

INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY HEALTH SCIENCES

ISSN: 2394 9406

“A LITERARY STUDY OF CHITRAK (*Plumbago zeylanica* Linn.) AN IMPORTANT MEDICINAL PLANT ACTIVITY ON VARIOUS DISEASES.”

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Abstract -

A member of the *Plumbaginaceae* plant family is (*Plumbago zeylanica* Linn). Also known as *Chitrak*.It's mool twak (Root Bark) is used in treatment of Hemorrhoids, Worms,Irritable Bowel Syndrome, and other conditions in the ayurvedic medical system.Additionally chitrak may have Anti Inflammatory, Aphrodisiacs,Libido stimulant Expectorant, Diuretics Androgenic, Analgesic, Spermatogenic,Anti-convulsant, Anti Amnesiac,Rheumatic Arthritis, Stress and Anxiety properties.The active ingredient's identified in Chitrak are PlumbaginChloro- plubagin, Droserone,Elliptinone,Zelyanone,thoes are responsible for the therapeutic potentials.The primary goal of this article is to highlight the Ancient and Recent Pharmacological activity of chitrak plant against a variety of diseases.

Key words-Chitrak ,*Plumbago zeylanica*, Disease,Medicinal plant activity,Toxic effect.

Introduction- The Sanskrit word " <i>Chitraka</i> " (चित्रक) is derived from " <i>Chitra</i> " (चित्र) – meaning variegated, bright, colorful, or distinctive. "-ka" is used as noun implying a quality or object related to the root word. " <i>Chitraka</i> " can be etymologically interpreted as "colorful or distinctive in appearance", or "The one with a marked or notable character or features". This may refer to the plant's strong medicinal potency, its distinct root structure, or possibly the fiery nature of its action in digestion (as it's known to stimulate the digestive fire in Ayurveda) ¹ Plumbago family or the Leadwort family especially in salt water areas. The Glands are key feature that allows members of the family to live in salty soils where most other species of plants cannot. The chalk-glands excrete calcareous salts dissolved in the water of the plant's tissues. The plumbaginaceae are distinctive in being perennial shrubs, lianas or herbs with simple, spiral leaves and pentamerous flowers with an actinomorphic calyx and corolla, the ovary unilocular with a single basal anatropous ovule, the fruits an acneme or circumscissile capsule. ²	Kingdom	Plantae
	Subkingdom	Tracheobionta (vascular plants)
	Division	Mangnoliophyta (Flowering plants)
	Class	Mangnoliopsida (Dicotyledons)
	Order	Caryophyllales
	Family	Plumbaginaceae
	Genus	Plumbago
	Species	<i>Plumbago zeylanica</i> linn.
	Latine Name	<i>Plumbago zeylanica</i> linn. ³

Description of Chitrak plant-

चित्रकोऽनलनामा ि पाठी व्यालस्तथोषणः । चित्रकः कटुकः पाके वह्ननकृत्पािनो लघुः । रूक्षोष्णो ग्रहणी कुष्ठशोथस्थः कृममअसनुत् । वातश्लेष्महरो ग्राही वातशथश्लेष्मपपत्तहत् ॥ ६४ ॥

चित्रकः – *Chitraka* (main name, *Plumbago zeylanica* linn. used in Therapeutic purposes). अनलनामा – Also called "*Anala*" (meaning fire, symbolizing strong digestive action). पाठी, व्यालः – Other synonyms (*Pathi*, *Vyaala* – traditional/local names). उष्णः – Hot in potency (*Ushna Veerya*). कटुकः पाके – Pungent in taste after digestion (*Vipāka*). वह्ननकृत् – Stimulates digestive fire (*Agni Deepaka*). पािकः – Helps in digestion (*Pachaka*). लघुः – Light to digest (*Laghu Guna*). रूक्षः – Dry (*Rūkṣa Guna*). उष्णः – Hot in quality. ग्रहणी, कुष्ठ, शोथ,

Taxonomical Classification of *Chitrak* (*Plumbago zeylanica* linn.)

अशशः, कृमम, अशनुत् – Alleviates Grahanī (malabsorption), skin diseases, swelling, piles, worms, and excessive eating disorders. वातश्लेष्महरः – Alleviates Vata and Kapha doshas. ग्राही – Absorbent (helps in drying excess intestinal moisture). वाताशशः, श्लेष्मपपत्तहृत् – Relieves Vata-type hemorrhoids and balances Kapha and Pitta disorders.⁵

Local name⁶ -Table number 1-

Marathi	Chitraka
Hindi	Cheetah
Bengal	Cheetaa, chitu
English	Leadwort.
Telgu	Tailchitra, Chitramulam

Synonyms-⁷ -Table number 2-

Chitrak	signifies the tearing action
Agnika,	Fiery Hot Nature
Analanama	Fiery Hot Nature
jarana	Digests food.
Dipaka	Stimulates Digestive fire.
Usana	Pungency
Daruna	Due to tiksna property it is bhedana and as such tears accumulated lumps.
Dvip, Pathina, vyal	like Leopard.
Agnika	Digestive property.



Macroscopic Feature of Chitrak –

Root Bark- Perennial herb with 0.6-1 meter long stem, somewhat woody, spreading glabrous. Leaves- Thin, Ovate, Subacute, Entire, Glabrous,

tongue.

Old Root have a low potency so fresh root should be used. Useful Part -Mool Twak (Root Bark)

Habitat -White variety grows in Bengal,UP,South India and Srilanka.Red one in Khansihills in NE States and Kuch bihar area of Bihar.⁸

Tubular,Densely covered with Stalked Gland.

Fruit-Capsule,Oblong,Pointed Pericarp Thin below,Thick and Harden above.

Macroscopic Feature of Chitrak -

Root Bark- Perennial herb with 0.6-1 meter long stem,somewhat woody,spreading glabrous. Leaves- Thin,Ovate,Subacute,Entire,Glabrous, Reticulate Veined,Petiole Short,Amplexicaul at the base.

Ripped Brown colour,covered with small sticky hairs,when plugged they attached with each other.

Root Bark-Blackish Brown ,with small nodes,dry root is brittle,Taste -Bitter Pungent.and gives tingling sensation to tongue.

Flower-In elongated spike,Rachis Glandular,White Colour,Narrowly,

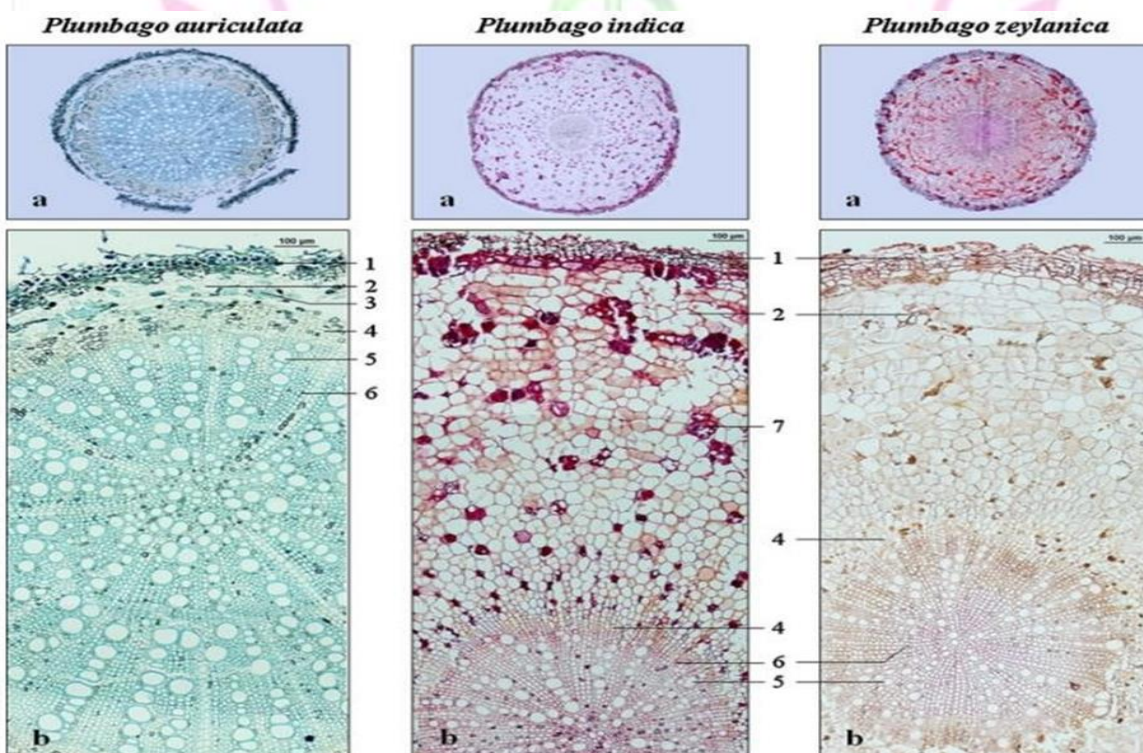


Figure number 2-Transverse sections of roots of Plumbago species. Features: 1

cork, 2 secondary cortex, 3 pericyclic fibers, 4 phloem, 5 xylem, 6 medullary ray, 7 cell content

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Microscopic T.S of Chitrak Root-

Transverse section of root shows outer most tissue of cork consisting of 5-7 Rows of cubical to rectangular dark brown cells.

Secondary cortex consists of 2-3 rows of thin walled,rectangular,light brown. Most of the cortex cell contain strach grains.

Secondary cortex followed by a wide zone of cortex, composed of large polygonal to

tangentially elongated parenchymatoes cells varying in size&shape,containing starch grains and some cells with yellow contents.

Fibers scattered singly or in groups of 2-6.

Phloem a narrow zone of polygonal thin-walled cells,consisting of usual elements and phloem fibres.

Similarly to cortical zone phloem fibres usually in group of 2-5or more but occasionallyoccurring singly,lignified with pointed ends and narrow lumen similar in shape and size to those of Secondary cortex cambium indistinct. Xylem light yellow to whitsh,vessels radially arranged with pitted thickenings.

Features	<i>Plumbago zeylanica</i> linn	<i>Plumbago indica</i> linn	<i>Plumbago auriculata</i> linn.
Periderm (Cork	8-12 layers thin-walled,Brown.	10-15 layers thicker,reddish, brown.	Less developed thin-walled cells.
Cork cambium	Single layer	Distinct and Active	Present but not prominent.
Secondary cortex	Parenchymatous large with starch grains.	Similar but with more intercellular spaces.	Loose parenchyma large cells.
Stone cells (Sclereids)	Few scattered	More abundant	Rare
Phloem	Stratified with Medullary rays	Similar but more compact	Scattered less differentiated.
Xylem	Well developed radial pattern.	More lignified and extensive	Less extensive
Starch Grains	Abundant in cortex	Present but fewer	Moderate

	and Phloem		
Colour under microscope	Pale Brownish	Reddish tinge due to anthocyanins	Slight bluish tone [10][11][12][13]



a. *Plumbago indica* L.

b. *Plumbago auriculata* L.

c. *Plumbago zeylanica* L.

Figure number 3- *Plumbago indica* Linn, *Plumbago auriculata* Linn, *Plumbago zeylanica* Linn.[4]

Features	Shveta Chitrak	Rakta Chitrak	Neel Chitrak
Botanical name	<i>Plumbago zeylanica</i>	<i>Plumbago indica</i>	<i>Plumbago auriculata</i>
Common name	White Leadwort	Red Leadwort	Cape Leadwort /Blue Leadwort.
Flower Colour	White	Reddish -pink	Blue to violet
Root Colour	White to pale brown	Reddish -brown	Pale yellow to light brown.
Ayurvedic use	Extensive used	Used with caution due to potency	Rarely used in classical Ayurveda
Potency (Tikshnats)	Mild to Moderate	Strong Pungent	Mild
Therapeutic actions	Deepana(appetizer) Pachana(Digestive) Anti-inflammatory	Similar action but stronger ,also used externally.	Milder,limited pharmacological data .
Dosage &Safety	Considerd safe for regular use	Caution advised due to potency	Not established
Distribution	Through out tropical india	Moist forests (e.g.western ghats)	Native to south africa grown Ornamentally 14,15,16,17,18,19

Medullary rays straight 1-6 seriate cells radially elongated and filled with starch grains, stone cells absent.⁶

Types of Chitrak-

Plumbago zeylanica Linn -White *Chitrak*.

Plumbago auriculata Linn-Blue *Chitrak*.

Plumbago indica Linn-Red *Chitrak*.⁵

Chemical Composition

Plumbagin, Chloroplumbagin, Droserone, Eliptinone, Zeylanone, Chitranone, Maritone,

Zeylinone³-

Chloroplumbagin, Isozeylinone, Isozeylanone, Dihydrosterone, Beta-Sitosterol. [8]

Rasapanchak-

Rasa – Katu

Vipak – Katu

Virya Ushna

Guna-Laghu, Ruksha, Tikshna.

Dose- *Mooltwak Churna* (Root Bark Powder) – 1-2 gm.

Kalpa- Chitrakadi Gutika, Chitrak Haritaki, Chitrak Ghrita, Chitrakadi Churna, Chitrakadi Awaleha, Chitrakadi Kwatha, Chitrak siddha tail. [6]

Vedic kala-

Botanical identification *Chitrak* plant during the Vedic period (roughly 1500–500 BCE) can be uncertain due to the symbolic and poetic nature of Vedic texts,

Chitrak is believed to have been known and used.

Atharva Veda- Certain plants were mentioned for their healing and magical properties. Though not named "*Chitrak*" directly, scholars interpret some references to fiery or purifying herbs as potentially including *chitrak* due to its digestive, stimulant, and detoxifying qualities.

It is associated with Agni (fire) due to its hot potency (*Ushna Virya*), which aligns with the fire-worship and symbolism prominent in Vedic rituals. [20]

Samhita kala-

Charaka-Dipaniya

Triptighna, Shulaprashamana, Bhedaniya, Arshoghan, Lekhaniya, Katukaskandhaa

Sushruta- Pipalyadi, Mustadi, Aamalakyadi, Mushakadi, Varunadi,

Aaragwadhadi. Bhavprakashapanchakola, Shadushana. [21]

Nighantu Kala

Table no 3

<i>Dhanwantari Nighantu</i>	<i>Shatpushpadi Varga.</i> ²²
<i>Raj Nighantu</i>	<i>Pipalyadi Varga.</i> ²³
<i>Priya Nighantu</i>	<i>Pipalyadi Varga.</i> ²⁴
<i>Nighantu Aadarsh</i>	<i>Chitrakadi Varga.</i> ²⁵
<i>Kayadev Nighantu-</i>	<i>Aaushadhi Varga.</i> ²⁶

<i>Madanpal Nighantu</i>	<i>Shunthyadi Varga</i> . ²⁷
<i>Bhavprakash Nighantu</i>	<i>Haritakyadi Varga</i> . ⁵
<i>Ashtanga Nighantu</i>	<i>Argvadhadi Gana</i> . ²⁸
<i>Shaligram Nighantu</i>	<i>Haritakyadi Varga</i> . ²⁹

Ayurvedic Properties –

Effect on Dosha -Kaphavatashamaka,Pitta vardhak.

Karma/Action-Deepana,Pachana.

Rakatpittaprakopaka,Pittasaraka, Arshoghna,

Grahi,Krimighna,Kushtahara,Jwaraghna,S hoolahara,Lekhana,Visphotajanana,Kapha ghna,Ka

nthya,Garbhasarvakara,Garbhashaya sankochak, Swedajanana,Vajikarana.[30]

Ancient Application and Medicinal Uses-

A mixture of Chitrakmula,Vacha,Shunthi and Kutaja used in Kaphaja Atisara and Shula. A paste made of Chitrak with butter should be applied in Scabies.

Vagbhata and Sushrut have Recommended Chitrak as Rasayana (Rejuvenator or the Young and Youthful again.)

Fine paste of Chitrak should be consumed with cow's urine to get rid of Leprosy. The root of plant are used with honey in Obesity.

The root revocation is orally useful in anaemia.

Chitrak is added to milk while boiling it later curd and buttermilk is prepared from that milk such buttermilk is excellent remedy for non bleeding piles.

Root paste is applied in Arthritis.

The root is used as masticating for tooth ache.

Paste of fresh root of Chitrak (Chitrak kalkam)is applied externally to filarial leg.

The paste made out of Chitrak root churnam(1-2gm)is taken with buttermilk (30-60ml) 2-3 times a day to give quick relief in diarrhea.

Kshirasatpalaka grita(Ayurvedic formulation) in which Chitrak is one of the ingredient and is used to cure kapha,gulma(Phantom Tumour)Sprue Syndrome,Anemia,Spleenic disorder fever.[8][31] Pharmacological activity –

Plumbagin (main active compound)- Antibacterial, antifungal, anti-inflammatory, anticancer,

hepatoprotective, and antioxidant.Anti-inflammatory,Spermatogenic,

Aphrodisiac, Anti-convulsant, Anti-amnesiac, Rheumatic arthritis, Stress, Anxiety

Abortificant activity. Libido-stimulant, Expectorant, Diuretic, Androgenic, Analgesic.[32]

Flavonoids-Antioxidant, anti-inflammatory, cardioprotective. Flavonoids scavenge free radicals and reduce inflammation.[33]

Tannins-Astringent, antimicrobial, antioxidant. Help in wound healing and gastrointestinal disorders.[34]

Saponins-Immunomodulatory, anti-inflammatory. Can enhance absorption and bioavailability of other compounds.[35]

Alkaloids-Contribute to various physiological effects like analgesic and antipyretic properties.[36]

Toxic effect-

Excessive use of Chitrak cause toxicity higher dose of Chitrak creates irritant and intoxicant effect. It causes burning of Throat, Stomach and whole body. also, Nausea, Vomiting, Diarrhea,

Dysuria, Burning micturation. If those symptoms are neglected it leads to weaken the Pulse and skin becomes Wrinkled and Cold. If it is given during pregnancy it

causes irritation of pelvic Organs which leads to Abortion within 3 – 6 hr.[31]

Treatment for excessive doses-

Discontinue its use and give sheeta and snigdha dravyas such as Milk, Ghee, Butter and also Suvaranabhasma.[31]

Shuddhi-

Chitrak roots are boiled in Shudhaksheer (Calcium hydroxide) for 3 hr. After shodhana Chitrak can be used for Medicinal purpose. To avoid the toxic effects. Chitrak should be used after shodhana.[37]

Conclusion-

Chitrak (*plumbago zeylanica* Linn.) It is a versatile medicinal plant with a long history of use in traditional system of medicine such as Ayurveda, Siddha & Unani. Traditionally it is used

to treat digestive disorders like, Atisara, Arasha, Gulma and Grahani. Skin Diseases like, Leprosy and Scabies. It is also used in Fever, Inflammation, Arthritis, Obesity, Anaemia.

An Ancient time period Vagbhata and Sushruta Recommended Chitrak as Rasayana.

It's Bioactive constituents particularly 'Plumbagin' is having Antibacterial, antifungal, anti- inflammatory, anticancer, hepatoprotective, and antioxidant properties. After Shodhana

Chitrak can be used for Medicinal purpose otherwise, it is having some Toxic Effects before Shodhana. The Ancient knowledge and pharmacological activity of this drug and also, it's Recent Biological active constituents or the phytochemical study's is used for new innovations in the field of Medicine.

Chitrak is useful drug in day to day life because of their therapeutic uses and it's Bioactive constituents.

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