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Chemical profile and Folk-lore uses of *Calotropis procera* (Willd.) R.Br.

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Abstract

Calotropis procera is a traditional medicinal plant used in Madhya Pradesh. It is commonly known as *Aak*. This plant is a richest source of bioactive constituents and is valuable in India to treat various diseases. So phytochemical study was carried out on different plant extracts. The extract of *Calotropis procera* was screened for phytochemical properties. Result of the phytochemical analysis showed that it contains the bioactive compounds alkaloids, carbohydrates, glycosides, reducing sugar, flavonoids, tannin, phenolics, saponins, protein, terpendoids, and steroids. Methane and petroleum ether extracts of *C. procera* were investigated.

Medicinal Plants have been used by human beings since time immemorial for curing diseases in traditional medicine world wide[2] and Bioactive constituents have been reported from plant extract. This phytoextract can protect human against a number of diseases. *Calotropis procera* (Willd.) R.Br. (Fig. 1) belongs to the family Asclepiadaceae. The plant has a number of pharmacologcial properties like antimicrobial, antifungal, antibacterial and antihepatotoxic. The plant is mostly used in Ayurvedic medicine. The leaves are used for the fast healing of wounds, to treat indigestion. They are used in to treat skin disorders, liver problems, as antidote for snakebite and burn injuries[8]. The dried leaves are used to promote sexual health including. the application of medicinal plant in traditional medicine is currently well acknowledged and established as a viable profession. This plant is richest source of bioactive constituents present in plant extract. The phytoextract can provide protection against a number of human diseases. It is one of widely used plant in Ayurvedic formulations and Homoeopathic system of medicine.

Plant material :

Calotropis procera leaves were collected in the month of January, 2017 from residential garden and Jayantikunj, Rewa. The plant material was identified at the field using standard keys and description.

Extraction :

For the extraction, petroleum ether and methanol were used.

Maceration procedure :

Leaf powder was weighed (500 gm) and kept in a container in contact with petroleum ether for seven days, with vigorous shaking at regular intervals. Material was filtered at first with muslin cloth and then with filter paper. Filtrate was collected and dried in water bath till no further reduction in mass of extract was observed. Dried extract was weighed and packed in airtight container.

Phytochemical testing:

Phytochemical screening was carried out using standard methods to detect the bioactive compounds.

Test for alkaloid: Substance was added with a few drops of 2NHCL with two drops of Mayer's Regent. Formation of white colour indicates the presence of alkaloids.

Test for Reducing sugar : The substance was mixed with equal volumes of Fehling A and B solutions, heated on water bath. The formation of red colour is the indication of the presence of reducing sugar.

Test for Flavonoids: To the test substance in alcohol, a small amount of magnesium and a few drops of Conc. of HCl were added and boiled for 5-8 minutes. Red colour shows the presence of flavonoids.

Test for Glycosides: The extract of plant dissolved in pyridine, sodium nitroprusside solution is added to it and made alkaline. Pink or red colour shows the presence of Glycosides.

Test for Tannin & phenolics: Test substance when mixed with boric lead acetate solution, white colourisation shows the presence of tannin & phenolics.

Test for protein & amino acid : To the test solution, the Biuret reagent is added the blue reagent turns violet and indicates the presence of proteins and amino acid.

Test for Terpendoids: Test substance with tin and thionyl chloride were added and boiled. Red colorization shows the presence of terpendoids.

Test for Steroids : One gram of the substance was dissolved in a few drops of acetic acid, acetic aldehyde, warmed and cooled under tap water. A drop of sulfuric acid was added along the sides of the test tube. The presence of green colour shows the positive test for steroids.

Test for fats and oils : Test substance mixed with ethanol, white colourisation (Milk like) shows the presence of fats and oils.

Table 1 : Phytochemical screening of *Calotropis procera* leaf

Phytochemicals	Petroleum ether extract	Methanol extract
Alkaloids	-	-
Carbohydrates	-	+
Reducing Sugars	-	-
Flavonoids	-	+
Glycosides	+	+
Tannin and phenolics	-	+
Saponin	-	-
Protein and amino acid	+	+
fats and oils	-	-
Terpendoids	+	+
Steroids	+	+

(+)= Indicates presence

(-) Indicates absence

Chemical profile :

Moisture content - 10-92%, Protein- 28.53%, Fats & oil - 20.42%, Carbohydrates -24.13%, Fibre - 6.50%, Alkaloid - 2.05%, Tannin, Glycoside & Saponin - 0-5% to 0.88%, Phenol - 1.15%, Aminoacid - 17%, Magnesium - 36.5 ppm, Pottasium 24.5ppm, Calcium- 17 ppm, Zinc - 2.10 ppm, Phosphorous - 0.40 ppm and Sodium - 12.5 ppm[1].

Folklore uses of Calotropis procera: The plants are used alone or in combination to treat common diseases such as fever, rheumatism, indigestion, cough, cold, eczema, asthma, elephantiasis, nausea, vomiting, diarrhoea, catarrh, anorexia, inflammations and tumors[1].

The phytochemical analysis of the extract of *C. procera* has been reported to have alkaloids, reducing sugar, flavonoids, saponin, fats and oil, glycosides, tannin, terpendoids, steroids, protein and amino acids[11]. The phytochemicals found in the plant are either the product of plant metabolism or synthesized for different purposes. These phytochemicals are useful for defense of many diseases like alkaloid are used in malaria, painkillers and heart diseases,[3,4] flavonoids are used as antiallergic, anti inflammatory and show anticancer activities[3]. Tannins are used to inhibit the growth of microorganism and act as anti fungal agents, Terpendoids are used in viral, bacterial and fungal infections; steroids are used as Antimicrobials, proteins form stable water soluble compounds, thereby killing bacteria by directly damaging their cell membrane[6]. Murti *et al.*,[8] carried out pharmacogonostic standardization of leaves of *Calotropis procera*. Varahalarao[12] examined bioassays for antimicrobial activities. The

Fig. 1. *Calotropis procera* (Willd.) R.Br.

leaves of *Calotropis procera* are used by various tribes of Central India as a curtative agent for jaundice[9]. The leaves are used to treat joint pain and reduce swellings. It is also used as a homoeopathic medicine[7]. It is used by Traditional medicine practitioners in Gwari communities for the treatment of ringworms[5]. Latex of *Calotropis procera* is reported to have hepatoprotective, antioxidant and bacteriolytic activities[10].

This research has been instrumental in providing a path to scientific community, who may implement the result of the present work in developing drugs from *Calotropis procera* against human pathogenic micro-organisms.

Very important phytochemicals were obtained from *Calotropis procera*. The plant *Calotropis procera* can be used as potent drug to be used as antiallergic, anti-inflammatory, anti infection, antidibetes, in cardiac diseases. It is interesting to note that

the action of the extract of *Calotropis procera* is non-toxic. The obtained results provide a support for the use of this plant in traditional medicine.

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