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Research Article

**STUDY ON THE ETHANOBOTANY AND PHARMACOLOGICAL PERSPECTIVES OF *GLORIOSA SUPERBA L. [LILIACEAE]* OF SITAMARHI DISTRICT OF NORTH BIHAR**

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**ABSTRACT**

Ethanobotany refers to the mother of all other systems of medicine and pharmacology refers to the use of plant parts as drugs for the treatment of various ailments. Today most of the world population is moving towards herbal medicines. Most of these herbal medicines are used for treatment of abortifacients. Research work has to be focused on finding successful results on therapeutic values of these medicinal plants and also on the exact molecular mechanism of their action at molecular levels. The present review is focused on the ethanobotany and current status of the pharmacological perspectives of *G.superba L.*, a member of *Liliaceae* family, with reference to Sitmarhi district of North Bihar. The phytochemicals present in this species were found to have analgesic, anti-inflammatory, antithrombotic, anticoagulant, anti tumor, enzyme inhibitory, antivenom therapeutic and chemotherapeutic potentials.

**Keywords:** *Gloriosa superba L.*, antitumor, therapeutic, chemotherapeutic potentials.

**INTRODUCTION**

The art of the use of plant medicine in Ayurveda is herbalism. Alternative medicine is attracting professionals due to the fact that herbalism is used as an old tradition for gaining highest potential against diseases. Human population depends heavily on plants for food, clothing, religious ceremonies, for their health related issues and overall they support us to a large extent in terms of biodiversity, although animals and microbes are equally important. Nearly 21,000 plants have medicinal values and about 6,000 of these plant species are estimated to be known to traditional, folk and herbal medicines. Therefore it is important that not only the habitat and detailed taxonomic significance but also their proper utilization should be known to humans. Generally, the abortifacients are used by tribal women's for various purposes such as for conception disorders, mensuration problems, sterility, abortion, birth control problems, etc. It is believed all over the globe that herbal products are the symbol of safety as compared to synthetic medicines, which could be regarded unsafe to human and environment. For many years in the past, herbs are used for medicinal, flavoring, and aromatic values. But mere dependence on synthetic drugs is over and now day's peoples are adopting herbalism with hope of security and safety to their health<sup>1</sup>. Abortifacients are generally those drugs or

agents that cause abortion, generally at any time before it is capable of sustaining life.

The forest of India is confined with rich collection of medicinal and aromatic plants. Ayurveda, the Bible of medicinal science has coded about 8000 herbal remedies used for various therapeutic purposes. Green plants biosynthesize and preserve many biochemical products. The secondary metabolites of plants possess the potential of anti herbal medicinal system which provide base to the synthesis of lead structures for the development of modified derivatives with increased efficiency and reduced toxicity. Some useful chemicals from plants include morphine, atropine, capscicine, curcumin, ephedrine, digitoxigenin, allicin, aspirin, reserpine, berbequine, etc. Most of them are secondary metabolites also. The crude extract from different herbs could be used as medicament<sup>3</sup>.

*G.superba L.* is a perennial climber and is used as an ayurvedic medicinal herb to cure diseases, in various parts of Africa and South East Asia. The plant was under threatened category due to its imprudent harvesting form wild and it is extensively used by the medicinal industries for its colchicine content. The plant is used to cure arthritis, gout, rheumatism, inflammation, ulcers, bleeding, piles, skin diseases, leprosy, impotency, snake bites, etc. It is a state flower of Tamil Nadu also. It is a semi woody herbaceous climber found throughout

India up to an altitude of 6000ft. It is a native of tropical Africa and is now growing in many parts of tropical Asia including India, Burma, Malaysia and Sri Lanka. In India it is spread from hotter Southern parts to the mid hill zones of Himachal Pradesh, Jammu & Kashmir and Uttar Pradesh. It has very high colchicine content. Various compounds have been isolated from the plant parts mainly tubers and seeds viz colchicine, colchicoside, superbine, gloriosine, lumicolchicine, 3-dimethyl-N- deformyl-N-deacetylcolchicine, N-formyldeacetyl colchicine. Pharmacies and drug manufacturing companies often meet their requirement up to 75% of the raw material from the wild. In horticulture, vegetative propagation of *Gloriosa* is commonly used but the growth is very low. In India, seeds are officially exported through basic chemicals, pharmaceuticals and cosmetics promotion council, Mumbai.

**Botanical description:** It is strikingly beautiful perennial creeper with hollow stem of about 6mt, which emerges per year from the tuberous underground stem in rainy season. It is a widely distributed monocot in India. There are several associated species of *Gloriosa* including *G.superba*, *G.simplex*, *G.grandiflora*, *G.lutea*, *G. planti*, *G. langifolia*, etc. Some of the natural habitats of the plant in India are Jammu & Kashmir, Himachal Pradesh, Uttar Pradesh, and Maharashtra & Orissa. Cultivation of the plant is done in Andhra Pradesh, Goa, Karnataka & Chhattisgarh.

**Ethanopharmacology:** It is a valuable tropical medicinal plant, all of its part is diversely used in indigenous systems of medicine. Leaves are used to treat ulcers, piles and expel placenta and seeds are used to cure cancer related diseases. Peoples burn the herb and apply ash on wounds to promote healing. They also drink plant juice as an antimalarial drug. The tuber is used as arbortifacient and as a suicidal agent to

commit homicide, because of its high toxicity. The paste of the rhizome is applied to the lower part of the belly for easing childbirth. The rhizome has been reported as abortifacient in the early stage of pregnancy and its rhizome starch is useful in gonorrhoea.

**Pharmacological activities:** *G. superba* being such an important medicinal plant shows a number of important pharmacological activities. The most important ones are:

1. **Analgesic and anti inflammatory potential:** Gloriosine and colchicines are two used phytochemicals for the treatment of gout and rheumatism<sup>5</sup>.
2. **Antithrombotic and Anticoagulant potential:** Methanolic aqueous extract of roots has displayed anticoagulant property which may be due to inhibition of thrombin induced clotting<sup>8</sup>.
3. **Antitumor potential:** The various extracts of roots and seeds have been found to contain certain cytogenic potential when studied under p<sup>388</sup> cell lines

**Sampling Area:** In the present study certain areas were selected for collection of the plant from different parts of Sitamarhi district of North Bihar. Major areas selected were (1) *Sursand*, (2) *Runni Saidpur* & (3) *Dumra*. The plant was found to have medicinal use as well as arbortifacients and anti-fertility properties.

## MATERIALS AND METHODS

**Chemical constituents:** The tubers of *G.superba* contain cholchicine, benzoic acid, salicylic acid, sterols and resinous substances like colchicimides, gloriosine, tannins, superbine. The tubers were digged out, washed out, dried and stored properly for further use<sup>1</sup>.

**Table: Some chemical constituents present in different parts of *G.superba***

Serial no.	Plant part	Chemicals present
1.	Tuber	Colchicine, $\beta$ - sitosterlol. It is a glucoside, a long chain fatty acid.
2.	Leaf	Cholidonic acid.
3.	Seed	High level of cholchicines.

## RESULTS AND DISCUSSION

The roots of the *Gloriosa superba* are used to induce abortion, not only in the selected areas for study but also in different parts of Bihar. More research is needed to be done to improve the quality and effectiveness of these medicines in different parts of the country. Also, proper documentation of the plant can help us to preserve the plant as it is becoming extinct due to overexploitation in these areas of Bihar. Overall it is categorized as an endangered plant.

## CONCLUSION

*G. superba* being such an ayurvedic medicinal herb has a vast number of important pharmacological properties. It is a valuable tropical medicinal plant used in indigenous systems of medicines with different uses in ayurveda. A wide diversity of these perspectives can be found in the same plant found in

different parts of India and all over the world. Different chemicals are present in different parts of the plants especially tuber, seeds and leaves. Due to overexploitation this plant is facing local extinction in these areas of Bihar also apart from other parts of the country. It is confirmed as an endangered plant by IUCN. Therefore, there is a need to conserve the plant by *in situ* and *ex situ* multiplication in general and micro propagation in particular, to fulfill the increasing demand of the plant always from the industries.

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