



Review Article

SURANJANA (COLCHICUM LUTEUM BAKER.) - A RHIZOMATIC PLANT**Malviya Reeta^{1*}, Sharma Ravindra², Tarun Sharma³, Nathani Sumit⁴, Meeta Kotecha⁵**¹Assistant Professor, Dept. of Dravyaguna, Mahatma Jyotiba Fule Ayurveda College, Chomu, Jaipur, Rajasthan, India.²Ph.D. Scholar, ³P.G. Scholar, ⁴Lecturer, ⁵Professor, Dept. of P.G. Studies in Dravyaguna. National Institute of Ayurveda, Jaipur, Rajasthan, India.**Article info****Article History:**

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KEYWORDS: *Suranjana*, *Colchicum Luteum* Baker., Digestive, *Unani*, Antiinflammatory, Analgesic.**ABSTRACT**

The drug with the name '*Suranjan*' commonly in practice today, is the dry extract of underground part of *Colchicum luteum* Baker. Medicinal use of *Suranjana* is majorly seen in *Unani* system of medicine. *Unani* practitioners have been using this drug as digestive, laxative, analgesic and aphrodisiac agent. It is a proven analgesic and a potent uricosuric drug. Its chief active principle colchicine is a well known drug to treat gout. Hence this drug enjoys an important status in *Unani* system of medicine and literature.

In *Ayurvedic* literature it has been first mentioned by Acharya Shankar Dutt Gond, in his *Shanker Nighantu* in 1935 A.D. so its addition to *Ayurvedic* literature is a recent one and its references in *Ayurvedic* literature is not in abundance. According to *Ayurvedic* literature, *Suranjana* is *Tikta* (bitter) and *Katu* (pungent) in *Rasa* (taste); *Laghu* (light) and *Ruksha* (dry) in *Guna* (properties); *Ushna* (hot) in *Virya* (potency); and *Katu* in *Vipak* (metabolism). Because of its properties it is pacifies *Vata Kapha dosh* and hence is a very good anti inflammatory agent. Modern researches on colchicines prove it as an antioxidant, anti inflammatory, antifungal and antibacterial drug. Some research also projects its anti cancer activities. This paper is an attempt to bring this effective drug to lime light by describing palliative, therapeutic and other uses of *Colchicum luteum* Baker.

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There are about seventy species in this genus and two are native to India. The plants under this genus are corm bearing herbs with short scape. *Colchicum luteum* Baker. is an annual herb, Species of *Luteum*, Family *Liliaceae* (*Ayurvedic-rason kul*), Genus *Colchicum*, Divison *Magnoliophyta*, Class *Magnoliosida*, wild in the western Himalayan range and commonly cultivated in India, Afghanistan, Pakistan and Nepal.¹

The word '*Suranjana*' probably came from *unani* language and commonly known as '*Suranjaan-e-Talkh*' in urdu, '*Hiranya-Tuttha*, *Tuthanjana*' in Sanskrit, '*Virkum*' in Kannada, '*HiranTutiya*' in Hindi, '*Suranja*' in Marathi, '*Suranjan-e-Lakh*' in Parashi.²

In English it is known as i). '*Meadow saffron*' – due to its solitary, long, violet and tubular crocus like flowers with six bright red style branches (It differs from crocuses in having 6 stamens, 3 styles, and a superior ovary, while crocuses have only three stamens, one style divided into 3 and an inferior ovary.

ii). '*Hermoactyis*' – as its finger shaped like flower, iii). '*Golden collyrium*' as its perianth is funnel-shaped and golden yellow in colour, iv)'colchicum' as the colchicum grows abundantly at a place of Italy known as *Cholchic*.³

Botanical Description

Colchicum is an annual herb with an underground dark brown; Scaly, oval shape corm. Leaves are 6 to 12 inch in length and 1/3 to 1/2 inch in Board. It is rounded in shape and small when it flowers (It is in leaf from March). Flowers are 1 to 2 inch in length and 1 to 1½ inch board (flowers are hermaphrodite have both male and female organs and are pollinated by bees, flies, self). Perianth is funnel-shaped and golden yellow in colour. Stamens are six in number. Ovary is sessile, three celled with three long styles. Capsules are septicidal with recurved beaks. Fruits are ½ to 1 inch in length and bears seeds. Seeds are 2 to 3 millimeter in diameter and are ovate in

shape, light brown to white in color and are bitter to taste. (All parts of the plant are extremely poisonous).⁴

Classical reference

Description about the drug *Suranjana* and its Ayurvedic properties are not found in Samhitas. Acharya Sankar Dut Gond included *Suranjan* (*Colchicum leuteum* Baker.) in his Sankar Nighantu In 1935 A.D. Later on many other authors of 20th century like Yadavji Trikamji, K.C. Chunekar, Ram Sushul Sing, have also described it as a specific drug for gout and Rhumatic Arthritis treatment. P.V. Sharma has included *suranjana* in *Rakta prasadan varg* (Group of Blood purifiers').

According to Ayurveda it is divide into three categories on basis of its taste and colour colour, these are:⁵

1. *Shweta* (White) – It is *madhur* (Sweet) in taste.
2. *Peeta* (Yellow) – It is small in size and has *tikta* (bitter) in taste.
3. *Krishna* (Black) – It is poisonous and applied externally to reduce pain and swelling.

Distribution and Cultivation

The plant is usually found on the edge of forests or in open grassy places and temperate western Himalayas from Kashmir to Chamba at altitudes ranging from 700 m to 2800 m in India.

It extends up to the Afghanistan, Pakistan, Hind Kush Mountains, Punjab and the areas of Himachal Pradesh and as well including Nepal, Sikkim. In general it is said that it is a plant that is available where climatic condition are low and has temperature lower than 15 degree Celsius.⁶

Natural habitat of *Suranjana* is characterized by physiologically temperate conditions like severe winter, snow, and low humidity. The plant can be successfully propagated through corms which can be extracted from natural habitats when snow melts in April-May. The corms should be free from any injury or infection. About 0.5 million corms are required for planting in 1 hectare of land.⁷

Planting in the field

- a. **Land preparation and fertilizer application** – The fields should be ploughed two to three times to make the soil porous to facilitate planting and sprouting of corms. The corms may rot in water logged condition. Therefore, the fields should be well drained and have some slope. The plant prefers sandy loam soil, and if required, sand may be mixed with soil to make it suitable for growth. Fym (Farm yard manure) 6 tonnes/hectare should be broadcast and properly mixed with soil while ploughing the fields at pre planting stage.
- b. **Transplanting and optimum spacing** – The corm are directly planted in rows in small beds laid out in the fields. The crop is sown in rabi season,

generally in October in temperate zones. The corms should be placed at an optimum spacing of 10 cm to 20 cm (corms germinate and develop roots within one month).

- c. **Crop maturity and harvesting** – The crop matures in about 16/18 months. The seeds should be harvested immediately after ripening of fruits in April. Corms are taken out after a gap of one month in May (After the leaves have died down), giving sufficient time for hardening of protective layer of the corm.⁸

Chemical composition

Seeds and roots both of the bitter variety of *colchicum luteum* Baker; are found to contain the alkaloid colchicine in fairly large proportions, readily soluble in water and spirit, decomposing into tannic and gallic acids, starch, sugar, gum etc.

The sweet variety also contains traces of an alkaloid which has been found to be physiologically inactive. The chemical analysis shows that they (seeds & roots of *Suranjana*) also contain a large amount of starch, a small quantity of oily resinous matter and a bitter alkaloid phenethylisoquinoline.⁹

The percentage of the colchicine alkaloid in the air dried corms of *colchicum luteum* Baker. was found to be from 0.21 to 0.25% and in the seeds from 0.41 to .43%. The alkaloid colchicine is liable to be affected by high temperature. The corm should therefore be collected early in the summer and dried at a temperature not exceeding 65°C.

Suranjana also contains colchicine analogs- decetyl thiocolchicine (DTC), decetylmethylcolchicine (DMC) and trimethylcolchicine acid (TMCA) that are effective in the treatment of gout.

The major phenolic compounds obtained from the colchicum are 4- hydroxy- 3- methoxybenzaldehyde (vanillin), 4- hydroxybenzoic acid (vanilic acid), 3-(3-hydroxyphenyl) -2- propanoic acid (Coumaric acid), Caffeic acid and 3, 4, 5, 7 Tetra hydroxy flavone (Luteolin).¹⁰

Properties and pharmacological action

According to Ayurvedic literature, *Suranjana* is *Tikta* (bitter) and *Katu* (Pungent) in rasa (taste); *Laghu* (light) and *Ruksha* (dry) in *Guna* (properties); *Ushna* (hot) in *Virya* (potency); and *Katu* in *Vipak* (Metabolism).

Having these properties its pharmacological actions are: *Kapha vatahara*, *Cakshushya*, *Rakta-Prasadan* (Blood Purifier), Analgesic, *Vran* (wound) *Sodhak & Ropak*, *Sara*, *Sukrala*, *Dipana-Pachana*, *Rechak*, *Vamak*, *Ama Vish Nashak* and *Vidahikara*. It has stimulant, laxative, bile expectorant, diuretic, anti-inflammatory and anti-cancerous actions.¹¹

Suranjana is irritant to the skin causing hyperemia therefore it is used externally on skin

related disorders like leprosy and internally it is mainly used in gouty arthritis.

Medicinal uses

The parts medicinally used are: dried corms (colchici tuber), dry seeds (colchici semen), *Hiranya-Tuttha* (a dark brown dry extract of *colchicum luteum* Baker.) and fresh flowers.¹²

The dry corm of *Suranjan* is bitter, pungent, hot and *Kapha vata* suppressant, therefore it is used in Inflammation, Swelling, Joint pain, Gout, Sciatica, Osteoarthritis, Rheumatoid Arthritis, Indigestion, and Healing of Wounds.

It also acts as diuretic thus it is used in urinary tract related problems such as - stones, Dysurea, urinary tract infection.

It is a mild laxative and helps in relieving from constipation. The corm of *Suranjana* is used in liver and spleen related ailments and it is also a good blood purifier, thus used in skin & blood related disorders like leprosy. It also acts as antidepressant if taken in proper doses.¹³

Hiranya-Tuttha (dry extract of *colchicum luteum* Baker.) is used in preparations prescribed by Medical practitioners mainly for acute attacks of gout and rheumatism. Tinctures of meadow saffron are used in homeopathy for the same complaints.

The seeds are acrid, bitter, Anodyne, Astringent, Anti-Inflammatory, Analgesic, Sedative, Aphrodisiac, Carminative, Alterative, Aperient, Laxative, Blood purifier and are useful in neuralgia, gout, leukaemia, pruritis, liver disorders, enlarge of spleen, sexual debility, sciatica, lumbago and familial mediterranean fever.

Flowers contain colchicine and democolcine which are used for the treatment of solid tumors and for certain forms of leukaemia, especially for chronic myelocytic leukaemia.

Therapeutic Uses

- i. *Majoon Suranjana* is a polyherbal formulation used in *Unani* system of medicine for the treatment of rheumatic arthritis.¹⁴
- ii. In *Unani* pharmacopoeia. "*Ilaj ul Amraz*" an *Unani* formulation contain (1) Dried Rhizome of Ginger (*Zingiber officinale* Linn) -3.5gm (2) Dried corm of *Suranjana* (*Colchicum luteum* Baker) - 3.5 gm (3) Dried exudate of Aloe (*Aloe vera* Linn.) -7 gm is used in treatment of Dysurea, constipation, inflammation and arthritis.¹⁵
- iii. A paste of *Suranjana*, saffron and egg can be applied beneficially to rheumatic and other form of swellings.¹⁶
- iv. Dried and powdered corms of the plant is very useful in healing the wounds, it should be sprinkled on the affected areas. It promotes cicatrisation.

- v. '*Tutthanjana*' is the term applied to a collyrium made of copper sulphate and root of *Cholchicum leuteum* Baker. is used as a cleanser for the eyes.¹⁷
- vi. When a cloth coated with cow *Ghrita* and paste of *Suranjana* corm is applied on piles mass, it necroses and falls down in due time.¹⁸
- vii. The extracted colchicine is employed orally in tablet form for acute gout, enlarged prostate, gonorrhoea, dropsy and familial mediterranean fever. It is also used in most of fingers, wrists and abdomen the most painful locations, in rheumatoid headache and in rheumatic iritis, swollen joints, with or without effusion, muscular pain sub acute and chronic sciatica.
- viii. Alkaloid colchicine extracted from this plant and used to alter the genetic makeup of plants in an attempt to find new, improved varieties. It works by doubling the chromosome number.¹⁹
- ix. It is used to treat rheumatic complaints especially gout also prescribed for its cathartic and anti emetic effects and also in initial treatment for pericarditis.
- x. Colchicum inhibits mitosis through the inhibition of motility, particularly of the phagocytosing lymphocytes. This is of therapeutic uses for blocking the immigration and the autolysis of phagocytes in inflammatory process and there by producing and antiphlogistic effect.

Precaution

The regular use of Colchicines can cause severe irritation to intestines. To counteract this, it is advisable to use the drug with *Suchi* (*Atropa Belladonna* Linn.) and *Khurasani Ajvain* (*Hyoscyamus niger* Linn.)²⁰

When taken in large doses it may cause diarrhoea, salivation, vomiting, abdominal cramps, convulsions and general paralysis, these symptoms appears several hours after administration even if the dose is large and this is probably due to its conversion in oxydicolchins. Colchicine in large doses lows body temperature, potentiates the action of central depressant drugs, Increases the effect of sympathomimetic agents depresses the respiratory centre, stimulates the chemoreceptor trigger some an vaso motor centre causing contraction of blood vessels and rise blood pressure. Muscular weakness and ascending paralysis may occur in toxic doses and death may take place due to the failure of respiratory centre. It is contraindicated during pregnancy and lactation.

At therapeutic dose, colchicine is an extremely effective as anti inflammatory agent and pain killer, as it prevents the migration of macrophages to the inflamed joint, associated with an acute attack of gout (caused by precipitation of urate crystals). Long term use of colchicum can cause kidney and liver damage. The plant *Suranjan* is also toxic to animals, particularly when they are fed on dry fodder. The alkaloids even

pass into milk and can accumulate to reach toxic level.²¹ The toxic dose in humans is about 10 mg, while 40 mg would always be fatal (leads respiratory and cardiovascular disruption within a few days).²²

Research Studies

Antioxidant Activity: The ethanolic extract form corms of *colchicum luteum* Baker. was investigated Phytochemically and found that the colchicum offerered promising antioxidant activity. The highest activity was displayed by chloroform fraction 91%, while the overall range was found (56-91%)²³

Anti fungal and Anti Bacterial activity: The Methanolic extract of the corms of colchicum luseum Baker and its sub sequent fraction in different systems were screened for anti bacterial and anti fungal activities. The crude extract and all the fraction demonstrated moderate to excellent anti fungal activity against tasted pathogens in anti fungal bioassay. Excellent antifungal activity was shown against trichophyton longifusus, up to 75%, and microsporum canis, up to 85% while the crude extract and subsequent fractions showed mild to moderate activities in an antibacterial bioassay with maximum anti bacterial activity 58% against bacillus subtilis.²⁴

Enzyme inhibition activity: The crude Methanolic extract and various fraction of colchicum luteum Baker including chloroform, ethylacetate, n-butanol and aqueous were carried out against acetylcholinesterase butyrylcholinesterase, lipoxygenase and urease enzymes, a significant enzyme inhibition activity (89%) is shown by the crude methanolic extract against lipoxygenase, while low to significant activity (32%) was evident against butyrylcholinesterase and acetylcholinesterase (29-61%) and no activity against urease.²⁵

In cancer treatment: Colchicum luteum, contains tropolone groups of alkaloid colchicines. Colchicine shows antimittotic activity and used in cancer for the dispersal of tumors and for treatment of various neoplastic diseases.²⁶

Cancer cells usually divide much faster than normal cell. Therefore compounds that stop cell division e.g. alkaloids such as colchicine, demecolcine are also being helpful in cancer treatment.²⁷

Colchicine extracts also being useful in treatment of SLE. Which is an auto immune disorder affects many organs but more particularly the brain, skin, kidneys and joints.

CONCLUSION

It is concluded that *Colchicum leuteum* Baker although new to the Ayurveda has been accepted and used generously by the Ayurvedic physician. Its main action is blood purification and helps in reducing uric acid which forms the mainstay for the treatment of gout. Apart from this, the medicine has several other uses which are supported by various researches done

by researcher through out of the world. Therefore the safe use of this drug should be promoted for the gain of humanity.

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