

The Review on the Pharmacognostic and Pharmacological Study of the *Gloriosa Superb*

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Abstract: *Gloriosa superba* Linn. is a medicinal plant which is also called as Glory lily belongs to family Liliaceae [Colchicaceae]. This plant has been used as a ethnomedicine in India and several parts of the world. Popularly it is known as Kalahari in Hindi and Glory lily in English. *Gloriosa* lily is the National flower of Zimbabwe. *Gloriosa superba* is an irritant plant poison which is mention Sthavaramulavisha in ancient Ayurveda texts. The rhizomes are capable of causing abortion and therefore, they are also called as Garbhaghatini. It is one of the endangered species among medicinal plants hence, International Union for Conservation of Nature has placed it in 'Red Data Book.' Seeds and tubers contain valuable alkaloids such as colchine and colchicoside which are having ethnobotanical and pharmacological properties to cure various diseases. It shows many pharmacological activities like anti-arthritis, analgesics, uterotonic, anti-microbial, anti-inflammatory, anthelmintics, antioxidants, anti-cancerous, anti-fertility, anti-thrombotic, anti-diabetic and anti-anxiety. This review article illustrates the importance of *Gloriosa superba* to retrieve the future prospects.

Keywords: *Gloriosa superba*, chemical constituents, uses

I. INTRODUCTION

From the beginning of human civilization, the plants, and their products particularly ethnomedicinal plants plays a great role. *Gloriosa superba* is considered as an important medicinal plant and very much used in Indian system of medicine. *Gloriosa superba* is an inhabitant of tropical Africa and now found growing naturally in many countries of topical Asia including India, Bangladesh, Malaysia and Myanmar⁽⁴⁾ *Gloriosa* popularly known as "Glory lily." The family Liliaceae. Germination of *Gloriosa* seeds by September to October and flowering is noticed from November to December. World Health Organization (WHO) encourages the usage of the herbal drug in healthcare programs, because it is cheaper and safer than synthetic medications. Several pharmacologically important phytochemicals such as gloriosine and colchicine have been isolated from this plant. The phytochemical investigations of *Gloriosa superba* plant exhibited the presence of carbohydrates, alkaloids, glycosides, flavonoids, steroids, terpenoids and phenolic compounds.⁽¹⁾ Traditional systems of plant-based medicine have served the people of south-central Asian region since time immemorial. Ancient texts among the Indian literary records such as Rigveda and Atharvaveda (2000-1000BC) portray extensive references on the description and use of several plants as source of medicine. *Gloriosa superba* L. (Colchicaceae) also known as Malabar glory lily or "kembangtelang" (Java, Indonesia) is a perennial tuberous climbing herb, extensively scattered in the tropical and sub-tropical parts of the India, including the foothills of Himalayas. It is called as 'Mauve beauty', 'Purple prince', 'Modest', 'Orange gem', 'Salman glow' and orange glow'.⁽⁹⁾

Geographical distribution

The flower of the herbaceous plant is the state flower of Tamil Nadu, India as well as the national flower of Zimbabwe. It is found growing throughout tropical India, from the north west Himalaya to Assam. It is now growing in many parts of tropical Asia including India, Burma, Sri Lanka, Bangladesh, Malaysia, Myanmar. In Karnataka, it is commonly found growing all along the western ghats.⁽⁵⁾⁽⁶⁾

Taxonomic Classification⁽³⁾

Kingdom: Plantae
Sub Kingdom: Tracheobiophyta
Division: Magnoliophyta
Sub-division: Angiospermae
Class: Monocotyledons
Sub-class: Liliidae
Order: liliales
Family: Liliaceae
Sub-family: Wurmbeodideae
Genus: Gloriosa
Species: Gloriosa superba L

Vernacular names/Synonyms

Latin name: *Gloriosa superba*

Ayurvedic: Langali, Langaliki, Langalaki, Langlahva, Indrapushpi, Agnishikha, Ananta, Vishalya, Visalya, Halini, Sirikrama, Shukrapushpika, Vahnimukhi, Garbhapatani, Kalahari, Kalikari, Shakrapushpi, Garbhaghatini

Siddha: KalappaikKizhangu

English: Glory Lily, Super Lily, Tiger's Claws, Climbing Lily

Bengali: Bisalanguli, Bishalanguli

Gujarati: Khadiyanag, Dudhiyavachnag

Hindi: Kalihari

Kannada: KolikutumanaGade, Nangulika

Malayalam: Mathonni, Menthonni

Marathi: Karianag

Orisa: Dangogahana

Punjabi: Kariyari, Kariari

Tamil: KalappoiKizhangu, Akkinichilam

Telugu: Potthidumpa, Adavinabhi

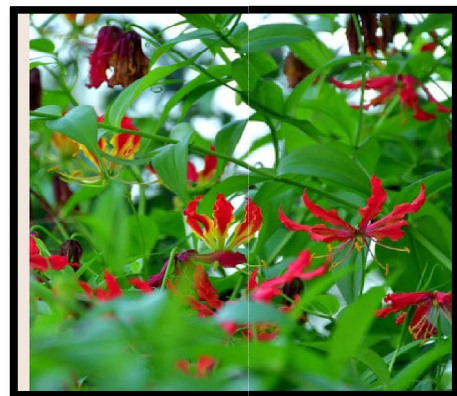
Myanmar: Si – mee – daul

Morphology

Langali is a climber with soft stem. The leaves are about 6-8 inch long and 2-3 inch wide, shiny in nature. They are mainly alternately arranged, but they may be opposite, as well. They are somewhat lance-shaped and tipped with tendrils. The flowers are attractive with a combination of bright red and yellow colors and having finger-like appearance.



Flower



Plant

They are seen in the rainy season. The fruits are about 2-4 inch long with reddish seeds inside. The rhizome is fleshy and grows to a length of about 1 foot and 1-2 inch thick. It has an appearance like a plough. The plant is found all over India in the temperate climate.⁽⁷⁾



Rhizomes



Fruit



Seed

Phytochemical constituents

Part of plant	Chemical constituents
TUBERS	The tubers contain colchicines, benzoic and salicylic acid, sterols and resinous substances 1,2- didemethylcolchicines, N-deacetyl colchicines, colchicoside, gloriosine, tannins and superbine, β -sitosterol, lumicolchicines, 2-hydroxy-6-methoxy benzoic acid
LEAVES	The active principles of leaves are superbine, colchicine, gloriosine, gloriosol, phytosterils and stigmasterin
SEED	Thiocolchicoside (TCC) which is chemically 2-demethoxy-2-glucosidoxythiocolchicine
WHOLE PLANT	Lumicolchicine, 3-demethyl-N-deformyl-N-deacetylcolchicine, 3-demethylcolchicine, and N-formyl-deacetylcolchicine, cornigerine

Ethnomedicinal Uses⁽⁸⁾

Sr no.	Plant part	Ethnomedicinal uses
1.	Leaf	Head-lice treated using leaf paste applied externally
2.	Flower	Flower is used in religious celebrations of Dongarya dev
3.	Tubers	In neurological pain warm paste of tuber is applied on the affected region. Decoction of tubers is administered in asthma. In wound tuber is crushed to paste and applied on affected region
4.	Root	Labour pain induced using root paste applied externally Snake bite and scorpion sting cure using root paste applied externally Gonorrhoea cured taking root infusion orally Abortion done keeping small cut piece of root in vaginal passage
5.	Whole plant	In case of sexually transmitted diseases decoction is given Skin disease cure using whole plant juice applied externally Spines are removed applying plant paste externally

Purification method⁽⁷⁾

Since Langali is considered as Upavisha (herb containing poisonous constituent) according to ayurveda, it is purified by boiling the rhizome of Langali in cow milk for 3 hours. After this procedure, the rhizome can be used for therapeutic

benefit. This procedure is called KsheeraSwedana. As per AyurvedaPrakasha, 6/50 Langhli-1 part Cow urine- quantity sufficient are taken.

Method: Small pieces of roots of langli are soaked in gomutra for 24 hrs then washed off.

Pharmacological activity⁽²⁾

Anti-cancer activity
Anti-anxiety activity
Anti- bacterial activity
Anti- fertility activity
Anti-coagulant and anti-thrombotic activity
Analgesic and Anti-inflammatory activity
Anti-diabetic activity
Anthelmintic
Rheumatism
Enzyme inhibition activity
Neuroprotective activity
Anti-microbial activity
Anti-arthritis activity
Antioxidant activity

Cultivation of *Gloriosa superba*

Glory lily is cultivated in some parts of India like Odisha, Chhattisgarh, Goa, and Tamil Nadu. It is exported from India; Tamil Nadu contributes the main share of global consumption of this plant 800-1000 tons annually. India is the major exporter of *G. superba*, the provisional export value of it was 53 million in the year 1996-97 and this value increased by about 15% in the year 2015.

Climate and soil

It is a tropical plant species. Annual rainfall of 350 - 400 cm, well distributed throughout the year, is ideally suited to the crop. It needs frequent irrigation up to flowering in dry periods and cannot tolerate prolonged moisture stress. It thrives in sandy loam soil, pH 5.5 - 7 is best

Planting

The rhizomes are planted during the rainy season i.e., June – July, in deep furrows of 6-8 cm with proper spacing. On average, approximately 2000 kg tubers are needed in a hectare. The rhizomes are treated with fungicides preferably 0.1% of Carbendazim to prevent the rotting of rhizomes. The plant requires some kind of support since the stem is tender; for this purpose wooden stick or iron rod is used.

Harvesting

The fruits are harvested after 170 -180 days of planting and dried in the shade for 10 -15 days. The right stage of the harvest is when the capsule skin shrinks, changes its colour and becomes light in weight. The rhizomes are harvested after 5-6 years of planting.

Isolation

The conventional method for extraction of colchicine by alcohol and chloroform extract yields less percentage of colchicine-type alkaloids from *Gloriosa superba*.

But by present aqueous extraction method, more than 80% colchicine is recovered and yield is also comparatively better.

Adverse effect

The tuber can stimulate the uterine muscles, thus leading to abortion. Hence the herb is to be avoided internally by pregnant ladies. Increased dosage can also cause vomiting, diarrhoea and increase in blood pressure. ⁽⁷⁾A pale yellow greenish yellow alkaloid Colchicine is mainly responsible for the toxic effect. The toxins in *G. superba* have an inhibitory action on cellular division resulting in diarrhoea, depressant action on the bone marrow and alopecia. After ingestion of tubers, initial symptoms develop within two to six hours. Intense vomiting, numbness and tingling around the mouth, burning and rawness of the throat, nausea, abdominal pain and bloody diarrhoea leading to dehydration etc. are some of the primary symptoms developed initially in the victim. The other important complications include respiratory depression, shock, hypotension, marked leukopenia, thrombocytopenia, coagulation disorders, oliguria, haematuria, confusion, seizures, coma and ascending polyneuropathy. Alopecia and dermatitis are the late manifestations that develop about one to two weeks after poisoning

II. CONCLUSION

Traditional medicinal systems have been an alternative to the synthetic medicines mainly due to benefits like easy availability, minimum side effects. *G. superba*, is well-known for its ethnomedicinal as well as therapeutic uses. Having an immensely strong ethnomedicinal and therapeutic profile, makes *G. superba* an important species that needs to be conserved. Numerous conservation strategies have been employed at various levels to overcome the problem. The plant also needs to be further researched upon as it may unravel new and amazing therapeutic uses.

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