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Delonix regia (Gulmohar) – It's Ethnobotanical Knowledge, Phytochemical Studies, Pharmacological Aspects And Future Prospects

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ABSTRACT: *Delonix regia* (Gulmohar) tree is a member of the family Fabaceae, subfamily Caesalpiniaceae family. It is an ornament plant and it is a deciduous, large tree with fern-like leaves. Gulmohar is also known as flame tree or royal poinciana or the peacock flower. Ayurvedic and traditional medicines uses the stem, bark, leaves, flower and seed of this plant to treat the various disease. Many phytochemicals have been extracted from differentextractsofvariouspartsofthisplant. Such as alkaloids, glycosides, carbohydrate, phenols, saponinds, sugar, steroids, fixed oils, amino acids, fats, protein, etc. Some part of the plant has a wide range of pharmacological actions. It has a Anti-diarrheol activity, antihelmintic activity, antidiuretic activity, larvicidal activity, antihemolytic activity, wound healing activity, antiarthiritic activity, gastroprotective activity, antiemetic activity, antimicrobial activity, nutritional activity, haemoglutination activity, hepatoprotective activity, hypoglycaemic activity, anti-inflammatory activity, analgesic activity, antioxidant activity, antimalarial activity and and free radical scavenging effect.

KEYWORDS: *Delonix regia*, flame tree, traditional uses, medicinal uses, phytochemical constituent, isolated compounds, pharmacological activity, economic importants, future prospects.

INTODUCTION:

The generic name 'Delonix' is derived from Greek words-delos (visible) and onyx (claw) due to the conspicuously clawed petals. The specific name 'regia' is from the Latin word 'regis' (royal, regal, magnificent) (Singh et al., 2014). Since the primitive age nature has been an enormous source of medicinal agents. Plants have served as the richest source of raw materials for traditional as well as modern medicine. The medicinal value of plants is mainly due to the presence of phytochemicals. The trees are almost evergreen with broad-spreading, open, umbrella-shaped crowns and it is known as flame of the forest or flame tree. They are basically plant metabolites, are synthesized in all part of plant body by itself and have some definite physiological action on animals (Hait et al., 2018). In every region or country it known as various names such as chura, radha (Bengali), royal, flamboyant, poinciana (French), gulmohar, shima, sunkesula (Hindi), mayirkonrai, panjadi (Tamil), flamboyant flame tree, gold mohur, flame tree, peacock flower, gul mohr and royal poinciana (English). This tree requires light for it's growth but under shade it grows weakly and sparsely. It grows in area with both high and scanty rainfall. Trees are deciduous only where the dry season is long and pronounced (Sharma and Arora, 2015).

fig.no.1: *delonix regia*

fig.no.2: trunk

fig.no.3: leaf

fig.no.4: flower

fig.no.5: branch & stems

fig.no.6: fruit

Table no.1: Taxanomic rank of *Delonix regia.*

Domain	Eukaryote
Kingdom	Plantae
Division	Magnoliophyta
Class	Spermatopsida
Order	Fabales
Family	Leguminosac
Genus	*Delonix*
Species	*Delonix regia*

HISTORY:

The tree is native to Madagascar. It is now widespread in most subtropical and tropical areas of the world and has been widely planted more as a garden and avenue tree in both moist and dry regions of tropical India. Although widely cultivated in the tropics since the 19th century, the native habitat of *Delonix regia* was unknown to science until the 1930s. It is discovered by botanist Wensel Bojer in its native Madagascar in early 19th century. It was introduced into Singapore around 1840 (Suhane *et al.*, 2016).

OCCURANCE:

Delonix regia originates from Madagascar. It is now widespread in most subtropical and tropical areas of the world. It is native in Madagascar and Zambia. It is exotic in Brazil, Burkina Faso, Cyprus, Ethiopia, India, Jamaica, Nigeria, Puerto Rico, Singapore, South Africa, Uganda, United States of America, Egypt, Eritrea, Kenya, Mexico, Niger, Sri Lanka, Sudan, Tanzania (Suhane *et al.*, 2016).

BOTANICAL DISCRIPTION:

Delonix is a genus of flowering plants in the pea family Fabaceae and subfamily Caesalpinioideae. It is a ornamental flowering tree. Height of gulmohar tree is generally 10-15m (maximum 18m). Stems are Woody throughout, erect or ascending, arching, spreading or decumbent. Stems or young twigs are glabrous or sparsely glabrate. The fruit of gulmohar is legume, stipitate, unilocular, elongate and oblong. Fruit is green and flaccid when young and turning to hard, dark brown,

woody pods, ending in short beak when mature. In the maturation fruit splite into 2 parts. Fruit is approximately 30-75cm long, 3.8cm thick and 5- 7.6cm broad (Suhane *et al.,* 2016). The trunk is buttressed and the stem form above the buttress is generally normal in taper. The trees are almost evergreen, with broad-spreading, open, umbrella-shaped crowns. It is deciduous in localities which experience long pronounced dry seasons. The bark is grey or brown, smooth or slightly rough, and exfoliating (Bhokare *et al.,* 2018). Seeds are olive brown or black in color and surface is smooth. Seeds are hard, glossy, oblong and shaped very much like date seeds. They are approximately 2cm long.Flower is actinomorphic or irregular, slightly fragrant and up to 5-13cm across. Calyx is 5 lobed, glabrous. Sepals are thick, reddish with yellow border within and green outside. There are 5 petals. Petals are orbicular, broadly spoon shaped, rounded, broader, 5-6.5cm long and 2- 3cm wide. 4 petals are orange-red, almost scarlet and 1 is whitish inside with red spots, longer and narrower than the others. Number of stamens range from 9 to 10. Stamens are completely free, separate and monadelphous. Filaments are hairy, villous and red or pink in color. The extract of *D.regia* consist mixture of various components such as flavonol, phenolic acid, carotenoid and anthocyanin from its flowers. Leaves are biparipinnate, slightly hairy, alternate, light green and 20-60 cm long. Leaflets are oblong, margins entire, opposite, stalk less, in 18 to 30 pairs, about 1.5 cm long. There are 2 compressed stipules at the base of the leaf stalk that have long, comb like narrow teeth (Suhane *et al.,* 2016).

MEDICINAL & TRADITIONAL USES:

The *Delonix regia* (Gulmohar) has various medicinal and traditional properties and various parts of this plant is used to treat diferent disorders. The decoction of leaves is traditionally used in treating gastric problems, rheumatic pains of joints. Flowers were used in gynaecological disorders and diarrhoea. Further the leaves are reported for It's antimicrobial, anti-inflammatory, anti-diabetic activity (Chakraborty *et al.,* 2016). The medicinal plants were used to cure wounds in Darikal Gaon of Tezpur, in Assam (North-East India). 19 species of plants belonging to 16 families were used in diseases and ailments; *Delonix regia* were one of them. The water International Journal of Pharmacy and Pharmaceutical Sciences ISSN- 0975-1491 Vol 7, Issue 8, 2015 Innovare Academic Sciences Kashaw *et al.* Int J Pharm Pharm Sci, Vol 7, Issue 8, 17-29 18 extracts of flowers were also used in traditional healthy beverages in several African counties. It is a part of local medicine and traditional bioproducts (Sharma *et al.,* 2015). The Shaiji community in Southwestern Bangladesh the flowers of this plant are used for curing chronic fever (Halim *et al.,* 2007). During the study on the traditional medicines and herbal plants in Nigeria the flowers of *Delonix regia* was noted to possess antibacterial activity (Ode *et al.,* 2011). The medicinal plants were used to cure wounds in Darikal Gaon of Tezpur, in Assam (North-East India). The leaves have also been used to treat constipation, inflammation, arthritis and hemiplagia in Koothanoallur and Marakkadai, Thiruvarur district of Tamil Nadu, India (Rekha *et al.,* 2013). The leaves and fruits are used in piles and helminthiasis in the areas of Pirojpur district, Bangladesh (Rahmatullah *et al.,* 2010). The bark used as traditional fever remedy in Zambia (Fowler *et al.,* 2006). *Delonix regia* is an ethnomedicinal plant possessed antibacterial activity (Zahin, 2010) The seeds are used in pyorrhea; the roasted and crushed leaves are wrapped in a cloth and inhaled just after scorpion bite; infusion of flowers are used in bronchitis, asthma and malarial fever. The leaves are also used in rheumatism and as purgatives. The plant has antirheumatic and sparmogenic potential. The bark showed antiperiodic, febrifuge potential; aqueous and ethanol extract of flowers were used against round worms (Khare, 2007). It is also present in the list of traditional plants used by people of Bangangte region, Western Cameroon in the treatment of peptic ulcer (Noumi and Dibakto, 2000). The water extracts of flowers were also used in traditional healthy beverages in several African counties (Onyekachi and Okwukweka, 2021).

PHYTOCHEMICAL CONSTITUENTS:

- **Flower:** flower contain alkaloids, cardiac glycosides, carbohydrates, flavonoids, phenols, phlobatannins, saponins, tannins, terenoids, quinines and diterpenes(Hait *et al.,* 2018).
- **Leaf:** alkaloids, glycosides, flavonids, saponins, proteins, amino acids, carbohydrates, diterpenes and steroids(Bhorga *et al.,*2019).
- **Bark:** alkaloids, flavonoids, phenols, tannins, sugar, protein and amino acids(Vala and Maitreya, 2017).
- **Seed:** flavonoids,fixed oils, fats, steroids, triterpenoids, carbohydrates(Shantha, 2016).
- **Root:**alkaloids, saponin, flavonoids and steroids (Bhokare *et al.,*2018).
- **Stem:** alkaloids, saponin, flavonoids and steroids ((Bhokare *et al.,*2018).

ISOLATED COMPOUNDS:

- **Flowers:** Itcontains tannins, saponins, flavonoids, steroids, alkaloids, and caretenoids. **Flavonols** consists Quercetin trihexoside, Quercetin 3-O-robinobioside, Quercetin 3-O-rutinoside, Quercetin 3-O-galactoside, Quercetin 3-O-glucoside, cynidine 3-β-D-glucoside, cynidine 3-β-D-rutinoside, cynidine-3-gentiobioside, Kaempferol rhamnosyl hexoside, Isorhamnetol rhamnosyl hexoside, Quercetin. Phenolic acids consists Gallic acid, protocatechuic acid, 2-Hydroxy 5-[(3,4,5-trihydroxyphenyl) carbonyloxy] benzoic acid. **Glucoside** consists Stigmasten-diol-3-O-glucoside, 12, 15-Dihydroxy-chol-8-en-24-oic-acid-3-oxy-6′-acetyl-glucoside and sodium, potassium adduct of 12,15-Dihydroxy-5-chol-9-en-24-oic-acid-3-oxy-rhamnosyl-rhamnoside. **Carotene hydrocarbons** contains Phytoene, phytofluene, β-Carotene, Pigment X, C-Carotene, γ-Carotene, Prolycopene, Neolycopene, Lycopene, **Ketocarotenoid**: Astaxanthin; **Anthocyanins:** Peonidin-3-O-glucoside, Petunidin-3-O-acetyl-glucoside and other various acids such as α-ketoglutaric acid, oxaloacetic acid, pyruvic acid, glyoxylic acid; Zeaxanthin (Modi *et al.* ,2016).

- **Leaves:** The leaves have alkaloids, glycoside, tannin, and carbohydrates. **Flavonoids:** Kaempferol-3-rhamnoside, Quercetin-3-rhamnoside, Kaempferol-3-glucoide, Kaempferol-3-rutinoside, Kaempferol3-neohesperidoside, Quercetin 3-rutinoside, Quercetin 3-glucoside. **Others:** L-Azetidine-2-carboxylic acid, **Tannin:** Prodelphinidin; Triterpenoidal

Saponin: Lupeol; **Sterols:** β-sitosterol, and proline with free OH group; Phytol, Oleananoic acid Coumarin 7, 8-dihydro-7-hydroxy-6-methoxy-8-oxo, Scopoletin, Squalene, and Vitamine-E (Modi *et al.*, 2016).

D. regia plant is reported to contain polyphenolic compounds viz., flavonols, anthocyanins, and phenolic acids as bioactive secondary metabolites, which are responsible for various medicinal properties.

- **Bark:** bark contains tannins, terpenoids, alkaloids, glycosides, carbohydrates and sterols. **Tannin** (Propelargonidin and procyanidin), alkaloids, **Sterols**: β-sitosterol, Stigmasterol; **Triterpenoidal saponins:** Lupeol, Epilupeol **Flavonoid:** Leucocyanidin and **Pigments:** Carotene, Auroxanthin **Other:** p-methoxybenzaldehyde; hydrocarbons, phytotoxins and prolin with free OH group (Modi *et al.*, 2016).

- **Seeds and Fruits:Fatty acids:** Linoleic acid, 7-[2-octaeyclopropcn-1-yl] heptanoic acid (malvalic acid), 8-[2-octacyclopropen-1-yl] octanoic acid (sterculic acid), myristic acid, palmitic acid, stearic acid, oleic acid. **Amino acids:** trans-3-hydroxy-L-proline, γ-methyleneglutamic acid, γ-methyleneglutamine; hydrocarbons; **Sterols:** Stigmasterol, Sitosterol, Phytol, Ergost-4-en-3- one and Ergost-5-en-3-ol, **Carbohydrate:** galactomannan, Crude protein, **Tannin** (Propelargonidin and procyanidin) (Modi *et al.*, 2016).

- **Root:** It has a secondary metabolite tannins, phenols, alkaloids, sterols, cardiac glycosides, terpenoids (Bhokare *et al.*, 2018). It contains Lectin, Fatty acid, Protein and free amino acid (Ahmed *et al.*, 2009).

PHARMACOLOGICAL ACTIVITY:

Table no.2: Pharmacological activities of *Delonix regia.*

Plants part	Activity
Flowers	Anti-diarrheol activity, Antihelmintic activity, Antidiuretic activity, Larvicidal activity, Antihemolytic activity, Wound healing activity, Antiarthiritic activity, Gastroprotective activity.
Leaves	Antiemetic activity, Antimicrobial activity.
Seeds	Nutritional and Haemoglutination properties, Hypoglycemic activity.
Whole plant	Anti-inflammatory and Analgesic activity, Antixidant and Free radical scavenging , Hepatoprotective activity, Antimalarial activity.

- **FLOWER:**

Anti-diarrhoeal activity:

The antidiarrhoeal activity is Shiramane *et al.* have evaluated in vivo antidiarroheal effect of 70% ethanolic extracts of flowers (100, 250 and 500 mg·kg−1, b.w., p.o) in rat models of castoroil-induced (1mL, p.o.) diarrhoea, prostaglandin-E2-induced g·kg−1μ(100) enter pooling, and charcoal-induced (1 mL, 3% aqueous solution) gastrointestinal motility, using loperamide (1 mg·kg−1, p.o) as standard drug. The extracts showed significant ($P < 0.05$) dose dependent protective effects in all the treated animals. The results suggested that flavonoids and tannins present in flowers might produce antidiarrhoeal effect by decreasing intestinal motility secretion or inhibiting protein precipitation or secretion of electrolytes (Modi *et al.*, 2016).

Anthelminitic activity:

The anthelminitic activity of *Delonix regia* Rafin flower, plant belonging to family Caesalpiniaceae was reported against Pheritima posthuma (Indian Earth worm). The aqueous and methanolic extract of flower was taken in three different concentration (25, 50 and 100 mg/ml). The determination time of paralysis and time death of worms was reported. The piperazine citrate (10mg/ml) was taken as standard drug and distilled water was taken as control. Both aqueous and methanolic extract shows considerable anthelminitic activity but methanolic extract show the highest activity (Singh and Kumar, 2014).

Diuretic activity:

Velan et al. have evaluated the diuretic activity of methanolic extracts of *D. regia* flowers (100 and 200 mg·kg−1, p.o.) using Lipschitz test using furosemide (20 mg·kg−1, p.o.) as positive control and normal saline (25 mL·kg−1, p.o.) as negative control [94]. The results revealed the increase in the urine volume (mL·kg−1 for5 h) at doses of 100 and 200 mg·kg−1 b.w. (2.89 ± 0.18 and 3.61 ± 0.37) ($P < 0.05$), compared to the control group (1.73 ± 0.09) (Modi *et al.*, 2016).

Larvicidal activity:

The extracts of flower was effective at higher concentrations showed larvicidal effect was tested against third and fourth instar larvae of *Culax quinquefasciatus*. Flower extracts of *D.regia* shows percentage of hatching of eggs was significantly

reduced. It is also highly toxic to larvae and pupae. Third instar larvae are more susceptible to extract than final instar larvae. The adult emergence from the treated pupae was completely inhibited at a concentration of 200 ppm (Ahmed *et al.,* 2009).

Antihemolytic activity:

The methanolic extract of flower petals (25, 50, 75 and 100 µg·mL−1) has been evaluated for its antihemolytic activity against cumene hydroperoxide and hydrogen peroxide-induced hemolysis and 90% antihemolytic activity was observed at the concentration of 100 µg·mL−1 (Modi *et al.,* 2016).

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 albino rats. The wound models were incision and excision wound. Wound Healing was assessed by the rate of wound contraction, period of epithelization, tensile strength (skin breaking strength) and estimation the hydroxyproline content of skin. The ethanolic and aqueous extracts significantly promoted the healing process (Singh and Kumar, 2014).

Anti-arthritic activity:

Chitra *et al.* have evaluated the anti-arthritic activity of alcoholic extracts of *D. regia* flowers (200 and 400 mg·kg−1 , b.w., p.o.) using the Freund's incomplete adjuvant induced arthritis model in rats, with diclofenac sodium (5 mg·kg−1 , b.w., p.o.) as standard. Decrease in rat hand paw odema and increase in the natural antioxidant enzyme level were considered as index for its antiarthritic activity. The treatment with ethanolic extract (400 mg·kg−1) significantly ($P < 0.001$) 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−1 did not show any significant effects. The results suggested that anti-arthritic activity of the extract might be due to antioxidant activity of the flowers (Modi *et al.,* 2016).

Gastroprotective activity:

The ethanolic extract of flower of *Delonix regia* Rafin 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 flower of *Delonix regia* Rafin was in a dose dependent manner (Singh and Kumar, 2014).

- **LEAVES :**

Antiemetic activity:

Salman *et al.* have evaluated the antiemetic activity of the methanolic extract of leaves (150 mg·kg−1, b.w., p.o.) using a chick emesis model, with chlorpromazine (150 mg·kg−1, b.w., p.o.) as standard. Emesis was induced by administering copper sulphate (50 mg·kg−1, b.w., p.o.). The mean decreases in number of retching and percentage inhibition of emesis were considered as index for its antiemetic activity. The leaves extract produces 96.74% inhibition ($P < 0.01$), significantly greater than chlorpromazine (33.97% inhibition) (Modi *et al.,* 2016).

Antimicrobial activity:

The dichloromethane extract of *Delonix regia* Rafin leaf led to separation of scopoletin by silica gel chromatography. Scopoletin shows antifungal activity against Candida albicans and also antibacterial activity Pseudomonas aeuroginosa, Esecherichia coli, Staphylococcus aureus and Bubtilis subtilis. The plant extract was inactive against fungi *Apergillus niger* and *Trichophyton mentagrophytes*. Antimicrobial activity of the different extracts (15 µg mm–2) was conducted by the disc diffusion method. The zones of inhibition demonstrated by the petroleum ether, carbon tetrachloride and dichloromethane fractions ranged from 9–14 mm, 11–13 mm and 9–20 mm, respectively. Kanamycin was used as standard drug which shows the zone of inhibition of 20–25 mm. In brine shrimp lethality bioassay, the carbon tetrachloride soluble materials demonstrated the highest toxicity with LC50 of 0.83 mg mL–1 , while petroleum ether and dichloromethane soluble constituent of the methanolic extract revealed LC50 of 14.94 and 3.29 mg mL–1 , respectively. The standard drug used was vincristine sulphate with LC50 of 0.812 mg mL–1 (Singh and Kumar,2014).

- **SEEDS:**

Nutritional and Haemagglutination properties:

The Haemagglutinating activity of the seed extract of 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 supplementation of the diets with individual amino acids. These seeds of *D.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 (Ahmed *et al.,* 2009).

Hypoglycemic activity:

Rahman *et al.* have evaluated the hypoglycemic effect of methanolic extract of leaves (50, 100, 200, and 400 mg·mL−1 b.w., p.o.) in glucose-induced hyperglycemic mice; the serum blood glucose level was estimated for hypoglycemic effect. The extract showed significant (400 mg·mL−1, P < 0.000 1) dose-dependent effect, compared to standard glibenclamide (10 mg·mL−1 b.w., p.o.) treated mice (Modi *et al.,* 2016).

- **WHOLE PLANT:**

Anti-inflammatory and Analgesic activities:

Analgesic activity at the dose of 200 mg/kg body weight was observed. The extract of bark and flowers used at the dose rate of 300 mg/kg, p.o. Aspirin (300 mg/kg, p.o.) was employed as a reference drug which exhibited significant anti-inflammatory activity, were also tested for analgesic activity, using Randall-Selitto method in rats (Ahmed *et al.,* 2009).

Antioxidant and Free Radical Scavenging Properties:

Methanolic crude extracts of *D.regia* was screened for their antioxidant and free radical scavenging properties using α-tocopherol and butylated hydroxyl toluene as standard antioxidant, measured by ferric thiocyanate (FTC) assay and compared with the thiobarbituric acid (TBA) method. Free radical scavenging activity was evaluated using diphenyl picryl hydrazyl (DPPH) radicals. The extract showed significant antioxidant activity. 10 Alcoholic extract of this plant shows potential antioxidant activity by FTC method using α-tocophrol and Butylated hydroxyltoluene (BHT) as standard antioxidant (Ahmed *et al.,* 2009).

Hepatoprotective activity:

The study was designed to evaluate the beneficial effect of methanol extract of aerial parts of *Delonix regia* in CCl_4 induced liver damage rats. The methanolic extract of aerial parts of *D. regia* possesses hepatoprotective activity against CCl_4 induced hepatotoxicity in rats (Singh and Kumar, 2014).

Antimalarial activity:

Fatmawaty & Astuti, (2013) have evaluated the antimalarial activities of the extracts of the fruits peels, leaves, barks, seeds and flowers of D. regia (72.8 mg·kg−1, b.w., p.o.) using parasitemia of Plasmodium berghei infection in mice (Mus musculus) by peter's standard method with chloroquine (8 mg·kg−1, b.w., p.o.) as positive control and reported that bark extract inhibited more significantly (122%, P < 0.05) parasite infection followed by fruits peels, seeds, leaves and flowers i.e. 117%, 87.45%, 78.43% and 75.99%. The results suggested that the presence of alkaloids might be responsible for its antimalarial activity (Modi *et al.,* 2016).

ECONOMIC IMPORTANCE:

The large pods and wood are used for fuel. The calorific value of wood is 4600 kcal/kg. Apiculture Flowers are used to produce bee forage. The tree yields thick mucilage of water-soluble gum in reddish-brown or yellowish warty tears. The seeds contain gum which is useful in textile and food industries. The gum obtained from dried seeds is used as a binder in the manufacturing the tablets. The heartwood is yellowish to light brown and the sapwood is light yellow. It is heavy (specific gravity 0.8) soft, weak, brittle, coarse grained, takes good polish and it is durable and resistant to water. The elongated and hard seeds are used as beads and it yield 18 to 27.5 % fatty oil known as the "karanga" or "pangam" oil of commerce. It is mainly useful in tanning industry. It is widely planted in the subtropics and tropics area as an ornamental tree in parks and streets. Tree is planted as a shade tree in tea plantations, dairy farms and compounds. It can be planted as live fence posts. It is host for lac- insect. It is a good tree to control soil erosion in the semi- arid and arid areas (Suhane *et al.,* 2016).

CONCLUSION:

Delonix regia (Gulmohar) plant is reported to contain polyphenolic compounds viz., flavonols, anthocyanins, and phenolic acids as bioactive secondary metabolites, which are responsible for various medicinal properties. The different parts such as leaves, flowers and seeds of this shows various pharmacological activities such as anti-diarrheol activity, antihelmintic activity, antidiuretic activity, larvicidal activity, antihemolytic activity, wound healing activity, antiarthiritic activity, gastroprotective activity, antiemetic activity, antimicrobial activity, nutritional activity, haemoglutination activity, hepatoprotective activity, hypoglycaemic activity,anti-inflammatory activity, analgesic activity, antioxidant activity, antimalarial activity and and free radical scavenging effect.

FUTURE PROSPECTS:

From the above information it has been observed that almost every part of the plant like flowers, leaves and seeds has a various pharmacological activity which can be used as a medicinal purpose. But compare to the leaves and seeds, flowers shows maximum pharmacological activities and leaves shows minimum activity compare to other parts of the plant. *D. regia* (Gulmohar) plant is not exploited for the other activities like antidiarrheal, anticonvulsant, antifertility, antidiabetic and wound healing activity. So, this plant shuld be exploited as it has not very much activity.

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