



Review Article

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AYURVEDIC AND MODERN ASPECTS OF *SUDARSHAN (CRINUM LATIFOLIUM LINN)*: AN OVERVIEW

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ABSTRACT

Sudarshana (Crinum Latifolium Linn) belongs to family Amaryllidaceae has a great importance due to its medicinal properties and for ornamental values found to be useful in plantation in homes, gardens etc. It produces beautiful white flower. Leaves also marked for its ornamental purpose. This plants mature mother bulb producing several new small adventitious bulbs around its body and are significantly used to propagate by vegetative modes. *Sudarshana (Crinum Latifolium Linn)* possess predominant *Madhur tikta rasa*, *Ushna veerya* and *Madhur vipak*. In *Ayurveda Sudarshan* is commonly used as a *Kushtaghna* (Useful in skin diseases), *jvraghna* (anti pyretic), *shodhahara* (anti-inflammatory), *Krumighna* (to kill worms). The useful part of *Sudarshana* is leaf and rhizome. The main chemical constituents of *Crinum latifolium* the rhizome of the plant contains Glucans Alkaloids-zeilamine crinofoline, crinofolidine, tazetine, flexinine, harmenthamine, ambelline, galanthamine. The leaves contain alkaloids latifine, cherilline, 3-O-acetalamine, crinomine and crinine. The plant includes much medicinal property and is used in multifold directions/purpose to treat varied disorders such as anti-oxidant, Anti-microbial, Anthelmintic. This review give detail information regarding *Crinum Latifolium Linn*. The present review article provides up-to-date information on the medicinal properties of the plant.

KEYWORDS: Crinum, Ornamental, *Sudarshana*, Amaryllidaceae, *Jvraghna*.

INTRODUCTION

Sudarshna (*Crinum latifolium* Linn) is a historical plant has a valuable importance because of its medicinal properties. In *Ayurveda* its many synonyms has been mentioned like *Nagdaman* (The big wide leaves resemble a snake hood), *Medhi* (It improves memory), *Jambu* (The fruit resembles jambu fruit), *Dudarshan* (as the crushed fruit gives foul smell), *Chakravaha* (Because the flowers grow on umbels and in circular pattern), *Madhuparnika* (The leaves taste sweet and bitter).^[1] In *Ayurveda*, *Crinum latifolium* Linn is known as “*Sudarshana*” or *Sukhdarshan*. It means it gives you peace and happiness just by its darshan (Seeing it). ^[2]*Crinum latifolium* Linn (*Sudarshana*) belongs to family-Amarylidaceae is widely used in *ayurveda* mainly for painful swellings, fevers of unexplained origin, poisoning and skin ailments.^[3] *Crinum* is a genus of about 180 species comprising family of various beautiful perennial plants. They are good for decoration, garden, bouquets and also known as various types of lilies like spider lily, Trumpetlily, and Swamp lily and so on. *Crinum* is basically a tropical plant growing in Asia, South east, Australia, Pacific island and spread up to Caribbean, Florida and Louisiana.^[4] *Sudarshana* is a small plant that grows up to 3 feet contain big green leaves to a length 2-4 inch with 3-4 inch width. It grows all over India. The flowers are beautiful, white in color with pinkish tinge. Flowering stems are stout, about 2-3 mm in height. Fruits are round, 2-3 inch in diameter with 8-10 seeds inside.^[5] It is widely used in *Ayurveda* for processing of various formulations. There are many *Ayurvedic* preparations like *Sudarshan ghan vati*, *Sudarshana kadha*, *Sudarshana Choorna* etc. Which contain *Sudarshana* as main active ingredients.^[1] *Crinum latifolium* Linn exhibits various pharmacological effects like anti-inflammatory, anti-diarrhoeal, hypoglycemic, antioxidant, hepatoprotective, antipyretic, and antimicrobial activities anti-bacterial, anticancer, anti-ulcer, antisecretory, hepatoprotective, hypoglycaemic, sore throat and wound healing etc.^[6] The main chemical constituents of *Sudarshana* are Crinamine, Lycoricidine, Lycoriside, Cirsiniatin, Hippadine, Crinine, Crinasiatine, Methyl linoleate, Cridnidine Glucans A & B, Alkaloids-zeilamine crinofoline, crinofolidine, tazetine, flexinine, harmenthamine, ambelline, galanthamine. The leaves contain alkaloids latifine, cherilline, 3-O-acetamine, crinamine and crinine.^[7] Thus the plant has diverse pharmacological actions. Therefore, the aim of this study is to

evaluate its various pharmacological activities which can be safely used for various ailments. However, future studies are needed to prove its efficacy in clinical trials.

AYURVEDIC ASPECT

The word derivation of *Sudarshana*-“*Sudrushya*”

The word meaning of *sudarshana* is- the one which is good to look.

Means that plant is very beautiful & pleasing to look at. [1]

***Sudarshana* has been included in *Nighantus* in the following *Vargas* (Groups)**

***Bhavprakash nighantu*: *Guduchyadi Varga*.** [8]

***Madanpal nighantu*: *Abhayadi varga*.** [9]

***Kaiyedeve nighantu*: *Oshadadi varga*.** [10]

***Nighantu Adarsha*: *Musali kandadi varga*.** [11]

***Shaligram nighantu*: *Guduchayadi varga*.** [12]

***Ayurved dravyaguna vignana*: *Talmulyadi varga*.**[1]

***Brihat dravyaguna adarsha*: *Krishna mushalyadi gana*.**[11]

SYNONYMS

TABLE NO-1

<i>Bhavprakash nighantu</i>	<i>Somvalli, madhuparnika, chakrahwa</i>
<i>Madanpal nighantu</i>	<i>Somvalli, madhuparnika, chakrahwa</i>
<i>Kaiyedeve nighantu</i>	<i>Somvalli, madhuparnika, chakrahwa, madhuparnika, vtsadani, mechaka, meyaka, dadhyali</i>
<i>Nighantu Adarsha</i>	<i>Nagadamani, sukhasudarshan, nagadavan.</i>

COMMON NAME OF SUDARSHAN IN DIFFERENT LANGUAGE^[8]

TABLE NO-2

<i>Hindi</i>	<i>Sudarshan, Sukhadarshan.</i>
<i>Gujrati</i>	<i>Nagadamani, Nagrikanda.</i>
<i>Marathi</i>	<i>Nagdaun, Gadambikanda, Gadanichakanda.</i>
<i>Urdu</i>	<i>Nagadaman, Nagdauna.</i>
<i>Tamil</i>	<i>Visha mungil, Tudevaachi</i>
<i>Telugu</i>	<i>Kesara Chettu, Vishamugali</i>
<i>Kokan</i>	<i>Kirathi Maari</i>
<i>Chinese</i>	<i>Quen Chou Lan.</i>

HABITAT

India, Srilanka, Java, Burma, New guinea, Indonesia, Malasia, Philipines, Island.

In India-Tropical india, Lakhmi pur, Orissa, Chota Nagpur, Bengal, Deccan, Central India, Madhyapradesh.^[13]

DIAGRAMS



RASPANCHAKA OF SUDARSHAN**TABLE NO-3**

<i>Rasa</i>	<i>Madhur, Tikta</i>
<i>Veerya</i>	<i>Ushna</i>
<i>Vipak</i>	<i>Madhur</i>
<i>Guna</i>	<i>Ruksha, teekshna.</i>

KARMA OF SUDARSHAN IN VARIOUS NIGHANTU**TABLE NO-4**

<i>Bhavprakash nighantu</i>	<i>Shodhahar</i> (reduces inflammation), <i>Raktavatahara</i> (useful in gout)
<i>Madanpal nighantu</i>	<i>Kafaghna</i> (useful in cough)
<i>Kaiyedeve nighantu</i>	<i>Shodhahar</i> (reduces inflammation), <i>Raktavatahara</i> (useful in gout), <i>Kafaghna</i> (useful in cough)
<i>Nighantu Adarsha</i>	<i>Kafaghna</i> (useful in cough), <i>Shodhahar</i> (reduces inflammation), <i>Karnashula</i> (useful in ear diseases)

UPYUKTANGA (part used)-Leaf, Rhizome. ^[14]

GENERAL USES

The paste of the leaves of *Sudarshana* is applied over the skin surface having eczema and fungal infections.

Fresh juice of the leaves of *crinum latifolium* is given in a dose of 10ml to induce purgation and vomiting in cases of adverse effect of poisoning.

The powder of rhizome of *Sudarshan* is given in a dose of 2-3 gm with honey or hot water in case of fever and joint pain.

The leaves of the plant is slightly heated and tied around joints having pain and swelling.

Fresh juice of the leaf is slightly heated and poured as drops to treat earache and discharge from the ear.

The rhizome of *crinum latifolium* is crushed, slightly heated and applied over the external pile mass to relieve the pain and swelling.

In condition of pustules, the paste of the leaf of *Sudarshan* is applied over it. [8,10]

USES IN OTHER SYSTEMS

Siddha-Leaf/fresh rhizome-used in carbuncle, dropsy, ear disorders, diaphoretic, emetic.

Unani-Seeds used in forunculosis.

FOLK MEDICINE

In lakhimpur-The leaves are applied to skin diseases (CARTAR) The leaves bruised and mixed with castor oil use ful in whitlows and local inflammation.

In java-Leaf is used as emetic.

SIDE EFFECTS

Increased dose of juice of the leaf can cause purgation and vomiting along with abdominal cramps. [15]

IMPORTANT FORMULATIONS

Sudarshanghana vati.

Sudarshana Choorna.

DOSAGE

Rhizome powder-1 to 3 gm.

Leaf juice-5 to 10 ml. [16]

MODERN ASPECT OF SUDARSHANA

TAXONOMICAL CLASSIFICATION

Kingdom -Plantae

Order- Asparagales

Family – Amaryllidoideae

Sub family- Amaryllidoideae

Genus -Crinum

Species-C.latifolium [2]

PLANT DESCRIPTION

It is a small plant growing to a height of 2-3 feet.

Leaves-The leaves are big, growing to a length of 2-4 feet and 3-4 inch wide.

The leaves emerge from the rhizome and resembles like emerging from the ground.

Flowering stems are stout, reaching about 2m in height.

Flower-Flowers have white color and pinkish tinge, emerge from the middle stalk and arranged in an umbel.

Fruits- The fruits are round, 2-2.5 inch in diameter having 10-12 seeds inside. [7]

BOTANICAL DESCRIPTION

Sudarshana-Crinum latifolium is a plant mentioned in *Ayurveda* for the treatment of fever, swelling, case of poisoning and skin disease.

Latin name-*Crinum latifolium* Linn.

Family- Amaryllidaceae. [1]

PHYTOCHEMICALS

Rhizome-of the plant contains Glucans A & B, Alkaloids-zeylamine crinofoline, crinofolidine, tazetine, flexinine, harmenthamine, ambelline, galanthamine.

Leaves-contain alkaloids latifine, cherilline, 3-0-acetalamine, crinomine and crinine.

Crinamine, Lycoricidine, Lycoriside, Crinasiatin, Hippadine, Crinine, Crinasiatine, Methyl linoleate, Cridinidine. [16]

MEDICINAL USE

Bulbs and leaves of crinum are useful in herbal medicines. It is highly useful in the treatment of serious health conditions like prostatitis, adenoma, benign prostate enlargement, uterine fibroids etc. It is used to enhance cell mediated immunity and acts as an effective Lymphocyte activator.

It is also used in cases of hypoxia, inflammation, detoxification, tissue regeneration, and hormone balancing. Leaf juice is used for earache, rheumatic pain, and sprain. Bulbs are used to induce vomiting. [17]

LEAVES JUICE

10-15 ml as strong emetic, purgative in case of poisoning. (Juice is easier to extract from leaves if they are warmed).

Usage- External application.

Benefits and Uses of *crinum latifolium* Linn leave juice

Ear infection-In case of ear pain swelling inside ear, acne inside ear the leaves juice can be instilled 3-5 drops twice to thrice daily.

Lice and other parasites (Scabies)-The leaves juice is a strong anti-lice and anti-scabies. it's also excellent for dandruff when used by mixing in lemon juice.

In painful joints-In case of Rheumatoid arthritis and other inflamed arthritis and other inflamed joints, the leaves as it is can be tied over the swellings. The leaves juice can be mixed with castor oil to massage the swollen joints in case of osteoarthritis.

The leaves can be tied over painful pustules or furuncles (Boil) to cook them and take out open up the pores so that the pus oozes out of them and relieves the pain.

The leaves can be dried; burnt and the ash can be applied over painful pile mass. This will help to relieve the swelling and pain of pile mass.

In small quantity 2 ml juice per day can be given internally to kill the worms in the abdomen.

Crinum latifolium Linn leaves juice can be applied over skin mix it with equal quantity of *Aloe Vera* get to use it as a mosquito repellent.

Poisoning-In case of ingested poison where emesis and purgation has to be induced, 10-15 ml juice of leaves of *Crinum latifolium* or *Crinum asiaticum* is used.

Benefits and uses of *Crinum Latifolium* Linn Root Extract

The rhizome extract of *Crinum Latifolium* is used in dosage of 500 mg 2 to 4 times a day internally to get the benefits. [15]

MEDICINAL PROFILE/PHARMACEUTICAL ACTIVITIES

The plant is main source of many active chemical compounds with important traditional medicinal uses among human society. The plant is utilized singly as well as by mixing with different plant parts of varied plant species. It has multifold ethnomedicinal uses such as

ANTI-OXIDANT ACTION

The antioxidant capacity of *Crinum latifolium* Linn (*Sudarshan*) shall be extracted in water is evaluated that by the ORAC (Oxygen Radical absorbance capacity) assay, which directly measures the capacity of chain-breaking antioxidants based on the hydrogen atom transfer mechanism. *Sudarshan* (*Crinum latifolium* Linn) evaluated potent peroxy-radical scavenging capacity in vitro. The ORAC (Oxygen Radical absorbance capacity) value of $1610 \pm 150 \mu\text{mol TE/g}$. This ORAC value of *Sudarshan* (*Crinum latifolium* Linn) remarkably high in comparison to the ORAC values of other herbs. Analysis of water extract of fourty five herbs used in Chinese medicine which showed broad range of activity in the ORAC assay of which only two herbal extracts *Spatholobus suberectus* and *Sanguisorba officinalis* shows higher ORAC value than the *Crinum latifolium* Linn analyzed in this study. [18]

ANALGESIC AND ANTI-INFLAMMATORY ACTIVITIES

The Pharmacological study of *Crinum*s extracts obtained from different parts using many algometric and inflammatory models show the probability for treatment of different types of pains and inflammatory processes. The methanolic extract of *Sudarshan* (*Crinum*

latifolium Linn) leaves exhibit sturdy to diffident inhibitory activity to nuclear factor-kappa which is an inducible and ubiquitous transcriptional factor required for gene expression of various inflammatory mediators.^[19] The significant anti-inflammatory effects of *Sudarshan*(*Crinum latifolium* Linn) leaves extract also showing by its potential to contain indoleamine 2,3-dioxygenase mediated tryptophan degradation in unstimulated- and mitogen-stimulated peripheral blood mononuclear cells at IC₅₀ of $241 \pm 57 \mu\text{g/ml}$ and $92 \pm 20 \mu\text{g/ml}$, respectively.^[20]

EFFECTS ON CENTRAL NERVOUS SYSTEM

Wildman had reported in 1960 the action of Amaryllidaceae family alkaloids on CNS. ^[21] The most important and common alkaloids of this family is galanthamine which concerned many pharmacological, biochemical and clinical investigations due to its variable central effects. ^[22] Galanthamine is a tertiary amine which is adequately lipid-soluble to cross the blood-brain barrier and act on the central nervous system. Galanthamine exhibited reversible muscarinic and anti cholinesterase activities and useful in a treatment of nervous diseases, neurological injuries, paralysis syndrome, schizophrenia, mania, and other forms of dementia as well as Alzheimer's disease. ^[22-23] galanthamine acts through restocking acetylcholine levels in brain areas lacking cholinergic neurons by binding to the enzyme acetyl cholinesterase. It activates the pre and post synaptic nicotinic receptors therefore increase the release of neurotransmitters like acetylcholine and glutamate, and stimulate neuronal function. Likewise, Galanthamine does not show any hepatotoxicity; hence, it has been permitted as its HBr salt for the first time in Bulgaria under the name of Nivalin in 1960s, and afterward licensed as Razadyne(formerly Reminyl) in the United States and some European countries.^[24] Galanthamine shows the central stimulant action. Early on reports from Bulgaria and Russia claim that improvement of consciousness after anesthesia was faster if galanthamine was used instead of neostigmine. This effect has been attributed to either a central stimulant action of galanthamine, or its ability to antagonize the actions of morphine-like analgesics. In addition, Cozanitis and Toivakka concluded from EEG recordings that galanthamine was a mild analeptic, i.e. a central stimulant. ^[25] In a study of sleep patterns in healthy volunteers, galanthamine HBr (10 or 15 mg, orally) shortened the latency to rapid eye movement sleep, but also increased the number of

awakenings.^[26] Additional information on central effects of galanthamine could be obtained from case reports in which galanthamine was used to reverse poisoning. It aided recovery after an overdose of the centrally acting muscarinic antagonist hyoscine (scopolamine).^[27] Moreover, it is also known to inhibit traumatic shock and has been patented for use in treatment of nicotine dependence.^[23]

IMMUNOLOGICAL ACTIVITIES

Aqueous extract of *Sudarshan* (*Crinum latifolium* Linn) shows the immunomodulatory properties within human peripheral blood mononuclear cells. The extracts of *Crinum latifolium* Linn (*Sudarshan*) somewhat increase neopterin production in unstimulated peripheral mononuclear cells, while effective decrease of neopterin formation in cells stimulated with concanavalin A, phytohemagglutinin, or interferon-gamma was observed.^[28] *Crinum latifolium* promoted human T-lymphocytes *in vitro*, particularly the cell-mediated immune response of CD4+T lymphocytes (T-helper cells).^[29] In addition, aqueous extracts of *Crinum latifolium* Linn (*Sudarshan*) and *Camellia sinensis* (*Syamparni*) showed immunomodulatory properties in human peripheral blood mononuclear cells, but the extracts of the previous seem to be supplementary efficient in reducing neopterin formation in stimulated cells than green and black tea extracts.^[28]

CYTOTOXIC AND ANTICANCER ACTIVITIES

The per os (instead of water) cold-hot aqueous extract from the Vietnamese plant *Crinum latifolium* Linn (*Sudarshan*) retarded *in vivo* the growth of chemically induced (by 20-methylcholanthrene) tumours (sarcomas) in rats such reticence of carcinogenesis has occurred probably due to the influence of immunomodulating and anti-tumour plant alkaloids and other biologically active components in the plant decoctions.^[30] lately, *Sudarshan* (*Crinum latifolium* Linn) become one of the crucial treatments in the world for prostate and ovarian conditions, as well as BPH (Benign prostate hypertrophy), prostatitis, adenoma, uterine fibroids, ovarian cysts and tumours polycystic ovarian syndrome. It was implicit that *Crinum* could boost the cellular communication so maintaining the stability among cellular proliferation and apoptosis. lately, it was shown that *Crinum* encourage cells to produce a substance called neopterin, which is responsible

for communicating with immune cells calling them into action against foreign invaders and unhealthy or proliferative cells. This suggests that *Crinum* may not only be precious for prostate and ovarian conditions, but may also be valuable for other conditions in which unhealthy, proliferative cells are involved. Another potentially valuable benefit of *Crinum* is that it may be used as a preventative agent, offering protection against prostate and ovarian conditions before they start.^[31] These findings were in agreement with the study carried out by Jenny *et al.* which showed dose-dependent inhibitory effects of the aqueous *Crinum latifolium* Linn extract on cell proliferation of highly metastatic human prostate carcinoma PC3 cells, androgen-sensitive prostate adenocarcinoma LNCaP cells and BPH-1 cells.^[32]

CONCLUSION

The *Crinum latifolium* Linn (*Sudarshan*) has rich potential to treat many disorders among human society. Several medicinal trees and their products are still widely used by the traditional medical practitioners for cure of various diseases in their day to day practice. *Sudarshana* have predominance of *madhur*, *tikta rasa ushna virya* and *madhur vipaka* it shows *Shodhahara* (anti-inflammatory) *Raktavatahara* (useful in gout), *Kafaghna* (Useful in cough), *Kaphavatahara* (alleviates *kapha* and *vata dosha*), *Karnyashulhar* (useful in ear diseases) property. It contains many phytochemical compounds like *Glucans* Alkaloids- zeylamine crinofoline, crinofolidine, tazetine, flexinine, harmenthamine, ambelline, galanthamine. The leaves contain alkaloids latifine, cherilline, 3-O-acetalamine, crinamine and crinine. Which are responsible for many pharmacological activities like Antioxidant, Analgesic, Anti-inflammatory, Effects on central nervous system, Immunological activities, Cytotoxic and anticancer activity etc. From ancient time *Crinum latifolium* Linn (*Sudarshan*) has been used as curative agent in many diseases. Hence, there is necessity to investigate the biological activity of its phytoconstituents at molecular level for development of an effective, safe and cheap herbal drug. The present review article provides up-to date information on the medicinal properties and phytochemical constituents of *Crinum latifolium* Linn. We hope this review article will help the scientists working in the area of traditional medicines and medicinal food in their future endeavour.

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