
Ethno-Medicinal Profile of Different Plant Parts of Calotropis procera (Ait.) R. Br.

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Abstract

The present paper reviews the literature on recent ethno medicinal uses of every plant part of Calotropis procera (1968-2009) and its medicinal properties used for the treatment of various ailments as in the case of many types of fevers, rheumatism, indigestion, cough, cold, eczema, asthma, elephantiasis, nausea, vomiting and diarrhea, etc. The review includes accounts of medicinal values of all parts of the plant that have been used in folk medicine as a remedy. The name and parts of the plant studied, the spectrum of activity, and methods used are discussed in this review paper.

Key words: Calotropis procera; traditional medicines; ethno-medicinal use.

Introduction

The herbal medicines occupy distinct position right from the primitive period to present day. The ethnobotanical pharmacology is as old as man himself. These medicines have less side effects and man can get the herbs easily from nature. India being a tropical country is blessed with vast natural resources and ancient knowledge for its judicious utilization. However, in order to make these remedies acceptable to modern medicine, there is a need to scientifically evaluate them, to identify the active principles and to understand the mechanism of action (Ashok Vaidya, 1998) Calotropis procera in India holds a pride of place largely because of its other uses and economic values. The genus Calotropis R.Br. (Asclepiadaceous) is distributed in tropical and subtropical regions of Asia and Africa (The wealth of India, 1959). It is represented in India by two species viz. C. procera and C. gigantean.

Calotropis procera (Ait.) R. Br., a wild growing plant of family Asclepiadaceae, is well known for its medicinal properties. Different parts of this plant have been reported to exhibit anti-inflammatory, analgesic, and antioxidant properties. It is found in most parts of the world in dry, sandy and alkaline soils and warm climate and is more common in south western and central India and western Himalayas. It is found in waste lands and grows as a weed in agricultural lands. In ancient Ayurvedic medicines the plant Calotropis procera was known as
“Rakta arka”.

Morphologically the plant is erect, tall, large, much branched and perennial shrub or small tree that grows on a height of 5.4m, with milky latex throughout. Bark is soft and corky, branches stout, leaves sub sessile, opposite, decussate, broadly ovate, oblong, elliptic or obovate, acute, thick, glaceous, green coloured with fine cottony pubescent hair on young. Flowers in umbellate cymes and tomentose on young. Seeds broadly ovate, acute, flattened, minutely tomentose, brown coloured and silky.

Methodology
Most of the research papers, research articles and review papers were consulted and compiled. The useful material regarding the information of ethno medicinal aspects of *C. procera* were collected from time to time and summarized in present paper. This paper recovers the traditional medicinal values of each and every part of the selected the plant (*C. procera*).

Result
A number of research papers, articles and review papers treat the ethno medicinal aspects of this plant. Table 1, 2 and Fig. 1 showing the percentage of ethnomedicinal uses of different plant parts of *C. procera*.

Table 1. Ethno medicinal uses of different plant parts of *C. procera*.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Part used</th>
<th>Preparation</th>
<th>Use</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Whole Plant</td>
<td>In Nigeria traditional medicine, <em>C. procera</em> is either used alone or with other herbs</td>
<td>To treat common diseases such as fever, rheumatism, indigestion, cold, eczema and diarrhea.</td>
<td>Kew (1985)</td>
</tr>
<tr>
<td>2.</td>
<td>Whole plant</td>
<td>Whole plant is used</td>
<td>In boils and also to remove thorn from body.</td>
<td>Rai <em>et al</em> (2000)</td>
</tr>
<tr>
<td>3.</td>
<td>Whole Plant</td>
<td>The whole plant is used</td>
<td>for the treatment of jaundice</td>
<td>Jan <em>et al</em> (2009)</td>
</tr>
<tr>
<td>5.</td>
<td>Root</td>
<td>The alcoholic extracts of the root and leaves of <em>C. procera</em></td>
<td>Were found to have anticanceractivity against human epidermal carcinoma of the nasophyrnx tissue</td>
<td>Dhar <em>et al</em> (1968)</td>
</tr>
</tbody>
</table>
6. Root

Root used as

culture.
digestive agent
Mishra and Fridowich (1972)

7. Root

Chloroform root extract of *Calotropis procera*

Induced acute and chronic liver injury by carbon tetrachloride.
Ajibade *et al* (2005)

8. Roots

Root is used as

Hydrocide, in headache, severe body pain, malarial fever and convulsion
Joshua (2006)

9. Roots

Root are used to treat

Eczema, leprosy, elephantiasis, asthma, cough and rheumatism.
Sen and Behra (2007)

10. Roots

Roots are tied with the help of a red thread on the affected part

To relieve filarial
Jain *et al* (2007)

11. Roots

Extract of root is taken orally by the tribal ladies.
in dysmenorrhea
Showkat (2007)

12. Roots

Used as purgative and taken in Dysentery.
Khan (2009)

The root powder is mixed with butter and this ointment is applied to.

rabid dog bite and on the paralized limbs
Kumar (2009)

13. Root

given with black pepper

protracted labour and also used for spleen complaints, elephantiasis, rheumatism,
Chopra *et al* (1983)

14. Root bark

The paste of root bark

Is locally applied in elephantiasis.
Jain *et al* (1985)

15. Root bark

The root bark powder is used.

In the treatment of Diarrhoea and dysentery.

In case of diarrhoea it changes the faecal matter into a semisolid mass
<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>17.</td>
<td>Root bark</td>
<td>with in the first day of treatment</td>
</tr>
<tr>
<td></td>
<td>Root bark powder</td>
<td>Is used to treat diarrhea and dysentery and it is an excellent substitute for ipecac. Traditionally it is used to treat cholera, extracting guinea worms and indigestion.</td>
</tr>
<tr>
<td>18.</td>
<td>Root bark</td>
<td>The secretions from the root bark are traditionally used</td>
</tr>
<tr>
<td></td>
<td>The bark of root is taken out and mixed with a minute dose of arsenic and given in the form of a pill</td>
<td>For the treatment of skin diseases, enlargements of abdominal viscera and intestinal worms.</td>
</tr>
<tr>
<td>19.</td>
<td>Root Bark</td>
<td>To people suffering from leprosy.</td>
</tr>
<tr>
<td>20.</td>
<td>Root Bark</td>
<td>Used as tonic, antispasmodic, expectorant and in large doses emetic.</td>
</tr>
<tr>
<td>23.</td>
<td>Stem latex</td>
<td>As Tooth brush having the property of curing toothache</td>
</tr>
<tr>
<td>24.</td>
<td>Stem bark</td>
<td>Latex is mixed with Sodium Chloride (NaCl) and warmed on hot slow heating. During heating continuous stirring should be done. One microgram given orally thrice a day.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The latex applied locally During the course of this treatment, prepared from the whole plant Swertia Chirayita is also taken.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Used as tonic and stimulant.</td>
</tr>
<tr>
<td>No.</td>
<td>Substance</td>
<td>Uses</td>
</tr>
<tr>
<td>-----</td>
<td>-----------</td>
<td>------</td>
</tr>
<tr>
<td>25.</td>
<td>Leaves</td>
<td>4 gm of latex is taken orally by the tribal’s</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Small pieces (stem bark) in maceration in a liter of water,</td>
</tr>
<tr>
<td>26.</td>
<td>Leaves</td>
<td>Dried powdered leaves can be dusted over wounds, ulcers and old sores</td>
</tr>
<tr>
<td>27.</td>
<td>Leaves</td>
<td>In morning, before sunrise, tender leaves were given in a capsule with water on an empty stomach. After treatment for three days</td>
</tr>
<tr>
<td>28.</td>
<td>Leaves</td>
<td>Leaf extract, chopped leaves and latex of <em>C. procera</em> have also shown great promise</td>
</tr>
<tr>
<td>29.</td>
<td>Leaves</td>
<td>Mature leaves of <em>C. procera</em> along with urine of the patient concerned are filled in an air tight earthen pot.</td>
</tr>
<tr>
<td>30.</td>
<td>Leaves</td>
<td>After ten days, a cloth wet in this urine is applied on</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Leaves of <em>Calotropis procera</em> are used</td>
</tr>
<tr>
<td>31.</td>
<td>Leaves</td>
<td>Leaves used as used for joints and waist pain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Leaf extracts mixed with oil on heat. Leaves are smoked.</td>
</tr>
<tr>
<td>32.</td>
<td>Leaves</td>
<td>Leaf and black pepper used leaves are used to treat</td>
</tr>
<tr>
<td></td>
<td></td>
<td>To confirm whether the snake that had bitten the person was poisonous or not,</td>
</tr>
<tr>
<td>33.</td>
<td>Leaves</td>
<td></td>
</tr>
</tbody>
</table>

Prasad (1985)
34. Leaves
Young leaves are crushed and the juice is expressed on
the palms of the person venomated. It is allowed to
be there for five minutes and is sniffed. If immediately
sneezing starts the snake is declared to be poisonous.

35. Leaves
To cure asthma.

36. Leaves
Milk of goat feeding on
leaves of *C. procera* is given
to infants

37. Leaves
Against rheumatism, gout and to relieve pains.

38. Leaves
The fresh leaves of the plant
are warmed and are applied
as poultice

39. Leaves
To get relief from joint pain.

40. Leaves
The leaves are heated and
bandage is made.

41. Leaves
To apply on ulcers

42. Leaves
Leaves are pounded with
castor oil and banded over
knee joints

43. Leaves
Leaves mixed with turmeric,
honey and karanji was
applied as a paste

44. Leaf latex
Powder of 5g dried leaves
mixed with gur given orally
before sunrise for 5 days.

45. Leaf latex
Leaves are used on

- Treat scorpion and snake
- To cure asthma.
- In rheumatism, gout and to relieve pains.
- Against rheumatism, asthma and also used as sedative.
- To get relief from joint pain.
- To apply on ulcers
- For washing cloths.
- Swelling part of body.
- To cure flatulence, anorexia, indigestion and intestinal worm infestation.
- On the wounds.
- To cure migraine
- Sores, skin diseases, inflammation and rheumatic joints.
- To treat pain in any part of the body.
<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Description</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>46</td>
<td>Leaf latex</td>
<td>Leaf latex is externally applied twice a day for 2-3 days. The wart affected area.</td>
<td>Misra and Fridowick (1972)</td>
</tr>
<tr>
<td>47</td>
<td>Latex</td>
<td>Leaf latex is used to apply for Scorpion bite. Fresh leaves are cut and the excluding latex applied to affected area.</td>
<td>Mortan (1981)</td>
</tr>
<tr>
<td>48</td>
<td>Latex</td>
<td>Small quantity of fresh latex is applied over Black scars on face; boils, cold, cough, asthma, ear ache, eczema, skin eruptions, inflammatory lesions, pain of the body, rheumatism, syphilis, leprosy and oedema.</td>
<td>Kew (1985)</td>
</tr>
<tr>
<td>49</td>
<td>Latex</td>
<td>Calotropin isolated from latex is used as a remedy for inserted in to painful tooth cavities and applied to various skin complaints.</td>
<td>Badruzzamana et al (1989)</td>
</tr>
<tr>
<td>50</td>
<td>Latex</td>
<td>Milky latex is locally applied in the treatment of Anti rabies and also in the treatment of toothache and cough.</td>
<td>Pandey and Anita (1990)</td>
</tr>
<tr>
<td>51</td>
<td>Latex</td>
<td>Milky latex is locally applied in the treatment of Anti rabies and also in the treatment of toothache and cough.</td>
<td>Kumar and Basu (1994)</td>
</tr>
<tr>
<td>52</td>
<td>Latex</td>
<td>Preparations from latex with honey are used as Used for abortion</td>
<td>Rasik et al (1999)</td>
</tr>
<tr>
<td>53</td>
<td>Latex</td>
<td>Latex is applied</td>
<td>Anis et al (2000)</td>
</tr>
<tr>
<td>54</td>
<td>Latex</td>
<td>Acute inflammatory response.</td>
<td></td>
</tr>
</tbody>
</table>
Latex is, either taken internally or locally to the mouth of uterus with the aid of a stick well coated with juice. For wound healing potential. Giday (2001)

A single dose of the aqueous suspension of the dried latex was effective to a significant level against the To cure arthritis. Negi et al (2002)

Topical application of 20 micro liters of 1% sterile solution of the latex of Calotropis procera twice daily for 7 days. Ahmad et al (2004)

Latex of the plant is filled in spaces between nails and finger tips of patient twice daily for a few days to cure conjunctivitis. Latex is used in the treatment of. Fatima (2007)

Pills of a black gram size are made from one tablespoonful of latex mixed with 20g sugar and 1g calcium carbonate. One pill twice a day given for three days is said Blackleg by Zay people

Latex is applied

Latex is used


Take 26 gm of lahori salt, put it in an earthen pot, add Calotropis milk so that the salt dipped in to it, and cover earthen pot mouth and heat up. Grind it and use the powder externally for gum bleeding with small amount of HCL. It is effective for Cholera and leprosy. Jain et al (2008)

Purgative and used in dysentery. Khan (2009)
4 to 5 drops of fresh latex of the plant is dropped over the injured portion as an antiseptic in the
Latex
64.

Milky latex is used to treat Various skin diseases also act as purgative.
latex
65.

Used as Antidote in scorpion bite.
Latex
66.

Latex is topically used as

Relieve inflammation and snake bite to neutralize poison.
Latex
67.

The milky juice is poisonous and is used in on the wounds

Latex of Calotropis procera and Mangifera indica mixed with one drop of conc. HCL is applied locally as an

Latex of Calotropis procera flower was investigated for

Tooth ache, ringworm and also for removing face darkness.
Flower
69.

Milky latex of plant is applied on inflamed areas to

Cytotoxicity of human colorectal carcinoma cell line and displayed the strong cytotoxic activity
Flower
70.

Latex and leaves mixed with turmeric, honey and karanji was applied as a paste.

In malaria fever
Flower
70.

Latex is used in

Extracts of Calotropis procera flower was investigated for

To get relief from migraine.
Flower
71.

Pills of the size of a black gram are made from the paste obtained by mixing 6gm flower buds with 7-8 black pepper seeds and 3gm

Abdominal diseases and asthma.
Flower
72.
73. Flower

Salt. Two pills are given twice daily for three days. Flowers of *Calotropis procera* and leaves of *Nicotiana tobacum* L. (Solanaceae) taken in equal quantity, are burnt to ash, which is inhaled.


To cure cholera and severe dysentery.

74. Flower

Internal part of flower and sugar used for

Khan and Kamran (2006)

To cure flatulence, anorexia, indigestion and intestinal worm infestation.

75. Flower

The hair is washed with flowers

76. Stigma

Powder of dried flowers of *Calotropis procera* grind along with *Papaver somniferum* and *Eletteria cardomomum* (20gm each), called Tally, used three times daily (about one teaspoonful)

To treat cholera.

In piles and asthmatic problems.

77. Seed

Flowers of this plant are used

It is useful in cholera

About 12gm stigmas are added to 5-8 black pepper, 3gm black salt and opium (equal to one seed of mustard) and make into pills of the size of black pepper. One pill three times daily to given with hot water for three times a days

Take 3 gm of *Calotropis* seeds, 18 gm of red chili seeds and 6 gm opium. Grind all of these and mix it in one
Table 2. Percentage of ethno medicinal uses of different plant parts of *C. procera* against total number of uses.

<table>
<thead>
<tr>
<th>PARTS USED</th>
<th>NUMBER OF USES</th>
<th>PERCENTAGE OF USES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. WHOLE PLANT</td>
<td>4</td>
<td>5.19</td>
</tr>
<tr>
<td>2. ROOT</td>
<td>10</td>
<td>12.98</td>
</tr>
<tr>
<td>3. ROOT BARK</td>
<td>6</td>
<td>7.79</td>
</tr>
<tr>
<td>4. STEM</td>
<td>2</td>
<td>2.59</td>
</tr>
<tr>
<td>5. STEM LATEX</td>
<td>2</td>
<td>2.59</td>
</tr>
<tr>
<td>6. LEAF</td>
<td>19</td>
<td>24.67</td>
</tr>
<tr>
<td>7. LEAF LATEX</td>
<td>3</td>
<td>3.89</td>
</tr>
<tr>
<td>8. LATEX</td>
<td>22</td>
<td>28.57</td>
</tr>
<tr>
<td>9. FLOWER</td>
<td>7</td>
<td>9.09</td>
</tr>
<tr>
<td>10. STIGMA</td>
<td>1</td>
<td>1.29</td>
</tr>
<tr>
<td>11. SEED</td>
<td>1</td>
<td>1.29</td>
</tr>
</tbody>
</table>

Fig. 1. Graphical presentation of ethno medicinal uses of different plant parts of *C. procera*. 

teaspoon of ginger and half cup of onion water, if unavailable then use syrup of sugar and citrus medica water..
Discussion

This ethno-medico-botanical study on the plant *Calotropis procera* has revealed the enormous diversity of its medicinal uses and popular use of the plant *C. procera* for a wide range of common ailments like fevers,
rheumatism, indigestion, cough, cold, eczema, asthma, elephantiasis, nausea, vomiting and diarrhea. Either the whole plant or a plant part used singly or mixed with other plant materials to enhance the efficacy.

Plant based drugs have been in use against various diseases since the time immemorial. The primitive man used herbs as therapeutic agents and medicament, which they were able to procure easily. 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 (Sher and Hussain, 1998a). They are valuable natural resources and regarded as potentially safe drugs. In addition, they are playing an important role in alleviating human suffering by contributing herbal medicines in primary health care system of rural and remote areas where more than 70% of population depends on folklore and traditional system of medicines. The reason for their popularity is due to high cost of allopathic medicines and side effects.

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).

This field is well established and a lot of work has been done worldwide. Radhakrishman et al (1998) reported ethnobotanical information on Ulteria salicifolia, a monotypic species endemic to south Western Ghats of peninsular India and gave its taxonomic identity, distribution pattern and affinity to an allied genus for the first time. Beyra et al (2004) carried out an ethnobotanical survey from Camaguey, Cuba and reported 111 plant species belonging to 96 genera and 55 families from the study area. These species are used in the treatment of 173 local health problems in the study area. Bondya & Sharma (2004) conducted a survey of medicinal plants used in diabetes in Jharkhand and collected 11 plant species with remarkable uses. Buckingham (1991) reported that there are total of 2,50,000 species of flowering plants in the world, much less than animal species (5-10 million) however, plants contribute to our lives more than animals mainly due to their extra ordinary array of diverse classes of biochemicals with a variety of biological activities. Ji et al (2004) reported the medico-ethnobotany of Nujiang, Northwest Yunnan, and China. They described 52 medicinal plant species belonging to 32 families used for the treatment of various human ailments. Among them, 11 species were reported as rare and 16 were commercially utilized.

The indigenous traditional knowledge of herbal plants of communities where it has been transmitted orally for many years is fast disappearing from the face of world due to transformation of traditional culture. The people, who are native to the area in which the plants occur, use around 90% of the medicinal species (Baquar, 1989). This is indicative of the vast repository of knowledge of plant medicine that is still available for global use, provided of course that it does not get lost before it can be tapped or documented. Traditional and indigenous medical knowledge of plants, both oral and codified, are undoubtedly eroding (Mujtaba and Khan, 2007). In the present scenario, traditional knowledge system in our country is fast eroding and there is an urgent need to inventoried, record all ethno-botanical and cultural information among the diverse ethnic communities before the
traditional cultures are completely lost. Therefore, documentation of information on ethno-medicinal uses will help in conserving the knowledge. A comprehensive database of the plants used for various purposes could be saved for the forthcoming generations.

Conclusion

This information about medicinal values of *C. procera* has paramount importance in life and how these ethno herbal data have key role in life. Moreover, it can be initiative for further phytochemical and pharmacological investigations about the medicinal use of the plant, which may be a step ahead towards the new drug development.

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