



A REVIEW OF *DELONIX REGIA*

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ABSTRACT:

Delonix regia is an ornamental tree of Fabaceae family. There is two species of Delonix genus like *Delonix regia* Rafin and *Delonix elata*. *Delonix regia* is a flowering plant. It containing five petals out of five four are of same colour but one is different having white colour streaking. *Delonix regia* reported to have anti-diarrhoeal, anti inflammatory activity, antioxidant, hepatoprotective and antimicrobial activity. It has been used in the folk medicine systems of several civilizations like for the treatment of constipation, inflammation, arthritis, hemiplagia, leucorrhoea and rheumatism. Flowers of *Delonix regia* have been used as traditional herbal remedies for gynecological disorders and they are also used as tablet binder.

Key words: *Delonix regia*, Gynecological, Phytoconstituents, Rheumatism

INTRODUCTION:

Delonix is a genus of flowering plants in the pea family, Fabaceae and subfamily Caesalpinioideae. This genus contains trees that are native to Madagascar and East Africa. By far the best known species is the Royal Poinciana (*D. regia*). The name of the genus is derived from the Greek words 'delos' meaning 'evident,' and 'onyx' meaning "claw," that refers to the petals^[1]. *Delonix* erect unarmed tree. Leaves are abruptly bipinnate, leaflets are many but small and stipules are small. Flowers are large, showy, in terminal corymbs, bracts small. Calyx tube is very short, 5 lobes, valvate and subequal. Petals are 5, orbicular, imbricate, clawed, subequal. Margins are fimbriate. Stamens are 10 free, declinate, longexserted. Filaments are villous below and anthers are uniform. Ovary is sessile, many ovuled. Style filiform and stigma truncate, ciliolate. Seed pods are elongate, flat, woody and dehiscent. Seeds are transverse and oblong^[2]. The members of the genus are flowering trees, native to the East Africa, has been used in traditional Indian medicine for the treatment of rheumatism, stomach disorders and its leaves are used in the treatment of bronchitis and pneumonia in infants [3, 4].

TAXONOMICAL CLASSIFICATION ⁽⁶⁾:

Class : Dicotyledons

Subclass : Rosidae

Order : Fabales

Family : Fabaceae

Subfamily : Caesalpinioideae

Tribe : Caesalpinieae

Genus : *Delonix*Botanical name : *Delonix Regia***VERNACULAR NAME** ^(7,8) : Sanskrit- Siddeshwara; Mumbai- Vayani; Telugu- Vatanaryana; Tamil- Vadanaryana**MACROSCOPY** ⁽⁹⁾:

Morphology of leaf:

1. Surface – Glabrous
2. Lamina – Oval
3. Margin – Entire
4. Apex – Obtuse
5. Base – Slightly asymmetrical
6. Venation – Reticulate

Figure: 1 *Delonix Regia* Plant Over View**PHYTOCONSTITUENTS:**

- i. Stem bark: Flavanoids, alkaloids, saponins, sterols, stigmasterols, carotene, hydrocarbons phytotoxins, beta sitosterol, lupeol, p-methoxybenzaldehyde, isolupeol, carotene, phenolic acids.^(10,11)
- ii. Root bark: Glycosides, tannins, alkaloids, sterols, terpenoids and carbohydrates.⁽¹²⁾
- iii. Flowers: Flavanoids, tannins, alkaloids, saponins,steroids,carotenoids [lycopene, phytoene,beta carotene,prolycopene,neolycopene],phenolic acid[galic acid, protocatochuic acid, salicyclic acid, trans-cinammic acid and chlorogenic acid], anthocyanins [cyanidin-3-glucoside and cyanidin-3-gentiobioside and beta sitosterol.^(10,13,14)

- iv. Leaves: Leupol, phenolic acids [gallic acid], protocatechuic acid and salicylic acid] and beta sitosterol. (13,14)
- v. Seeds: Saponins and galactomannons. (14,15)

Table 1: Various parts of *Delonix Regia* and Its Traditional Therapeutic Uses

S.NO	Parts of <i>Delonix Regia</i>	Therapeutic uses
1	Bark	Anti periodic
2	Plant	Rheumatism, Spasmogenic, Cathartic, Emetic, CNS depressant and in the treatment of anemia and fever
3	Flowers	Anthelmintic, insecticidal, gynecological disorders of dysmenorrhoea, inflammation and diarrhoea.
4	Leaves	Bronchitis and pneumonia in infants, anti diabetic, gastric problem, body pain and rheumatic joint pain
5	Root	Abdominal pain

REPORTED BIOLOGICAL ACTIVITY:

Many biological activity have been reported of *Delonix regia* Rafin. These are as follows,

ANTI-DIARRHOEAL ACTIVITY:

The flowers of *Delonix regia* plant have been reported to have in vivo anti diarrhoeal activity. The experimental models were castor oil induced diarrhoea, prostaglandin -E2 induced enteropooling and charcoal induced gastrointestinal motility test in Wistar albino rats. The 70% ethanolic extract of *Delonix regia* flowers was used for activity. The flowers of *Delonix regia* shows the dose dependent antidiarrhoeal effects in all the treated groups. (16)

ANTI INFLAMMATORY ACTIVITY:

The powdered leaves of the *Delonix regia* were used for the anti -inflammatory activity. The models for the anti-inflammatory activity were the carrageenan -induced rat paw edema and cotton pellet granuloma. The ethanolic extract of leaves of *Delonix regia* shows significant activity at 400 mg/kg in the both models when compared with standard group. (17)

HEPATOPROTECTIVE ACTIVITY:

The study was designed to evaluate the beneficial effect of methanol extract of aerial parts of *Delonix regia* in CCL4 induced liver damage rats. The metabolic extract of aerial parts of *Delonix regia* possesses hepatoprotective activity against CCL4 induced hepatotoxicity in rats. (18)

WOUND HEALING ACTIVITY:

The ethanolic and aqueous extracts of *Delonix regia* flowers were prepared to study the effect on wound healing. The animals used were Wistar albino rats. The wound models were incision and excision wound. The wound healing was assessed by the rate of wound contraction, period of epithelization, tensile strength and estimation of the hydroxyproline content of skin. The ethanolic and aqueous extracts significantly promote the healing process. (19)

ANTIDIABETIC ACTIVITY:

The methanolic extract of *Delonix regia* leaves were used for reporting glucose tolerance in glucose induced hyperglycemic mice. Glibenclamide [10 mg/kg] was used as standard reference drug. At every dose

of glucose the statistical data indicated the significant oral hypoglycemic activity on the mice. The maximum Anti hyperglycemic activity was measured at 400mg /kg of drug extract. ⁽²⁰⁾

GASTROPROTECTIVE ACTIVITY:

The ethanolic extract of *Delonix regia* flower was obtained which was investigated for gastroprotective activity in experimental induced ulcer model. The various parameters like ulcer index, PH of gastric juice, percentage protection in all models and gastric volume, free acidity and total acidity in pylorus ligation induced gastric ulceration model were monitored. The gastroprotective activity of ethanolic extract of *Delonix regia* was in a dose dependent model. ⁽²¹⁾

ANTHELMINTIC ACTIVITY:

The aqueous and methanolic extract of *Delonix regia* flower was taken in three concentration [25,50,100 mg/ml] differently. The determination of time of paralysis and time of death of worms was reported. The piperazine citrate [10 mg/ml] was taken as standard drug and distilled water was taken as control. Both aqueous and methanolic extract shows considerable anthelmintic activity, but the methanolic extract show the highest anthelmintic activity. ⁽²²⁾

LARVICIDAL:

The extracts of *Delonix regia* was effective at higher concentrations showed larvicidal effect was tested against third and fourth instar larvae of *Culax quinquefasciatus*. Flower extracts of *Delonix regia* showed the percentage of hatching of eggs was significantly reduced. ⁽²³⁾

ANTIOXIDANT ACTIVITY:

The radical scavenging activity of leaf and flower extracts was determined on the basis of the radical scavenging effect on the DPPH [1,1- diphenyl-2-picrylhydrazyl] free radical. 1ml of different concentrations of extracts was mixed with 3ml of DPPH solution [0.004% in methanol] in labelled tubes. The tubes were incubated in dark for 30 mins at room temperature and the optical density was measured at 517nm using UV-Visible spectrophotometer. ⁽²⁴⁾

NUTRITIONAL AND HAEMAGGLUTINATION PROPERTIES:

The Haemagglutinating activity of the seed extract of *Delonix regia* plant was evaluated against a range of animal and human erythrocytes by a serial dilution method. Nutritional performance of rats fed upon diets containing seeds was achieved without expensive pre-treatment of the seeds or for the supplementation of the diets with individual amino acids. The seeds of *Delonix regia* contained only low levels of essentially non – toxic lectin and they have great potential for development as source of dietary protein for man and animals. ⁽²⁵⁾

ANTIEMETIC ACTIVITY:

The antiemetic activity of methanolic extract of *Delonix regia* leaves using a chick emesis model, with chlorpromazine as standard. Emesis was induced by administering copper sulphate. The leaves extract produced a 96.74% inhibition significantly greater than chlorpromazine [33.97% inhibition]. ⁽²⁶⁾

ANTI-ARTHRITIC ACTIVITY:

The alcoholic extracts of the *Delonix regia* flowers using the Freund's incomplete adjuvant induced arthritis model in rats, with diclofenac sodium as standard. The treatment with ethanolic extract significantly reduced the paw edema volume as well as increased the level of antioxidant enzymes viz. catalase, glutathione peroxidase, glutathione-s-transferase, and total protein as compared to standard treated rats while ethanolic extract at a dose of 200 mg/kg did not show any significant effects ⁽²⁴⁾.

DIURETIC ACTIVITY:

The diuretic activity of methanolic extracts of *Delonix regia* flowers using Lipschitz test using furosemide as positive control and normal saline as negative control. The results revealed the increase in the urine volume at doses of 100 and 200 mg / kg, compared to the control group. ⁽²⁷⁾

ANTIMALARIAL ACTIVITY:

The antimalarial activities of the extracts of the fruits peels, leaves, barks, seeds and flowers of *Delonix regia* using parasutemia of Plasmodium berghei infection in mice by Peter's standard method with chloroquine as positive control and reported that bark extract inhibited more significantly parasite infection followed by fruits peel, seeds, leaves and flowers i.e. 117%, 87.45%, 78.43% and 75.99% respectively. The results suggested that the presence of alkaloids might be responsible for its antimalarial activity. ^(28,27)

CONCLUSION:

Delonix regia is an ornament plant in all over world. Its plant parts are used as a traditional as well as medicinal. Recent research on *Delonix regia* have shown many medicinal properties like Antidiabetic activity, Anti-Inflammatory activity antioxidant, hepatoprotective, gastroprotective, wound healing, antiarthritic, larvicidal, antimalarial, antiemetic, antibacterial, antifungal, anti-inflammatory, analgesic, antidiarrheal, antihemolytic, diuretic, and anthelmintic activities. This review is an up-to-date compilation on its traditional uses in context to morphological and pharmacological perspectives.

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