



SAFETY AND EFFICACY OF *LANGALI* (*GLORIOSA SUPERBA*): A POTENTIAL HERBAL DRUG FOR INDUCTION OF LABOUR - A REVIEW

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ABSTRACT

As per Ayurvedic system, *Langali* is classified as *Garbhapatani* (abortifacient)¹ (1) and used for promoting labour pains² in traditional Indian medicine, the Liliaceae plant *Gloriosa superba* Linn has been used to induce childbirth. *Langali*, scientifically known as *Gloriosa splendid* Linn, is not only listed as one of nine *Upavishas* (semi-toxic substances) in many Ayurvedic pharmacopoeias, but also as a *Moolavisha* (poisonous root). Information about its techniques of purification and its medicinal usage in compound formulations as an antidote that has been referenced in the traditional classical literature. Possible alkaloids like colchicine were responsible for the oxytocic and early abortifacient effects seen in the water-based *Gloriosa superba* extract, because of this, its use in traditional medicine is justified. This review article contains information of safety, efficacy and detailed classical information of *Gloriosa superba*

Keywords: *Langali*, *Garbhapatana*, *Gloriosa superba* Linn., Uterine contractions, Induction of labour

INTRODUCTION

Medicinal uses for most plants that are considered oxytocic's include inducing and maintaining labor, helping with retained placenta removal, controlling postpartum hemorrhage, and even as an abortifacient. There will be more contractions since the plant extracts stimulate the uterus to contract more on its own. Boiling and then orally administering a decoction of some animal products, such as skin and flesh from the Hippopotamus amphibius or fats and feces from the Panthera Leo, has been used to induce labor and remove retained placenta. In most cases, the medicinal herbs used to hasten the delivery process are given either as the pregnancy nears its conclusion or as the first signs of labor begin. The function of oxytocin, which stimulates the uterus and causes severe contractions, thereby triggering labor, is comparable to that of plants that cause uterine contractions.

In most cases, these herbal medicines to induce labor are prescribed by traditional birth attendants, mothers-in-law, moms, and the pregnant mother herself. While they are giving birth, cows and goats

are given some of these therapeutic herbs as well. The tropical rainforests and several regions of tropical including as India, Burma, Malaysia, and Sri Lanka, are home to *Gloriosa superba* L., often known as *Langali*. Locations in India where it is most often found include: Maharashtra (Nasik, Ratnagiri, and Savanthwadi), Karnataka (Uttar Kannada, Hassan, Chikmagalur, Coorg, and Mysore), Kerala (Cannanore, Palakkad, and Trivandrum), Tamil Nadu, Goa, and others. Climbing perennial plant that stands tall and proud. To hasten labor and ensure a healthy birth, indigenous Patalkot women rub an extract of the rhizome to their navels and vaginae. They claim that a woman who is one to two months along in her pregnancy may have an abortion if she takes 250 to 500 mg of the extract³, Additional uses include the treatment of ulcers, leprosy, piles, inflammations, thirst, bruises, skin issues, snakebite, and intestinal worm infestations⁴.

AIM:

1. To study the safety & efficacy of *Langali (Gloriosa superba)* in detail.

Objectives: -

1. To study the therapeutic and pharmacological action of *Langali (Gloriosa suberba)*.
2. Detailed study of *Langali (Gloriosa superba)* as a potential drug for Induction of Labour.

MATERIAL AND METHODS

• **Conceptual Materials**

1. Literary references were collected from *Ayurvedic* as well as from modern sciences and various published research articles.
2. Collection of all references was done and data was analyzed.

Methods – Drug Review – Langali

Botanical Name: *Gloriosa superba*

Langali belongs to *Upavish varga* ^{5, 11},



Fig.1 *Langali (Gloriosa superba)* Flower



Fig. 2 *Langali (Gloriosa superba)* Root



Fig.3 *Langali (Gloriosa superba)* Root

GLORIOSA SUPERBA

The beautiful and medicinal geophyte *Gloriosa superba* is well-liked for both its vibrantly colored blossoms and its use as a medicinal crop for medications like colchicine. Originating in tropical regions, *G. superba* the delicate beauty of the blooms is where the name of the genus comes from. From the North-West Himalayas to Assam and the Deccan peninsula, it may be found growing up to a height of 2,120 m in tropical India.

Taxonomy and botany of the plant

Classes: Clode, Monocots,

Kingdom: Plantae,

Division: Angiospermae Belong to the Colchicaceae family,

Liliales: order The *Gloriosa* genus

Genus: *Suprba*

The System, the Dahlgren System, and the Thorne System all acknowledge it as a member of the Colchicaceae family, to which it belongs. This recognition was made public in October 2009. The Liliaceae family has undergone several transformations over the years, mostly as a result of the taxonomists' inability to reach a consensus on how to classify the members of this family. The

Colchicaceae are currently considered a separate family, but they were once members of the Liliaceae order. A tall herbaceous climber, *G. superba* has a delicate stem. A cylindrical, bifurcated, often 'V'-shaped tuber with limbs that are equal or uneven in length and pointed at the ends is the source of the stem. The simple ovate lanceolate leaves attenuate into a terminal curled tendril that twines around any accessible object; they are sessile, opposite, alternating, or whorled. Single blossoms are supported on a lengthy, acutely curved pedicel that droops from the top of the stem.

The six unattached perianth segments are reflexed, narrowly oval, acuminate, and typically have crisped segments that flatten out as they mature. Something special happens in the blossoms of *G. superba*. While the petals droop over the ovary in the bud stage, they stand upright as they mature, exposing the stigma at a right angle to the ovary. Inverted green and mild yellow tinges the petals, while a flush of pale crimson marks their tips. The color intensifies as the petals open and stand tall, becoming a muted carmine when they reach three quarters of their full height. Half of the top petals are a rich vermilion red and the other half are a deep yellow when the flower is completely open. When the blooms start to fade, the yellowish hue becomes orange, then darker orange flecks appear, and finally the whole petal turns a deep crimson. The petals start to fall, and then all of a sudden, they flop. Rich orange pollen is shown by the six long spreading stamens that have bilocular flexible anthers. Numerous axile ovules fill up the ovary's three locules. The style has three stigmatic arms and a pointed base. In addition to being leathery, the ovoid to cylindrical capsule has three valves and is speticidally dehiscent. The brilliant red, meaty, globose seeds, about the size of a tiny pea, are revealed as it opens flat. Seeds are easily set by *G. superba*, although the capsules may be any size or form; the longest ones are 8–10 cm long and 2.5 cm across. Observations of anthesis begin before 7:30 am and continue until 9:30 am, with full anthesis achieved by 10 am. The anthers separate from the body a day after anthesis.

Within eleven hours of pollination, viable pollens will begin to germinate. According to Sudhendra and Rudre Gowda (1997), stigma is most reactive up to 50% the day before anthesis and 50% the day after, with some reports suggesting that it remains susceptible for up to three days later⁶. In the stigma-receptive stage, the perianth lobes are red at the tip, yellow in the center, and greenish at the base. The top half of the perianth lobes will be reddish-purple after pollination, while the bottom half will be yellowish. Finally, the perianth lobes become completely red. When pollinated by hand one day after anthesis, glory lilies reach fruit set rates of 90–100%, compared to about 40% when pollination was done openly. According to Mamatha et al. (1993), there is no record of self-pollinating⁷

In terms of tuberization, *G. superba* is unlike any other. Concurrent vegetative development, blooming, and fruiting are the stages of plant life cycle. Glory lily seeds typically need three to four seasons in typical environments to develop into big tubers that can bloom and bear fruit.

The plant's tubers are fashioned like. The tuber is not hard to break since it is fragile and brittle. The tuber won't sprout if something harms the developing bud. In June and July, the latent tubers begin to sprout; the sprouting is erratic and reaches 60% in 30 days. Germination of seeds is unpredictable and may take anywhere from three weeks to three months because of the dormancy of the seed coat. Although seedlings begin to develop and produce little tubers in the second year, it is not until the third year that they begin to bloom. *Gloriosa superba*, *Gloriosa lutea*, *Gloriosa plantii*, *Gloriosa latifolia*, *Gloriosa magnifica*, *Gloriosa rothschildiana*, *Gloriosa abyssinica*, *Gloriosa longifolia*, and *Gloriosa simplex* are the ten to fifteen species that make up the genus *Gloriosa*.

Gloriosa species have a wide range of chromosomal numbers, with 1–90 ranging from 14–77. *G. superba* is thought to being a unique species with a great deal of variation. Of the ten elemental species, three are diploids four are tetraploids and three are octoploids *G.superba*, *G.lutea*, and *G.plantii*, *G.carsonii*, *G.virescens*, and *G.richmondensis* are the other three. *G. superba* and *G. rothschildiana* are the two most significant species discovered in India⁸)

GLORIOSA SUPERBA IS A GEOPHYTE

Among the several plant families known as geophytes, you'll find *Gloriosa superba*. Herbaceous perennial plants that have their reproductive parts and storage organs underground are called geophytes⁹

The capacity to regenerate into subterranean storage organs such bulbs, corms, rhizomes, stem tubers, root tubers, and expanded hypocotyls (caudex) allows them to withstand dry environments. Physiological dormancy of the storage organ occurs when aerial development is stopped. Dormancy does not stop it from changing and sensing its surroundings, however.

Geophytes in their native environments are capable of having several generations because they can tap into subsurface food stores and sprout when the weather is right. Underground bulbs, rhizomes, or tubers are the primary means of propagation for the majority of geophytic plant species. In general, plants with resting buds are referred to as geophytes. This subgroup of cryptophytes is itself a subdivision.

Depending on whether their dormant buds are in dry soil, halophytes are cryptophytes; hydrophytes are cryptophytes that are submerged; and geophytes are cryptophytes that are resting in marshy places, on the borders of lakes, or in ponds. The world over, geophytes are farmed for their edible (onions, asparagus, potatoes, etc.), decorative (gloriosa, gladiolus, liliun, narcissus), and secondary metabolite-producing (e.g., medicinal, pigmented, fragrant) qualities. According to Hartmann et al. (1990), geophytes include both dicotyledonous and monocotyledonous genera, including *Aconitum*, *Anemone*, *Begonia*, *Dahlia*, *Oxalis*, *Ranunculus*, and *Alstroemeria*, *Caladium*, *Colchicum*, *Crocus*, *Gladiolus*, *Gloriosa*, and *Lilium*¹⁰

Langali is included in *Upavishavarga* (Semi -Poisonous) in view of its abortifacient activity or because of presence of colchicines in it⁸¹. According to Vaidya Bapalal, scholar of Ayurveda , *Langali*(*Gloriosa superba*) is not consider as poisonous, drug has wrongly been considered as poisonous due to its abortifacient effect⁸²

Chemical Composition¹¹- Colchicine (0.2 to 0.3%), Gloriosine, Benzoic acid, Salisilicacid, Cholin.

LITERATURE REVIEW

I. Classical literature of *Langali* mentioned in Different Nighantus :-

Synonymes and Varga of *Langali* in different Nighantus: -

No.	Name of Nighantu	Synonyms of <i>Gloriosa superba</i> in different languages	Varga
1	Kaiyadevnighantu ¹²	Sansrit Names- <i>Langali</i> , <i>Halini</i> , <i>siri</i> , <i>Vishalya</i> , <i>Garbhapatini</i> , <i>Indrapushpi</i> , <i>Vanhijihva</i> , <i>Pradiptagnishikha</i> , <i>Shikha</i> , <i>Kalihari</i> , <i>Vanhimukhi</i> , <i>Prabhata</i> , <i>Pushpasikara</i>	<i>Aushadhi varga</i>
2	Rajnighantu ¹³	Sanskrit Names: - <i>Kalikari</i> , <i>Langalini</i> , <i>Halini</i> , <i>Garbhapatni</i> , <i>Dipti</i> , <i>Vishalya</i> , <i>Agnimukhi</i> , <i>Hali</i> , <i>Naktendupushpika</i> , <i>Vidyutjwala</i> , <i>Agnijihva</i> , <i>Vranahrut</i> , <i>Pushpaso urabha</i> , <i>Swarnapushpa</i> , <i>Vanhishikha</i> . Total 16 Sanskrit Names of <i>Langali</i> are mentioned in <i>Rajnighantu</i> . Hindi Name- <i>Kalihari</i> , <i>Kaliyari</i> , <i>Kariyari</i> , <i>Bangali Name- Vishalangala</i> , <i>Marathi Name- Kalalavi</i> , <i>Gujarathi Name- Kalgari</i> , <i>Kannad Name- Radagari</i> , <i>English Name- Mala glory lili</i> , <i>Wolfs bane</i> , <i>Latin Name- Gloriosa superba</i> Linn.	
3	Sodhala Nighantu ¹⁴	Sanskrit Name- <i>Langali</i> , <i>Halini</i> , <i>Vishalya</i> , <i>Garbhapatini</i> , <i>Kalikari</i> , <i>Agnijihwa</i> , <i>Dipta</i> , <i>Aanantendupushpika</i> , <i>Vranahari</i> , <i>Shikhimukhi</i> , <i>Ukari</i> , <i>Swarnapushpika</i>	<i>Karviradi Varga</i>
4	Madanpal Nighantu ¹⁵	Sanskrit Names- <i>Kalikari</i> , <i>Vanhimukhi</i> , <i>Langali</i> , <i>Garbhapatini</i> , <i>Vishalya</i> , <i>Halini</i> , <i>Shiri</i> , <i>Prabhata</i> , <i>Shuklapushpika</i> , <i>Vidyudulka</i> , <i>Agnijihwa</i> , <i>Pushpasi</i> , <i>Bhara</i> , <i>Vanhishikha</i> , <i>Agnika</i> , <i>Nalarandhri</i> , English Name- The Glory Lily, Tiger's claws Sanskrit Names: Mentioned in <i>Bhawaprakasha</i> - <i>Kalihari</i> , <i>Halini</i> , <i>Langali</i> , <i>Shukrapushpa</i> , <i>Vishalya</i> , <i>Agnishikha</i> , <i>Ananta</i> , <i>Vanhivaktra</i> , <i>Garbhanut</i>	<i>Upavisha</i> <i>Abhayadi Varga</i>
5.	Nighantu Adarsh ¹⁶	Sanskrit Names - <i>Langali</i> , <i>Langalika</i> , <i>Haalini</i> , <i>Kalikarika</i> , <i>Agnimukhi</i> , <i>Vishalya</i> , <i>Garbhapatini</i> , <i>Agnijwala</i> , Hindi- <i>Kalihari</i> , <i>Languli</i> , <i>Kalihari</i> , <i>Gujarathi- Dudhiyo</i> , <i>Vachanag</i> , <i>Vadhvardi</i> , <i>Kaliyari</i> , <i>Marathi – Kalalavi</i> , <i>Khadyanag</i> , <i>Kannad- Langulik</i> , <i>Panjabi- Malim</i> , <i>Kariyari</i> , <i>Marvadi- Rajarad</i> , <i>Telagu- Agnishikha</i> , <i>Advinabhi</i> , <i>English- The Glori lily</i> , <i>Latin name- Gloriosa suberba</i>	<i>Lashunadi varga</i>
6.	Dhanwantari Nighant ¹⁷	Names- <i>Kalikari</i> , <i>Halini</i> , <i>Visalya</i> , <i>Garbhapatini</i> , <i>Langali</i> , <i>Agnimukhi</i> , <i>Siri</i> , <i>Dipta</i> , <i>Naktendupushpika</i> Sanskrit Names- <i>Kalihari</i> , <i>Sakrapuspi</i> Bangali- <i>Visalanguli</i>	<i>Krviradi chaturth Varga</i>

		(Bom)- <i>Kalalawi</i> Marathi – <i>Khadyanag, Vagnakta</i> Gujarathi- <i>Dudhiyo, Bachanaga</i> Tamil- <i>Akkini, Chilam, Kandala</i> Telugu – <i>Agniskha, Masoni</i> Kannada- <i>Kolikuttum</i>	
7.	<i>Bhavaprakasa</i> ¹⁸		<i>Guduchyadi varga</i>

II. *Rasa virya Vipak Prabhav and guna's (Properties of Langali (Gloriosa superba) Langali*

No.	Name of Nighantu	Ras	Virya	Vipak	Guna (Properties)and Karma	Doshagnata	Rogaghanata
1	<i>Kaiyadev Nighantu</i> ¹²	<i>Katu Tikta</i>	<i>Ushna</i>		– <i>Kharyukta</i> <i>Tiksha, Saraka, Laghu</i> <i>Garbhapatkar, Relives</i> <i>pain in Basti region</i>	<i>Pittavardhak</i> <i>,Kaphaghna</i>	<i>Kushta, Shoth, Arsha, Vran Krumi</i>
2	<i>Rajnighantu</i> ¹³	<i>Katu</i>			<i>Sara,</i>	<i>Kaphavatagna</i>	<i>Garbhapatana, Shalyanishkasak,</i>
3	<i>Sodhala Nighantu</i> ¹⁴						
4	<i>Dhanwantari Nighantu</i> ¹⁷	pungent, bitter				pacifies <i>Kaphavata</i> <i>dosas</i>	It is laxative & useful in oedema , difficult labour and wounds .
5	<i>Nighantu Aadarsh</i> ¹⁶	<i>Katu, Tikta ,</i> <i>Lavana</i>	<i>Ushna</i>	<i>Katu</i>		<i>Doshagnata-</i> <i>Vaphavata</i> <i>shamak</i>	<i>Aaparapatana</i> ¹⁴ . ⁷² (For expulsion of Placenta) Su.sha.10-21 <i>Unmantha</i> ^{15,73} – Karnarog (Disorder of Ear) Su. Chi.25-19 <i>Indralupta</i> ^{16,74} –Langali root mixed with honey is used local application to treat Indralupta (Va.U.24.29) <i>Apachi</i> ^{17, 75} Medicated oil prepared with decoction of Langalika ,paste of the same in one-fourth part along with four parts of fresh juice of Nirgundi used as nasal drops etc.Cues apachi(Va.U. 30-21) <i>Shalyanirgamanartha</i> ¹⁸ - To remove shalya <i>Krimikarna</i> ¹⁹ – (Worms in Ear) - Shodhala <i>Sukhaprasava</i> ²⁰ - (Patha langali Ref-----
6	<i>Madanpal Nighantu</i> ¹⁵	<i>Katu ,Tikta,</i> <i>Kashaya,</i> ,	<i>Virya –</i> <i>Ushna</i>	<i>Vipak</i> <i>–</i> <i>Katu</i>	<i>Sara, Tiksha, Laghu</i> <i>Karma- Garbhapatana</i>	<i>Kaphavatanash</i> <i>ak</i> <i>Pittavardhaka</i>	<i>Rogagnata- Kushta, Shopha, Arsha,</i> <i>Vrana, shool, Krumi, Skin disorders</i> <i>,Upadansha, Kandu(</i> <i>itching),Mudhagarbha ,Indralupta,Visha</i> <i>Dorbalya ,Karna Roga</i>
7	<i>Bhavaprakasa</i> ¹⁸	& It is bitter, pungent & astringent in taste, penetrating,	hot in potency, acts as a vermifuge, light in action		Laxative It has Kshara property (it can reduce the excess mucus secretions, & can reduce kapha.	increases pitta	cures skin diseases, edema, haemorrhoids, ulcers/wounds & colicky pains. & is an abortifacient.

***Rajnighantu*¹³**

Acharya Sushruta has mentioned 8 *Moolavisha*, in which *Vidyujwala* is *Kalihari (Langali)*, it is considered as *Visha*. Acharya *Charaka* also mentioned as *Langali* as a *Visha*, in *Visha Chikitsa* and *Kushta chikitsa*

Useful Part- Bark, Flowers, Seeds, Roots

Dose- 120-500mg orally.

***Madanpal Nighantu*¹⁵-**

Langali is included in 7 *Upavisha* by Acharya *Bhavaprakasha*¹¹

Langali is included in 11 *Upavisha* in *Rasatarangini* and in *Bhaishajyaratnawali*¹¹,

Useful Part – *Kanda* -Root

Langali is included in *Upavisha*, it is mentioned to use *Langali* for medicinal use only after *shodhana* (Purification process)

Two Types of *Langali Kanda*- 1. *Purush Jati* ,2. *Stree Jati*

Pratinidhi / Apmishran Dravya- Kebuka, This *Kebuka* is also *Pratinidhi / Apmishran Dravya* of *Kushta Drug*. *Kebuka* is more potent in *Garbhashaya sankochaka* property than *Langali*.

Bhavaprakasa¹⁸

Scientific name- *Gloriosa superba* Linn., English Name- The glory lily, Tiger's claws, Family- Liliaceae

Hindi Name- *Kalihari*

Morphology- It is an extremely beautiful annual climber, climbs with the help of spirally twisted modified leaf apex into a tendril. This plant is known as "Flame of the forest" Flowers- scarlet or crimson coloured, solitary or in corymbs. Fruits-capsule, linear oblong, It contains a tuberous root of the shape of plough which is the officinal part & hence the synonyms *Langali* & *Halini* are suitable, Seeds- many, rounded.

Chemistry- Tuber & Seeds contain Colchicine, isoperlolyrine & related tropolane alkaloids. Air dried rhizomes contain Beta -Sitosterol & its glucoside, 2-hydroxy 6-methoxy benzoic acid, Leaves contain chlidonic acid. Flowers contain glucosides.

Therapeutic uses:-

1. Juice of *Langali* is used to induce abortions. 2. Externally it is applied on insect bites. 3. Dried tubers are given internally in cases of arthritis in very small doses. 4. In *Vatarakta* (probably gout) root powder is given. Dosage- Root 50-100mg

Nighantu Aadarsh¹⁶

Utpatistana – In Rainy season it gets plants

Useful part – *Moola* (Roots)

References of Langali in Charaka Samhita¹⁹–

Acharya Charaka included *Langali* in *Shaka varga*¹⁹, Acharya Charaka mentioned *Nasya* with *Langali* for *Aparapatnarth*²⁰ (To expel the placenta), Acharya Charaka mentioned *Langali* as one of the ingredient of *Sutikagar*²¹ (Room for Parturating Women)

References of Langali in Sushruta Samhita –

Acharya Sushruta had mentioned Use of *Langali* in *Sanshodhana varti* for *Vrana chikitsa*, and also mentioned that *Langali* is useful in treatment of *Gandamala*, *Bhagandhar* (Fistula), *Ajagallika*, *Kushta*, *Arsha*²² (Piles), Acharya sushruta had included drug *Langali* in *Shleshmasanshamana Varga*. Acharya Sushruta had mentioned internal use of *Langali* only in the treatment of *Aruchi* (Anorexia), along with *Brahmi* (*Bacopa monnieri*), *Arka* (*Calotropis gigantea*) and *Amruta* (*Tinospora cordifolia*) it reduces *Gulma*, *Aruchi*, *Swasan*, *Kantha*, *Hrudayrog*²³

References of Langali in Ashtanga Hrudaya –

Acharya Vagbhta had mentioned use of *Langali kshara* in *Pushparog*²⁴ (Eye disorders)

References of Langali in Ayurvedic Pharmacology & Therapeutic uses of Medicinal Plants²⁵ –

Kula- *Rason kula*,

Family- Liliaceae,

Latin name- *Gloriosa suberba*, *Gloriosa*= Beauty of the flowers, *Superba*= Splendid, Brilliant

English – Wolf's bane, Glory lilly

Sanskrit Names- *Vishalya*, *Agnishikha*, *Garbhapatini*, *Visha*, *Deepta*, *Vranahrut*, *Swarnapushpa*, *Ananta*, *Kalikali*

Botanical Description : A creeper having nice attractive flowers. Stalk -3 to 4 mtr long. The stalk near the ground is crooked like plough & contracted distantly. Leaves- Stalkless, 18 to 24 cm long with hook like tip & climbs taking its support. Flowers- 9 to 12 cms in size, Yellow & Red towards periphery. Fruits – Round, flat & 3cm long. It grows during monsoon & dries up as soon as rain stops.

Varieties- 1. Female- Round tuber

2. Male- Flat & Long tuber

Habitat – Bengal, South India, Brahmadesh & Sri Lanka

Chemical Composition – Tuber contains resin, superbine, gloriojine & starch

Properties- *Rasa- Katu , Tikta, Virya – Ushna ,Guna – Laghu , Tikshna ,Prabhav -Garbhapatka(Abortifacient) ,Dosha – Kaphavata shamak*

External Uses- Locally abortifacient & vitiates blood, It's paste is applied on wounds, inflammations, lymphadenopathy, Piles & scorpion sting. Its application on palms, soles, umbilicus & lumbar region eases the process of delivery & expulsion of placenta. Tuber kept in vagina acts as abortifacient.

Internal Uses- In low dose, it is useful in loss of appetite, pitta disorders, worms, dermatoses, typhoid & general debility.

Dose- For easy delivery & abortion – 3 to 6 gratti, otherwise in a low dose of 1 to 2 gms

Srotogamitva- *Dosha- Kaphaghna, Pittaghna & vataghna ,Datu – Rakta (Dermatoses,Mala- Purisha (Anthelmintic) ,Organ – Uterus (Abortifacient – local application on umbilicus ,pelvis or palms & soles)*

USE OF LANGALI IN AGADA PRAYOGA

1. For *Vyantaradashta*, a sort of snake, prepare *Saarkarmikaagada* using the following ingredients: *Karaveera, Arkakusuma, Langalimoola, Kakana, Pata, and Maricha* made into a paste with *Aranala*²⁸.
2. To make *Swedana*, boil *Langali patra* in *Tandulodaka*, then reduce to 1/4th. You may take this remedy alone or in conjunction with other medications such as *Erandapatra, Nimbapatra, Karanga patra*, or *Shireeshapatra*.
- To treat any *Sarpavisha* (snake bites), mix equal parts root of *langali* and *maricha* (*piper nigrum*) in clean water²⁹
- To treat *Moha* (unconsciousness) and *Visha* (poison) through *Nasya* (nasal instillation) and *Lepa* (external application), the following ingredients are prepared: 7 days of sunlight-cured *Kupilumajja* resin³⁰; half a quantity of *Vacha, Hingu*, and *Langalikanda* is taken and triturated for 3 days; 1/2 th of *Somnadihingu* is added and triturated with *Snuhiksheera* for 3 days; finally, store in a coconut shell.
- Applying a mixture of *Langali, Alabumoola, Trivrut, Snuhi, Neelimoola, and Apamarga* mixed with *Tila* externally in the *Mooshikavishakarnikapatana*, which means growth like the pericarp of a lotus in rat poisoning.

USE OF LANGALI IN PRASUTI TANTRA

- 1) Used for *Yonilepan* (Local application of *Langali Kalka* inside vagina) and *Yonidhoopan* (Fomentation inside vagina) in *Garbhasang*³¹ (Obstructed labour), *Yoni lepana* (Local application of *Langali Kalka* inside vagina) *Yonidhoopan* (Fomentation inside vagina) with *Langali* is also mentioned as *pathyaka* (beneficial) during *Prasava kala*⁷⁸ (During delivery)
- 2) For *Pradhaman nasya* with *langali churna* in *Garbhasang*³² (Obstructed Labour)
- 3) Local application of *langali kalka* on palms and soles for *Aparapatana*^{33,72} (for expulsion of placenta)
- 5) *Langali* churn is administered to alleviate difficult labor, 3 to 6 gms of *Langali churn* (Powder) is recommended orally for expulsion of foetus³⁴.
- 6) Placing the root of the *langali* in the vagina is used for fetal evacuation³⁵.
- 7) Rhizome paste may be used to ease labor by applying it to the palm, sole, and lower abdomen.
- 8) For *Aparapatana* (Expulsion of Placenta) Paste of *Kusht (Saussurea lappa)* & *Langali* root should be administered orally either with wine or cow's urine⁷²
- 9) For *Aparapatana* (Expulsion of Placenta) , *Uttarbasti* with *Siddhartaka Tail* is used, *Langali* is used for preparation of *Asthapan Basti*, and *Langali* is also used for *Uttarbasti*⁷² (Intrauterine instillation of Medicine)
- 10) To fasten the delivery in *Vilambit Prasava* (Prolonged labour) *Langali* root is used as Amulate, *Langali* root is advised to tie on hands & Legs.⁷⁶, For *Aparapatana* (Expulsion of Placenta) also *Langali* root is advised to tie it on hands & legs.⁷⁷

11) For *Sukhaprasava* (Easy vaginal delivery) *Langali* root paste is used for local application over navel and suprapubic region⁸⁰

Major Therapeutic claims- In Gout³⁶

Ethnomedicinal uses -1. To terminate a pregnancy up to three months along, make a paste by grinding together piper nigrum seeds and *langali* roots. Take two spoonsful of this mixture with a pinch of ghee first thing in the morning³⁷. 2. For women experiencing issues with menstruation, delayed puberty, sterility, or delayed childbearing, a soup prepared from processed sap of leaves or tubers might be quite helpful³⁸. 4. Applying rhizome extract to the navel and vagina may induce labor pain while ensuring a normal birth³⁹.

SHODANA (PURIFICATION) OF *LANGALI* -

The *Shodhana* (detoxification process) involve the soaking of roots and seeds in *Gomutra* (Cow's urine) for 24 h and then washing with warm water⁴⁰) after the *Shodhana* (purification) process the level of colchicine significantly reduces as colchicine is polar in nature and therefore soluble in *Gomutra* (Cow's urine) and water. Traditional system of purification (*Sodhana*) can influence the phytochemical, pharmacological and toxicological profile of the plant drugs and thereby useful in increasing safety profile and efficacy of the drugs⁴¹. Some *Granthas* recommend soaking *Langali* in a solution of *Takra* and *Saindhava* for three or seven days as a purifying ritual. The media (*Takra* and *Saindhava*) were analyzed using UV spectroscopy both before and after *Shodhana* to bring objectivity to the procedure and the function of the media. water soluble extractive, and alcohol soluble extractive, as well as a reduction in acid insoluble ash, as compared to the samples taken before the operation. Although their quantification was not done, qualitative examination reveals that both the pre- and post-*Shodhana* samples included alkaloids, saponins, tannins, and carbohydrates. Additional research on purification using various medium is recommended in the article⁴².

Gloriosa superba Linn used as a Folk Medicine⁴³ -

Among the tribal and rural population of Hadoti (Rajasthan) the root paste is applied on forehead in the form of tika for curing menstrual obstruction or irregularities in ladies (Sharma, 2002.p.157) Dried tuber powder is given to women as a contraceptive. (Pal and Jain. 1998.p142). According to Ganesan and Kesavan (2003.p.758) the ethnic group of Valaiyans of Vellimalai Hills-Tamil Nadu, uses the paste of tuber as abortifacient. The tribals of Wynad dist. of Kerala apply the ground paste of the tuber on the umbilicus. palms. soles and on the sides of the vagina for easy delivery (Thomas and Britts2003.p.819)

III. References of *Langali* (*Gloriosa superba*) mentioned in Different Research articles:-

1. Sharma, Pallavi et. al (2022)²⁶

Colchicine is utilized to treat the hyper-inflammatory phase in COVID-19 patients and has the potential to cure deadly illnesses like cancer. Preventing heart disorders, such as pericarditis, is another purpose for it. Colchicine, a gout treatment derived from *G. superba*, has become more popular in recent years as an alternative for patients who have adverse reactions to non-steroidal anti-inflammatory medicines. According to the literature, this species is also used to treat a variety of diseases and conditions, including typhus, cholera, impotence, arthritis, rheumatism, and cholera. This species is included in the "Red Data Book" by the International Union for Conservation of Nature because it is considered to be on the brink of extinction. This article made an effort to survey the many pharmacological and therapeutic uses of *G. superba*²⁹.

2. **Amin, Hetal (2016)²⁷** *Langali Moola* specimen collected from its native environment. In order to submit the compiled *Langali* to *Shodhana* in *Gomutra* For the purpose of conducting a pharmacognostic, physicochemical, and phytochemical comparison between the *Ashodhita* and *Shodhita* samples. In accordance with the traditional scripture, the *Shodhana* of *Langali Moola*

was performed. The organoleptic qualities and physical properties of Sample A (Ashodhita) and Sample S (Shodhita) were measured in three different solvents: water, benzene, and alcohol. These properties included moisture content, ash value, specific gravity, and extractive values. A preliminary phytochemical analysis was performed on all of the extracts from both Sample A and Sample S. Both Sample A and Sample S had their alkaloid percentages estimated. The A and S samples were subjected to qualitative analysis using TLC and HPTLC

3. safety and efficacy studies of *Gloriosa superba* Linn. -

S. No	Title of research article & Journal	Safety	Additional information in Article
1	Study of the safety profile of raw (asodhita) and cow's urine processed (gomtrasodhita) tubers of <i>Gloriosa superba</i> L. (Langali) in albino rats. International Journal of Ayurvedic Medicine, 2012, 3(2), 58-67. ⁴⁴	Chronic toxicity - (Ref Results- No mortality was observed during the chronic toxicity study. No significant behavioral changes were observed. Food intake was also not affected. It is observed that aqueous, chloroform and alcohol extract of <i>G. superba</i> resulted in an increase in body weight and organ weight at the dose of 500mg/body weight. This result may be due to rasayana property of <i>Langali</i> which is mentioned in text. Significant decrease in the weight of uterus in two groups can be attributed to uterine contraction activity of the drug. The weight of testis was found to be increased in asodhit group as compared to sodhit group, marked decrease in spermatogenesis was observed in testis of asodhitalangali, no such change observed in sodhita group. Asodhita group shows decrease in Hb % may be due to alkaloid like colchine present in the drug which is known to reduce Hb% while Hb% was found normal in sodhita samples which may be due to removal of that particular component through sodhana. Triglycerides were found decrease in asodhit group at higher dose levels while it was not observed sodhita group. Lower triglycerides, cholesterol as well as HDL Conclusion: No mortality and significant behavioral changes were observed. The result indicates that sodhana process removes or reduces certain principles which have the tendency to cause changes in some hematological and biochemical parameters. Raw (asodhit) <i>Langali</i> , at ten times dose level, showed significant alterations in some haematological and biochemical parameters. Raw (asodhit) <i>Langali</i> , at ten times dose level also showed decreased spermatogenesis whereas GS <i>Langali</i> showed moderate to good spermatogenesis. So, it can be concluded that both raw and sodhit <i>Langali</i> found relatively safe up to five times therapeutic dose level.	The therapeutic dose of <i>Langali</i> as per API is 125-250mg/day. The study showed that sodhana process attenuates the toxicity producing potential of raw <i>Langali</i> . This study indicates that sodhana process removes or reduces certain principles which tendency to cause changes in hematological parameters.

S. No	Title of research article & Journal	Safety	Additional information in Article
2	Colchicine poisoning: the dark side of an ancient drug ⁴⁵ . Clin Toxicol (Phila) 2010, June; 48(5):407-14. PMID:20586571	Reproductive Toxicology and Lactation: Colchicine was not shown to adversely affect reproductive potential in males or females. It crosses the placenta but there is no evidence of fetal toxicity. Colchicine is excreted into breast milk and considered compatible with lactation.	Colchicine is used mainly for the treatment and prevention of gout and for familial Mediterranean fever (FMT)

S. No	Title of research article & Journal	Safety	Additional information in Article
3	Anti-Implantation Activity of Hydroalcoholic Tuber Extract of <i>Gloriosa superba</i> Linn in Female Albino Rats. International Journal of Advances in Pharmacy, Biology and Chemistry ⁴⁶ , Vol.2(3), Jul-Sep, 2013	Acute Toxicity Study of the Hydroalcoholic extract was performed in Pregnant albino mice. Pregnant rats were randomly divided into four groups containing six in each group. Group 1 served as control, Group 2 nd served as standard group (Estradiol, 0.45mg/kg) Group 3 rd and Group 4 th were treated with Hydroalcoholic extract at 30mg/kg and 60 mg/kg body weight respectively. extract was administered orally. Animals were laparotomized the uteri were examined; the rats were allowed to recover and deliver after full term. The number of litters born was counted. The litters were allowed to grow in order to check for postnatal growth and any congenital abnormalities Result; Preliminary phytochemical analysis of the hydroalcoholic extract of <i>G. superba</i> revealed the presence of alkaloids, tannins and traces of phytosterols. Acute toxicity study of hydroalcoholic extract-It was found that no mortality and changes in the behavior were observed up to dose 300mg/kg body wt., Therefore, 1/5 th and 1/10 th of the maximal and sub maximal tolerated safe HGS doses (60 and 30mg/kg body wt) were selected for anti-implantation activity. Effect of Hydroalcoholic tuber extract of <i>G. superba</i> on implantation- HGS exhibited significant anti- implantation activity in a dose- dependent manner. None of the treatments altered the number of corpora lutea, Resorption sites on day 10 were present in treated groups and no teratogenic effect was observed at the various doses used	<i>Langali</i> is classified in Ayurvedic system as Garbhapatani (abortifacient) and used for promoting labour pains (kirtikar K R and Basu BD. Indian. 2 nd ed. L.M. Basu Allhabad, Vol3,1988,1932-33

S. No	Title of research article & Journal	Safety	Additional information in Article
4	Analgesic and anti-inflammation activities of the hydroalcoholic extract from <i>Gloriosa superba</i> Linn. International Journal of Green Pharmacy, July-September 2009 ⁴⁷	Acute toxicity study-The preliminary pharmacological studies were conducted to assess the acute pharmacological effects and LD ₅₀ of the crude extract Result-Acute Toxicity Studies of Hydroalcoholic Extract of <i>G. superba</i> – No death was observed even at the maximum administered dose of 2000mg/kg body weight. The hydroalcoholic extract of <i>G. superba</i> exhibited dose-dependent anti-inflammatory activity. The acute toxicity study in Rats revealed that the hydroalcoholic extract of aerial parts of plant is safe up to 2000mg/kg body weight. The significant analgesic, anti-inflammatory and wound healing action may be attributed to the phytoconstituents present in it. The present study offered	<i>G. superba</i> is a good abortifacient causing expulsion of fetus from the womb. (Mali RG, Hudiwale JC, Gavit RS, Patil D A, Patil KS. Herbal abortifacients used in north Maharashtra. Nat Prod Radiant 2006; 5:315-8

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	a scientific proof to the traditional use of G. superba.	
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Sr.No.	Title of Research article Journal	Efficacy study	Safety study	Additional information in Article
5	Effect of the Aqueous Extract of Gloriosa superba Linn (Langali) Roots on Reproductive System and Cardiovascular Parameters in Female Rats ⁴⁸ .	Antifertility study showed early abortifacient activity. No increase in uterus and decidua weight was observed. Both the reference (Oxytocin) and extract produced dose-dependent contractions but the extract had no effect on heart parameters and blood pressure. Conclusion- The aqueous extract of Gloriosa superba showed oxytocic activity and early abortifacient activity which may be due to the presence of alkaloids such as colchicines. The extract provides spasmogenic activity, which was not as strong as that of oxytocin. Its anti-implantation and early abortifacient activity may be due to its oxytocic property. This provides justification for its use in traditional medicine.	Acute oral toxicity study-Aqueous extract was given in doses of 5000, 1750, 550mg/kg p.o. The mice were observed for 2h for behavioral, neurological and autonomic profiles and for any lethality or death over the next 48 h. Result-The aqueous extract of Gloriosa superba was found to be safe at a dose as high as 550mg/kg body weight, which is approx. 10 times higher. Preliminary phytochemical assessment showed that the aqueous extract of roots of Gloriosa superba contains flavonoids, tannins, alkaloids and glycosides. The extract treatments produced increase in uterine contractility both in vivo and in vitro but height of contractions produced by the extract was significantly less than produced. The extract did not show any apparent teratogenicity as the pups born seemed normal and no death occurred during the 7-day observation period. The failure of extract to increase the uterine weight suggests absence of estrogenic activity, progestogenic activity was not manifest as the extract did not increase decidua (Uterine horn) weight. Conclusion -The mechanism of G. superba extract was neither estrogenic nor progesterone like. its early abortifacient activity is oxytocic. Absence of any effects on the cardiovascular parameters enhances the plant extract's safety profile in pregnancy. Study lends some credence to folkloric use of Gloriosa superba Linn. (<i>Langali</i>) in labour induction.	Tribesmen of Patalkot apply the rhizome extract over the navel and vagina to induce labour and facilitate normal delivery. According to them 250 to 500mg of the extract may lead to abortion if given to a lady with a pregnancy of 1-2 months. (Maurya R, Srivastava S, Kulshreshtha D, Gupta C. Traditional remedies for fertility regulation. Current Med.Chem.2004;11(11):1431-1450) The extract provides spasmogenic activity, which was not as strong as that of oxytocin. Its anti-implantation and early abortifacient activity may be due to its oxytocic property, the ability to cause uterine contractility raises the possibility of its being developed as a medicine for induction of labour

Sr. No.	Title of Research article Journal	Efficacy study
6	A Review of Herbs with Uterotonic Property The Journal of Phytopharmacology, May-June 2015 ⁴⁹	Uterotonic assessment in-vitro and in -vivo of aqueous extract of G. superba was carried out in rats. Oxytocin was used as the standard uterotonic. Both the oxytocin and the extract produced dose dependant contractions. (Malpani A A, Aswarum, Kushwaha SK, Effect of Aqueous Extract of Gloriosa superba

Sr. No.	Title of Research article Journal	Efficacy study
7	Pharmacological action of Sukhprasavakara Drugs- A Review ⁵⁰	The Extract demonstrated spasmogenic activity which was not strong as that of oxytocin, The extract was safe up to a dose of 550mg/kg. The extract did not show any apparent teratogenicity.

Sr. No.	Title of Research article Journal	Efficacy study
8	Experimental studies on the ecobolic properties of Gloriosa superba Linn. (Kalihari). J Res Indian Med 7, 27-38 ⁵¹ Reviews on Indian Medicinal plants Vol11, (Fa-Gy), Medicinal plants unit, Indian Council of Medical Research, New Delhi 2013, Editor, Neeraj Tandon, ISSN:0972-7957, Published by -Indian council of Medical research, New Delhi. pg.no.914 ⁵²	Pharmacological and Biological studies- Oxytocic- The alcoholic extract of the rhizome showed in vitro oxytocic activity in various animal preparations viz. isolated gravid and non-gravid uterus of guinea pig and rabbit, isolated dog and human uterus. The extract also contracted human round ligament. In vivo experiments 0.113-113mcg/kg dose in guinea pig and rabbits and 1.13-113mg/kg dose in dogs, the extract showed oxytocin activity. At higher doses, it initiated labour in pregnant rabbits. The activity was not blocked by pentolinium bitartrate, atropine sulphate or mepyramine maleate in both in vitro as well as in vivo experiments indicating that the effect was direct on the muscles and was not mediated through autonomic nervous system, in isolated human fallopian tube, it produced relaxation initially followed by stimulation.

Sr. No.	Title of Research article Journal	Efficacy study
9	Tewari, P., Prasad, D.N, CHATURVEDI, C. and Das, P.K. 1967. Preliminary studies on uterine activity of Gloriosa	The fresh root juice shows spasmodic effects in isolated guinea pig (gravid as well as non-gravid) and rabbit uterus, isolated rat uterus

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superba Linn. And its adulterant costus Speciosus, Sm. J. Res Indian Med 1, 196-202 ⁵³ Reviews on Indian Medicinal plants Vol11, (Fa-Gy) Medicinal plants unit, Indian Council of Medical Research, New Delhi 2013, Editor, Neeraj Tandon, ISSN:0972-7957, Published by -Indian council of Medical research, New Delhi, pg.no.914 ⁵²	(gravid as well as non-gravid) and human uterine strips. At higher concentrations, the effect was reduced in human uterine stripes and turned to relaxant effect. In rat uterus and also blocked the spasmogenic effect of barium chloride; 5-HT, Pitocin and acetylcholine in rat uterus. The juice also showed in vivo spasmodic effect in uterus of rabbit and dogs at 100-500 and 250-400mg/kg I.V doses, respectively.
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Sr. No.	Title of Research article Journal	Safety study
10	John, J.C., Fernandes, J. Nandgude, T., Niphade, S. R. Savla A. and Deshmukh, P.T.2009, Analgesic and anti-inflammatory activities of hydroalcoholic extract from Gloriosa superba Linn.Int. J Green pharm 3,215,219 ⁵⁴ . Reviews on Indian Medicinal plants Medicinal plants unit, Indian Council of Medical Research, New Delhi 2013, Editor, Neeraj Tandon, ISSN:0972-7957, Published by -Indian council of Medical research, New Delhi., pg.no.914 Vol11, (Fa-Gy) ,pg.no.914 ⁵²	Toxicity study- The hydroalcoholic (50percent V/V) extract of the dried aerial parts did not cause any mortality in acute toxicity study up to 2000mg/kg bw P.O. dose in albino mice. In acute toxicity study, LD ₅₀ of the 90 percent ethanolic extract of tubers was found to be 1260mg/kg P.O in albino mice

Sr. No.	Title of Research article Journal	Safety study
11	Varkey and Shifila 2011 Reviews on Indian Medicinal plants ⁵⁵ Medicinal plants unit, Indian Council of Medical Research, New Delhi 2013, Editor, Neeraj Tandon, ISSN:0972-7957, Published by -Indian council of Medical research, New Delhi, pg.no.914 Vol11, (Fa-Gy) pg.no.914 ⁵²	In acute toxicity study, LD ₅₀ of the 90 percent ethanolic extract of tubers was found to be 1260mg/kg P.O in albino mice

Sr. No.	Title of Research article Journal	Efficacy study
12	Herbal abortifacients used in North Maharashtra, Natural Product Radiance, Vol.5(4),2006, pp.315-318 ⁵⁶	Gloriosa superba Linn. Roots- 25ml of root extract is given orally twice a day for 6 days to induce abortion.

Sr.No	Title of Research article Journal	Efficacy study	Safety study
13	Critical review on medicinally potent plant species: Gloriosa superba, Fitoterapia ⁵⁷	The plant is used to cure arthritis, gout, rheumatism, inflammation, ulcer, bleeding piles, skin disease, leprosy, impotency, snake bites, etc	Glory lily contains 0.1 to 0.9 % colchicine but in Indian corms it is reported to be 0.02% (Thakur RS, Potesilova H, Santavy F. Substances from plants of the subfamily wurbbaeioideae and their derivatives. Part LXXIX, Alkaloids of the plant Gloriosa superba L. Planta Med 1975;3:201-9

Sr. No.	Title of Research article Journal	Efficacy study
14	Gloriosa superba (L): A Brief Review of its Phytochemical Properties and Pharmacology. Int J Pharmacogn Phytochem Res 7(6),2015 ⁵⁸	Paste of the G.superba tuber is externally applied for parasitic skin disease and also this plant used to cure disease like inflammatory disease, gout, ulcers, it induces abortion due to presence of colchicine.

Sr. No	Title of Research article Journal	Efficacy study	Additional information in article
15	Langali (Gloriosa superba) Linn. And its therapeutic importance in Ayurveda- a review Intrernational Journal of Ayurvedic Medicine ,2012,3(2), 58-67 ⁵⁹	In this article information of Langali is collected from six samhitas, seven samgrahagranthas, seven Nighantu, and five other texts. It is observed that the Langali drug is used in 159 formulations, among them 60 formulations are used as internal application and 99 formulations are used as external application which are effective in more than 30 disease conditions among which aparapatana (removal of placenta), mudhagarbha (dead foetus), vrana(wound), agnimandya (loss of appetite), javara (fever), grahani (Irritable bowel syndrome), kasa (cough) hikka (hiccough), kushtha (leprosy),shvitra (leukoderma), visarpa(erysipelas), arsha(piles)etc. Highest number of formulations was found in kushta (34), followed by arsha(16), bhangadara(9), and vatarakta(7), Useful part of plant is root in the dose of 125-250mg, should be administered internally after	Useful part of the plant is root with a dose of 125-250 mg, should be administered internally after passing through various shodhana procedures. It is used in various dosage forms such as svarasa, kvatha, lepa, varti, avaleha, taila,rasa,vati,kshara,moda ka,ghruta,loha,rasakriya,c hurna, dhupa nasya,lepa(paste) and

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	passing through various shodhana(purification) procedure. It is used in various dosage forms such as svarasa, kvatha, lepa, varti, avaleha, taila, rasa, vati, kshara, modaka, ghruta, loha, rasakriya, churna, dhupa, nasya and udvartana. Especially <i>Langali</i> is mentioned for inducing labour pain and also for carrying out delivery classically as well as traditionally ⁴⁸	udvartana. <i>Langali</i> is having Rasayana property ⁴⁶ .
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Sr.No	Title of Research article Journal	Efficacy study	Safety study	Additional information in Article
16	Sodhana: An Ayurvedic process for detoxification and modification of therapeutic activities of poisonous medicinal plants, Ancient Science of Life, Apr-Jun 2015/vol34/Issue 460	Gloriosa superba is used in inflammations, gout, rheumatoid arthritis, gonorrhea, fever, and in promoting labour pains. The Shodhana /detoxification process involve the soaking of roots and seeds in Gomutra for 24 h and then washing with warm water, after the Shodhana (purification) process the level of colchicine significantly reduces as colchicine is polar in nature and therefore soluble in Gomutra and water	Method of purification of <i>Langali</i> - Sock <i>Langali</i> into Gomutra for 1day (Referance Ayurveda Prakash, Yogratanakar)	Traditional system of purification (Sodhana) can influence the phytochemical, pharmacological and toxicological profile of the plant drugs and thereby useful in increasing safety profile and efficacy of the drugs.

Sr. No	Title of Research article Journal	Efficacy study	Safety study	Additional information in Article
17	Gloriosa superba: Content change of colchicine during sodhana (detoxification) process, Indian Journal of Traditional Knowledge, Vol.12(2), April2013, pp.277-280 ⁶¹	The tuberous roots of Gloriosa superba have been used as a drug in the traditional system of medicine. The tubers are regarded as tonic, stomachic and anthelmintic when taken in doses of 5-10 grains. It is used for promoting labour pains and also as abortifacient.	The <i>sodhana prakriya</i> prescribed for Gloriosa superba involves soaking of the sample in Gomutra for 24hrs and then washing with warm water and subsequent drying. Colchicine has high solubility in water (1gm dissolves in 22mi of water) The use of Gomutra in Sodhana sample prakriya exposes the sample to an aqueous environment which readily dissolves colchicine. The analysis of the medium used for sodhana prakriya as well as the subsequent water washings show presence of colchicine in them. The Sodhana prakriya for Gloriosa superba roots leads to the decrease in the concentration of the toxic component, colchicine due to solubilization in the treatment medium.	The drug is made safe for human consumption by subjecting it to the ayurvedic sodhana prakriya. Ayurvedic shodhana prakriya reduces the concentration of colchicine to tolerable limits.
18	George M, Pandalai, Investigations of plant antibiotics. Part IV Further search for antibiotic substances in Indian Medicinal plants. Indian J.Med Res 1949;37:169-181 ⁶²	Antibacterial activity Ethanollic & aqueous extract of the root of Gloriosa superba showed antibacterial activity against staphylococcus aureus		

Organoleptic study of *Langali*-

Organoleptic study of *Langali (Gloriosa superba)* was conducted in the Quality control laboratory, All India Institute of Ayurveda, New Delhi as per the methods & references of API & compared with available published scientific literature.

Organoleptic Parameters-

Parameters	Observation
Colour	Brown
Odour	Characteristic
Texture	Rough

Physicochemical Parameters-

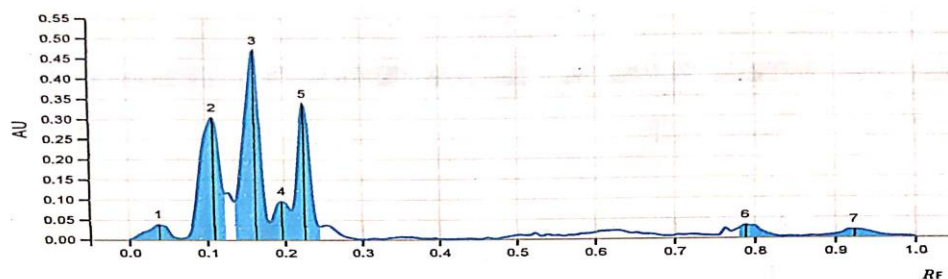
Parameters	Average of 3 Values
PH	4.9
Loss on drying at 110 ⁰ C	18.50%
Total ash value	3.14
Acid insoluble ash	1.007

Water soluble extractive	23.76%
Alcohol soluble extractive	17%
HPTLC	Report attachd

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Dr. Tejasvini_20220913_162257

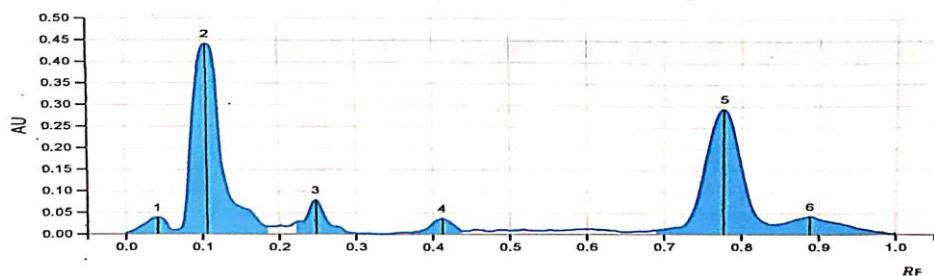
Type	Sample
Vial ID	2
Description	Langali
Volume	7.0 µl



Peak #	Start R _F	H	Max R _F	H	%	End R _F	H	Area A	%	Manual peak	Substance Name
1	0.000	0.0000	0.039	0.0375	2.91	0.065	0.0026	0.00119	3.78	No	
2	0.065	0.0026	0.110	0.3027	23.50	0.124	0.1150	0.00873	27.71	No	
3	0.135	0.0957	0.163	0.4682	36.36	0.181	0.0427	0.01119	35.50	No	
4	0.181	0.0427	0.197	0.0950	7.37	0.206	0.0768	0.00201	6.39	No	
5	0.208	0.0736	0.226	0.3358	26.07	0.247	0.0327	0.00641	20.34	No	
6	0.771	0.0140	0.789	0.0304	2.36	0.834	0.0013	0.00106	3.37	No	
7	0.879	0.0025	0.924	0.0182	1.41	0.979	0.0027	0.00092	2.91	No	

Track 3:

Type	Sample
Vial ID	3
Description	Kustha
Volume	7.0 µl



Report generation: 13-Sep-2022 17:01:01 - All india institute of ayurveda

Id: W9Bzsy0=

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IV. Therapeutic aspects of *Gloriosa superba* –

In Ayurvedic classics, *Langali* is classified as *Garbhapatani* (abortifacient) and used for promoting labour^{63&64}. *Gloriosa superba* is used for labour induction by traditional birth attendants in India⁶⁵. *Langali* is an essential drug to be kept in *Sutikagara* (Labour room)⁶⁶ Glory lily contains 0.1 to 0.9 % colchicine but in Indian corms it is reported to be 0.02%⁶⁷, Ayurvedic classics recommends its clinical use after *shodhana* (purification) and also Colchicine is soluble in water, hence after *shodhana* of *Langali*, colchicine concentration decreases due to solubilization⁶⁸ and then it becomes safe to use in clinical practice, hence from all these studies it is concluded that *Shodhita* (purified) *Langali* is safe to use in pregnancy for induction of labour. Colchicine was not shown to adversely affect reproductive potential in males and females, it crosses the placenta but there is no evidence of fetal toxicity. Colchicine is excreted into breast milk and considered compatible with lactation⁶⁹. *Gloriosa superba* has been proven to be safe in animal studies in the dose up to 2000mg/kg b.w.⁷⁰.

In all these animal studies *Langali* is given orally, still it is safe have not shown any mortality and behavioral changes and no teratogenic effect was observed⁷¹ and also shows Uterotonic activities in In- vitro and In-vivo studies in rats, rabbits, dog, guinea pig and also in human uterine strips, It shows initiation of uterine contractions in Human uterine muscle and round ligament also.it shows relaxation effect on human fallopian tube also, hence it is safe and effective for induction of labour. The extract also contracted human round ligament⁵².The ability to cause uterine contractility raises the possibility of its being developed as a medicine for induction of labour⁷¹. In both acute and chronic toxicity studies no mortality, no significant behavioral changes observed.

CONCLUSION - Various Preclinical in vitro and in-vivo studies have already been carried to study the safety, toxicity and efficacy studies on *Gloriosa superba*, in all these animal studies *Langali*(*Gloriosa superba*) is given orally, still it is safe have not shown any mortality and behavioral changes and no teratogenic effect was observed, *Gloriosa superba* also shows Uterotonic activities in In- vitro and In-vivo studies in rats, rabbits, dog, guinea pig and also in human uterine strips, It shows initiation of uterine contractions in Human uterine muscle and round ligament also, it shows relaxation effect on human fallopian tube also. Ayurvedic classics recommends its clinical use after *shodhana* (purification) hence from all these studies it can be concluded that *Shodhita* (purified) *Gloriosa superba* is safe, effective and potential drug to be develop as a medicine for induction of labour.

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