REVIEW OF RESEARCH
ISSN: 2249-894X
IMPACT FACTOR : 5.7631(UIF)
VOLUME - 13 | ISSUE - 6 | MARCH - 2024

STUDY OF MEDICINAL VALUE OF *STERCULIA URENS ROXB.* UNDER THE FOREST COMMUNITY OF PENCH SEONI (M.P.)

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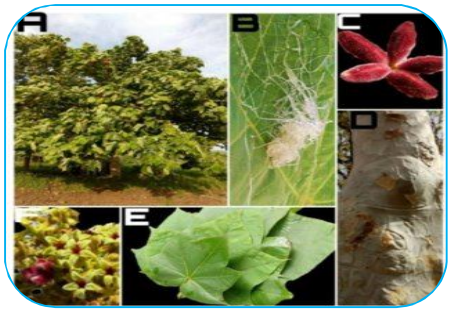
ABSTRACT :



Sterculia urens Roxb, commonly known as Indian tragacanth or Karaya gum, is a tree species native to India and distributed across Pench tiger reserve forest regions Seoni. *Sterculia urens* is a significant species in the area, valued for its gum and medicinal properties, but its natural regeneration faces challenges. *Sterculia urens* belonging to family Sterculiaceae. Its medicinal value has been recognized in traditional Indian medicine systems such as Ayurveda and Unani. The medicinal properties of *Sterculia urens* vary depending on the forest region; it is cultivated in the arid and semi-arid ecological regions of Pench tiger reserve Seoni. It is traditionally used for its mucilaginous and emollient properties. The gum obtained from its stem treats gastrointestinal disorders such as constipation and diarrhoea. Additionally, it possesses anti-inflammatory and wound-healing properties, making it valuable in traditional wound care. In India's eastern and north-eastern regions, *Sterculia urens* is utilized for its medicinal bark extracts, which are known for their antimicrobial and antifungal activities. These extracts have been used in traditional medicine to treat skin infections and fungal diseases. Furthermore, in the southern regions of India, *Sterculia urens* is recognized for its anti-diabetic properties. Studies have shown that extracts from its seeds have hypoglycaemic effects, potentially beneficial in managing diabetes. *Sterculia urens* exhibit diverse medicinal properties across different forest regions of India. Its versatility in traditional medicine systems highlights its importance as a valuable natural resource with potential applications in modern pharmacology. However, further research is warranted to explore its pharmacological properties comprehensively and elucidate its potential in developing novel therapeutics. This research is to highlight the importance of *S. urens* to the tribal peoples of Pench forest area Seoni district (M.P.) India. *S. urens* can be very important species for tribal communities for medicinal and employments generation for their sustainable livelihood development. *Sterculia urens* has a great economic importance. The medicinal and other importance of the plant has been noted from the mouth of tribal of Seoni district. From very ancient it was used in various ways.

KEY WORDS: *Sterculia urens*, human health, medicinal value and Pench forest Seoni.

INTRODUCTION:

India is renowned for its rich biodiversity, encompassing a vast array of flora and fauna. Among its botanical treasures, *Sterculia urens Roxb*, commonly known as the "Karaya gum tree" or "Indian tragacanth," stands out for its medicinal properties and ecological significance. By understanding its significance in different ecological contexts, we can appreciate its role in traditional healing practices

and explore avenues for its sustainable utilization in healthcare. Tribal species use *Sterculia urens* Gum as traditional medicine to cure various ailments. While almost every part of the plant has therapeutic value, the collection of the gum-*Sterculia urens*-serves as a means of subsistence and employment because it has a long history of significant importance in the waste management, food, pharmaceutical, paper and textile, composite fibre, and leather industries. This tree's gum exudate is highly valuable globally. *Sterculia urens* gum is utilized as a commercial food additive and a thickening agent, especially in textile printing paste Forest management, as an important environmental indicator, has a significant impact on plant species diversity.

Sterculia urns Roxb. is a culturally, ecologically, and economically significant species belonging to the family Malvaceae (formerly Sterculiaceae). This deciduous tree, characterized by its large lobed leaves and distinctive yellow flowers, is native to the tropical and subtropical regions of India, Bangladesh, and Myanmar (Hasnat et al., 2019; Lyzu et al., 2022). Traditionally, it has been used in Indian ethnomedicine as a diuretic, aphrodisiac, and anti-inflammatory agent (Kumar et al., 2004; Namsa et al., 2009), reflecting its relevance in local healthcare systems. The primary objective of this study is to review and synthesize existing knowledge on the botanical characteristics, phytochemistry, medicinal applications, propagation techniques, and conservation status of S. villosa, with a focus on its potential for sustainable utilization. This review aims to bridge the research gap surrounding its declining population trends, especially in central India, and the underexplored pharmacological potential of its bioactive compounds. Although categorized as Least Concern by the IUCN Red List (IUCN, 2022), recent field observations suggest a marked decline in its natural population in central India due to habitat loss, overharvesting, and climate change (Rai et al., 2020; Das et al., 2017).While earlier literature (e.g., Ghani, 2003) provides baseline knowledge, updated insights from recent studies (e.g., Lyzu et al., 2022; Hossain et al., 2016; Das et al., 2017) are essential to reassess the plant's current ecological and pharmacological relevance. This paper emphasizes the urgent need for systematic conservation strategies, sustainable cultivation practices, and further research into the therapeutic properties of *S. urens*. By consolidating multidisciplinary evidence, it provides a foundation for promoting the species as a candidate for community-based agroforestry systems, traditional medicine, and sustainable livelihood enhancement.

Forest resources have value to human beings. The forestry is an art and science of managing a devaluating forest resources with the object of producing goods and services on sustained basis of human society. Forests provide several products broadly classified as major and minor forest products which serve as back-bone in rural economy. In this research, we are discussing about economic and medicinal significance of *Sterculia urens* for local forest dwelling communities.

The present investigation is to highlight the importance of *S. urens* to the tribal peoples of Pench forest area Seoni district (M.P.) India. *S. urens* can be very important species for tribal communities for medicinal and employments generation for their sustainable livelihood development. *Sterculia urens* has a great economic importance. The medicinal and other importance of the plant has been noted from the mouth of tribal of Seoni district. From very ancient it was used in various ways.

MATERIAL & METHODS:-

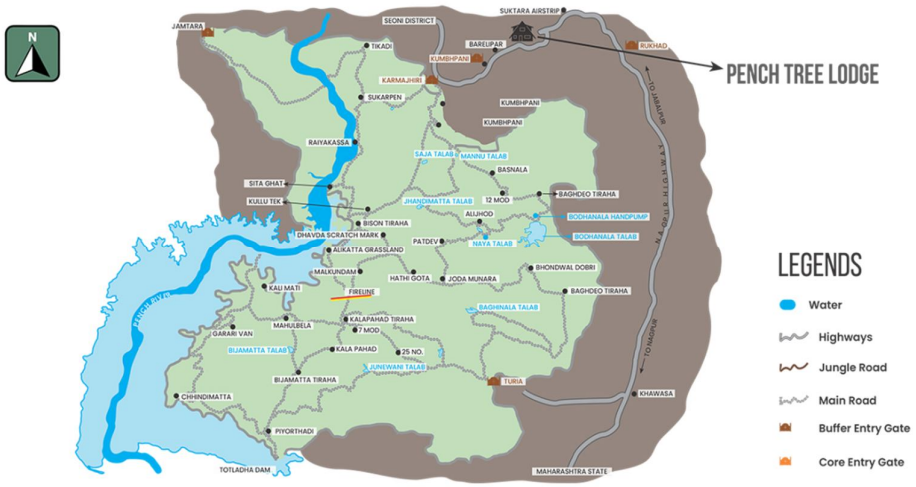
Pench Tiger Reserve or Pench National Park is a tiger reserve in India straddling across Madhya Pradesh and Maharashtra. On the Madhya Pradesh side, it encompasses a core area of 411.33 km^2 (158.82 sq mi), with a buffer of 768.3 km^2 (296.6 sq mi), making for a total protected area of 1,179.63 km^2 (455.46 sq mi). On the Maharashtra side, the Pench Tiger Reserve has a core habitat area of 257.3 km^2 (99.3 sq mi) along with a buffer zone of 483.96 km^2 (186.86 sq mi) making total protected area of 741.2 km^2 (286.2 sq mi). Pench Tiger Reserve comprises Pench National Park, Mowgli Pench Sanctuary and a buffer area, which span more than 1,920 km^2 (740 sq mi).

A comprehensive literature review was undertaken to collate information related to the utility, botany, conservation, and cultivation of *Sterculia urens* Roxb. The selection of databases—PubMed, Web of Science, Springer Nature, and Google Scholar—was based on their wide

acceptance, credibility, and access to peer-reviewed scientific literature across fields such as plant sciences, pharmacognosy, ecology, and ethnobotany. PubMed was specifically used to access biomedical and pharmacological research, while Web of Science and Springer Nature provided high-impact multidisciplinary scientific resources. Google Scholar facilitated access to grey literature and region-specific publications that might not be indexed in other databases.

To ensure the retrieval of relevant and comprehensive information, a combination of specific and broad keywords was used, including: *Sterculia urens*, ethnobotany, phytochemistry, medicinal uses, conservation status, traditional medicine, propagation, and sustainable cultivation. Boolean operators and truncation symbols were applied to refine and expand the search results.

Collected data were organized thematically under sub-headings: taxonomy and distribution, phytochemistry, traditional and pharmacological uses, propagation techniques, and conservation concerns. The reliability of each source was assessed based on its citation frequency, publication venue, and consistency with other findings. Discrepancies were addressed by cross-referencing multiple studies. This multi-source, multi-method approach ensured a well-rounded synthesis of current knowledge while identifying gaps for future research on *S. urens*. An extensive literature survey was carried out for compilation of ecological and medicinal information on selected gum yielding woody plant species *Sterculia urens* Roxb. The data were compiled on the traditional uses of various plant parts of these species along with industrial applications and various management practices as adopted by the local communities and the concerned state departments. The fieldwork was conducted in Pench forest division Seoni Madhya Pradesh of India. An ecological and medicinal survey was conducted eliciting information through personal interviews of villagers with the help of local assistants and also through direct and indirect observations made during the field surveys. Locals who practice traditional medical practices and local elder and knowledgeable people were interviewed for information on medicinal uses.



Map of Study Site Pench National Park Seoni (M.P.)

RESULT AND DISCUSSION:-

Sterculia urens Roxb. (Family: Combretaceae) popularly known as 'Karaya' or 'Kadaya'. *Sterculia urens* is commonly known as: Gujarati: Kadayo/Kogdol, Konkani: Pandruk, Hindi: Kulu/Katira, English: Indian-Tragacanth

Phytochemistry:-

Sterculia urens habits diverse pharmacological properties, including anti-inflammatory, antimicrobial, antioxidant, and analgesic effects. Below are the specifics of the identified phytochemicals.

Medicinal Uses:-

The medicinal uses of *Sterculia urens* emphasize its significant role in traditional Indian medicine, reflecting its therapeutic potential and contribution to overall well-being within local communities. The plant's traditional uses are well-established, with *S. urens* serving as a diuretic, cooling agent, and aphrodisiac herb in Indian traditional medicine.

3.3 Other Uses:-

Sterculia urens stands out as a versatile and valuable resource, playing a vital role in culinary, ecological, and economic aspects. Its impact extends from traditional uses to various industrial applications, highlighting its cultural and ecological importance. Responsible conservation efforts are essential to ensure the sustained existence of this botanical wonder for future generations.

Culinary uses:-

Edible Resource: *Sterculia urens* serves as a valuable dietary resource, enhancing culinary diversity and nutritional well-being.

Root Powder Preparation: The powdered root, mixed with rice flour, is used to create a bread-like doughnut known for its soft texture and pleasant taste.

Nutrient-Rich Seeds: Roasted or cooked seeds are consumed, similar to pulses, contributing to dietary sustenance and food security (Facciola, 1998).

Gum Substitute: The gum from the bark is used as a substitute for gum tragacanth in confectionery, highlighting its role in food production (Facciola, 1998).

Traditional Drink Ingredient: The plant is a popular ingredient in locally made drinks during hot summers, promoting a feeling of freshness, relaxation, and sound sleep (Manandhar, 2002).

Ecological contributions Nectar Source: The flowers of *Sterculia urens* provide nectar for pollinators like bees and butterflies, supporting local biodiversity.

Wildlife Food Source: Fruits with edible pulp contribute to wildlife food sources, enhancing overall regional biodiversity.

Economic contributions Wood Utilization: The soft wood is used in tea boxes, toys, guitars, matchboxes, and commercial plywood, contributing to various industries (Ghosh & Baruah, 1997).

Fiber Production: Coarse fiber from inner bark is used in ropes, bags, and cordage, fulfilling industrial needs.

Gum Production: The plant produces gum karaya, used in lozenges for sore throats, emphasizing its medicinal and commercial significance (Verma & Kharakwal, 1977).

Paper Pulp Potential: *Sterculia urens* suitable for paper production, with its fibrous material exhibiting a remarkable pulp yield and wood fiber properties. The fibrous material contributes significantly to the pulp and paper industry, supporting sustainable paper resources (Ghosh & Baruah, 1997; Barua & Rabha, 1992).

Cultural and ecological significance Botanical Wonder: *Sterculia urens* symbolizes the intricate connection between nature and human culture, emphasizing responsible land management and conservation efforts for its sustained existence.

Versatile Resource: From traditional medicine to diverse industrial applications, *Sterculia urens* proves its versatility and value, impacting various sectors.

Economic and Cultural Relevance: Beyond economic significance, the plant holds cultural and ecological relevance, underlining its importance in various contexts.

CONSERVATION STATUS:-

Sterculia urens, classified as a species of Least Concern according to the IUCN Red List ver 3.1 (Year Published: 2022), exhibits extensive geographical spread and a substantial population with no substantial current threats or foreseeable risks. Despite this favorable classification, conservation efforts are deemed critical, especially in the face of regional threats such as deforestation and climate change. The urgency for preservation is highlighted by the dwindling number of trees in central India, emphasizing the need for dedicated propagation and cultivation initiatives. Ongoing deforestation and habitat degradation necessitate monitoring of populations and habitats, underlining the importance of conservation measures to ensure the continued presence of *Sterculia urens*. These efforts are vital not only for the survival of this unique tree but also for its significant contributions to local ecosystems and cultures.

FUTURE PERSPECTIVES:-

Future research on *Sterculia urens* should encompass a comprehensive exploration of its pharmacological, morphological, conservation, and cultivation aspects. Pharmacological studies should aim to unveil its medicinal potential, exploring applications in traditional medicine or pharmaceutical development. Morphological analyses, including molecular investigations, are crucial for a nuanced understanding of the plant's structure and genetic diversity. Conservation efforts should focus on robust strategies, considering ecological significance, reintroduction programs, and sustainable harvesting. Cultivation techniques need optimization, with an emphasis on agroforestry models and sustainable practices. Assessing economic viability, community engagement, and climate resilience are pivotal components, ensuring a balanced approach that integrates ecological preservation, traditional medicine, and sustainable development. Interdisciplinary collaboration among pharmacologists, botanists, ecologists, and social scientists is essential for a holistic understanding and effective management of *Sterculia urens*. These future perspectives aim to contribute significantly to biodiversity conservation, traditional medicine, and sustainable development, fostering a harmonious relationship between the plant species and the communities it influences.

CONCLUSION

Sterculia urens is a vital component of the forest community in Pench, providing habitat and resources for various species. In conclusion, *Sterculia urens* stands out as a plant of great significance, not only for its ecological role but also for its potential pharmacological applications. The studies discussed shed light on the plant's distinctive morphological features, distribution, and its role in supporting local ecosystems. While currently classified as a species of Least Concern, conservation efforts are deemed crucial, given regional threats such as deforestation and climate change. The comprehensive seed and fruit morphology descriptions provide valuable insights into the reproductive cycle and ecological interactions of *Sterculia urens*. Overall, the knowledge compiled here offers a foundation for informed conservation strategies and sustainable utilization of *Sterculia urens*, ensuring its continued contribution to ecosystems and potentially benefiting pharmaceutical and agroforestry endeavors. Almost every part of *S. urens.* are useful to cure various diseases. Thus the finally concluded from the study that the *Sterculia urens* Roxb. Plant is of a great economic as well as Ecological significance.

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