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## Traditional Ethno-Medicinal Plants Used for Snake Bite in Mahoba district of South-Western Uttar Pradesh

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Received: 08 May 2019, Accepted: 11 May 2019 ; Published on line: 15 May 2019

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### Abstract

Snakebite envenomation is a serious public health concern in rural India, often resulting in morbidity and mortality due to limited access to modern medical care. Traditional plant-based remedies play a vital role in primary healthcare in such regions. This study documents the ethnomedicinal plants used for snakebite treatment in Mahoba district, Bundelkhand region, Uttar Pradesh, India. Ethnobotanical surveys were conducted among local communities and traditional healers using semi-structured interviews, personal discussions, and field observations. A total of 10 plant species belonging to 9 families were recorded, with roots and whole plants being the most frequently used parts. Families such as Caesalpiniaceae, Apocynaceae, and Fabaceae were predominant. These plants are employed to alleviate symptoms of envenomation, including pain, inflammation, and neurotoxic effects. The findings underscore the richness of indigenous knowledge, highlight the need for pharmacological validation, and emphasize the importance of conservation of medicinal flora in Bundelkhand. This study provides a foundation for future research in pharmacology and drug development.

**Keywords:** Ethnomedicine, Snake bite, Mahoba, Bundelkhand, Medicinal plants, Traditional knowledge.

### Introduction

Snakebite envenomation is considered a neglected tropical disease and poses a significant health challenge in rural and semi-arid regions of India (Warrell, 1999). Due to limited access to modern healthcare facilities and antivenom therapy, local communities rely heavily on traditional remedies derived from medicinal plants (Kala et al., 2006).

India's rich biodiversity and longstanding ethnomedicinal traditions have led to the utilization of numerous plant species for managing snakebites and associated symptoms such as pain, inflammation, and neurotoxicity (Jain, 1991). Bundelkhand, including Mahoba district, is characterized by semi-arid conditions, rocky terrain, and dry deciduous forests, supporting a variety of medicinal plants adapted to extreme environmental conditions (Singh & Singh, 2005).

Tribal and rural communities such as Saharia, Gond, Kol, and semi-nomadic groups like Kanjad and Kuchbandhiya possess traditional knowledge of local flora for therapeutic purposes. Several plant species, including *Rauvolfia serpentina* and *Gymnema sylvestre*, have reported pharmacological activities relevant to snakebite management, including anti-inflammatory, neuroprotective, and antioxidant effects (Biswas et al., 2002; Fabricant & Farnsworth, 2001).

Despite its importance, documentation of ethnomedicinal knowledge for snakebite treatment in Mahoba district is limited. This study aims to record and analyze medicinal plants traditionally used for snakebite, preserving indigenous knowledge and providing a foundation for pharmacological investigations.

### 2. Materials and Methods

## 2.1 Study Area

Mahoba district is located in south-western Uttar Pradesh, India ( $25^{\circ}18' N$  latitude,  $79^{\circ}53' E$  longitude), covering an area of approximately 3,071 km<sup>2</sup>. The district is bounded by Hamirpur to the north, Banda to the east, Madhya Pradesh to the south, and Jhansi to the west. The region has rocky terrain, dry deciduous vegetation, and a semi-arid climate. Local tribal and rural populations have historically relied on medicinal plants for healthcare (Singh & Singh, 2005).

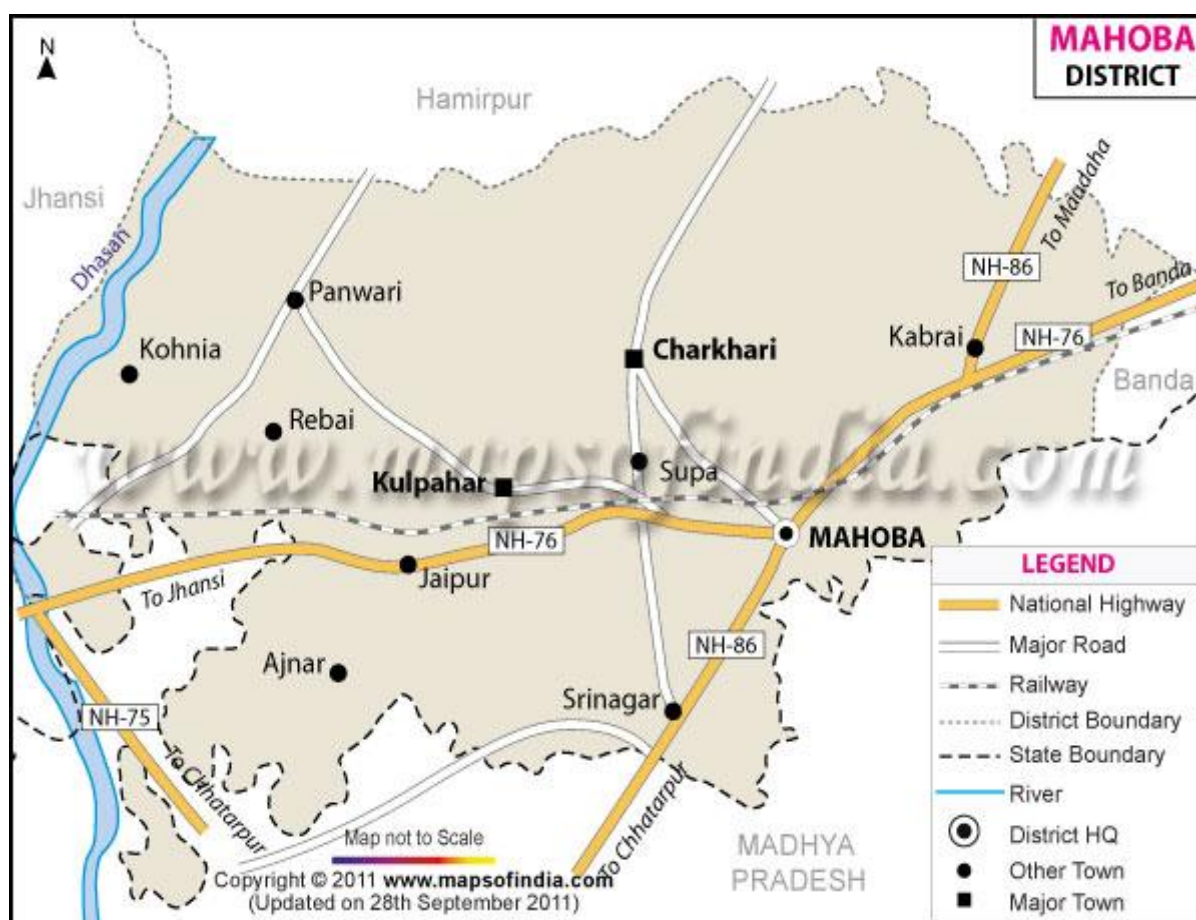


Figure 1. Location map of Mahoba district in Bundelkhand region, Uttar Pradesh, India.

## 2.2 Data Collection

Ethnobotanical data were collected during field surveys in various villages of Mahoba district from 2018 to 2019. Information was obtained from local healers, elderly villagers, and other knowledgeable informants through semi-structured questionnaires, personal interviews, and participant observation. Only remedies reported by at least two independent sources were considered for documentation (Cotton, 1996; Jain, 1964).

## 2.3 Plant Identification

Collected specimens were processed and preserved according to standard herbarium techniques (Jain & Rao, 1977). Identification was verified using regional floras and herbarium comparisons at the Duthie Herbarium (DUTHIE), Department of Botany, University of Allahabad, Prayagraj. Voucher specimens were deposited at DUTHIE for future reference. Traditional uses were cross-checked with published literature to assess novelty and previously reported uses (Jain, 1991).

### 3. Results

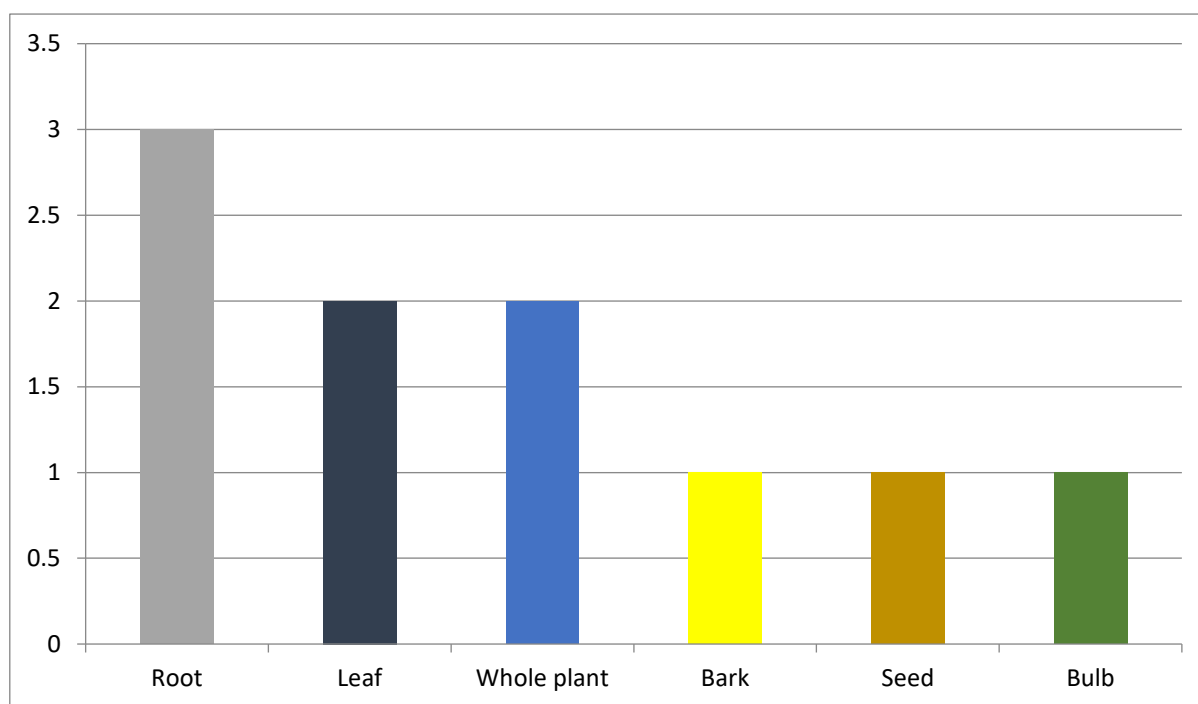
#### 3.1 Ethnomedicinal Plants

A total of 10 plant species belonging to 9 families were documented for snakebite treatment in Mahoba district. The recorded species, local names, families, plant parts used, and field numbers are presented in Table 1.

S. No.	Botanical Name	Family	Local name	Used Part	Field No.
	<i>Adiantum incisum</i> Forsk.	Adiantaceae	Hansraj	Whole plant	274
2.	<i>Alysicarpus monilifer</i> (L) DC	Fabaceae (Papilionaceae)	Akranti	Whole plant	50
3.	<i>Cassia fistula</i> Linn.	Caesalpiniaceae	Amaltas	Leaf	290
4.	<i>Tamarindus indica</i> Linn.	Caesalpiniaceae	Imli	Seed	06
5.	<i>Madhuca ZongifoZia</i> (Koen.) Mac.. Br.	Sapotaceae	Mahua	Bark	157
6.	<i>Rauvolfia serpentina</i> (L.) Benth. ex kurz.	Apocynaceae	Sarpagandha	Root	220
7.	<i>Gymnema sylvestre</i> R. Br.	Asclepiadaceae	Gurmar	Root	44
8.	<i>Nicotiana tabacum</i> L.	Solanaceae	Tamakhu	Leaf	301
9.	<i>Peristrophe bicalyculata</i> (Retz.) Nees	Acanthaceae	Choti Harjodi	Root	240
10.	<i>Urgenia indica</i> (Roxb.) Kunth.	Liliaceae	Van-piyaz	bulb	357

#### 3.2 Plant Parts Used

Roots and whole plants were most frequently used, followed by leaves, bark, seeds, and bulbs. Roots and whole plants accounted for 50% of documented remedies, reflecting their perceived potency and higher concentration of bioactive compounds.



**Figure 2.** Percentage distribution of plant parts used in traditional snakebite remedies in Mahoba district.

### 3.3 Dominant Families

The most represented family was Caesalpiniaceae with two species, while Apocynaceae, Fabaceae, Adiantaceae, Liliaceae, Asclepiadaceae, and Acanthaceae were represented by a single species each.

### 4. Discussion

Traditional remedies for snakebite in Mahoba district primarily rely on roots and whole plants, consistent with other ethnobotanical studies where these parts contain higher concentrations of active metabolites (Ghorbani, 2005). Documented species have pharmacological relevance:

- **Rauvolfia serpentina** – contains alkaloids with neuroprotective effects.
- **Gymnema sylvestre** – exhibits anti-inflammatory and antioxidant properties.
- **Madhuca longifolia** – bark extracts show analgesic and anti-inflammatory activity.

The use of these plants demonstrates empirical knowledge developed over generations. Validation through phytochemical and pharmacological studies is essential to understand mechanisms of action and support integration into modern healthcare.

### 5. Conclusion

This study documents 10 ethnomedicinal plants traditionally used to manage snakebite in Mahoba district. Indigenous knowledge continues to play a critical role in rural healthcare. Recommendations include:

- Conservation of medicinal plant species to prevent overharvesting.
- Phytochemical and pharmacological validation of documented plants.
- Comprehensive documentation of indigenous knowledge for future research and drug development.

These findings provide a foundation for future research into plant-based interventions against snake envenomation.

## 6. Acknowledgment

The authors sincerely thank local healers and villagers of Mahoba district for sharing their knowledge. Special thanks are extended to the Department of Botany, University of Allahabad, Prayagraj, and the staff of Duthie Herbarium for assistance in plant identification and specimen preservation.

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