

A REVIEW ON GLORIOSA SUPERBA L AS A MEDICINAL PLANT

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ABSTRACT

This spectacular lily is a native of Africa, where it is the national flower of Zimbabwe, and also of India where it is the state flower of Tamil Nadu. It's a herbaceous climber with tuberous roots, using its leaf-tip tendrils to cling to support. If it's left to scramble through other plants in a conservatory it will grow to a couple of metres tall and typically produces 5-6 blooms. The plant grows from an underground tuber and is easy to cultivate in a warm conservatory in summer. All parts of the plant are poisonous and the tubers particularly so, since they contain the toxic alkaloid colchicine. Colchicine is the important alkaloid extracted from the seed and used in modern medicine. Like many poisonous plants it has a long history of use in folk medicine and along with several related genera that contain colchicine it has been used to treat. In Africa and India there has recently been resurgence in interest in extracting a broad spectrum of medicinally useful and antimicrobial compounds from the plant, even to the extent of growing it as a crop, but it's those flame-like flowers that make it horticulturally interesting.

Key words: *Gloriosa superba*, gloriosa lily, medicinal activity

1. INTRODUCTION

Gloriosa superba lilies valued much for their distinctive, showy and vividly colored blooms. While it's unusual climbing habits makes *Gloriosa superba* an eye catching addition to any home garden, its extreme toxicity requires the most cautious of handling. *Gloriosa superba* is one of the medicinal plant grown as a commercial crop and will give good returns. Among the medicinal crops it gives more returns like cash crops. The generic name *Gloriosa* means 'full of glory' and *superb* means 'superb', alluding to the striking red and yellow flowers. *Gloriosa* is a genus of ten species in the plant family Colchicaceae and include the formerly recognised genus *Littonia*. They are native in tropical and southern Africa to Asia and naturalised in Australia and the Pacific as well as being widely cultivated. The most common English names are flame lily, fire lily, gloriosa lily, glory lily, superb lily, climbing lily, and creeping lily. They are tender, tuberous rooted deciduous perennials, adapted to summer rainfall with a dormant dry season. All parts of the plant, but especially the tubers (swollen, underground stems), are extremely poisonous and the ingestion of flame lily has caused many accidental deaths. Contact with the stems and leaves can cause skin irritation. Various preparations of the plant are used in traditional medicines for a variety of complaints in both Africa and India. It has also been used to commit murder, suicide, to induce abortions and to poison dogs. African porcupines and some moles are reputed to be able to consume the roots with no ill effect (Bhushan Pawar, 2010).

1.1. Botany: Gloriosais an annual climbing perennial herb with tuberous roots. It grows between 3.5 to 6 m in length. They have showy flowers, many with distinctive and pronouncedly reflexed petals, like a Turk's cap lily, ranging in colour from a greenish-yellow through yellow, orange, red and sometimes even a deep pinkish-red. Some synonyms, arising from the many variations, for *Gloriosa superba* include *G. Rothschildiana* (or) *G. superba* (*Rothschildiana*), *G. simplex*, *G. virescens*, *G. abyssinica*, *G. Carsonii* and *G. lutea*.

1.2. Taxonomy:

Class :Equisetopsida
Subclass :Magnoliidae
Super order :Liliana
Order :Liliales
Family :Colchicaceae
Genus :*Gloriosa*

1.3. Genus description: Scan dent herbs, the rootstock a horizontal rhizome, the stem leafy, the leaves spirally arranged or sub opposite, the upper ones with cirrhose tips; flowers solitary, large, borne on long, spreading pedicels, actinomorphic, hermaphrodite; perianth segments 6, free, lanceolate, keeled within at base, long-persistent; stamens 6, hypogynous, the anthers extrorse, medifixed and versatile, opening by longitudinal slits; ovary superior, 3-celled, the carpels cohering only by their inner margins, the ovules numerous, the style deflected at base and projecting from the flower more or less horizontally; fruit a loculicidal capsule with many seeds.

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1.4. Species information

Scientific name : *Gloriosa superba* L.
Common name(s) : Flame lily, glory lily, climbing lily, creeping lily
Synonym(s) : *Methonica superba*,
Eugonia superba
Habitat : Sparse savanna woodlands, grasslands, sand dunes, in abandoned fields or at the boundaries of cultivated ground and roadsides; in sandy-loam soil.
Key uses : Medicinal, ornamental.
Known hazards : All parts of the plant are extremely poisonous due to the presence of toxic alkaloids, including colchicine; ingestion can be fatal; contact can result in skin irritation.

1.5. Types of species: There are ten accepted species of *Gloriosa*, ignoring hybrids, varieties and cultivars.

Gloriosa aurea Chiov.

Gloriosa baudii (A.Terracc.) Chiov.

Gloriosa flavovirens (Dammer) J.C.Manning & Vinn.

Gloriosa lindenii (Baker) J.C.Manning & Vinn.

Gloriosa littonioides (Welw. ex Baker) J.C.Manning & Vinn.

Gloriosa modesta (Hook.) J.C.Manning & Vinn.

Gloriosa revoli (Franch.) J.C.Manning & Vinn.

Gloriosa rigidifolia (Bredell) J.C.Manning & Vinn.

Gloriosa sessiliflora Nordal & Bingham

Gloriosa superba L.

1.6. Habitat/ Ecology: In Australia, scattered naturalized populations exist in the understory of coastal dry sclerophyll forest and sand dune vegetation throughout south-east Queensland and New South Wales. It is considered a rampant and dangerous invasive weed in Australia, dominating the coastal dunes at the expense of native species and leading to deaths of native animals and birds when ingested. In India, *Gloriosa* is distributed in the Western Ghats but the density is rapidly decreasing due to excessive uprooting by the Herbal Medicine producers.

1.7. Toxicology: All parts of the *Gloriosa* contain colchicine, the roots and seeds are especially rich. Tubers and seeds contain colchicine, isoperlolyrine and related tropolane alkaloids, sitosterol and its glucoside, 2-hydroxy 6-methoxy benzoic acid. Flower's contain Luteolin, its Glucoside, N-Formyl-de-Me-colchicine, its Glucoside and 2-de-Me-colchicine. The colchicine content varies from 0.15 to 0.3% in the tubers and 0.7 % to 0.9% in the seeds.

The lethal dose of colchicine is about 6 mg/kg and it has been used as a means of committing suicide.

1.8. Uses: Flame lily has a wide variety of uses, especially within traditional medicine as practised in tropical Africa and Asia (including Ayurvedic medicine in India). It contains the alkaloid colchicine, which has been used effectively to treat acute gout, intestinal worms, infertility, wounds and other skin problems. The roots and leaves used as an antidote for snake bite, as a laxative, and to induce abortion. It has proven useful in the treatment of chronic ulcers, arthritis, cholera, colic, kidney problems and typhus. Colchicine, an alkaloid extracted from the tubers and seeds gives high price in the market and used in scientific research. Glory lily extract is useful against many skin diseases. It is used to rectify the many respiratory disorders.

Colchicine is widely used as an experimental tool in the study of cell division, as it can inhibit mitosis (a type of cell division), induce polyploidy (cells containing more than two sets of chromosomes), and has been used in the treatment of cancer.

The sap from the leaf tip is used for pimples and skin eruptions. Tribals of Patakot apply the powder of rhizome with coconut oil in skin eruptions and related diseases. *Gloriosa* paste can be applied for curing inflammation like wound, lymphadenopathy, piles and skin related problem. It is also effective in poisoning. Their powder helps in easy digestion of food. It is also helpful in relieving from menstrual disturbance. It's also providing strength to the body. *Gloriosa superba* is widely cultivated as an ornamental for its stunning flowers.

1.9. Propagation: Propagation generally occurs from seeds, although mature plants can be divided and grown from tubers. The hard seeds can remain dormant for 6-9 months.

1.10. Soil and Land preparation: A well drained red loamy soil is good for cultivation. Water logged soils are not suitable. Planting can be done during the rainy seasons and required the seed rate of nearly 1800 - 2000kg of tubers per ha. Planting is distributed from June – July. The ideal pH should be 6.0 – 7.0. This can be cultivated up to 600 m from mean sea level with an annual rainfall of 70 cm. Land should be ploughed many times and soil should be in fine tilth and incorporate 10 tonnes of Farm Yard Manure (FYM) during last ploughing. Furrows of 20 cm depth and 120 to 140cm between the furrows are formed and tubers are planted at 20 – 35 cm spacing. It is mainly propagated through tubers. Tubers are treated with 0.1% carbendazim for half an hour for controlling tuber rot.

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Glory lily is cultivated in Tamil Nadu mainly in the western parts viz., Mulanur, Dharapuram of Tirupur district, Oddanchatram and Ambilikai of Dindigul district, Markampatty and Aravakurichi of Karur District, Attur of Salem district.

The plant requires some support. Vines trained over support plants (*Commiphora beryii*, *Dedonea viscosa*). Permanent structures like iron wires can also be formed for growing the vines.

1.11. Irrigation: Irrigation is given immediately after planting. Subsequent irrigation is given at 5 days interval. After flowering there is no need of irrigation. Nowadays drip irrigation is well suited with growers. During early stages frequent weeding is necessary.

1.12. Manuring: NPK (Nitrogen, Phosphorus and Potash) at 120:50:75 kg/ha is applied in two split doses. Half of N and the entire dose of P and K are applied as basal dressing. Remaining quantity of N is applied at one and two months after planting.

1.13 After cultivation practice: *Commiphora* must be trimmed annually. Care must be taken to avoid the damages to growing portions. Artificial pollination can be done between 8 – 11 am for getting higher yield.

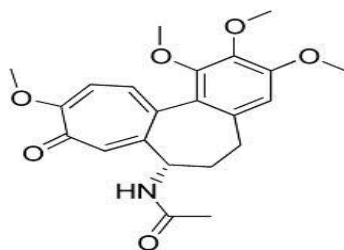


Fig 1: Chemical structure of Colchicine



Fig 3: Ariel part of *Gloriosa superb*



Fig 4: Field Preparation

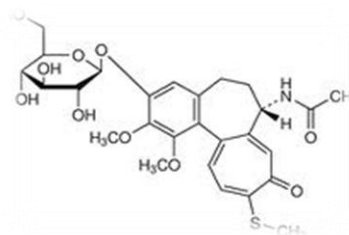


Fig 2: Chemical structure of Colchicoside



Fig 5: Sprouted tuber for Planting



Fig 6: Matured pod with seeds



Fig 7: Dried Seeds

2.0. CONCLUSION

This is an important medicinal plant, used as an antidote for snake poison, is in demand commercially. The tuber is poisonous, when consumed in high quantities. Colchicine is the important alkaloid extracted from the seed and used in modern medicine. It is also the state flower of Tamil Nadu.

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