

## PRELIMINARY PHYTOCHEMICAL SCREENING OF ROOT BARK OF *DEOLONIX REGIA*

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### ABSTRACT

Medicinal plants have been of age long remedies for human diseases since they contain valuable components. In India, indigenous herbal remedies such as Ayurveda and other Indian traditional medicine have since ancient times used plants in treatment of various diseases. The present investigation was carried out to assess the qualitative phytochemical analysis of *Delonix regia* root bark was carried out by using various polarity solvents including hexane, butanol, methanol, and water. The methanol and water extracts indicates the presence of major bioactive compounds compare to other extracts. The Phytochemical screening of plant extracts revealed the presence of tannins, terpenoids, alkaloids, glycosides, carbohydrates and sterols. The results suggest that the phytochemical properties of the root bark can be used for curing various ailments.

**KEYWORDS:** *Delonix regia*, phytochemical screening, bioactive compounds, herbal remedies.

### INTRODUCTION

Knowledge of the chemical constituent of plants is desirable for the discovery of therapeutic agents and in discovering the actual value of folklore remedies. Traditionally, screening methods have been used to study the pharmacological effects of phytochemical compounds. The medicinal value of these plants lies in some chemical substances that produce a definite physiological action on the human body. The most important of these bioactive constituents of plants are alkaloids, tannins, flavonoids, and phenolic compounds<sup>1</sup>. Biologically active compounds from natural sources have always been of great interest to scientists working on infectious diseases. World Health Organization advocated that both developed and developing countries should interact with the traditional medicine with a view of safe and effective remedies of ailments.

The plant *Delonix regia* is belongs to ceasalpiniaceae, family, commonly called as Gulmohar in Hindi and royal Poinciana or Flamboyant in English. In many tropical parts of countries around the world it is grown as an ornamental tree. The plant is broad, spreading, flat crowned deciduous tree and well known for its brilliant display of red-orange bloom, literally covering the tree from May to June. The bark of this plant reported to contain β-sitosterol, saponins, alkaloids, carotene, hydrocarbons, phytotoxins and flavonoids. Flowers of this plant reported consist of tannins, saponins, flavonoids, steroids, alkaloids, carotenoides<sup>2 & 3</sup>.

Several experimental studies have revealed biological and pharmacological properties of phenolics compounds, especially their antimicrobial activity. Antiviral, anti-inflammatory and cytotoxic activity. Tannins decrease the bacterial proliferation by blocking key enzymes at microbial metabolism. Steroids have been reported to possess anti-inflammatory activities<sup>4, 5, 6</sup>.

### MATERIALS AND METHODS

#### Collection of Plant material

The root bark of *Delonix regia* was collected from Coimbatore district, Tamilnadu in the month of May 2011 and identified by Botanical Survey of India, Tamilnadu. The root bark was washed thoroughly and shade dried.

#### Extraction of plant material

About 10g of dried powder was subjected in 100ml of different solvents in their polarity variation such as hexane, butanol, methanol and water in separate flasks. Then the flasks were kept in rotating shaker at 190-220 rpm for 48 hrs and filtered. The filtrate was evaporated and stored at 4°C for further use.

#### Preliminary phytochemical screening

The condensed extracts of different solvent used for preliminary phytochemical screening were carried out using standard procedures to test the presence of bioactive compounds<sup>8, 9</sup>.

#### Test for alkaloids

##### Mayer's Test

To a fraction, each extracts were treated with Mayer's test reagent observed for the formation of cream coloured precipitate.

##### Wagner's Test

About 5 ml of each extracts few drops of Wagner's reagent were added to observe the formation of reddish brown colour precipitate.

##### Hager's Test

To 1 ml of each extract 3 ml of Hager's reagent was added for the formation of prominent yellow precipitate.

#### Test For Flavonoids

##### NaOH Test

To 1 ml of the extract few drops of aqueous NaOH and HCl were added along the sides of the test tube to observe for the formation of yellow orange colour.

##### Sulfuric Acid Test

A fraction of the extract was treated with concentrated H<sub>2</sub>SO<sub>4</sub> for the formation of orange colour.

##### Lead Acetate Test

A volume of 3 ml of extract were mixed with 5 drops of lead acetate was added to observe the formation of white or cream precipitate.

#### Test for glycosides

Each extracts were dissolved (0.1g) in pyridine, added sodium nitro prusside reagent and made alkaline with NaOH solution. Pink to red colour solution indicates the presence of glycosides<sup>8</sup>

#### Test for phenols

##### Ferric Chloride Test

A fraction of each extracts were treated with 5% ferric chloride and observed for the formation of deep blue or black colour.

#### Test for tannin

The extracts were dissolved in water and then it was then subjected to water bath at 37°C for 1 hour and the filtrate was treated with ferric chloride and observed for the formation of dark green colour.

#### Test for saponin

##### Foam Test

To a small amount of each extracts few drops of distilled water were added and shaken vigorously until a persistent foam forms.

**Test for sterols****Liebermann-Burchard Test**

To a volume of 1 ml extracts was treated with chloroform, acetic anhydride and few drops of H<sub>2</sub>SO<sub>4</sub> were added along the sides of the tube and for the formation of dark pink or red colour.

**Test for quinone**

To 1 g of the extract 5 ml of concentrated HCl was added for the formation of yellow colour precipitate<sup>9</sup>

**Test for carbohydrates****Molisch's test for carbohydrates**

A few drops of Molisch's reagent were added to each of the portion dissolved in distilled water; this was then followed by addition of 1 ml of conc. H<sub>2</sub>SO<sub>4</sub> by the side of the test tube. The mixture was then allowed to stand for two minutes and then diluted with 5 ml of distilled water. Formation of a red or dull violet colour at the inter phase of the two layers was a positive test<sup>9</sup>.

**Test for terpenoids (Chloroform test)**

A volume of 5 ml of the plant extract was taken in a test tube with few ml of chloroform and add concentrated sulfuric acid carefully on the side of the test tube to form a layer and observed for presence of reddish brown colour<sup>9</sup>

**RESULTS AND DISCUSSION**

The present study carried out on the plant sample revealed the presence of medicinally active constituents. The qualitative analysis of the plant was summarized in table 1 given below.

The phytochemical analysis of the hexane extract of the plant sample shows positive result on carbohydrates. Butanol extract shows the presence of tannin, terpenoids, sterols and glycosides.

The methanol and water extracts of the plant shows the maximum results which shows the presence of bioactive compounds including phenols, alkaloids, glycosides, tannins, terpenoids and sterols.

Carbohydrates were present in hexane and chloroform extractions. (Table1).

**CONCLUSION**

The qualitative analysis of the extracts from the root bark of *Delonix regia* showed the presence of phytochemical constituents such as tannins, terpenoids, alkaloids, glycosides, carbohydrates and sterols. These plant secondary metabolites can be used as a potential source for various treatments in herbal remedies. As we are in the fast moving world drugs became a part of mankind. Apart from the common needs like food, water drugs are also became an essential thing. There is no end for the drugs till life mankind is there. Herbal medicinal plants are said to the nature's gift to mankind. So developing this kind of medicinal spray from medicinal plants helps mankind to a great extent in remedy of diseases.

**REFERENCES**

- Hill AF. Economic Botany. A textbook of useful plants and plant products. 2 nd edn. McGraw-Hill Book Company Inc, New York. 1952.
- Parekh J, Chanda SV. *In vitro* Activity and Phytochemical Analysis of some Indian Medicinal Plants. Turk J Biol 2007; 31:53-58.
- Jungalwala FB, Chama HR. Carotenoids in *Delonix regia* (Gulmohor) Flower. Dept of Biochem, IIS Bangalore. Biochem. J1962; 85:93.
- Narayana KR, Reddy MS, Chaluvadi MR, and Krishna DR, Bioflavonoids classification, pharmacology, biochemical effects and therapeutic potential. Ind J Pharmacol. 2001; 33:2-16.
- Chabra SC, Viso FC, Mshiu EN. Phytochemical Screening of Tanzanian medicinal plants. IJ Ethnopharmacol 1984; 11:157-79.
- Geidam YA, Ambali AG, and Onyejeli PA. Preliminary phytochemical and antibacterial evaluation of crude aqueous extracts of *Psidium guajava* L.leaf. J Applied Sci 2007; 7(4):511-4.
- Chawla AS, Handa SS, Sharma AK and Kaith BS. Plant Anti-inflammatory agents. J Sci Ind Res 1987; 46:214-23.
- Raaman N. Phytochemical Techniques by New India Publishing Agency. 2008.
- Trease GE and Evans WC. Text book of pharmacognosy. Edition 12, Balliere Tinad, London. 1983; 257

TABLE: 1 PHYTOCHEMICAL SCREENING TESTS OF *DELONIX REGIA* ROOT BARK

PHYTOCHEMICALS	EXTRACTS OF <i>DELONIX REGIA</i>			
	Hexane	Butanol	Ethanol	Water
Alkaloids	-	-	+	+
Flavonoids	-	-	-	-
Phenols	-	-	+	+
Tannins	-	+	+	+
Terpenoids	-	+	+	+
Saponins	-	-	-	-
Sterols	-	+	+	+
Quinines	-	-	-	-
Glycosides	-	+	+	-
Carbohydrates	+	-	-	-

+ = Presence - = Absence

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