

# *Calotropis Procera* (Asclepiadaceae) : A Review

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## ABSTRACT

*Calotropis procera* belongs to the family Asclepiadaceae. It is a erect, soft wooded, evergreen perennial shrub. *C. procera* commonly known as “Akra” and “milk weed”. All the parts (root, stem, leaf and flowers) of *C. procera* are in common use in traditionally system of medicine. The present paper is an attempt to provide a detailed botanical description, classification, pharmacological study of the plant.

**Keywords:** Medicinal, Drug, Anticancer, Antifertility

## I. INTRODUCTION

The nature has provided plant wealth for all living creature, which possess medicinal virtues [Bhatti, et al., 1998]. Medicinal plants are an important source of drugs in traditional system of medicine. Medicinal plants have been used since prehistoric period for the cure of various diseases. Since these are in common use by the local people and are of great importance that’s why a lot of people are engaged in the trade of important medicinal herbs throughout the world (Elisabetsky, 1990). Especially, people living in villages have been using indigenous plants as medicines since ages because this knowledge transfers from generation to generation and is based on life long experiences. Besides, the villages are far away from cities and mostly lack proper health facilities (Shinwari and Khan, 2000).

The genus *Calotropis* is distributed in tropical and subtropical regions of Asia and Africa. *Calotropis procera* belongs to the family Asclepiadaceae and it is a xerophytic erect shrub, soft wooded, evergreen perennial shrub. *C. procera* commonly known as “Akra” and “milk weed”. This plant is popularly known because it produces large quantity of latex. All the parts, viz, root, stem, leaf and flowers of *C. procera* are in common use in indigenous system of medicine (Mukherjee, et al., 2010).

The latex of *Calotropis procera* is easily available and is used in medicine for treatment of many diseases. It is used as wound healing agent, anti-diarrheas, anti

inflammatory and anti- rheumatism agent. It is also used against malaria and skin infection (Sameer, 2010). The milky latex and flowers were considered to improve digestion and increases appetite (Oudhia, 2001). The latex is also used as an abortifacient, spasmogenic and carminative properties, antidysentric, antisiphilitic, antirheumatic, antifungal, diaphoretic and for the treatment of leprosy, bronchial asthma and skin affliction. Different parts of the plant have been reported to possess a number of biological activities such as proteolytic, antimicrobial, larvicidal, nematocidal, anticancer, anti-inflammatory (Basu and Chaudhary, 1991). Its flowers possess digestive and tonic properties. On the contrary, the powdered root bark has been reported to give relief in diarrhoea and dysentery. The root of the plant is used as a carminative in the treatment of dyspepsia. The root bark and leaves of *Calotropis procera* are used by various tribes of central India as a curative agent for jaundice (Kumar and Arya, 2006).

## II. METHODS AND MATERIAL

### 1. Geographic Distribution

*Calotropis Procera* is drought-resistant plant and it disperses seeds through wind and animals. It quickly becomes established as a weed along degraded roadsides, waste land and in overgrazed native pastures. It has a preference for and is often dominant in areas of abandoned cultivation especially sandy soils in areas of low rainfall, assumed to be an indicator of over-cultivation. *C. Procera* is native to India, Pakistan,

Nepal, Afghanistan, Algeria, Iran, Iraq, Israel, Kuwait, Nigeria, Oman, Saudi Arabia, United Arab Emirates, Vietnam, Yemen and Zimbabwe (Chatterjee and Chandra, 1995).

## 2. Taxonomic Classification

Kingdom : Plantae  
Subkingdom : Tracheobionta  
Superdivision : Spermatophyta  
Division : Magnoliophyta  
Class : Magnoliopsida  
Order : Gentianales  
Family : Asclepiadaceae  
Genus : *Calotropis*  
Species : *C. procera*

## 3. Botanical Description

*Calotropis procera* Linn is an erect, tall, large, much branched and perennial shrubs or small trees that grow to a height of 5.4 m., with milky latex throughout. Bark is soft and corky. Branches stout, terete with fine appressed cottony pubescence (especially on young). Leaves sub-sessile, opposite, decussate, broadly ovate-oblong, elliptic or obovate, acute, thick, glaucous, green, covered with fine cottony pubescent hair on young but glabrous later and base cordate. Flowers in umbellate-cymes and tomentose on young, Calyx glabrous, ovate and acute. Corolla glabrous, lobes erect, ovate, acute, coronal scales 5-6, latterly compressed and equally of exceeding the staminal column. Follicles are sub-globose or ellipsoid or ovoid. Seeds broadly ovate, acute, flattened, minutely tomentose, brown coloured and silky coma is 3.2 cm long (Yelne, 2000).



**Figure 1:** Plant of *Calotropis Procera*

## 4. Pharmacological Activities

### Antifertility Activity

The effect of an ethanolic extract of the roots of *Calotropis procera* has been studied in albino rats to explore its antifertility and hormonal activities. Strong anti-implantation (inhibition 100 %) and uterotropic activity was observed at a dose of 250 mg/kg (1/4 of LD50). No antiestrogenic activity was detected (Saxena and Saxena, 1979).

### Gastroprotective Activity

The methanolic extract of *Calotropis procera* latex was investigated on experimentally induced gastric ulcers in rats. The methanolic extract was found to inhibit mucosal damage in both ethanol (85-95%) and aspirin (70- 80%) model, with maintaining the tissue integrity and significant reduction in gastric hemorrhage. Oxidative stress markers (glutathione, thiobarbituric acid reactive substance and superoxide dismutase) were found to be regulated (Ramos, 2012).

### Antimicrobial Activity

Chloroforms extract of *C. procera* seeds exhibited better antimicrobial activity. On the other hand, the extracts obtained *C. procera* seeds tested have been evaluated for their possible in vitro antibacterial activities based on paper disc method (Bhaskar, 2000).

### Anti-Inflammatory

The milky white latex obtained from the plant exhibits potent anti-inflammatory activity in various animal models that is comparable to standard anti-inflammatory drug (Sangraula, 2002). *C. procera* ethanolic extract of the flowers is reported to have anti-inflammatory activity while latex administration in animal models induce peritonitis, paw edema, hemorrhagic cystitis (Alencar, 2004), immunological and allergenic responses which are controlled by administration of different anti-inflammatory drugs (Arya and Kumar, 2004).

## Antimalarial Activity

The ethanolic extracts of the different parts of *Calotropis procera* showed antimalarial activity against *P. falciparum*. These extracts deserve further study aimed at identification of the active constituents. The results obtained support the ethnobotanical use of this plant (Sharma and Sharma, 2004).

## Antipyretic Activity

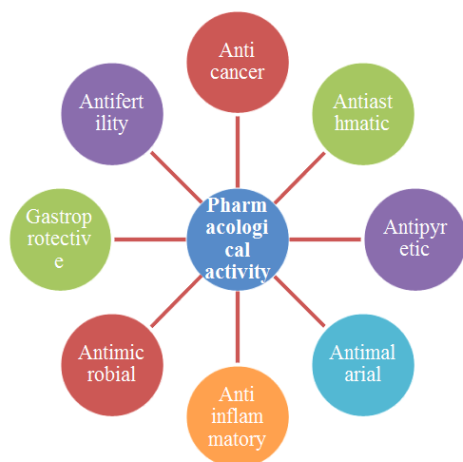
The ethanolic extract of the aerial parts, aqueous extract of flower and aqueous solution of the dry latex of *C. Procera* showed significant antipyretic activity in animal models that was comparable to aspirin (Dewan, 2004).

## Antiasthmatic Activity

Flower of *C. procera* have been evaluated for its usefulness in the treatment of asthma. A clinical study on human beings showed the good recovery from the symptoms of asthma (Upadhyay, 1979).

## Anticancer Activity

*C. procera* possesses a novel compound cardenolide that displays potent in vitro anti-tumor activities and in vivo high tolerance (Quaquebeke, 2005). Similarly, di-(2-ethylhexyl) phthalate (DEHP) isolated from *C. procera* showed anti-tumor activity (Habib and Karib, 2012), while Copper nanoparticles synthesised by using aqueous extract of *C. procera* latex showed cytotoxic (Harne, 2012), and cytostatic activity against tumor cells and cell lines (Taylor et al., 2013).



**Figure 2:** Some Pharmacological activity of *Calotropis procera*

## III. CONCLUSION

In Ayurveda, *C. procera* is described as Aakra and is widely used for its medicinal applications and therapeutic properties and it has its importance in Ayurvedic preparations due to its wide variety of pharmacological properties. Ayurvedic practitioners recommend the use of the root and leaf of *C. procera* in asthma and shortness of breath, stem bark in liver and spleen diseases (Ghosh, 1988). Plant is also effective in treating skin, digestive, respiratory, circulatory and neurological disorders and is used to treat fevers, elephantiasis, nausea, vomiting and diarrhea (Das, 1996). Hence, the plant is in need to a greater research emphasis for better utilization of this plant for humankind. Hope this review will serve the purpose of aiding in future Research work on this plant.

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