

# Phytochemistry of *Calotropis procera* and its Traditional Uses

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## Abstract

Medicinal plants are important by biological active ingredients as the major source of medicine. *Calotropis procera* is drought resistant medicinal perennial shrub mostly found in arid to semi-arid areas. It is a major source of secondary metabolites including phenols, flavonoids, terpenoids, sugars, alkaloids, tannins cardenolides, glycoside, saponins and steroids. It has medicinal properties as hepatoprotective, antioxidant, inflammatory, antimicrobial and antimalarial. It is vigorously used for the ailment of common diseases *i.e.*, fever, leprosy, eczema, diarrhoea, dysentery and jaundice.

**Keywords:** Medicinal flora • Secondary metabolites • Medicines • Perennial shrub • Antioxidant

**Table 1.** Botanical name: *Calotropis procera* (Aiton) W.T. Aiton.

Taxonomy	<i>C. procera</i>
Kingdom	Plantae
Order	Gentianales
Family	Apocynaceae
Genus	<i>Calotropis</i>
Species	<i>C. procera</i>

## Introduction

Ever since ancient times, in search for treating their disease, the people looked for medicine in nature. Medicinal plants are known to human beings throughout history. These are valuable source of active ingredients vital for pharmaceutical industry. Hence herbal plants have long been used in folk medicine. For some aspects herbal derive biological active compounds important for health care and used to the treatment of various types of diseases [1]. *Calotropis procera* is inflammatory, antimicrobial, antimalarial and hepatoprotective for patients. It has strong action for treating skin infections like (leucoderma, eczema and leprosy). It also used as antidote for scorpion and rabies [2].

## Description

### Distribution

*Calotropis procera* is perennial shrub belongs to the family Apocynaceae. It is widely distributed in Asia, America and Africa. It grows in almost all parts of Punjab Pakistan as wild shrub especially in plains, pasture and roads way. It is a multipurpose plant. The fiber of plant useful for making baskets, rope, bags and nets. The wood used as timber and fuel purpose [3]. Also used as fodder for animal. The latex of plant is an important source for the preparation of folk medicines.

### Morphological characters

*C. procera* is a perennial shrub has ability to achieve height of 2.5 m-6 m, grey green leaves, with succulent and waxy appearance derived the name *Procera*. They are 15 cm-30 cm long and 2.5 cm-10 cm broad. The flower petals are arranged in pentamerous form, small, cream or greenish white at the base and purple violet at the extremity of the lobes (Table 1)[4]. It has deep root system and contains fleshy fruits. *C. procera* is mostly pollinated by two carpenter bees (*Xylocopa*) (Figure 1).

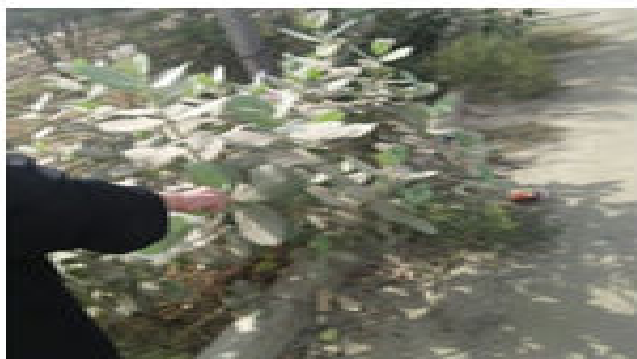


Figure 1. *Calotropis procera*.

### Medicinal activities

This medicinally important shrub is used in several folk or traditional medicine to cure various diseases. It has analgesic, antitumor, antihelmintic, hepatoprotective, antioxidant, inflammatory, antidiarrhoeal, anticonvulsant, antimicrobial, oestrogenic, antinociceptive and antimalarial activities. It is fight against various diseases i.e., fever, leprosy, eczema, diarrhoea, dysentery and jaundice [5].

Table 2. Ethnomedicinal uses of *C. procera* plant.

Parts	Uses
Leaves	To cure leucoderma (skin disease), antidote as rabies, to prompt healing, applied for poultice, to treat migraine, to treat fever, eczema, leprosy elephantiasis, asthma, cough and rheumatism etc.
Flower	Skin infection gum treatment used in dysentery and antidote of scorpion
Root	Used as digestive to treat body pain, malaria, eczema, leprosy elephantiasis, asthma, cough and rheumatism

### Response to abiotic stress

Plants are sessile nature and always face stresses around their surrounding environment. Growth, yield and quality of medicinal plants are influenced by these environmental fluctuations. The quantity of biological active compounds/secondary metabolites enhanced under stress conditions and alter the potency of medicinal plants. According to previous reports that the heavy metal integrates genes which changed the nature of secondary metabolites. Drought and osmotic stress situation enhanced the level of amino acids in medicinal plant reason behind that *C. Procera* adapted to harsh arid environment [7].

### Conclusion

This mini reviews briefly explained the phytochemistry and traditional uses of *Calotropis procera* plant. Various parts of this plants are useful for treating fever, leprosy, eczema, diarrhoea, dysentery and jaundice. This is important for pharmaceutical and in future open the new ways of research.

### Acknowledgment

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### Phytochemicals and traditional uses

The plant leaves having secondary metabolites such as phenols, flavonoids, terpenoids, sugars, alkaloids, tannins, cardenolides, glycoside, saponins and steroids including bitter contents as calotropin, calotoxin, calactin and uscharin also produces volatile organic compounds. All parts of the plant are used in folk medicine and threat various diseases like fever, leprosy, eczema, diarrhoea, dysentery and jaundice. Latex has pharmacological property because it is a mixture of biological active compounds including caoutchouc, calotropin, calotoxin, calactin, uscharin, trypsin, voruscharin, uzarigenin, syriogenin and proceroside. However, the latex shows toxic effect for mammals. The latex of leaves of *C. procera* plant used for joint pain and its oil is used for the paralyze parts of the body. The latex used in antifungal drugs to treat of *Tinea capitis* in children. The flowers mostly have flavonoids compounds. The flowers are bitter in taste have medicinal activities i.e., digestive, astringent, anthelmintic, tonic, anti-inflammatory, spasmolytic, stomachic and useful to treat colds, asthma, catarrh, anorexia, intestinal worms, inflammations and tumors. The root bark is the major source of calotropoleanyl ester, proceroleanenol compounds. The root has anticancer digestive, hepatoprotective activities (Table 2) [6].

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