There are several factors

for the persistent popularity of traditional drugs and one is their ready availability as compared to the modern medicines besides the adverse effects of synthetic drugs.^[8] *Prosopis cineraria* (L.)Druce. (Family Fabaceae), is locally known as shami, Ghaf. The plant effects socially, ethnologically, traditionally and remedially in the life of the people. *Prosopis cineraria* is an almost evergreen tree growing to 6.5 m in height. It has an open crown that becomes rounded under lopping. The bole is 2 m high, straight, up to 30 cm in diameter. *Prosopis cineraria* has many internodal thorns, like rose-trees. It has a deep taproot going down to 3 m or even deeper (down to 20 m). The leaves are pinnately (3 pinnae) compound, petiolated. The leaflets are glabrous or puberulous, borne on 2-7 cm pinnae, in 7-1 pairs. Leaf blade is ovate, without nerves, mucronate, 4-15 mm long 2-4.5 mm broad. The leaflets are greenin color, becoming grey when dry. yellow-green flowers. The fruit is an elongate, sub cylindrical pod, 8-19 cm long 4-7 mm in diameter. The pods contain 10-25 seeds, oval-shaped and

brown-colored There may be considerable variation in growth rates, pod size and composition.

Common names of plant are in shami, khejri, jandi, sangria, long, jand, kandi, vanni, sumari, jammi and jund respectively. Synonyms of the plant are *Adenanthera aculeate* Roxb, *Mimosa cineraria* L, *Prosopis spicigera* and *Prosopis spicata* Burm. *Prosopis cineraria* (L.) Druce. is an important drug of Indian system of Medicine (ISM). It is show Antioxidant activity,^[9] Antidiarrheal activity,^[10] Antibacterial activity, Analgesic activity,^[11] Antihyperglycemic activity,^[12] Anti-cancer activity¹³, Antitumor activity, Bronchodilatory activity, Skeletal muscle relaxant and Anticonvulsant activity. The Great Indian Desert, popularly known as the Thar, the arid regions are characterized by the extremely arid climate with low and erratic rainfall, dry atmosphere and high wind velocities. *P. cineraria* (L.). Its population is centered on the of India and Pakistan, but smaller populations occur in Iran, Pakistan, Afghanistan, and the Arabian Peninsula, *P. cineraria* (L.) is an important native species to the Northeastern United Arab Emirates (UAE) and Oman. *Prosopis* has been reported to occur in 129 countries globally and many more countries are climatically suitable. The use of paste, gum, and smoke from leaves and pods used as anticancer, antidiabetic, anti-inflammatory, and antimicrobial purposes. Fresh Leaves juice mixed with lemon juice issued for dyspepsia; extract of crushed pods is used for earache, toothache. The leaf paste applied on boils and blisters; leaf infusion on open sores on the skin. The stem bark has folkloric repute to possess anti-inflammatory, anti rheumatic, tonic, and vermifuge. Also used in the treatment of anxiety, asthma, bronchitis, dyspepsia, fever, dysentery, leprosy, piles, and tremors, asthma, bronchitis, dysentery, leukoderma, leprosy, muscle tremors and piles. The bark is used as a remedy for rheumatism, cough, common cold asthma and scorpion stings, and also against miscarriage. It studied detoxifying action of aqueous bark extract of *P. cineraria* (L.) against crude venom for Indian Cobra *Naja naja*.^[14] The ashes of bark are rubbed over the skin to remove hair. The flowers are used as an antidiabetic agent Herbal plants have ability for the formation of secondary metabolites such as steroids, phenolic substances, flavonoids, alkaloids, glycoside etc. These secondary metabolites are used to treatment of many diseases. The secondary metabolites provide a rich biogenic source for novel drug discovery. The metabolites produced by different plants vary from each other. No proper report was found regarding and preliminary physico-phytochemical phyto-cognostical evaluation of *Prosopis cineraria* (L.) Druce, till the date. Standardization of herbal drugs is difficult because generally mixture of constituents and the active constituent in most cases is unknown. Now the present study deal the standardize stem of *Prosopis cineraria* (L.) Druce . Keeping this view the aim of the current study deal the Preliminary physico-phytochemical phyto-

cognostical evaluation of the stem parts of *Prosopis cineraria* (L.) Druce.



MATERIALS AND METHODS

Prosopis cineraria (L.) Druce stem were collected from fields of Itaura, district of Azamgarh, Uttar Pradesh, India in the month of February and authenticated by Dr. Anil Kumar Pharmacognist, Pharmacy College, Azamgarh, Uttar Pradesh, India. A voucher specimen has been preserved in Department of Pharmacognosy, Pharmacy college Azamgarh, Uttar Pradesh, India for future reference (Voucher specimen no. PCA-01/2/23). The stem parts were dried under shade and powdered (40 mesh size) and stored in airtight containers.

Macroscopical studies

The stem of the plant were studied for their macroscopic characters such as color, odour, taste, shape and size of the stem. The macroscopic characters were studied as per given procedure in WHO guidelines on quality control methods for medicinal plants materials.^[15]

Physicochemical and Phytocognostical studies

The loss on drying,^[16,17] ash value,^[18-19] foaming index,^[20] swelling index,^[15,21] phytochemical screening,^[22-24] microscopy,^[25-26] extractive value (methanol and water), foreign matter were determined according to the official methods of Ayurvedic Pharmacopoeia of India.^[16,27-30] Indian Herbal Pharmacopoeia.^[31] and the WHO guidelines.^[15]

Extraction method

The powdered plant material was extracted with methanol, aqueous respectively using a maceration process. The extracts were concentrated to dryness in vacuum individually to get Methanol extract (MEPC), Aqueous extract (AEPC) respectively. The yield of methanol, aqueous extracts were 7.51, 13.01% w/w respectively. The extracts are stored in a desiccator.

RESULT AND DISCUSSION

The macroscopical study of the stem of *Prosopis cineraria* (L.) Druce was done. The bark is thick, rough, deeply fissured and cinereous (ash-grey in colour). The stem were The shrub has much branched or small tree, branches are slender, glabrous, compressed, straight and scattered prickles. The bark is thick, rough, deeply fissured and cinereous (Table-1). The values of the

physical constant like ash values, foreign matter and loss on drying were determined. Extractive value and color of extract was investigated (Table-2). Preliminary qualitative phytochemical screening showed that presence of alkaloids, tannins, flavonoids, and saponins (Table-4). Swelling index contain powered drug 1.4cm.

The height of the foam in every test tube was less than 1cm, the foaming index were less than 100 (table-5). The TS of stem were showed secondary xylem and phloem, parenchyma cells and collenchyma with lower epidermis. Also powder microscopy showed trichomes and fibers.

Table 1: Macroscopical evaluation of *Prosopis cineraria* (L.) Druce stem.

S.NO	Feature	Observation
1.	Color	ash-grey in colour
2.	Odour	Characteristic
3.	Taste	Bark of the plant has sweetish taste
4.	Shape	The shrub has much branched or small tree, branches are slender, glabrous, compressed, straight and scattered prickles. Thebark is thick, rough, deeply fissured and cinereous
5.	Size	Evergreen tree, 10-25m high, short triangular 3-6mm spines.

Table-2: Physicochemical analysis of *Prosopis cineraria* (L.) Druce stem.

S.NO	Solvent	Weight of plant material (gm)	Percentage of yield(%)	Color of extract
1.	Methanol	4	12.5	brownish
2.	Aqueous	4	16.01	Dark brown

Table 3. Physicochemical parameters of *Prosopis cineraria* (L.) Druce stem.

S. No	Physicochemical parameters	Observation
1.	Loss of drying	10.01%
2.	Total ash value	13.5%
3.	Foreign matter	Nil
4.	Swelling index	1.4 cm

Table 4: Phytochemical screening of *Prosopis cineraria* (L.) Druce stem

S. No.	Test	Methanol extract	Aqueous extract
1.	Alkaloids	+	+
2.	Saponins	+	+
3.	Flavanoids	+	+
4.	tannins	+	+

(+)- present, (-)-absent

Table 5: Foaming index of *Prosopis cineraria* (L.) Druce stem Extract.

Treatment	Sample number of the test tube									
	1	2	3	4	5	6	7	8	9	10
Dilutions(drug extract + water)	1:9	2:8	3:7	4:6	5:5	6:4	7:3	8:2	9:1	10:0
Height of foam(cm)	00	0.1	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8

Microscopy of *Prosopis cineraria* (L.) Druce stem

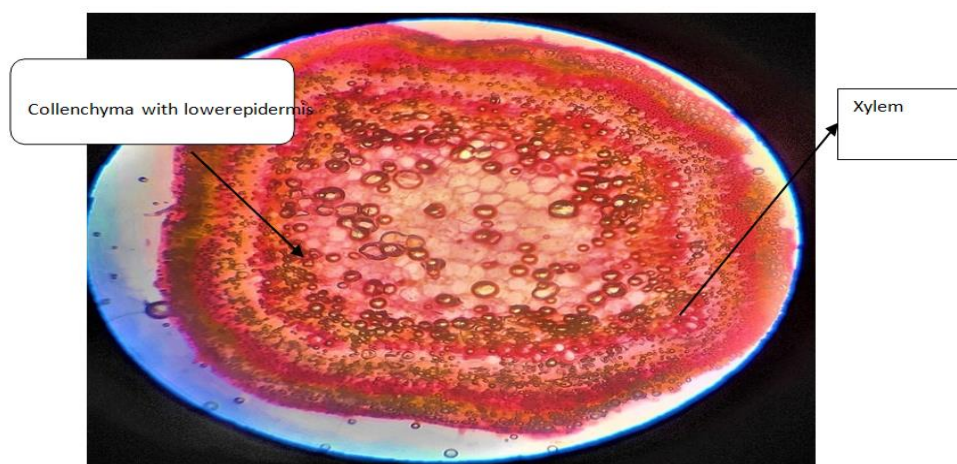


Fig. 1: Microscopy of *Prosopis cineraria* (L.) Druce stem.

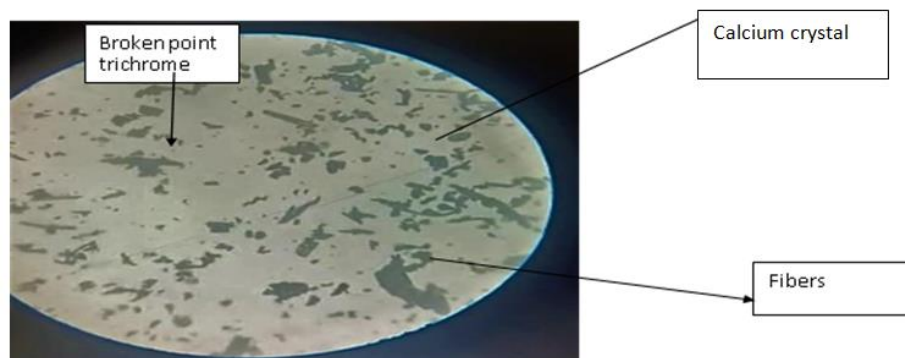


Fig. 2: Powder microscopy of *Prosopis cineraria* (L.) Druce stem.

CONCLUSION

Preliminary physico-phytochemical study of the *Prosopis cineraria* (L.) Druce stem were study concluded to macroscopic, other physical values and parameters will help to identify the species of plant, phytochemical screening will help the presence of compounds, Microscopy is an important tool in the evaluation of crude drugs which is applicable at various levels such as the authentication of the crude drugs, study of powdered drugs, study of T.S. *Prosopis cineraria* (L.) Druce stem is known as wide range of medicinal value, it helps to identification, authentication and standardization. It also require to research on phytochemical and pharmacological aspect. However research going on it would be easier to develop new innovation.

Compliance with ethical standards

ACKNOWLEDGEMENT

Authors sincerely thanks to H.O.D, Department of Pharmacognosy, Pharmacy College, Itaura, Chandeshwar, Azamgarh 276128, Uttar Pradesh.

Conflict of Interest

All the authors hereby disclose no conflict of interest.

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