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## Comparison of intensity and percolation of traditional knowledge of *Calotropis procera* and *Calotropis gigantea* in rural area of Kurukshetra district, Haryana- A survey

**Savita Rani, Gajendra Singh and Neelu Sood**

### Abstract

India has a long history of traditional plant usage for medicinal purposes and hence preserves the infinite reservoir of ethnomedicinal knowledge of plants. The ethnomedicinal knowledge is the most affordable and easily accessible source of treatment of various ailments. This knowledge is lying scattered in bits and segments in an unorganised form. Sporadic work has been done to retrieve, compile and utilize the traditional knowledge. Therefore, mega components in Indian economy which is based and dependent on traditional knowledge is going unacknowledged. An effort has been done on the part of authors to devise a strategy whereby this eloping knowledge can be fished out from rural India and finally put to purposeful usage after scientific screening. A novel methodology was framed which included format design, information collection from rural area after field survey.

**Keywords:** *Calotropis procera*, *Calotropis gigantea*, traditional knowledge, ethnobotany, medicinal plants

### 1. Introduction

India is a highly populated and developing country having rich plant diversity and hence considered as one of the mega biodiversity countries of the world [1]. Though urbanization is at its pace now a days but still rural sectors contribute a big part of the country. In villages, modern health facilities are either unavailable or insufficient. People rely on old healing practices which they got as a heritage from their ancestors. They use local/regional plants to make the herbal remedies. The medicinal properties of plants have been investigated in the recent scientific developments throughout the world due to their potent therapeutic efficacy, nil side effects and economic viability [2]. The knowledge acquired by the indigenous/traditional people bases upon experience and adaptation to local culture and environment is called as traditional knowledge. However, another term i.e. ethnobotany was coined by Harshberger in 1895 [3] for the traditional knowledge. Ethnobotany is the study of relationship between plants and people or it is how plants have been used by indigenous people since ancient times. Traditional knowledge has been acquired, tested by trial and error and transmitted to future generations orally or by shared practical experiences [4]. Several active compounds have been discovered from plants on the basis of ethnobotanical information and are used directly as patented drugs [5]. The main purpose to select traditional knowledge as basis of our study is to combine the different experiences, knowledge and expertise select group of knowledge carriers in various applications. Also, the traditional knowledge is diminishing every day with a frightening speed. Due to lack of the specific research awareness, people are not getting full benefits of our cultural heritage [6]. This ancient traditional knowledge has been conserved by TKDL (Traditional Knowledge Digital Library) by its electronically documentation. But only documented uses are subsumed in TKDL [7]. It is general perception that the traditional knowledge is conserved and practised amongst rural as compared to urban people, where modern health facilities are available. Authors have attempted to trace the extent of ethnobotanical knowledge being conserved and reserved in rural area through a field survey of four villages of Kurukshetra District, Haryana. The present study will help us trace the root cause/route for transmittance and diffusion of ethnobotanical knowledge through prevailing socio-economic setup. For our survey, a well-structured format was designed in the lab. Care was taken that voluminous data is collected from primary source.

PCTK (Person carrying traditional knowledge) score strength was calculated for the plants on the basis of their maximum and minimum reported usage.

*Calotropis procera* and *Calotropis gigantea* are two most common medicinal plants of *Asclepiadaceae* family. Plants are well known for their medicinal potential since ancient times. Some of their medicinal uses have been reported and many of them are yet to be recognized. *Calotropis procera* and *Calotropis gigantea* have been used and still being using by traditional people to make herbal remedies. *Calotropis procera* is a very popular and socially integrated plant since ancient times as its uses has been well documented in many age old medicinal books such as Charaka Samhita. Medicinal properties of *Calotropis procera* have been studied by several workers [8-9]. The extracts of different parts of *Calotropis procera* have remarkable therapeutic potential [10]. The plant has been reported to exhibit anti-inflammatory, analgesic and antioxidant properties [11]. Medicinal uses of *Calotropis gigantea* have also been reported by various workers [12-13]. The present study is an effort to retrieve this knowledge from them for its judicious utilization.

## 2. Materials and Methods

An ethnobotanical format was designed in order to help the author to screen out the significant informative features relating to traditional medicinal knowledge in our society. Selection of sites and sampling was done randomly and four villages of Kurukshetra districts of Haryana state in India were selected i.e. Mirzapur, Jyotisar, Narkatari and Ravgarh.

### 2.1 Design of format

#### 2.1.1 Format includes two parts

- 1) Socio-economic profile of the person in which personal details of an individual were filled up i.e. age, sex, qualification, occupation, address etc.
- 2) Knowledge regarding the medicinal plant in which medicinal uses of plants, side effects, plantation(wild/cultivated), level of information, domain of diffusion, status of knowledge was included.

### 2.2 Our survey was done under following steps

#### 2.2.1 Field visit to a selected village

Random selection of four different villages of Kurukshetra district was done and a field survey trip was planned to these villages for the collection of first hand native, useful and effective data.

#### 2.2.2 Collection and analysis of data

Village Sarpanch of the concerned village was approached so that the verification of credentials through a responsible authority could be done and accurate, authentic and related information about the village could be collected. Rural subjects were queried according to the format to collect information about the plant, its vernacular names, medicinal value, side effects and any other related information. Authors tried to communicate with them in their local language so that maximum information could come out in an easy way. Traditional words which they originally use for the plant and plant parts were noted down. The socio-economic profile of each individual was filed up along with a photograph and signatures/thumb impression as a record. Health care centres, hospitals, doctors, aanganwaari workers, hakims (local physicians) were also approached for the collection of maximum information. Minimum ten samplings were done in each selected village. The native data was analyzed,

regrouped and lately managed in tabular and histogram form for better interpretation. PCTK score strength was calculated and compiled for *Calotropis procera* and *Calotropis gigantea*.

## 3. Results and discussion

The traditional knowledge of *Calotropis procera* and *Calotropis gigantea* was gathered and PCTK score strength for both the plants was compiled in table 1 & table 2. This helped to study the pattern and trends of diffusion of traditional knowledge along with the denudation threats.

**Table 1:** showing the % PCTK score strength in *Calotropis procera*

Sr. No.	Reported Ethnomedicinal uses	Traditional knowledge existed	PCTK Strength (%)
1	Religious value	Yes	92.68
2	Thorn removal	Yes	87.80
3	To cure joint pain	Yes	51.21
4	To cure toothache	Yes	19.51
5	To cure Skin Disease	Yes	14.63
6	Wound healing	Yes	14.63
7	To cure gastric troubles in animals	Yes	9.75
8	To cure asthma	Yes	7.31
9	To cure cough	Yes	7.31
10	To cure boils	Yes	4.8
11	To cure stomachache	Yes	4.8
12	To cure snake bite	Yes	2.4
13	To cure cyclic fever	Yes	2.4
14	To cure wasp bite	Yes	2.4
15	To cure earache	Yes	2.4
16	To cure flatulence	Yes	2.4
17	Blood purifier	No	0
18	To cure Jaundice	No	0
19	To cure piles	No	0
20	To cure chest congestion	No	0
21	To cure ring worm	No	0
22	To cure corns	No	0
23	Removal of intestinal worms	No	0
24	To cure chicken pox	No	0

**Table 2:** showing the % PCTK score strength in *Calotropis gigantea*

Sr. No.	Reported Ethnomedicinal uses	Traditional Knowledge existed	PCTK strength% Strength (%)
1	Religious value	Yes	2.43
2	Antifertility	No	0
3	To cure ascites	No	0
4	Anticancer activity	No	0
5	Wound healing	No	0
6	To cure tooth	No	0
7	To cure fever	No	0
8	To cure eczema	No	0
9	To cure snake bite	No	0
10	To cure leprosy	No	0
11	To cure cleft on the	No	0
12	To cure sciatica	No	0
13	To cure dysentery	No	0
14	To cure injuries and	No	0
15	To cure epilepsy	No	0
16	Abortifacient	No	0

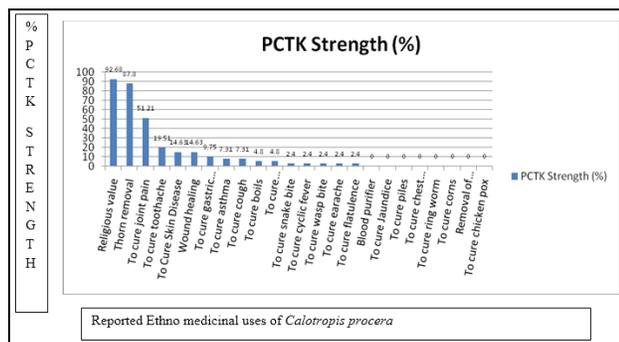


Fig 1: showing the PCTK strength of *Calotropis procera*:

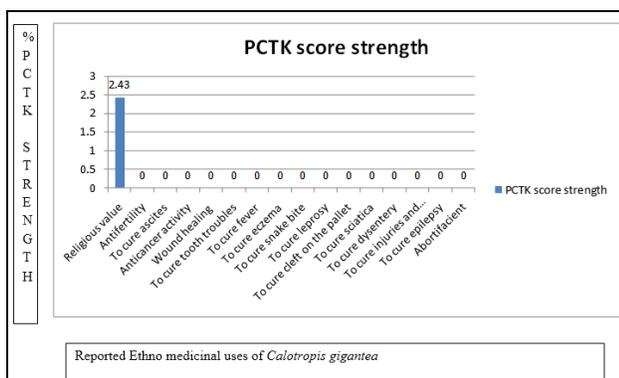


Fig 2: showing the PCTK strength of *Calotropis gigantea*:

The collected data pointed out that the PCTK score strength of the *Calotropis procera* plant, which grows abundantly in wastelands, is higher amongst indigenous people because the plant is growing in the close vicinity of their habitation and has a deep religious integration too. Therefore, ethnomedicinal knowledge of this plant is highly diffusing amongst rural people. In contrast, most of the informants failed to identify the other species of *Calotropis* i.e. *Calotropis gigantea*. However, *Calotropis gigantea* is more similar to *Calotropis procera* in morphology except a few differences like color of flower, plant height etc. PCTK score strength for both the plants was compiled in tables 1-2 and Figs. 1-2. PCTK score strength was calculated on the basis of their maximum and minimal reported usage. PCTK score strength for *Calotropis gigantea* was extremely low as compared to *Calotropis procera*.

Table 1 & Fig. 1 indicate that *Calotropis procera* is very well known for its religious value and some other ethnomedicinal uses. Indigenous people are aware of almost all the reported ethnomedicinal uses of the plant. Some of the traditional uses of the plant i.e. thorn removal, to cure joint pain, to cure tooth ache, to cure asthma etc. are still known and practiced by indigenous people. However, traditional knowledge about some other ethnomedicinal uses has been completely eloped indicating a gradual denudation of TK. PCTK score strength was either zero or very low for these uses. PCTK score strength of *Calotropis procera* was also compiled in villages of Rohtak district of Haryana<sup>[14]</sup>.

In *Calotropis gigantea*, a very alarming threat to ethnomedicinal usage was observed. Table 2 indicates that out of numerous reported ethnomedicinal uses, no use was narrated by the informants. The plant was identified by few informants only because of its religious value. This may be due to the less visibility of *Calotropis gigantea* as compared to *Calotropis procera* which is grows abundantly in wastelands.

#### 4. Conclusion

Medicinal plants have the significant contribution in the treatment of various diseases. The present study highlights the need of exploration of ethnomedicinal knowledge about the plants. The traditional knowledge is losing its originality due to exposure to modernization. Additionally this knowledge is in danger of being dissipated because written documentation is insufficient or unavailable. There is a dire need to design various research projects to encourage the documentation of traditional knowledge before its complete denudation. Such efforts will help us to be benefited by our unconfined traditional knowledge resource.

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