International Journal of Botany Studies
www.botanyjournals.com
ISSN: 2455-541X
Received: 04-01-2026, Accepted: 03-02-2026, Published: 18-02-2026
Volume 11, Issue 1, 2026, Page No. 216-219

Ethnobotanical uses of *Calotropis gigantea* (L.) Dryand. Among rural communities of Bargarh district, Odisha, India

S K Sen[1*], L M Behera[2]
[1] Ex- Demonstrator in Botany, Panchayat College, Bargarh, Odisha, India
[2] Ex- Reader in Botany, Modipara, Near Water Tank, Sambalpur, Odisha, India

Abstract
Calotropis gigantea (L.) R.Br. commonly known as giant milkweed or crown flower, is a perennial shrub widely distributed across tropical and subtropical regions of Asia and South Africa. The plant holds significant ethnobotanical importance and has been traditionally used in various indigenous systems of medicine, including Ayurveda, Unani and Siddha and folklore practices. The present study was documents the ethnobotanical uses of *C. gigantea* in the Bargarh district of Odisha, India with an emphasis on traditional knowledge systems practiced by local and indigenous communities. Through structured interviews, particularly observations, field surveys conducted across selected villages, data were gathered from local healers, herbal practitioners, and elders to document the plant's utilitarian roles in healthcare, agriculture, ritualistic practices, and material cultures. Findings reveals that various parts of the plant such as root, bark, leaf, flower and latex are traditionally used to manage ailments such as diarrhea, filaria, asthma, joint pain, joint swelling, piles, syphilis, epilepsy, obesity, otorrhea and earache as well as in the preparation of paste, extract, and decoctions. Additionally. *C. gigantea* plays a vital role in socio-religious ceremonies; its flowers, leaves and fibres are employed in worshiping rituals and symbolic practices during festivals such as *Maha Shiva Ratri*, *Dusshera* and many more. Despite its widespread use, the medicinal efficacy and safety of *C. gigantea* remain under-explored scientifically, and local knowledge is increasingly at risk of erosion due to socio economic changes. This study under-score the need for conservation of traditional knowledge and sustainable utilization strategies, while advocating for future phytochemical and pharmacological research to validate therapeutic claims. The ethnobotanical documentation from Bargarh district contributes valuable baseline information for future interdisciplinary studies and supports the integration of indigenous wisdom into community health and biodiversity conservation frameworks.

Keywords: Traditional knowledge, ethnobotany, *calotropis gigantea*, medicinal plants, indigenous healthcare, bargarh district, odisha

Introduction

Calotropis gigantea (L.) Dayand. is a weed plant belonging to the family Asclepiadaceae; however, it is now classified under the family Apocynaceae. It is mostly found in waste places and roadsides. It is locally called as '*Arakh*'. The plant holds significant ethnobotanical importance and has been traditionally used across various indigenous medical systems, including Ayurveda, Unani and Siddha, as well as in diverse folk medicinal practices. *Calotropis gigantea* commonly known as giant milkweed or crown flower, is a perennial large shrub native to India and widely distributed across tropical and subtropical regions of Asia and South Africa. It is a plant widely distributed and commonly found across Odisha as a wild and fast-growing shrub. *Calotropis gigantea* known as a toxic weed as well as a medicinally important plant, and its pharmacological potential is currently under active investigation. Numerous phytochemical and pharmacological studies have shown that *Calotropis gigantea* contains bioactive compounds such as alkaloids, flavonoids, tannins, and triterpenoids, anthocyanins, saponins, and cardiac glycoside and exhibits a wide range of pharmacological activities, including antimicrobial antibacterial and antifungal), anti-pyretic, anti-inflammatory, anti-convulsant, sedative, hair growing activity (Wagh *et al*., 2024) [15], analgesic, cytotoxic, anti-diarrheal, proteolytic enzymes, cardiac glucosides and hypoglycemic effects (Ghegade and Aher, 2021) [5].

The spiritual realm also embraces *Calotropis gigantea*, whose flowers represent purity and a deep connection to the divine. In mythology narratives, the plant is often regarded as a protective entity, with its milky sap symbolizing life-giving nourishment. The star shaped flowers, crowned with a regal form, signify royalty, reverence, and spiritual connection, particularly in Hindu traditions. In Hindu society, there is a long-standing tradition of decorating and offering leaves and flowers of various plants to deities in different rituals and festive occasion. From a mythological perspective, certain plants hold special significance and are offered to specific deities. Among them, *Calotropis gigantea* is considered dear to '*Lord Shiva*', especially its flowers and occupies a sacred place in Hindu mythology and symbolism, reflecting deep spiritual and cultural roots.

The plant is deeply associated with *Havan* and offered to God Sun as a *Navagraha* wood, one among the nine astrological trees (Sen and Behera, 2021) [13]. According to Hindu beliefs, this plant is dedicated to '*Surya Dev*' (the Sun God). By offering its wood into the sacred fire during a *Havan*, the wrath or adverse effects of '*Surya Dev*' are believed to be pacified. The leaves of the plant are among the *Pancha Pallav*; a ritual assortment of five leaves used in various rituals. The leaves are also offered to '*Lord Hanuman*'.

Various parts of the plant including roots, leaves, stems, flowers and milky latex are used in traditional and Ayurvedic medicine, particularly by the tribal communities in Odisha and other parts of India and abode. Medicinal preparation of this plant must be used with caution due to toxic nature of the plant.

Besides *Calotropis gigantea* (L.) Dayand, *Calotropis procera* (Aiton) Dryand. is another closely related species found in the study area. Both species share several similar morphological characters and exhibit comparable medicinal properties. (Mishra, 1993) [11]. Additionally, they are known by the same vernacular name '*Arakh*' in local language, which often leads to their overlapping traditional use and identification. Owing to these morphological, medicinal, and ethnobotanical similarities, *Calotropis procera* can be considered an allied species of *Calotropis gigantea*.

Vernacular names
English: Giant milkweed, Crown flower, Swallow Wort
Hindi: Madar, Sveta Arka, Akanda
Sanskrit: Arka, Ark, Mandara
Odia: Arakha
Local: Arakh

Classification of *Calotropis gigantea*

Kingdom	Plantae
Order	Gentianales
Family	Apocynaceae
Sub family	Asclepiadaceae
Genus	Calotropis
Species	*Calotropis gigantea*

Description of the plant
A tall shrub, 2-3 m height, stout, hairy tomentose, dark ash coloured bark, wrinkled. Leaves sessile, elliptic, ovate to obovate, acute apex, cordate or slightly arcuate base, thick, glabrous, hairy tomentose beneath than above, appressed with white floccose. Flowers in umbelliferous cymes, pedicel long, cottony. Calyx 5-lobes, broadly ovate, cottony. Corolla rotate, 5- lobes, imbricate, glabrous, white to purple. Corona short ca 1.2 cm long, shorter than staminal column. Fruit is follicle, recurved, 7-10 x 3-4 cm. Seeds many, broadly ovoid, flat, hairy; coma white, silky. Flowering and fruiting: Most part of the year.
Distribution: It is native to India Chine, Nepal Sri Lanka, Cambodia, Vietnam, Bangladesh, Indonesia, Malayasia, Philippines, Thailand and Pakistan.

Materials and Methods
Study area
The study area, Bargarh district is situated in the western part of Odisha and extends between 82°39' and 83°58' East longitude and 20°43' and 21°41' North latitude. The district is characterized by a rich cultural heritage and traditional lifestyle, with a long-standing history of utilizing plant resources for diverse purposes, particularly in traditional herbal medicine. Plant parts play a significant role in the socio-cultural life of the local communities and are extensively used in religious rituals, dietary practices, fairs, and festivals.
The study area was conducted in selected rural areas of Bargarh district where *Calotropis gigantea* is naturally distributed and commonly used by local communities. The area was chosen based on the abundance of the plant and the presence of traditional healers and knowledgeable elders.

Plant collection and identification
Specimens of *Calotropis gigantea* were collected from natural habitats during systematic field surveys. The collected samples were processed following standard herbarium techniques (Jain and Rao, 1977) [8]. Taxonomic identification was carried out using regional flora books (Haines, 1922; Saxena and Brahmam, 1995) [6, 14]. A voucher specimen was deposited in the Herbarium of the Department of Botany, Panchayat College, Bargarh for future reference.

Ethnobotanical data collection
Frequent field visits were conducted across different forest localities and adjacent villages to document the traditional uses and the ritual significance of the plant. Ethnobotanical information related to medicinal applications and other uses during festivals and religious occasion was gathered through interactions with village heads, traditional herbal healers (*Vaidyas*, *Kabirajs* and *Guniyans*) and local priests such as *Deheri*, *Jhankar*. Date recorded including vernacular names, plant parts used, preparation methods, modes of administration, therapeutic uses, dosage, and associated precautions. Ethnobotanical data on plant uses obtained from different study areas was critically compared with existing literature to ensure accuracy and reconfirmed accordingly. (Kirtikar and Basu, 1991, Jain, 1991, Rastogi and Mehrotra, 1990; Ambasta *et al*., 1992; Mishra *et al*., 1993; Warrier, 1995; Chopra *et al*., 1996; Khare, 2004) [2, 3, 7, 9, 10, 11, 12, 16]. During the preparation of this research paper, Google search was utilised to identify relevant documents and references.

Ethnobotanical observation
Field surveys were carried out through repeated visits to different localities within the study area. During the field visits, the following ethnobotanical information was systematically collected and recorded for future reference through interviews and direct observations.
Filariasis: The root paste is applied externally over the affected area to treat filariasis.

Diarrhoea: Root paste of the plant and opium (dried milky latex of Papaver somniferum) is mixed in a proportion of 10:1. Small tablets about the size of Abrus precatorious seeds, are prepared and taken 2-3 times daily to cure diarrhoea.

Bleeding piles: Root of the plant and the seed oil of *Ricinus communis* are boiled together and is applied to the affected part regularly to relieve bleeding piles.

Obesity: Regularly eating from plates made of the leaves of *Calotropis gigantea* is practiced to manage obesity.

Joint swelling and joint pain: Mustard oil is applied to the leaf and warmed. The warmed leaf is then applied to the affected area to treat joint pain and joint swelling.

Pain due to piles: The leaves are fried in seed oil of Ricinus communis, applied to the affected area, and bandaged to relieve pain due to piles.

Otorrhea and Earache: Warmed leaf extract (2-3 drops) is poured in to the ears three times a day to treat otorrhea and earache.

Scabies and ringworm: Root extract with warm coconut oil is applied 2-3 times a day to treat scabies. Root extract

with a little salt and coconut oil is applied externally twice daily to cure ringworm.

Syphilis and Obesity: Equal amounts of flower powder and sugar candy are mixed together. The powder (3 gm) is taken once daily on an empty stomach to treat syphilis and the same dosage is used to manage obesity.

Asthma and epilepsy: Equal amounts of flower powder of the plant and fruit powder of Piper nigrum are mixed together. The powder (2-3 gm) is taken once daily on an empty stomach in the morning to treat asthma and the same dosage is used to manage epilepsy.

Equal quantities of bark paste and latex are mixed and smoked using a chillum as a traditionally remedy for asthma.

Joint Pain: The latex and cloves of *Allium sativum* are boiled in *Brassica Rapa* seed oil and applied topically to the affected area to relief joint pain. Fresh Arakh leaves coated with *Brassica Rapa* seed oil or Ricinus communis seed oil are warmed and placed over the affected area for the treatment of swollen knees and joint pain.

Pain due to scorpion sting: The latex is applied locally to relieve pain caused by a scorpion sting.

Miscarriage: Milky latex is inserted into the vagina of a woman at an early stage of pregnancy to induce miscarriage. The stem bark is processed to yield a white bast fiber, which has been traditionally used to make ropes, cord and fishing nets.

Results and Discussion

The present ethnobotanical investigation documented diverse traditional medicinal uses of *Calotropis gigantea* reported by local healers and knowledgeable informants. Various plant parts such as root, bark, leaves, flowers and latex are employed either singly or in combination with other natural ingredients for the management of multiple ailments, indicating the plant's significant role in indigenous healthcare systems.

The roots of *C. gigantea* were frequently cited for their therapeutic value. Root paste is used for the treatment of filaria infections, root decoction with seed oil of *Ricinus communis* is used against bleeding piles. In some communities, root paste with opium is administered for the management of diabetes. These practices highlight the ethnomedicinal belief in the root's systematic activity, though such uses raise concerns regarding safety and toxicity, emphasizing the need for pharmacological validation and toxicological assessment.

Leaf constitute one of the most commonly used plant parts. Leaves mixed with *Brassica Rapa* seed oil are used to alleviate joint swelling and joint pain. Leaves of *C. gigantea* with *Ricinus communis* seed oil are used to manage pain associated with piles. Leaf extract is useful in the treatment of otorrhea and earache, indicating antimicrobial or soothing properties attributed the leaves. Theses external and topical uses are consistent with the widespread ethnobotanical reliance on *Calotropis gigantea* leaves for inflammatory and pain-related

The flowers of *C. gigantea* are utilized in powdered form for internal administration. Flower powder mixed with sugar candy is traditionally consumed for the treatment of syphilis and managing obesity. Besides, flower powder is consumed with *Piper longum* fruit powder to relieve epilepsy and asthma. Such practices suggest that flowers are believed to bronchodilatory properties, although these claims require rigorous scientific validation.

The bark, used in combination with latex, for the treatment of asthma, indicating traditional use targeting respiratory disorders. The latex is employed externally for scorpion sting management. The latex is reportedly used for the treatment of joint pain along with cloves of *Allium sativa* and *Brassica Rapa* seed oil. However, the latex is also reported to be used intravaginally to induce miscarriage during the early stages of pregnancy, highlighting its strong bioactivity and potential toxicity. This particular use underscores the dual nature of *C. gigantea* as both a medicinal and toxic plant, necessitating extreme caution.

Herbal medicines are predominantly utilized by the tribal communities through traditional healers, and their application is deeply embedded in spiritual belief systems. Although these magico-spiritual and religious beliefs may not be supported by scientific evidence, they hold substantial cultural importance and therefore cannot be overlooked (Gelfand, 1970) [4]. In the Indian folk traditions, including songs and oral narratives, certain plants are revered as incarnations of specific deities. The ritualistic offering of *Calotropis gigantea* leaves to Lord '*Hanuman*' and its flowers to Lord '*Shiva*', may contribute to psychotherapeutic effects by reinforcing faith, emotional well-being and cultural identity (Agrawal, 1981) [1].

Conclusion

The Arakh plant holds significant cultural, religious and medicinal value in Odisha much like the rest of India. Despite its toxic properties, it is widely used in traditional practices. The stem bark of *Calotropis gigantea* yields a white bast fiber that has traditionally been used to make ropes, cord and fishing nets. The plant is considered sacred; its flowers are frequently offered to Lord Shiva, while its leaves are offered to Lord Hanuman during worship. Arakh is also one among the *Navagraha* herb, associated with the nine astrological trees. Additionally, its leaves are included in the Pancha Pallav, a ritual assemblage of five sacred leaves used in various religious ceremonies.

Overall, the ethnobotanical data reveal that *Calotropis gigantea* occupies an important place in traditional medicine particularly for treating inflammatory conditions, pain, metabolic disorders, respiratory ailments, and reproductive health issues. While these traditional claims suggest the presence of bioactive compounds, the known toxicity of certain plant parts, especially the latex and roots, raises serious safety concerns. Therefore, systematic phytochemical, pharmacological and toxicological studies are essential to validate these traditional uses and to ensure safe therapeutic applications.

References

1. Agrawal SR. Trees, Flowers, and Fruits in Indian Folk songs, Folk proverbs and Folk tales. In Jain SK. (ed.) Glimpses of Indian Ethnobotany. Oxford IBH Publishing Co., New Delhi, 1981, 3-12.
2. Ambasta SP, Ram Chandran K, Kashyappa K, Chand R. The Useful Plants of India. Reprint Edn. Publication and Information Directorate, CSIR, New Delhi, 1992.

3. Chopra RN, Nayar SL, Chopra IC. Glossary of India Medicinal Plants. Reprint edn. National Institute of Science Communication, Council of Scientific and Industrial Research, New Delhi, 1996, 46-47.
4. Gelfand M. Medicine and Magic. The Central African Journal of Medicine,1970:16:45-48.
5. Ghegade RY, Aher AN. *Calotropis gigantea* Linn. - An Indian Traditional Medicine Treasure. International Journal of Pharmaceutical Sciences Review and Research,2021:68(1):43-147.
6. Haines HH. The Botany of Bihar and Orissa. Arnold Sons & West Nirman Limited, London,1922:2:577-578.
7. Jain SK. Dictionary of Indian Folk Medicine and Ethnobotany. Deep Publications, New Delhi, 1991.
8. Jain SK, Rao RR. A Handbook of Field and Herbarium Methods. New Delhi: Today and Tomorrow's Printers and Publishers, 1977.
9. Khare CP. Indian Herbal Remedies (Rational Western Therapy, Ayurvedic and Other Traditional Usage, Botany). Springer, 2004, 119-121.
10. Kirtikar KR, Basu BD. Indian Medicinal Plants. (Reprint ed.), Lalit Mohan Basu, Allahabad,1991:3:1606-1611.
11. Mishra MK, Mohanty MK, Das OK. Studies on the method- Ethnobotany of *Calotropis gigantea* and *Calotropis procera*. Ancient of Life,1993:12(1&2):40-56.
12. Rastogi RP, Mehrotra BN. Compendium pf Indian Medicinal Plants, Central Drug Research Institute and Publication and Information Directorate. New Delhi,1990:3:118.
13. Sen SK, Behera LM. Ethnomedicinal usages of Navagraha herbs in Bargarh district of Odisha. Academy of Plant Sciences,2021:34(1&2):159-161.
14. Saxena HO, Brahmam M. The Flora of Orissa. Regional Research Laboratory, and Orissa Forest Development Corporation Limited, Orissa, 1995, 2.
15. Wagh P, Handge K, Kurhade S, Wagh S, Bhoir V, Dhokale K, *et al*. The hidden powers of *Calotropis gigantea*: Exploring its medicinal, toxic, and ecological dimensions. Current trends in Pharmacy and Pharmaceutical chemistry,2024:6(4):160-167.
16. Warrier PK, Nambiar VPK, Ramankutty C. Indian Medicinal Plants. A compendium of 500 species. Orient Longman Pvt. Ltd,1995:1:341-345.