

IMPORTANT MEDICINAL PLANTS OF JAMMU AND KASHMIR I. KESAR (SAFFRON)

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ABSTRACT: *Kesar has been an important ingredient of the recipes of our ancient physicians in the field of Indian systems of medicine and its cultivation is a monopoly of Jammu and Kashmir. This paper presents in detail the historical review, botanical description, vernacular names, distribution in India and world, cultivation, collection, preservation and storage, adulterants, purity tests, chemical composition, action and uses, folk – lore claims and markets with special reference to its medicinal utility.*

INTRODUCTION

Kesar has been an important ingredient of the receipts of Vagbhata (500 – 100 B. C.) and Sushruta (700 – 600 B. C.) who practised medicine. During second century B. C. Kalidas also referred to the occurrence of this plant in Kashmir. Afterwards the works of Carak and Susruta were translated in Persian and Arabic, a little earlier than 800 A. D., wherein this plant is mentioned by the name of Saffron, derived from the Arabic name “Azaferon”. In the Ayurvedic Literature the plant Kesar has 3 important synonyms i.e. Kashmiran or Kashmirajam and Valhikam, denoting its place or origin. Further its third place of origin had been mentioned by Bhavmishra as “Parsikan” i.e. Iran, but he claims that the best variety of it was of Kashmiri origin. Ab-ul-Fazal (1500 A. D) in his book Ain-e-Akaber confirms the cultivation of the saffron in the fields of Kashmir.

Botanical Name : *Crocus sativus* Linn.

Family : Iridaceae

Botanical Description

A small herb upto 25 cm in height. Root stock a sheathed corm. Corm 3 – 5 cm. diam. Stems none, Leaves radical, narrowly linear, channeled margins curved. Flowers 25 mm across, solitary or clustered, narrowly sessile. Calyx funnel – shaped, tube slender, lobes 6, in 2 series petal – like, light violet, reddish – purple or mauve coloured. Corolla none. Stamens 3, beared, anthers yellow basifixed. Gynoecium 3 – carpellary, 3 – locular, placentation axile, ovary inferior, style pale – yellow branches above into 3 brilliant orange – red stigmas, 25 – 30 mm long. Rolled lengthwise to form a funnel – shaped structures. *The stigmas along with an approximately 50 mm portion of style of a flower in dry state, constitute the pure saffron.*

Vernacular Names

A. India

Bengali	- Jafran
Gujarati	- Keshar
Hindi	- Kesar, Zafran
Kashmiri	- Kong
Malayalam	- Kungumapu
Marathi	- Kesara
Sanskrit	- Agnishekhara, Agnishikha Aruna, Asra, Asrika, Balhika, Chandana, Charu, Dhira, Dipaka, Gaura, Ghasra, Ghasruna, Harichandana, Jaguda, Kaisara, Kaleyaka, Kanta, Kashmara, Kashmiraja, Kunkuma, Lohita, Pishuma, Pitaka, Raja, Rakta, Raktasanjna, Ruchira, Rudhira, Sankocha, Sankochapishuna, Saubhara, Shantha, Shonita, Vara, Varabalhika, Varenya, Vira.
Tamil	- Kugumapu
Telugu	- Kunkumapave
Urdu	- Jafranekar

B. Other countries

Arabic	- Jafrana, Zahafaran
Burmese	- Thanwai
Chinese	- Fan Hung Hua
Danish	- Safran
Dutch	- Saffran

English - Saffron, Saffron crocus, Spanish saffron.

French - Safran, Safram cultivate, Safran d' Espagne, Safran du Gatinaus, Safran oriental, Safran de sicile.

German - Safran

Greek - Krokos

Halian - Giallone, Groce, Grogo, Grotago, Zafferano.

Persian - Larkimasa, Zaafaran

Polish - Szafran

Portuguese - Acafrao

Russian - Schafran

Spanish - Azafran

Swedish - Saffran

Turki - Zafar

Distribution

Saffron is considered to be the native of south Europe and is cultivated in France, Italy, Turkey, Greece, Persia, China, Spain and Australia but Kashmir (India) is regarded the largest producer of it in the world. It is largely cultivated in Pampore (Srinagar) at the height of 1700 m. and in Kistwar at the height of 1900 m. in Jammu province. Recently it has also been cultivated in Ranikhet (U.P.) at the height of 2000 m. on trial basis.

In fact there is firm belief in Kashmir and in the other states in India too that Kesar cultivation is a boon of Kashmir and Saffron can grow only in and around Pampore and to cultivate saffron elsewhere it is necessary to

transfer soil from there to the areas where it is to be cultivated. But it is a myth and now it has been proved that the soil of Pampore has nothing in special so far as the growth of saffron is concerned.

Cultivation

Saffron thrives well in cold regions with warm or sub-tropical climate. It requires a rich, well drained, sandy or loamy soil which is free from clay and decaying humus. The plant is propagated vegetatively by corms. The corms are fleshy structure, and can be observed after removing the film of inter-woven fibre which protects the starchy flesh of the corm.

It is important to prepare raise beds, in the water logged areas, with a convenient slope with all round drains of convenient depth and width giving it the shape of a good vegetable nursery. The soil requires thorough preparation. The small plots raised and squarred surrounded by drains of 22 cm. wide, 15 cm. deep, laid out in well pulverized soil, are quite suitable for transplantation. The corms are planted at the depth of 8 – 10 cm. and 15 – 20 cm. apart in straight rowas with usually a distance of 18 cm. between the rows. The soil is to be broken gently a few times before the flower appears. The plots are hoed and weeded. No manure is applied or irrigated once the plants are established. The corms once established continue to live for 10 – 15 years, new corms being produced annually and the old ones rooting away.

The corms are usually transplanted in the month of August – September. It has been reported that corms sown in July generally succumb to various diseases and do often decay of the soil. About 18.6 quintals of corms are required to plant one acre. In

good soil the corms multiply to about 23.32 quintals in 3 years and double their weight in 10 years. (Fotidar, Agric, Live J & K India, 1934, 4, 242).

Recently it is reported that Agronomists had been dreaming for long to grow saffron, highly valued all over the world beyond the traditional saffron yielding lands of Jammu and Kashmir. So far the crop has been confirmed to pampore in Kashmir valley. Even adjoining fields in the valley were found totally infertile for saffron cultivation. But there has now been a break through in saffron cultivation in Doda district of Jammu & Kashmir, of which Kistwar forms a part. A recent report reveals that they have not only succeeded in increasing the yield of Saffron in the above mentioned area but also extended cultivation of it to new lands. Now the researchers are confident that Saffron can be successfully cultivated wherever certain necessary agro climatic conditions are available.

These facts have experimentally been proved by srivastava *et al.* (1974). According to him, he successfully carried out the experimental cultivation of saffron in lower altitude of 300 meter in Jammu. In total 100 corms were introduced, all of them were germinated, leaves appeared and 60 had come in flower. Remaining would have also been flowered, but due to rains no flowers appeared. Finally he concluded that rains have got adverse effect upon flowering of this plant. The above observation proved that, climatical conditions play an important role in Saffron cultivation. It needs adequate moisture during spring, moderate showers in later summer and bright cool and dry flowering season in autumn. Apart from India other notable cultivators of saffron are Italy, Francee and Spain.

Collection, Preservation and Storage

The plants flower in October – December. For preparation of Saffron, the flowers are collected daily early in the morning soon after the dew disappears. Heavy rains during this period are harmful. Style and stigmas are separated and dried either in sun light or oven – artificial heat.

The quality of the final product varies with the method of extraction of floral parts and subsequent treatment. *The tripartite stigmas plucked from freshly collected flowers and dried in the sun constitute saffron of best quality.* In Kashmir, Saffron is obtained by drying the whole flowers in the sun for 3 – 5 days and then beating them gently with sticks and passing the material through course sieves. The material which passes through is then thrown into water, the petals which float on the surface are thrown away and the parts which sink are collected and dried. The product thus obtained constitutes the first quality of *Mogra* saffron. The portions which has not passed through the sieve is dried, and process of beating with sticks, sieving and throwing into water repeated two or three times. The product obtained each time is inferior to that obtained in the preceding treatment.

The yield per acre is small and the cost of labour high. One lb. of good quality saffron is obtained from about 75,000 flowers (Wentzel, Net. Geogr Mag., 1948, 93, 523). In Kashmir the average yield per acre is about 140 lb. of fresh flowers corresponding to 5 lb. of dried saffron.

The yield of saffron in Kashmir is much lower than those in other countries, where yields of 8 – 11 lb. per acre have been obtained. Irrigation and application of suitable fertilizers account for higher yields. It is cultivated as an irrigated crop in Spain.

In France saffron is uprooted every 3 years and in Italy it is grown as an annual crop (Fotidar, lac. Cit.).

The final product as sold in the market is a loosely mated mass of dark, reddish brown flattened stigmas with a characteristic aromatic odour and bitter taste. When fresh they are glossy (and unctuous) to the touch, but after keeping they become dull and brittle (Wallis, 143).

Adulterations

Saffron is frequently adulterated with styles and stamens of *Crocus sativus* Linn., stigmas of *Zea mays* L., *Calendula* spp., Outer skin of red onion, petals of *Papaver somniferum* L., flakes of *Areca catechu* L., and *Cuscuta* stems, Paper cuttings coated with glycerine is adulterated to increase weight.

Purity test

- (i) It imparts a yellow colour to water, alcohol, methanol, ether, chloroform, but not to xylene and benzene.
- (ii) In sulphuric acid, the saffron stigmas immediately become blue, gradually changing to deep violet or purple and finally purplish – red.

Chemical composition

The average composition of commercial saffron is as follows: Water, 15.6, Starch and Sugar, 13.35; essential oil, 0.6; fixed oil, 5.63; total N – free extract, 43.64; crude fibre, 4.48, and ash, 4.27%. Yields of essential oil and fixed oil as high as 1.37 and 13.4% respectively, have been recorded. The ash is rich in potassium and phosphorous and contains traces of boron (Wehmer, I, 171). Saffron contains the glycosides,

crocin and picrocrocin together with lycopene β -carotene, μ -carotene and Zeaxanthin, and a crystalline hydrocarbon (Mayer & cook, 71; Wallis, loc. Cit). Crocin is the chief colouring principle in saffron. On hydrolysis it yields digentibiose and the carotenoid pigment crocetin. The colourless bitter glycoside, picrocrocin, gives on hydrolysis, glucose and the aldehyde, safranal. The essential oil of saffron (sp. Gr. 15°, 0.9514 – 0.9998) deposits, on standing, stearoptene (m.p., 106°), probably a tertiary alcohol (Mayor & cook, 71; Wallis. Loc. Cit.; U. S. D. loc. Cit.; Winton & winton, IV, 278)

Action & Uses

In action, saffron is aphrodisiac, astringent, cordial, deobstruent, diuretic, emmenagogue, stimulant and stomachic.

The saffron has been an important ingredient of the recipes of Vagbhatt (500 – 100 B.C.), Susruta (700 – 600 B.C.) and Charaka (3000 – 500 B. C.) who practiced medicine. It is generally used as a condiment for its aromatic odour and beautiful colouring and flavouring matter. It is also used medicinally in small doses in rheumatism, menorrhagia, loss of appetite, dyspepsia, diarrhoea and dysentery, vomiting, enlargement of liver and spleen in spasmodic cough, asthma and Catarrhal affections of children, epilepsy, fevers and general tonic. It is a good stimulant to heart, brain, liver and sex. It is given to relieve flatulent colic, amenorrhoea, dysmenorrhoea and leucorrhoea. Passaries of saffron are used in painful affections of the uterus. It gives warmth in snowy areas. Externally saffron is used in headache in the form of paste, also applied to bruisies and superficial sores rheumatic and neuralgic pains and congestion of chest. It is given in anaemia, chlorosis and seminal debility. It is given in

a dose of 1.5 to 3.00 grains. In large doses it is abortifient. It is highly useful as a remedy for infection of urinary bladder and kidney and cures cholera. Dry boiled corms are administered for sciatica and other rheumatic pains. It is good in scabies.

Main Ayurvedic preparations are *Kumkumadi – ghrita* and *Kumkumadaya – taila*.

Medicinal uses

In Ayurvedic system of medicine, the uses of saffron as medicine is available in the ancient codex of Ayurvedic classics. Apart from Caraka Samhita, Susrut Samhita, Astanga Sangraha and Astanga Hridaya, Bhavamishra (16th century A. D.) an eminent physician of Ayurveda had given an excellent picture about saffron and described its properties elaborately. Table I represents the various relevant references available in the ancient Ayurvedic classics of Saffron in different synonyms.

Folklore claims

1. *Bulb of the Saffron for vathasonita / Amavata (Rheumatoid arthritis) preparation of the medicine*

Bulbs of Saffron are to be boiled in Cow's milk and prepared in the form of paste. The paste is to be applied locally when the inflammation appeared in the joints of *Vathasonita / Amavata* (Rheumatoid arthritis) patients.

2. *Saffron for colour complexion.*

120 mg of Saffron if taken every day with one cup of milk by the pregnant women, it is said that the same will give good colour complexion to the new born baby.

TABLE – I

Showing the reference available in Charaka, Susruta, Vagbhatt according to its synonyms

S. No.	Synonyms	Name of the Text Books		
		Charaka Samhita	Susruta Samhita	Astanga Hridaya
1.	<i>Kumkum</i>	Visha chikitsa 23/54, 23/78, 23/190 Three marmeeya chikitsa 26/52 Vathavyathi chikitsa 28/152, 28/162 Vatha sonitha chikitsa 29/113	Sutrasthan 38/24, 46/287 Vathavyathi chikitsa 4/24 Kalpasthan 6/22, 7/33, 8/44 Utharasthan 12/13, 39/248, 39/279, 55/25, 58/31	Suthrasthan 3/11, 3/15, 3/20, 15/43, 21/15 Chikitsasthan 1/137, 7/18, 11/7, 21/77 Utharasthan 5/19, 11/12, 13/23, 13/82, 22/84, 24/7, 27/38, 32/29, 32/33, 35/25, 37/74, 38/18
2.	<i>Valhika</i>	Chikitsasthan 23/102, 30/91	Kalpasthan 6/3	Utharasthan 34/46
3.	<i>Sankoch</i>	Chikitsasthan – 2, Vajeekarana chapter	Nil	Nil
4.	<i>Kashmiram</i>	Nil	Nil	Utharasthan 37/44
5.	<i>Ruchir</i>	Sutrasthan 4/46	Nil	Nil

Markets

In Spain, Albcete is the main market for Saffron, and from there, high grade Saffron is exported to the other parts of the world. Bombay is the main market for the imported saffron in India. Saffron is classified as Asiatic, French, Italian, Spanish etc. according to its origin. In India, Spanish saffron is quoted at higher price than that from Kashmir. The French and Italian saffron do not compete with the Spanish

product; competition to Spain is mainly from the saffron growers of Algeria and the United Arab Republic, whose product is in no way inferior to that of Spain.

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