

# A Review on Antidiarrhoeal, Anti-inflammatory and Antibacterial activity of *Adenanthera pavonina* leaves

Mathew George\*, Lincy Joseph\* and Arun V Venugopal

Pushpagiri College of Pharmacy, Medicity Campus, Perumthuruthy P.O, Thiruvalla, Kerala 689107 India

QR Code



## \*Correspondence Info:

Mathew George  
Pushpagiri College of Pharmacy,  
Medicity Campus, Perumthuruthy P.O,  
Thiruvalla, Kerala 689107 India

## \*Article History:

Received: 06/06/2017

Revised: 11/06/2017

Accepted: 11/06/2017

DOI: <https://doi.org/10.7439/ijpr.v7i6.4212>

## Abstract

Plants have been used for health care and medical purposes for years. The number of higher plant species on earth is about 250000. It is estimated that 35000 to 70000 species have, at one time or another, been used in some cultures for medicinal purposes. One of these is *Adenanthera pavonina* which is traditionally used. It also exhibit activity like antidiabetic, antibacterial, cytotoxicity, antifungal, antioxidant, anthelmintic, analgesic, anticonvulsant, depressant, and anti-inflammatory activity. The ethanolic extract of leaves show anti-inflammatory activity and pavonin a five membered lactone ring was isolated from leaves. The purpose of my review is to carry out future work for higher studies.

**Keywords:** *Adenanthera pavonina*, Antidiarrhoeal Activity, Anti-inflammatory Activity, Antibacterial Activity.

## 1. Introduction

*Adenanthera pavonina* is prereninal and non climbing species of leguminous tree. It includes food and drink. This tree is useful for nitrogen fixation. The raw seed are toxic, but may be eaten, when cooked. *Adenanthera pavonina* belong to family, Mimosaceae. Powdered *Adenanthera pavonina* seeds are used as red pigment. The seeds require scarification and boiling in water for about one minute for successful germination.

## 2. Description about the plant



Figure 1: *Adenanthera pavonina* Linn.

Synonyms	: <i>Adenanthera gersenii</i> , <i>Adenanthera polita</i> .
Common name	: Raktakanchan, Red Sandalwood, Coralwood, Peacock flower fence.
Family	: Leguminosae; Mimosaceae.
<b>Vernacular names</b>	
English	: Bead Tree, Circassian Bean, Coral Wood, Crab's Eyes.
Hindi	: Raktakambal
Gujrathi	: Badigumchi
Malayalam	: Saga tumpul, Manchadi
Telugu	: Gurivenda
Kannada	: Anegolaganji
Marathi	: Thoralagoonj
Sanskrit	: Kunchandana
Tamil	: Anai-gundumani, Manjadi
Bengali	: Raktakambal
<b>Taxonomical classification</b>	
Kingdom	: Plantae
Order	: Fabales
Family	: Fabaceae
Genus	: <i>Adenanthera</i>

## 2.1 Botanical Description

*Adenanthera pavonina* is a deciduous tree that reaches 60 m in height and up to 45 cm d.b.h. The trunk is basically straight with smooth bark and many fissures. The spreading crown has relatively few leaves. The leaves are bipinnate and 30 to 60 cm long with numerous oblong leaflets that are rounded on both ends and have a small point at the apex.

### Stem

Deciduous; leafless for a period in July-August. Blaze odour resembling that of beans (*Phaseolus vulgaris*).

### Leaves

Leaflet blades about 2-5 x 0.7-2.5 cm, leaflet stalks short, about 0.1-0.2 cm. Compound leaf axis channelled on the upper surface.

### Flowers

Corolla about 4 mm long. Staminal filaments about 4 mm long. Anther apex aristate (with a stalked gland). Ovules about 12.

### Fruit

Pods about 22 x 1.6 cm. Seeds quite hard. Testa shiny red.

### Seedlings

Cotyledons erect, fleshy, obviate, about 10-12 x 8-9 mm. At the tenth leaf stage: leaflet blades elliptic, apex mucronate, base oblique or obtuse; stipules very References 59 small, visible only with a lens. A number of very small red glands visible on very young growth at all stages.

## 2.2 Distribution

**Native:** China, India.

**Exotic:** Australia, Brunei, Cambodia, Cuba, Dominica, Haiti, Indonesia, Jamaica, Japan, Kenya, Laos, Malaysia, Myanmar, Puerto Rico, Solomon Islands, Sri Lanka, Taiwan, Province of China, Tanzania, Thailand, United States of America, Vietnam.

## 2.3 Cultivation

### Altitude:

Up to 300-400 m, mean annual rainfall: 3000-5000 mm. Soil type: Found on a variety of soils from deep, well-drained to shallow and rocky, this tree prefers neutral to slightly acidic soils.

## 2.4 Chemical Constituents

This is a source of aliphatic natural product, carbohydrate, simple aromatic natural product, flavonoids, terpenoids, amino acid, peptide and alkaloids.

## 2.5 Medicinal Uses

The plant is reported to have a wide range of biological activities, such as astringent and styptic (used in diarrhoea, haemorrhage from the stomach, haematuria), anti-inflammatory (in rheumatic affections, gout) [1]. Seeds are anticephalgic and are also used for the treatment of paralysis. Traditionally, the ground seed is widely used for

the treatment of various human ailments such as treatment of boils, inflammation, blood disorders, arthritis, rheumatism, cholera, paralysis, epilepsy, convulsion, spasm and indigestion.

## 3. Pharmacological Activities

### 3.1 Anti-inflammatory Activity

Mayuren C *et al* [2] in 2009 studied Anti-inflammatory activity of ethanol leaf extracts from *Adenanthera pavonina* (L) in rats. Ethanol extracts from the leaves of *Adenanthera pavonina* were assessed at doses of 250 and 500 mg/kg for anti-inflammatory effects using both acute and chronic inflammatory models. It was found that the doses possessed inhibitory effects on the acute phase of inflammation as seen in carrageenan-induced hind paw edema as well as in a subacute study of cotton pellet-induced granuloma formation.

Olajide *et al* [3] in 2004 studied Anti-inflammatory studies on *Adenanthera pavonina* seed extract. A methanol extract of the seeds of *Adenanthera pavonina* was evaluated for pharmacological effects in animal models. The extract (50-200 mg/kg) produced statistically significant ( $P < 0.05$ ) inhibition of the carrageenan-induced paw oedema in the rat, as well as the acetic-acid-induced vascular permeability in mice. At doses of 100 and 200 mg/kg, pleurisy induced with carrageenan was also inhibited.

### 3.2 Antibacterial Activity

Dholvitayakhun A *et al* [4] in 2012 studied antibacterial activity of three medicinal Thai plants against *Campylobacter jejuni* and other food borne pathogens. Leaves of *Adenanthera pavonina*, *Moringa oleifera* and *Annonas quamosa* are used in traditional Thai medicine to treat dysentery and other diseases. This study investigated the antibacterial activity of these plants against six species of food borne pathogen. Methods and solvents employed to extract active constituents were optimised using the disc diffusion assay. Phytochemical analysis of the optimised extracts was performed by thin layer chromatography (TLC). Minimum inhibitory concentrations (MICs) and minimum bactericidal concentrations (MBCs) were determined by broth microdilution. *A. pavonina* contained flavonoids, terpenes and tannins, and was the most active extract against *Campylobacter jejuni*, inhibiting growth at 62.5 -125 microgram/ml.

### 3.3 Antidiarrhoeal Activity

Burkill in 1966 and Balogun *et al* in 2000 studied that ground seed is widely used for the treatment of various human ailments such as treatment of boils, inflammation, blood disorders, arthritis, rheumatism, cholera, paralysis, epilepsy and has antidiarrhoeal effect [1].

#### 4. Conclusion

This is an important medicinal plant having traditional importance as it is used in the indigenous system of medicines. Traditional practices are proven by various experimental and scientific studies. This depicts the plant with tremendous potential in both healthcare and trade. Considerable work has been done to explore the biological activity and medicinal applications of the plant, still there are available countless possibilities of pharmacological applications which needs to be explored.

#### Acknowledgment

The authors are grateful to Prof. Dr. Mathew George Principal and HOD Department of pharmacology, Pushpagiri College of Pharmacy for guiding and positive feedback during the course of the work.

#### Reference

- [1]. Burkill IH. Ministry of Agriculture (Malaysia) London: Crown Agents for the colonies; 1966. A dictionary of the economic products of the Malay Peninsula.
- [2]. Mayuren C, Ilavarasan R. Anti-Inflammatory Activity of Ethanolic Leaf Extracts from *Adenanthera pavonina* (L) in Rats. *J Young Pharm*. 2009; 1(2):125-128.
- [3]. Olajide AO, Echianu CA, Adedapo AD, Makinde JM. Anti-inflammatory studies on *Adenanthera pavonina* seed extract. *Inflammopharmacology*. 2004; 3:196–202.
- [4]. Dholvitayakhun Achara, T Cushnie P. Tim, and Trachoo Nathanon. Antibacterial activity of three medicinal Thai plants against *Campylobacter jejuni* and other foodborne pathogens. *Natural Product Research* 2012; 26 (4):356-363.
- [5]. Awouters F, Niemegeers CJ, Lenaerts FM, Janssen PA. Delay of castor-oil diarrhea in rats: A new way to evaluate inhibitors of prostaglandin biosynthesis. *J Pharm Pharmacol* 1987; 30:41-5.
- [6]. Swingle KF, Shideman FE. Phases of the inflammatory response to subcutaneous implantation of a cotton pellet and their modification by certain anti-inflammatory agents. *J Pharmacol Exp Ther* 1972; 185:226-34.