



## Biodiversity and Conservation Assessment of Medicinal Plant Species in Surgana Tahsil, Nashik District

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### Abstract:

Surgana Tahsil of Nasik District, Maharashtra, is a forest-rich tribal region possessing significant medicinal plant diversity. The present study aims to assess the biodiversity status and conservation needs of medicinal plant species in this ecologically sensitive area. Field surveys were conducted in selected forest patches and tribal villages using quadrat sampling, transect walks, and interviews with local healers.

The study documented approximately 45–60 medicinal plant species, including several rare and threatened taxa. Notable species recorded during the survey include *Rauvolfia serpentina*, *Gloriosa superba*, *Chlorophytum borivillianum*, *Ceropegia vincifolia*, and *Oroxylum indicum*. These species are facing population decline due to overharvesting, habitat degradation, forest fires, grazing pressure, and increasing anthropogenic activities.

The conservation assessment indicates that while common medicinal plants remain moderately abundant, rare species require immediate protection measures. Strategies such as *in situ* conservation, *ex situ* cultivation, community participation, awareness programs, and sustainable harvesting protocols are essential for maintaining ecological balance. Proper scientific documentation and conservation planning are crucial to safeguard the medicinal plant wealth of Surgana Tahsil for sustainable utilization and future pharmacological research.

**Keywords:** Medicinal Biodiversity, Rare Species, Conservation, Ethnobotany, Surgana Tahsil, Sustainable Use.

### Introduction:

Medicinal plants constitute an important component of forest biodiversity and play a vital role in traditional as well as modern healthcare systems. India, recognized as one of the world's mega-biodiversity countries, harbors a rich diversity of medicinal flora distributed across varied ecological regions. Forest-dominated tribal areas are particularly significant reservoirs of ethnomedicinal knowledge and plant resources.

Surgana Tahsil of Nasik District, Maharashtra, is characterized by hilly terrain,

semi-evergreen to dry deciduous forests, and substantial tribal population. The region supports a wide range of medicinal plant species, including rare and threatened taxa such as *Rauvolfia serpentina*, *Gloriosa superba*, *Chlorophytum borivillianum*, and *Oroxylum indicum*. These species are widely used by indigenous communities for the treatment of various ailments including fever, snakebite, inflammation, reproductive disorders, and respiratory problems.

However, increasing anthropogenic pressures such as deforestation, overharvesting,

habitat fragmentation, grazing, and forest fires have led to a decline in natural populations of several medicinal plants. Lack of systematic conservation measures further threatens their sustainability. Therefore, assessing the biodiversity status and conservation needs of medicinal plant species in Surgana Tahsil is essential for sustainable utilization, ecological balance, and preservation of traditional knowledge systems.

The present study focuses on documenting medicinal plant diversity and evaluating conservation priorities to ensure long-term protection of this valuable biological heritage.

#### Methodology:

The present study was conducted to assess the biodiversity and conservation status of medicinal plant species in Surgana Tahsil, Nashik District, Maharashtra.

**1. Study Area Survey:** Field surveys were carried out in selected forest patches and tribal villages of Surgana Tahsil during different seasons to record maximum plant diversity.

**2. Field Exploration:** Transect walks and quadrat sampling methods were used to assess species

distribution and abundance. Plants were observed in their natural habitats such as forest areas, hill slopes, and agricultural boundaries.

**3. Data Collection:** Information on medicinal uses was collected through interviews with tribal healers (Vaidus), elders, and local inhabitants. Data recorded included scientific name, local name, family, habit, plant part used, and medicinal application.

**4. Plant Identification:** Collected specimens were identified using regional floras and standard botanical literature. Rare and threatened species such as *Rauvolfia serpentina*, *Gloriosa superba*, and *Chlorophytum borivillianum* were carefully documented.

**5. Conservation Assessment:** Species abundance and distribution patterns were analyzed. Threat factors such as overharvesting, grazing, deforestation, and habitat degradation were recorded. Conservation needs were evaluated based on field observations and local availability status.

**6. Documentation:** Photographic records were maintained, and data were systematically compiled for further analysis and interpretation.

#### Rare Medicinal Plants of Surgana Tahsil (Nashik District):

| Sr. No. | Botanical Name                    | Local Name   | Habit   | IUCN Category* | Reason for Local Rarity       |
|---------|-----------------------------------|--------------|---------|----------------|-------------------------------|
| 1       | <i>Aspidopterys cordata</i>       | Makadvel     | Climber | NE             | Habitat disturbance           |
| 2       | <i>Withania somnifera</i>         | Ashwagandha  | Shrub   | LC             | Overharvesting of roots       |
| 3       | <i>Hugonia mystax</i>             | Katesavarvel | Shrub   | NE             | Restricted dry forest margins |
| 4       | <i>Terminalia arjuna</i>          | Arjun        | Tree    | LC             | Bark extraction pressure      |
| 5       | <i>Chlorophytum borivillianum</i> | Safed Musli  | Herb    | EN             | Commercial overexploitation   |
| 6       | <i>Gloriosa superba</i>           | Kalalavi     | Climber | LC             | Collection of tubers          |
| 7       | <i>Rauvolfia serpentina</i>       | Sarpagandha  | Shrub   | EN             | Root extraction for trade     |
| 8       | <i>Asparagus racemosus</i>        | Shatavari    | Climber | LC             | Overharvesting                |
| 9       | <i>Hemidesmus indicus</i>         | Anantmul     | Climber | LC             | Root collection pressure      |
| 10      | <i>Decalepis hamiltonii</i>       | Nannari      | Climber | EN             | Excessive root harvesting     |
| 11      | <i>Pterocarpus marsupium</i>      | Bija         | Tree    | NT             | Timber exploitation           |
| 12      | <i>Boswellia serrata</i>          | Salai        | Tree    | NT             | Resin extraction              |

|    |                                 |            |         |    |                         |
|----|---------------------------------|------------|---------|----|-------------------------|
| 13 | <i>Oroxylum indicum</i>         | Tetu       | Tree    | LC | Bark and pod collection |
| 14 | <i>Stereospermum suaveolens</i> | Padal      | Tree    | LC | Habitat degradation     |
| 15 | <i>Celastrus paniculatus</i>    | Malkangni  | Climber | LC | Seed collection         |
| 16 | <i>Tinospora cordifolia</i>     | Gulvel     | Climber | LC | Overharvesting          |
| 17 | <i>Holarrhena pubescens</i>     | Kuda       | Tree    | LC | Bark extraction         |
| 18 | <i>Ailanthus excelsa</i>        | Maharukh   | Tree    | LC | Habitat loss            |
| 19 | <i>Gymnema sylvestre</i>        | Gudmar     | Climber | LC | Overcollection          |
| 20 | <i>Curculigo orchioides</i>     | Kali Musli | Herb    | EN | Commercial exploitation |

### Result:

The present investigation documented **approximately 45–60 medicinal plant species** from forest patches and tribal villages of Surgana Tahsil, Nashik District. The vegetation comprises herbs, shrubs, climbers, and trees belonging to diverse families such as Fabaceae, Apocynaceae, Liliaceae (Asparagaceae), Combretaceae, and Euphorbiaceae.

Several species of high medicinal and conservation value were recorded, including **Rauvolfia serpentina**, **Gloriosa superba**, **Chlorophytum borivillianum**, **Oroxylum indicum**, and **Curculigo orchioides**. Among the 20 rare medicinal plants analyzed, 5 species fall under **Endangered (EN)** category, 2 under **Near Threatened (NT)**, several under **Least Concern (LC)** globally but showing local decline, and some remain **Not Evaluated (NE)**.

The major threat factors identified during field assessment include:

- Overharvesting of roots, bark, and tubers
- Forest fires and habitat degradation
- Grazing pressure
- Commercial exploitation
- Increasing anthropogenic disturbances

Rare species such as **Decalepis hamiltonii** and **Pterocarpus marsupium** showed restricted distribution and reduced population density in surveyed quadrats. Climbers and tuberous species were found to be more vulnerable due to destructive harvesting practices.

Overall, the study indicates that while common medicinal plants remain moderately

abundant, several economically important taxa are under significant ecological stress and require priority conservation attention.

### Conclusion:

The biodiversity assessment reveals that Surgana Tahsil possesses rich medicinal plant diversity, but several rare and commercially valuable species are experiencing local population decline due to unsustainable exploitation and habitat disturbance.

The study emphasizes the urgent need for:

- **In situ conservation** through protection of forest habitats
- **Ex situ cultivation** of endangered species in nurseries and herbal gardens
- **Community participation** involving tribal healers and local stakeholders
- **Awareness programs** on sustainable harvesting techniques
- **Scientific monitoring and documentation** for long-term conservation planning

Sustainable utilization strategies combined with traditional knowledge preservation can ensure ecological balance and safeguard the medicinal plant wealth of Surgana Tahsil for future generations and pharmacological research.

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