

# Effect of *Gloriosa Superba* Root Extract on Development of Chick Embryo

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## ABSTRACT

*Gloriosa superba* has been widely used for several medicinal purposes in Indian traditional medicine system. It is traditionally used for the treatment of gout, chronic ulcers, haemorrhoids, cancer, and leprosy and also for inducing labour pains etc. The seed and tubers of this plant contain colchicine as major constituent. The purpose of study is to evaluate the effect of *Gloriosa superba* root extract on development of chick embryo. The Soxhlet aqueous extract of tuber was extracted using methanol. The effect of different concentration of tuber extract was carried out on eggs. The effect of extract was found that it stops development of chick embryo. *Gloriosa superba* showed abortifacient and oxytocic activity due to the presence of colchicines.

**Keywords:** Abortifacient ; *Gloriosa superba*; Oxytocic activity

## I. INTRODUCTION

In traditional medicinal culture thousand of references are available for the use of plants for the problems related to reproduction. Traditionally used herbs have great importance in modern world because of their efficacy, safety and minimal side effect on the human health as compared to chemically synthesized medicines. *Gloriosa superba* Linn. ( Family-Liliaceae) is a flowering plant commonly known as flame lily, fire lily, climbing lily. It is semi-woody, climbing using tendrils on bushes<sup>[1]</sup>. The plant has great importance in Ayurveda and is used in inflammations<sup>[12]</sup>, anthelmintic<sup>[5]</sup>, gout, rheumatoid arthritis, gonorrhoea and relieving fever<sup>[2]</sup>. Root extract are used to cure leprosy, ulcer, piles, skin diseases and show anti-dote property against snake bite. It is also used as abortifacient<sup>[4]</sup> and extract of tuber are applied topically during childbirth for reducing labor pains<sup>[6][10]</sup>. The leaf powder is extensively used to overcome jaundice and head lice<sup>[10][7][8]</sup>. The anti-microbial<sup>[9]</sup>, antibacterial<sup>[11]</sup> properties of tuber of the plant are reported<sup>[8]</sup>.

Literature study show that a plant seed and root are great source of colchicine and colchicoside. Colchicine is a powerful antimetabolic agent that blocks or suppresses cell division by inhibiting mitosis, the division of a cell's nucleus. These phytochemical constituents are responsible for the plant's abortifacient and oxytocic activities<sup>[16][17]</sup>. Considering traditional importance of

*Gloriosa superba*, the aim of study was to investigate the effect of root extract of *Gloriosa superba* on embryonic development of chick egg.

## II. MATERIAL AND METHODS

### Collection and authentication of the plant material

The tuber of the healthy plant *Gloriosa superba* was collected from Mordara, Pengiri, Sangamner (Maharashtra). The plant material was taxonomically identified with the help of available literature.

### Preparation of extract

Freshly collected tubers were washed with distilled water. The cleaned tubers were subsequently dried under sunshade to remove moisture completely and powdered by using mechanical grinder. The powdered plant material was extracted using methanol with Soxhlet apparatus for 18 h. The extract was concentrated by evaporating on water bath and dried to obtain a dark brown semi-solid mass.

### Phytochemical screening

Identification of the phytochemical was carried out on the plant extract to find out the presence of alkaloids, steroids, proteins and glycosides by using specific reagents<sup>[18]</sup>.

## Experiment

Chick Embryos: The chick embryos are easily available in large numbers hence chick embryo has been used to observe the teratological studies, because the post-blastula chick embryo and the mammalian embryo are similar, and thus the chick embryo is a good model for studying vertebrate embryonic development. All aspects of animal care compiled with the ethical guidelines and technical requirements were approved by the Institutional Animal Ethics Committee (IAEC) and Institutional Review Board (IRB).

Eighteen (18 nos.) fertile, pathogen free eggs incubated at 35° C for 48 hrs. and 75% relative humidity until the embryos reached stage ten of development according to Hamburger and Hamilton [12]. All the eggs were labelled and divided into three groups consisting of six eggs per group. The Group one (G1)- Normal (uninjected) eggs, Group two (G2)- Injected with physiological saline, Group three (G3)- injected with the 5 mm root extract of *Gloriosa superba* and 5 mm physiological saline

### Dosage of root extract of *Gloriosa superba*

Dosage was prepared by diluting 0.5 gm root extract of *Gloriosa superba* in 1 ml physiological saline(50 % solution).

### Method of injection

Eggs were wiped with 70% alcohol and labelled on the outer shell. A hole was made on the blunt pole of the egg with a sharp and thick needle under aseptic condition. Using a sterile needle and a syringe, 0.5 ml dosage of 50% solution of root extract in saline was injected to the corresponding groups of eggs. The gap created in the eggs was sealed.

All eggs were kept in incubator for 48 hrs.

### Observations

In each group, to determine the development of the chick embryos, the eggs were removed from the incubator after 48 hrs. The egg shell was opened to see the embryo. All the chick embryos were transferred to a petri dish by the careful sterile dissection.

On observation it is revealed that embryos from G1 and G2 shows development and embryo from G3 showed no development. (Table 1) (figure 1)

Table 1. Experimental design of chick embryos

Sr. No.	Groups	Observation
G1	Normal group	Normal Development
G2	Group injected with physiological saline	Normal Development
G3	Group injected with dilute root extract of <i>Gloriosa superba</i> in physiological saline	No Development

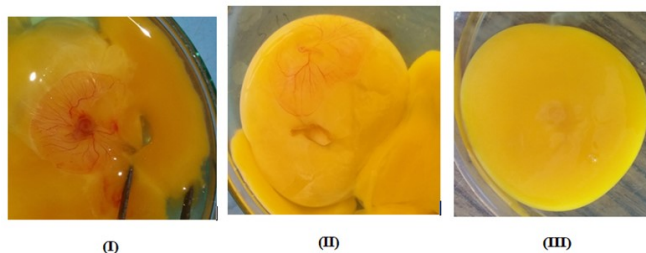


Figure 1. (I) chick embryo of Normal group, (II) chick embryo injected with physiological saline, (III) injected with dilute root extract of *Gloriosa superba* in physiological saline

## III. Conclusion

The experiment indicates that due to the injection of root extract, there is no further growth seen in chick embryo. It gives scientific evidence for the traditional use of *Gloriosa superba* as a abortifacient.

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