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RESEARCH ARTICLE

A REVIEW ON CALOTROPIS PROCERA ITS PHYTOCHEMISTRY AND TRADITIONAL USES

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ABSTRACT

Medicinal flora have proven their significance as a source of biologically active ingredients used in folk medicine. These active molecules have therapeutic potential and a vital pool for identifying novel medicine. Medicinal plants are widely used in developing societies like in India, Pakistan, and Southern America because they are thought to be cheaper than modern medicines, most effective and readily available. They have been used for thousands of years to treat and prevent health disorders along with epidemics. Also, they utilized for flavour and for conserving food items. They play a golden role in the development of human culture. Plants produced the diversity of secondary metabolites that are responsible for the biological functions of plants used around the world. *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, diarrhea, dysentery and jaundice. This short-review about the phytochemistry of *Calotropis procera* and its traditional uses.

KEYWORDS

Medicinal flora, drought resistant, inflammatory, perennial shrub, epidemics.

1. INTRODUCTION

Ever since ancient times, in search of treating their disease, the people looked for medicine in nature. Medicinal plants are known to human beings throughout history. Humans have highly relied on the use of plants for their needs as shelters, medicines, fragrances, foodstuffs, flavours, clothing and fertilizers (Gurib-Fakim, 2006). The acknowledgement of medical and financial aids of these plants is on the rise in both industrialized and developing nations (WHO, 1998). For thousands of years, the increased the trend of traditional systems of medicine that already have made fruitful contributions to modern medicine gets from plant sources (Karunamoorthi et al., 2013).

This medicinal flora remains to introduce human beings with new medicines or remedies (Petrovska, 2012). Some of the valuable characters attributed to plants have acknowledged being flawed and medicinal plant treatment is based on the experimental findings of hundreds to thousands of years (Dar et al., 2017). The traditional medicine practice is widespread in India, China, Pakistan, Japan, Thailand and Sri Lanka. In China, approximately forty percent of the total medicinal consumption is ascribed to traditional tribal medicines. In Thailand, herbal medicines make use of legumes encountered in the Fabaceae, the Caesalpiniaceae and the Mimosaceae. In Japan, the herbal medicinal preparations are more

in demand than mainstream pharmaceutical products (Dar et al., 2017). Medicinal plants are a valuable source of active ingredients vital for the pharmaceutical industry (Jain et al., 2019). Hence herbal medicinal plants have long been used in folk medicine (Pan et al., 2014). For some aspects, herbal derives biological active compounds important for health care and used in the treatment of various types of diseases (Al-Snafi, 2015). *Calotropis procera* is inflammatory, antimicrobial, antimalarial and hepatoprotective for patients (Ali et al., 2014). It has strong action for treating skin infections like (leucoderma, eczema and leprosy) (Verma et al., 2010). It also used as an antidote for scorpion and rabies (Khan and Kamran, 2006; Ahmad and Beg, 2001).

2. DISTRIBUTION

Calotropis procera is a perennial shrub belongs to the family Apocynaceae (Figure 1). 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 (Azhar et al., 2014). It is a multipurpose plant. The fibre of plant useful for making baskets, rope, bags and nets. The wood used as timber and fuel purpose. Also used as fodder for the animal. The latex of the plant is an important source for the preparation of folk medicine (Orwe et al., 2009).

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

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

3. MORPHOLOGY

C. procera can achieve the height of 2.5-6m, grey-green leaves, with a succulent and, have a waxy appearance, derived the name procera. They are 15-30 (cm) long and 2.5-10 (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. It has a deep root system and contains fleshy fruits (Orwe et al., 2009). *C. procera* is mostly pollinated by two carpenters' bees (*Xylocopa*) (Eigikowitch, 1986).

4. MEDICINAL ACTIVITIES

This medicinally important shrub is used in several folk or traditional medicines to cure various diseases. It has analgesic, antitumor, antihelmintic, hepatoprotective, antioxidant, inflammatory, antidiarrheal, anticonvulsant, antimicrobial, oestrogenic, antinociceptive, and antimalarial activities. It fights against various diseases i.e. fever, leprosy, eczema, diarrhea, dysentery and jaundice (Meena et al., 2010; Verma et al., 2010).

5. PHYTOCHEMICALS AND TRADITIONAL USES

The plant leaves have 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 (Shrivastava et al., 2013). All parts of the plant are used in folk medicine (Table 1) and treat various diseases like fever, leprosy, eczema, diarrhea, dysentery and jaundice (Meena et al., 2010). Latex has pharmacological property because it is a mixture of biologically active compounds including calotropin, calotoxin, caoutchouc, uscharin, trypsin, calactin, voruscharin, syriogenin, uzarigenin, and proceroside. However, the latex shows the toxic effect for mammals (Grieve, 1994). The latex of leaves of *C. procera* plant used for joint pain and its oil is used for parts of the body which paralyzes (Abhishek et al., 2010). The latex used in antifungal drugs to treat *Tinea capitis* in children (Aliyu et al., 2015). The flowers mostly have flavonoids compounds (Meena et al., 2010). The flowers are bitter have medicinal activities i.e. stomachic, astringent, tonic, anti-inflammatory, digestive, anthelmintic, spasmolytic, and useful to treat asthma, catarrh, colds, intestinal worms, inflammations, anorexia and tumours (Orwe et al., 2009). The root bark is the major source of calotropoleany ester, proceroleanol compounds (Meena et al., 2010). The root has anticancer digestive, hepatoprotective activities (Orwe et al., 2009).

Table 1: Ethnomedicinal uses of <i>C. procera</i> 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. (Anis et al., 2000; Ahmad and Beg, 2001; Shah et al., 2006; Joshua, 2006; Bhogonkar and Kadam, 2007; Ready, 2008; Bhatt et al., 2009).
Flower	Skin infection gum treatment used in dysentery and antidote of scorpion (Abhishek et al., 2010; Kumar, 2009; Khan and Kamran, 2006)
Root	Used as digestive to treat body pain, malaria, eczema, leprosy elephantiasis, asthma, cough and rheumatism (Kumar, 2009; Sen and Behra, 2007; Showkat, 2007)

6. RESPONSE TO ABIOTIC STRESS

Plants are sessile in nature and always face stress around their surrounding environment. Growth, yield and quality of medicinal plants are influenced by these environmental fluctuations (Naeem et al., 2013). The quantity of biologically active compounds/secondary metabolites enhanced under stress conditions and alter the potency of medicinal plants (Nasim and Dhir, 2010). According to previous reports that the heavy metal integrates genes which changed the nature of secondary metabolites (Nasim and Dhir, 2010). Drought and osmotic stress situation enhanced the level of amino acids in medicinal plant reason behind that *C. procera* adapted to the harsh arid environment (Mutwakil et al., 2017).

7. CONCLUSION

This short-review briefly explained the phytochemistry and traditional uses of *Calotropis procera* plant. Various parts of these plants are useful for treating fever, leprosy, eczema, diarrhea, dysentery and jaundice. This is important for pharmaceutical and in future open the new ways of research. Herbal medicinal plants are a promising future as there are approximately half million plants around the world, and most of them are not explored yet for their medical activities and their hidden potential of medical activities might be significant in the treatment of present and future studies. Studying the natural poisons of these plants is vital in predicting their safety. The medicinal properties are due to the production of the secondary metabolite of plants. In respect of natural product chemistry, research may be several aspects, including, the remarkable variety of both chemical structure and biological properties of secondary metabolites, the therapeutic needs, and the efficacy of unique bioactive ingredients as biochemical probes. The establishment of several techniques to isolate, purify, and structurally characterize these biological active components, and improves in solving the demand for the supply of novel compounds. However, *Calotropis procera* is a potential plant species a good source of active ingredients and might be used in various remedies. So, they can exploit their uses for their well being in daily life.

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