



# Qualitative Phytochemical Analysis Of An Traditional Medicinal Plant- *Plumeria rubra* (Pod) For The Evaluation Of Abortifacient Activity

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**Abstract:** Many traditional plants have been used as a source of medicine since ancient times. These plants showed positive results on experimental animals having no or less side effects. Hence, such a traditional medicinal plant *plumeria rubra* were used for this study. The aim of this study was to investigate the presence of phytochemicals for the evaluation of abortifacient activity in female albino rats. Soxhlet apparatus was used for the extraction of plant material. Ethanol was used as a solvent for the extraction. Tannin, Glycoside, Flavonoids, Quinone, Coumarin and Carbohydrate were detected in the plants tested. Our findings provided the evidence that the ethanolic extract of the tested plant contain medicinally important bioactive compounds and some of the compounds will be proved as an important bioactive abortifacient agent.

**Keywords:** *Plumeria rubra*, pod, Abortifacient activity, Phytochemical Analysis

## I. INTRODUCTION

A large number of plant extracts have been used as antifertility agents in traditional medicine in indigenous systems of medicine in different countries throughout the world. Throughout history, women have tried to control their fertility with various levels of societal support. The information was passed from generation to generation. The use of plants as abortifacients, emmenagogues, and as local contraceptives might have been known to the ancient physicians of India as reported in some of the available books, journals, monographs, and reviews.

Ancient literature mentions the use of a number of plants for fertility regulation. (Neeru Vasudeva & S. K. Sharma 2008) Some plant-based contraceptive agents have also been described various traditional texts including Ayurveda (Bora D. et al., 2015). During the last few decades, in increasing interest in the study of the traditional use of the medicinal plant has been witnessed in different parts of the world, (Chellaiah et al., 2006).

Many unwanted pregnancies result in abortion. It is estimated that around 50 million abortions are performed each in developing countries and many a pregnancy is terminated in unsafe conditions. These factors expose women to a high risk of mortality and morbidity. In this new environment, it may be necessary to introduce a new safe herbal abortifacient drug with minimal side effects successfully. Keeping this factor as the background, the present study will under be taken to screen *Plumeria rubra* medicinal plants for abortifacient activity

### 1.1 *Plumeria rubra*

*Plumeria rubra* L. is a deciduous tropical plant, often ornamental, grown in homes, parks, gardens and cemeteries for its beautiful and attractive flowers of various colors and sizes. *Plumeria rubra* L. (Hindi: Lal champa; English: True Frangipani) are laticiferous trees and shrubs, belong to the Apocynaceae family. Different parts of the plant are used to treat various diseases and conditions such as leprosy, inflammation, diabetes, ulcers, wounds, itching, acne, toothache, earache, tongue cleaning, soreness, asthma, constipation, and infertility. Traditionally used. The decoction of bark, pod and roots of *P. rubra* is traditionally used to treat asthma, ease constipation, promote menstruation, reduce fever and the latex is used to soothe irritation.

### 1.2 Antifertility activity

Ethanol extract of *Plumeria Rubra* has been evaluated for its antifertility properties. At doses of 50, 100 and 200 mg/kg body weight, dose-dependent adverse effects on the fertility index and the number of uterine horn implantations in female rats were observed. Due to increased rate of embryo loss after implementation. (4)

### 1.3 Qualitative Phytochemical Analysis

Plant products have been part of phytomedicines since time immemorial. Knowledge of the chemical constituents of plants is desirable because such information will be value for synthesis of complex chemical substances.<sup>[3]A</sup>

In the present work, qualitative phytochemical analysis were carried out in *plumeria rubra (pod)* plant to evaluate its abortifacient activity in female albino rats.

### 1.4 Scientific Classification of *Plumeria rubra* <sup>[4]A</sup>

#### Plant Profile

*Plumeria rubra*

Common Name: Frangipani Vernacular

Name: Mar - Lal champa

English: Frangipani

Kingdom: Plantae

Subkingdom: Tracheobionta

Super division: Spermatophyta

Division: Magnoliophyta

Class: Dicotyledons

Subclass: Asteridae

Order: Gentiales

Family: Apocynaceae

Botanical Name: Plumaria rubra

Plant Type: shrub

Origin: India, Sri Lanka

## 1. MATERIALS AND METHODS

### 1.1 Collection of Plant Material

Fresh stem of *Plumeria rubra* were collected from different regions of Amravati and Yavatmal district in Maharashtra. The plant material were then shade dried. After drying, it was grinded into fine powder by using mixer and then it was filtered using muslin cloth.

### 1.2 Preparation of Plant Extract

#### 2.2.1 Soxhlet extraction of plant powder: Methodology- Ethanol extraction

The powdered samples were subjected to Soxhlet extraction (Borosil) using ethanol as solvent. The powdered samples were made a 20g thimble using handmade filter paper. The plant sample filled thimble was carefully placed inside the extractor chamber and poured with selected solvent ethanol as 1:10 ratio. The reservoir round bottom flask was heated to 55-60°C in a heating mantle. At least 20 refluxes were run to get good quality plant solvent extract. The resultant solvent extract was condensed using a rotary evaporator (Buchi, Bangalore, India) under reduced temperature in vacuum condition. The resultant extract was collected in a container for further analysis and storage under -20°C.

Qualitative phytochemical analysis:

The extract solution was prepared by dissolving 200mg of the extract in 20 ml of distilled water. Concentration: 10mg/ml  
Methodology

- **Detection of Saponins (foam test)**

To 2 ml of extract, 2 ml of distilled water were added and shaken vigorously; formation of foam indicates the presence of saponins.

- **Tannin**

1 ml of the extract was mixed with 2 ml of FeCl<sub>3</sub>. Formation of greenish black coloration indicates the presence of tanins.

- **Detection of Terpenoids & steroids – Salkowski test**

1 ml of the extract was mixed with chloroform and concentrated H<sub>2</sub>SO<sub>4</sub>. An appearance of reddish brown color of interface indicates the presence of terpinoids. In the lower chloroform layer red colour appears that indicates the presence of steroids.

- **Test for Glycosides**

2 ml of concentrated H<sub>2</sub>SO<sub>4</sub> was added to the extract. A reddish brown colour formed which indicated the presence of glycoside.

- **Test of flavonoids**

Alkaline reagent test 2ml of extract is added with sodium hydroxide, dilute hydrochloric acid. Formation and disappearance of yellow colour indicates the presence of flavonoids in the sample extract.

- **Test for Alkaloids**

To 2ml of extract, concentrated hydrochloric acid was added. Then few drops of Mayer's reagent were added. Presence of green colour or white precipitate indicates the presence of alkaloids.

- **Test of Quinones**

To 1ml of extract, concentrated sulphuric acid was added. Formation of red color indicates the presence of quinones.

- **Test of Phenols**

Ferric chloride test 2ml of distilled water followed by 3-4 drops or 2ml of 10% ferric chloride were added to 1ml of the extract. Formation of blue or green or bluish black color indicates presence of phenols.

- **Test of Coumarins**

1ml of sodium hydroxide was added to extract. Formation of yellow color indicates the presence of Coumarins.

- **Test of Carbohydrates**

1 ml of Molisch reagent was added to extract. 1ml of concentrated H<sub>2</sub>SO<sub>4</sub> was carefully added. The mixture was then allowed to stand for 2 to 3 minutes. Formation of a purple or red or dull violet colour at the interphase of the two layers indicates the presence of carbohydrates

### 3. RESULTS

The phytochemical characteristics of the medicinal plant – *Plumeria rubra* tested were summarized in the table below. From the table, it could be seen that, Tannin, Carbohydrates, Phenol, Glycosides, Flavonoids, Quinone and Coumarin were present in the plant while Saponins, Terpenoids, Steroids and Alkaloids were absent.

S. No	Parameters	Result
1	Saponin	Absence
2	Tannin	Presence
3	Terpenoids	Absence
4	Steroids	Absence
5	Glycoside	Presence
6	Flavonoids	Presence
7	Alkaloids	Absence
8	Phenol	Presence
9	Quinone	Presence
10	Coumarin	Presence
11	Carbohydrate	Presence

Table - Phytochemical analysis of *Plumeria rubra*

### 4. DISCUSSION

Medicinal plants have been of age remedies for human diseases they contain components of therapeutic values .Phytochemical analysis conducted on the plant extracts revealed the presence of constituents which are known to exhibit medicinal as well as physiological activities.<sup>[3]</sup> Analysis of the plant extract revealed the presence of phytochemicals such as Tannin, Carbohydrates, Phenol, Glycosides, Flavonoids, Quinone and Coumarin.

Glycosides are known to lower the blood pressure according to many reports. Flavonoids are hydroxylated phenolic substances known to be synthesized by plants in response to microbial infection and they have been found to be antimicrobial substances against wide array of microorganisms in vitro. Their activity is probably due to their ability to complex with extracellular and soluble proteins and to complex with bacterial cell wall. They also are effective antioxidant and show strong anticancer activities.<sup>[3]</sup> Quinones are of pharmacological interest. They are used in the fight against cancers. They show anti-tumoral, anti-microbial, anti-parasitic activities. Coumarin constitute an important class of pharmacological agents which possess a wide range of different

physiological activities such as anti-cancer, anti-oxidant, anti- inflammation, anti-HIV, anti-coagulant, anti-bacterial, analgesic and comparative immune-modulation. Carbohydrates have five primary functions in the human body. They are energy production, energy storage, building macromolecules, sparing protein, and assisting in lipid metabolism. Flavonoids isolated from *Striga lutea* and *striga orobanchioides* possess strong estrogenic activity and anti-fertility activity.(dinesh)

Thus, the results obtained from the present study suggest the identified phytochemical compounds may act as the bioactive components responsible for the antifertility activity in experimental animals.

## 5. CONCLUSION

Many studies revealed that the presence of these phytochemicals shows medicinal as well as physiological properties in the plant. This review describes the phytochemical and pharmacological screening of *plumeria rubra* for medicinal purposes. A compound with structures isolated from plant parts was studied along with traditional uses and pharmacological activities of his. An evaluation should be conducted on *Plumeria rubra* and used in formulations for practical and clinical application for the well-being of mankind.

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